THE SIX AND TEN REPORT

November 2003

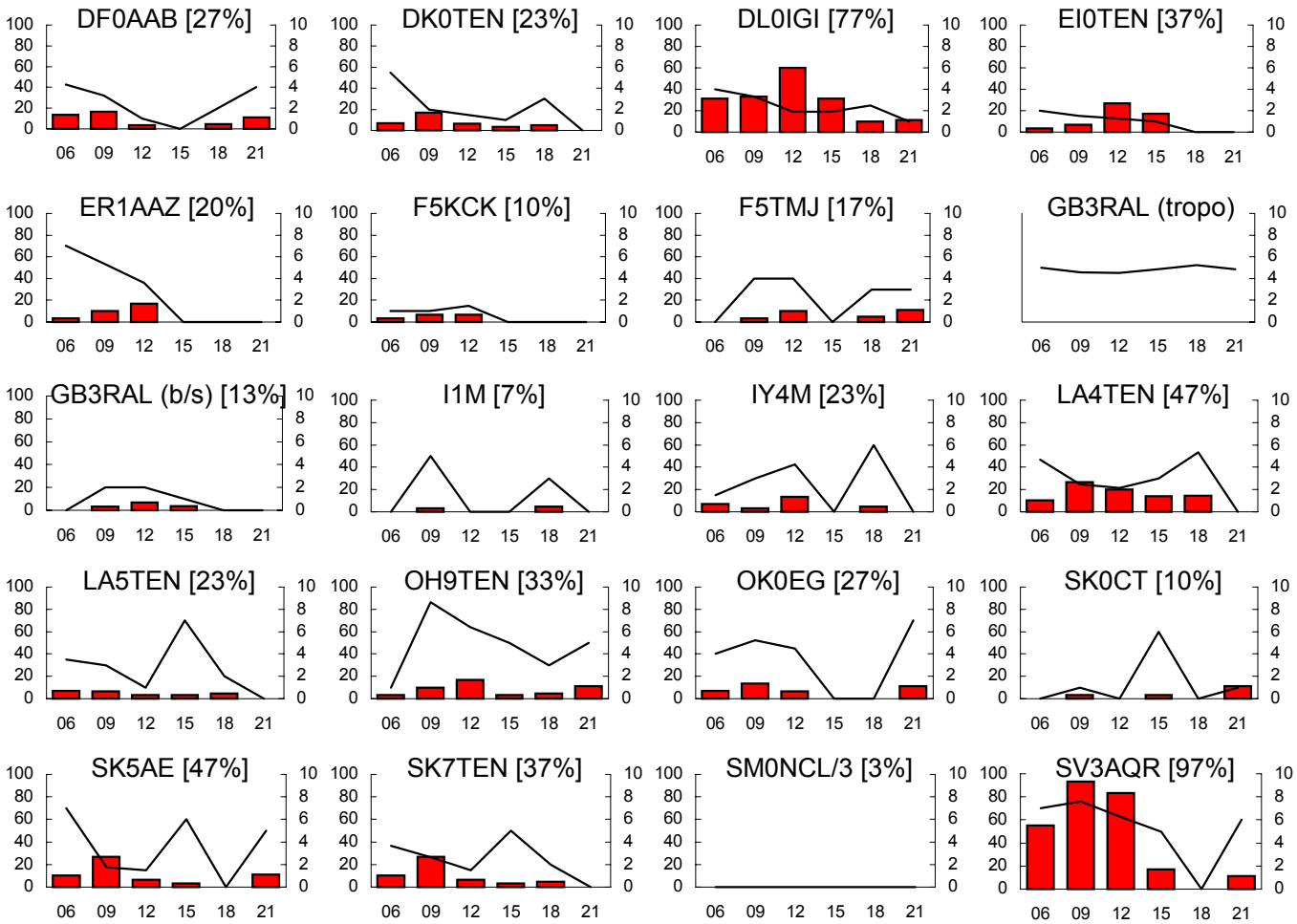
Editors. Martin Harrison G3USF and Steve Reed G0AEV

Analysis of 28 MHz reports from the UK

28 MHz reports and logs for November 2003 from G2AHU, G3IMW, G4UPS, G0AEV, G0IHF, GM4WJA and packet cluster reports. Compilation and commentary by G0AEV.

November saw a small overall improvement in DX conditions compared with October. Although fewer individual countries were heard/worked (80 in November against 114 in October), propagation was more reliable (an average 19.8 beacons/day in November versus 12.3 in October). And despite many geomagnetic disturbances (some severe) DX was reported on every day. The best period for DX was during the final week of the month when solar rotation brought the active part of the Sun into view. 1st November saw the monthly highs for solar flux and sunspot counts but DX activity levels were higher 27 days (a solar rotation) later. Two other days are worthy of mention. On the 20th a major aurora brought good aurora to 10m (as well as to 6m and higher bands) with associated auroral E and multi-mode transatlantic propagation. Sporadic E occurred on a number of days, but the event of the 25th was clearly the most significant. .

European Propagation / Beacons



Propagation modes for European beacons.

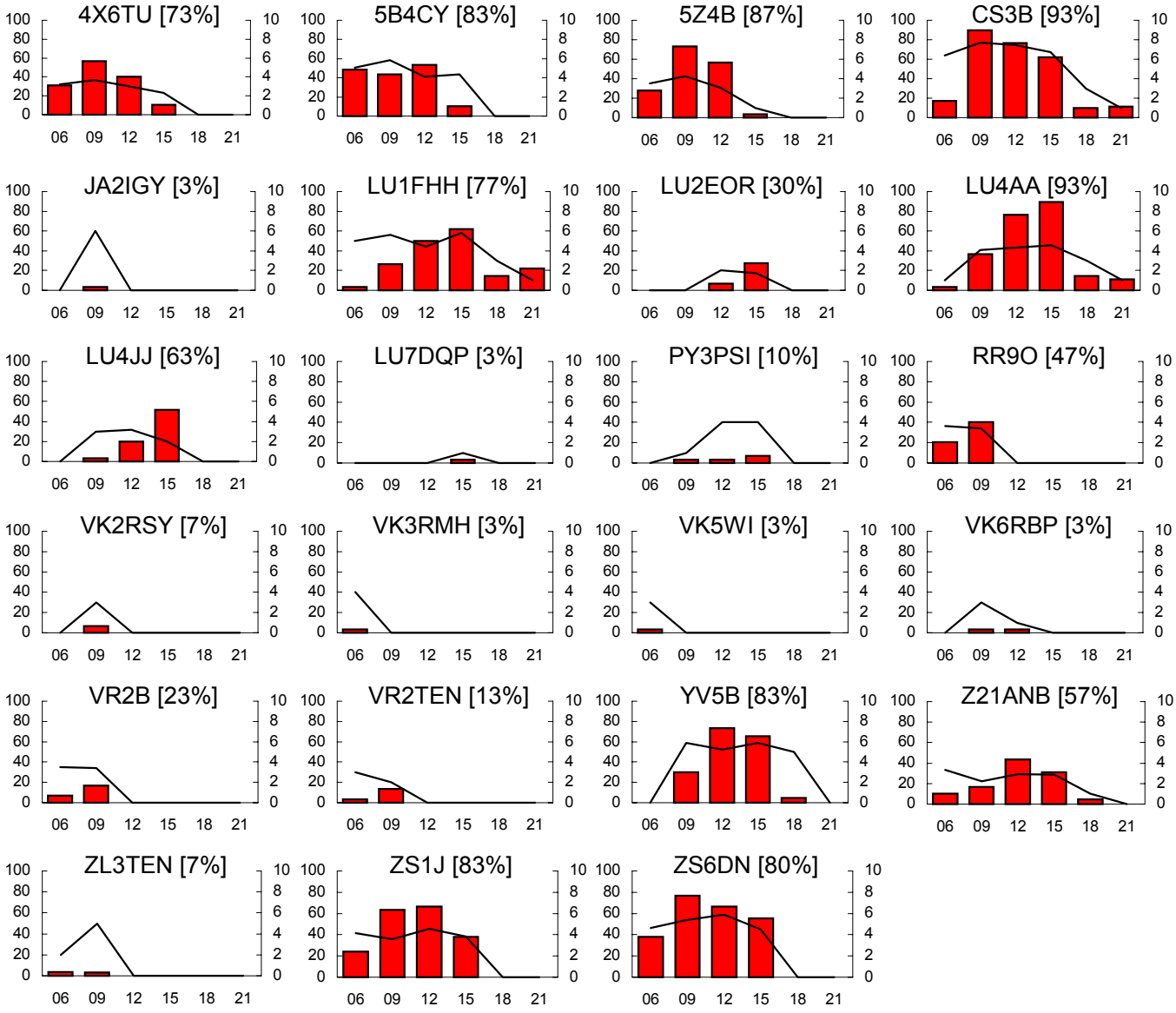
European beacons (graphs above – graph legend at the end of this 28 MHz section) show results due to an interesting mixture of propagation modes. The 3 beacons most distant from the UK – ER1AAZ, OH9TEN and SV3AQR – were heard by normal single hop F2 (though OH9TEN was also heard by backscatter and by auroral E). F-layer backscatter was responsible for all the results from EI0TEN and F5KCK and also contributed to the results from most of the other beacons. GB4RAL was heard both by backscatter and directly via the troposphere (at G0AEV).

Sporadic E was heard on a number of days, the best of these being 16th, 23rd and 25th. The following beacons were heard entirely or predominantly by Es: DK0TEN, F5TMJ, I1M, IY4M and OK0EG, while DF0AAB and DL0IGI were reported via a 50:50 mix of Es and F-backscatter. The Scandinavian beacons were heard by auroral E in the evenings of several days (especially 20th-22nd November), and in a few instances by auroral backscatter too. Sporadic E and F-backscatter contributed to the results from all of the Scandinavian beacon with the exception of SM0NCL/3, which was reported only once and that was by auroral E after midnight (and therefore appears blank in the graphs above).

European Beacon Notes.

European beacons appear to be operating normally with no major outages, although the only European NCDXF/IARU beacon OH2B is still QRT. SM0NCL reports that during late November SK0CT/B had reduced output power (to approximately 1W). New beacon LA6TEN (28.282) reported only once by 6&10 listeners last month has not been heard subsequently.

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



Suggested propagation modes. Normal F-layer propagation was responsible for all the results shown above. It was suggested that some propagation (e.g. to ZL) was via long path, but I am unsure this was in fact the case!

