Jon Jones, N0JK, n0jk@arrl.org

Lightning Strikes Again On 6 Meters

Magic transpolar long-path contacts completed from KH7Y, KH6SX, and N0JK/KH6 to Europe!

On March 30, I was operating as N0JK/KH6 in Oahu and was calling JS6RGQ around 1050Z. Another signal rose up out of the noise and called me. It was Bert, S57RR! Signals continued to strengthen and 559 reports were exchanged. A few minutes later Art, KH6SX, worked Bert and Bruno, IS0GQX. The opening lasted about half an hour. Bert, S57RR, sent me the following e-mail:

> Hello Jon,
>
> It was great; you were the first signal via LP, which I heard in this solar cycle. Many congratulations and I am delighted.
>
> I could not find your QTH locator, thanks for BL01.
>
> I just put it on March 20 a new antenna system with 4 × 5 element Loop Fed Antenna (LFA), which I'm still trying, however I have seen [it is] good.
>
> Take care and good activity yet.
>
> Bert, S57RR

The next night, signals were stronger. Fred, KH7Y, reported "I worked 19 stations in I, IS, 9A, and S57. Signals were strong at times with Transequatorial Propagation (TEP) flutter. At the same time as the long-path opening, we had KH9, V73, FK8 beacons being received plus the 49.75 MHz BY TV was very strong. KH6SX and N0JK/KH6 also made contacts. The opening lasted about 50 minutes, starting about 1032Z, which is 1232 HST here."

The band opened again on April 2 starting at 0957Z. Fred worked "S57, I5, IK0, I4, 9A, and IK8." The last opening occurred April 4 with two LZ stations going in Fred's log. The LZ stations had "S-9 signals and many stations from the surrounding countries were listening for me when the opening quit at 1035Z having only been open for 5 minutes." These are perhaps the first transpolar long path (TPL) contacts going west from Hawaii to Europe since 2002, in Solar Cycle 23.

Last month's column discussed KH7Y and KH6SX's TPL contacts to the Middle East, which took place the last week of February. The long path went southeast of Hawaii and the contacts took place between 1800 – 2100Z. KH7Y also worked Costas, SV1DH, on February 28 at 1841Z for the first Europe – Hawaii TPL contact

