

THE SIX AND TEN REPORT

**July
2004**

- Section 1. Analysis of 28 MHz reports from the UK**
- Section 2. Analysis of 50 MHz reports from the UK**
- Section 3. Solar and Geomagnetic Data**
- Section 4. 50 MHz outside Britain**
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Analysis of 28 MHz reports from the UK

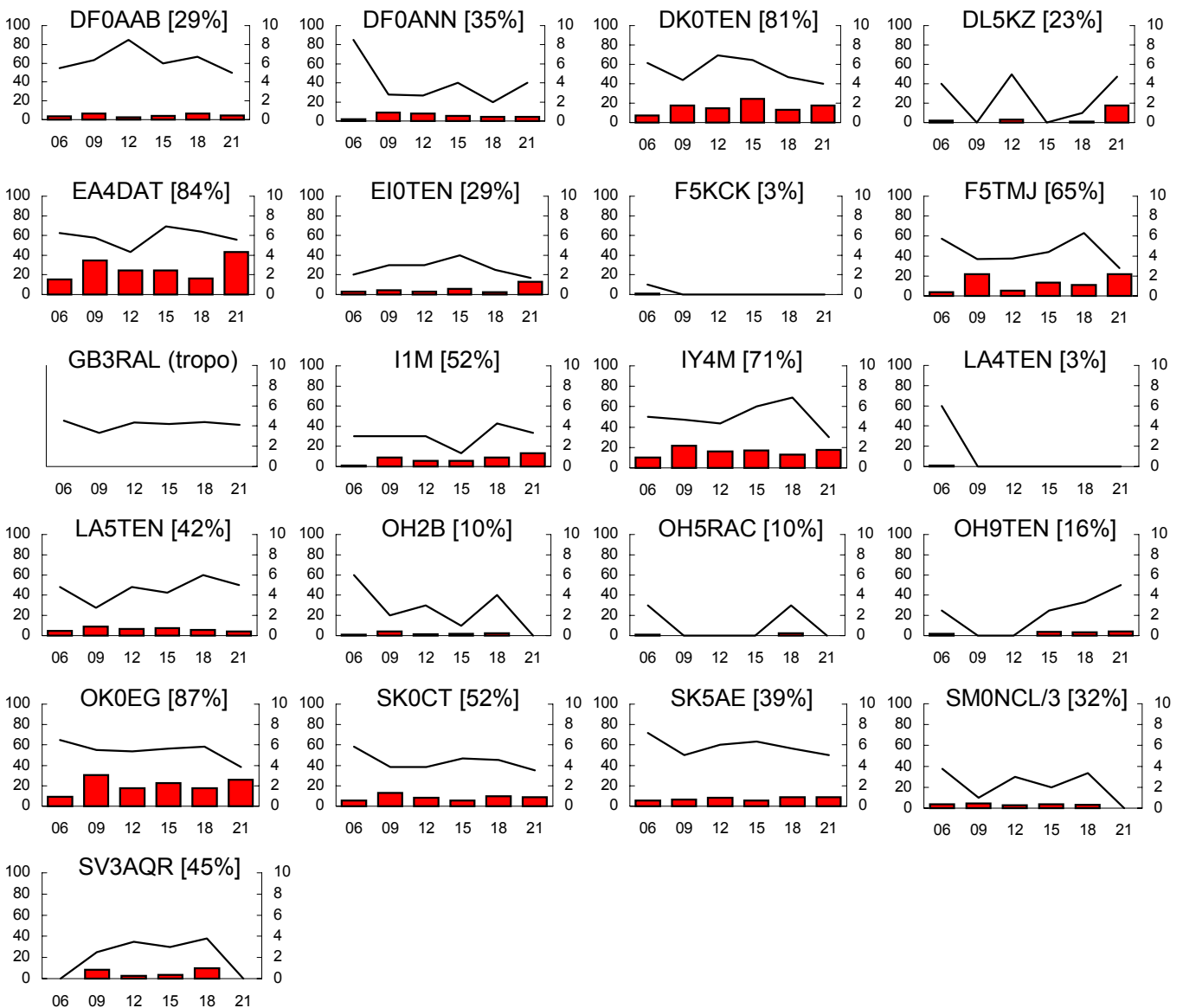
28 MHz reports and logs for July 2004 from G2AHU, G3IMW, G3USF, G4TMV, G4UPS, G0AEV, G0IHF and packet cluster reports. Compilation and commentary by G0AEV.

Sporadic E dominated propagation on 10m – as expected, of course – and was slightly more prevalent in July than in June. The best days for Es were in the first 10 days of the month. Conditions in the remainder of July were mixed with some reasonable days and some very poor. The pattern is similar to that seen on 6m (as discussed in the next Section). F2 openings were restricted to southern circuits from Africa and southern South America on less than 50% of days.

Beacon graphs legend

Legend for all beacon graphs in this section: - graph bars (left Y-axis): beacon reliability as the percentage of days a beacon was heard by any UK observer within each time band. Graph lines (right Y-axis): signal strength as the average of the daily maximum signal reported by any observer in each time band. Time band codes (X-axis): 6=0600-0900, 9=0900-1200, 12=1200-1500, etc. Callsigns are followed by daily reliability figures, the percentage of days per month when the beacon was reported.

European Propagation / Beacons



Propagation modes for European beacons.

Propagation for the beacons graphed on the previous page was sporadic E in all cases except for a little auroral E in the 21z period on OH9TEN, SK0CT and SK5AE, and all the results shown for GB3RAL which are via "tropo" at G0AEV. Some of the results – e.g. for EI0TEN and F5KCK – were probably via Es backscatter. There was no direct or scatter F-layer propagation within Europe, which is as anticipated (mid-summer ionospheric critical frequencies being too low). However, despite some quite intense auroras, no one reported auroral signals on any of the 10m beacons – some aurora might have been expected considering how extensive the aurora were on 6m (see Section 3).

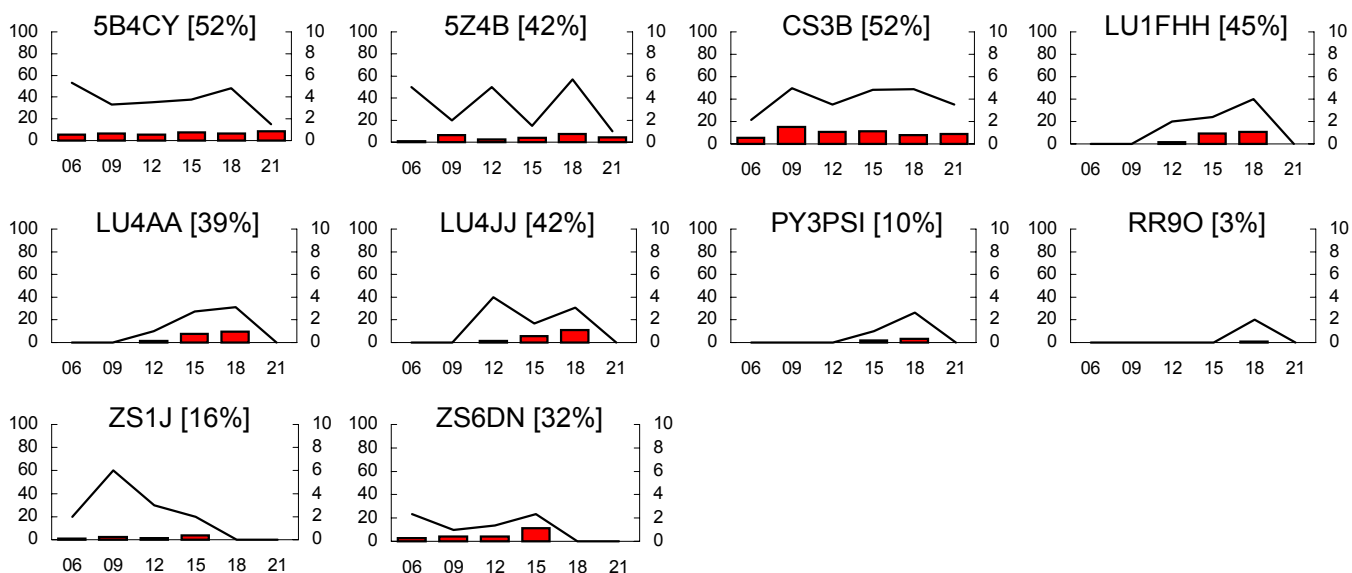
Daily reliabilities were generally higher than in June. For many of the European beacons, and in the absence of solar cycle peak F-backscatter, the midsummer Es season provides the most reliable propagation mode. As indicated in the graphs, OK0EG was heard on 87% of days, EA4DAT on 84% and DK0TEN on 81%. Reliability within each day for these beacons ranged around 20% - this figure can be interpreted as there being a 1 in 5 chance of hearing the beacon at any time during July daylight hours..

European Beacon Notes.

The spiky results in graph for DL5KZ indicate relatively few reports of this beacon (due to the frequency of 28.320?), but this beacon – and the other 3 German beacons heard – was QRV all month. DL0IGI was still QRT. There were no reports of either IZ2DAY or IK1ZYW – the former is probably not active and the latter too weak. IY4M and I1M both produced good results. S55ZRS on 10m beacon is QRT. LA4TEN is now off air – the one report in July was at the beginning of the month and perhaps in error?. OH2B returned to service in late July. The new OH5RAC continue to be rather disappointing.

Propagation to Asia, Africa, Oceania, South and Central America

Beacon Graphs.



Suggested propagation modes.

Sporadic E was responsible for the propagation to 5B4CY and for most of the propagation to CS3B. The single report of RR9O on 26th was via multi-hop Es – a good catch by G0IHF. The other beacons reported (in Africa and southern South America) were heard by normal F-layer propagation probably some (but non-quantifiable) assistance of a sporadic E first hop.

Beacon Notes.

There were no reports of 4X6TU, despite good propagation at times to 5B4CY. The beacon is still active (I have heard it a couple of times in August and September) but it clearly has some operational problems. The results from the ZS beacons are better than the relatively poor showing last month and both were probably QRV. However ZS1J was last reported on 26th July and it has not been reported (to me at least) since and is now probably off-air. PY3PSI is believed to be intermittent. Other beacons known to off include OA4B.

10m DX in July 2004

The following list of DX countries worked or heard in the UK comes mainly from packet cluster spots (DX Summit: <http://oh2aq.kolumbus.com/dxs/>) and from Six and Ten reporters. The countries heard in the Middle East, North Africa and North America (including the Caribbean) are via Es.

DX in July: 4J, 7X, CE, CE0Z, CT3, EA8, FY, IH9, KP4, LU, P4, PY, TU, VE, W

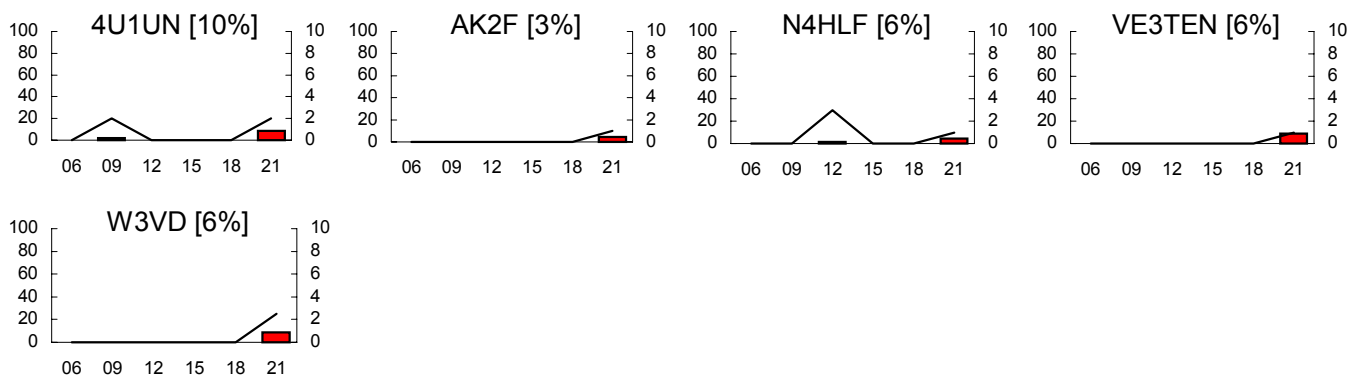
DX in June (for comparison): 4X, 5B, CE, CN, CX, D2, EA8, KP4, LU, OD, PY, ST, SU, V5, VE, W

Propagation to North America

Suggested propagation modes.

All the propagation between UK and North America was by multi-hop sporadic E. The mode was identified on 6 days – 3rd, 4th, 6th, 8th, 10th and 18th – not as many as the 12 days reported by 6m operators (see Section 2 of this Report). On Six, QSOs rather than beacons are used to determine which areas the band is open to. Many of the July 6m events were with stations in the Caribbean, areas without 10m beacons (assuming the KP4SQ beacon is QRT), and this may explain some of the 6-10 discrepancy. It is also probably the case that 10m beacon monitors don't listen for (or listen but don't hear) some weak N American beacon signals while 6m operators are more vigilant in picking up marginal 50MHz openings. In theory 10m propagation should occur at least as frequently as that seen on 6m but in July only one 10m opening (to Florida on 18th) was not also seen on 6m.

North American Beacon Graphs



Beacon Notes.

The beacons heard above are known to be QRV from observations made by listeners in the USA and Canada and reported on the HFbeacons email list. Many other 10m beacons are active and, with a bit of luck, some of these will be heard again in the UK during the coming winter DX season.

Solar and Geomagnetic Data for July 2004

Data supplied by G0CAS (Sun Mag¹) and from Internet sources. Compilation by G0AEV.

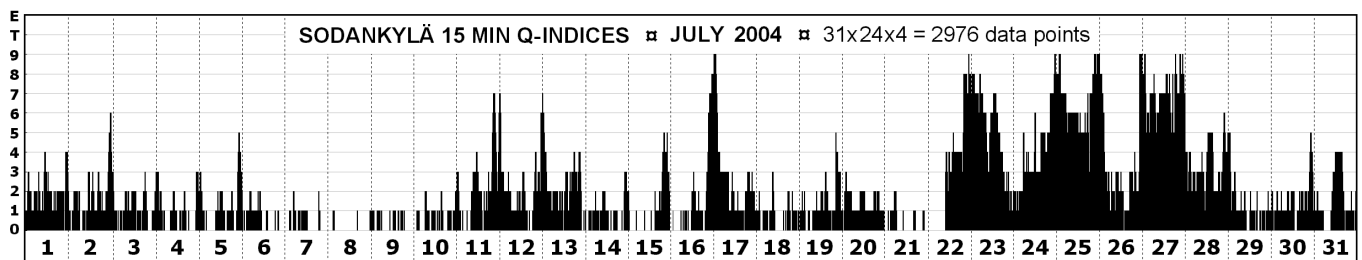
| | | | |
|-----------------------|------------|-----------------------------|---------------------------|
| Sunspot numbers (SEC) | Mean 87.8 | Max 176 (19 th) | Min 17 (8 th) |
| Solar Flux (28 MHz) | Mean 118.7 | Max 175 (20 th) | Min 78 (5 th) |

Solar data for July 2004 are presented in the table at the end of this section. Numbers in the 28 and 50 MHz columns of this table are the total daily “areas” worked/heard from the UK for each of several propagation modes and are a summary of the data presented in the first sections of this Report. On 28 MHz “areas” refer to the number of beacons reported via Es and F-layer, on 50 MHz the number of countries via Es, F-layer, Aurora and Auroral E. F2 critical frequencies from Chilton in Oxfordshire. SIDC spots are from SIDC, and other solar data from the joint USAF/NOAA daily summaries or directly from SEC.

Energetic Events. This section lists the most energetic solar X-ray events recorded during the month, and since the last solar minimum these have been of M or X class. During the last several months there have been very few flares of this magnitude and I was considering including C-class events from this month. However July provided a surprising level of solar activity 32 M and 6 X class events (the largest X3.6) – so clearly reducing the reporting threshold to the “C” category is premature!

| | | | | | | | | | |
|------------------|-----------|---------|------------------|------------------|-----------|---------|------------------|-----------|---------|
| 12 th | 0736-0859 | M1.6 | | 17 th | 0751-0759 | X1.0 1f | 24 th | 0601-0610 | M1.0 1f |
| 13 th | 0009-0023 | M6.7 | | | 1645-1657 | M2.5 1n | | 1840-1856 | M2.5 |
| | 0840-0855 | M5.4 1n | | | 2124-2138 | M2.0 1f | 25 th | 0539-0558 | M7.1 2b |
| | 1159-1212 | M2.9 | | | 2254-2316 | M1.1 | | 0630-0645 | M1.0 1f |
| | 1833-1842 | M1.1 1n | 18 th | 0000-0040 | M2.0 1f | | | 1337-1355 | M2.2 |
| | 1924-1936 | M6.2 1b | | 0251-0303 | M1.5 Sf | | | 1419-1643 | M1.1 1f |
| 14 th | 0502-0527 | M6.2 1n | | 1704-1715 | M1.9 1f | | 26 th | 0536-0601 | M1.3 Sf |
| 15 th | 0130-0148 | X1.8 | 20 th | 1222-1245 | M8.6 3b | | | 1723-1737 | M1.1 2n |
| | 1815-1828 | X1.6 | 22 nd | 0014-0043 | M9.1 | | | 2346-0011 | M1.2 |
| 16 th | 0143-0212 | X1.3 | | 2240-2307 | M1.6 2n | | 27 th | 0541-0552 | M1.1 1n |
| | 1032-1046 | X1.1 1f | 23 rd | 1707-1735 | M2.2 Sf | | | 1959-2037 | M1.5 1f |
| | 1349-1401 | X3.6 3b | | 2115-2130 | M1.7 | | | 2346-0011 | M1.2 1f |
| | 1622-1631 | M1.2 Sf | | | | | 28 th | 2345-0016 | M2.0 |

Q-indices from Sodankylä, Finland (Thanks Vaïno, OH2LX)



The Q-index graph above shows clearly the very disturbed period 22nd-28th and the particularly quiet days 8th and 21st. Geomagnetic data from Finnish observatories in July 2004:

Monthly averages

Sodankylä: monthly Ak average = 28.7
 Nurmijärvi: monthly Ak average = 26.4

Most disturbed day:

Sodankylä: 27 July, Ak = 203
 Nurmijärvi: 27 July, Ak = 255

Analysis of 50 MHz reports from the UK

UK 50 MHz reports for July 2004 from G2ADR, G2AHU, G3HBR, G3IMW, G3USF, G4UPS and via packet cluster spots. Compilation and commentary by G0AEV.

The analysis of UK 50Mhz activity this month benefited from well in excess of 2500 reports - a combination of contributions from 6&10 members and DX cluster spots. Around 300 of these reports were of auroral contacts that were made in the period 22-27 July, the first extended period of auroral activity for many months. However, as expected, the majority of reports were for sporadic E, and these included a nice selection of DX from the Middle East, North Africa and North American. The Caribbean area alone provided UK amateurs with Es contacts with (or reception reports of) stations in 9Y, C6, FG, FM, HI, HP, J7, KP2, KP4, P4, PJ2, PJ7, V4, and VP5. J97KV and PJ7M were particularly busy in the early part of the month with both operations making many QSOs with G stations. Several of our reporters worked new countries, including Eric G2ADR whose wishes for DX have at last been fulfilled!

Once again the reports provided by 6&10 members proved particularly useful, and this time especially for 16 and 17th July when DX cluster data from DX Summit (<http://oh2aq.kolumbus.com/dxs/>) was unavailable.

Sporadic E

July sporadic E activity (as seen from the UK) came in 3 phases. Activity was good to excellent in the first third of July (1st to 11th) with an average of 22.7 country/areas worked per day. The best days for Es in July (2nd, 4th, 8th and 10th) all fell in this period. The middle phase (12th-20th July) brought indifferent conditions with only 6.5 country/areas worked on average each day. In the final phase (21st-31st) there were many geomagnetic storms (and generally unsettled conditions in all but the final few days of the month), and these events had a distinctly negative effect on sporadic E. This final period was marked with alternating moderate to good activity levels – the best day here being 26th – with very poor days – 23rd, 25th, and 27th – when there were radio aurora and elevated geomagnetic indices. The average number of country/areas worked/heard by Es during this period was 10.5. General trends in sporadic E in July are shown in the Es Propagation Summary on page 5 of this section of the Report.

Sporadic E results below are in tables grouped by country area and ordered alphabetically by country prefix. Percentages following the country name are the daily reliability values (the number of days when propagation was reported). The first row of each table, "D" is the day of the month, subsequent rows give the maximum signal strength reported from the UK in each of three hour time bands ("06" for the band 0600 - 0900, "09" for the band 0900 - 1200, etc.). A figure of "0" indicates that signal strength was not reported.

| | 4X Israel (23%) | 5B Cyprus (16%) | 5T (13%) | 7X Algeria (16%) | 9Y Trinidad (16%) |
|----|-------------------|-----------------|----------|------------------|-------------------|
| D | 1 4 8 10 14 21 22 | 1 2 7 8 10 | 1 3 7 30 | 1 2 4 5 14 | 1 6 8 12 26 |
| 06 | | 6 | 5 | | |
| 09 | 5 0 0 | 5 3 | | | |
| 12 | 9 8 7 | | | | |
| 15 | 9 3 5 7 | 5 9 7 | 1 | 3 5 9 9 | 5 |
| 18 | | | 0 9 | 9 9 | 1 9 7 5 3 |
| 21 | | | 9 7 | 0 0 | 5 6 |

| | 9H Malta (23%) | A4 (3%) | CN Morocco (61%) |
|----|-------------------|---------|---|
| D | 2 5 7 10 14 29 31 | 14 | 1 2 3 4 5 6 7 8 9 10 11 14 15 19 20 22 24 28 31 |
| 06 | | | 5 9 9 8 5 5 7 |
| 09 | 0 | | 9 9 6 8 9 9 5 6 9 |
| 12 | 9 5 0 1 | | 9 2 7 5 0 3 7 7 |
| 15 | 5 | 0 | 3 7 5 6 9 5 6 1 7 |
| 18 | 2 5 5 5 | | 9 5 7 9 9 5 6 2 5 2 5 |
| 21 | | | 9 6 0 5 5 9 |

| | C6 (3%) | CT Portugal (65%) | CT3 Madeira (19%) |
|----|---------|--|-------------------|
| D | 6 | 1 2 3 4 5 6 7 8 9 10 11 14 15 19 20 22 24 26 30 31 | 1 2 3 11 17 24 |
| 03 | | | |
| 06 | | 9 4 8 9 | 0 |
| 09 | | 9 0 5 9 | 0 |
| 12 | | 0 9 7 2 | |
| 15 | | 4 | |
| 18 | | 9 9 | 0 6 7 |
| 21 | 6 | 9 | 5 |

| | CU Azores (45%) | DL Germany (55%) |
|----|------------------------------------|---|
| D | 1 2 3 4 6 7 9 10 11 15 19 22 26 30 | 1 2 3 4 7 8 9 10 11 12 21 22 24 26 29 30 31 |
| 00 | | |
| 06 | 3 | |
| 09 | 5 0 | 9 9 9 |
| 12 | 9 9 2 9 | 9 9 0 9 0 7 |
| 15 | 0 9 2 9 | 9 5 9 6 0 0 7 0 5 |
| 18 | 2 3 9 2 3 | 9 7 9 6 9 0 7 9 9 9 |
| 21 | 4 9 9 9 9 3 | 9 9 9 9 8 9 0 |

| | EA Spain (68%) | EA9 Ceuta/Melilla (23%) |
|----|---|-------------------------|
| D | 1 2 3 4 5 6 7 8 9 10 11 12 14 15 20 21 22 26 29 30 31 | 2 3 5 11 15 29 31 |
| 06 | 5 9 9 | |
| 09 | 9 9 6 9 9 0 6 | 9 |
| 12 | 9 9 6 9 9 9 | 9 9 |
| 15 | 0 5 9 9 9 9 9 9 9 3 9 | 7 |
| 18 | 2 9 9 9 9 0 9 9 0 9 | 5 9 0 |
| 21 | 6 0 0 0 | 1 |

| | EA8 (13%) | EI (6%) | ER (3%) | ES (13%) | F France (39%) | FG (3%) |
|----|-----------|---------|---------|------------|-------------------------------|---------|
| D | 2 4 10 26 | 8 11 | 26 | 4 10 16 26 | 1 2 3 5 7 8 10 11 12 21 29 31 | 26 |
| 06 | 9 | | | | 0 9 0 | |
| 09 | | 5 7 | | | 0 9 0 | |
| 12 | | | | 0 8 | 9 6 0 0 0 5 | |
| 15 | 9 3 | | | 6 0 | 0 9 0 9 0 0 0 | |
| 18 | 0 5 | | 0 | 0 0 | 0 0 9 9 9 7 | |
| 21 | | | | | | 5 |

| | FM (3%) | G<>GM Inter-UK (26%) | HA rx (3%) | HB Switzerland (42%) |
|----|---------|----------------------|------------|------------------------------------|
| D | 3 6 | 1 2 7 10 11 16 21 26 | 4 | 1 2 4 8 10 11 21 22 24 27 29 30 31 |
| 06 | | 9 9 | | 9 |
| 09 | | 9 9 | | 0 0 0 9 0 |
| 12 | 2 | | | 9 |
| 15 | | 9 9 | 5 | 9 9 9 8 0 7 |
| 18 | 5 | 0 | 0 9 | 6 5 |
| 21 | | | | |

| | HI (3%) | HP (6%) | I/IS/IT Italy (81%) |
|----|---------|---------|---|
| D | 7 | 10 26 | 1 2 3 4 5 6 7 8 9 10 11 12 14 15 17 18 20 21 22 24 25 26 29 30 31 |
| 06 | | | 9 |
| 09 | | | 3 5 5 9 8 9 9 9 7 7 9 9 0 6 9 |
| 12 | | | 9 9 9 9 8 9 9 9 5 8 9 9 9 9 9 |
| 15 | | | 9 9 7 9 6 6 9 3 9 9 5 9 6 6 9 |
| 18 | | | 6 9 9 9 5 9 9 9 8 9 9 7 9 9 9 |
| 21 | 9 | 5 5 | 2 0 |

| | J7 (13%) | JW (3%) | KP2 (10%) | KP4 (10%) | LA Norway (32%) | LX (3%) |
|----|----------|---------|-----------|-----------|---------------------------|---------|
| D | 1 2 3 4 | 28 | 6 7 26 | 6 7 26 | 1 4 7 8 10 11 16 21 26 30 | 8 |
| 06 | | | | | 9 | |
| 09 | 7 | | | 0 | | |
| 12 | 9 | | | 9 | 5 5 9 | |
| 15 | | | | 5 | 3 7 7 | |
| 18 | 9 0 7 | 9 | | 9 7 | 9 0 9 | 9 |
| 21 | 0 | | 5 0 3 | 7 7 9 | 5 5 9 | |

| | LY Lithuania (32%) | LZ Bulgaria (16%) | OD (10%) | OH Finland (29%) |
|----|----------------------------|-------------------|----------|--------------------------|
| D | 3 4 8 10 12 16 17 18 20 21 | 2 4 7 8 9 | 2 10 21 | 4 8 10 11 13 16 24 26 30 |
| 06 | 9 9 0 | 7 | 5 | 0 9 |
| 09 | | 7 0 5 | 0 | 7 0 |
| 12 | 6 | 9 | 9 | 0 9 9 0 |
| 15 | 9 9 0 | 3 5 | | 8 5 0 |
| 18 | 0 0 9 9 5 9 | 9 0 | | 9 9 9 |
| 21 | | | | 0 5 |

| | OE Austria (52%) | OK/OM Czech/Slovak Republics (48%) |
|----|---|--|
| D | 1 2 4 7 8 9 10 11 12 14 15 21 22 24 26 30 | 1 2 4 7 8 9 10 11 12 21 22 24 26 30 31 |
| 06 | 5 9 9 | 9 7 9 |
| 09 | 9 4 | 6 9 5 9 |
| 12 | 9 9 7 9 7 | 9 9 9 5 2 0 |
| 15 | 5 9 5 9 8 6 9 | 9 9 9 9 0 9 9 |
| 18 | 9 8 8 | 0 6 9 9 9 0 |
| 21 | | 0 |

| | ON (7%) | OX (3%) | OY Faeroe Is (23%) | OZ Denmark (23%) | P4 (7%) | PA Holland (13%) |
|----|---------|---------|---------------------|-------------------|---------|------------------|
| D | 1 7 | 10 | 7 10 11 16 24 26 28 | 4 7 8 10 12 16 21 | 2 6 | 10 11 23 26 |
| 06 | | | 9 5 | 5 7 9 | | 9 |
| 09 | | | 7 | 6 5 | | 2 |
| 12 | | | | 6 6 | | |
| 15 | 0 | 0 | 7 9 | 5 0 | | 9 |
| 18 | 4 | 3 | 9 9 9 9 | 3 0 9 9 | | 9 |
| 21 | | | 5 0 | | 2 5 | |

| | PJ2(3%) | PJ7 St Maarten (23%) | SM Sweden (26%) | SV Greece (32%) |
|----|---------|----------------------|-----------------------|--------------------------|
| D | 6 | 2 3 4 5 6 7 8 | 4 8 10 11 16 21 26 27 | 1 4 5 8 9 10 12 14 30 31 |
| 03 | | | 7 | |
| 06 | | | 9 | 5 5 |
| 09 | | | | 0 |
| 12 | | 9 3 7 | 9 | |
| 15 | | 9 5 | 9 9 | 7 9 |
| 18 | | 0 7 9 3 9 | 9 9 9 | 5 0 7 9 9 9 |
| 21 | 5 | 9 4 9 7 | 5 2 | 0 |

| | SP Poland (52%) | TF Iceland (16%) | UA (3%) | V4 (3%) |
|----|---|------------------|---------|---------|
| D | 4 7 8 9 10 11 12 19 21 22 24 26 27 29 30 31 | 10 16 19 26 31 | 30 | 6 |
| 06 | 9 8 9 | | | |
| 09 | 8 9 9 9 9 9 9 9 | | 9 | |
| 12 | 9 9 9 0 9 5 9 | | | |
| 15 | 8 8 9 6 9 0 0 | 1 7 | | |
| 18 | 7 5 9 9 7 5 9 | 9 2 7 | | 5 |
| 21 | 9 | 0 5 | | 1 |

| | UR Ukraine (26%) | VE Canada (16%) | VP5 (3%) | W USA (26%) | YA (3%) |
|----|-----------------------|-----------------|----------|------------------|---------|
| D | 8 9 10 12 21 22 24 26 | 3 6 7 8 10 | 7 | 2 3 4 5 6 8 9 10 | 10 |
| 00 | | | | 7 | |
| 06 | 0 | | | | |
| 09 | 0 5 7 0 | | | 2 3 | |
| 12 | | | | 7 | 5 |
| 15 | 9 9 7 9 9 | 0 | | | 2 |
| 18 | 5 0 | | | 6 | |
| 21 | | 9 2 0 7 | 0 | 5 9 9 8 | |

| | YL (3%) | YO Romania (26%) | ZA (3%) | ZB Gibraltar (26%) | |
|----|---------|---------------------|---------|--------------------|--|
| D | 4 10 | 2 5 8 9 10 22 29 30 | 14 | 1 2 3 4 5 6 10 11 | |
| 06 | | 9 0 9 5 | | 0 | |
| 09 | | 7 5 0 0 0 | | 7 5 5 0 | |
| 12 | | 8 0 0 | | | |
| 15 | 5 | 4 6 5 | 0 | 7 7 9 | |
| 18 | 9 | 8 | | 1 0 | |
| 21 | | | | | |

| 9A/S5/T9/YU/Z3 Ex-Yugoslavia (71%) | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| D | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 18 | 19 | 21 | 22 | 24 | 25 | 26 | 29 | 30 | 31 | |
| 03 | | | | | | | | | 9 | | | | | | | | | | | | | | |
| 06 | | | 0 | 0 | | | 9 | 9 | 9 | 5 | | | 8 | | | | 0 | | | | | | |
| 09 | 5 | 9 | | | | 8 | 9 | 9 | 9 | | | 9 | 4 | 7 | 9 | | 9 | 0 | 9 | | | | |
| 12 | 6 | 9 | | | | 9 | 9 | 9 | 9 | | | | | 9 | 7 | | | | 9 | 9 | | | |
| 15 | 9 | | 9 | | | 9 | 7 | 9 | | | | 7 | | 9 | | | | | | | | 0 | |
| 18 | | 9 | 9 | | 9 | | 9 | 9 | 9 | | 0 | | | 7 | | | 6 | 0 | | | | | |
| 21 | | | | | | 7 | | | 5 | | | | | | | | 9 | | | | | | |

Sporadic E backscatter

Sporadic E scatter contacts are listed below. There were several periods when backscatter (and allied "side-scatter") modes appeared to be particularly strong – notably in the evening of the 3rd and the midday period on 26th.