One or more of the above beacons were heard on each day in November. As expected, southward paths and single hop paths showed the highest reliabilities – 80% or more from 5B, 5Z, CT3, LU, and ZS. For the first time in many months we had reports of beacons in Oceania, the Far East and Japan, including the now rarely heard 100w VK6RBP. 10m propagation to these parts of the world is likely to be uncommon at this stage of the solar cycle but I am surprised at the rarity of G-VK6 propagation.

On a related topic, John GM4WJA wonders how it is we in the UK can work (in the solar maximum years) VK, ZL and mid pacific stations in our winter yet equivalent propagation is very poor during our summer when it is winter in the Southern Hemisphere?

The answer lies in relative latitudes. (In the following discussion I refer to the seasons as they are in the Northern Hemisphere). VK, to take an example, lies closer to the equator than the UK therefore more of the (short path) G-VK circuit lies in the Northern Hemisphere and the critical parts of the circuits are where they pass closest to the North Pole. Propagation is best in the critical areas during our winter and this provides the predominant control on the whole path. Actually best overall path conditions will be on the winter sides of the equinoxes because the total circuit-conditions must reflect conditions along all parts of the path including those south of the equator. However, only during our mid-winter are Southern Hemisphere conditions sufficiently poor enough to be the controlling influence on the total path reliability. In our summer the Northern Hemisphere ionosphere can not support paths within the Northern Hemisphere – there is no propagation to N America, for example – and this precludes short path to VK.

Long path to VK is somewhat different. Here it is proximity to the South Pole that is the critical part of the path and best long path conditions are on the summer-side of the equinoxes. Long path doesn't always behave in easily predictable patterns because of the additional hops required and because of awkward-to-predict phenomena such as chordal hops, but the principals apply.

Beacon Notes. 4S7B has recently (December) been report as active but it has not been heard in the UK. ZS6DN was off air in the first week of November – it was reported again on 7th and all subsequent days in November. OA4B is still QRT. The status of several other NCDXF/IARU beacons absent from our graphs can't be determined from UK 10m monitoring results: for the latest information check http://www.ncdxf.org/beacon/beaconSchedule.htm. The Argentine beacons behaved as "normal" – this month's intermittent beacon was LU7DQP – heard once only in November but has also been heard in December. On the other hand, LU2EOR, heard sporadically throughout November, now appears to have stopped transmitting.

10m DX in November 2003

The following list of DX countries worked or heard in the UK data in November 2003 comes from packet cluster spots (DX Summit: http://oh2aq.kolumbus.com/dxs/) and from the logs of GM4WJA and other reporters.

DX in November: 3B8, 3B9, 3V, 3W, 4L, 4X, 5B, 5N, 5R, 5U, 5V, 6W, 6Y, 7Q, 7X, 8P, 9J, 9K, 9M2, 9Y, A4, A6, BV, BY, CE, CO, CP, CT3, CX, D4, EA8, EA9, ET, FJ, FM, FY, HC8, HI, HR, HS, HZ, J8, JT, JY, KP2, KP4, LU, OA, OD, PJ2, PJ7, PY, PZ, S9, SU, TA, TI, TU, TY, UA9/0, UK, UN, V5, VE, VK, VP5, VP9, VU, W, YA, YB, YI, YN, YV, Z2, ZC4, ZD8, ZF, ZP, ZS.

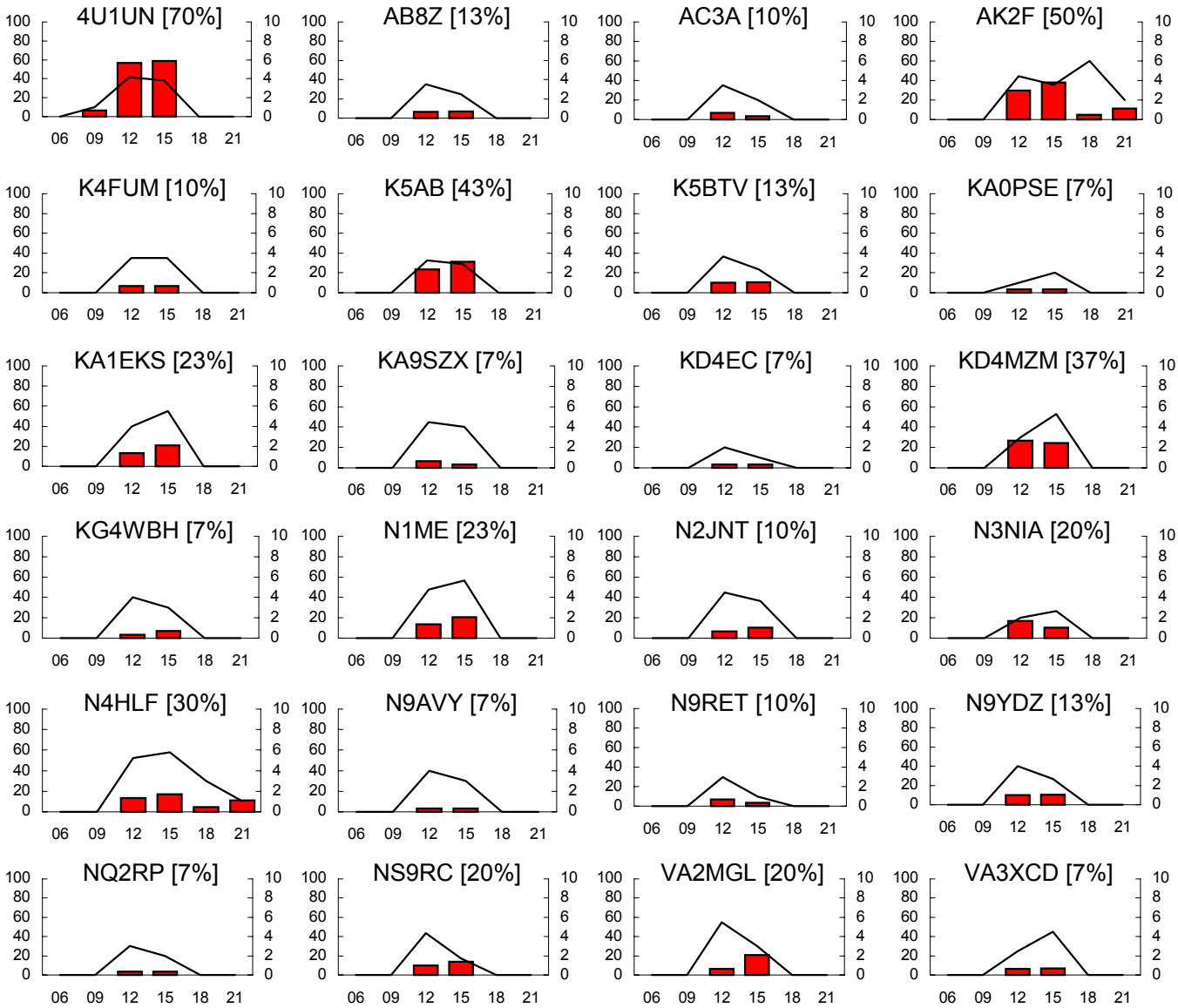
As mentioned in the opening remarks to this section of the Report, this month's DX list contains 80 entries, a rather big drop from the 114 in October – why? Both this and last month's lists benefited from contest activity but it can be argued that the SSB leg of the CQWW contest in October had more 10m participation than the CW leg in November and that this may have influenced the results. It is also noticeable that some countries were not spotted in November although propagation to these countries was indicated from beacon monitoring (to JA and ZL for example). Finally, proximity to the autumnal equinox should have provided a natural advantage for October over November in producing opportunities for longer haul DX. Any or all of these could be explanations for the apparent drop in DX.

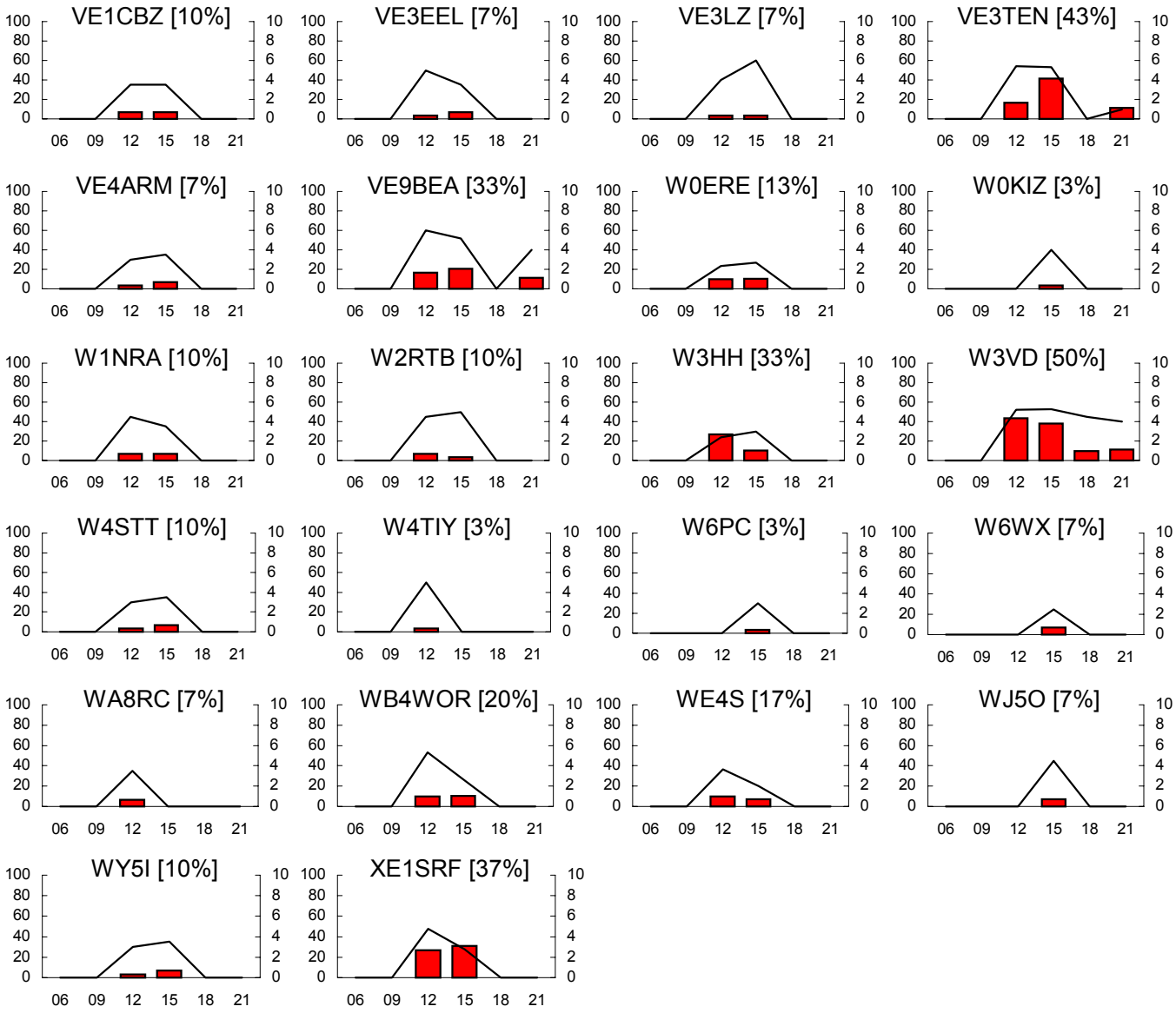
Propagation to North America

46 North American beacons were reported in November compared to 37 in October and 34 in September, a trend consistent with the expected winter seasonal advantages for Trans-Atlantic circuits. The improved propagation didn't extend to the West Coast – W6WX was heard on only 2 days and W6PC on one. However, East Coast propagation was moderately good with 4U1UN reported on over two-thirds of November days and some of the "stronger" (not necessarily the highest power) beacons - AK2F, K5AB, VE3TEN and W3VD – on around 50% of days. These were the exceptions though – most beacons were only heard on a couple of occasions, in part a reflection of listening and reporting habits and the absence of a couple of regular contributors of November.