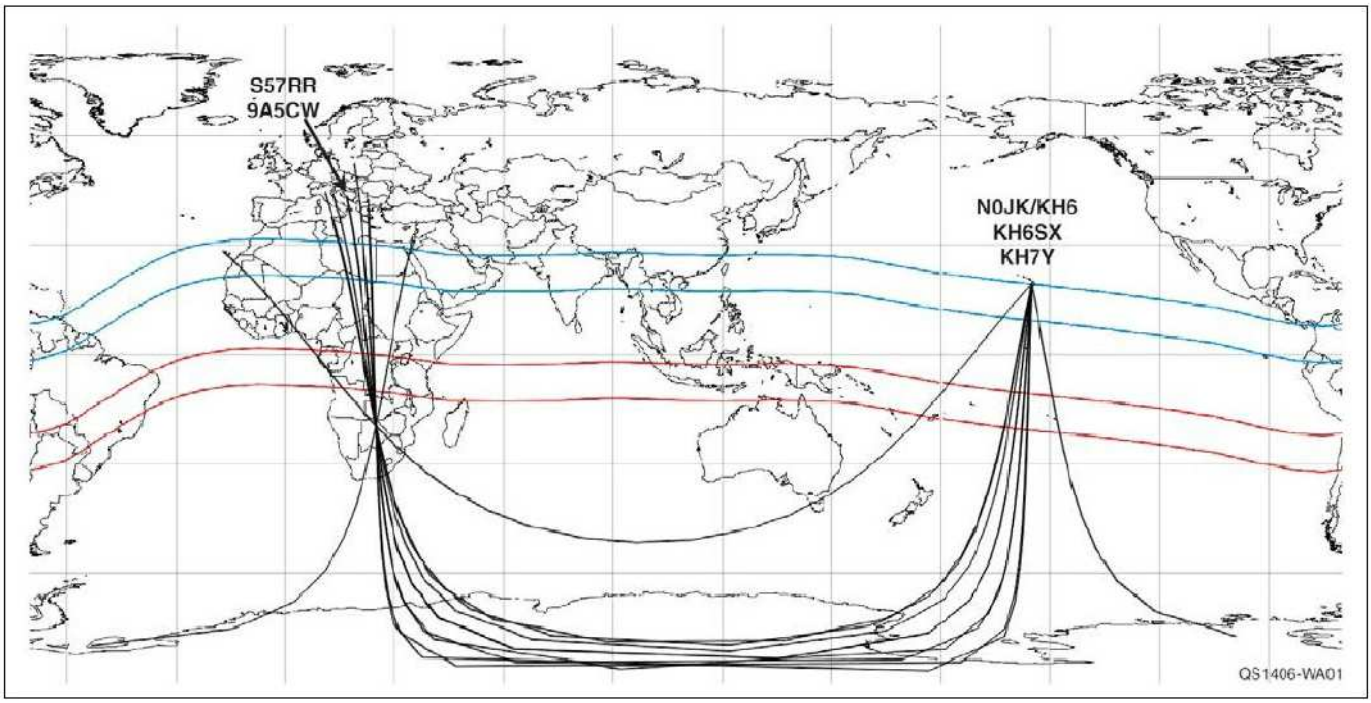

Figure 1 — The biggest activity dates for TPL this season were 3/31, 2/28, and 4/02 (UTC) in that order. This map shows a sample of contacts that have been worked from KH6 this season. The convergence point over the southern African continent is the antipodal point for KH6. [Map created by Jim Kennedy, K6MIO/KH6, using *G.Projector* written by Robert B. Schmunk, NASA Goddard Institute for Space Studies]

of Solar Cycle 24 going east. The March European long path went south and west from Hawaii and usually took place around 1030 – 1200Z.

Jim, K6MIO/KH6, noted the "typical Hawaiian (to Europe) TPL opening occurs near the solar cycle maximum on an evening TEP is already in evidence over the usual paths (KH6 – VK4), but the TEP is generally sporadic and not particularly intense or widespread. Quite strong backscatter coming from headings of about 195° is very common, suggesting lots of ionization and tilted layers. Sometimes within an hour or two of midnight HST, some very weak signals show up on 6 meters. After a few calls, signals improve, call signs are finally worked out, and contacts begin into southern Europe. Usually, signals are very weak and power (and large Yagi arrays) are quite helpful. However, on a few occasions signals are extremely loud (for example, 50 W to an indoor dipole in Portugal working Hawaii or 100 W to a dipole in Oahu working Slovenia) and even low-power contacts may be possible.

On the nighttime end of the path, the openings occur within an hour or two of local midnight. Because the paths extend more than halfway around the world, on the daytime side, they occur within an hour or two of 1100 local time." These openings are called transpolar, but "they are near the geographic poles" (see Figure 1). Jim goes on to say "The real poles of interest are probably the geomagnetic poles, which are offset by about 11° of latitude. The nighttime Hawaiian openings were almost always close to the long-path great circle headings to Europe. These headings are about 15 – 20° west of south."[1]

Small TPL Footprints in Europe

The footprints of the March TPL openings were small in Europe. They centered around Slovenia and the immediate surrounding countries. On one evening, KH7Y heard only Bulgaria. This was a very small footprint for such a long path. The small size of the European footprint may be due to this being the same TEP footprint for the southern Africa – southern Europe path. This also suggests regular TEP is involved for the last part of the path.

The Hawaiian TPL contacts are also sensitive to the high-latitude polar K index. Over 90% of the Hawaii contacts were made with a Kp (planetary K index) of 1 or 0. Typically a smoothed solar flux of over 165 is needed for the path to open, though openings have been reported at 140. The solar flux the last week of March 2014 was between 145 – 150. Why did the TPL going east from Hawaii peak in late February, while the west TPL to Europe was best in late March? I think the answer relates to the position of the geomagnetic equator. It dips south, going east from Hawaii. TEP is best with the sun directly over the geomagnetic equator. This would be before the spring equinox in this region. The geomagnetic equator gradually moves north, going west from Hawaii. It would be directly under the sun between the spring equinox and the first week of April.