- | | |
|---|--|
| 3 0903 G4UPS > PA2M (JO21) 559 QTF 150 | 11 1724 MW1MFY > F1DUZ (IO97) BS |
| 3 1928 F8DBF (IN78) > G5RS/P 55 QTF 245 | 16 1545 G4UPS > PA0HIP 569 QTF330 |
| 3 1931 F5TND (IN96) > G4BRA/P 55 QTF 230 | 26 0900 G (IO93) > GM4NFC BS QTF 150 |
| 3 1936 MW1MFY spots "strong BS" QTF 240 | 26 1200 G7RAU > MU0FAL 559 BS |
| 3 1940 F8DBF several G stations backscatter | 26 1218 G4RGK > GI6ATZ BS 240 |
| 3 1952 F8DBF > GM3HAM/P (IO74) 52 BS | 26 1221 EI7BMB > G0JHC BS 59 |
| 3 2015 F8DBF > GI0RQK/P (IO74) BS | 26 1228 F8DBF (IN78) > GB3BUX 539 BS |
| 5 1801 G0SAY (IO83) > GM4NFC (IO75) | 26 1230 PA5DD > G0JHC 56 BS |
| 6 0932 G3IMW > I1NAI "peaking QTF 180" | 26 1311 G8IZY > G8BCG/P (IO70) QTF 240 |
| 7 21z G2ADR > PA "scatter" at S3 | 26 1321 G8PSF > G8BCG/P BS QTF 270 |
| 7 2224 G4VPD (IO92) > GI6ATZ 52 BS | 26 1855 G4UPS > GB3LER 599 QTF 240 |
| 8 0955 DL3LFA (JN76) > GB3BAA BS 599! | |

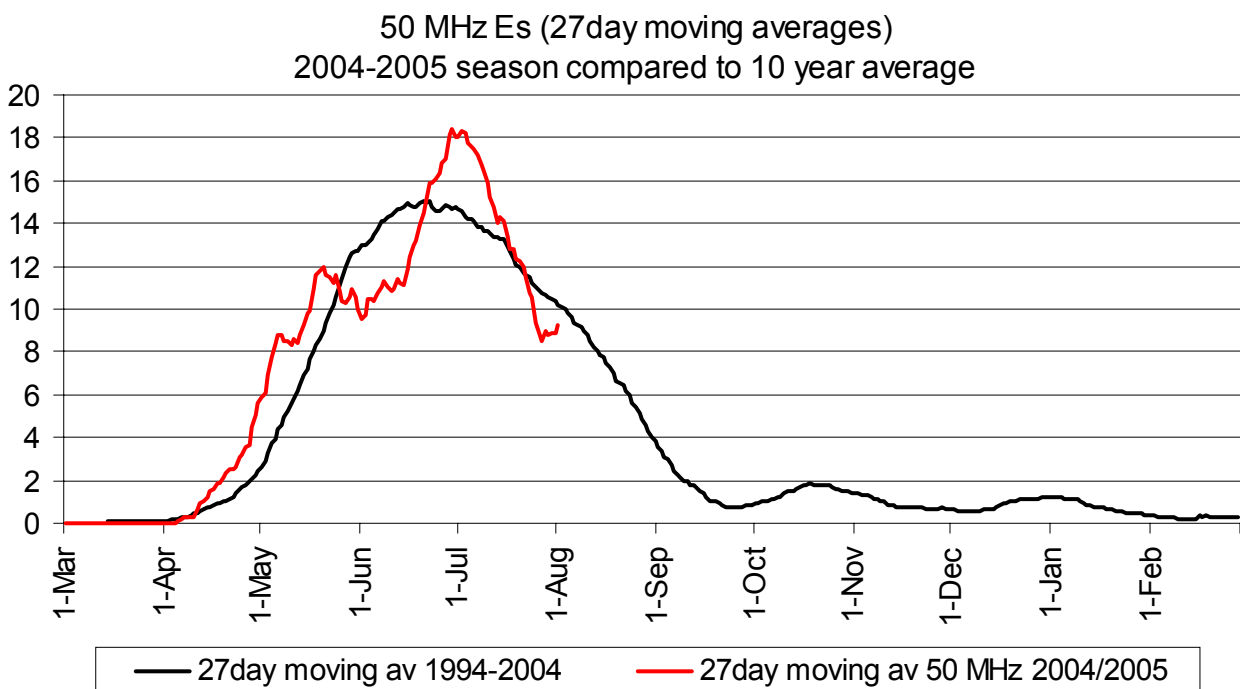
Because of the relatively small sample of scatter data it is difficult to be sure what inferences should be made from these data. Are the peaks in reporting due to operating activity levels (e.g. due to contest activity) or is there propagation significance? A clearer view of the distribution of backscatter is given in the Es summary table (below) in which the days when scatter was reported are highlighted on a tabulation of other Es data.

DX (F2 and TEP) Propagation

There were no reports of "F2/TEP DX" this month. All contacts made with stations outside of Europe were by sporadic E.

Es Propagation Summary:

The general trends of Es activity in July can usefully be shown by using the chart first presented last month. In this graph I have plotted 27-day moving averages of the daily 6m country/area scores to the end of July 2004 against a 10-year average of the same measure. The rise in average Es "quantity" at the end of June identified in the last report extended into early July making the period around the 1st of July the Es "peak" in 2004. With poor to mediocre conditions in the middle and latter parts of July, average conditions plummeted and by the end of the month were lower than the 10-year mean. See the June 2004 6&10 Report for comments on the limitations of this type of comparison.



The table below displays total counts of country/areas heard/worked via sporadic E by UK stations, a summary of the detailed tables in the previous section. Table cells are highlighted (in yellow) when 10 or more country/areas were reported in any 3-hour period by direct path Es. The cells with bold borders are days when Es backscatter was reported. The table shows the concentration of activity in the period 1-11 July. Interestingly days when backscatter was reported were not generally those days when "normal" direct-path Es was most extensive. Only on 8th and 26th did scatter occur at Es peaks.

Es Summary

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|----|-----------|-----------|----------|-----------|----------|----------|----------|-----------|-----------|-----------|----------|----|----|----|----------|----|----|----|----|----|-----------|----|----|----|-----------|----------|----|-----------|----|----|----|
| 00 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 03 | | | | | | | | | | | 2 | | | | | | | | | | | | | | | 1 | | | | | |
| 06 | 5 | 2 | 7 | 7 | 2 | 1 | | 5 | | 15 | 12 | | 2 | 2 | | | | | 1 | 9 | | 1 | | 1 | 1 | | 3 | 3 | 2 | | |
| 09 | 1 | 5 | 7 | 5 | 5 | 4 | 9 | 15 | 4 | 13 | 10 | | 1 | | | | 1 | 2 | 4 | 3 | 10 | 1 | 8 | | 8 | 1 | 8 | 10 | 3 | | |
| 12 | 5 | 8 | 7 | 6 | 1 | 4 | 7 | 8 | 8 | 12 | 2 | 1 | 2 | 1 | 6 | 1 | 1 | 2 | | | 10 | 5 | | 7 | | 4 | | 3 | 4 | 8 | |
| 15 | 15 | 9 | 3 | 17 | 8 | 3 | 4 | 10 | 10 | 20 | 6 | 8 | 5 | 5 | 6 | | | | 1 | 4 | 13 | 2 | | 1 | | 6 | 1 | | 5 | 6 | |
| 18 | 7 | 16 | 8 | 12 | 5 | 6 | 8 | 14 | 7 | 21 | 5 | 9 | 7 | 3 | | 2 | 1 | | 1 | 7 | | | 1 | 2 | 15 | | 3 | | 5 | | |
| 21 | 4 | 6 | 4 | 4 | 2 | 9 | 8 | 9 | 1 | 10 | | | 1 | | 2 | | | | | | | | | | 1 | 7 | | | 3 | | |

The following table shows the pattern of Trans-Atlantic multihop sporadic E in July. The numbers in the table cells are counts of the number of Caribbean and Central American countries (9Y, C6, FG, HI, HP, J7, KP2, KP4, P4, PJ2, PJ7, V4, VP5) worked/heard in UK in each 3-hour period. Contacts with the USA and Canada are indicated by grey-shading.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 09 | | ■ | 1 | ■ | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| 12 | | | 3 | 1 | ■ | 1 | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| 15 | | | | | 1 | 2 | | | | | ■ | | | | | | | | | | | | | | | 1 | | | | | |
| 18 | 2 | 2 | ■ | 2 | | 5 | 1 | 2 | | | | 1 | | | | | | | | | | | | | | 2 | | | | | |
| 21 | 1 | 1 | ■ | 1 | | 7 | 5 | 2 | ■ | 1 | | | | | | | | | | | | | | | | 5 | | | | | |

There was some Trans-Atlantic sporadic E on each day in the first third of the month – the same period when Es was good within Europe. There is little indication in these data of a movement of Es “clouds” from east to west (i.e. moving west from Europe to a mid-Atlantic position) as can sometimes be supposed. The propagation was so widespread any such trends would have been swamped. However, it is interesting to note that the best day for Trans-Atlantic propagation (based on the numbers of countries worked) was the 6th July when inter-European propagation was the (relatively) poorest of this period. 35% of the country/areas worked on 6th were in North America. There was virtually no other propagation to North America in the rest of the month except for the 26th, in an interesting slot sandwiched between the major aurora of the 25th and 27th.

Meteor Scatter

Contest-inspired meteor scatter activity that featured in June appeared to be absent this month and there were very few MS reports of any kind – even interest in JT6M and similar digital MS modes seems to have waned. There were no major showers to grab operator’s attention, but there is no particular reason to suppose that the flux of random meteors couldn’t have produced as much propagation as seen in June.

- 3 1528 GM8LFB (IO88) > MM0CPS/P “bursts”
- 5 0903 OE5MPL > G3UYM JT6M 27/27 via JT6M
- 25 0737 G4PCI > GB3LER “419 +MS”
- 25 1054 G4PCI > GB3LER “419+MS”
- 26 18z period, G2ADR reported a French station via MS

Tropospheric propagation

Below is a selection of “tropo” reports – once again I have filtered out short distance contacts unless these indicate particularly good tropo conditions. There was less “good” tropo in July than in June even when taking into account the additional inter-G activity generated by several major contests in June.

- 3 1407 ON6ZK > G0VHF/P (JO01)
- 1626 G0CHE (IO90) > MM0CPS/P (IO85) 519
- 1651 G4PCI > PA6M 31
- 3 2155 EI7GL (IO51) > GM3HAM/P (IO74)
- 2343 G0CHE EI7M/P (IO62) 55
- 4 0625 G7RAU PA6M 59+ io90>jo21 tropo
- 1057 G8PSF (IO91) > EI7M/P
- 14 0806 G4UPS > GB3BAA 559 not normally audible
- 19 0747 GM8LFB > GB3LER/B “tropo”
- 22 1921 GM8LFB > GB3LER/B “still tropo :(“
- 24 0832 EI3IO > GB3MCB “good tropo”
- 25 1305 G (IO93) > GM4WMM+MM5DWW (IO89)
- 27 1928 GM8LFB > GB3LER “tropo”

Aurora

After several months of nil (or virtually nil) to report under the “aurora” heading, auroras abounded in the latter part of July 2004. The period 22-27 July saw an aurora on every day though the events of the 25 and 27th were the most significant. On 27th July (when K-indices reached the index maximum value of K=9, and Ap was 162) a total of 8 different country/areas were worked via aurora by stations in Britain.

| | | |
|------------------|--|--|
| 21 st | 2201 | G4IFX (IO91) > GB3MCB (IO70) “weak aurora” QTF 330 (<i>K</i> = 1 – <i>not aurora?</i>) |
| 22 nd | 2116-2219 2234-2242 2306-2344 | EI7IX > GB3LER 31a, G4FVP > GB3LER 55a QTF 330. Auroral E from 2140 GM7NZI > GB3LER 55a; PA4PA > GM4DZX; G4FVP > LA0FX & LA8WF 55a GI4FUE > GM4DZX 55a; G1SWH > TF8GX 59a; DL8PM > GM4DZX; G4FVP (IO94) > OZ8ABE JO55 QTF 000 |
| 23 rd | 0023-0026 0536 0736 1352 1438-1500 1500-1600 1628-1648 1748 | MM0BSM > GB3LER 57a; EI5FK > GB3LE 51a GM4NFC > GB3LER 51a QTF 045 LA6QBA (JP61) > GB3LER 56a MM0AMW > GB3LER 55a, OY6SMC 53a, LA TV video via aurora EI7IX > GB3LER 53a; MM0DRI (IO88) > GM4NFC (IO75) 58a; OZ0JD (JO47) > GM4NFC 55a Many G <> GM QSOs; GM <> GI; ON7GB (JO21) > GM4DZX (IO89) 55a GM4NFC (IO75) < G4JZF (IO82), < F6HRP IN88 55a, < G0CHE (IO90) 52a GM8LFB (IO88) > GB3LER “going aurora now” |
| 24 th | 1934 2157 2254-2320 | MM0AMW (IO75) > GB3LER 55a GM8LFB > GB3LER “just gone auroral” GM8LFB, MM0BSM > GB3LER 53/55a, > OY6SMC 51a; G4VCJ > GB3LER 51a |
| 25 th | 0000-0005 0114-0126 0258 0647-0655 0945 1025 1105-1200 1200-1300 1326-1400 1406-1500 1500-1530 1534 1601-1630 1748 1803-1830 1832-1834 2133-2136 2145-2200 2200-2228 2341 | GM8LFB > MM0BSM (IO86), > G4FVP (IO94) 56a. Auroral E from 0110. MM0BSM > GB3LER 59a, > OY6SMC 52a; GM8LFB > GB3MCB “weak auroral” GM8LFB spots “aurora ongoing” G0JHC > GB3LER 57a; LA8HGA (JO58) > GB3LER 51a EI7IX > GB3LER 51a G0FYD (IO83) > LA6HL (JO28) G > EI/GI, GM, LA, OZ; GM > EI, G, GM, LA, ON, PA, SM. Many QSOs to 1530z. G > EI, GM, LA, ON, PA; GM > GI, PA; G4FVP > LY1CX (KO25) SP4JWD (KO03) G > EI; GM > PA, SM; DL8PM (JO30) > G, GM; OH6KTL (KP02) > GM4NFC G > G, GM, DL, OZ; GM > G, PA; OY4TN > GM4NFC (IO75) G > EI, G, DL, OZ; GM > OZ; G4FVP > DK7UY (JN49) 55a QTF 100; G4PCI > SP2BDR 55a G > EI, G, PA; GM > EI, PA. Few QSOs EI7IX > GB3LER 51a “in again” EI7BMB > GB3LER 51a, GB3MCB 31a QTF 070; G4IGO > GB3MCB 59a QTF 60 ON7GB (JO21) > GM4NFC 52a; OZ1BNN > GM4NFC 53a. End 1 st phase. EI7BMB > GB3LER 51a, GM4NFC 51a; EI7IX > GB3LER 51a. Start 2 nd phase G and GM > GB3LER; G0JHC > OH1ZAA 57a; GM8LFB > SM6WET (JO68) 59a G > EI, GM, LA, OZ; GM > EI; GM0TGE > SP1DID; G4FVP > SP4JWD, SM7FJE MM0BSM > DF9OX 51a |
| 26 th | 0003 0043-0154 2341 2350-0000 | DL9USA (JO71) > GM0TGE 53a (IO87) Minor auroral E (see auroral E descriptions below) MM0AMW > OY6SMC 55a G0TSM (IO90) > GM4WJA, GM0TGE; EI7IX > GM4WJA 55a |

27th 0000-0050 G > GM (QTF 000), OZ; GM > DL, G (QTF 330), GM, LA, OZ, PA, SM
0100-0200 GM > DL, EI, G; GM0TGE > SP1DID; GM8LFB > OY6SMC 52a, TF3SIX 517 (a?)
GM > OH Auroral E (see below).
0212 GM8LFB > GM0BSM 51a
0547 G8VHI (IO92) > GB3LER 58a QTF 010
0803 EI7IX > GB3LER 52a
0844 GM8LFB > OY6SMC 51a
1216 G4VCJ > GB3LER 52a
1235-1247 GB3BUX < EI7IX 51a QTF 060, GM4WMM 55a; G3IMW > GM 53a, LA5GZA? 43a
1300-1330 G > EI, G, GM, G3IMW (IO80) > GI4NKB 55a QTF 020, PA2V 52a QTF 050
1346-1355 G (IO93) > DK8XK 55a (JO53), SP1DID (JO73)
1400-1423 G4UPS (IO80) > G, GM, DL, ON, PA; G3IMW (IO80) > DL, ON, PA, SP2BDR
(JO83) 54a QTF 050, SP6NVN/3 52a; G (IO93) > OK1MPO (JO70), SP9DSD
1428 G4UPS > PA2V 55a "Not much activity: either selective opening or few ops around
1434 G3IMW > GI0BFD (IO64) 56, MU0FAL (IN89) 55a QTF 050
1448-1500 MU0FAL < G0JHC 58a, ON7GB (JO21) 55a
1505 G4UPS > GM4AWA 55a, MU0FAL 59a "lots of G activity now but not much DX"
1505-1515 G (IO93) > SP2MPOJO94; G4OBK (IO94) > LA8HGA (JO58)
1515-1600 G4UPS > G, PA, SP1KV 44A; G3IMW > DL, EI, F6ISR (JN09), G, GM, ON, OE5DI
(JN78) 52a "not much Au", OK1HBT + SM2MPO + SM7AED each "529 slight Au
tone"; SM7FJE 55a QTF 030 "medium Au tone - nearly T9 later"; G0JHC spots
"aurora S.EU QTF 090", F6HRP 59a; G (IO93) > LX1JX (JO30) "very short skip"(!)
1600-1618 G > GM; G3SED (IO90) > ES2RW (KO91) 55a; G4UPS > PA, SM7FJE 59a
1640 G3IMW reports "no Au signals now"
1704-1725 GM8LFB (IO88) > LA1V 52a, OY6SMC "weak au", GM0PWS 55a, LA8HGA 51a.
1742 G0FYD (IO83) > LA1V (JO49) 55a
1845 G3IMW reports "no Au signals"
2002 GM8LFB > OH0A 51a
2042-2052 EI7BMB > GB3LER 31a; GM8LFB > GB3LER; G8BCG (IO70) > GB3LER 52a
2130-2224 Auroral E – details below

Auroral E

There were auroral E events associated with most of the aurora above but despite several of these aurora exhibiting "typical" early and late phases, auroral E seemed not to be present during the Harang discontinuity but mainly after the final phase of the aurora.

22nd Auroral E to TF and SM contemporaneous with aurora backscatter
2140-2152 G4IGO > OH9SIX 599, OY9SMC 599 auroral E; SM3JLA > G4IGO "fluttery"
2209 G0JL > TF3SIX 539
2246-2258 SM3JLA > GI4FUE, GW3LEW 579
2336 G4FVP > SM6CTQ

25th Auroral E between late evening aurora on 24th and aurora in early hours of 25th
0109-0117 GM8LFB (IO88) > OH9SIX 529, TF3SIX 529

26th Propagation following major aurora of evening of 25th
0043 GM0TGE > DF9OX (JO53)
0141-0154 DF9OX (JO53) > GM0TGE (IO87), GM0TGE > DL9OX auroral E

27th GM>OH after aurora event late on 26th (into early hours on 27th)
0144 GM8LFB > OH9SIX 559 auroral E
Auroral E phase following major aurora of 27th
2131 GM8LFB > JW9SIX 529 QSB
2205 G4IGO > GB3LER 599 auroral E
2226 GM0TGE > DF9OX 519 QSB

K-indices.

The following four tables present the Kp index (from SEC) and the Lerwick ("KL"), Eskdalemuir ("KE"), and Hartland ("KH") K-indices (from the British Geological Survey). Each table is set out with the day of the month in the top row followed by rows containing the K-values or each 3-hour period. The bottom row of each table is the sum of the K-values for the day. Pale (yellow) shading indicates K = 5. There were 7 disturbed days in July when one or more of the UK K indices or the planetary Kp index was 5 or higher.

Planetary K (Kp)

| KP | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 4 | 4 | 2 | 2 | 2 | 6 | 1 | 1 | 1 | 2 | 2 | 5 | 3 | 6 | 6 | 8 | 3 | 2 | 2 | 2 |
| 03 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 0 | 4 | 3 | 3 | 2 | 1 | 0 | 6 | 4 | 7 | 4 | 7 | 3 | 3 | 1 | 2 |
| 06 | 3 | 2 | 2 | 2 | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 2 | 4 | 3 | 1 | 2 | 5 | 3 | 2 | 3 | 2 | 0 | 6 | 5 | 7 | 3 | 8 | 3 | 3 | 1 | 2 |
| 09 | 3 | 2 | 3 | 2 | 1 | 2 | 1 | 1 | 0 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 2 | 1 | 3 | 6 | 3 | 8 | 3 | 8 | 3 | 2 | 2 | 2 |
| 12 | 3 | 3 | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 1 | 3 | 5 | 5 | 6 | 3 | 9 | 3 | 2 | 3 | 3 |
| 15 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 4 | 7 | 2 | 7 | 3 | 3 | 2 | 3 |
| 18 | 3 | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 5 | 3 | 4 | 6 | 3 | 5 | 2 | 2 | 2 | 3 |
| 21 | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 2 | 1 | 2 | 4 | 4 | 3 | 2 | 4 | 4 | 2 | 2 | 3 | 3 | 2 | 6 | 2 | 5 | 7 | 6 | 5 | 3 | 2 | 3 | 3 |
| Σ | 23 | 19 | 18 | 15 | 15 | 17 | 11 | 12 | 13 | 18 | 21 | 24 | 24 | 19 | 17 | 19 | 29 | 18 | 20 | 19 | 14 | 22 | 38 | 33 | 54 | 30 | 57 | 23 | 19 | 16 | 20 |

Lerwick K (Shetlands)

| KL | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|----|----|----|---|---|----|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 2 | 1 | 2 | 1 | 2 | 1 | 0 | 0 | 1 | 2 | 2 | 3 | 4 | 0 | 1 | 0 | 7 | 0 | 1 | 1 | 0 | 0 | 7 | 2 | 7 | 8 | 9 | 3 | 2 | 0 | 1 |
| 03 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 0 | 0 | 5 | 1 | 2 | 2 | 1 | 0 | 5 | 1 | 7 | 5 | 7 | 3 | 2 | 1 | 1 |
| 06 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 3 | 2 | 0 | 1 | 1 | 0 | 4 | 3 | 5 | 1 | 7 | 2 | 1 | 1 | 1 |
| 09 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 0 | 2 | 4 | 2 | 7 | 1 | 7 | 2 | 1 | 1 | 1 |
| 12 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 4 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 3 | 0 | 4 | 6 | 5 | 6 | 2 | 8 | 4 | 1 | 1 | 2 |
| 15 | 2 | 3 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 2 | 2 | 1 | 3 | 2 | 2 | 3 | 1 | 1 | 3 | 2 | 1 | 3 | 5 | 5 | 7 | 2 | 9 | 4 | 1 | 2 | 3 |
| 18 | 2 | 2 | 2 | 1 | 2 | 1 | 0 | 0 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 0 | 4 | 3 | 4 | 7 | 3 | 6 | 3 | 1 | 2 | 1 |
| 21 | 2 | 2 | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 1 | 4 | 3 | 2 | 1 | 2 | 4 | 1 | 1 | 3 | 2 | 1 | 8 | 2 | 7 | 9 | 8 | 5 | 3 | 0 | 2 | 1 |
| Σ | 15 | 16 | 8 | 9 | 10 | 8 | 2 | 0 | 6 | 11 | 18 | 15 | 19 | 9 | 8 | 11 | 22 | 9 | 14 | 14 | 4 | 21 | 36 | 29 | 55 | 30 | 58 | 24 | 9 | 10 | 11 |

Eskdalemuir K (southern Scotland)

| KE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|----|----|----|----|----|----|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 3 | 1 | 2 | 2 | 3 | 1 | 0 | 0 | 1 | 1 | 3 | 3 | 4 | 0 | 1 | 0 | 5 | 1 | 1 | 1 | 1 | 1 | 5 | 2 | 6 | 6 | 7 | 3 | 2 | 1 | 1 |
| 03 | 1 | 3 | 1 | 1 | 2 | 2 | 1 | 0 | 1 | 2 | 1 | 3 | 3 | 1 | 1 | 0 | 4 | 1 | 2 | 2 | 2 | 0 | 4 | 2 | 6 | 3 | 6 | 3 | 2 | 1 | 1 |
| 06 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 2 | 3 | 1 | 0 | 0 | 4 | 1 | 0 | 1 | 1 | 0 | 5 | 4 | 5 | 1 | 5 | 2 | 2 | 1 | 1 |
| 09 | 2 | 2 | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 1 | 3 | 1 | 2 | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 0 | 3 | 5 | 3 | 6 | 1 | 7 | 1 | 1 | 1 | 1 |
| 12 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 0 | 2 | 4 | 2 | 3 | 1 | 1 | 3 | 2 | 2 | 2 | 4 | 0 | 4 | 5 | 5 | 5 | 3 | 9 | 4 | 2 | 1 | 2 |
| 15 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 0 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 1 | 4 | 5 | 5 | 7 | 3 | 7 | 4 | 2 | 2 | 2 |
| 18 | 2 | 2 | 2 | 1 | 3 | 1 | 1 | 0 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 0 | 4 | 3 | 4 | 6 | 4 | 6 | 3 | 1 | 3 | 2 |
| 21 | 2 | 3 | 0 | 3 | 2 | 1 | 0 | 0 | 0 | 1 | 4 | 3 | 2 | 2 | 3 | 4 | 1 | 1 | 3 | 3 | 1 | 6 | 1 | 5 | 6 | 6 | 5 | 3 | 1 | 3 | 2 |
| Σ | 17 | 18 | 10 | 12 | 16 | 10 | 5 | 1 | 6 | 13 | 21 | 19 | 23 | 12 | 12 | 13 | 21 | 12 | 14 | 17 | 6 | 22 | 33 | 30 | 47 | 27 | 52 | 23 | 13 | 13 | 12 |

Hartland K (SW England)

| KH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | |
|----|----|----|----|----|----|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| 00 | 3 | 1 | 3 | 2 | 3 | 1 | 0 | 0 | 1 | 1 | 3 | 4 | 4 | 1 | 1 | 0 | 5 | 1 | 1 | 1 | 1 | 1 | 5 | 3 | 6 | 6 | 6 | 3 | 2 | 1 | 1 | |
| 03 | 2 | 3 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 2 | 1 | 3 | 3 | 1 | 1 | 1 | 4 | 2 | 2 | 2 | 2 | 1 | 5 | 2 | 6 | 3 | 6 | 3 | 1 | 1 | 1 | |
| 06 | 2 | 2 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 2 | 3 | 2 | 1 | 1 | 4 | 2 | 1 | 1 | 2 | 0 | 5 | 4 | 5 | 2 | 6 | 2 | 2 | 2 | 1 | |
| 09 | 2 | 2 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 1 | 2 | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 0 | 3 | 4 | 3 | 5 | 2 | 6 | 1 | 1 | 1 | 1 | |
| 12 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 0 | 1 | 0 | 4 | 2 | 2 | 1 | 1 | 4 | 2 | 0 | 1 | 4 | 0 | 4 | 5 | 5 | 5 | 2 | 8 | 3 | 1 | 1 | 2 | |
| 15 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | 2 | 1 | 4 | 5 | 5 | 7 | 2 | 6 | 4 | 2 | 2 | 2 | |
| 18 | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 5 | 3 | 4 | 6 | 4 | 6 | 3 | 1 | 3 | 2 |
| 21 | 3 | 3 | 0 | 2 | 2 | 1 | 1 | 0 | 1 | 1 | 4 | 4 | 3 | 1 | 3 | 4 | 1 | 1 | 3 | 3 | 1 | 6 | 1 | 5 | 5 | 6 | 5 | 3 | 1 | 3 | 2 | |
| Σ | 18 | 18 | 12 | 15 | 15 | 10 | 6 | 2 | 8 | 12 | 22 | 21 | 23 | 13 | 13 | 16 | 21 | 12 | 14 | 17 | 8 | 24 | 33 | 31 | 45 | 27 | 49 | 22 | 11 | 14 | 12 | |