Propagation was by normal F2 in most cases, but in the late evening of 20th UK stations worked North Americans via a mode probably involving auroral E. The auroral E suggestion is based on the late time of day (20.30- 22.15z) when, under current solar activity levels, F2 propagation would not be expected and the presence of contemporaneous auroral E in an easterly direction to large areas of N Europe and Russia. Unlike similar openings in October (and the auroral E on 6m on 11th November) I am not aware of aurora tones being heard on North American signals. More on this by G3USF in Section 5.

North American Beacons





Beacon Notes. Interest in the USA and Canada in putting new beacons on the air appears undiminished despite falling band conditions. Perhaps this is because single-hop F2 propagation is still favourable and many North American beacons continue to be reported regularly by listeners in the same continent. I wonder if this enthusiasm for beacon operating will survive solar minimum? New beacons heard in the UK in November include (with nominal frequencies) K5BTV in Texas on 28.272 and VE3EEL on 28.223. W0KIZ (28.237 from Colorado) has been active for a few months but was reported here for the first time in November. WB4WOR (28.290), frequently a good signal into Britain, returned to service after many months off air. New beacons to look out for include two very welcome additions from the Caribbean: NP2SH (28.275) and KP4SQ (28.250).

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.

Analysis of 50 MHz reports from the UK

UK 50 MHz reports for November 2003 from G2ADR, G2AHU, G3HBR, G3IMW, G4UPS, GM4WJA and via packet cluster spots. Compilation and commentary by G0AEV.

In November the best bet for working outside of Britain on 6m (excluding "tropo" to the near continent) was via aurora. Counts of country/areas give an average of 1.3 country/areas worked per day via aurora, 1.1 for sporadic E, 0.8 for auroral E and a paltry 0.2 for DX propagation (i.e. propagation involving the F-layer over at least part of the path). Weak aurora related to coronal hole activity were common in the mid part of month but the high country/area count for auroral propagation is almost entirely due to one event: the aurora of 20th November. In this event 19 different country areas were worked by UK stations via auroral backscatter (more DXCC countries than this because for propagation purposes small "countries" like 4U1ITU are counted as part of their larger neighbour country/areas).

On the 25th there was a less obviously spectacular but nevertheless interesting opening, this time by sporadic E. This provided 14 country/areas for UK operators – a good haul for an event on the periphery of the winter Es season. This opening was also strong on 10m.

DX propagation was disappointing – especially so for G2ADR who is still looking for his first ZL on six! Realistically, at this stage of the solar cycle, the presence of 4 African countries in the logs of a few lucky (or perhaps well-equipped and persistent) UK operators must be considered pretty good going. G3HBR described November as a fairly dull month with some bright periods – rather like the WX! Brian's first bright spot was the sudden appearance of TU2OJ on the 4th. The 10th brought in OY6SMC by auroral E and then LA1YCA on aurora (at 2443Km distance) – more about this later. The 20th brought the big Aurora with signals audible over a wide range of beam headings. At G3HBR's QTH, southern Gs were best beaming due North and SPs at almost 90 degrees. In the middle of this event TS7N (in Tunisia) was a big signal at T9 on 10m. Brian continues "tThe morning of 25th was enlivened by a short Es opening that started with a few strong SP and SM stations then quickly moved south."

Sporadic E

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.

	3V (10%)	9H (7%)	CN (7%)	CT (3%)	DL (3%)	EA (10%)	EA9 (3%)	F (3%)	G-GM (3%)
D	19 23 26	19 23	1 23	25	25	23 25 29	19	25	25
06					9				9
09		5			9			0	7
12	9		9	7		9	0	9	
15									
18	9	9		0		9			
21	9		9			0			

	HB (3%)	I/IS/IT Italy (12%)	OE (3%)	OK (3%)	OY (3%)	OZ (3%)	PA (3%)	SM (3%)	SP (3%)
D	25	5 19 23 24 25	25	25	2	25	25	25	25
06				9	8	9		9	9
09	7	4 5 9	9	9		9	9	9	9
12		9 9							
15		9 0							
18		9 0							
21									

	YO (3%)	YU/9A/S5/T9/Z3 ex-Yugoslavia (10%)	
D	18	19 23 25	
06		7	
09	7	7 9	
12		9	
15			
18		9	
21			

There were more Es openings in October than in November, but both months were better than the seasonal "norms". As discussed last month, the distribution of events and how these relate to discrete winter or autumnal "seasons" will not be clear until we have the results from a few more months

The Es event of the 25th has been mentioned already. This showed a "classic" pattern with the opening starting with countries to the east and northeast with and closing with countries to the south and southwest, presumably reflecting a general westward drift of the Es "cloud". E-layer critical frequencies were high enough at times to support moderately short skip (G to GM, PA to GM) and E-backscatter.

DX (F2 and TEP) Propagation

	5V (3%)	TR (7%)	TU (3%)	ZD8 (3%)	
D	20	5 21	4	25	
06					
09					
12	9	0 3	3	3	
15					
18					
21					

6m DX openings (to the UK) are rare under current solar activity levels and presumably only take place because of some exceptional circumstance. In November 5 events were reported, and "special circumstances" can be elucidated for 3 of them

On 4th G3HBR when heard TU2OJ, the Chilton ionosonde recorded the highest F2 critical frequency of the month at 12.7 MHz. This was the result of an active sun that produced several X-class flares in the preceding days and elevated background x-ray flux – which is a better guide to HF conditions than 2800 MHz flux. This opening can therefore be ascribed to F2 MUF just breaching 50 MHz on this path at this time as a result of high solar activity. Reasons for the opening to TR on the 5th are less easy to suggest as critical frequencies were 3 MHz lower than on 4th. On the 20th strong signals from 5V were reported just before UK K-indices indicated the onset of severe magnetic storming and before the start the major aurora. G to 5V can perhaps be ascribed to a pre-auroral enhancement of the F-layer. The Chilton ionosonde recorded 12.1 MHz, the second highest of the month at this time. There appears no special reason for the TR opening on 21st. ZD8 on 25th was almost certainly mixed mode with sporadic E providing the necessary link – the band was open to CN, CT and EA at the right time.

Backscatter.

Some interesting backscatter reports this month – (*G0AEV comments in Italics)*

10th 2244 G4FVP (IO94) > PA0O "good signal by scatter" (*E-layer b/s during auroral E event*)
11th 2314 G3WZT > F3SIX "b/s" (*presumably also auroral E backscatter?)*
25th 0830 G3IBI (IO90) > F6GEX (IN97) "backscatter" (*E-layer backscatter during Es event)*
25th 1309 G4FUF spotted "loud backscatter" to PA/DL QTF 220 (*E-layer backscatter, Es event)*
30th 1205 G3FPQ > IV3GBO "weak b/s from east" (*I suggest this is weak direct propagation*)

Comparison of Sporadic E and DX Propagation.

The tables below display total counts of country areas heard/worked as summarised from the results tables on the first two pages of this section of the Report.

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
06		1																							7					
09																		1	2				2		12					
12	1																		4						4					
15					1																		1							
18																							5	1						
21																							1			1			1	

DX 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
06																														
09																														
12				1	1															1	1				1					
15																														
18																														
21																														

In the previous discussion of the timing of the few November 2003 DX events,only the ZD8-G opening on the 25th appeared to correlate with a sporadic E opening, as can be verified in the summary tables above. Sporadic E was concentrated in the last half of the month but it isn't clear if this represents the "start" of the mid-winter season or part of a broader autumn-winter "season" (with absence of Es in the middle part of the month perhaps due to the presence of persistent geomagnetic disturbances).

Meteor Scatter

Meteor scatter – at least via traditional modes – was poorly reported. As discussed in previous 6&10 Reports, the advent of digital modes such as JT6M (which is designed specifically for optimum performance via meteor scatter at 6m) has made making weak signal contacts considerably easier. It is also far harder to know what propagation mode is actually responsible. It is very clear that JT6M contacts are not confined to meteor scatter. I have, therefore, restricted comments to the traditional meteor scatter modes

16th 0037 G7RAU > S55M " weak iono + ms"
17th 0715 SM5LE > GB3LER "549 and pings"
0900 G3IMW > GB3RMK "3sec m/s burst"
21st 0815 G4UPS > GB3RMK "several bursts from GB3RMK with T9 signals"
23rd 1304 G3IBI > 5V7BR "ms bursts 57" (*clearly mixed mode propagation. G0AEV*)

Tropospheric propagation

7th 2135 MM5AHO > GB3LER "very strong T9"
13th 0800 G4UPS >GB3BUX 569 "fluffy sigs"
14th 0800 G4UPS >GB3BUX 569
15th 0800 G4UPS >GB3BUX 569
21st 0815 G4UPS > GB3BUX 449
23rd 1905 G7RAU > GW6TYO 559 tropo

Aurora

GM4WJA writes "there was plenty of auroral activity this month with the big one on the 20th being the highlight. This was similar to auroras last month which seemed to suit the southern UK as we (*in GM*) seemed to be directly beneath the center of it". John heard stations from G, DL, southern SM and YL working into North America on 10m but nothing was heard at his QTH. G0AEV (IO81) worked Ws as far west as Texas and up to 22.15z all with T9 signals interleaved with auroral E to Europe and (mostly) UK stations via aurora.

