K1SIX SIX METER TRANSATLANTIC Es SEASON BEST FIVE DAYS

and

Data Collection Methodology[1]

To date, using the objective accumulated data point method described below, the best five UTC days of the present 6M transatlantic Es season were (**values in ( ) are the data point scores**):

4 June 2021 (**675**) ***This is also the best 'data point day' in all records to date!***[2]

17 June 2021 (**632**) ***This is also the 2nd best 'data point day' in all records to date!***[2]

19 May 2021 (**611**) ***This is also the 3rd best 'data point day' in all records to date!***[2]

20 May 2021 (**317**) ***Tied for 4th place best 'data point day' with 11 July 2020!***[2]

8 July 2021 (**288**) ***The 5th place best 'data point day' in all records was 4 August, 2018.*** (**300**).[2]

And the diurnal maximum peaks were at: 12:30 UTC for the AM Peak (**705**) and 21:30 UTC for the PM Peak (**732**) with a null during the high activity period at 17:30 UTC (**196**). Note correlation. ***The hghest accumulated annual data point count since 1982 was for the record 2021 summer season*** (**T.B.D.**).[2]

Data Collection Methodology (Updated 30 July 2021)

Data Points Defined (Thresholds)

A data point is defined as follows: For CW or SSB- a signal strong enough to accurately determine the full call sign. For WSJT (JT65 and FT8 effective 17 June 2017) - A signal equal to or greater than -10 dB with an accurate call sign decode. Note that -10 dB signal levels are weakly audible by ear here in the 3 kHz wide IF WSJT bandwidth utilized and should be detectable on CW (not SSB) when the IF bandwidth is narrowed down to 500 Hz or even 250 Hz or less. In addition, -10 dB is an easy number to remember.

Note that it was essential to account for the popularity of FT8 in the entire history of data collection so that some correlation to past history could be determined. It had to be done. Some have argued the point but this is what I have adopted as a standard going forward and I have high confidence in the methodology.

Data Points are accumulated in one hour time bins

The overall data points accumulated are parsed to ensure they all meet the minimum signal levels required and represent ***mostly*** 3 hop paths across mostly 3-hop+ ranges across ***mostly*** mid-latitude transatlantic paths. Some Arctic paths like OH and TF are maintained as are the Azores which could be 2x Es at times from here. OX is removed as are more southern end-points in southern Africa to avoid equatorial zone contribution which would greatly over-complicate a generally temperate zone goal.

After the initial parsing, the time stamped data are placed into one of 24 one hour UTC time bins for the particular UTC date then parsed again. This time to remove any dupes. No duplicate call signs are allowed within any one hour time bin to ensure that the total data point count for each individual hour represents different stations. The data counts for each individual hour are then placed in a master spreadsheet.

This process continues until all hours for a day's run are completed. Daily dupes are allowed in different hourly bins but never within a unique hourly bin. Once entered into the master spreadsheet, hourly data point counts are summed with all previous years' hourly counts to produce a diurnal plot such as **this**. Diurnal plots for transatlantic and **far east paths** are updated annually along with the models from contributors in the Es_Predict.xls spreadsheet on my website at **https://www.k1six.com/**.

The file ALL.txt within the WSJT-X application is the source for all WSJT data collected. I hit STOP then Open Log Directory, choose ALL.txt then File Save As to a transport thumb drive during a "run" renaming the exported file to something like "ALL062521 12Z" and compile on a separate workstation. The compilation run can be as small as 1 hour, batches of several hours or several days. Once I ensure I have a good file transport, I hit Erase ALL.txt, hit MONITOR and start all over again. Usually at the top of the hour. Each "Time Bin" starts at the top of the UTC hour and runs through 59 minutes, 59 seconds after that hour. They are plotted at half past the hour for best resolution and to avoid confusion. Thus, a "time bin" starting at 12:00 UTC would have the results plotted at 12:30 UTC. **CLICK HERE FOR A 4 JULY 2021 JA OPENING EXAMPLE OF MANUALLY PARSED HOURLY SUMMARY DATA PREPARED FOR IMPORT.**

The parsing process is manual at this time and can be time consuming after a busy day, taking up to three days to catch up. But it's a learning process as I develop an outline for an automated import/parsing utility to be embedded within the master MS Excel spreadsheet.

Daily data point counts and compilation

The final step in the process of compilation is to take the sum of all accumulated data points for a given UTC day and place them in the daily database portion of the master spreadsheet for a unique date (MM/DD). These are recorded for each year then summed to estimate some statistical assessments of things like **summer Es season 3x Es seasonal probabilities** (from which **single hop probabilities** can be statistically derived from which any number of hop probabilities can be statistically derived), **a season report card** to compare against previous seasons with a projection, estimated quality, etc., etc. Please note that I am presently using 3 past year moving average projections which is subject to change. 4 of these will fit into the span between solar maximums. Past moving average projections account for the dynamics of change from the influences of ***modern*** history. And there have been many influences over the past 10 years! WSJT-X is certainly one of them.

Operational Planning using Statistical Modeling

The best dates and times to operate can be estimated to a reasonable degree of accuracy by using the following formula where **X** equals the % chance of probability for a desired path:

X = DIURNAL Prob. % (A) x UNIQUE or BLENDED SEASONAL Prob. % (B) x CHAOS Prob. % (C)

Chaos cannot be modeled. An example of chaos is when a similarly capable neighbor only 7 miles away is working stations you can't even hear. This is caused by ray focusing, particularly during multi-hop events. The more hops, the more likely this is to occur. At times just waiting can bring you into the path footprint as the dynamics of multiple interrelated complex refraction points comes into play for your benefit.

FURTHER BRIEF EXPLANATION WILL BE ADDED HERE LATER!

Table 1.

Previous Date of Test > **30-Jul-21** **Past Season Model Confidence >** **NA.NA%**

Model Used ** **>** **K1SIX 31 August 2020 Diurnal, 16,790 datapoint samples**

Paths of Interest ** **>** **Transatlantic, mostly Temperate Zone, some Arctic**

Number of samples for test > **6,492** **5 point averaged confidence** ** **:** **99.10%**

MODEL USED**			TEST RESULT OF COMPARISONS**		
MODEL PARAMETER	**COMMON UTC**	**MODEL %**	**TEST % to date**[3]	**Unsigned Deviation from 100% model**	**CALCULATED CONFIDENCE**
R (ise)	**09:30**	**1.42%**	2.94%	1.52%	98.48%
AM (peak)	**12:30**	**9.08%**	10.74%	1.66%	98.34%
NULL	**18:30**	**4.22%**	4.34%	0.12%	99.88%
PM (peak)	**21:30**	**12.14%**	11.26%	0.88%	99.12%
F (all)	**00:30**	**0.55%**	0.25%	0.30%	99.70%

5 Measurement Points Assessed against present model:

R: Path UTC rising edge time where diurnal probability rises above 1.00%.

F: Path UTC falling edge time where diurnal probability falls below 1.00%.

AM: Westrrn end sunrise diurnal peak UTC time per model.

PM: Westrrn end sunset diurnal peak UTC time per model.

NULL: Null point UTC time between AM and PM peaks per model.

NOTE: Valid only for the unique location and paths of interest indicated!**

NOTES

[1] ***Please hit RELOAD/REFRESH for all links to ensure your browser cache receives the most recent data!***

[2] ***Values are updated any time the main plot is updated. The Confidence Test table is at least one day behind to allow a determination of how many new samples were added between the two dates (chart – Table 1).***

[3] ***All 5 new season data point parameter values must be non-zero for a valid assessment!***

Vy 73,

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