| July 2004 | 28 Areas | | | -- 50 Areas -- | | | 2800 | | | - Spots - | | | Max | | | X-ray | | | Min foF2 | | | -- Particle Fluences -- | | |
|--------------|----------|-----|------|----------------|-----|-----|-------|------|------|-----------|------|------|-------|-----|------|-------|------|---------|----------|-----------|-----------|-------------------------|---------|---------|
| | Es | F | Es | DX | A | AE | Flux | SEC | SIDC | Kp | Ap | Aa | b.gnd | MHz | Hour | MHz | Hour | MHz | Hour | 2MEV Elec | 1MEV Prot | 10MEV Prot | 5.4E+05 | 1.1E+08 |
| 01-Jul | 11 | 4 | 23 | 0 | 0 | 0 | 81 | 26 | 17 | 3 | 13 | 18 | A3.9 | 7.8 | 21 | 4.1 | 03 | 1.1E+08 | 5.4E+05 | 1.3E+04 | | | | |
| 02-Jul | 13 | 3 | 26 | 0 | 0 | 0 | 81 | 33 | 20 | 3 | 9 | 17 | A3.4 | 6.7 | 21 | 3.9 | 23 | 1.4E+08 | 3.7E+05 | 1.3E+04 | | | | |
| 03-Jul | 7 | 4 | 17 | 0 | 0 | 0 | 80 | 31 | 20 | 3 | 9 | 13 | A3.5 | 7.2 | 21 | 3.9 | 04 | 1.7E+08 | 2.5E+05 | 1.4E+04 | | | | |
| 04-Jul | 17 | 2 | 27 | 0 | 0 | 0 | 79 | 37 | 19 | 2 | 6 | 12 | A3.2 | 6.0 | 22 | 3.4 | 02 | 1.0E+08 | 1.6E+05 | 1.4E+04 | | | | |
| 05-Jul | 6 | 0 | 14 | 0 | 0 | 0 | 78 | 26 | 16 | 3 | 7 | 12 | A3.3 | 6.8 | 21 | 3.7 | 03 | 4.7E+07 | 1.2E+05 | 1.4E+04 | | | | |
| 06-Jul | 10 | 2 | 18 | 0 | 0 | 0 | 79 | 39 | 17 | 3 | 7 | 9 | A3.4 | 5.8 | 21 | 4.4 | 05 | 3.4E+07 | 1.8E+05 | 1.4E+04 | | | | |
| 07-Jul | 11 | 0 | 23 | 0 | 0 | 0 | 79 | 31 | 9 | 2 | 5 | 5 | A3.4 | 6.7 | 21 | 4.1 | 04 | 3.4E+07 | 2.2E+05 | 1.6E+04 | | | | |
| 08-Jul | 19 | 4 | 29 | 0 | 0 | 0 | 82 | 17 | 11 | 2 | 5 | 3 | A5.9 | 7.1 | 21 | 4.5 | 03 | 4.2E+07 | 3.6E+05 | 1.6E+04 | | | | |
| 09-Jul | 12 | 4 | 15 | 0 | 0 | 0 | 87 | 32 | 27 | 3 | 5 | 7 | B1.0 | 6.3 | 22 | 4.1 | 03 | 1.5E+07 | 3.3E+05 | 1.6E+04 | | | | |
| 10-Jul | 19 | 1 | 37 | 0 | 0 | 0 | 93 | 58 | 38 | 3 | 8 | 11 | B1.5 | 6.8 | 19 | 3.2 | 04 | 8.4E+06 | 3.1E+05 | 1.5E+04 | | | | |
| 11-Jul | 13 | 2 | 21 | 0 | 0 | 0 | 104 | 98 | 47 | 4 | 14 | 27 | B5.7 | 7.4 | 20 | 3.2 | 04 | 1.3E+06 | 5.9E+05 | 1.5E+04 | | | | |
| 12-Jul | 10 | 0 | 13 | 0 | 0 | 0 | 125 | 118 | 50 | 4 | 13 | 23 | B7.3 | 6.3 | 21 | 3.6 | 04 | 2.2E+06 | 3.1E+05 | 1.5E+04 | | | | |
| 13-Jul | 3 | 3 | 1 | 0 | 0 | 0 | 127 | 129 | 88 | 4 | 16 | 26 | B7.2 | 7.2 | 21 | 3.6 | 03 | 1.9E+06 | 4.5E+05 | 3.4E+04 | | | | |
| 14-Jul | 11 | 1 | 12 | 0 | 0 | 0 | 138 | 149 | 90 | 3 | 9 | 12 | B6.1 | 7.1 | 21 | 3.7 | 02 | 6.6E+06 | 2.8E+05 | 1.5E+04 | | | | |
| 15-Jul | 8 | 4 | 7 | 0 | 0 | 0 | 146 | 146 | 82 | 4 | 9 | 12 | B7.5 | 8.1 | 20 | 4.5 | 04 | 1.6E+07 | 2.6E+05 | 1.4E+04 | | | | |
| 16-Jul | 13 | 1 | 9 | 0 | 0 | 0 | 147 | 142 | 65 | 4 | 12 | 17 | B8.4 | 7.4 | 21 | 4.8 | 04 | 3.8E+06 | 2.2E+05 | 1.3E+04 | | | | |
| 17-Jul | 8 | 3 | 3 | 0 | 0 | 0 | 149 | 165 | 79 | 6 | 24 | 31 | B6.7 | 5.9 | 22 | 2.9 | 05 | 6.5E+05 | 1.5E+05 | 1.2E+04 | | | | |
| 18-Jul | 9 | 4 | 3 | 0 | 0 | 0 | 155 | 169 | 93 | 3 | 9 | 11 | B6.8 | 7.1 | 20 | 3.7 | 04 | 4.0E+06 | 3.1E+05 | 1.3E+04 | | | | |
| 19-Jul | 4 | 2 | 6 | 0 | 0 | 0 | 170 | 176 | 100 | 3 | 9 | 15 | B8.2 | 6.8 | 21 | 4.1 | 04 | 5.5E+06 | 1.2E+05 | 1.3E+04 | | | | |
| 20-Jul | 11 | 4 | 5 | 0 | 0 | 0 | 175 | 147 | 91 | 3 | 9 | 18 | B8.2 | 7.0 | 18 | 3.7 | 02 | 1.6E+07 | 1.3E+05 | 1.2E+04 | | | | |
| 21-Jul | 15 | 6 | 17 | 0 | 0 | 0 | 172 | 162 | 88 | 3 | 6 | 7 | B6.5 | 7.1 | 09 | 4.4 | 04 | 2.9E+07 | 2.0E+05 | 1.3E+04 | | | | |
| 22-Jul | 7 | 4 | 13 | 0 | 8 | 4 | 173 | 117 | 84 | 6 | 19 | 45 | B9.1 | 7.8 | 20 | 4.2 | 23 | 1.6E+07 | 9.8E+05 | 2.9E+04 | | | | |
| 23-Jul | 0 | 0 | 1 | 0 | 8 | 0 | 165 | 86 | 74 | 6 | 47 | 66 | B6.2 | 5.5 | 18 | 2.7 | 03 | 4.0E+08 | 2.1E+07 | 1.5E+05 | | | | |
| 24-Jul | 10 | 4 | 13 | 0 | 3 | 0 | 147 | 109 | 69 | 5 | 27 | 50 | B5.0 | 7.8 | 14 | 2.5 | 03 | 3.3E+08 | 1.8E+07 | 1.2E+05 | | | | |
| 25-Jul | 0 | 2 | 2 | 0 | 13 | 2 | 145 | 130 | 57 | 8 | 122 | 143 | B7.2 | 6.2 | 17 | 2.0 | 02 | 9.3E+07 | 1.9E+07 | 5.9E+05 | | | | |
| 26-Jul | 18 | 4 | 24 | 0 | 4 | 1 | 128 | 113 | 64 | 6 | 31 | 62 | B6.6 | 5.7 | 22 | 2.5 | 04 | 4.3E+08 | 1.6E+08 | 9.5E+06 | | | | |
| 27-Jul | 1 | 0 | 3 | 0 | 18 | 4 | 118 | 66 | 55 | 9 | 162 | 192 | B4.4 | 4.8 | 16 | 1.9 | 04 | 9.4E+07 | 2.7E+08 | 1.9E+06 | | | | |
| 28-Jul | 1 | 0 | 3 | 0 | 0 | 0 | 101 | 66 | 39 | 3 | 14 | 27 | B4.3 | 5.6 | 17 | 2.3 | 04 | 4.5E+09 | 2.9E+07 | 3.5E+05 | | | | |
| 29-Jul | 9 | 1 | 10 | 0 | 0 | 0 | 100 | 32 | 24 | 3 | 9 | 10 | B3.7 | 5.8 | 19 | 2.0 | 02 | 9.3E+09 | 7.0E+06 | 4.1E+04 | | | | |
| 30-Jul | 6 | 0 | 16 | 0 | 0 | 0 | 89 | 33 | 24 | 3 | 7 | 13 | B2.6 | 5.8 | 22 | 2.7 | 04 | 6.4E+09 | 1.3E+07 | 4.7E+04 | | | | |
| 31-Jul | 11 | 1 | 14 | 0 | 0 | 0 | 86 | 39 | 23 | 3 | 9 | 13 | B2.0 | 6.9 | 20 | 3.1 | 04 | 3.0E+09 | 1.4E+07 | 7.9E+04 | | | | |
| Sum | 293 | 70 | 425 | 0 | 54 | 11 | 118.7 | 87.8 | 51.0 | 3.9 | 21.0 | 29.9 | B4.4 | 6.7 | 20 | 3.5 | 03 | 8.2E+08 | 1.8E+07 | 4.2E+05 | | | | |
| Average | 9.5 | 2.3 | 13.7 | 0.0 | 1.7 | 0.4 | 118.7 | 87.8 | 51.0 | 3.9 | 21.0 | 29.9 | B4.4 | 6.7 | 20 | 3.5 | 03 | 8.2E+08 | 1.8E+07 | 4.2E+05 | | | | |
| Maximum | 19 | 6 | 37 | 0 | 18 | 4 | 175 | 176 | 100 | 9 | 162 | 192 | B9.1 | 8.1 | 22 | 4.8 | 05 | 9.3E+09 | 2.7E+08 | 9.5E+06 | | | | |
| Minimum | 0 | 0 | 1 | 0 | 0 | 0 | 78 | 17 | 9 | 2 | 5 | 3 | A3.2 | 4.8 | 09 | 1.9 | 23 | 6.5E+05 | 1.2E+05 | 1.2E+04 | | | | |

50 MHz Outside Britain

Compilation and Commentary by G3USF

Europe

Auroral-Related Propagation

That tentative figure reflects uncertainty about some T9 high-latitude reports, typically of the JW/JX beacons. It can be hard to tell whether these were due to Es, near its seasonal peak, or auroral-E, which is the more usual mechanism at other periods. The likelihood is that the listings below slightly understate AE events. Also, the SK4MPI beacon, which is the main reference for OH5IY's compilation of auroral backscatter events, went silent on July 4 and although we have his auroral FM results at 88.7 and 107.9MHz, some events may not have been recorded.

Perhaps the most notable event was less the storm towards the end of the month than reception of three North American beacons by the ever-vigilant MM0AMW on the 17th - a day when DX Summit sadly failed GOAEV. Coming after 0100 with a Kp of 6, AE must surely have been involved, perhaps in conjunction with Es at the American end. We have recorded a number of reports of VE8BY in Europe over the years, always noting that the amateur population in the far north is so small and scattered that it is not surprising no QSOs result. However, there are a number of amateurs close to VE6EMU, so it is a pity that, as far as we know, nobody seized the opportunity.

Subsequently, aurora appeared every day from the 22nd to the 27th, reaching well to the South on the 25th and 27th, with contacts down to 9A on both occasions. The southerly limit appears to have been around Rome (JN62), which is about latitude 42N. Several other Italian call areas to the north of Rome also reported contacts. The event fell short of giving SV1DH his first auroral contact, or indeed EA7, from which an auroral QSO was made a year or so back. It appears to have missed EA/CT completely, but less usual contacts (for 50MHz) were reported with YU, ER and UR - though none of these was remarkable in propagation terms. HA was worked on 144MHz but was of course not available on Six. Auroral-E made a relatively rare appearance on 144MHz

During the 144MHz event on the 25th strong FAI was reported between I2FAK and DK5YA, dk5YA giving a report of 599+10 with 500Hz bandwidth, qtf 075 elevation 15 deg. I2FAK reported DK5YA initially at 55a then 579 clear beaming 030 with 5 deg. elevation. DF7KF reported I2FAK at 080 259, inaudible direct. At 000-005 deg. He was 55a. A comparable occurrence at G4SWX at (080 0 elevation) at 1515 had I2FAK's signal switching suddenly from FAI to 59a at 2kHz. PA0PVW reported DD0VF auroral with an echo of approximately one second. See www.vhf.de for map and commentary.

July 3 1900-10 Au>OH5IY 20-2100 JW7SIX>SM2(mode?) 21-2200 JW0>SM3 SM3>SK7(mode?)

July 11 20-2100 JW7SIX>LA(JO58 559) AE 2150 E2,E3(LA)>OH2(AE) 2159 GB3LER>LA(559 JP99) 22-2300 OY6SMC>LA(559 JP99) LA>LA(JP99 559)

July 13 1721 49750>OH6(KP02)

July 16 1100-20 AuFM>OH5IY 1130-40 AuFM>OH5 1220-30 AuFM>OH5 20-2100 OH9SIX>LA 21-2200 JW9SIX>SM0(559) LA7SIX>SM0(529) JW7SIX>SM0(539) 22-2300 JW7SIX>LA(JP99 539) OY6SMC>LA(JP99 599) TF(IP16)>SM0(JO89 58) 23-2400 TF(IP16)>SM0(JO89 557) OH2>SM0(JO89 56a 320)

July 17 0020-0220 AuFM>OH5 01-0200 VE8BY>MM0AMW(IO75 539) K1SIX>MM0AMW(IO75) VE6EMU>MM0AMW(539)

July 22 2039 49750,48250>SM3(57a) OH9SIX>OZ(mode?) 2040-2110 AuFM>OH5 21-2200 OH2(KP10)>OZ(JO55) LA>EI(319) GB3LER>EI(31a) DL(JO53)>OH1(55a) DL>SM0(53a 000) SM0>OZ G>SM3(fl) OZ6VHF>EI(519) 2200-2320 AuFM>OH5 22-2300 GB3MCB>TF(mode?) LA>SM0(57a) TF3SIX>EI(519) LA>OZ(55a) GM>PA GI>SM3 DL>SM3(sc) 23-2400 SM6>PA OY6SMC>PA(53a) OY6SMC>EI(31a) TF>EI(51a 000) OH8>SM3(mode?) OH9SIX>PA(53a 000) GM>DL(mode?) 2330-2400 AuFM>OH5

July 23 0000-0130 AuFM>OH5 00-0100 GB3LER>EI(51a) 0140-50 AuFM>OH5 0300-10 AuFM>OH5 0330-50 AuFM>OH5 0400-10 AuFM>OH5 0500-10 AuFM>OH5 0530-50 AuFM>OH5 0640-0700 AuFM>OH5 08-0900 OH9SIX>OH1(57a) 0939 GB3LER>PA(529 mode?) 13-1400 JW7SIX>OH1(579 KP23) JW9SIX>OH1(589 KP00) 14-1500 LA(JP61)>OZ(mode?) SM3(JP83)>SM6(mode?) SM5(JO78)>OZ ES2(KO29)>OZ LA(JO58)>DL(JO53) LA(JO59)>DL(JO53) LA>PA(55a) GB3LER>EI(53a) LA(JO58)>PA(55a) LA(JO28)>DL(JO53) GM>OZ(JO4755a) 15-1600 SM6(JO78)>DL(JO52) OH6(KP46)>OH1(55a) GM(IO89)>ON(JO21 55a) LA(JP50)>DL(JO53) SM5(JO88)>PA 16-1700 LA>DL(mode?) SM7(JO47)>OZ(JO57 55a) GM>F(IN88 55a)

July 24 2230-50 AuFM>OH5 21-2200 JW9SIX>SM2(569 AE) 23-2400 LA>SM0(mode?) 2330-2400 AuFM>OH5

July 25 0000-10 AuFM>OH5 0050-0110 AuFM>OH5 0230-0310 AuFM>OH5 0324 Es2>OH2(mode?) 0330-0410 AuFM>OH5 0450-0620 AuFM>OH5 0557 49750>OH6(KP02 53a) 06-0700 LA>SP4(54a) LA(JO58)>OH2(56a) 07-0800 OH1>SM0(mode?) 0800-10 AuFM>OH5 08-0900 OH3>OH2(mode?) 49750>OH6(KP02 57a) SM2>OH2(55a) LA>LA(57a) ES4>SM0(mode?) 0850-0950 AuFM>OH5 09-1000 ES4>OZ(JO47 55a) OH9SIX>OH5(57a) LA>LA(JP55 55a) OH3>OZ LA(JP50)>OZ(JO47 45a) ES2>SM0(JO89 55a) LA(JP50)>S<0(JO89 53a) 1000-20 AuFM>OH5 10-1100 ES4>OZ LA(JO59)>SM0(JO89 41a) LY>OZ9mode?) PA>SM0(JO99 53a) LA(JO58)>SM0(JO99 57a) OH4(KP20)>SM0(JO89 55a) LA(JO58)>DL(JO41 54a) LA(JO59)>DL(JO41 55a) OZ(JO55)>SM0(JO89) SM3(JP83)>OH6(KP02)(mode?) LA>PA(JO21 52a) LA(JO59)>PA(JO32 58a) 11-1200 LA(JO59)>DL(JO50 53a) SM5>JO32(53a) SM7(JO77)>DL(JO41 55a) GB3LER>PA(54a) Es1>DL(JO41 55a 355) Es1>PA(mode?) OZ(JO57)>DL(JO41 55a 000) GI>EI(57a) SP2>SM0(JO99 57a) SM7>DL(JO77 mode?) GM>PA SM7>PA LA>SM0(53a) SM6(JO57)>PA GM(IO87)>ON(JO21 55a) LA>PA SM5(JO88)>PA 1120-50 AuFM>OH5 1200-30 AuFM>OH5 12-1300 SP4(KO03)>OH2(55a) SP4>SM0(JO89 55a) SP3>SM0(JO89 53a) GM(IO89)>PA(JO23 58a) EI,OZ>DL(JO62) LA(JP40)>PA(JO22 55a) SM7(JO65)>PA(JO22) G>EI(55a) OH3>PA ON>OZ SM7>OK1(JO70 59a) LA>SM0(JO89 55a) 1240-1420 AuFM>OH5 13-1400 SM7>SP6(JO65) LA>SP2 LA(JP40)>DL(JO53) SM7>9A(JN86 52a) GM>PA(000) LA(JO99 57a) G(IO93)>DL(JO30 57a) GM(IO75)>OH6(KP02) GM(IO75)>DL DL(JO53)>DL(JO50) ON>DL PA>OZ ES4>SM9JO89 53a) OZ(JO57)>DL(JO30 55a) DL>SP6 14-1500 OZ(JO55)>DL(JO30 57a) G(IO95)>DL(JO31 53a) SM7>SP6(59a) PA>PA(59a) SP2(JO93)>9A(JN86 55a) LA,SM6>PA DL>PA(57a) SM7(JO76 59a) DL(JO50)>9A(JN86 55a) OZ>SP6 DL(JO62)>9A(JN86 55a 350) DL>SP6(57a) PA>EI 1430-40 AuFM>OH5 15-1600 OE5(JN68)>OZ(56a) SP2(JO93)>9A(JN86 55a) GM(IO99)>OZ(JO55 56a) 9A>SP6(59a) OK1(JO60)>PA(JO22 57a) SP4>LY(KO03 57a) DL(JO51)>DL(JN68 55a) SM7>LY OK1(JO70)>OZ(JO55 58a) PA(JO23)>OK1(JO60 59a) PA(JO23)>SP1(JO73 56a) DL>DL(JO30 55a) 16-1700 SP6(JO81)>PA OZ(JO55)>ON(JO21 57a) LA(JO59)>LY GM(IO78)>EI(IO53 57a) EI(IO63)>SP2(JO83) I5(JN53)>DL(JO51 55a) LY>SP4 OH3>DL SM7(JO65)>SP9(JO90 55a) LA(JO38)>ON OH3(KP11)>DL(55a) SM7>SP4 LA>PA 17-1800 SM5>PA(JO33) ES2>DL GB3LER>EI(51a) 18-1900 GB3LER>EI(51a) GB3MCB>EI(31a 070) GM(IO75)>ON(JO21 52a) GM(IO75)>OZ(53a) 1949 OH4>OZ(55a) 2100-2230 AuFM>OH5 21-2200 I5>G OH1>LY(59a) GB3LER>EI(51a) LA>LY(59a) OH9SIX>PA(53a) LA>PA(JO59 59a) OH4(KP21)>OZ(020) 22-2300 OH3(KP10)>SM2(59a) GM>EI(52a) LA>PA OY6SMC>PA(JO22) DL>PA GB3BUX>EI(41a) SP4(KP03)>OZ 2240-2300 AuFM>OH5 2259 LA>OH9(KP35 559 AE) 23-2400

JW9SIX>SM2(KP15 569) LA>ES6(549 AE) GM>PA 2320-30 AuFM>OH5 2322 SK6>OH9(KP35 569 AE) 2322 OY>OH9(KP35 339 AE) 2340-2400 AuFM>OH5

July 26 0000-10 AuFM>OH5 00-0100 GM(IO87)>DL(JO71) DL(JO53)>PA(57a 315) 01-0200
JW9SIX>OH2(529) GM(IO87)>DL(JO53 AE) 0140-50 AuFM>OH5 1750-1800 AuFM>OH5 1950-
2010 AuFM>OH5 23-2400 GM>EI(55a) 2330-2400 AuFM>OH5

July 27 0000-0110 AuFM>OH5 00-0100 GM(IO87)>DL(JO30 59a) OY6SMC>EI(51a) OZ>DL 01-0200
GM>SP1 0200-20 AuFM>OH5 0320-50 AuFM>OH5 0450-0510 AuFM>OH5 0520-0630
AuFM>OH5 0700-30 AuFM>OH5 06-0700 LA>OZ OH3>OZ(56a) 07-0800 LA>OZ(mode?) 08-0900
GB3LER>EI(52a) 1000-10 AuFM>OH5 10-1100 SP8>ON(mode?) 1013 OH1>GM(144 AE) 1100-
1220 AuFM>OH5 12-1300 JW9SIX>SM3(539) SM5(SP4(KO03 57a) GB3BUX>EI(51a 060)
LA(JO58)>PA SP3(JO93)>OK1(JO60 55a) SP2(JO93)>DL(JN68) SP2(JO63)>DL JN58 55a)
LY(KO25)>DL(JN58 55a 020) LY>SP9(57a) SM7(JO65)>DL(JN68 63a) SP1>SP9(59a)
SM7>PA(59a) 1229 DL>OH9(KP35 57a 144) 13-1400 OZ(JO54)>SP2(JO94 55a)
GB3MCB>EI(52a 055) SP5(KO02)DL(JN58 55a) SP5(KO02)>SP2(JO94) DL(JO51)>9A8A(JN86
59a) PA(JO22)>9A8A(JN86) SP8>SP9(55a) DL(JO71)>DL(JO31 57a) DL(JO51)>SP2(JO94)
PA(JO22)>DL(JN68) DL(JO71)>DL(JN68 63a) ON>PA DL>SP9(59a) UT(KO21)>(PA 55a) 14-
1500 HB>PA OM3(JN88)>DL UT(KO21)>SP2(JO83) UT(KO21)>SP6) PA(JO22)>DL(JO51)
PA>9A(JN86 59a) YU1AW>PA(JO33 55a) G(JO80)>PA(JO22) SP9(JO90)>9AA(JN86 59a)
SP2(JO83)>9A(JN86) OZ>LA(JP50 55a) OK2(JN89)>9A(JN86 59a) SM7(JO65)>DL(JN68)
SQ3(JO82)>9A(JN86) IZ5EKV>PA(55a) F>PA OE5>PA SM7>SP7(59a) OE5(JN77)>DL
DL>ER1(51a)? GU(IN89)>ON(JO21 55a) 1350-1420 AuFM>OH5 1500-20 AuFM>OH5 15-1600
OK2>I5(JN53) DL>I5(53a) I5>PA 57a) I1(JN45)>PA(JO22 100) OK2(JN89)>IW4BET(JN54 55a
030) OK2(JN99)>SP6 OE3(JN87)>SP6 S5>PA(55a) OK1(JO60)>SP6 SP1(JO73)>DL(JN58 55a
060) LA>OZ OE3(JN87)>SP6(JO80) PA>OH3(KP11 57a) JW7SIX>SM2(599) OH3>SP3 OY>PA
OZ(JO54)>DL(JN68) 1550-1600 AuFM>OH5 16-1700 DL(JO62)>9A(JN86 59a)
DL(JO50)>9A4K(JN86 59a) PA(JO22)>DL(JN68) DL(JO73)>OZ(JO55 55a) 17-1800
OZ(JO50)>DL(JO50 55a) OZ>PA(57a) OZ>OH1(55a) OZ(JO54)>SP6 OH2>PA(52a)
OH3>SP4(53a) SM4(JP90)>OZ(55a) 18-1900 OH8>OH6(59) LA(JO49)>OZ(JO55 599)
OH5>OH1(KP00 060) 19-2000 OZ>DL(JO50 55a) OH7(KP11)>OZ(JO55 55a) OZ>SM0(55a)
SM7>PA(52a) OH8>SM0(55a) ES4>SP4(KO03 57a) OH3<SP4(54a 010) OH6>SP4(55a)
SK6>DL(JO50 54a) 1700-10 AuFM>OH5 1749-50 AuFM>OH5 2300-30 AuFM>OH5 20-2100
GB3LER>EI(31a)

July 30 1952-8 JW9SIX>SM2(55 KP07) JW9SIX>SM0(55 JO89) JW9SIX>SM2(599 KP15) 20-2100
JW9SIX>LA(579 JO99) JW7SIX,JW9SIX>SM6(429) LA(KP09)>SM0(JO89 55) 21-2200 LA>LA(57)
JW9SIX>ES6(KO27 559) JW9SIX>OZ(559 JO55) JW9SIX>SM6(569 JO57) LA(KP09)>OZ(JO45
59) LA7SIX>LA(59 JP50) 22-2300 LA(KP09)>OZ(mode?) OH9SIX>LA(JP50 559) 2140-2300
E2,E3,E4(LA,TF)>OH2(AE)

July 31 1837 JW7SIX>SM2(599)

Other Modes

Auroras apart, the vast majority of July reports related to sporadic-E (or Es scatter) which was present almost every day from around 0600UTC through to 2100 or thereabouts. The exception was the 23rd, which reached minor storm level (Kp6) at times - but some Es was nevertheless reported on the much more disturbed 25th and 27th, when Kp 8 and 9 were reported. The 25th was the only day when ZS6 was reported into southern Europe, very possibly due to southerly intensification of ionization during the disturbance.

The other day when Es was well below the monthly average was the 13th, which was no more than unsettled (Ap 16). As always, one has to emphasise that our tabulations reflect only reported openings - many operators do not report banal routine contacts, though the volume of reports this month was so great that it seems unlikely the full picture has been substantially understated. The detail for the 31st indicates that although day-by-day occurrence was variable, the season held up well right to the end of the month. However, openings requiring multiple-hop Es ceased after the 12th, apart from scattered exceptions towards the end of the month.

The earliest Es reported during the month was UT5G into 9A at 0313, with GB3MCB, also into 9A, a little later. On four days signals lingered until after midnight UTC.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|-------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| UTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 00-03 | | | | + | | | + | | + | | | | | | | | | | | | | | | | | | | | | | + |
| 03-06 | | | | + | | | | | | + | + | | | | | | | | | | + | | + | | | + | | | | | + |
| 06-09 | + | + | + | + | + | + | | + | + | + | + | | | + | + | + | | + | + | + | + | + | | + | | + | + | | + | + | |
| 09-12 | + | + | + | + | + | + | + | + | + | + | + | + | | | + | + | + | + | + | + | + | + | | + | + | + | + | + | + | + | + |
| 12-15 | + | + | + | + | + | + | + | + | + | + | + | + | | | + | + | + | + | + | + | + | + | | + | | + | | + | + | + | |
| 15-18 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | + | + | + | | | + | + | |
| 18-21 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | + | + | + | + | + | + | + |
| 21-24 | + | + | + | + | + | + | + | + | + | + | + | | | | | + | + | + | | | | + | + | | | + | + | | + | + | |

As in June, multihop contacts eastward beyond 4X/5B/OD were scarce, though whether this was attributable to propagation or (more likely) to absence of activity, is uncertain. YA4F was reported as working into Europe on the 10th (DL,G,I,LY,SP,YO), the 16th (DL,PA,9A) and 17th (Z3). A4 was into I,S5 and 9A on the 1st and the UK on the 14th. There was a single report of FR into Belgium on the 10th - sadly the beacon there has not as yet been activated as promised. The catch of the month would have been XV1V worked by PE1ZMS on the 1st, with a reported 599 signal. Unfortunately there is no corroboration.

| Europe<->Africa | |
|-----------------|--|
| 5T | 0 days 1(DL,EI,F,G,LA,LX,OK,OZ) 3(EI,G,PA) 7(F,G) 29(YU) 30(EA,G,I,LY,S5,9A) |
| S0 | 2 days 2(DL,OZ) 5(DL,LX,OK) |
| D4 | 1 day 12(CT) |
| ST | 1 day 2(I,PA,9H) |
| ZS | 1 day 25(9A) |
| 7Q | 1 day 28(EA) |

Africa was a little more productive, particularly with UK stations, which seem more favoured - although even here reports were down on June 2003. Again there was no telling whether this was due to lack of activity or inadequate propagation, though there were several days when 5T5SN was known to be active but was not reported in Europe. The only signals from southern Africa were from ZS during the enhancement on the 25th. 7X,CT3,EA8,EA9 and CN, all within single hop range of much of Europe are not included above.

Europe<->North America

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|--------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Med | | | + | + | + | | + | + | + | | | + | | | | | | | | | | | | | | + | | | | | |
| Iberia | | + | + | + | + | + | + | + | + | + | + | + | | | | | | | | | | | + | | | | | | | | |
| North | | + | + | + | + | + | + | + | + | + | | | | | | | | | | | | | + | | | | | | | | |

Europe<>North America

| | Mediterranean | Iberia | Northern Europe |
|-----|-----------------|---------------------|--|
| W1 | 4 days 3,4,8,12 | 10 days 3,4-9 10-12 | 4 days 3(EI,G) 6(EI) 8(DL,EI,G,PA) 9(EI) |
| W2 | 2 days 3,5 | 2 days 3,5 | 1 day 8(ON) |
| W3 | 5 days 3-5 8 12 | 7 days 2-7 9 | |
| W4 | 6 days 3-5 7-9 | 6 days 3-9 | 4 days 3(EI,G) 4(G) 6(EI,G) 8(EI,G) 10(DL,G) |
| W5 | 1 day 9 | 4 days 3,5,6,9 | |
| W7 | | 1 day 6 | |
| W8 | 1 day 5 | 3 days 3,5,6 | 1 day 3(EI) |
| W9 | | 1 day 5 | |
| W0 | | 2 days 6,7 | |
| VE1 | 2 days 3,26 | 3 days 3,7,8 | 5 days 3(EI,G) 6(G) 7(G) 8(G) 10(G) |
| VE2 | | 1 day 7 | |
| VE3 | | 1 day 3 | |
| VE6 | | | 1 day 17(G) |
| VE8 | | | 1 day 17(G) |
| VO1 | | 2 days 7 22 | 0 days 3(EI) 6(G) 10(G) 22(PA) |
| VY2 | 1 day 2 | | |

Propagation between Europe and North America was on a par with July 2003, with openings on ten days (2003 9) if the aurorally-related event on the 17th is included. However, the Iberian peninsula was down to 11 days (2003 22) and the Mediterranean (excluding F) was down from 14 days 8. Nevertheless, the detailed listings show a number of widespread openings of reasonable duration - though the scarcity of beacon reports suggests that low-power stations or poor locations may often have struggled. Different seasons can produce somewhat different propagation patterns. This month appears to have favoured the north-eastern states and Canadian maritime provinces (W1,VE1,VE9,VO,VY2) less than usual while the north of Northern Europe scarcely featured. G0AEV has already noted the concentration of openings in the first twelve days of the month, after which the path appears to have collapsed. The earliest trans-Atlantic opening reported was around 0930. On a couple of occasions, events lasted until after UTC midnight.

There was no slump in propagation to Central America and the Caribbean (almost wholly the Caribbean). As in 2003, there were openings on 13 days, including northern Europe on 12(12), Iberia on 6(8) and the Mediterranean also on 8(9) - though care is needed in drawing conclusions because activity levels are so variable. However, we can be reasonably sure multihop Es was the prevailing mode, with ranges of around 7,000km requiring at least three hops. The most prominent stations were the J79KV and PJ7M dxpeditions. The former ended operation on the 4th, having worked Europe on all four days. The latter was active until the 11th, working Europe on all but the 9th. On the Continent both stations' signals reached OK, with PJ7M also contacting SV1, SV3 and 5B on the 9th, SV3 on the 2nd, 4X on the 8th and 5B on the 11th. (The furthest contact however, reported by SV1DH, was 5B<->W4 on the 9th, at a range of 10,500km - a minimum of four hops.)