GM4WJA notes that "this type of propagation was similar to the openings we had here in North Europe during auroral activity after the solar maximum". John had a huge visual display filling all of the sky for most of the evening on the 20th, and another big visual to the north in a lesser event on the 22nd.

2nd	18/21z		GM4WJA (IO87) reports aurora in early to late evening
6th	18/21z		GM4WJA reports aurora in mid to late evening
9th	12z	1412	GM7PBB (IO68) > GB3LER 53a, GB3RMK 52a
10th	18z	1837-1840	G4FVP (IO94) > GB3LER 52a, PA0O > GB3LER 52a
	21z	2109-2340	Auroral E into UK – see details under *Auroral E* below
		2239	G4FVP > GM7PBB 55a
		2315-2335	G > LA1YCA (KQ10) (53a at G4IFX, 51a at G4FVP, 51a at G3HBR)
11th	15z	1501	G3HBR > GB3RMK 55a
	18z		GM4WJA has aurora in mid evening.
12th	18z	1901-1904	G4PCI (IO91) > GB3RMK 52a, MW1MFY (IO81) > GB3RMK 55a
13th	12z	1405	GM7PBB > GB3LER 52a "also GB3RMK"
	18z	1809	G1INK (IO93) spots GM stations "rag-chewing" with 55a signals
		1915	EI7IX > GB3LER 51a
14th	18z	2003-2012	GM7PBB > GB3RMK 51a, GB3LER 53a
15th	12z	1410	GM7PBB > GB3LER 51a "also GB3RMK weak"
	15z	1642-1652	G3IMW (IO80) > GB3RMK 51a, GM7PBB > OZ6ABA (JO57) 55a
		1754	GM7PBB > GB3LER 52a, GB3RMK 53a
16th	18z	1803-1810	GM7PBB > JW9SIX 51a, MW1MFY > GB3RMK 55a.
20th	12z	1242-1255	GM7PBB > GB3LER 55a, GB3RMK 56A, GB3BUX 57a
		1343-1400	G's > GB3BUX via aurora, G4DBL > GM3UA 55a, PA0LOU > GM3UA 52a
		1400-1500	G <> G and G > GM QSOs. Also G > EI, ON, OZ; GM > EI, ON, PA; G3IMW (IO80) > SP1EUS (JO74) 41a, G3IMW > 4 OZ stations
	15z	1500-1600	very many inter-UK QSOs and reports. G > DL, EI, G, GM, ON, OZ, PA, SM; GM > EI, G; G2ADR > LA in 15z period; G4UPS > OK1ACF, OK1FM, SP1EUS; G3IMW > OK1ACF; G3HBR > OH3XA (KP21) 55a. At 1517 G4UPS reports GB3MCB very strong (57a) at QTF 005 degrees. At 1557 G3IMW > EI2JD 59+20a "strongest Au signal ever heard on 50" At 1557 G4DBL (IO91) > S51UF (JN86) 54A
		1600-1700	Many QSOs, though there were few reported inter-UK contacts. G > DL, F (northern France), PA, SM; GM > F
		1700-1800	Very many QSOs. G > EI, G, DL, F, PA; G3HBR > SP6NIC (JO81) 55a; G4UPS > OK1AVY (JN79) 57a, 4U1ITU (JN36) 55a, SP2CNW (JO93) 56a Auroral E for stations in SW England in this period (see below) At 1708 G3IMW > EH2KP (IN83) 54a; 1727 G4UPS > EH2KP 53a At 1743 IK5YJY > GM7PBB – only report of/from GM in this hour. Aurora? At 1731 IZ5EME (JN52) > G0JHC 59a
	18z	1800-1900	G > DL, F, G, GM, ON, PA; GM > G, PA; GI > F, LX; G0PQO > HB9BOS G3HBR > 4U1ITU 55A, G4UPS > OK1DPU (JO60) 53a; G4FVP > I4EAT
		1900-2000	Many QSOs (none with GM reported), with good DX. G > DL, ES, G, GI, LX, ON, plus at 1903 G4FVP > S54M, 1906 G0JHC > IW5DHN 59a QTF 080, 1908 IW0GPN (JN62) > G1YLE (JO02) 53a, 1915 G4UPS hears 9A1CAL 56a, IZ1EPM 55A, S55ZRS 55A, 1917 G4FVP > F1JG (JN23), 1921 G4UPS (JN54) I4EAT 57a, 1931 9A2F > G0JHC 59a, 1937 G0JHC > IK4GRO 59a, 1937-1957 G4UPS > OK1AUN (JO60) 57a, SP6NIC (JO81) 59a, SP8AWL (KO11) 59a, F8OP (JN26) 53a, SP6GWB (JO80) 53a.

		2000-2010	G4UPS > DL2OE (JO72) 55a, PA2M > GI3VAW 59a, then no reports until
		2045-2100	G4PCI > GB3RMK 55a, EI2JD 59a, PA7FM; GM0WDD > ON6AA; PE1MZS > G4ZJP 59a
	21z	2100-2106	G4UPS > DF9OX 55a, EI2JD 55a, G1ZJP 59a; G4PCI > GM1DKS 55a
		2129-2148	2129 F6HRP > GI6ATZ 57a, 2148 G4UPS > EI8HZ 55a
		2228-2300	G > GM, G's > SM7FJE, GI4FUE, EI7IX > GJ3YHU 55a, At 2300 (last report) G3IMW > SM7FJE 52a from N to NE, no sharp peak
22nd	15z	1643-1651	DL3AT (JO50) > GB3LER 51a QTF 010, GM0SM < DL1EJA, G1XUU 51a
		1711-1719	G4PCI > GB3RMK (weak), GM7PBB 55a, EI7IX > GB3LER 51a
		1756	MW1MFY > GI6ATZ 59a
	18z	1810-1846	Many Inter British Isles QSOs) G > G, G > GM, GM> GM, EI > GI, GM,
	21z	2106	OZ1ING heard 2M0AVY 55a
30th	18z	1808	EI7IX > GB3LER 41a. GM4WJA has aurora "all evening"

Auroral E

10th	21z	2109	G4FVP hears OH9SIX via auroral E 559-599
		2143-2146	G1XUU > LA7SIX 519, GM7PBB > OH7HD 599, MM3TFN > OH9SIX
		2217-2242	G4FVP > LA7SIX, LA4SI; G0JHC > LA1MFA 599
		2307-2308	G4FVP > OH6YF, G3HBR > OY6SMC 559
		2332-2340	GM7PBB heard by LA7FJA (JP50), OZ1DJJ and OZ1DPR
11th	18z	2000	Weak aurora in mid afternoon. First auroral E: GM7PBB > OH9SIX 59.O68
		2005-2100	G > LA and OH9SIX, GM > LA, OH, SM
	21z	2100-2136	G > LA, OH, SM; GM > SM
		2200-2300	G > LA, OY6SMC (including fairly short skip: G4FVP > OY6SMC), TF3SIX, G3HBR > JW9SIX (559); GM > OZ
		2300-2349	G > LA, OY6SMC, TF3SIX, M0BCG > TF8VET At 2304 G0JHC (IO83) > VE8BY 519-539 (no tone A) At 2349 M0BCG > VE8BY 519 "+aurora"
20th	15z	1703	First auroral E: G4UPS > ES4EQ 57, G3IMW > SM7FJE 59 "slight Au tone"
		1710-1750	G4UPS > LY, SM; G3IMW > SM7CJE "slight Au tone". G4UPS > F5JLQ (JO00) 599 described as "Auroral Es" but skip very short – tropo?
	18z	1803	G3IMW > DG1VL 55 "slight Au"
		2059	G0CHE > SQ9SX 59 "Auroral E" QTF 060
21st	00z	0123	PA0FRE (JO21) reports GB3LER 599.
		0124	GM0EFT IO86) > VE8BY
22nd	18z	1932	MM0AMW (IO75)> OH9SIX
		2010	GM7PBB (IO68) > OH9SIX
30th	18z	1803	MM5DWW (IO89) > JW9SIX
	21z	2131	SM2CEW (KP15) hears GB3RMK 599
		2248	MM0CWJ (IO67) > OH9SIX 599

<u>Aurora contact between southern England and northernmost Norway</u>

At around 23.15z Chris G4IFX in IO91 worked LA1YCA in KQ10 on 50MHz CW. The signal was strongly auroral sounding and the beam heading at G4IFX was more or less direct (LA1YCA was using a dipole fixed N-S so he couldn't test the beam heading. A few other Gs made contacts subsequently. No other aurora contacts were noted by G stations at this tiem, though G > GM *via* aurora was noted in the previous hour and some TV signals were also heard with auroral tone

At the time of the QSO, G4IFX also reported hearing 48.260MHz TV in JP66 was S9+ with T9 signals, presumably auroral-E. Auroral E on 50 MHz was also reported between G and OH and G and OY on 50 MHz at about the same time.

The distance between G4IFX and LA1YCA is 2497km which, as G4IFX put it, "must rule out auroral backscatter at E-layer heights". Chris then asked what is the propagation mode, and is there such a thing as auroral forward scatter, and if so what is the geometry?"

'Expert' opinion from members of the RSGB Propagation Studies Committee was split on the issue of aurora forward scatter. It was felt that some sort of forward scatter involving aurora was possible but that this was not the same mechanism as aurora backscatter. G3NAQ used evidence from best DX data for claimed aurora contacts on 2m (and quoted in Fig. 2.26 of the *VHF/UHFDX Book)*, which shows a very rapid drop off of contact distance beyond 1800 km, and only one claim in the range 2100 - 2200 km. Geoff notes that "this is very different from the plot of the distance of Es contacts, and proves the that there is no direct forward scatter. This cannot take place because the field lines are never horizontal in the auroral zones. The longest distance contacts are presumably from glancing angles from an inclined auroral layer". For a detailed discussion of auroral contact range, see "*Radio Auroras*" by Charlie Newton G2FKZ, which includes G3NAQ's work on this subject.