On the Bands

50 MHz. Hawaii was not the only "hot spot" for 6 meters in March. Stateside DXers had fireworks the last week of March as well. A major F2 and TEP opening took place Friday, March 28. Sam, K5SW (EM25), related the following:

> I was listening for about one hour, starting around 1830Z. There were stations in Florida and South Texas working into South America, but I heard nothing. Around 1923Z I began to hear HC5K in FI07 Ecuador and by 1926Z I worked Ted using SSB on 50.110 (this was probably in 2001, which was the last cycle that I worked HC stations). Hearing no other signals until 1949Z, I heard a loud signal on 50.102 MHz. It was Carlos, OA1F (a sharp CW Operator), in FI03 (new grid for me) on CW. I was the second US station to work him, after that, I posted him on the logger and he ran a big pileup for over an hour, working all over the US.
>
> During that time I also copied OA4TT/b (FH16) on 50.077 very loud for about the same length of time. On backscatter I heard many US signals. I was watching 50.110 where VP8ALJ was and I heard two Florida stations, on backscatter, work him, but never heard the VP8.

Tim, NW0W (EM47), "heard the VP8VHF/b off and on for about an hour on the 28th." He also observed "OA1F was in today about 20-30/S9 for a long time. As HC5CR and KP4EIT (on sidescatter I guess)" Bob, W4GCB, in Georgia said "OA1F was loud and clear on CW and I worked him at 2014Z, 599 both ways. He remained strong for more than an hour and made dozens of contacts. An hour later at 2115Z, I had a solid QSO with LU1WI, also on CW. He was an honest 569 and later peaked above S7, although he was more up and down in strength than OA1F."

Russ, K4QI (FM06), worked HC5CR, HC5K, and OA1F with strong signals on the 28th. Jay, K0GU (DN70), found the March 28th opening to "be a very nice opening with big US backscatter." OA4TT/b was loud for a long time. Got two new grids. YV1DIG was skewed toward Easter Island almost straight south from me.

"Prop to OA died out here before OA1F showed up on CW and created a huge pileup. I could hear much of the pile on backscatter skewed west." Jay's reception reports are in Table 1. TJ3SN reported working FK8CP and VK4MA around 2300Z. This may be TEL (Trans-equatorial long path).

On March 30, Dave, N9HF (EL99), worked CP6UA "for his country 96!" From Hawaii, N0JK/KH6 (BL01) worked PP5XX (GG53), CE3RR (FF46), and LU5FF (FF99) the same day. Not long path, but over 12,000 kilometer contacts. Also on the 30th there was an extensive E_s link to TEP opening to the South Pacific. Remi, FK8CP, was spotted across the country to the East Coast (see Figure 2) by AA4SC, K4PI, W7DO (EM94), and N8RR (EM98). Extensive E_s was noted by Bob, W4GCB, the same evening: "By the way, we had a legitimate single-hop E_s opening March 29 around 9 PM local time (March 30 UTC). I happened to tune across the beacon band and Larry's beacon, N0LL/b, almost blew me out of my chair.

"Ed, KE4EE, and Rob, N4VPI, quickly joined the fun and we worked a number of stations in Texas, Oklahoma, and Kansas — prototypical E_s contacts, and the opening lasted about an hour. Last year, we had no E_s until early May, so we are a month ahead — maybe that's a good sign for 2014." As you read this, hopefully the summer 2014 E_s season will be in swing. March has the lowest occurrence of mid-latitude E_s in the northern hemisphere of any month.

[1] J. Kennedy, KH6/K6MIO, "50 MHz Long-Path Propagation," *Proceedings of the 37th Conference of the Central States VHF Society*, 2003, pp 84 – 105.