Apart from KP4, none of the other countries in the region was worked with any frequency, while FJ, 6Y, HR, V3, VP2E and VP2M, were among countries known to have been active, were not reported in Europe. As the preceding table shows, several countries could be worked from the western edge of Europe but not from either Iberia or further across the Mediterranean basin. In Europe, OZ features fairly often, LY occasionally, SM once and LA and OH not at all. (In June, there were no reports of Caribbean signals from any of the Scandinavian or Baltic states)

Europe<>Caribbean and Central America

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| Med | | + | + | + | + | + | + | | | | + | | | | | | | | | | | | | | | + | | | | | |
| Iberia | | + | + | | + | + | | | | | + | + | | | | | | | | | | | | | | | | | | | |
| North | + | + | + | + | + | + | + | + | | + | | + | | | | + | | | | | | | | | | + | | | | | |

| | Mediterranean | Iberia | Northern Europe |
|------|-----------------|----------------|--|
| PJ7 | 6 days 2-6 11 | 3 days 5,6,11 | 9 days 2(DL,G,HB,ON) 3(EI,G) 4(DL,EI,G,LY,PA,SM) 5(F,G) 6(DL,EI,G,OK,ON,OZ,PA,SP) 7(DL,G,OZ,PA) 8(DL,EI,G,PA,SP)10(EI,G,OZ,PA) 26(G) |
| J7 | 4 days 1-4 | 1 day 3 | 4days 1(G,LX,LY,LZ,PA) 2(DL,G,PA) PA) 4(DL,EI,G,LY,OK) |
| FM | | | 2 days 3(G) 6(G) |
| HI | 2 days 2,7 | 2 days 5,12 | 1 day 7(G) |
| KP2 | | | 3 days 6(EI,G) 7(DL,G,PA) 26(G) |
| KP4 | 4 days 1,4,5,26 | 4 days 2,3,5,7 | 5 days 2(DL) 4(ON) 6(G) 7(G,ON) 26(DL,G,ON,PA) |
| 9Y | 1 day 16 | | 8 days 1(EI,G) 3(EI,G) 6(EI,G,PA) 8(DL,G,LX,OK,ON,OZ,SP) 12(G,ON) 15(DL,OK,ON,PA) 17(G) 26(EI,G) |
| VP9 | 2 days 2,3 | 2 days 3,6 | 2 days 2(DL) 3(EI) |
| P4 | 1 day 2 | | 2 days 2(DL,G) 6(G) |
| HP | | | 2 days 10(EI,G,OZ) 26(G) |
| V4 | | | 2 days 6(G) 7(PA) |
| PJ2 | | | 2 days 6(G) 26(G) |
| FG | | | 1 day 26(EI,G) |
| VP5 | | | 1 day 7(G) |
| VP2E | | | 1 day 4(DL) |
| C6 | | 1 day 6 | 1 day 6(EI,G) |

Note, in the detailed listings that follow, callsigns given in full either relate to DX contacts or to beacons, as indicative of paths accessible with low erp.

July 1 06-0700 UR>9A,SP9,SM0,9A UU5SIX>HA1,I7 ZB>EI 07-0800 CT0SIX>I1 CT3,OH5SIX>HB EA7>EI YO7>DL 08-0900 4X>DL LZ2>PA CN8MC,YO3KWJ>EH3 XV1V>PE1MZS(599 ?) UR>DL 09-1000 ES0>I4 UT5G>EA7,I5 CU3URA>F CN8MC>F,EI SV1SIX,OM3,LZ1JH,SP6>I5 LZ2,LZ1,YZ>DL CT0SIX>EI,HB YU1EO,OH5SIX,LZ1JH>HB 10-1100 UU5SIX>9A,EH3 UR>S5 CT3>EA7,SP2 S55ZRS>9A OK1>EH3 S5>I0,9A I7,I0JX,F>DL T9>F 11-1200 S5>F SM7>9H EH6>OM5 UU5SIX>S5 12-1300 UR>9H SV1SIX>9H,SP9>9H LZ1JH,5B4CY,F1GTU>SP9 G>I5 13-1400 S55ZRS,9A0BHH, OE3XLB>EI SV1SIX>F LZ3>DL LZ2>OH2 I9>I5,I0 14-1500 YO3KWJ>PA,ON S55ZRS,9A0BHH>OH2 UU5SIX>SP4 SV1SIX>DL,PA T9>OZ ES1,OH3>9A I9>LA OH5RAC>S5 YU1EO,UT5G>DL ZB>EI LY0SIX,I9>I5 I0>I9 CN8MC,CT>ON 15-1600 SV2,SV1SIX,UU5SIX>F GB3BUX>OM5 EH6>OZ F,EI,GI>9A OM3,OK2>ON 5B4CY>EI FX4SIX,GB3MCB,LZ1JH,4X,SV5SIX>DL SV1SIX>DL,OZ,EI F>SM7 4X>EI YU7>OH2 I3>ES6 16-1700 UR,EI,GI,ER1,G,GM>9A YO7,LZ2>I5 4X,5B4CY>EI SV1>SP6,ON,PA GB3BAA,F,4X>DL ES0>F SV1SIX>EI,YO3 F>PA,9A EI>HB A45XR>S57RR 17-1800 G>EA5,9A SV1SIX>S5 J79KV>IZ5EKV,IT9IPQ,5B4FL,IS0GQX 4X>9A F>SM7,9A I0,9H>PA ZA,Z3>I5 CT>LX I0>ER1 F>SQ9 GI>ON 18-1900 F>LA I8>ON J79KV>I5MXX, G4IGO,PA2M,G3FPQ,DL9USA,5B4FL, F8DBF,F6HRP,9A5Y,F6FHP,IZ1EPM,LY2BAW GU>I4 SV8>SP6 GM,LZ2>F 5T5SN>DL8YHR, EI7IX,DK5AI,DL9USA 3A>I5 EH2>SQ9 9H>PA 19-2000 5T5SN>OZ1BNN,LX2SM,LA6PV, M0BCG,F5HRY,DL2FDL,OK1FDD J79KV>G4FUF,G4DHF,I0JX,GW7SMV,F5HRY,PE1ZMS, G4AJC,IT9EJW,IK8DYD,9A6R, LX1JX,G7RAU EH3>4X EH2>DL 20-2100 EH2>OZ EH1>9A J79KV>9A8A,GW7SMV, G4BWP,G4FVP,G4RGK,DL2FDL,G3JHM,G4FVP,EI7BMB, DC8TS, EI5FK,G4OBK,G0JL,MM0AMW,EI7GL LX0SIX>F CT>DL 9Y4AT>G4PCI 21-2200 9Y4AT>EI5FK F,EH3>EI J79KV>DL8YHR,M0BCG,PA2M,EI7GL,PA0LOU EH8>CT 23-2400 CN8MC>F GB3MCB>EA5

July 2 06-0700 A45XR>9A8A SV1SIX>EH3,SP6,OE6,I0 CN8MC>I1 LA>EI,OE6 07-0800 YO3KWJ>I0 EH7,YZ1>9A CN8MC>F,HB OY6SMC>DL S5,IQ4AD>EA5 SV1SIX>I1 08-0900 SV1SIX>I0 CN8MC>I0,I5 OH3>OH2 0940 4X>YU1 10-1100 7X2RO>I5 GB3BAA>I0 I5MXX,I0JX>DL 11-1200 CN8MC>SV1 CU3URA>EA7 UR>9H SV1>EH3 YU7>ON 9H>DL SV1SIX>SP9 YO3KWJ>I5 12-1300 S5,9H,EH9,I1>I0 SV1SIX>SP6 EH7,CN,OZ>I5 CN,I5,S5>EA5 S5,I0>CN CN>EA1,I4 9H>ON 9H,T7>F LZ2>SP9 13-1400 EH6,F,T7,3A>I0 CT3>I9 UR>9A F>I5 ZB2>DL EH6>PA 3A>9H IS0>SP9,DL F>ON FX4SIX>OE6 I0>I5 (short) 14-1500 DL,EH2,CN>9A ST2DX>9H1XT,IT9TJH GU>I0,HB,9H,I9 S5,OE6>EH4 EH6>SP6 GB3MCB>DL,OE5 F>DL,PA GB3IOJ>HB VP9/W3CMP>IK2GSO PA>I0 4U1ITU>DL 15-1600 4U1ITU>DL,OZ,EI 9A0BHH,LX0SIX>EI G,EI>OE5 F>LA PA,GB3MCB,EH4>DL OZ>ON EH1>PA VP9/W3CMP>DL6AMI,IK2GSO ST2DX>PA7FM 5B>I9 16-1700 5B,T9>F I0>5B 17-1800 G>I8 IQ4AD,4U1ITU>EI CN8MC,I9>DL CU3URA>EA7 CT3>CT,8A,OE5,DL,EH3,OZ A45XR>F8DBF YZ1,ON0SIX,PI7SIX>F I8>EA1 CT,EH5>SP6 CT,GB3MCB>I5 CT>SP7,9A 18-1900 G>I0 EH8,CT3,EH3, CT,EH7>DL F>9A,I2,9H CN>ON EA6>EI SV1SIX>I1 SV1>F CT3>9A J79KV>G3FPQ,DL9USA,PC7M,9A7V,9A6R,DK7UY G,GU,LA.EH8>I5 EH3>HB PJ7M>DK1MAX,ON4KST 5T5SN>D44TD EH8>I9,CN,OK1 S5>CN 19-2000 CU3URA,F,EH5>I3 EH9>ON,OZ EH8,3A,F>9A EH8>PA I0>LA CN>F EH3>SP5 F,CT3>DL G,GU>I0 CT>DL,SP9 PJ7M>9A8A,9A6R,IK2GSO,9A4K,DL1YD EH9>DL,I8,OZ CN>F,SP6,DL F>I1 7X0AD>ON G,I1>EH4 20-2100 CN>DL,OZ EH1>EI CT3,F>9A CT>OE5 I5>EH4 9A>I5 ZB2>EI EH2>LX,DL EH4>DL S01A>DL,OZ PJ7M>DL9NDC, IK5MEN,DL7QY,HB9DBM,G3FPQ NP3CW>DL7QY,IK2GSO 21-2200 CU3URA,I3, F,EH1>9A VP9/W3CMP>IK2GSO,IK5MEN,9A8A GB3BUX,GB3BAA>I0 CT>PA NP3CW>CT1EEB 7X2RO>PA,DL CT3>I2,OK1,9A,CT CU3URA>OE5 HI8ROX>F5OQK,I5MXX 22-2300 NP3CW>I4CLK CT3>DL,CN HI8ROX>CQ44NH, IK5GQK,CN8LI,IZ1EPM VP9/W3CMP>IK1EGC,IK0FTA,IK5GQK CT>DL,9A P43JB>I5MXX,IK5MEN,MU0FAL,DL7QY,MW1MFY CU3URA,CN8MC>I5 EH5>I7 23-2400 HI8ROX>IW5DHN VY2ZM>9H1XT
+++ 144MHz Es 1240-1418 and 1835-1900 including UK, as far north as IO83

July 3 0556 CU3URA>CN 07-0800 SV1SIX>9H,I1 9H1SIX>OE5,DL 4X>ER1 GB3LER,OZ7IGY>EA7 LZ1JH,YO3KWJ,DL>EA3 CT0SIX>EI 08-0900 EH3,CT,I3>DL EH3>EI ON0SIX>9H GB3MCB>5T5SN 5T5SN>EI7IX,EI7GL,G0CHE,EI5FK CU3URA>DL,I0,I1 CN8MC>EI,OE5

CT>OE5 ZB2>PA CN>ON 4X>EH3,9H S5>CN 09-1000 CT>EI,I1,CT,I0,I4,9H EH1>EH3
CT3>DL,EA1 EH9>I5 ZB,EA5>F CN8MC>5T5SN ZB>9A,EI,I0 PA>OE5,I1,EA5,CN,9A
CU3URA>EH3 F>CN EH9>PA 10-1100 EH7>9A CT>DL,9A I2>CN IS0>EA7 W3JO>EH3AKY
VP9/W3CMP>EH3AKY,IZ1EPM, EA7RM,IH9GPI,IS0GQX 10-1100 K1SIX>EA7RM ZB>9H,EI
CU3URA>F LX>EA7 CN>I2 EH8>HB 11-1200 K7BV/1>EH3AKY EH7>EH1 CT>I9,EA5,LX,ON
J79KV>MW1MFY, EI7IX,I4EAT,M0BJL,PA1SIX,F6HRP,EI7BMB,I5MXX F>CN EH7>EH1
PJ7M>F6FHP SP6>SP9 S5>EA5 AA2AE>IH9GPI W3EP/1>EH3AKY K1TEO>EA1WZ EH9>EH7
CN>EI KF2O>IH9GPI 12-1300 W3EP>F6FHP K7BV/1>IK0FTA GU>EA5 J79KV>G3SED,
CT1EEB,G4PCI,F6FHP,G3IBI,F8DBF PJ7M>MW1MFY,F6FHP KP4EIT>EH3AKY CT>F ZB>S5
VP9/W3CMP>9H1YZ,EA5RM EH7>S5 13-1400 VP9/W3CMP>EA5YU,EI5FK, F5OQK
PJ7M>EI7IX,G3WOS,EI5FK,MW1MFY CT>EI W1MU>CT1DVG J79KV>G4BGW,F6FHP,G4IFX
WP4U>EH1WZ EH8>EH3 VE1CSM>EA7KW FM5WD>MW1MFY 14-1500 G>PA,ON
VP9/W3CMP>G0KOM/EA5 NG4C>EA7KW CN8MC>EA3 CN>EA7 9A,YU1>S5 J79KV>EI7IX
G>I5 15-1600 YT4,9A>T9 9A>S5,PA,I4 3A,YU7>I5 PA>DL GB3LER>F CU3URA>EI 16-1700
CU3URA>ON G>PA PA>LY CN,CT,ZB>CT3 17-1800 CT3>EA7 OH2>SQ2 OH1,LY>OH2
LY>SM5 OZ>9A 18-1900 CN8MC>F,9H,I5 G,CT>EA5 EH3>EI CN>EA2 CT>F,LY G>LY
CU3URA>EI 19-2000 G,GC,GM,CT,CN>F G,GI>EA5 GD,CN8MC>DL CU3URA,G>F EI>SP2
JW7SIX>LA (mode?) 9A>EI CN>PA ES0>SM5 20-2100 GI>EA5 CU3URA,G>F N3DB>F5TND,
EH3LL K1SIX>EH3LL,G4IFX,MW1MFY,EI7IX VE3NH>EA7KW K8ZES>EH3LL K7BV/1>EH3LL,
MW1MFY,IK1EGC K3KYR>EA7KW VO1PJN>F8AAL VE1YX>I5MXX 5T5SN>GW7SMV, G4PCI
K3KYR>EA5/G0KOM 21-2200 N3DB>I5MXX,F6FHP 5T5SN>PA4PA,G4DHF 9Y4AT>EI7IX,
GI6ATZ YU1>9A PA>LY,9A G>PA CT,CN8MC>9H K3KYR>I5MXX KN4SM>IK2GSO
NG4C>MU0FAL CU3URA>EI W1MU>EA7 K7BV/1> EH3LL,EI7GL K2ERG>DF9CY JW5>SM3
W1FC>MW1MFY K8MFO>EI5FK 22-2300 K4PI>MW1MFY K5AND>MW1MFY WZ8D>F8DBF
K6EID/4>MW1FMY OZ>LY VE1YX> G8BCG WZ8D,VE1ZZ>EI5FK 23-2400 VE1ZZ>F4DXW
VO1ZA>EI5FK,F4DXW CU3URA>F
+++ 1040-1150 144MHz Es, including UK>EA

July 4 0007 VE1YX>F8DBF 0457 YO7>DL 05-0600 YT7,9A,YU1>DL PA>9A,DL YU7>S5,DL 06-0700
PA,CT>DL PA>EA7 CT>9H,I8 YU1,ES6,9A>ES5 SQ9>PA 07-0800 YU1>LY,ES5 9A,YU1>PA
CT>F UU5SIX>OH2,ES5,ES6 CN8MC>F,I1,I5 YU1>I1 08-0900 PA>DL UU5SIX>LY GB3MCB>CN
CT>F,I1 EH8>I2 YU1>OZ PA>ON,EA5 09-1000 OZ,ZB,EH7,EH8,EH5>DL SM3>ES5 PA>EA5,LA
GB3MCB,EH2>CN EH5>ON CT>I5 9H,CT3>EA2 OZ>LY SQ9>ON EH7>I0 ON0SIX,EH8>PA 10-
1100 EH8>DL,EA2 W3JO>EA7KW YU1,YU7>EA5 EH7,ZB,EH1>DL N3DB>IK0FTA,EA7KW
ZB>I0 PA>SP4 F>EH4 EI>F EH1,EH5>9A K7BV/1>9H1TX 11-1200 7X2RO>CT,I2,PA ZB>I5,I8
EH5>EI,9A SV2>SV1(t) I8>EA2 CU3>I8 9A>I5 UU5SIX>LY EI>I0 EH1,CT>EI SV3>9H
KN4SM>EA7KW EA7>I5,9A OZ>ON 12-1300 ES0>LY KN4SM>I8LPR PA>EI,EA5 OZ>EA5
EI>F,9A 13-1400 G>PA YU1>SM0 9A>OH2 EI>I5,LY PJ7M>EI7IX 14-1500 4X>I0
OH6,OH3,OH2>ON PJ7M>LY2IJ,GD0TEP,MW1MFY,G0JHC ON0SIX>ES6 LY,ES6>F LY>EI 15-
1600 ES2,ES1,OH3,SM3>F G>OH2 F>OZ GW>ES6 GM>SP6,DL SP2>ON GB3LER>DL
GB3MCB>CN OZ>EI F,GW>OH6 5B,OH2>I0 ES1>PA 4X>ES6,I9 G>OH6 I5>EI 16-1700
ZA>I7,OK1,ES1 LA>I1 OD>I8,9H,F,I0 GM>SP9 4X,HB0,CN8MC,EH7>F F>OE5,SP6,OK1,HA1
GB3LER,GB3IOJ>OE5 LA>EH3 4X>9H,I9 EH4,EH7,CT,UT5G, UU5SIX>DL SP3>SP6 CT>9A
G>I8 SV2>ES1 EH7>HB CT>S5 17-1800 EH4,EH5,EH9,F,GB3MCB,GW,SV1SIX>DL I2>CT
7X0AD>F GM>I5 7X0AD>F,I9,EA5 5B>CN EI>S5 F>OZ,CT HB0>CN,EI,CT GW,G,I1>9A I3>CT
UR>CN GM>I1 18-1900 PJ7M>PE1M,G4RGK,SM6CMU YO6>F SV2>I8,DL,SP5,SP4,HB,PA
OD>9A 9A>PA 4X>ON,DL,F,PA SP5,DL>I0 LZ2CC>I5 9A,Z3,F>DL 9A0BHH,TF3SIX,CT0SIX>EI
19-2000 9A,S55ZRS>EI LX,ON0SIX>I0 SV2>I5 J79KV>LY2BAW,G4IFX,G0TSM,EI7IX
PJ7M>EI7IX KP4EIT>ON4KST 3A>I5 CN>DL,SP6,SP1,LA,I0 G>I8 GI>9A,I0 LA>F 20-2100
UU5SIX>CN IQ4AD>EI EH2>DL CQ14HZE>DL,PA S5,GB3MCB>I5 EH2>OZ KP4EIT>S57RR
PJ7M>EI7IX S5>9A 21-2200 PJ7M>DL9USA,MW1MFY,G0FYD,F4DXW, I5MXX,M0BCG,
MU0FAL,IK2QWI,IZ1EPM,OK1FFD,EI7GL VP2E>DL9USA N1TKK/KP4> S57RR.I5MXX
KP4EIT>I5MXX CU3URA>EI EH2,EH1>ON WP4N>G3SED 22-2300 PJ7M>EI7BMB,GW7SMV,
DL8YHR,EI7IX,F4DXW,EI3IO,DJ6XV,G4FVP,G0CHE,I7CSB,GI6ATZ,S57RR

July 5 06-0700 UT5G>OZ,I1,DL 9A0BHH,LZ2CC>OZ 9A>LA SV1SIX>I1 07-0800 LY,UR>I1 DL>9A YO3KWJ>DL SV1SIX>HB I0JX>LA CT0SIX>I5 SV2>PA,DL 9H1SIX>OE5 08-0900 SV1SIX>OE5, I1 09-1000 SV1SIX>I2,I4,DL I9>I2,I1,F,ON LZ2CC>I1 CN8MC,GB3LER, 9H1SIX,F>I5 G>OE5 I9>I2 EA6>DL 10-1100 UT5G>DL CT3>I8,OE5 EH9,EH7>OE5 CU3URA>EA7 9H>9A 11-1200 UU5SIX>9A,I0,S5 CN8MC>F EH7>5B EH9,EH7>I8 12-1300 9A0BHH>S5 PJ7M>EA7RM CN8MC>SP6,F KP4EIT>EA7RM,IH9GPI CT0SIX>EA7 CN>EH5 13-1400 EH1,EH2>EH7 CN,EH7>F PJ7M>CT1CJJ KP4EIT>EH3LL K4RX>EH7RM EH7>F 14-1500 CT,EA7,I1>F UR>EA7 EH7>DL,OE5 CN8MC>DL W4SO>EA7RM CU3URA>SV1 SV1>I7(bs) T7>EA3 I9,LZ2CC>DL PJ7M>I4LCK,IK0VAQ, I0WTD 15-1600 SV8>F,SP6,EA1,9A,I0 PJ7M>G8BCG,F8OP I9>OE5,I0 LZ1JH>SP6 G,I2>I8 I0>PA,9A YU1>F DL>I0 16-1700 PJ7M>F5GTR,IK8DYD I3>I0 YU6>F I7,I9>SP6 SV8>I9 YU1,LZ2CC>I3 LX0SIX>SK0 YO6>LA KP4EIT>I4CIL,F8OP K4RX>IK0FTA I2>I8 I9,ZB>9A K1DN>IK8DYD I0JX>HB,ON EH9>S5 I7>I0 7X0AD>OE5,ON I0>DL 17-1800 I8>I2,I5 EH6>9A,DL,PA,OE5 CT3>PA,9A,F I9,I0>EI 9A,YU1,T9,I9>F F,I5>LZ1 ZB,EH1>9A 7X0AD>SP9,OZ LZ2CC,SV1SIX>EA7 PA>EA5 CT,Z3,I9,EH1,EH6>DL F>LX EH1>SP6 CT>I1 18-1900 3A>LZ1 I9,ZA>DL EH2>9A F>I1,9A S01A>LX,OK1,DL CN8MC>EI I5>SM7 T9>LA C3>I9,DL GB3IOJ,LZ2CC,GB3MCB>I5 EI>I8 CU3>9H CU3URA>I5,9A SV1SIX>F LZ2>S5 EH6>ON 19-2000 F>DL,OK1 CU3>9A I9>SP6 EH8,I9>DL EH8>OZ EH9>DL,LX,S5 CN>PA,F CT,I9>I0 I0>OH2 N3DB>EA7RM CU3>CN 20-2100 LY>CN KB3LEF>IS0KEB,9H1YZ WA4NJP>EA5/G0KOM EH9>DL W4SO>IW9CER 9H>CT3,DL EH7>5B K8MD>9H1XT CT3,CT>I2 N4JJ>SV1DH W4DR>IK4DRY 5B>I0 WB4UNA>EA7 21-2200 NW5E/4>I5MXX EH1>YU7 5B>I7 S5>I2(bs),I3 N4XD>EA7 I9>I0 I9>DL 5B>9H WB9Z>IZ5EME 22-2300 W3ZZ>IT9RZR W1QK>EA7KW K8ZES>CT3DL 23-2400 YU1>9H K8ZES>CT1EAT GB3LER>F
+++ 144MHz Es 1300-1355, 1820-1850 1850-2010

July 6 07-0800 EH7>DL 08-0900 CT0SIX>DL,I0 09-1000 G>EH3 ZB>DL,EI,PA CN8MC>EI 10-1100 EH1>I8 CT>PA PJ7M>F5JJK,IW1AZJ,IK8DYD 11-1200 EH7>EI PJ7M>EA7RM CT,EH1>PA EH1,ZB>DL 12-1300 K4PI,K6EID/4>EA7RM CU3URA>F 13-1400 EH8>EA5 WB4UNA,N8PR/4>EA7RM CN>I9 CU3URA>F,EA5,EI IW3FZQ,IK5ZUL>I9 W4VC,W5OZI>EA7KW K4RX>EH2KP 3A>SV1 14-1500 PJ7M>EI7IX,G3ZSS,9H1XT, G4PCI,DK1MAX,DJ6MB,DJ4PI,F4DXW, G3KNU,9H1TX,SP6MLK,OK1MP CU3URA>DL 15-1600 PJ7M>DJ3JF,SP9SPD,MU0FAL,G3SBP, OK1DPU,F4DXW,DL9USA FM5WD>F5JJK F>ON 16-1700 PJ7M>F6HRP,EI5FK,DL6AMI, EI7BMB, GW3JXN, G4PCI,EI3IO,MW1MFY,ON5PU K4RX>EA7RM 9Y4/AJ9C>G4PCI,G4IFX, EI3IO,EI7IX 9Y4AT>EI7IX W1IPL/7>EA7RM(WY) VP9GE>CT1DYX KP4EIT>F4DXW 18-1900 PJ7M>ON6AA,PA4PA,MM0AMW,GW7SMV,G0CHE,PA5DD,OZ0JD,G4DHF,PA3DOL,G7KHF PA>ON N1TKK/KP4>G4PCI 9Y4AT>EI3IO,G4DHF,M0CTP 9Z4BM>M0BCG N1TKK/KP4>G7RAU,G3SED GW>EI I0JX>SP6 ON>PA 19-2000 9Y4AT>G4ASR,G4DHF, MW1MFY PJ7M>PF7M,PE1MZS,G4AJC,SP9DSD, DG9BDI,DF9OX,PC5C,DG5YIL 9Z4BM>G4DHF,EI7IX,PC5C V44KJ>M0BCG,MW1MFY IS0>9H F>SP6 CU3URA>EI WP4NIX>MW1MFY,G4PCI GB3LER>I1 GI>9A 20-2100 G,GW>9A 9Z4BM>G4PCI,GM4NFC, G4DHF V44KJ>MW1MFY KP4EIT>G4DHF NP3CW, FM5WD>MW1MFY N1TKK/KP4>GW7SMV 21-2200 NP3CW>G3WOS N1TKK/KP4>G4RGK,G0JHC WP4NEG>GW7SMV,G0JHC,G3FPQ PJ7M>M0BCG K7BV/1>F5JJK,EI7IX V44KJ>G8BCG KP4EIT>F4DXW K4DLJ>F5JJK P43JB>G0JHC 22-2300 K4DY>F5JJK PJ7M>G8BCG P43JB>G3FPQ,G3IBI WA4NJP>EI7IX,F5JJK,G8BCG K6EID/4>EI7IX,G3FPQ,F5JJK,EA7RM W4SO>EI3IO AA4V>GI6ATZ C6AGN>EI3IO,CT1EEB WB2QLP/4>EI3IO W4SO>F5JJK KP4EIT>EI7IX,GI6ATZ N1TKK/KP4,KP2L>GI6ATZ VO1ZA>GM0EFT 23-2400 K4UTE>F4DXW PJ2BVU>GI6ATZ,G3FPQ,G4DHF WP4NIX>F4DXW C6AGN>G4IFX,F4DXW,G8BCG WP4N>G4DHF KP2L>EI7IX,G4DHF WP4U>EI7IX,GI6ATZ,G4DHF,G3IBI N4JBK>CT1EEB P43JB>G3IBI CU3URA>EI

July 7 00-0100 W4SO>CT1DYX W4BP,WP4G>F5JJK K4EA,W4SO>EA7RM 0920 E3tv(YK)>OH2(Es) 0947 CN>EI 10-1100 CU3URA>I2 CN>DL CT0SIX>I9 VO1ZA,VE2MGL>EA7RM SV1SIX>DL 5B4CY,UR>OZ 5B>I9,DL,OH3,ON UR>LA OH9SIX>DL 11-1200 VE1RG,N1RAM,K1TOL,K1GUN>EA7 3A>I4 5B>9A,SP6 WA1OJB>EA7RM OH9SIX,OH1SIX>SP6

ES4>DL SM3>9A OH2,OH5RAC>DL CN>I1 12-1300 CN>EA2 OH2,CN8MC,OH3>DL 13-1400
 CN>HB,PA I9>PA CN8MC>SP5 DL>I7 GB3LER,GB3BAA>I5 I5,I7,I8>PA I9>SP6 14-1500 F>LZ3
 PA>I7,DL DL>I8 I9,I0>OK1,SP6 SV1SIX>SP6,PA I0JX>SP6 PA,I7,I0,UR>DL T7>PA LZ2>OZ
 GU>LZ2 GU>9A,S5 15-1600 DL>I8 I0>SQ3 IS0,T9,SV2,T7>DL SV1SIX,5B4CY,YU6>OZ
 I0JX,S5,T9>PA I5>SM7 I6>SP6 I2,I1,GW,GB3MCB>9A IS0>OK1 I5,I0>OZ UR>9H OK1>I0
NW5E/4>IS0GQX,ES6VQ,I4EWH CN8MC>EI 16-1700 T9>F,PA,DL,SM7,OK1
 YU6,I9,4X,4N1ZNI>DL I2,I6>SP5 PA,DL,I4>9A I8,I0>SM7 I9,I8>SQ3 SM7>9H 7X0AD>EI
 Z3>ON,PA UR,LX>I1 9A>HB I7,YU1>OK1 SV1,YU7>PA YU1>LX 17-1800 LZ2CC>DL UT5G>I8
 YU1EO,ZA>DL EH8>EA7 18-1900 UT5G>I4,S5 YO7>OE3 OK1,S5>9A GB3MCB>CN OK1>SQ9
 CT0SIX,YO3,Z3,LZ1,LZ2>DL LZ2>OK1,DL SV1SIX>SP6 19-2000 VE1YX>EA5/G0KOM
 UU5SIX>EI SV1SIX>DL,PA LZ3>DL,OK1 F>DL 20-2100 GM>9H VE1YX>EA5/G0KOM
 GB3LER,CN8MC,OY6SMC>F EI>OK1 F>I9 JW7SIX>F,LA 21-2200 LX0SIX,PI7SIX>I9
 GB3LER>5T5SN 5T5SN>F5TND PJ7M>PA4PA,MM0AMW, G0TSM,DF9OX,DK5WL SR9FHA>I9
KP4EIT>G4VPD WP4U>GI6ATZ,G0JHC VE1ZZ>G4IGO KP2L>G0JHC HI8ROX>IZ1EPM G>EA7
 22-2300 KP2L>DF9OX HI8ROX>G0JHC,DF9OX,PA2DB,G3FPQ,PA4PA,PA0RDY WP4U>ON4HF
PJ7M>G0JHC,OZ0JX,PA4PA,G0TSM,DL3DXX,F4DXW,G3IBI VP5JM>G3FPQ 23-2400
NP3CW>GI6ATZ,G0JL V44KJ>PA4PA GB3MCB>9A