G0AEV thought there was another possibility, a solution applied in other cases of 'over-distance' aurora contacts, and that's the 6m favourite: mixed mode. In this case there was contemporaneous auroral E between IO91 and JP66 on almost exactly the same bearing as IO91-KQ10. If auroral E linked southern England to JP66, there could have been an auroral backscatter circuit between JP66 and KQ10, The backscatter component would contribute the auroral tone distortion and Doppler shift while the efficient E-layer ionisation would do the "DX work"! KQ10 is very far north (70+ degrees N) and might be expected to be the "wrong side" of the scatter area - hence the attractiveness of the forward scatter idea. However, G4IFX's contact was quite late (23z) and several (3 to 4?) hours after LA1YCA's local magnetic midnight. LA1YCA might have been experiencing the end phase of radio aurora at his QTH at a time when the auroral oval might have been at latitude to allow the backscatter geometry

Aurora / Auroral E Comparison

	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
00																														
03																														
06																														
09																														
12									1				1		1					7										
15											1				3					17		4								
18										2		1	2	1		2				14		3								1
21										2										6		1								

	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
00																					2									
03																														
06																														
09																														
12																														
15																				3										
18											3									1		1								1
21										4	8																			2

The correlation between aurora and auroral E events are obvious, but it is interesting that the best auroral E (11th) had only a weak associated backscatter event.

Solar and Geomagnetic Data for November 2003

Data supplied by G0CAS (Sun Mag[1]) and from Internet sources. Compilation by G0AEV.

Sunspot numbers (SEC)	Mean 103.0	Max 277 (1st)	Min 11 (7th)
Solar Flux (28 MHz)	Mean 140.8	Max 210 (1st)	Min 91 (7th)

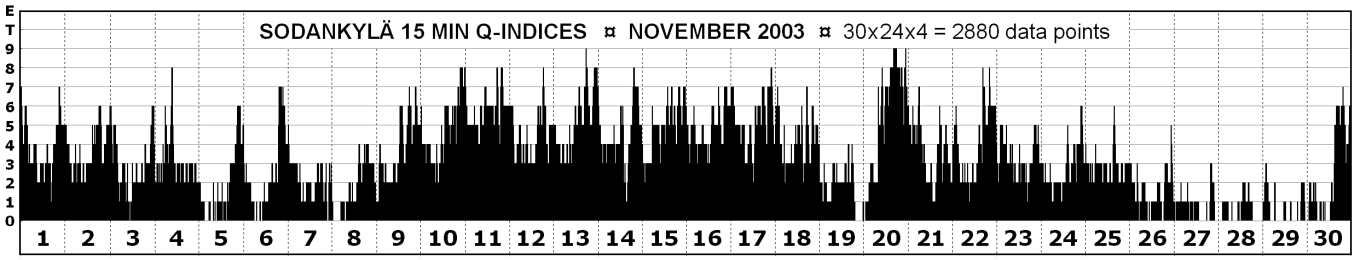
Solar data for November 2003 are presented in the table at the end of this section. Numbers in the 28 and 50 MHz columns of this table are the total daily "areas" worked/heard from the UK, a summary of the data presented in the first sections of this Report. On 28 MHz "areas" refer to the number of beacons reported via Es and F-layer, on 50 MHz the number of countries via Es, F-layer and Aurora. F2 critical frequencies are from Chilton in Oxfordshire, SIDC spots from SIDC, and other solar data from the joint USAF/NOAA daily summaries or directly from SEC.

Energetic Events (Flares of M and X class).

More intense energetic solar flares again this month – 4 of X-class – including another record-breaking event (> X17.4 - the sensor reached its maximum) on the 4th.

1st	0839-0906	M1.3
	1742-1808	M1.1 SF
	2226-2249	M3.2 1N
2nd	1230-1312	M1.8
	1703-1739	X8.3 2B
	2226-2249	M3.2 1N
3rd	0109-0145	X2.7 2B
	0943-1019	X3.9 2F
	1526-1543	M3.9 SF
4th	0543-0607	M2.6
	1011-1033	M3.0
	1343-1401	M1.1
	1929-2006	X17.4 3B
5th	0237-0245	M1.6 SF
	1046-1056	M5.3 SF
11th	1321-1417	M1.6 SF
13th	0454-0506	M1.6,
	0903-1002	M1.4
17th	0128-0139	M1.2
	0855-0919	M4.2 1N
18th	0134-0142	M1.8
	0723-0806	M3.2 2N
	0812-0859	M3.9,
	0923-1101	M4.5
19th	0355-0406	M1.7 1N
20th	0735-0753	M9.6 2B
	2342-2358	M5.8
21st	2342-2358	M5.8 2B

Q-indices from Sodankylä, Finland (tnx OH2LX)



OH2LX reports:

Sodankylä monthly Ak average = 46.0
Nurmijärvi monthly Ak average = 28.7

The most disturbed day:

Sodankylä: 20 Nov Ak = 157
Nurmijärvi: 20 Nov Ak = 194

[1] Sun Mag: Sunspot and Magnetic data compiled by Neil Clarke G0CAS. Email neil@g0cas.demon.co.uk

K-indices.

There were 14 disturbed days in November when the UK K index or Kp was 5 or greater: on 3 of these Kp reached 9. The following four tables present the planetary 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 shading indicates K = 5, darker shading indicates K > 5.

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
00	4	3	3	3	2	2	3	1	2	4	5	4	3	5	3	4	5	4	2	1	7	3	3	2	3	2	2	2	2	2
03	5	4	3	2	1	2	2	1	3	4	6	4	5	5	4	5	4	4	3	3	6	3	5	2	3	2	2	2	2	2
06	4	3	2	5	2	2	1	1	4	4	5	4	4	5	6	5	4	4	4	6	6	3	4	3	3	2	2	2	2	2
09	3	3	3	7	2	2	2	3	4	5	6	5	5	5	5	5	5	4	4	7	4	3	3	2	3	2	2	3	3	2
12	3	3	2	3	2	3	3	3	6	5	5	4	6	5	5	4	5	4	3	7	3	3	3	4	3	3	3	3	3	3
15	3	4	3	3	3	3	3	3	4	4	5	4	5	3	5	5	5	4	3	8	3	5	3	3	3	3	3	3	3	3
18	3	4	2	4	3	5	2	3	4	4	5	4	5	4	4	4	4	3	3	9	3	5	4	3	3	3	3	2	2	3
21	3	3	3	3	3	4	2	3	3	4	4	3	4	3	4	4	4	2	2	7	3	4	4	3	2	2	3	2	2	2
Σ	28	27	21	30	18	23	18	18	30	34	41	32	37	35	36	36	36	29	24	48	35	29	29	22	23	19	20	19	19	19

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
00	4	2	3	2	1	3	3	2	2	3	5	4	3	6	2	3	4	4	1	0	6	4	3	2	3	2	1	1	1	1
03	3	2	3	2	0	0	2	1	2	3	4	2	2	3	3	4	4	2	1	3	4	2	4	1	3	1	1	2	1	2
06	2	3	2	4	1	0	1	0	3	3	5	2	4	3	4	4	3	2	1	4	4	2	3	1	2	1	0	0	1	0
09	2	2	2	5	1	0	2	1	2	2	4	3	4	3	3	3	3	3	2	4	2	2	2	2	2	1	1	1	1	0
12	2	2	2	2	0	1	1	1	4	3	4	3	5	3	4	4	3	4	2	8	1	2	2	3	2	2	1	1	1	1
15	3	2	2	1	1	2	2	3	3	2	5	4	4	3	6	5	5	4	3	9	3	7	2	2	3	2	0	1	0	4
18	3	4	3	2	2	5	1	3	6	5	6	5	6	5	4	4	4	3	3	8	3	7	4	2	2	2	1	0	0	4
21	4	3	3	2	3	4	2	1	3	4	4	2	6	3	4	5	4	3	0	7	2	5	3	3	2	2	1	0	2	3
Σ	23	20	20	20	9	15	14	12	25	25	37	25	34	29	30	32	30	25	13	43	25	31	23	16	19	13	6	6	7	15

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
00	4	3	3	3	1	3	3	2	2	2	5	4	3	4	2	3	4	4	1	1	6	4	3	2	3	2	1	1	2	1
03	3	3	2	2	0	1	2	1	2	3	4	2	3	4	3	3	4	3	1	3	4	2	3	2	3	2	1	2	1	2
06	3	3	2	5	1	0	1	1	3	3	5	3	4	3	4	4	4	3	2	5	4	2	3	2	3	1	1	1	1	1
09	2	2	3	5	1	1	2	1	3	3	4	3	4	4	4	3	3	3	2	4	3	2	2	3	2	1	1	2	1	1
12	2	3	3	2	1	1	1	2	5	3	4	3	5	4	4	4	4	4	3	7	2	3	3	4	2	2	1	2	1	2
15	3	3	2	2	1	2	2	3	4	3	5	5	4	3	5	5	5	5	3	9	3	5	2	3	3	2	0	1	0	4
18	4	4	3	2	2	5	1	3	5	4	5	5	6	5	5	4	5	3	3	9	3	6	4	3	2	2	2	0	0	4
21	4	3	3	2	4	4	2	2	3	5	4	3	5	3	4	4	4	3	1	8	2	4	3	3	3	3	1	0	2	3
Σ	25	24	21	23	11	17	14	15	27	26	36	28	34	30	31	30	33	28	16	46	27	28	23	22	21	15	8	9	8	18

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
00	4	3	3	3	1	3	3	2	2	3	5	3	3	5	2	3	4	5	2	1	6	4	3	3	3	2	2	1	2	2
03	3	3	2	2	0	1	2	1	2	3	4	3	2	4	3	3	4	3	2	3	4	2	4	2	3	2	2	2	2	3
06	3	3	3	5	1	1	1	1	3	3	5	3	4	3	4	4	4	2	3	5	4	2	3	2	2	1	1	1	1	1
09	2	3	3	6	1	1	2	1	3	3	4	4	4	4	4	3	4	4	2	4	3	2	2	2	3	1	1	2	1	1
12	3	3	2	3	1	1	1	3	5	3	4	3	5	4	4	4	4	3	2	6	2	3	3	4	2	3	1	2	1	2
15	3	3	2	2	1	2	2	3	4	4	5	5	5	3	6	5	5	5	3	9	3	4	2	3	4	2	1	1	1	4
18	4	4	3	2	2	6	2	3	6	4	5	5	6	5	5	4	4	3	4	9	3	5	4	3	2	2	2	0	0	5
21	4	2	4	2	4	5	2	2	3	5	4	3	6	4	4	5	4	3	1	7	2	4	4	3	3	3	1	0	2	3
Σ	26	24	22	25	11	20	15	16	28	28	36	29	35	32	32	31	33	28	19	44	27	26	25	22	22	16	11	9	10	21