July 8

06-0700 UR>LA,SP2,DL YO3KWJ>SP2 07-0800 UR>DL,SP6,LA,PA,OZ OH9SIX>ER1
 SV1SIX>DL,SP2,OZ SV2>SP9 UT45G>SP1 OH2>YO8 OH9SIX>SP2 08-0900
 YO8,LZ1,LY,SV1SIX,LZ1JH,YO3KWJ,9H>DL UR,ES6,SV1SIX,UU5SIX,UT5G, OH5RAC>SP9
 DL>EI OH9,9A>SQ2 UR,ES5>9A OY6SMC>F LZ1,LY>SQ3 09-1000 DL,LA>9A 9A>EB5
 SV2>OH1,OK1 T9,UU5SIX,HB,ON0SIX,GB3BAA,YU1EO>DL UR>OZ,DL OH2,YU6>SP9
 LA,GB3LER,S5>EI YO3KWJ>SM7 Z3,LZ3>ON SP9>ES1 LZ2>OE1 SV2>ES6 YU1>PA
 UT5G>EA7 10-1100 LZ2,I9,YO2,YU1,LZ1JH, UR,9A, I9,YU6>DL YO3KWJ,9H1SIX>OE5 G>I1
 GB3LER>EA7 5B,9A>SP9 SP9,OK1>I8 I1>SK0 CT>ON 11-1200 ON>SP9 CN8MC>I9
 HB>EA5,SP5 LA>ER1 SQ5>9A EI>EA5 CT,SM7>I1 I2>PA PI7SIX,GB3BUX>OE5 I0,3A>SP2
 OM3>DL 12-1300 9A,GU,PA(bs),OK2,I5>DL S5,SQ3>F DL>EA5 SP7>I1,EI I2,I3,DL,F>SP6
 CN8MC>9H GU>9A I9,SP2>SP2 OY6SMC>EA7 SP3>I1,DL LX>ON OM6>SP9 13-1400
 3A>SP2,I9,F,OZ CU3URA>EI I1>SP6 OK2,OK1,SP9>F DL>I3 OY6SMC>EI PJ7M>DL8PM
 EH8,T9>EA5 I5,I2,I1>SP9 I2,HB,T9,FX4SIX,UT5G>DL GM>I1 SM7,SP9>HB 14-1500
 F,CN8MC,EI,GU,GD,4X,I1, I2,EH8>DL PA>YO8 IQ4AD,FX4SIX>SP5 IZ1EPM,GB3BAA>SP9
 4X,I4>PA G,GD>I7 I2>OZ LA>I8 UR>F 4X>I0 CT3>EA3 15-1600 ES1>I8 GB3MCB>DL,OE5
 LX>OM5 GB3LER>OE5 I8>ES6 5B>PA G>EA5 CU3URA>EA7 EI>OE5 16-1700 EH7>EA6(short)
 OY6SMC>F EH3>SV1 4X>S5,SV1 17-1800 CU3URA,LY,9H>DL SQ6,LZ2>I9 OH1SIX>SP6,OE3
 SP8>PA SR9FHA>OZ UR>PA,DL OH2>I5 SM5,9H>OE3 18-1900 LA,LY,UR,SP5>PA
 SP5,OY6SMC,GB3LER,GB3MCB,GB3RMK,9H1SIX,SP8>DL SM7>EI,ER1,SP9 OH5RAC>OE3
 DL>9A OH3,9H>I5 DL>ER1 EI,G>OZ SQ9>SM0 OJ0>SP5,SP6,OH1 4N1NB>CT OH3>SP7
 EH5>I2 I4>I3 19-2000 GM>SP9,S5,OK1 F>SM7,ES6,DL EH6,CN>I1 EI,CN8MC,GB3MCB>DL
 F>PA PJ7M>DL9USA,DL0KCT SM0>9H EH6>I9 GB3LER>LX,I1 OH9SIX>F ON0SIX>ES6
 GM,EI,LA>LX GB3MCB>SP6 GM>I3 CN>I7,I1 20-2100 LA>LX,SP2 GB3LER>OZ,F
 F,CU3URA,GB3MCB,LY>DL GM>I0 CN>OZ
PJ7M>EI7IX,G0JHC,G3IBI,SP4WJD,PA4PA,G8BCG,GI4FUE,F4DXW,DL3DXX,
 G4ASR,M0BCG,PE1M,SP4Z,G4FVP EH1,G>I7 GW,F>9A F>LA 9Y4AT>M0BCG,G4ASR 21-2200
9Y4AT>F4DXW,DL3DXX,SP8AWL,DL7QY,LX1JX,OK1FM CU3URA>I1,S5 EH5>CT(short)
PJ7M>OK1DDO,OZ0JX,G4OBK,SP8AWL,DL8PM,ON5PU YO5,UT5G>PA ES2,GD>I1 YU7>OZ
W1JJ>EI7IX,EI7BMB,G3SED,DL8PM,EI7BMB,G4RGK W3EP/1>G3SED,GW3LEW
K7BV/1>M0BCG KM1T>G8BCG YO5>DL YU1>LA 4N1>LA,DL 22-2300 KM3T>IK1EGC
 T9,4N>OZ K7BV/1>PA4PA,EA7RM WZ1V>EI7IX,M0BCG W1QK>GU0FAL,I2SVA
K2LZQ>ON7GB JW7SIX>LA,DL HB>I7 T9,I4,I5,4N>ES6 KY5R/4>EA7RM W3EP/1>9H1XT
 DL>OZ K4EA>EI7IX,F4DXW VE1YX>MM0AMW 23-2400 VE1YX>EI7IX,CT1EAT K4EA>G8BCG
K7BV/1>EH7RM,MM0AMW W3EP/1>EH7RM KD4NMI>EI7IX
 +++ 1010-1344 includes southern/mid UK and 1515-1610 144MHz Es reaching north to KO27

July 9 0003 K1SG>EI7IX 06-0700 OH9SIX>OM3 07-0800 OH9SIX>SP6,S5 UU5SIX>SP6,SP9,OZ OH1SIX>SP6 UT5G>SP6,SP9,OZ I0JX>SM7,OZ 08-0900 OZ7IGY>I9 YU1EO>LA LA,SM5>I0 LA>LZ2 UR>I7 IQ4AD>SM3 I9>F,DL 09-1000 ES1,UR,EH6>DL OJ0>DL,I0,LZ2,I2,I4,9A,OK1 T9>LA SM6>OE3 SM3,LA>9A CU3URA>EA7 LZ1>DL YU1EO,SQ5,UR>PA I2>SM3 SM3,LA>OE6 LA>LZ2,I0 10-1100 LA>I0 UN6P/R4A,UR,G>LZ2 UR>SP6,9A I9>SP5 I1>SK0 LZ2>9A SV1SIX>DL GB3BUX,SV1SIX,GB3IOJ>9A 11-1200 UR,F,G>9A SV1SIX>OE3 EH5>SP6,DL LZ2>I2,DL GU>S5 KY5R/4,K6EID/4>EA7RM CU3URA>EI F>SP6 EI>OZ 12-1300 EI>9A UR>OE3 I9>SP9 4X>DL I5MXX>EI SV1SIX>SP6 PA>I7 KY5R/4>9A8A,IW9CER YO2>9A LZ2>ES1 F>DL G>I2 W4GF>9A8A GU>SP6 13-1400 5B,YU7,PA,9H,T7,GU>9A 9H,SQ9>F 9A,T7>DL GU>OE3 I9>I8 NG4C>IT9RZR FX4SIX>SP9 N4DA,W5OZI>9H1XT KY5R/4,N5BLZ>EA7RM OJ0>I4,DL WD5K>9H1XT 5B>DL K5WLT>PE1MZS OJ0>I4 UR>SP9 14-1500 OJ0>I2 UR,GD>DL SP2>I0 YO6>RK3 K6EID/4>F6FHP,EA7KW NG4C>EH7RM,EA1CCM AC4TO,W4BP>EH7RM W5GAI>9H1XT K4PI>EA7KW,I7CSB W4GF>EA7KW,EH7RM K5XX>EA7KW,9H1TX,IH9/I2ADN YT4>DL,PA N8PR/4>F6FHP 9A>SM0,DL LA>I0 IK5ZUL>SP9 W6JKV/5>IW9CER 15-1600 W5OZI>EA7RM T9>DL I3>EA5 3A>SQ9 K5XX>9A8A W6JKV/5>9A8A,IT9TJH,EA7KW,PA4PA YU2EO,YO3,LZ3,9A,OM3>DL I9>F CU3URA>9A,DL I0>EA7 OJ0>I5 YO5>PA GJ>SP9 N8PR/4>IW9CER YU7,LZ2,YU9,LZ3,SP8>LX 3A>I9 HB,I2>OH2 HB>SM7 W4BP>IS0GQX 16-1700 YZ1,9A,I2>PA GU,YO3KWJ,CU3URA,F,LZ2,I2,UT5G>DL N8PR/4>IK1IQC, IK8DYD LZ1,UR,T9,YT4>OK1 DL>EA5 F>SP6 9A>ON SV1SIX>SP9 I5>YO8 17-1800 Z3,ZA>DL HB>OZ SM0,OZ,LA>I3 I1,I8>PA YO8>I5 CU3URA>SP6 PA>9A I1,I3>SM0 OZ,LA>I1 DL>HB I0,I5>ER1 18-1900 KC4PX>EA7KW CT0SIX>DL G>9A FX4SIX,LZ2,EH5,I0>DL LZ2>SP7 I0>ER1 F>SP9,OM5 I1>SM0 19-2000 G,OJ0>I0 I0,I5MXX>PA F>SP2,SP6 CN8MC>F 20-2100 CU3URA>DL GB3MCB>S5 K4PI>I7CSB
+++ 1340-1400 small 144MHz Es event mainly central, eastern Europe

July 10 0406 49749,49757,49760>G(qtf 065) 05-0600 OH5RAC>SP6 06-0700 UT5G>I1,OZ UR>OM5 YO7,UR>DL GB3MCB,9A0BHH>SP2 UU5SIX,LY>9A 07-0800 GB3MCB,YO7,LZ2,YO3KWJ,F>DL FX4SIX,GB3IOJ>OZ GB3LER,OJ0>I1 G>S5,SP9 OH3>OH1,I0 GM>I2 LA,G>9A SR9FHA>EI 08-0900 OJ0>EH3,CN,HB,F,9A,ON UR>ON OH3>I2 EI>S5 SM0>HB,I0 ZC4>UR EI,OD,EH3,GB3LER>9A DL>SP9 G>OE3,OH2,I1,5B,SP9,SP6 F>DL 9A0BHH,9A1CAL,5B,IW3FZQ>EI UU5SIX>I0 LY,GB3BAA>F 09-1000 G>SP6 OJ0>CN,EB7,9A,DL,CT,F SV9>OK2,S5 LA,ES1,DL>9A PA>DL,EA5 SV1SIX,I2>EI LZ1,LZ2>ON OZ>I1 EH5>I7 YU1,4X>PA,I7 ON>EA5 ON,SP4>F GB3LER>SP9 YU1>ON G>I0 HB>SM0 EH6,EA1>DL LA>I8 EH6>PA 10-1100 CU3URA>DL EH5>OH2,DL EI,CT3>F GM,PA>9A I4>SM7 EH2>OK1 G>I0 F,EH3>PA LA>OM5 I9>SM5 GB3MCB>CN UT5G>HB,PA SV1SIX>I1 GB3BUX,GB3LER>OE6 UU5SIX,I9>SP9 S55ZRS>PA OJ0,F>DL 11-1200 F,GB3MCB,GB3IOJ,SM5>SP6 GW,PA>I0 EH8>CN GW>I5 OE6>PA,DL LA>CN YU1EO>LX 9H1SIX>S5 GU,LA>I1 EH7>I1,OZ 9A,I8>DL I1>SP5,CN 12-1300 I0>SP5 CN>DL FX4SIX>OE6 EH9>9H SP3,SP6>LX GM>DL,SP5,I0>DL I9>I1 SM5,PA>CN CN8MC>F S5,I3,I2,I4>EH4 EH3,GI>SP6 13-1400 I9>I1 YA4F>IK1EGC,IW1GEU,YO5BIM,DL3YEE,LY2BAW, SP8AWL ZB2>I9,DL 9A>CT YA1RS>LY2BAW EH1>I5 3A>SP6,9H I1>SP6 I9>I2 EI>OK1 14-1500 4X>F,9H I4>EA7 I5,IS0>OZ F>I8 EH3>SP7 ZB2>F DL>CT YA1RS>MW1MFY CT>I5,OE9,HB HB9SIX,LX0SIX>EI I1>SM0 YO7,T7>PA CN8MC>DL,ON,PA 15-1600 5B4CY,4X>F 4X>S5 YA4F>G3FPQ I9>PA,DL,I8 4X>9H,I7 UT5G>S5 G>EI,I5 CU3URA>EI GW>EA7 I9>OK1 9H>OZ 16-1700 EH6>DL,SV1 CT0SIX,GB3MCB>DL ZB2,EH8,I4,CN>9A CT>I5 EH5>I5,OE6 GM>F,PA GB3MCB>OZ GW>PA 9A,4X>EA5 OZ7IGY>EI 17-1800 OY6SMC>EI,F GB3RMK,LY>EI G>SP6 LA>EA2,CN GU,F>OH2 CT>SM5 EH4>SM6 LA,SM>DL UT5G>SP4 GB3MCB>LA 7X0AD>PA,I7 EH3>I7 CT,OH3>I1 G>SP6 OX3VHF>F,EI VO1ZA>MW1MFY 18-1900 LY,I9>DL OX3VHF,GW>9H OZ6VHF,LA7SIX>DL OY>SP6,DL ES5>I3,CT GB3BAA>SM0 UR>PA YL>EI SM0>ON LA>OK1,I1,9A GB3MCB,GW>9A G>I1 GM>SP6 SV1SIX>F EH1,EH6>OH2 EH5>SP9 1830-1920 FM(EA to 102MHz)>OH2(Es)19-2000 EH5>DL,SM0 LA>OK1 TF>PA,9H,DL EH5>SV1,I1,SQ9,ES1 LY,LA,YL2>CN DL>EI GD>I8,I1 LY>CT F,EH3>SM0 ES7>I2,PA GM>EA8 EH7>9A LA>OE3 TF>F,SP4 EH4>LY EI>OK1 20-2100 ON0SIX>CT,S5 UU5SIX>S5 OZ>ON I4,CN>PA SV1SIX>EI,SP4 GB3MCB>SP4 GM>OE3 PJ7M>PC5C,EI7IX,OZ0JX,PA2V OZ>CN G>SQ3 SV1,OY6SMC,7X0AD>DL UT5G>CT F>S5 21-

2200 G>OZ,9A VE1YX>G4PCI EH4>ON OZ>CT CN>I1,OZ 9H>SP7 EH1>PA GW>9A GU>SM0
22-2300 G>SM0 S5>F W4SO>GI6ATZ 23-2400 W1JJ>DF9OX
+++ 1852-2010 144MHz Es extending to IO83

July 11 0313-0400 UT5G,GB3MCB>9A 04-0500 SV1SIX>SP6 05-0600 OH5RAC,OJ0>PA 06-0700
OJ0>OH3,I4,PA LA,YU1EO>PA SP3>9H LY>I4 UR>DL GM>DL,SP2 OZ6VHF>EI ZB2>CN
GB3LER>PA 07-0800 GM,UT5G>DL SP8,SP3,DL,OJ0>I8 OH1>F OJ0,LY>EI I9,ZB2,UR>CN
YT4>F LA,I7,I9>LY I9>SM2 OE3>I1,ON I1>SP4 I9>UR OJ0>9H OZ6VHF>EI ON,SV1SIX,
GB3BAA>OE3 UR>OH7 F>SP7 GM>PA UU5SIX>SP6 SP6>CN 08-0900 SV2,GM>F
I9,UR,G>OE3 I9>SP9 UU5SIX,I3>DL YL2>CN OY6SMC>PA I4>OZ ZB2>CN I9>SM5 G,EI>SM0
SV8>SM6,DL FX4SIX>SP9 DL,PA>I7 EH6>I0 I8>EA5 09-1000 CT0SIX,GM(short)>EI UR,I9>OK1
9A>LY SV1SIX>I1 SV8>ON I4>I7 OH9SIX>EH3 0932 K1SIX>EA7KW SV1SIX>SQ9
CU3URA>DL,SP6 SM0>EI 9H1SIX,GB3BAA>DL UT5G,UU5SIX>I0 UR>SP9 EH3>PA G>9A
CN8MC>F 10-1100 CN>F,PA,DL,OZ,EA7 LZ2,OH9SIX,I9,UR>DL SP7,YL2>I7 I8>ON HG1>S5
SV1SIX>EI EH3,F>OZ G>EA5 I9>OE5 I8>OE3 7X2RO>PA 11-1200 SX1>OK1,SQ9,DL
CN>DL,PA G>I1 OZ,EH5, UT5G, EH4>PA I9>OM2 OH9>SP2,SP7 EH4,YU1EO,LZ1JH,UT5G,
4N1ZNI>DL EH4>ON 12-1300 9A,UR>DL ZA>DL,SP2,SP4,OZ I4>SP4 G>F,EA5 PA>YU1
LZ2,YZ1>ON LZ2>OZ, DL CN8MC>SV1(2xEs) 14-1500 EH4>9A CN8MC>SV1 EH2>CT(short) 15-
1600 F,G>EA7 9H>I1 CN8MC>I5 EH7>ON ZB2>EH5,EI PJ7M>IK2GSO,EH3AKY 5B,9H>I0
CT0SIX>PA 16-1700 PJ7M>EA7KW,5B4FL CT3>I2, PA,DL SV9>YU1_ZB2>9H CU3URA,EH7>DL
IS0>I1 EH7>ON,PA,9A EH3>EH7 17-1800 CT3>OZ,DL EH7>HB,ON,LX CN8MC>EI
EH1>F,DL,PA CT>HB G>EA7 CT>I2 18-1900 EH5,ZB2>DL CT>OK1 ON,G,EH1>EA7 5B,SV1>9H
EH1>I7 CT0SIX>EI SV9>IS0 EH6>LX 19-2000 7X2RO>DL EH6>F G,EH1>EA7,I0 EA7>OK1
EH6>F,PA,LX CU3URA>I0 CT>I2,LX,OK1,SP2 EH9>DL 20-2100 ON>DL(t) I1>EI 21-2200
CU3>EA7 22-2300 CT0SIX>PA
+++ 1710-1820 144MHz Es including southern UK

July 12 09-1000 UT5G>OZ CN8MC>I5 12-1300 CU3URA>EA7,I9 13-1400 I9>EA7 K1SIX>IT9TJH
9H>EA5,F I7>EA5 UU5SIX>9A W4GF>IW9CER 14-1500 FR1HZ>ON4UM I8>I0(bs)
K3KTJ>IW9CER,I9/I2AND 15-1600 UT5G,OE6>S5 SV1SIX>OH1,S5,I0 UU5SIX>OE3, SV8,OE5
UR>DL,I7 16-1700 SV1SIX>SP9,DL,OE3,OE6 OY6SMC,GB3LER,UT5G>DL CT0SIX>EI
4X>I4,I7,S5 5B4CY,SV5SIX>S5 CU3URA>EI CN>I9 17-1800 SV1SIX>OK1, OZ LY0SIX>PA
HI8ROX>EA7RM I9>I8 LY>PA CT3>EA7,EA1,EA5,CT,I9 CN>I9 G,GI>OK1 4X>I7 EI,9A,F>OZ
ES7,GM>DL GD>OE3 CU3URA>EA7 G>SP9 18-1900 GM>I1 EI>SP6,DL,SP9 CT3>EA5
SV8,DL,UR,EI,G>DL I4,9A>EI SV8,TA2>I0 LZ2CC>I8 IS0>EA7 OE3>OK1 GB3MCB>OE5
SV8>I2 EI,GW,GM>I1 GM>SV1 19-2000 G>DL GW>I1,I2 LX>PA EH6>EI 9Y4AT>MW1MFY,
G4PCI,ON4IQ 20-2100 CU3URA>EH3 CU3URA>EI TF3SIX>LA(mode?) 2344 CT1FAK>D44TD

July 13 1755 UT5G>I0 18-1900 UT5G>I0 LZ2CC>EH3 9H1SIX>SP6 UR>SP9 I5>CN 9H1SIX>DL
UU5SIX>SP4 YO7>EA6 19-2000 UR>OK1 LX0SIX>DL(t) I9>PA SM7>I8 SV>PA I5>OK1 20-2100
YO3KWJ>SP2 UU5SIX>DL,OK1

July 14 0653 UT5G>I1 07-0800 UU5SIX>OE6,SP6 UT5G>I1 OE3XLB>EH3 T9>F SR9FHA>EA3 I0>PA
UR>9A I7>PA 08-0900 IOJX,LZ2CC,I9,YT1>PA LX0SIX>I8 UR>I4 SP9>EH3 G,DL,9H>I7
ON0SIX>I0 YI7>ON 9H>PA 09-1000 GB3BUX,DL>I0 I7>ON,HB I8>PA YU6>F SV1SIX>I1,PA,SP6
10-1100 LZ2CC,GB3MCB>I0 YO3KWJ,UR>PA SV9>SP6 YU1>OZ 9H1SIX>F,SP6,SP9
SV1SIX>I3,SP6,OZ SR5SIX>I3 11-1200 4X>I7 9H1SIX>SP9 LZ2,YO7>I7 SV3>I3 YZ1>PA,I0,OZ
SV1SIX,S5>PA YO7>DL SV2,LZ2CC>EH3 SV2>I0 EH9>I2 CU3URA>I7,SV1 12-1300 LZ2>I8
I8>I7 F,I1,I2,I3>I8 CU3URA,EH3,9A>I0 9H1SIX,SV1SIX>I1 EH6>I4 9H>PA,SP9 I7>F F>CN 13-
1400 I9>SP9 I1>I8 F>CN,EA7 I7>I2 I9>SP6 3A>LZ2,SV1 I2>SV1 T7>I4 GU>9H ON>EA5
EH5>SP6 I9>PA 14-1500 CN8MC,CT0SIX>I1 I9,EH5,SV1SIX>PA I0,CU3URA>DL DL>I7
LZ2CC,CT>I5 15-1600 SV1>I3,F,OK1,PA SV1SIX>SP6 16-1700 CN8MC,I0>F SV1,I9>PA
GB3IOJ>I8 F>I0,I8,I1 G>I8 4X>LY,SP4,PA,F,I7,I9 FX4SIX>I5 7X2RO>PA,OK1 T9>OZ
EH3,ZA,I9>DL UT5G,5B4CY>PA SV1>I1,PA,S5 DL>CN I3,F>CT EH2>OZ LZ2>I9,PA 18-1900

EH3>SP6 IS0,EH6,EH3>DL SV1>HB I8>LX,HB,DL EH1,G>OE3 4X>ON OE9>I9 I9>LX LZ2>SM0
IS0,SV1,I7,4X>F LX,GM>9H GB3MCB>CN CN,F>SP6 EH1>OM5 EH6>ON 9A>I9 19-2000 CT>I1
EH1,EH3,EH5>PA I9>I3,F,PA IS0>ON,I9,F 7X2AD,CN,9H>DL EI,IS0>I8 F>I8 GW>I8,I9 I5>EI
G>I5 20-2100 CT0SIX>S5 SV1>I9,F CN8MC>PA,F EH1>IS0 CU3URA,CT0SIX>EI

July 15 0656 UT5G>I1 0740 OZ6VHF>LA 0820 OH9SIX>LA 09-1000 4X>LZ1 SV1SIX>I4 10-1100
UU5SIX>LZ2,OK1,SP6,OK1 UT5G>OK1 UR>DL 11-1200 LA>OZ UT5G>LA 12-1300
CU3URA>EA7 UU5SIX>SP9 15-1600 EH1>9A CT0SIX>DL 7X0AD>CT 16-1700 DL,CT,F>OZ
IQ4AD>EI EI>I0,I3,I2 F>PA UR>SP9,SM0 CT>DL,SP6 EH2>9A I9,CT>PA 17-1800 EH6>OK1
EH5>OK1,LX F>OZ,I7 LA>T9 CT>PA,OE5,DL,LX,I7,I2 T9>EI UR,CN8MC>DL IS0,EH2,EH4>PA
IS0,EH4>LX G>I2 YT1>OZ 9Y4AT>ON4KST SP4>LY 9A1CAL>EI 18-1900 T9,ZA>OZ ON>EA5
EH1>I2 UT5G>ON YT1>SM0 EH4>DL EH2>PA EH6>OE3,DL 7X0AD>PA,I1,SP6 YL3,EH5>I5
EH3>SP9 EH5>HB,PA T9,I8>SM0 LZ2,EH8,CU3URA,YO7>DL LZ2>OE3 19-2000 ES7>I8
EH5>SP9 EH6>SP9,DL,SP2 EH8>DL 5B4CY>OZ CU3>OK1,DL 7X0AD>9H,OK1
9Z4BM>DK7UY,OK1FFD,DL7QY, F6HRP,S59F,PH7A,9A6R 20-2100 LZ2CC>DL
9Y4AT>PE1ZMS,F4DXW CU3URA>DL I5,CU3>F JW7SIX>LA(JP99) CT0SIX,G>PA
9A0BHH>OH1 G>OZ FM5AD>F4DXW

July 16 06-0700 UU5SIX>OK1 FX4SIX>OZ OH1,LY,OZ>F 07-0800 LY>F,DL LA>I1
ON0SIX,F,GB3MCB>OZ LA,G,OY6SMC>DL OZ>ON,PA G>SP2,SP6,I I4>LA OH5,OH6>LZ2
ON>OH1 08-0900 GJ>OZ G>SQ3 LA>HB GB3BAA>OZ GB3LER>S5 IZ1EPM>EI UT5G>OZ,PA
SV1SIX>PA EH1>OE5 09-1000 SV1SIX>I4,PA,SP6 SV2,YU6,G,LZ2CC,LZ1,YU1EO,DL>PA
I8,SR9FHA>EI SV2,ON,LZ2,HB,YU6>DL EH1>OK1 UU5SIX>OK2 UR>SP5,SP6 10-1100 SP2>I2
LZ2CC>SP6 UT5G>DL UR>I8 11-1200 OH9SIX,SV1SIX,I9,GB3RMK,GB3LER,LZ2CC,OH5,
OY6SMC,YZ1>SP6 YO3KWJ,YO7>DL UT5G,I7,OH5RAC>PA LZ2>DL,OK1,SP7 UR>I2
I9,LA>LZ2 4X>DL,OK1,LZ2 LA>SP9 GB3RMK,GB3LER>SP5 OY6SMC>OK1 12-1300
GB3LER,LA,OM3>SP9 LA>OK1,SP6,SP9 OY6SMC>SP9,SP6 4X>DL,I7,OZ LZ2,YO7,OZ>DL
LZ2,YO7,ES6,ES4>PA SP3,GM,LZ2,SM5>SP6 GM>LY CU3URA>EA7 OM3>LA DL,F>SM0 13-
1400 GI>SM7 SM5>SP6 LA>OK1 GB3BAA,GU,F>LA OZ6VHF>EI OY6SMC>DL YA4F>PA2V,
9H1XT,DJ3TF,DL2DXA SP2>SP9 G>SM0 14-1500 G,PA>OH1 SP2>SP9 ES2,SM3,LA,SM3>PA
OH1>OE1 OH1>DL LA>HB OY6SMC>OK1 GI>OZ GB3LER>OK2 G>SM5,OH1 GB3MCB>LA
OH9>OH6 15-1600 OH3,OH9SIX>DL GB3LER>EI GW>EI(t) TF>ON,PA GM>SP2 PA>OZ(bs)
OY6SMC>PA DL>OK1 CU3URA>I9 16-1700 TF>PA OY6SMC>DL,PA,SP6 17-1800 OH7>OH3
PI7SIX>LA 19-2000 CT0SIX>ON 21-2200 YT1>Z3 aurora

July 17 10-1100 UT5G,YO3KWJ>IS0 11-1200 CN>F EH1>9H GB3BUX>PA SV1SIX>SP9 12-1300
TA2>9A UT5G>9H 13-1400 CN8MC>F CU3URA>EA7 14-1500 YA4F>Z32ZM EH5>S5 15-1600
CT0SIX>I5 16-1700 SV1SIX>OK1 TK>HB 18-1900 OK1>DL 9A,EH3, EH6>LA EH3>OZ 19-2000
S55ZRS,9A1CAL,9A0BHH>F 9A>LA JW9SIX>OH7,OH2 (mode?) I1>S5 JW7SIX>SM0(mode?)
20-2100 JW7SIX>LA,SM5,LA,SM0,SM3(mode?) ES2>OH2(mode?) JW9SIX>SM3,SM0(mode?)
GB3LER>EH3 JW0B>SM3(mode?) TF>OH7(mode?) 9Y4AT>MW1MFY 9A>OK1(t) G>9A
U1>S5(t) IZ1EPM>EI 21-2200 OK1>F EH3>EI F>S5 JW9SIX>SM0,LA(mode?) I1>S5
JW7SIX>SM0(mode?) CT3>F OH9SIX>TF(mode?)

July 18 05-0600 OM5>9A 06-0700 9A>UR 07-0800 DL>OH1 YU1,OH9SIX,9A>LA OE6>9A S5>SM0
S5>F,I0 OH1SIX>I5 OK1>OZ 08-0900 YU1>OZ 9A,EH3,OZ>LA OK1>OZ,PA SP2>SP6
9A>T9,OE3,DL,PA SR9FHA>F EH3,EH6>SP2 SP1>I7 SP2>I0 G>9A EH3,OK1>DL S5,T9>PA
G>YO5 10-1100 YO9,I0,EH6,OK1,9A,I8,S5>DL YU7,YZ1,YO7.I0>PA EI>S5 EH3,EH6>SP6
9A>EI,OZ G>LZ2 S5>I1,I4 DL,PA>I7 F>I3 EH3>OZ 11-1200 CN>9H,PA,I9 EH6>OZ,PA EI>I0,I\$
PA>I8 CT3>EA7 GM>I9 OK1>SP9 EH3>DL,PA IZ1EPM>EI S5>I1 9A.DL OY>OZ 12-1300
EH3>PA,LA CT,EH7>PA CT0SIX>EI EI,GI>I0 14-1500 9A>DL,OE3 16-1700 OK1>DL 18-1900
ON>OH2 ES2,OH4>ON OK1>LA LA>OZ PA>OH2 19-2000 ES1.OH6>ON OK1>OZ
OY6SMC>SP2,SP9 GB3LER>SP2,SP6,SP9 LA>DL,OE8 ES1,LY>PA G>OH2 LY>EI 20-2100

GM>LY JW7SIX>OH1(599 mode?) 21-2200 JW7SIX>SM0(429) JW7SIX>LA(539) 22-2300
CU3URA>EA7 SM,LA>TF(mode?) IQ4AD,IZ1EPM>EI

July 19 08-0900 EH5>DL CN8MC,EH5,CT0SIX>PA UT5G,UU5SIX>SP2 09-1000 CN8MC>F,ON
UT5G,LY>OZ EA7>ON ES1>PA OM3>OH1 10-1100 ES1,OH2,OH4>DL SM4,SM0>SP9
DL,SP7>SM0 LY>OZ OM3,SP9,OK2>SM0 UT5G,ES4,OH2>PA OH5RAC>SP6,PA G>9A 1206
LY>PA 13-1400 OZ>DL IOJX>OZ 15-1600 CU3URA>EI 1938 IOJX>OZ 21-2200 OH9SIX,LA>TF

July 20 0656 UT5G>OZ 07-0800 SM7>OZ CN8MC>EA3 08-0900 CN>EH3,EH5,I0,F,OZ LY>F 09-1000
LZ2CC,I9,OE3XLB,UU5SIX,9A>4X OY6SMC>DL 10-1100 CU3URA>EA7 11-1200 SV1SIX>4X
12-1300 4X>9H,Z3 15-1600 5B4CY>SV1 16-1700 OZ6VHF>LA CN8MC>EI GW>F,I9
GB3MCB>EA3 17-1800 EH1>I3 CU3URA,CT0SIX>EI 18-1900 CT0SIX>EI 19-2000 I9>EA6(t)
2039 CU3URA>EI

July 21 0642 UU5SIX>9A 0755 LZ2CC>F 08-0900 LZ2>F UU5SIX>SP6,SP9 YO7>F I9>OZ
SV1SIX>DL,SP6 09-1000 LZ2CC,YO3KWJ>I0 SV1SIX,SV5SIX>OE6 10-1100
UU5SIX>9A,SP6,4X SV1SIX>SP2,SP6,DL 9H1SIX>SP6,DL UT5G>SP6,4X LZ1>9A,I2 SV2>OE6
11-1200 GB3MCB>DL 4X,CN,GW,GB3BUX>9A UT5G>DL UU5SIX>SM0,DL
OH3,OH9SIX,OH5RAC>DL UR,4X>ES6 UR>LY,OH1,SM0 LZ2>I0 12-1300 SM5,EI,GU,4X,G>9A
YO7>9H 4X>ES6,SM0 OH5RAC>PA 5B4CY>EI,ES6 YT4>EI GU>OM3 UR>OH1,SP6 I8,I0>PA
OH9,F>SP7 OD>SM0 SV1SIX,G>I5 OH5>OZ 13-1400 GB3MCB>DL UR>SQ2,OZ I9>9A S5>I8
SP2,9H>OH6 SM5,OH3>ER1 OH6,OH9>9H DL,GM>EB1 YO7>SM0 OH3>DL,EA7
OE6,S55ZRS,EH2>EI I3>I9 LA,UR>PA OH1>ER1,9H 14-1500 ES1>9A SP8>ER1 OH3>ON
OD5SIX,OH3>Z3 GW>I8 EH2>DL GB3MCB>OZ,SP6 UT5G>EI T9>OH2 SV1SIX>EI
YO8,FX4SIX,UR,GU,EH2,EH3>OZ G>SP7 ON>EB1 15-1600 EH5,OH9>SP2
SP3,OH5,OH8,EI>DL UR>SM7 F>PA,SM0,SP5 G>I8 OZ,9A,DL,S5>EB1 EI,G>S5 LX0SIX>F
9A>EI 7X0AD>9A HB>PA T9>SM0 EH5>SP7 LY>I3 GM>F 16-1700 G>F,PA,OZ,SM0,I8,I1 ES4>I8
GI>I2,I3 I9,DL>EI ON>9A,PA,F GM,G>I1 GU,GW,I9,OM5>DL OZ>EB1 SM7,OZ7IGY,ON>F 17-
1800 G>SP2,SP6 GB3IOJ,F>SM0 GM>I1 EH2>SP2 UU5SIX>OE3 EI>OZ GM>9A UR>OH1,I3
TF3SIX>ON 18-1900 LZ2CC>DL YO3KWJ>SM0,LX GB3IOJ>DL LZ2CC>DL,LX UT5G>OH1,EH3,
I1 9H>PA UU5SIX>EI OZ>Z3 Z3>DL 19-2000 I8>OZ SV1SIX>ON UU5SIX>SP2 9H>OH1,OZ
I9>OH1 SR9FHA>EI 20-2100 GB3LER>9A,S5,HB OY6SMC>S5 S5>9A EH3>OZ,S5,9A,SM0,LA
GB3MCB,GW>LY EI>9A GW>S5 OZ7IGY>EI 2250 LA,GM,SM>TF(mode?)