November	28 Areas		-- 50 Areas --				2800	- Spots -		Max			X-ray	Max foF2		Min foF2		-- Particle Fluences --		
2003	Es	F	Es	DX	A	AE	Flux	SEC	SIDC	Kp	Ap	Aa	b.gnd	MHz	Hour	MHz	Hour	2MEV Elec	1MEV Prot	10MEV Prot
01-Nov	0	9	1	0	0	0	210	277	106	5	21	41	C1.8	7.4	11	1.8	22	1.5E+08	1.6E+07	7.6E+05
02-Nov	3	11	1	0	0	0	190	174	112	4	18	31	C1.9	7.9	13	n.a.	n.a.	4.3E+08	3.1E+07	1.5E+07
03-Nov	2	19	0	0	0	0	167	76	72	3	10	24	C3.2	9.3	13	2.0	04	2.2E+08	3.6E+08	8.9E+07
04-Nov	0	12	0	1	0	0	168	79	52	7	31	55	C2.3	12.7	13	1.8	06	7.0E+07	4.3E+08	1.0E+07
05-Nov	0	15	1	1	0	0	114	32	12	3	9	13	C1.2	9.8	11	2.4	06	3.9E+06	9.3E+07	1.2E+07
06-Nov	0	21	0	0	0	0	98	12	9	5	14	32	B2.5	9.5	11	2.1	05	2.2E+06	4.9E+07	3.7E+06
07-Nov	1	12	0	0	0	0	91	11	12	3	8	14	B1.6	7.7	12	2.1	05	4.3E+06	1.3E+07	8.1E+05
08-Nov	0	24	0	0	0	0	93	29	21	3	10	20	B1.0	8.8	11	1.8	04	6.0E+06	8.7E+06	3.5E+05
09-Nov	0	14	0	0	1	0	93	47	39	6	25	50	A9.7	9.2	13	1.9	04	1.4E+07	1.3E+07	1.5E+05
10-Nov	0	16	0	0	3	4	95	47	39	5	30	48	B1.0	9.0	12	2.1	05	5.6E+07	2.0E+06	1.1E+05
11-Nov	0	6	0	0	1	8	96	43	30	6	51	78	B1.8	5.7	13	1.8	02	5.4E+07	2.1E+07	8.9E+04
12-Nov	3	6	0	0	1	0	99	39	11	5	26	47	B2.2	7.0	12	1.6	06	4.4E+08	1.5E+07	5.9E+04
13-Nov	2	12	0	0	3	0	102	25	21	6	42	76	B3.2	8.4	12	1.7	06	5.0E+08	2.0E+07	5.2E+04
14-Nov	0	8	0	0	1	0	99	34	23	5	37	57	B2.2	7.8	15	n.a.	n.a.	2.4E+08	8.1E+06	4.3E+04
15-Nov	0	11	0	0	3	0	98	52	33	6	40	62	B1.9	7.1	13	1.7	06	2.4E+08	1.5E+07	3.1E+04
16-Nov	4	14	0	0	2	0	104	54	42	5	35	61	B2.9	8.8	13	n.a.	n.a.	4.6E+08	1.5E+07	1.7E+04
17-Nov	0	10	0	0	0	0	121	72	34	5	34	53	B7.2	7.9	12	n.a.	n.a.	5.7E+08	7.9E+06	1.1E+04
18-Nov	1	19	1	0	0	0	144	90	52	4	20	46	C1.1	9.9	11	1.9	04	5.8E+08	1.2E+07	1.9E+04
19-Nov	2	18	5	0	0	0	155	114	70	4	14	24	B8.4	9.3	10	2.0	03	7.7E+08	8.0E+06	2.3E+04
20-Nov	1	13	0	1	19	5	175	118	90	9	117	228	B7.3	12.1	12	1.7	06	9.6E+07	1.6E+07	1.5E+05
21-Nov	0	27	0	1	0	2	177	131	97	7	37	59	B6.1	9.5	12	2.0	06	1.7E+06	2.3E+07	3.2E+05
22-Nov	0	28	0	0	5	1	176	123	91	5	22	46	B6.2	10.4	12	2.1	06	5.8E+06	2.8E+07	7.3E+05
23-Nov	6	29	6	0	0	0	178	158	109	5	21	40	B5.9	8.2	15	1.7	22	3.3E+07	2.0E+07	5.4E+05
24-Nov	2	25	1	0	0	0	177	149	107	4	12	27	B5.5	9.9	11	1.9	04	7.1E+07	1.3E+07	2.4E+05
25-Nov	10	19	14	1	0	0	171	202	131	3	13	27	B6.4	9.4	12	1.9	06	8.7E+07	4.4E+06	3.1E+04
26-Nov	0	20	1	0	0	0	171	209	119	3	9	16	B6.0	11.1	12	1.8	06	1.2E+08	1.0E+06	1.2E+04
27-Nov	0	27	0	0	0	0	175	154	132	3	10	11	B7.0	10.7	11	2.1	06	2.2E+08	7.0E+05	1.1E+04
28-Nov	0	30	0	0	0	0	168	185	121	3	10	11	B6.4	10.4	14	2.1	04	2.1E+08	1.3E+06	1.1E+04
29-Nov	1	58	1	0	0	0	166	177	113	3	9	11	B6.8	10.4	11	2.7	04	1.4E+08	1.1E+06	1.2E+04
30-Nov	0	60	0	0	1	3	153	178	116	3	10	29	B5.9	10.2	12	2.7	04	7.1E+07	9.4E+05	1.2E+04
Sum	38	593	32	5	40	23														
Average	1.3	19.8	1.1	0.2	1.3	0.8	140.8	103.0	67.2	4.6	24.8	44.6	B7.4	9.2	12	2.0	04	2.0E+08	4.2E+07	4.5E+06
Maximum	10	60	14	1	19	8	210	277	132	9	117	228	C3.2	12.7	15	2.7	06	7.7E+08	4.3E+08	8.9E+07
Minimum	0	6	0	0	0	0	91	11	9	3	8	11	A9.7	5.7	10	1.6	22	1.7E+06	7.0E+05	1.1E+04

50 MHz Outside Britain

Compilation and Commentary by G3USF

Continental Europe

Auroral-Related Propagation

Another month of relatively high geomagnetic activity with Sodankyla reporting a daily average of 46 units and Nurmijrvi 28.7. And another month in which, for northern Europe at least, aurora offered the most interesting propagation. With the SK4MPI beacon qrt from the 4th to the 8th, aurora was nevertheless reported in Europe (Britain and continent combined) on no fewer than 26 days, with six days when propagation came south of the Baltic-GM. There were ten days when aurora-related propagation was reported but which were not 'disturbed' by our conventional K5 yardstick. This was probably mainly because auroral phenomena occur at lower geomagnetic indices at very high latitudes. The month was also notable for the number of occasions when auroral backscatter occurred but was not reported in OH5. This suggests that some openings reached a relatively limited area. The 20th-21st was the only time when southerly propagation occurred over a wide area and for a substantial period. From breakfast on the 20th, through to an early evening peak until it petered out early on the 21st aurora was almost continuously present in some part of Europe. The spread was wider than during the big October event, reaching Central Italy, Slovenia, Croatia and (by AE) Ukraine. However, there were again no reports from Spain, Romania or Bulgaria. Costas, SV1DH, monitored in vain for hours. Elsewhere, contacts were reported with power as low as five watts or with manifestly unsuitable HF verticals and the like. Given the path losses normally associated with auroral backscatter this made it a noteworthy event.

Once again, few stations reported beam headings. The only unusual one was G<>I5 around 1900 on a bearing of 080. As in October one suspects that contacts were lost because operators used their beams unambitiously; at times, northern operators might well have found QTFs above 080 successful, as the visual aurora lay well to the south of many stations.

At this stage in the geomagnetic cycle auroral-related propagation is an everyday occurrence at very high geomagnetic latitudes. (Perhaps literally so, since an SM2 station is said to have experienced aurora every day in November: this would not be exceptional.) This was demonstrated in the November reports by the prevalence of the JW/JX Arctic beacons, most of them relatively recent, received with t9 notes, usually in southern Scandinavia, but sometimes reaching further south. Auroral-e was more widely reported on the 20th. The most striking reports were of a contact between UT5JAJ and an SM5 at a distance of around 1984km and reception of the UT5G beacon by an SM0 at roughly 1715km, both t9. However. A contact between UT5JAJ and an OZ station was reported as both 'a' and 't9', leaving the mechanism involved in more doubt. Similarly, on the 11th, reception of the VE8BY beacon was 't9' for G0JHC and a PA operator but as 'a' by another G. As usual, no actual contacts ensued. A little surprisingly, there were no such reports on the 20th-21st.

A reminder that the 'au' information we receive from OH5IY, via the good offices of OH2LX, relates either to SK4MPI (144.912) backscatter monitored at KP30HV with a 30sec/10-minute resolution or AuFM at 88.7 and 107.9 MHz, with 1.2min/10min resolution. Antenna gain at 144 12dBd and on FM 5dBd.

Nov 1 0020-40 Au>OH5IY 1951 JW9SIX>SM0(579) 20-2100 LA(KP09)>SM3(559) 21-2200 LA(JP99)>SM0(JO89 539) LA(JP99)>SM3(559) LA(JP99)>OZ(JO54 mode?) LA(KP09)>OZ(?) LA(KP09)>SM6(?) TF>SM3(599) LA(JO59)>OZ(JO54 51a) 22-2300 TF>SM3 LA(KP09)>OZ(?) TF>OH1(559) TF>LA(?)

Nov 2 1510-30 Au>OH5 1820-40 Au>OH5 no continental reports but GM4WJA had aurora early to late evening

Nov 3 no continental reports but GM4WJA had aurora in late evening

Nov 4 1545 LA>SM6(?) 18-1900 JW5SIX>SM2(579 KP15) JW9SIX>SM2(599 KP15) JW9SIX(?) JW9SIX>SM0(JO89)(?) JW5SIX>OH6(?) 19-2000 SM6(JO58)>DL(JO33)(?) JW9SIX>LA(559)(?) JW9SIX>OH6(KP20)(?) 21-2200 JW5SIX>SM0(529) JW9SIX>SM0(539)

Nov 5 2057 JW5SIX>SM2(549) 21-2200 JW5SIX>SM0(539) JW9SIX>SM0 JW5SIX>OH5(KP30 ?) 2207 LA7SIX>SM0(?)

Nov 6 No continental reports but GM4WJA had aurora mid-to-late evening

Nov 7 1920 JW5SIX>SM2(KP15 599)

Nov 8 No continental reports but GM4WJA had aurora early evening

Nov 9 1320-1440 Au>OH5 1320-1420 AuFM>OH5 1430 AuFM>OH5 1810 OH9SIX>SM2(KP15 57a) 1830-40 Au>OH5 1834 49757.5(UA)>SM0(56a)

Nov 10 1350-1510 Au>OH5 1723 JW5SIX>SM2(KP15 599) 18-1900 OH3>SM0(55a) JW5SIX>SM0(599) 19-2000 JW9SIX>OH6(KP20) LA>OH6(KP20) LA(JO57)>SM6(JP99 AE) JW9SIX>SM6(JP99 579 AE) 20-2100 LA7SIX>PA LA>OZ(559) OH9SIX>PA LA7SIX>PA(599) LA7SIX>OZ(599) OH7>OZ(57a) 2040-2330 Au>OH5 22-2300 LA7SIX>PA(559) TF3SIX>SM6(JO57 559) OH3>OZ(57a) ES3(KO29)>OZ JW9SIX>PA OH3>OZ(mode?) OX3VHF>SM6(JO57) 23-2400 SM3>EI(55) GM>LA(JP50 mode?) GM>OZ(55)

Nov 11 0010-0120 Au>OH5 1110-1220 Au>OH5 1230-1400 Au>OH5 13-1400 LA(JO59)>PA (JO22 54a) LA(JO59)>DL(JO53 55a) LA(JO69)>PA(JO32 53a) LA(JO69)>SP6(JO82 51a) SM5>LA(55a) SM7(JO65)>PA(JO22) 1410-50 Au>OH5 15-1600 JW5SIX>SM2(KP15 599) JW5SIX>LA(549) SM7(JO65)>PA(JO22 57a) 1510-1600 Au>OH5 1730-50 Au>OH5 18-1900 LA>SM5(559 AE) 19-2000 OH9SIX>OZ(559 AE) OH9SIX>LA(599) JW9SIX>SM6 JO57 579 AE) SM2(KP07)>SM6(JO57 599) 20-2100 LA>PA(JO22 559) LA(JP99)>PA(JO22 55) LA(JP66)>OZ(?) SM3(JP73)>OZ OH9SIX>DL(JO62 599) LA7SIX>DL(JO51 559) OH9>OZ(?) 2010-40 Au>OH5 2045-2100 48.2tv>Jokela(AE(?) 21-2200 PI7SIX>SM2(KP15 599) SM2(KP05)>PA(JO22 57) GM>LA(?) LA7SIX>DL(?) LA(JP42)>DL(JO31) OH9SIX>PA(JO21)(?) OH7(KP32)>OZ(59) SM2(JP16)>PA(J)22 57) SM3(JP73)>PA(JO22 59) OH8(KP25)>DL(JO41) OH7(KP32)>OZ(?) LA(JP41)>PA(JO21 59) GB3LER>OZ(529) 22-2300 LA>DL(?) LA(JP41)>PA(JO21)(?) OH7(JP42)>DL)JO31)(?) OH9SIX>DL(599 JO60) OX3VHF>OZ(JO45 559) TF3SIX>PA(579) OY6SMC>PA(579) SM7>PA(56a 320) 23-2400 VE8BY>PA(52a) VE8BY>G(IO83 529 AE) TF3SIX>PA(519) 2349 VE8BY>G(519a)

Nov 12 0001 VE8BY>G(IO83 519) 1550-1600 Au>OH5 18-1900 JW9SIX>SM0(579) JW5SIX>SM0(539/52a) 1840-50 Au>OH5 19-2000 JW5SIX>OH1(KP10 599)

Nov 13 1200-50 Au>OH5 1200-10 AuFM>OH5 1230-1300 AuFM>OH5 1320-153- Au>OH5 1350-1400 AuFM>OH5 1410-20 AuFM>OH5 1500-10 AuFM>OH5 1600-40 Au>OH5 16-1700 OZ>OZ SM0(JO89)>OZ(?) 1720-50 AuFM>OH5 18-1900 LA7SIX>SM0(599) JW9SIX>SM0(599) LA(JP99)>SM0(599) GB3LER>EI(51a) 1840-1900 Au>OH5 2100-10 Au>OH5 2159 AuFM(EI)>OH6 2200-10 Au>OH5 2220-30 Au>OH5 2240-2310 AuFM>OH5 2259 SM5>OZ(57a) 2302 SM5>OZ(?) 2350-2400 Au>OH5

Nov 14 0030-50 Au>OH5 1103 49750>OH6(KP02 51a) 1230-1350 Au>OH5 19-2000 TF3SIX>OH3(KP21 539) OH9SIX>OZ(579) 20-2100 OH9SIX>OH6 2000-10 Au>OH5 2140-2210 Au>OH5 2220-40 Au>OH5

Nov 15 0926 49750>SM2 1320-1640 Au>OH5 1620-40 AuFM>OH5 1750-1810 Au>OH5 20-2100 49746>SM0(AE) OH9SIX>OZ(579) LA7SIX>DL(54) OH8>OH6(52a) OH9SIX>DL(JO62 559) OH9SIX>DL(JO33 54) OH9SIX>SM0(JO99 mode?) OH8(KP44)>SM6(JO57 589) OH9SIX>PA(559 AE) 2010-50 Au>OH5 2050-2100 AuFM>OH5 21-2200 LA7SIX>OZ(559) OH9SIX>SQ2(JO94 599) OH8>OH6 SM7>OZ(?) 2210-20 AuFM>OH5 2250-2310 Au>OH5 2250-2340 AuFM>OH5 2320-40 Au>OH5 2340-50 Au>OH5 2350-2400 Au>OH5

Nov 16 0000-10 AuFM>OH5 1350-1510 Au>OH5 17-1800 JW5SIX,JW9SIX>OH6(559) JW5SIX>SM2(KP15 599) JW8SIX>SM2(KP15 569) JW5SIX>OH6(AE) JW9SIX>LA?) 1710-20 Au>OH5 Au>OH5 18-1900 JW5SIX>SM3(AE) OH9SIX>LA(53a) 2140-2200 Au>OH5

Nov 17 0130-40 Au>OH5 1110-20 Au>OH5 1015 49750>OH6(KP02 52a) 1340-1410 Au>OH5 1430-1550 Au>OH5 15-1600 49750>OZ(000) LA(JO55)>OZ(JO59) OH5>OZ(55a) 1520-30 AuFM>OH5 1630-40 Au>OH5 1720-30 Au>OH5 1720-40 AuFM>OH5 1748 JW5SIX>SM2(KP15 579) 18-1900 OH9SIX>SM6(JO57 AE?) ES0SIX>LA(599) 2100-10 Au>OH5 2130-50 Au>OH5 2230-2310 Au>OH5

Nov 18 1300-30 Au>OH5 1440-1500 Au>OH5 17-1800 JW9SIX>OH6(KP20) JW5SIX>SM2(KP15 579) JW9SIX>SM0(559) JW5SIX>SM0(539) 1710-20 Au>OH5 1710-20 AuFM>OH5

Nov 20 0850 49750>OH6(KP02 52a) 0943 OH9SIX>SM2(57a) 0950-1110 Au>OH5 1020-50 AuFM>OH5 1130-1430 Au>OH5 1210-1430 AuFM>OH5 13-1400 OZ>PA(JO21 57a) GM>PA(52a) 14-1500 GB3LER>EI(51a) OZ>ON(JO21 55a) GM>ON(JO21 59a) OZ(JO55)>ON(JO21 55a) LA(JO59)>SP3(JO82 58) OJ0(JO54)>ON(JO21 55a) SM5>DL(JO61 57a) GM>PA(JO21 55a) GM(IO78)>ON(JO21 55a) OZ(JO65)>DL(JO61 55a) 1440-2120 Au>OH5 1440-1540 AuFM>OH5 15-1600 OZ>OK1(mode?) LA>ON(JO21) SM5(JO78)>DL(59a) GB3MCB>EI(53a) ES1>ON(JO21) SM5>ON(JO21) SM7(JO76)>SP6 SM7(JO76)>ON(JO21) GM(IO86)>PA(JO21 59a) G>ON(JO21) GB3BUX>EI(53a) EI>EI(IO63 59a) SM7(JO65)>PA EI>PA(59a) OZ(JO55)>DL(JO61 55a) F>PA(59a) PA(JO22)>DL(JO50 55a) OZ>SP9(JO90 55a) OZ(JO45)>PA(JO23 59a) OZ>SP9(JO90 55a) 1550-1730 AuFM>OH5 16-1700 OZ(JO55)>PA(JO23 59a) G(JO02)>DL(JN48) G(IO91)>PA(JO23 59a 5watts) SM7>OM7(55a) OZ(JO46)>OE6(JN77) G(JO02)>DL(10m dipole) EI(IO63)>PA SM7(JO65)>OK1(JO60 59a) ES5(KO38)>OZ(JO55) OZ(JO55)>SP6 DL(JO53)>OE6(JN77 55a) OZ(JO55)>ON(JO21) SM7>F(?) ES5>PA(AE) G,GW>F(?) G>PA(55a) ON>F(?) SP6(JO81)>DL PA(JO21)>F(IN88 57a) G(JO02)>PA(JO23 57a 5watts) GM>F(?) 17-1800 G(IO91)>PA(JO23 59a) PA(JO33)>DL OK1(JN69)>DL(JO31 55a) OE5(JN68)>SP6 G(JO01)>F(IN88 57a) DL(JO62)>DL(JO31 55a) SM7>IW5DHN(JN53 59a) PA>HB(JO33 59a) F(JN16)>DL SP2>DL(?) G>IZ5EME(JN52 59a) ON(JO21)>HB(52a) OK1>SM6(?) GJ>EI(59a) GM>SP3(?) GB3BUX>SP6(JO80 55a) G>SM6(?) EH2KP>OZ(54a) GM(I)68)>I5 SM7>ON(?) GM(IO67)>IW2LC(JN45) EI>DL(?) SP9>SP2(?) SM7(JO65)>F(?) US5II>DL(?) OH7(KP42)>9A4K(JN86) G>SP7(?) ON(JO11)>F(IN88 59a) G(JO02)>IW2LC(JN45) IW3RI>DL(59a) MM0CWJ>9A4K(Au+Es) GM>DL(JO40 58a) SM7>9A(59A) GM(IO67)>IZ5EKV(JN53) SM7>DL(JN58 59a) IW5DHN>DL(57a) SP6(JO81)>DL G(JO02)>F(IN88 59a) PA(JO22)>F SM7>DL(JO40 53a) ON(JO21)>DL ES1>IK1EGC(JN35 Es) PA(JO23)>DL(JN59 57a) G(IO90)>F OH7(KP32)>HB(JN36 599 AE) G(JO02)>DL 52a) FX4SIX>DL(55a) SP6>ON(59a) SP2>F(?) S59A>DL(?) 1720-40 48.2>Jokela(AE?) 1800-10 AuFM>OH5 1900-30 AuFM>OH5 19-2000 IW5DHN>G(59a 080) G(JO02)>IW0GPN(JN62) G>SP6(?) IW5DHN(JN53)>F(55a) G(JO02)>DL(59a) 4U1ITU>PA(JO21 55a on GP) G(IO92)>IW2LC(JN45 59a) LX>F(?) UT5JAJ(KN64)>SM5(JO89 579) IW5DHN>EI LX>DL(53a) G>9A2F(59a) UT5JAJ>OZ(55a/579) F>F(IN88) G(IO83)>IW0BET(JN54 55a) 1815-20 48.2>Jokela(AE?) 1940-50 AuFM>OH5 20-2100 F>ON(59a) SP5(KO02)>SP2 SM3>LA(JP50) AuVisual>JN86 GI(IO64)>PA 59a) 9A1Z>OZ(54a) S5>OZ(55a) SP2>OZ(52a) SP8(KO12)>OZ 55a) OZ>PA(57a 060) OE3>OZ(55a) 49760(OK)>PA(59 AE) LY>IZ1EPM(JN35 559) G(IO92)>PA(JO21 59a) 21-2200 EI(IO63)>F(IN88 59a) SM0>IZ1EPM(JN35 559) EI>F(59a) OH3>IZ1EPM>539) SM,OH,ES>I4LCK(AE)