July 22 0559 LZ2CC>F 06-0700 UT5G,YO7>OZ 07-0800 LZ2,I0JX,9A1CAL>OZ OH5>I1 SR5SIX>F
IW3FZQ>SM3,OZ GB3BUX,OZ2VHF>I0 IZ1EPM>ES6,EB1,OZ I5MXX>EB1,OZ IK5ZUL>OZ
IQ4AD>OZ,SM0 YO5>F LA>YO5 OZ>I8 I8>PA SP2>ON T9>EA7 08-0900 LY,EH7,EH5,SP9,
OK2>ON F,G>OK1 OM3>CN,EI I2,SP7,T7>PA LX>SP2 EH7,EH8,I5,SV1SIX>OZ I5,YU1>EB1
F,G,ON,PA>SP6 GW>EB1,CN 09-1000 I4>EB1 F,HB>OZ SM7,UU5SIX,LZ2CC,UT5G,EH5>DL
S5,LZ2>ON F,G>OK1 7X2RO,SP7>PA I5MXX,OH5RAC>ER1 G>I8 DL>F 10-1100
FX4SIX,SV2>DL EH5,LZ2CC I0,LZ2>ON I0>OZ UR>PA,I3,OZ,I1 YZ1,LZ2>PA YO3KWJ>ES6,PA
11-1200 SV1SIX>OZ SV,LZ1,LZ2CC,EH1>DL SM1>SM0 I0>OZ 4X>9A 7X0AD>I2,I3
UU5SIX>EA7 SV>PA 12-1300 I7,YO3KWJ,SV,LZ2CC>DL I5MXX,IK5ZUL>EA5 SV>PA SP2>I8
EH9,CN8MC>F CT0SIX>I7 EH7>F CU3URA>EA7 I7>OZ 13-1400 UT5G>SM0 GB3MCB>DL
VO1ZA>EA3AKY,F6FHP CT>F YO3KWJ>ON 14-1500 LZ2CC>OZ CT0SIX>I0
I0,UT5G,CN8MC>S5 SV1SIX>I0 CU3URA,VO1ZA>PA2V 15-1600 CN8MC,IS0>F F>EA6
CU3URA>ON 16-1700 LX0SIX>DL LZ2CC>PA CN8MC>EB1,F 9A>EA3 CN>EB1 9A>S5 17-1800
CN>S5 LZ3>ON SR5SIX>I0 CT0SIX>EI LX0SIX>DL(t) 20-2100 UU5SIX>DL DL>OZ 21-2200
LA>EI UT5G>DL aurora SV1SIX>SP9

July 23 auroral reports only

July 24 06-0700 OZ6VHF>LA EH5>9A 07-0800 S55ZRS,SR9FHA,YO3KWJ>EA3 EH6>PA UT5G>OH2
08-0900 UU5SIX>LY2 OZ6VHF,TF3SIX,OY6SMC,GB3MCB>EI EH5>DL,PA UR,I8>LA

LA>OZ,LZ2 CN8MC>I0 UT5G>SM0,PA YO3KWJ>I5 09-1000 I0,OZ,UR>LA GB3LER>I0 SV1SIX,LZ2>DL UT5G>DL,LA EH6>F CN>EA6 UU5SIX>LA SM1>I5 LZ2>OZ UR>PA,I5 OH4>I1 OM3>SM0 10-1100 EA5>IS0,SP2 CN,EH5>EA3 T9>DL,PA,EI LX>ON 9A>PA EH6>OZ,DL S5>OH6 UR>SM0 GB3LER>11 OH1>OE5 ES1,OH7,CN8MC, OH5RAC>DL SP9>SP6 I8>I0 GU>OK1,DL I5>SP4 DL>OH1 11-1200 GW,OH6,GU,OH8,SM2,OH1SIX,G,F>DL G>OE5,SP6,SP2,I5 OH4>PA GM>I1 LA,GB3IOJ>SP6 SM5>I0 12-1300 G>I0 OH9SIX>PA GB3MCB,UR,UU5SIX>DL S5>9A OH6>ON 9A1CAL>EI 14-1500 UT5G>OE6 IZ1EPM>9H UU5SIX>OE6 CN8MC,CT0SIX>F UR>I2 16-1700 SV1SIX>EA6 17-1800 7X0AD>EA5

July 25 aurora 09-1000 S5>OE6 SV1SIX>OE2 1048 UT5G>I4 1105 SV1SIX>I1 aurora 15-1600 ZS6NK>9A8A ZS6BTE,ZS6NK>9A1Z aurora 1638 OM3>9A(599 mode?) 17-1800 SV1SIX>I0,I2 UR>9A,OE3,S5 5B>9A 18-1900 5B>SP6 SV1SIX>SP6,DL S5>5B,OM5 LZ2>9A 4X>DL YO7>I5 19-2000 SV1SIX>SP6,OK1,DL,OE3 SV1>PA 4X>OK1,DL 3A>DL GB3IOJ>9A S5>OK1,9A PI7SIX>I4 YO3KWJ>9A LZ2>OK1 YO7>HB,I2 I0>SP6 I9>SP4 YO4,YU1>I2 I1>ER1 SP3>I9 SV2>ON 20-2100 I0>DL I2>ER1 9H>PA,DL F>9A I0>I3,EI G>I8 S5>F aurora 21-2200 OZ7IGY>EA5 YU1>4X

July 26 0546 UU5SIX>9A 07-0800 CT0SIX>PA GB3BUX>EH3 YO3KWJ>DL 08-0900 G>EH3 CN8MC>F EH2>DL UR>PA UT5G>DL 09-1000 SV1SIX,GB3IOJ>SP6 4X,G,GW>OM5 IZ1EPM>LA UT5G>HB,I3,I8,SP6 CN8MC,CT,CU3URA>I8 CT>PA S5,OD5SIX>CN GB3MCB>DL OE5>OK1 UR>SP7 YU1>SP2 UU5SIX>SP6 10-1100 EH6>I2 F>I8 9Z4BM>EI5FK,G ON0SIX>EA5 CT0SIX>I4 11-1200 I5MXX,S55ZRS>EA5 CT0SIX>DL KP4EIT>DL8YHR,ON4KST,DG5YIL,G4FUF,G4VPD,ON4ASV,IK5EKV CT>I5 9A>OZ EI>F GB3LER>OE5 LY>I5 12-1300 LA>I3 IZ1EPM>SM3 OH5,YO8,LA>DL WP4NEG>GW3MFY YL2,G,UT5G>PA,ON KP4EIT>G4AJC,PA2V,PA1T,G8BCG,DL8PM KP4AAQ>G4AJC G,CT3>EI OM3>I5 GB3BUX>F 13-1400 CT>EI,DL UT5G,YO3KWJ>ON I9>SP9 OH5RAC,OH1SIX,YO9,DL>DL LY>I9 OH1SIX,I0,GB3LER,OY6SMC>SP6 CN8MC,EI>F 14-1500 IS0>I3 LZ1>YO7 UU5SIX>SP4 YO4>OK1,PA YU1EO>ER1,F S5>ER1 EH3,UT5G>9A HB>I9 SV1SIX>SM3 15-1600 4N>F UT5G>I2,OE5>ON UR>IS0,OK1,I7,9A,EH3,OE6,I9 SM3>EH3 OH9SIX,OH1SIX>OK1 LZ2>OE6 G>EI(t) F>I9 OH1,OH8>DL PI7SIX>SM3 16-1700 SM3>EH3 UR>OE5,9A,OE6,OE3,DL,I0,I4 UU5SIX>ER1,SP6 4X>YU1 OH1>DL OH9SIX>I2 UT5G>SP9 SM0>PA CU3URA>EI YO3KWJ>SP6 17-1800 LA,OH1,OY,SV>DL 4X>LY UR>S5,SM0,9A LA7SIX>ON SP6>SP9 CT3>EA7,F PA>SM0 SV1SIX>SP6,SP9 YO3KWJ,OH6>PA SM0,TF3SIX>ON UT5G>I1 G,PA,EI,F>SM0 CU3URA>EA7 EI>SP4 OY6SMC>SP9,DL 18-1900 OY6SMC>DL SV3>SP9 GM,UR,YU1EO,9H,LZ2>DL GM>SP1 OH6>F LZ2,LZ4>EH3 YO7,LZ2,YU1EO,YO3KWJ,4N1SIX,LZ2CM>EA6 SV1SIX>DL,HB,EI OH3>OH7 SM1, OH5>EI SM4>PA S5>SV1 9H>SP9 CU3>CT KP4EIT>G4PCI OH8,EH6>ER1 YO7>I1 19-2000 WP4NEG>G3SED 9H>OE9,OE3,OE6 GW,OH1,ES1>ER1 UT5G>HB SQ8,OY>I1 LA>EI OY6SMC,I9,9H,EI>DL I2>I7 GI>9A,OH1 SV,LZ2>EA6 OH6>OH1 GB3LER>PA OY>CT,DL HB>I8 GM>SP7 CN8MC>ON EI,OH7>OZ OH9SIX>F T9>EH3 CT0SIX>S5 20-2100 OY>I5,9H,DL,S5 OY6SMC>EA5 GM>I2 OH9>DL SV1SIX>I1 SM4,LA>EI GM, OH5RAC>SP6 SR5SIX,OK2>EA3 9Y4AT>G4PCI,G0JHC,EI3IO VE1YX>9A4K 21-2200 9Y4AT>G0JHC,EI7IX F>9A HP1AC>G8BCG OH7>SP9 KP2BH>G8BCG FG5FR> G8BCG,EI7IX 22-2300 FG5GP>G3SED,G8BCG PJ2BVU>G8BCG 9Y4AT>EI7IX WP4LTR>G8BCG +++ 1450-1556 144MHz Es South-East Europe/Black Sea

July 27 aurora 06-0700 SP6>I1 SV1SIX>ER1 07-0800 YU7>ON UT5G>9A 08-0900 UU5SIX>9A 09-1000 UU5SIX,GB3BUX>SP6 SP6>SP9 18-1900 OZ>PA(t) 19-2000 I4>I2 G>PA 20-2100 OH0>SM0 2146 OE5>DL(t)

July 28 10-1100 UT5G>HB UU5SIX>SM0,OK2 LZ2,UR>SM0 UR>DL,SP6,SP9 LZ2>DL 11-1200 UR>DL,OZ,SM0,ON S5>OE6 DL>PA LZ2,LZ1,YO7>SM0 YO3KWJ>PA OE3XLB>RK3 12-1300 SP1>RY3 1348 4U1ITU>I1 17-1800 7Q7RM>EA5/K0KOM 20-2100 JW7SIX>PA, SM2,SM0,OH2 JW9SIX>SM0,OH2 (mode uncertain) 2139 JW0IB>SM0 2320 DL>EI

July 29 07-0800 UU5SIX>SP2,DL UT5G>I1,9A F>SP2 08-0900 I5>OZ OK1>I1 UU5SIX>SP6
OD5SIX,GB3IOJ,GB3MCB,F,UU5SIX>SP9 LZ2>HB GM>9A GB3LER>EB1 SB3IOJ>SP6
YU1EO,S55ZRS,UR>PA 09-1000 5B4CY,F>SP9 9A,LZ2,GB3MCB>DL F>OK1,SP6 G>9A,HB
SV1>SP6,SP7,DL I7>HB IQ4AD,I5,I2>PA SP7>HB 10-1100 9A0,T9>F F>SP7
EH3,EH6,I7,YO3KWJ,OK1>DL I0,YO3KWJ,EH6>PA GB3MCB,EI,SV2>I1 GW>I2 UT5G>HB,DL
I9,I0>HB 9H1SIX>SP9 EH5>HB,I2,DL I0>EI EH6>OK2 11-1200 I9>PA 4N>CN PA,YU1,S5>EB1
OM3>DL PA>CN UR>OE6 G<I0 EH2>EI YT4>SP6,SP9 9H>I5,HB EH7>PA IW3FZQ>EA7 12-
1300 EH4,EH9,YU6,ZB2>DL EH5>I7,PA,SP6 SV1>SP9 I5MXX>SSP9 9A0BHH,S55ZRS>EA5
F>I5 PA>CN GU>I0 13-1400 UT5G>DL LZ1>SP9 S5>EA5 14-1500 SV1SIX>SP6,SP7 UT5G>HB
YU1EO>DL YO7>PA 15-1600 SR5SIX>EA6 16-1700 S5>F SR5SIX>EA3 17-1800
UT5G,YO3KWJ>IS0 SV1SIX>EA3,S5 18-1900 OD5SIX,SV2>EA3 9H1SIX,SP2>SP6 SV1SIX>I0
19-2000 SV1SIX,CT0SIX>EA3 2014 5T5SN>YU1FW 23-2400 YT1AU>OZ 9A1CAL>EI

July 30 05-0600 UR>UR 0612 UU5SIX>SP6 07-0800 IQ4AD>CN UU5SIX>9A CN8MC>F 08-0900
UT5G,F,HB,I1,I5>CN UR>I0 SV8>HB S5>LA I5,I3>SM0 SM1>HB SV1>F I1>PA SV1SIX>OK1 09-
1000 SV8,I8>DL I3>LA I9>ON CT3>OE5 EI>HB EH7>OK1 OE6>SM0 LA>LZ2 SM5,I5,F>CN
I2>SM0 SV1>DL,SP9 SR9FHA,SP6>PA ON>SP9 10-1100 LZ2,UT5G,OK2,I9,UR,CN8MC>PA
EI>SP9 GB3BAA>SP6,SP9 LA>I0 OD5SIX>SP5 GB3LER,G>SP6 CT3>HB CN>I2 I7>I3
GB3BUX>I0 CT3>OK1 11-1200 GB3BUX>SP9 LX1SIX,SV1SIX,SR9FHA>EI
FX4SIX,9H1SIX>SP9 ON0SIX>I0 I2,I5>EA7 G>SP8 12-1300 YO3KWJ>ON 9H1SIX>ON,OM5
SV1SIX>I6,PA,9A IQ4AD>F CT0SIX,CN8MC>EI YU1EO>PA EH5,I9,9H,SV1SIX,DL>9A
9A0BHH,IK5ZUL,I5MXX,I0JX>EA5 I8>I1 I7>I0 13-1400 I7>OZ,SP9 UT5G>SP6 9H>I7 EH5>SP9
G,UR,IS0>9A EH5,UT5G,LZ2,SV2>DL LZ2>I3 SV1SIX>EH3,DL I9>F 14-1500
UR>EA7,I7,9A,EH3,I7,OK1 EH3,SV7>9A I1>F IQ4AD>5T5SN F>I8 Z3,LZ1>LY ZA>DL
LZ2>I5,SQ2,I3 YO3KWJ>SP9 5T5SN>HB9TLN LY>I7 ES7>I3 15-1600 YU6,SV2>LY
UT5G,SV1>OE3 LZ1,SV1,YO7,S5>I3 SV1>OE1 9H>9A Z3>SP6 OM3>I8 I9>OE3 EH7>DL,ON
IS0>ON 5T5SN>G0CHE SP9>SQ3 OE3XLB>ER1 YO8>I8 SV2>DL EH6>OE6,I3 Z3>OM5,DL
LZ2>I5 UR>OE6 I7>SP6 EH5,UR>9A 16-1700 EH5>9A,DL LZ2,ZA,SV2>I3 IS0>DL Z3>OE5
IS0>YU1 F>OZ,LA GB3MCB>DL EI>S5 ZA,GU>DL 17-1800 ZA>OK1 I1>EA7 F>OZ S5>EA5
GBMCB>DL OZ>EH3 18-1900 EH5,CN8MC>S5,PA EH7,EH5>PA 9H1SIX>DL 19-2000
5T5SN>S57RR,9A4K,EH3AKY,IK2DXF,LY2BAW S5>I3,EA5 EH5>PA CN8MC>EA6 EH7>S5 20-
2100 UR>I7 UU5SIX>S5 IQ4AD>EI 21-2200 GM>EA3 2358 YO3KWJ>I0

July 31 0000 UT5G>I0 0554 YO3KWJ>EH3 06-0700 CT0SIX>EA3 UT5G>4X OH5RAC>ER! 07-0800
I0JX,SV1SIX,SV3,CU3URA>EA3 4X,5B>I8 OH1>OH3 S5>SP6 0800 E3tv(JY)>OH2(es) 08-0900
CT,CN8MC,9H1SIX>EA3 OD5SIX>EA3,S5 4X>ER1,9A S5>4X UU5SIX>SP6,DL,SM5
YO3KWJ,I7>DL UR>S5 CN8MC>F LY>9H 09-1000 CN8MC>F,I0,HB,EB1 EH7,YO3KWJ>F
SV1SIX>SP6 IS0>I3 I2>S5 SV8,SV2>DL 9H1SIX>EH3 I7>OK1 10-1100 SV1SIX>EH3,SP6
SV2>PA CN>F,I0,OH7,EA3,I4 SV8>SP6 S5>I0,I3 UT5G>I0 OH9SIX>SP6 EH7>I6 9H1SIX>EA5
9H>OK1,SP6,PA,DL I8,OK1>SP6 SV3>EA3 YO3KWJ>ER1(short) 11-1200 OH5RAC>DL
9H1SIX>OE5 EH4>I9 EH5>LZ1 12-1300 9H,GB3MCB>EA5 OX>OZ CN>DL,I1,I2,F,I5 EA3VHF>I5
EH7>I5 13-1400 UR>LY,SM0 GB3MCB>I8 LY>ER1 F>PA GB3BUX,EH1>I0 EH4>I2
UU5SIX,UT5G>SP6 CN8MC,CT0SIX>EI GD>9H CN>F 14-1500 G>I3,DL F>DL,I0
S55ZRS,9A0BHH, IZ1EPM>EI GB3MCB>DL GB3BAA>S5 GB3IOJ>DL 15-1600 UU5SIX>SM0 16-
1700 9H>9A,I3 SM6>I9 F>OZ SR5SIX>F SV2>DL,OZ,PA GB3IOJ>DL GM>I5 OK1>EI 17-1800
ZA,UR,Z3>DL EH5>LA UU5SIX>F SQ9>I7 EH3>OZ LZ2,SV1SIX,UR>EI SV1>HB SV2>I3
LZ2>SP6,OZ GW>I4 SP3>I7 Z3>F YO8>PA,SP6 LZ1>SP9 ER3>SM0 18-1900 YO8>I8
UT5G,YO8,YO4>SM0 YO7>PA EH3>I7 SV1>SP6,9A UR>OZ 5B>SP6,OK1,9A,I4 G,S5>I9
3Ctv>G EH2,EH7>DL YO3KWJ>F SM0>I9 19-2000 OH3>PA EH7>SM0,PA
GB3RMK,SR9FHA>EH3 UT5G,YO3KWJ>EA7,EH3 CT0SIX>PA OH3>OH7 EA3>OM5,F
LZ2,UT5G>F 20-2100 SV1SIX,YO3KWJ,YU1,UT5G,LZ2>F I9>EH3 OH9,LY>SM5 UR>SM0
TF3SIX>PA YU1EO>OZ 21-2200 CU3URA>EH3 OK1,GD>SM5 UT5G>F 22-2300 GM>SM5
GD>OK1

50MHz PROPAGATION REPORT FOR JULY 2004 BY SV1DH

- 31 Data for 25 days, internet data 25-31st Jul
2. Relatively good days on: 1(+),2,5(+),10,11(+),14
3. 48 MHz AF video (3C or 5Z) on: NIL
4. 55 MHz AF video (5N) on: NIL
5. " to 7X on: 5
6. " to EH9 on: 5
7. " to CN on: 1-4,8,11,14,22 (2Es)
8. " to CT3 on: 2,5,11(2Es)
9. " to W on: 5(2030-2115 W4)
10. " to J7 on: 1
11. " to PJ7 on: 5(1445-1545)
12. " to KP4 on: 5(1700-1800)
13. " to 4X on: 1,3,4,14,20
14. " to OD on: 20
15. " to 5B on: 3,14,20
16. " to CU on: 4,5,14 (3Es)
17. " to CT on: 4,5,11,14(2Es)
18. " to ZB on: 11
19. " to EH9 on: 11
20. " to EH on: 1-5,8,10,11,14,29-31(1+2Es)
21. " to EH6 on: 1,4,5,10,14,24
22. " to F on: 1-7,9-11,14,21,31
23. " to 3A on: 1,2,5,6,12,14
24. " to I on: 1-3,5-7,9-12,14,15,21,22,26,29,30 (R=55%)
25. " to 9H on: 1,3,5,11,14
26. " to IS on: 1,2,4,5,11,12,22
27. " to EI on: 1,5,12,14,21,30,31(2Es)
28. " to GM on: 1,10,11(2Es)
29. " to GD on: 10
30. " to GW on: 1,10,11,14
31. " to G on: 1,2,5,10-12,30,31
32. " to GU on: 2,10
33. " to PA on: 1,5,7,8,10,11,14,16,21,25,29,30,31
34. " to ON on: 1,2,5,14,21,25
35. " to LX on: 4,21
36. " to OZ on: 1,4,7,8,10,12,14,15,21,22,26
37. " to DL on: 1,4,5,7,8,10-14,16,21,25,26,29,30
38. " to OE on: 1,4,5,8,11,12,14,21,25,30
39. " to HB on: 1,2,5,9,14,15, 21,26,31
40. " to 4U on: 2
41. " to S5 on: 1,2,7,12,14,25,29
42. " to 9A on: 1,2,5,7,9,11,12,14,25,30
43. " to T9 on: 14
44. " to YU on: 2,7,14
45. " to SM on: 26
46. " to LA on: 10(2Es)
47. " to OH on: 8,12(1+2Es)
48. " to YL on: 10
49. " to LY on: 1,4,10
50. " to SP on: 1,2,4,5,7-17,21,22,25,26,29-31 (R=68%)
51. " to OK on: 10-12,14,17,21,26,30

- 52. " to OM on: 2,11,14
- 53. " to YO on: 1,2,12
- 54. " to ER on: 27
- 55. " to UR on: 1,2,4,7,9,10,12,14,15,24
- 56. " to SV/A on: 4(T)

57. Special events on:

- 1 (1700 LZ+I0+5B to J7+ 1730 IS0 to J7+ 1800-1930 SV1 to J7 up S9!)
- 2 (1445-1530 I2 to J7+ 2000 SV3 to PJ7)
- 3 (1015-1130 I0 to VP9 early+ 1115 IS0 to PJ7+ 1230 9H to VP9+ 2000-0200 W. EU to W+VE)
- 4 (1400 I1 to PJ7)
- 5 (1215 EH7 to HI early+ 1300-2200 SV1 to CU/B continuously!!)
- 6 (1015-2200 W. EU to PJ7+ 1415 9H to PJ7)
- 8 (0830 EI to 4X 3Es+PJ7 to NW.EU for hours)
- 9 (5B to W4 spot ; >10500Km! Nes?)
- 11 (10C flares+0930 EH7 to W1 v. early+1100-1830 SV1 to CN/B 2Es continuously!+1530 I2 to PJ7 +5B to PJ7 spot prop)
- 12 (11C+1M flares +0645 JA1 to W6+1315 9H to W1)
- 13 (10C+5M flares +poor Es day)
- 14 (12C+2M flares)
- 15 (4C+2X! flares)
- 16 (4C+1M+3X!! flares)
- 17 (12C+3M+1X!flares)
- 18 (13C+3Mflares)
- 19 (8C flares)
- 15-19(Poor Es days)
- 20 (SFI=170, SSN=176, 8C+1M flares)
- 21 (SFI=175, SSN=147, 3C flares)
- 22 (8C+3M flares)
- 23 (5C+2M flares)
- 24 (12C+2M flares)
- 25 (3C+4M flares)
- 26(5C+3M flares)
- 27 (7C+2M flares)
- 28(7C+1M flares)

58. DXCC entities heard/worked during July 2004 : 52 on 4 cont

59. DXCC entities heard/worked on 5th July 2004 : 24 on 3 cont.

73 COSTAS

The Americas

Auroral-Related Propagation

This month's crop of reports is one of the largest for some time, largely due to the timing and advanced warning of the events on the 25th and 27th, which brought KL7 and VE8 signals into VE6, VE7, W7, W9 and W0, probably mainly by AE, though the propagation mode was not always clear. The openings were notable for the extent to which they were reported from the West, with W7 and VE6 and VE7 featuring prominently. At the height of the storm contacts reached down into the northern fringe of southern states - Virginia and North Carolina.

July 2 03-0400 VE6EMU>VE6 VE6ARC>W9(559 EN44) K0KP>VE6(DO33 599) W0(EN37)>VE6(DO33 mode?) W0(EN35)>VE6(DO33 mode?) W9(EN45)>VE6(DO33 mode?) 04-0500 VE8BY>VE6(DO33 579a)

July 16 01-0200 VE8BY>W1.VE5(mode?) 02-0300 W8(EN84)>W3(FM19)

July 22 21-2200 VE2>W1 W2>W1 W3(FM28)>W1(FN32) W2(FN34)>W1(FN32) W9(EN55)>W8(EN81) 22-2300 W8>W2 VE5(DN59)>W7(CN88 57a) W7(DN57)>W7(CN88 55a) W8>W4(589A) W0(CN85)>W7(CN88 55a) VE3>W3(FM29 56a) W8>W4(EM74 57a GA?) W7(DN16)>W7(CN88 57a) 23-2400 N8PUM(55a),VE3UBL(55a)K0KP(55a)>W3 W9>W4(mode?) VE7>W0(mode?) W7(DN07)>W0(EN10) W3(FN10)>W1(FN31 44a 010) W1(FN31)>W1(FN32) N0UD>W7(DN47) W3(FN03)>VE3(FN02)(mode?)

July 23 00-0100 W7(DN47)>W7(CN87) VE7(DO00)>W7(CN88 55a) W7(DN17)>W7(CN88 59a) VE6EMU>W7(CN88 59a) VE7(CN79)>W7(CN88 59a) VE7>W0 VE6(DO20)>W7(CN88 55a) 01-0200 W7>W0(mode?) W7(DN46)>W7(CN88 57a) W7(DN13)>W7(CN88 59a) 02-0300 VE7(CO83)>W7(CN88 57a) VE5(DO61)>W7(CN88 55a) OX3VHF>VE3(FN04 559) VE8BY>VE6(DO33 559) 03-0400 KL7/KG0VL(BP75)>W1(s1) VE7>W1(s1) VE7FG>W1(s1) KL7>W1(mode?) KL7(BP54)>W7(CN88 58a) W7(CN86)>W7(CN84) 05-0600 W7(DN07)>W7(CN84) W7>W0(mode?) KL7/KG0VL(BP75)>W0(EN10 mode?)

July 24 0434 VE4ARM>W9(EN44 53a) 23-2400 W8(EN84)>W9(EN61 55a) VE3(EN92)>W9(EN61) W3(EN35)>W9(EN61)

July 25 00-0100 W8(EN83)>W3(FM19559A) W0(DN76)>W0(DN70 57a) W9(EN63)>W0(DN70) VE6(DN39)>W7(CN88 55a) W7(DN57)>W0(DN70) W0(EM48)>W9(EN61 55a) W0(EN11)>W0(DN70 57a) W7(CN94)>W7(CN88 59a) W9(EN41)>W9(EN44 53a) K0GUV>W9(EN44 52a) W7(CN84)>W7(CN88 55a) 01-0200 W8(EN72)>W8(EN72) W6>W9(56a) W0(EN35)>W9(EN44 55a) VE4ARM>W9(EN44 55a/Es) VE4ARM>W9(EN44 57a) VE6EMU>W7(CN88 59a) VE7FG>W7(CN88 59a) VE4ARM>W9(FN44 579 AE) W0(DN70)>W7(CN88 53a) VE8BY>W9(FN44 549 AE) VE7>W0 02-0300 VE7>W0 VE8BY>W9(EN44 549) VE8BY>W8(mode?) VE5(DN59)>W7(CN88 59a) 03-0400 VE8BY>W0(EN10) W1(FN43)>VE9(FN65 44a) W1>W2 W8>W2 N0UD>W9(FN44 55a) W0(EN57)>W9(EN52)(mode?) VE2YAT>W8(EN82)(mode?) W0(EN10)>W8(EM79(mode?) VE3UBL>W3(52a) VE7CO83)>W7(CN88 59a) 04-0500 VE6(DO20)>W7(CN88 57a) VE6(DO33)>W7(CN88 59a) N8PUM>W0(DN70 51a) VE7>W0 W8(EN84)>W3(FM19 55a) W7>W0(mode?) W0(EN18)>W9(EN61) W7(DM09)>W7(CN88 59a) W9(EN445)>W9(EN61) W0(EN57)>W8(EN82 55a) W0>W7(CN85) VE6(DN39)>W0(DN70) VE3(FN03)>W8(EN82 55a) 05-0600 W7(DN26)>W7(CN88 59a) W7>W9(EN61) W9(EN63)>W9(EN61) W9(EN27)>W9(EN61) W2(FN23)>W9(EN61) W1(FN43)>W1(FN31 57a) W8(EN57)>W9(EN61) W1(FN65)>W1(FN31 55a) W1(FN42)>W1(FN31 55a) W0>W0 06-0700 VE3UBL,N8PUM,K0KP>W3 W7>W0 AL7RT>W9(559) W9(EN44)>W0(DN70 59a) W0(EN10)>W9(EN44 55a) W9JN>W9(EN44 54a) N0LL>W9(EN44 52a) W8>W9(57a) VE6EMU>W9(EN44 579 AE) VE6(DO21)>W7(CN88 57a) 07-0800 W8>W9(EN44 58a) KL7NO>W0(AE) KL7NO>W9(EN44 579) W3>W8(EN82 AE) VE3UBL>W3(FM19) N8PUM>W3(FM19) VA2MGL>W3(FM19) VE2RCS>W2(FN21) VE5(DN59)>W0 W8(EN82)>W3(FM19 AE) 12-1300 K0KP>W9(EN60 mode?) KL7/KG0VL>VE6(DO33 539a) VE7FG>VE6(DO33 559a) N8PUM>W8(EN81) 13-1400 VE2>W1(mode?) K0KP>W0(DN70) VE4VHF>VE6(DO33 579a) W8(EN80)>W8(EN81) VE2>W3(FM29 55a) KL7FU(BQ11)>VE6(DO33 579a) 13-1400 W0(EN10)>W0(DN70 53a) 14-1500 WA7X>VE6(DO33 559a) VE4ARM>VE6(DO33 559a) VE7FG>VE6(DO33 559a) N0UD>VE6(DO33 579a) W4(EM93)>W0(EN10)(mode?) W0(EN10)>W9(EN44 57a) 15-1600 K0KP>W9(EN44 55a) N0UD>W9(EN44 54a) N8PUM>W9(EN44 51a) 1818 Au>W1(FN46) 19-2000 VE4ARM>W9(EN44 53a) VE3(FN14)>W1(55a) 20-2100 VE2(FN25)>W4(FM08 57a) W1>W1 W8(EN71)>W4(FM08 57a) VE3(FN03)>W1(FN42) VE2(FN25)>W2(FM19) W0(EN26)>W9(EN44 51a) W0(EN82)>W8(EN12) W8>W3 W9(EN61)>W9(EN44 55a) VE1>W2(FM19) 21-2200 VE1(FN74)>W8(EN82 55a) W0(EN27)>W0 W8>W3(FM29) W3(FM28)>W9(EN61) 22-2300 VE7FG>W7(CN88 59a) VE8BY>W7(CN88 51a) N0UD>VE6(DO33 559a) W0(EN35)>W8(EN81) W2>W1 W8(EM79)>W3(FN00) W4(FM06)>W3(FN00) 23-2400 W7>W0(mode?) W9(EN60)>W8

July 26 00-0100 VE7>W0(mode?) VE8BY>VE1(mode?) W0(DM79)>W7(CN88 59a) W9(EN60)>W4(EM74) WA7X>W0 0233 VE2YAT>VE1(FN74) 03-0400 W8>W3 (mode?) VE8BY>W1(mode?) 23-2400 W8(EN84)>W1(FN43) W8(EM99)>W3(EM79) W2(FN32)>W2(FN21 53a) W9>W8 OX3VHF>VE1

July 27 00-0100 VE6EMU>W(CN88 59a) W9(EN70)>W8(EM78 51a) W7(CN88)>W7(CN85 59a) W0(DN79)>W7(CN88 57a) VA2MGL>W2(55a) VE6ARC>W7(CN88 33a) W0>W3 01-0200 W6(CN92)>W7(CN88 55a) W0>W7(CN85) W9(EN61)>W8(EN80) VE5(DN59)>W7(CN84) VE6>VE7(54a) VA2MGL>W1 W7>W7(54a) VE3>W8 VE3(FN04)W1(FN42) 02-0300 VE2(FN56)>W1(FN42) VE7FG>VE6(DO33 539a) VE8BY>VE6(DO33 539a) W8(EN83)>W8 VE3>W2 KL7/KG0VL>VE6(DO33) W7>W7 W1(FN31)>W8(EN83) VE5(DN59)>W7(CN88 59a) N0UD>VE6(DO33 59a) VE4VHF>VE2(FN25) 03-0400 E8>W8 W8>W9 W1(FN31)>W0(EN10) VE4(E010)>VE3(FN03) W1>W7(mode?) W8>W7(mode?) W2(FN12)>W2(FN20) W9(EN81)>W8(EN51) 04-0500 W3(FM19)>W8(EN83) W2(FN13)>W8(EN83) VE4(DO90)>VE6(DO33) VE4>W2(mode?) W9(EN54)>W3(FM19 55a) VE6(DO33)>W7(CN88 57a) VE2(FN35)>W3(FM19) 05-0600 KL7NO>VE6(mode?) VE7(CO83)>W0(EN10 AE?) W0(EN33)>W3(57a) W0(EN33)>W9(EN61) 06-0700 W0(EN24)>W9(EN61 57a) VE3(EN93)>W9(EN61 57a) W0(EN24)>W9(EN61 55a) W9(EN55)>W9(EN61) W9(EN45)>W9(EN61 55a) W3(FN00)>W9(EN61 51) 07-0800 W9(EN63)>W9(EN61) N8PUM>W8(EN91) VE2YAT>W8(EN91) VE2RCS>W8(EN691) W9(EN62)>W8(EN91) 08-0900 W0(EN33)>W8(EN91) VE2MGL>VE1 VE2RCS>VE1 WA1OJB>VE1 0901 K0KP>W8(EN81) 10-1100 W1(FN41)>W3(FN00) VE2(FN37)>W1(FN41) W2(FN21)>W1(FN41) VE1>W1 VE2>VE1 11-1200 VE3UBL,VE2KYT,VE4ARM,VE4VHF>W8 (mode?) W8(EN42)>W3(FN00) VE3(EN93)>W8(EN80) VE3(EN93)>W3(FN00) W8(EN91)>W3(FN00) W4(EM73)>W8(EN80)(mode?) VE4VHF>W1(54a) 13-14 W4(FM17)>W1(mode?) W1(FN34)>W4(FM16) VE3(FN03)>W8(EM88) 14-1500 VE5(DN89)>W0(EN10) 21-2200 Au>W1 VE8BY>VE9 22-2300 W3(FN20)>VY2(FN86) VE3(FN14)>W1(FN43) VE5(DN59)>VE6(DO33 57a) W1>W8 W2(FN42)>W1(FN34) 23-2400 VE8BY>VE6(DO33 63a) OX3VHF>VE6(DO33 51a) W2(FN32)>W1 W1(FN43)>W1 W8>W3(FN00)

July 28 0408-20 VE4VHF>W9(EN61 559) VE4(DO90)>W9(EN61)

Other Modes

The timeline of openings between North America and Africa repeats the pattern already discussed: a concentration on the first twelve days (but why was the 1st relatively weak?) and only a couple of openings thereafter. Reports mostly relate to the offshore CT3 and EH8 (but where was CU3?), though CN/EH9 was also prominent. 5T5SN appeared in two days, reaching W0, giving a hint of missed opportunities, had there been more activity at the African end and a greater number of alert operators in the States... The great majority of openings were from W1-4, less frequently to VE or W9/0. No openings were reported from western states.

The detailed daily listings show openings between the US (and occasionally Canada too) to the Caribbean and/or Central America almost every day, essentially by 1xEs or 2xEs. Almost every country (or DXCC entity) in which there is known to have been 6-metre activity was reported at one time or another.) At the US end openings heavily favoured the eastern states.

United States/Canada<>Africa

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | + | + | + | + | + | + | + | + | + | + | | | | | | | | | | | | | | + | | + | | | | | |

United States/Canada<>Africa

CT3 12 days 2(W1) 3(W4) 5(W1,W2,W3,W4) 6(W1,W3,W4,W5) 7(W1,VE1) 8(W1,VE1)
 9 (W1,W2,W3,W4,W5) 10(W1) 11(W2,W4) 12(W1,W2) 24(VE1) 26(W2)
 CN 7 days 2(W1,W3) 3(W2,W3) 4(W3) 5(W2,W3,W9) 6(W4,W9) 7(W1) 8(W1,W4) 12(W1)
 EH8 4 days 2(W1,W2) 3(W1,W2) 5(W1,W2,W3,W0,VE2) 8(VE1) 11(W1)
 EH9 3 days 3(W1,W2) 5(W3,W9) 7(W1)
 5T 2 days 5(W1,W3) 6(W1,W0)

Openings to YV, PZ and HP in the table below were almost certainly by multihop Es. The modes involved in the openings to LU and PY are not immediately obvious.

United States<>South America

YV 5 days 6(W8) 21(W4) 26(VE1) 30(W2,W3,W4) 31(W4)
 PZ 2 days 6(W2,W3) 12(W1)
 HP 2 days 26(W4) 27(W4)
 LU 1 day 28(W3)
 PT2 1 day 10(W1)

July 1 01-0200 W9>W7 02-0300 N8PUM,W9JN,VE3,K4TQR,KD4NMI>W0 W7>W8 W9>W5 03-0400
 KE4SIX>W0 W7>W9 15-1600 XE2>W7 W9VW>VE1 K6FV>VE6 K4KWK>W9 16-1700
 VE1SMU,VE3>W8 17-1800 K0KP>VE6 22-2300 EH8BPX>WP4NEG

July 2 00-0100 28242(CT)>W4 W7>W7 W6>XE2 01-0200 K6FV,W4,W0>W7 W0,VE4VHF>W5 02-0300
 WA7X>W7 K4TQR,K6FV>W0 W6>VE6 N0UD>W5 WA6LIE>W7 03-0400 W7>W7
 VE7,W6(bs),VE6ARC,VE6EMU>W6 1026 48250>W2 11-1200 EH7RM>K1GUN,K1SIX
 CT3>K1SIX VO1ZA>W1 12-1300 9H1XT,IW9CER>W1JJ 13-1400 N8PUM>VE6 15-1600
 W5GPM>W4 K4AHO,W4CHA>W0 K0UO>W7 16-1700 W9,WA6HTC,WA6LIE>W0
J79KV>WQ5W,K4RX,AB5A,W1JJ,W5GAI,K1MS,W5DN,K5CM 17-1800 J79KV>K4RX,K1GUN
 K0KP>VE6 KA7BGR>W0 18-1900 J79KV>N6KK,W7GJ,WB9Z 19-2000 J79KV>AA6YQ/1 W7>W5
PJ7M>AA6YQ/1 J79KV>KR7O C6AFP>WZ8D 20-2100 W3CMP/VP9>WP4NEG
 W7,VE6ARC,VE7FG>W0 K0EC>VE6 CN8KD>W1JJ W2>W0 21-2200 CN8MC>N3DB,W1RA
J79KV>K2WE CN8TW>K3OO EH9IB>W1RA,N3DB K6FV>W0 CN8KD>K3OO
CT0SIX,CQ14HZE>N3DB CO2OJ>K3OO,K3HX EH8BPX,CT3FT>W1RA 9Z4BM>AF9R 22-2300
CT3FT>K2MUB FG/AI5P>K4CY, KM0A, WB5XX,KU4BL HI8ROX>KP4 CO2OJ>W8TN,K4PI
9Z4BM>K4PI PJ7M>KM0A,K4PI W4>W1 9Y4AT>K4CY J79KV>W4SO,K4RX,KA1A
VP5JM>K4CY,K4PI 23-2400 FG/AI5P>WQ5W PJ7M>VE9DX,WQ5W
J79KV>KB8UYZ,N0JK,K2WE,K1ACL,NB1U 9Y4AT>W1RA CO2OJ>N3DB 9Z4BM>KA1A
VP9GE>VE1CSM W9>W2 FM5WD>W1RA,KF2HC FG5FP>W1RA,VE9KAR VP2MDD>VE9KAR

July 3 00-0100 VP2MDD>K2WE,K5CM FM5WD>K2WE,K5MA,KA1OPD,N3II W6>VE6 W9AFB>W2
PJ7M>VE1CSM,W5VU,AA2AE,KA1OPD K0KP>W2,W1 KA7BGR>XE2 V44KJ>W1RA,W5VU
 W9,VE2,W5>W5 W2,VO1>W2 01-0200 V44KJ>N3II W4>W5 K0UO>W2 VO1,W0>W5
VP9/W3CMP>AE5B,K1SIX,K9DXR,K4CEB,K2PLF.K2IO W8>W0 02-0300 W0>W1,W0 W2>W5
VP9/W3CMP>K0HA KL7NO>W7 0356 KL7NO>W7 0452 KL7NO>W6,W7 0513 KL7NO>W7_0602

KL7NO>W7 0844 48250>W2 10-1100 EH7RM>K2MUB 11-1200 48250(EA)>W4
CT1ILT>KA1A,K2MUB,K4RX CT1EEB>K1ZM EH3AKY>KF2O,K1ZM,W3TC 12-1300
9H1BT>K4RX,WZ1V J79KV>KF2O F6FHP>WZ8D VY2>W4 EH8BPX>K1GUN 13-1400
VP9/W3CMP>KA1A EH5YU>K4MM EH5DIT>WZ1V EH5RM>W1ZZ W3>W8 ED9KY>K1GUN
EH8BPX>K2PS,K1MS 14-1500 EH8BPX>K1VW EH5HT>K4PI,K8KS W1>W4 CN8LI>N2NRD,
W3LPL CQ14HZE>KA1A EH7KW>KA1A,N3OC,W1JJ FP5BU>W2 VP9./W3CMP>N1RWY 15-
1600 FP5BU>W4 CQ14HZE>K4PI,K4CIA,K5UR,W1VW EH7KW>W1VW,K4PI,AA1K
EH9IB>K2PLF W8>W5 W4CHA>W2 W4>W1 VP9/W3CMP>K1GUN, WA8JOC 16-1700
CQ14HZE>W3LPL WB5LLI>W0 CN8TW>AA2DR,KC2TN EA7KW>K2PLF NOLL>W4 17-1800
K0UO>W4 EH7KW>W3KWH W8,W5>W3 K0UO>W4 W9>W5 18-1900 W0>W4 W5>W9 W0>W5
19-2000 W5>W9 W0>W5 K0EC>W5 20-2100 W0>W5 K0EC,K5AB,W5HN>W0
F6HRP,F6FHP>K1TTT CT.G.I.S5>K1SIX G8BCG>KG4QMI VY2>W1,VE2 21-2200 W0>W5
F6HRP>K1SIX W5>W9 W2>VY2 W4>W4 EH1EH>VE3FF, K4PI,K8KS F6FHP>N3DB,K8KS
F5BYM>K8KS 22-2300 EH1DDU>KB8U VE1>W3 CQ14EEB>W8GEX PZ5RA>NP3CW
VE2>W2,W1 CT1DXQ>WZ8D VE9>W8 W1>W4 MW1MFY>K4PI K0KP>W5 W8,W9>VE9
N8PUM>VY2 E15FK>K4RX 23-2400 F4DXW>VE1ZZ W2>W9 W1>VE1

July 4 0-0100 VP9/W3CMP>N3DB(Es/ms) 0142-50 CQ14ILT>W1GF,WA1T VE2RCS>W4 0238
W5>W4(sc) 0941 48242,48250(EA)>W2 10-1100 W3CCX>W2 9H1TM>W1JJ 11-1200
EH5FX>W4TJ,K4PI EH>K1SIX CQ14HZE>K4PI,K4DY CN8MC,CT0SIX>N3DB 12-1300
CN8KD>N3DB VY2,VE9>W4 VE1>W1,W4 VP9GE>K4DY 13-1400 C6AFP>KJ9I VE1,W4,W8>W4
14-1500 J79KV>KO1H W3>W2 W4>W3,W1 VP9GE,CU3URA>K4RX W1>W3 W2>W9
C6AGN>WA4JQS,K9SM W9>W4 15-1600 KD4HLG>W7 KP4>W4 W8>W6 W4>W9
C6AGN>K0HA,W2AJM,W3 K5AB>W0 W5>W3 W0>W5 KP4>W9 16-1700 W4>W2
J79KV>N3DB,KB0FHP W4>W3,W8 W4CHA>W2 VO1ZA>W4 W0>W8 17-1800 W4>W4,W8
J79KV>N2NRD K4AHO,W8>W2 W2>W4 C6AGN>W3MEL K0GUV>W0 W1>W8,W3 18-1900
C6AGN>W7RN PJ7M>W2JU W2>W4 W4>W0,W1 W8>W2 FM5WD>AA6YQ/1,KB0FHP
VP9GE>K0HA J79KV>K2PLF W9>W4 19-2000 W4>W9,W1,W2 J79KV>KB2WTB W3>W3
VE2>W4 W4>W8 20-2100 W9>W2 22-2300 K0UO>W3 W9,VE3>W5 23-2400 W2,W1>W5
W5,W0,W1,VE3,W8>W3 VE2>W9 W4>W1,W9

July 5 00-0100 W4>W8,W9,VE3 W0>W4 W5>VE3,W1 C6AFP>K1VW,N2NB
VP9GE>N3DB,K0GU,W4DUP VE7,W4>W0 W0>W2,W3 W8>VE9 01-0200
VE8BY,VE3UBL,W1>W0 VE6>W4 W0>W3 W5>VE3,VE6 K0UO>W7 C6AFP>K0HA W4>W1,W0
02-0300 W0>W4 W9>W0 W5>W8 KD4NMI,KD4HLG,W9AFB>W0 11-1200 W8>W4 W1>W1 12-
1300 KP4>W8 13-1400 EH7RM>NW5E/4,W1JJ,K5UR,K4UTE WA1OJB>W0 W9JN>W2
W1,W4>W4 EH7IT>K4RX,K5UR PJ7M>K8WW,WB9Z VE1>W3 W1>W8 EH5CXL>WP4NIX 14-
1500 W0>W4,W2 G4CNG>W4SO W4>W9 VP5JM>K1VW,N2NRD,W1UF CT1HZE>K4RX
EH7RM>N2NB C6AGN>K2PLF,K1VW,N2NRD CT1ALF>K4RX W5>W4 15-1600 KD4HLG>W3
W1>W4 VE2>W3 C6AGN>W8OI W1>W8 W4>W3,W8 VE1>W9 16-1700 W4>W3
PJ7M>K1TOL,K2WE,AA2DR,N9RS W2>W5 W1>W4 K4KWK>W0 17-1800 PJ7M>W4SO
NOLL>W4 18-1900 PJ7M>N3DB,K1GUN,N9RS,AK3E,N2AU KP4>W1 W3>W4
CT1HZE,CT1FJC>K3OO 5T5SN>AI3Z 19-2000 KP4>W1 PJ7M>KF2HC,AG2A.W4SO,KB2WTB
FP/K9OT>AK3E W5>W5 VP9GE>K2PLF,N2AU CT1HZE>AI3Z W1>W1 V44KJ>W1JR
CN8TW>K3OO VE1>W4,W5,W0 VP2MDD>W2LK 5T5SN>K1GUN 20-2100 CT1BXT>K2WE
CT1HZE>K2PLF,N3OC V44KJ>K2PLF VE1>W9,W1,W2 CN8LI>K9RJ,K2WE W1>W3,W8,W9
FP/K9OT>K2PLF 9H1BT>K8MD ZB3B>K8MD,K9RJ EH7KW>KF2HC CT3FT>K2PLF
9H1TX>K2PLF CT1EAT>AI3Z,W3MRG CT1EIF>K1VW 21-2200 VE1>W3 CU3EQ>KC2TN,
W8OI/4 CT1HZE>K1VW W4>W4 VE9>W0 EH7AJR>K4MQG CT1CJJ>KB0FPH/3 VE2>W3,W9
EH9AI,EH5HT>W3OC CT1EHX>N2WM KD4MD>YV1DIG FP/K9OT>N8KOL VY2>W3
EH7KW>WQ5W.N0JK EH9IB>K3OO EH7RM>KC2FDQ EH9AI>WB9Z,N9US IT9RZR>W3LPL
CT3BM>K1GUN VO1,VE2>W2 CT1EAT>K4YYL 22-2300 V44KJ>K1BD,KC2TN
CT3BM>K4MAU,KC2TN VE1,W1>W3 EH6NB,EH8JF>K3OO EH7RM>K3JT VE2>W9,W0
VE9,VE1>W3 VE2>W8 CT3BD>W3LPL CT1ILT>K3OO EH8BPX>N3AM,W3EKT

9Y4/KE9I>K1GUN W3>W3 W1>W0 CT3BD>K1GUN EH8BPX>N0OK,K0HA W9,W0>W1 PJ7M>K3HX 23-2400 VE2>W8 EH8BPX>AA1QD,AA6YQ/1,W3LPL,KB0FHP/3,N2NRD,VA2UK YU1>9H VO1>W3 VE2>W9 FP/K9OT>KB0FHP/3 VE1>W4 W1>W0 CT3BM>NA1T

July 6 00-0100 W3,W4>W5 W9,W0>W3 W0>W8 5T5SN>K1DG,W1MU,K0HA VE1>W3,W8 W0>VE3,W3,W5,VE2 W3>W1 01-0200 W0>W3,W8,W5 VE4VHF>W9 W1,W4>W5 W7>VE9,W7 W4>W9 02-0300 FP/K9OT>N3DB VE1SMU>W3 W5>W1 VE4VHF>W0 VE9>W4 W5>W8 03-0400 W4>W0 W0>W2 K0UO>W1 04-0500 VE8BY,VE1SMU>W3 05-0600 VA2MGL,VE4VHF>W3 VA2YKT>W3 1053-4 EAfv,CTfv>W4 11-1200 48239,48250,48256>W2 EH7RM>K4RX,K1SIX EH5AX>K4RX VY2>W1,W4 K5AB,W5HN>W4 12-1300 PJ7M>VE1ZZ EH5AX>K4PI,K4MQG EH7KW>K4PI,K4MM CT3FT>K4PI,N1NK W4>W1 CN8KD>K4MQG,K4PI,K9HMB,KY5R/4 EH1EAU>K4MM W8>W5 CT1HZE>K4PI 13-1400 CT3DL>K4CIA,K4RX PJ7M>N3LL,AI9L,W8OI,K9HMB W3>W3 EH5VQ>K4PI CT1HZE>K4PI,WB4UBA,W4LK CU3URA>K4MM V44KJ>K9HMB CN8KD>K4RX EH7RM>N4GM W5>W1 CT3BM>K5XX C6AGN>K2MUB 9Y4/KE9I>K9HMB 14-1500 9Y4/KE9I>N4CH KP4>W2 YV1DIG,FM5WD>K8MD CT1ALF>K0HA(NE) CTfv>DN70 9Y4/AJ9C>K9IZ,KE9I CT1FIJ>K4PI CT1BXT>K4PI,K5XX ZB3B>K4RX WB5LLI>W0 VP9HE>K0HA P43JB>AA1K 15-1600 ZB3B>KE3Q VE3,W8>W4 W5>W1 PJ7M>AA1K,K0HA W4>W9,W3,W4 W0>W3 F6DRA>K4RX 16-1700 W0,W4,W5>W3 W3CCX>W8 K8UK>W0 CTfv>W0 EH7RM>K0GU 17-1800 EA7RM>K4RX,K0GU F6FCP>AA1K W0,W8>W3 PJ7M>K8WW F5FKK>K4RX VP9GE>K4CY W0,VE6EMU>W0 NOLL>W8 W3>W2 18-1900 PJ7M>N8UUP EH7RM>K0GU W0,W9>W3 W3>W4 F6FHP>K4RX,K0GU,K5XX W4>W1 C6AGN>K3HX,AK3E VP5JM>W3EKT,W1JJ 19-2000 VE6EMU>W0 W0>W3,W8 PJ7M>W2YE V44KJ>N3DB,W8CAR,N0JK W9>W3 20-2100 W3,W7>W3 FP/KB9LIE>W3UR,N4DA FP/K9OT>W3UR CU3URA>AK3E(skew 090) FM5WD>K3HX,AI3W,W3YY VO1>W4 W4>W2 21-2200 V44KJ>K1GUP,W3EKT,AK3E G3NVO>WP4NEG FM5WD>KE3Q,K0HA,N3EQF,N2NRD CU3URA>N3DB,W1JJ W4>W8,W9 FP/KB9LIE>W2YE PJ7M,P43JB>K2MUB 9Y4AT>W3UR PZ5RA>K2PS,W3UR W3CCX>W0 G8BCG>WP4NEG FP/K9OT>W4SO W8>W1 22-2300 VP5JM>K8SIX PZ5RA>K2PS W3,W4>W9 W4>W0 EH7RM>N3DB,WZ8D VP2MDD>VE1ZZ W4>W3 9Z4BM>KA1A MM0AMW>W4SO W1>W5 W4>VE1,W8 FP/K9OT>NL7AU/4 C6AGN>K2CS 23-2400 W0>W3 CT1HZE>K5IX EH7RM>K5XX,K4CY,KE3Q W4>W8 W3,W5>W9 W2>W5 W9>W4 W1,W4,W8>W3 W2>W0 MU0FAL>W4SO,N8PR/4 W0>W4

July 7 00-0100 W2>W9 CT1EAT>N3DB VA2MGL>W0 EH7RM>N0JK W2,W3,W0>W0 F5JJK>W4SO VE3>W5 CT1HZE>K4EA W4,W8>W9 EAfv>DN79 W1>W5 W8>W4,W9 W9,W0>W3 01-0200 W0,W3,W4,W5,W8,W9>W3 W0,W3CCX,VE2,W3VD>W0 VP9GE>K0HA W9>W4 W4,W7>W8 KA0CDN,VE3,W1>W5 02-0300 W4,W5,W7,W0>W3 W2,W9>W5 W5>W1 W7>W9 W7,W4,W6>W8 W9>W4 03-0400 W0,VE5,VE6,W7,VE8BY,XE2ED>W0 W8>W5 W0>W3,W5 W2>W2 W5>VE6 W8,VE4VHF>W5 04-0500 KA0CDN>W3 VE6>W0 W0>W7,W4 W9>W9 05-0600 W0,W7,KL7/KG0VL>VE6 1030 48250(EA)>W2 11-1200 EH7RM>K1GUP,VE9DX,K1SIX EH7IT>K1GUN,K1SIX W1>VE9 CU3URA>K1SIX 12-1300 CT0SIX>K1SIX CU3URA>W1MU EH7FK>K1GUN EH9IB>K1GUN,K1SIX,W1MU EH7RM>VE1ZZ K0UO>W7 13-1400 W4>W4 K0UO>W2 K0KP>W4 14-1500 W0>W4,W9 PJ7M>NL7AU/4,K2ZD N8PUM>W4 15-1600 PJ7M>K4UTE VP5JM>KB4ET,NW5E/4,KE7V K0KP>W0 W0>W4 W4>W7,W4 W7,W0>W3 16-1700 W9>W7 VE4VHF>W0 W3>W3 VE7>W6 17-1800 VE7>W8 VE4>W5 W8,W0,W2,VE3>W6 W0,VE6EMU,W7,W8,VE6ARC>W0 W4>W5 W7>W3,W8 18-1900 VE3,W7,W0,VE5>W6 W7,VE4VHF>W8 CN8KD>K4MM K0GUV>W8 19-2000 CU3URA>VE1ZZ KA7BGR>W0 CT0SIX>VE1ZZ VP5JM>N3NTN,KF2TI,N2NRD,W1JJ WA7X,W5,W6>VE6 W7>W7 20-2100 CT0SIX>VE1ZZ WA7X,W6>VE6 KP4>W4 PJ7M>VE1ZZ VE5>W6 21-2200 VP5JM>K4CIA,KB3IWW,KE4MBP,W4TJ,KG4ODX PA4PA>KP2L KP4>W4 W0,WA7X>VE6 CT0SIX,G4DHF>VE1ZZ PJ7M>K1MS TG9AFX>NW5E/4 22-2300 W5>W1 VP5JM>K4EA,K4KJZ,K5AB PJ2BVU>K0HA,KB4ET KP4>W5,W4 23-2400 HI8ROX>NW5E/4 V44KJ>NW5E/4 W1>W5 9Y4AT>NW5E/4,WQ5W W4,ZF>KP4 KP2BH>WQ5W

- July 8 00-0100 KP4>W5 9Y4AT>N0RQ/5 KP2L>K5IX,NW5E/4 HI8ROX>WQ5W,K5IX
PJ7M>W5LUA,K5IX,AEB,AB5A 01-0200 9Y4AT>NW5E/4 K4AHO>W3 02-0300 W6>W7
K6FV,WA6LIE,NN7K>W0 W6>W5,W0 W7>W7 03-0400 KA7BGR,W6>W5 W7>W7 W0MTK>VE6
11-1200 CTtv>W4 CN8MC>W4 13-1400 CU3URA>VE1ZZ CT3FT>K1DAT EH8JF>VE1ZZ
PJ7M>N3DB 9A4MF>K4MM 14-1500 EA7RM>K1GUN K5AB>W8 15-1600 W5RP>W8
CU3URA>K1SIX PJ7M>K4CIA K0UO>W4 16-1700 EH2JG>K1GUN EH7RM>K1GUN,KM3T/1
EH7KW>K1GUN,K1SIX W9>W5,W9 VO1>W2 17-1800 VO1>W1 K0KP>W2 18-1900
VO1>W1W5>W9 FP/K9OT>W1_K4TQR>W0 19-2000 VO1>W2 CU3CI>W1JR 20-2100
W0MTK>W0 W5>W3 W5HN>W8 21-2200 W0>W9 W9>W5 22-2300
G8BCG>KE4OYS,K2LZQ,K4EA CY2>W1 MM0AMW>K4XP CU3URA>VE1ZZ 23-2400
VO1>W2,W3,W4 CN8LI>W3EP/1 F6FHP>N4CH,W3YY CT1BH>W1JJ
EH7RM>W1MU,K5XX,W1RA VE1,W5>W3 W7,K4TQR>W2 CU3URA>VE3FGU OX3VHF>K1ZM
- July 9 00-0100 CU3DI>K5XX,K2MUB,N3DB,W3UR,W3YY,WQ5W F6FHP>N4CH,K4MQG W4>W2
W2>W5 W5>W3 01-0200 WB5LLI>W2 W5,W1>W3 W4>W5 W7>W4 02-0300 W2,W4,W5>W3
W5>W9 C6AFP>K0HA W4>W0,W7,W9 W6>W0 W5RP,W5HN>W3 11-1200
48239,48242,48250>W2 EH7RM>K4DY W5GPM>W1 VO1ZA>W4 12-1300 49739(UA)>W4
EH7RM>K4DY,KY5R/4 EH>W1 W8>W4 W5>W2 W5,W8,WR9L,W9AFB, W5GPM,VO1>W1 13-
1400 OH9SIX>KB2TWB 9H1XT>K5AB W8,W4>W1 W3>W4 14-1500 W9>W3,W4 W5>W5
CT3FT>K4YYL 9H1XT>K5NA VE9>W4 W4>W1,W3 9H1AW>AA5XE 15-1600 IW9CER>N4GM
W4>W1 C6AFP>K0HA 16-1700 CO8LY>K0HA C6AGN>K8LEE,K1VW,K2MUB XE1>W9
PJ7M>KE3Q 17-1800 K4KWK>W1 VE1>W3 W0>W4 CT3FT>N3DB,N4AVV W2,W3,W9>W0
V44KJ>K3RA,AK3E,K0HA,N8UUP,W8GG PJ7M>K0HA EH7KW>N3DB 18-1900
C6AGN>W1JR,VE9KAR,N8UUP FM5WD>K0HA,K4MQG 19-2000 FM5WD>N8UUP,K4WS
9Z4BM>K1DAT,W3LPL,N4HL W4>VE1,W4 C6AGN>K3TW VP9/WA4PGM>W3UR,W3LPL 21-
2200 PJ7M>K4PI 23-2400 WR9L>W1 W3,W6,W8,W9>W3 W9,W1>W1 W1>W5 VE3>W7
W9,W0>W2
- July 10 00-0100 W0>W3 W2>W5 W9>W2 01-0200 W4,W6>W8 VE3>W4 W8,W4,W0>W3
W3,W6,W7,VE4VHF>W5 W6>W7 W5>W1 W4>W9 02-0300 W7,VE4>W0 W5,W9,W8>W7
VE4,VE7>W9 W1>W5 VE5>W4,W8 03-0400 W7>W9,W3,W0,W6 VE5>W0 W0>W3,W9 04-0500
W1>W8 W7,W5>W4 W6,W0,W9>VE6 VE4VHF,VE4ARM>W0 05-0600 WA7X,N0UD,N0LL>VE6
11-1200 PJ7M>NL7AU/4,K5AND,K4YNT W5>W4 12-1300 NP3CW>W3 W5GPM>W2
CO2OJ>KG4ODX,K4CEB,K5IX,KU4BL,W4VD FM5WD>KB4ET,K0HA CO8LY>N3DB
FM5AD>WQ5W 9Z4BM>K4PI,W5ZN,K0HA PJ7M>K4PI W5>W3 13-1400 CO8LY>N3DB,K0HA
9Z4BM>WQ5W,NW5E/4 9Y4AT>K0HA W>W4 CO2OJ>AI9L,K0HA,K0DLW,K4KJZ,N3OC
VP5JM>AA4V,NW5E/4,K0SD/4,KE9I,W3LPL 6Y5IC>K4DY W7>W9 V31KG>K04BB,K4KJZ 14-
1500 9Y4/KE9I>K5UIC VP5JM>KI4M CO2OJ>K4IQJ CO8LY>KE4OYS,K0SD/4,W3YY,
KB4ET,WA4NFO V31KG>K1LH/4,K0HA VE7FG>W0 15-1600 TI2ALF>K4IQJ W5,W6>W7
CO8LY>K4MQG,K0GU V31KG>NF4L 6Y5IC>K4UEE VE4VHF,VE7FG>W0 6Y5/YO3YB>K0GU
K0UO>W2 XE1KK>W4 VE7FG>W2 W0>W7 16-1700 V31KG>N4JF,WQ5W W6,W7>W5 W0>W7
W0,W6>W0 17-1800 W5RP,N0LL>W0 W9,W0>W7 18-1900 W5>W0 W7,N0LL>W7 XE2>W6 19-
2000 XE2>W0 W6>W6 20-2100 V44KAI,HI8ROX>HP2CWB PJ7M>K2MUB GB3LER>PJ7M
PT2ADM>K1TOL 21-2200 KP4,PJ7M,HI8ROX,GI6ATZ,OZ0JX,GD0TEP,EI7IX>HP2CWB 22-2300
V44KAI,WP3NZ,FM5AD>HP2CWB PJ7M>W4SO,K4RX CU3URA>K1VW 23-2400
MM0AMW>W4SO W1>W1
- July 11 02-0300 W5,K0UO>W3 W0>W5 W6>W2 03-0400 K0KP>W3 W3>W2 WA7X,W5RP>W0 04-0500
W6>W5 W0>W7 11-1200 W9VW,QW4>VY2 VE1SMU>W8 12-1300 VE1>W4,W8
CU3URA>K2MUB VE2>W4 W4>VE9,W2 13-1400 CU3DI>K4DY VE9,W9>W4 W4>W1 W9>W8
W1>W3 CO2OJ>N3II W5GPM,C6AGM>W2AJM C6AFP>K9APW W4CHA>W9 PJ7M>K5AB
W4>W5 14-1500 VE1,W4>VE9 W4>W1 CO2OJ>K4HA,K9DXR,W3KWH VO1ZA>W4
C6AFP>WQ5W VP9KK>VE9KAR K5AB>W2

15-1600 VP9/WA4PGM>WQ5W,VE3FF,K1TTT, W1CAT W5>W3 C6AGN>WQ5W,K9SM,K1TTT, W3LPL,W3YY W4>W5,W3,W1 W1>W1 W9>W9 16-1700 W5>W9 C6AGN>KK9H,K1VW,KA1OPD W1>W5 WB5LLI>W2,W0 W4>W9 W0>W3 VE3UBL>W4 W4CHA>W0 KD4NMI>W3 W8>W9 W4>W8 W9VW>W0 17-1800 W9,W0>W4 PJ7M>K0HA,W3UR,K8LEE W5>W1 W0,W6>W3 W4>W4,W1,W8 C6AFP>WQ5W W7>W4 KD4NMI,W4>W0 EAfv>W4 VP9/WA4PGM>K0HA 18-1900 W4>VE3,W3,W9 W3,W4>W5 W0,W9,W5>W2 W8,W9,W5>W0 PJ7M>K0HA W3>W9 19-2000 VE3,W2>W4 W5>W3 W8>W5 W4>W0,W9,VE2 W3>W9 W0>W1 K0ETC>W2 20-2100 W3>W5,W9,W3 W4>W2,W8,W9 W8>W2 W0>W3,W0 W9>VE3 21-2200 W0>W3 W4CHA>W5 22-2300 W5>W4 23-2400 C6AFP>WQ5W W7>W7 W9>W4

July 12 00-0100 W2,W3>W5 W5>W4 02-0300 XE1>W6 04-0500 VE7,W6,W7>W7 W7>W0 05-0600 VE7,W7>W7 12-1300 EH7RM>K1MS CN8MC>K1SIX 13-1400 EH7RM>W1RA 9H1BT>W1RA,N3DB IW9CER>W1RA 14-1500 W8>W5 W5GPM>W3 CU3URA>K1GUN W4,WR9L>W0 15-1600 W4,K5AB>W0 16-1700 K0ETC,W5GPM>W0 XE2,W4CHA,K4AHO,C6AFP>K0GU 19-2000 V31KG>K4JAF 21-2200 V31KG>W5GAI,KG4EFR,NL7AU/W4, K5UIC,K7BV/1,W5SJ,N4GM TG9AFX>NL7AU/W4 22-2300 V44KAI>W4SO HI8ROX>W4SO, N4GM 48242,48250>W2 PZ5RA>K7BV/1 9Y4AT,9Z4BM>W4SO CU3URA>K2MUB 23-2400 YS1YS>NW5E/4,W4SO 9Y4/N9LAH>NW5E/4 W4CHA>HP2CWB 9Y4AT>NW5E/4,K1GUN NW5E/4>HP2CWB W1>W1

July 13 00-0100 TG9AFX,YS1YS>K4RX 0220 W9>W0(t) 03-0400 W6>W0 W7>W6,W0 04-0500 W6>W6,W7 W0,WA6LIE>W0 0534 W6>W0 1640 VP9/WA4PGM>K9DXR W4>W4,W5 17-1800 W4>W8,W9 18-1900 K4AHO,W4CHA>W3 W4>W4 2138 W8>W5

July 14 02-0300 W0>W7 NOLL>W3 03-0400 W7>W3 W0,W9,W3>W0 VE5>W5 NOLL>W7 11-1200 VE1SMU>W1 1252-9 VP9/WA4PGM>W3UR,W1JJ 13-1400 9Y4AT>N3DB VP9/WA4PGM>K2LZQ 14-1500 W7>W5 C6AFP>K2LZQ K5AB,W6>W0 W4>W4 15-1600 W4,W5,W6>W0,W4 K0UO>W6 W4,W5,W6,W7>W4 W6>W5 C6AGN>K2LZQ,N3DB,W4ET K0EC,KA7BGR>W0 W4CHA>W6 VP9/WA4PGM>KT4U 16-1700 W4>W4 KA0CDN,K5AB,K0EC,WA7X>W6 VP9/WA4PGM>W0VX/5,K4JAF 17-1800 K0UO>W0,W4 W6>W4 CO8LY>K2LZQ,K0HA,N3DB WA7X,KE4SIX>W6 W4>W9 W5>W3 19-2000 W6>W4 19-2000 W6>W4,W0 W5>W3 22-2300 9Y4AT>KP4 W7>W6 W6>W0 23-2400 KP4>W4 W0>W3 CO8LY>KG4ODX W4>W3

July 15 00-0100 VP9/WA4PGM>K4UTE CO8LY>K3IXD,N4VA,WB8ZTV W7>W0 01-0200 XE2>W5 W7,W0>W0 W5>W3 W7>W3,W0 VE7>W6 02-0300 W0>W7,W6 W7,W0>W4 WA7X>W0 W1>W2 W0>VE6 VE5,N0UD>W7 03-0400 W9>W7 N3LL>W3 W1,W2>W2 W7>W5 XE2>W0 W5>W6 KA0CDN>W0 W6>W4,W7 04-0500 KA7BGR,W6>W0 NOLL,K0EC,W4>W7 W6,W7>W6 05-0600 W7>W0 0604 KL7NO>W7 11-1200 W4>W1,W4 14-1500 W5>W1 CO8LY>N3DB VP9/WA4PGM>W2LK 15-1600 VP9/WA4PGM>K2MUB W4>W4,W3 W4>W0 16-1700 VE1,W4>W4 C6AFP>K4VU 17-1800 W4>VE1 18-1900 K0KP>W4 20-2100 N3LL>W3

July 16 00-0100 WA7X>VE5 K0KP>W1,W8 VE2YAT>W0 VE4VHF,W8>W8 K0UO,VE4ARM>W3 NOLL>W4 W0>VE3 01-0200 K0KP>W4 W4CHA,W7>W2 NOLL,W5,W4>W8 W4>W3 W1,W9VW,K0GU>W1 W0>VE3,W3,W4 K0EC>W7 02-0300 W0>W3,W8,W9 W0>W9,W0 W3,W4,W0>W7 VE6>W5 VE5,W7>W9 VE7FG,VE6ARC,VE6EMU>W0 04-0500 W8GTX,W9>W0 VE4VHF,VE5,W5,W9>W7 W7>W8 05-0600 W7>W8 W8,W0,VE5>W7 12-1300 W4>W3 W5GPM,K0ETC>W2 14-1500 WA1OJB,K4TQR>VP9/WA4PGM 16-1700 W3>W3 N8PUM,K0KP>W5 17-1800 W6>W5 K5AB>W8 20-2100 KA7BGR>W7 WB5LLI>W0 21-2200 K6FV>W0 W6>W7 22-2300 W7>W6 23-2400 W4>W3

- July 17 01-0200 VE7,W7>W7 N0UD>W0 W6>W7 02-0300 W4,W1>W1 VE6,W7>W0 W7>W7 03-0400 W3>W3 10-1100 W5>W4 11-1200 W8>W4 W2>VE3 W4>W5 W2>W3 12-1300 W3,W4>W5 W4,W5>W2 W2,W4,W8>W1 W4>W4 13-1400 VP9/WA4PGM>N4HN VP5JM>K4SX,N4LI N3LL>W3 W4>W3,W5 W0>W4 14-1500 W2,W4>W4 W4>W5 W1>W1 W5>W3 15-1600 W4>W5,W0 K5AB,K4AHO>W8 VE1,W3>W9 VP9/WA4PGM>N8UUP,K3OO 16-1700 VP9/WA4PGM>K9DXR,KB2WTB,VA3SPH K0ETC>W2 C6AFP>WQ5W W4,W3>W1 W8>W0 VE1>W9 W5>W4 17-1800 W4>W1,W5 VE2>W9 K0KP>W2 W6>W6 18-1900 W1,W2,W4>W1 VP5JM>W4LK,K4MQG,N4LI W3>W5 W1>W9,W0 CO2OJ>K5IX,W5GAI W2,W4,VE1,VE2>W9 W4>W4 W5,VE1>W5 VP5KE>WW4L 19-2000 VP5JM>KE4OYS,K0HA VP5KE>N4UTE W5>W4 W1>W9 W8>W8,VE9 C6AFP>N4LI 20-2100 VP5JM>N4GG,K0GW W4>W8 W1>W1 W4>W3 W4,W9>W4 CO2OJ>K9DXR W2,W4>W3 W3>W2 21-2200 W4>W4 W4,W5>W9 22-2300 W5,W0>W4 W4,W8,W9>W8 W3>W3 W1>W1
- July 18 00-0100 W1>W2,W3 W3,W8>W8 W2>W2 02-0300 W4>W4 W3>W3,W0 03-0400 W3>W0 W1>W1 04-0500 W3>W0 10-1100 W4>W2 11-1200 W1,W2,W3>W1 12-1300 W2>W1 W1>W8 W3>W4 W8>W9 13-1400 W3>>W1,W3 W5>W5,W2 W4>W8 14-1500 W3,VE3,W1>W0 W4,W1,W0>W8 W1,W3>W1 W0>W2 15-1600 W9>W9 XE2>W5 W5>W4 W2>W0 W3>W3 16-1700 VP9/WA4PGM>KA0GGI W0>W0 W1,W8,W9>W9 W4>W4,W8 W7>W0 W5>W5 17-1800 W7>W7 W2,W3>W3 W5>W4,W5 W3>W0 18-1900 W1>W1 W4,W9,N8PUM>W2 W5>W7 W6>W6 W1,W3>W9 19-2000 W5>W2 W1,W2,W3>W1 W2,W4>W4 W4,W5,W9>W3 W1>W4,W5,W9,W0 W4,KO4>W0 22-2300 W5>W3
- July 19 00-0100 W4>W5 W2>W2 14-1500 W8,W3,W9,W4>W5 VP9/WA4PGM>KA0GGI 15-1600 VP9/WA4PGM>N4AVV,N4WI K5AB>W4 1646 K5AB>W8 1722 W5GPM>W4
- July 20 0046 VE3>W4 0315-22 W0MTK,WA7X>W0 04-0500 W7,W6>W0 VE6EMU>W6 0505 W6>W7 1551 W1>W1 2241-53 W4>W2,W9 2309 W2>W4
- July 21 00-0100 W0>W4 VE5>W0 01-0200 K0ETC>W4 W4>W9 0221 W7>W5 0324 N8PUM>W9 12-1300 CO8LY,YV4AB>K4MM 1339 W4>W4 1443 W2>W3 15-1600 KP4>W4 W9>W5 1724 IK4GRO>WP4NIX 1803 ZX5PGA>WP4NIX 21-2200 C6AFP,WB5LLI>W2AJM 22-2300 W1>W4,W5,W0 W4>W9 W5>W0 23-2400 W5,W0,W8>W1 W2>W8,W2 W4,W8>W4 W3>W1,W3
- July 22 00-0100 W2>W1,W2 W0>W1 K0UO>W2 W5>W3 01-0200 6Y5IC>K4MQG KP4>W0,W5 W0>W1 W5>W3,W5 W7>W4 02-0300 W4>W0 W0>W4 W7>W3 03-0400 W3,W5>W0 18-1900 W5RP,K5AB>W6 20-2100 K6FV>W7 aurora
- July 23 1058 KQ4E>W4 1158 VP9GE>WP4NEG 16-1700 C6AFP>K2MUB 1747 W0>W1 W4>W1 KP4>W4 W1>KP4 2227 V44KAI>NW5E/4
- July 24 00-0100 W0MTK,KA0CDN,WA7X,K0EC,N0LL,KA7BGR>W0 WEA6LIE>W7 VE1,VY2>VE9 01-0200 K0UO>W0 VE6EMU>W7 N8PUM>W2 VE4VHF>W2,W3 W2,VE2>W9 W9>W3 W0>VE9 02-0300 VE8BY,K0GUV>W3 W0>VE3,W2,W3 W9>VE9 W1,W3>W9 W2,K0KP>W2 W8>VE3 03-0400 N8PUM,K0GUV,W2,W4,W9>W0 04-0500 VE5>W9 W8>W0 14-1500 VE2>W4 W3,W9,W1>W1 15-1600 W8,W9>W1 W1,VE1>W4 W2,VA2MGL,WA1OJB,W0>W3 W0>W8 16-1700 W9,W0,W3,W4>W1 W8,W9,W0>W2 W3>VE1 K0GUV,K0KP,W9,VA2MGL,K9MU, VE2RCS>W3 W8>W1 W3VD,K2ZD, W3CCX>W9 17-1800 W9,VE1,W3>W9 VE2>W4 W0>W2,W1 W9>W6,W1 18-1900 W9>W4 VE4VHF>W3,W9 VE2YAT,VA2MGL>W0 2041 CU3URA>VE1ZZ aurora
- July 25 aurora 1239 W4>W4 14-1500 WP3>W4 1456 V44KAI>W4SO aurora 2224 HR2RCH>KP4

- July 26 aurora 00-0100 W6>W0 0358 W9>W9 12-1300 G3EDD,PA0AB>WP4NEG 14-1500 W1>KP4 WA1OJB,W2>W4 KP4>W9,W3 VP5JM>W3UR,K4KJZ W4>W4 NP3>W4,W5 15-1600 VP5JM>K2PLF,WA4NFO,W4DUP,N3CY,K1MS,KB9JCW W4>W3 NP3>W4,W5,W2 W2>KP4 VE2RCS>W4 KP4>W3 16-1700 VP5JM>W4ET V44KAI>N4DB,WA4JQS,KB9JCW W3,W8>KP4 W4>W4 KE4SIX,K4AHO>W2 W4CHA>W9 KP4>W9 17-1800 VE3,W9>KP4 K0HA,W8>W2 18-1900 KP4>W2 K0KP,N8PUM>W4 20-2100 48250>W2 9Y4TL>VE1ZZ,W8OI YV4AB>VE1ZZ TG9AFX>N4ZQ 9Y4AT>W1JJ HP1AC>W4TRH 21-2200 HP1AC>K4MQG WR9L>W1 W2>W9 PJ2BR>K8WK FG5FR>W1JJ 22-2300 CU3URA>K2MUB 9Y4AT,HP1AC>W4SO W9>W2 YV4DDK>NW5E/4,W4SO FM5WE>NW5E/4 YY5PER>K4RX KP4>W4 aurora
- July 27 aurora 1541 48239>W2(mode?) 1920 W5>W4 aurora 20-2100 KS5V>W4 21-2200 K4AHO,W4CHA>W4 W5>W5 W6>W6 2232 YV4AB>W4SO
- July 28 03-0400 XE2,W5>W0 XE2>W5 14-1500 VO1ZA>W2 16-1700 C6AFP>N3DB 1752 W9>W4 1947 W4>W4 21-2200 W4>W3,W8 LU1DMA,LU8DO>N3DB
- July 29 01-0200 W9,W8>W3 K5AB,KA7BGR,VE7FG>W0 WA7X,W0MTK,K0EC>VE6 02-0300 VE7>W5 N0UD,K6FV,XE2,KL7/KG0VL>VE6 XE2,VE7,NL7ZW>W0 03-0400 KL7NO>W7 VE6EMU>W5 W0>W1,W9 W2,XE2>W0 1258 VE3>W2 1358 W7>W0 14-1500 K0HA,K5AB,VE5,N0LL,K0UO>W7 W0>W3 15-1600 W9>W8 N0LL>W0 VE5>W7 W0>W 17-1800 VE5,W7>W6 W7>W7 1858 WA7X>W7 1955 XE1>W0 22-2300 TI2NA,TI5RVV,HP3XUG>W4SO 9Z4BM>KP4 23-2400 W4CHA>HP2CWB 9Y4AT>KP4
- July 30 00-0100 XE1KK>W5 04-0500 N0LL,KA0CDN,W7>W7 KD4HLG>W0 1505 W5>W4 16-1700 W4,W0>W3 17-1800 W4>W5 WB5LLI>W8 C6AFP>K8WW 18-1900 W4>W0 XE2,W7>W5 19-2000 W6>W5 W5>W0 VE3>W2 20-2100 W4>VE9 21-2200 HI3/ON4IQ>N3DB,W1RA,K8KS,W3UR,K2LZQ YV4GLD>W3UR,NW5E/4,AK3E YV4YC>K2LZQ W2>W1 NP3CW>W3 VP5VAC>K8MFO,W4TJ 22-2300 HI3/ON4IQ>VE9DX VP5JM>K2LZQ,KC2TN,W3EKT,W2AJM W3>W8 9Z4BM>N4XD KD4HLG>W2 23-2400 VP5JM>K1TTT W4>W1 9Y4AT>W3YY CO2OJ>K4EA PJ2BVU>K9SM,W3UR,K1MS,K9APW W1>W5 W2>W2 9Y4TL>K9APW,K9DXR W4>W9
- July 31 00-0100 W4>W2,VE2 W4SO>YV5SSB KP4,W5HN,W5GPM>W4 YV4AB>KE4WBO YV4DDK>W4SO PJ2MI>K9APW,NR0X,W4GF W9>W3 01-0200 WB5LLI,W0,W4,K5AB,W8>W3 W4>W0 W5>W2 W1>W1,W5 02-0300 K8UK,W9,W3>W4 W3,W4,W5>W5 W4>W9 04-0500 W7>W7 05-0600 W6,W7>W7 06-0700 W6>W7 11-1200 W1>VE1,W3,W4 KD4NMI>VY2 12-1300 K4AHO>W8 9Y4AT>W1MU 13-1400 W4>W5,W1,W2 W8>W4 W1>W1 14-1500 KE4SIX>W2 48250(EA)>W4 V44KAI>K8WW,K2MUB CO2OJ>AE5B W4,W2>W4 W8>W5 NP3CW>W2 W1>W2 15-1600 V44KAI>W2AJM FJ5DX>K1TOL,W4TRH VE3,W4,W2>W4 W9,XE2>W5 K4AHO>VE3 W1,W4CHA>W2 W3>W8 16-1700 W4>W8,W3,W2 W2>W3 17-1800 W4>W2,W1 W7>W5 20-2100 9Y4AT,YV4AB>HP2CWB 21-2200 PJ2BVU,YV4YC>HP2CWB

Asia/Pacific

Japan

JA1VOK's always welcome report is the briefest we have had from him in some time and it calls for little comment, except to note that for the first time in a long while it includes no VK or ZL stations. Times are getting difficult in Asia, as they are for the other continents.

6m DX results in JA during July from JA1VOK

| DATE | TIME(UTC) | STATIONS |
|------|------------------------|--|
| 1 | 0055-1100 | 9M2TO, BD4ALC,BD4SDB,BD7OH,BG7IFT,BG9BA, DU1EV/B, DS1CCU,HL1ST, VR2KW,UW,XLN,XMT,SIX/b, XV1X |
| 2 | 0200-1030 2232-0500 | 9M2TO, DU1EV/B, KG6DX, DS1CCU,HL5XF,HL0U, VR2BG, XV1X BG9BA, DU1EV/B, HL5XF, VR2XMT,SIX/b, XV1X |
| 3 | 2330-0900 | BD2LH, BN0F, 6K2AVL,6K2DHP,DS1MFC,DS1PEG,DS2DKW,DS4EOI, HL1AEY,HL2HN,HL5BME, XV1X |
| 5 | 0100-1000 | BG9BA, BV2NT, DS5ISO,HL9NP, VR2SIX/b, XV1X |
| 6 | 0030-0100 | VR2SIX/b |
| 7 | 0120-0400 | BD2LH, VR2SIX/b |
| 8 | 0100-0500 | BD2LH,BG9BA, VR2SIX/b, XV1X |
| 9 | 0150-0200 | VR2SIX/b |
| 10 | 0310-0800 | BD2LH, BV2NT, DS4EXT,HL2AVK/2, UA0LE, XV1X |
| 12 | 0230-0600 | DU1EV/B, HL5XF, UA0LE |
| 16 | 0300-0900 | 9M2TO/B, DS1PEG, VR2XLN,SIX/b |
| 17 | 0245-0400 2310-0000 | DS2CYI,HL2FDW JD1YBJ |
| 18 | 0110-0300 | BD4SDB |
| 19 | 0230-0630 1324-1330 | BD2LH, BN0F, DU1EV/B, DS1MFC,HL5XF, JD1BKW/JD1, JD1YBJ HL1LTC |
| 23 | 0230-0300 | BG9BA, DS4CNB/5 |
| 24 | 0150-0500 | BG9BA, BN0F,BW9W, DS4DBF |
| 31 | 0630-0700 | JD1YBJ |

Elsewhere

Again, no comment is called for here, apart from noting that VK/ZL showed no signs of life and that KH6 also appears to be dormant.

July 1 0431 BD7OH>VR2 05-0600 BG5QCI>VR2 BD7OH>DS4 0752 XV1X>HL4XM 08-0900 XV1X>VR2 JA6YBR,JE7YNQ,JA2IGY>KG6DX 0946 JT1CQ>VR2

July 2 0235 HL0>DS1 03-0400 XV1X>HL1 0429 JA8>HL1 0613 JA1>DS1 1010 JA2IGY,JE7YNQ>KG6DX

July 4 00-0100 JA4,BN0F>DS1 03-0400 JA1,JA8>DS4

July 5 0357 JA8>KG6DX

July 8 0623 JA6YBR>KG6DX

July 15 0708 VK4>VK1

July 16 0744 JA1>KG6DX 0757 JE7YNQ>DS4 09-1000 JA8>VR2 13-1400 UT5G,UU5SIX>YA4F

July 18 00-0100 JA3,JA5>DS1 04-0500 BG9BA>HL2

July 19 04-0500 JA1>DS4 JA6YBR>DS1

Beacon News and 28 MHz Worldwide

Compilation and Commentary by G3USF

Beacon News

- 28115 PY4YYF Belo Horizonte MG GH70XB running 15 watts to vertical reported to have returned to activity and appears to be 24/7(K0HA)(Sep)
- 28173 DF4PV Ingelheim (JN49AX) runs 5 watts to GP 24/7
- 28185 I8EMG Nr Consenza (JM89BJ) 10 watts to omni PLANNED, frequency approximate
- 28204.7 KA9QMD Milwaukee runs 1 watt to vertical
- 28206 AF0H Park Hills (EM47RU)
- 28231 OH5RAC has changed frequency due to local interference problem (OH5IY)
- 28263.5 W4JPL Liberty NC (FM05) new beacon runs 4 watts (K0HA) (Sep)
- 50012 HP1RCP not currently operational
- 50033 OH5RAC runs 20 watts to 2-el with 2dBd gain beaming 200 (OH5IY)
- 50062 OZ2VHF reported by IK0BAL (August). No further information
- 50071 W9AFB temporarily off air (W9AFB)
- 50074 EH1DVY moved here late August. Runs 10 watts to vertical from Soria (EN81) (EH1DVY)
- 50086 LU7YS returned to operation (LU7YS)(Sep)
- 50395 EA5SIX running 10 watts to 3-el NBS beaming 035 from IM98VX

28 MHz Worldwide

July 2004 was a flourishing month for 28MHz sporadic-E. Along with some Es scatter, it reported every day in Europe apart from the storm-ravaged 27th, which was a complete blank for this mode, all four periods of the day had occurrence rates of 90 per cent or better. While the first twelve days were the strongest, as at 50MHz, the subsequent weakening was less marked, with the obvious exception of the 27th. Results for North America were less impressive, but equaled or exceeded July 2003. Results within Asia, by contrast, were markedly weak - as in 2003. This is a trifle odd, given the relatively high incidence of high values of foEs in areas around Japan; it is possible that the geographic distribution of activity in the region, or reporting practices, work against higher figures.

While F-layer propagation is slowly but inevitably weakening, some circuits remained reliable (possibly aided by Es at times), notably Europe<->South America in the evening (after 1700LT). This was open every day except the 6th, 16th and 27th. Africa was reported from Europe every day except the 5th, 12th, 23rd and 27th, with the four segments of the day down little or not at all compared with the previous year. By contrast, North America reported South America on only 17 days and results for the four periods of the day were below 2003 levels. Somewhat surprisingly, there was just one report of propagation between North America and Africa, on the 31st, and none for the North America<->Asia path. The path to Oceania had also almost disappeared. Oceania<->Europe was no better. However, although openings between Asia and Europe were scattered irregularly through the month, some propagation was reported at one period or another on 17 days. All other paths were reported very occasionally or not at all.

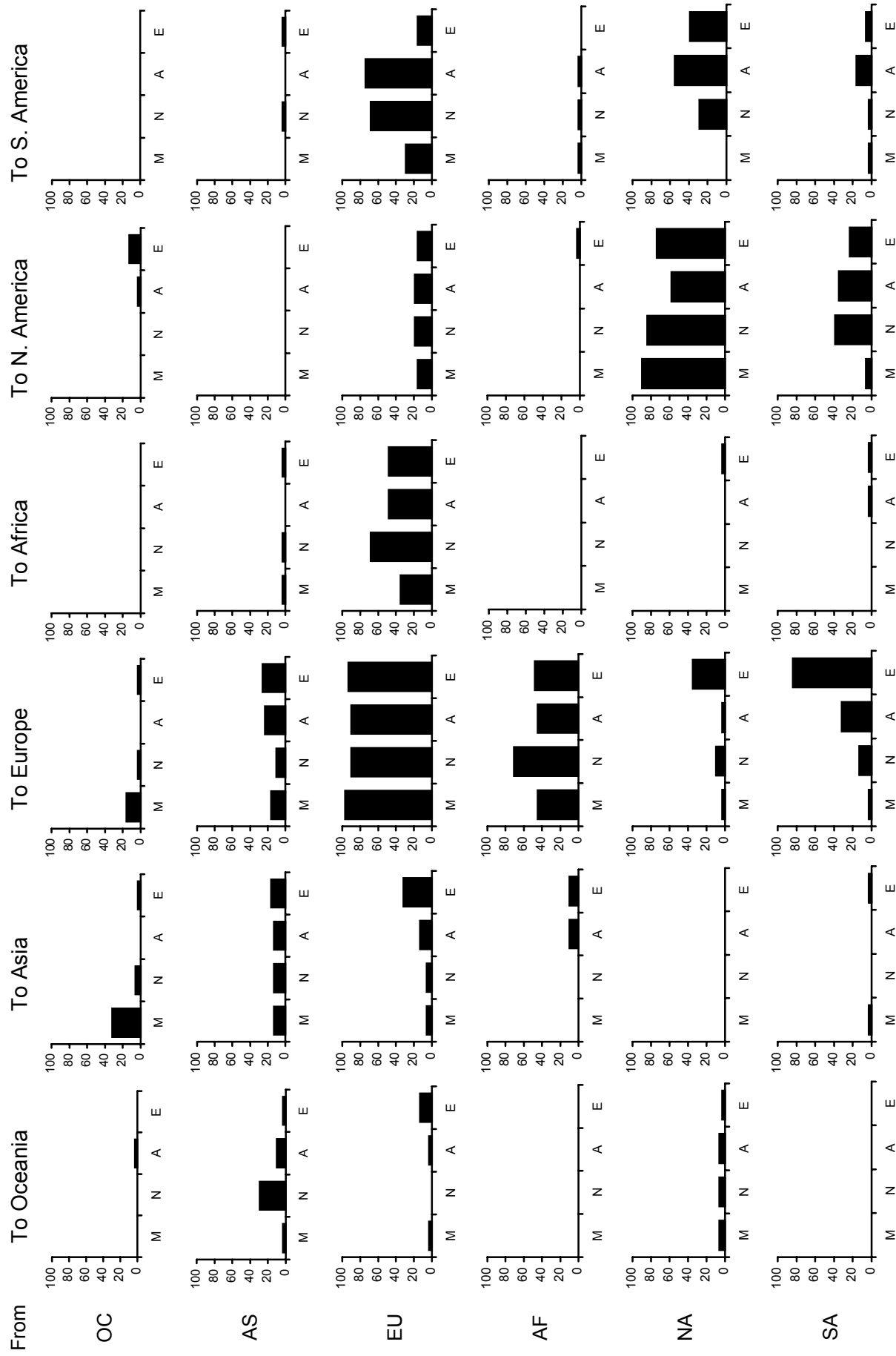
Still, almost every month produces surprises or rewards for the enterprising. I have a report of DJ7KG hearing VK6ABP at 43a at 0910 (regrettably I have mislaid the date.) In a late opening on the 5th EA7UU reported VK2GTW at 2157, while in another late opening IK4GRO worked WB6CMX/4 at 2235 on the 6th, as did G3SED at 2255 on the 8th. There were in fact 13 days when contacts between Europe and North America were reported.

The earliest opening was on the 9th, when 5B/RW4WR reported K4DY at 1137; at 1248 K4CEB reported 'many European stations'. (There was a 6-metre opening to the western Mediterranean around this time.) There was another good opening during the afternoon and evening of the IARU contest on the 10th, though this time 50MHz was not open.) This appears to have lasted until DA0HQ<>W3RJ at 2250. There was a further opening during the second day of the contest, around noon on the 11th. And EA7WA worked N3RS at 0004 on the 16th.

Among other non-routine reports were I1APQ<>VU7KQ at 0639 on the 10th, an opening between the US and VK after 0200 on the 23rd, possibly due to pre-auroral enhancement. Between 1442 and 16000 on the 27th there was a strong and sustained auroral opening in Europe, including auroral working between Gs and PA<>F, OK<>DL, DL<>SP and DL<>9A - one of the most southerly points from which tone-A working has been reported on 28MHz for some considerable time. Earlier, SM3JLA had reported OH9TEN by auroral-E at 2242 on the 16th.

(28 worldwide graphs on the following page)

28 MHz Worldwide - July 2004



Time bands: M=Morning, N=Noon, A=Afternoon, E=Evening - used for the "To" continent