LY>IZ1EPM(559) DL>IZ1EPM(539a) OH6(KP20)>IW0GPN(579 AE) SM0>9A1BTU(JN85 599) SP6(JO80)>I4LCK>JN54 57a) LY>DL(JO41 579 AE) GI>F(57a) ES1>IW5ACZ(JN53 539) OH6>OZ(559) ES2(KO29)>9A4K(JN86 559) ES0(KO18)>IW0GPN(JN62) OH6(KP20)>DL(JO41 AE) DL(JO43)>DL(JN48 55a) SM5(JO87)>9A4K(JN86) UR4UC>DL(JO41 559) SP8>DL(JO41 579) 2100-20 AuFM>OH5 2130-50 Au>OH5 2140-50 AuFM>OH5 22-2300 SM7(JO76)>ON(JO20 51a) YL3>LY(?) SP2(JO93)>DL(JO42 030) DL>PA(JO22 59a) SM7(JO65)>OK1(JN69) GJ>EI(55a) DL(JO59)>LA(59a) 2356 OH9SIX>SP6(JO80 529) 2220-2400 Au>OH5 2220-2310 AuFM>OH5

Nov 21 0000-0030 Au>OH5 0000-0100 48.2>Jokela(AuE?) 00-0100 UT5G(KN66)>OH2(?) UT5G>SM0(JO99)(?) 0010-30 AuFM>OH5 01-0200 OY6SMC>PA(JO21 529) GB3LER>PA(JO21 599) OH9SIX>PA(JO21 589) OH1SIX>PA(JO21 569) 0419 OH9SIX>SP6(JO80 599) 0130-40 AuFM>OH5 2055 JW5SIX>SM2(559) 21-2200 JW9SIX>SM0(JO99)(?) JW9SIX>SM6(JO57)(?) 22-2300 JW9SIX>SM0(JO99)(?) JW5SIX>SM0(JO99)(?) JW9SIX>LA(JO59 529)

Nov 22 1345 49750>SM2(57a) 1440-1610 Au>OH5 16-1700 GB3LER>DL(JO50 51a 010) 1610-40 AuFM>OH5 1630-1710 Au>OH5 17-1800 JW9SIX>SM0(JO99 599) JW5SIX>SM0(JO99) GB3LER>EI(51a) ES0SIX>SM0(JO99 51a) JW9SIX>LA(599) JX7SIX>SM0(JO99) 18-1900 SM7>SM3(59a) 1820-40 Au>OH5 19-2000 JW9SIX>OZ(JO54 559 AE) JX7SIX>OZ(579a) ES0SIX>EI(519) OH9SIX>PA(JO32 529) SM0>EI(599 AE) OZ>PA(JO32 59a) SM5(JO78)> OZ(JO54 55a) OH9SIX>PA(JO33 mode?) OH3(KP20)>SM0(JO99 mode?) SM5>LA(JO59 59a) OZ>LA(JO59 55a) 1920-30 Au>OH5 1929 AuE(UA)>OH6 1940 PenzaFM>OH6 1951 SaranskFM>OH6(AE) 1957 MoskvaFM>OH6(AE) 20-2100 OX3VHF>OH3(559) GM>OZ(55a) LA7SIX>LA(599) OY6SMC>EI(51a) OH3>OZ(55a) SM7>OH6(KP02 AE) JX7SIX>SM6(JO57 569) SM7>SM0(59a) 2020-40 Au>OH5 2100-10 Au>OH5 21-2200 JX7SIX>SK7(JO65 55) G>OZ(55a) 2150-2210 Au>OH5 2230-50 Au>OH5 2320-30 AuFM>OH5

Nov 23 1406 OH9SIX>SM2(KP15 56a)

Nov 25 1540-1610 Au>OH5

Nov 27 2005 OH9SIX>SM2(KP15 56a)

Nov 28 1721 JW9SIX>SM5(mode?)

Nov 30 15-1600 OH9SIX>SM2(KP15 56a) 1520-1830 Au>OH5 1620-1830 AuFM>OH5 17-1800 JW9SIX>SM2(KP15 599) JW5SIX>SM2(KP15 599) JX7SIX>SM2(KP15 599) JW9SIX>SM0(JO89 599) JW5SIX>SM9(JO89 579) JW9SIX>LA(569) 18-1900 GB3LER>EI(41a) SM3>LA(57a) JW5SIX>SM0(539) JW9SIX>SM0(589) 1850-1910 Au>OH5 1951 JX7SIX>SM0(539) 20-2100 LA7SIX>SM0(539) LA7SIX>OZ(JO75 559) LA7SIX>LA(599) JX7SIX>SM0(559) OH9SIX>LA(559) LA7SIX>PA(mode?) OH1>OZ(mode?) 2050-2150 AuFM>OH5 2131 GB3RMK>SM2(KP15 599) 22-2300 LA>EI(539) 2200-2340 AuFM>OH5

Other Propagation Modes

Was there not a George Formby song with the catch line 'But it might have been a great deal worse'? Certainly November was in many respects well down on a year previously, but (Scandinavia apart) much of continental Europe enjoyed at least some long-haul propagation. Not, however, from Asia or the Pacific. The nearest that came was JA6<>5B on the morning of the 1st. In 2002 there had been openings between Europe and Australia, the Far East, the Gulf and Central Asia. Quite apart from higher geomagnetic activity this year flux levels were insufficient to sustain multihop F2.

Southern Africa was, as so often, more productive, though a shadow of the previous year, with openings from the Mediterranean on 8 days (2002 20, 2001 28) and from countries further north on two days (4 in 2002 and 2001). As in the earlier years most openings came in the first half of the month, which happened this year to be when flux levels were healthy and geomagnetic unsettled-to-active rather than seriously disturbed. Unsurprisingly, the 10th to the 22nd were nearly blank; the solar flux was below 100 and this was when the greatest disturbances occurred.

Europe<>Southern 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
Med		+	+		+	+		+	+					+									+						
North		+																					+						

	Mediterranean	Northern Europe
ZS6	6 days 2,3,6,8,9,14,23	2 days 2(ON,PA) 23(ON)
Z2	day 23	
9J	2 days 3, 5	
V5	1 Day 9	

West Africa was also markedly down on 2002, with openings reported on 23 days (2002 28, 2001 22) from the Mediterranean and from further north on 8 days (2002 28, 200116). Openings were spread more evenly through the month, including several of the more disturbed days. On some of these occasions this may well have been attributable to pre-auroral enhancement, to which G0AEV has already alluded. By the 23,24,25th flux levels were close to their highest levels and the geomagnetic field was well below the month's average. The presence of a number of expeditions in the region also helped focus operators' attention - but the consistency of the TR0A beacon, which accounts for the majority of TR reports suggests that the relatively healthy results this month do to some extent reflect propagation rather than being simply a product of activity levels.

S9 was not reported from continental Europe but was worked from Cyprus on the 10th.

	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
Med		+	+	+	+	+		+	+	+		+		+	+	+	+	+	+		+	+	+	+	+	+			+	+
North				+	+					+										+	+		+	+	+					

Europe<>West Africa

	Mediterranean	Northern Europe
TR	20 days 3,5,6,8-10,12,14-19, 21-26,29,30	6 days 4(G) 5(G) 10(HB) 21(G) 23(HB), 5(DL)
5V	5 days 16,19,20,23,24	2 days 20(DL,G,OZ) 24(HB)
TY	2 days 16,23	
5T	2 days 3,	1 day 5(ON,PA)
C5	2 days 3	1 day 4 (DL,SP)
5U	1 day 16	
5N	1 day 23	
6W	1 day 14	
TU		1 day 4(G,ON,PA)

In addition to the above an expedition to TS(Tunisia) made many contacts, notably on the 19th (Mediterranean and G), 23rd (Mediterranean,DL,G,OE,ON,OZ,PA) 24th (OZ) and 26th (Mediterranean, DL,F,G,OK,PA,SP)

Sporadic-E was infrequent but the report from SV1DH in particular records its presence on several days, as well as occasional backscatter contacts. The 25th, which G0AEV has already noted as producing some very good Es in the UK, was also fruitful on the continent, particularly for Scandinavia. Few reports were specifically attributed to significantly enhanced tropo or to meteor scatter, though stalwarts who appeared to be running JTSM sustained activity levels during protracted blank periods.

Nov 1 1059 ES0SIX>PA 11-1200 DL>PA 12-1300 CN8MC>I3 3Ctv>I1 14-1500 I4>I0(bs) CN>DL,F 18-1900 PP5LD,LU9EHF>EA7 aurora

Nov 2 0656-8 UT5G,UU5SIX>I0 07-0800 YO4,LZ2>I5 9H1SIX>OE5 08-0900 UT5G,YO7>IS0 SV1SIX>DL,F I4>OK1 I9>9A IS0>YO5 SV1>I2,DL SV2>I1 09-1000 YU7>I1 SP8>I5 SV2>F SV1>I2 ON>DL 10-1100 ZS6NK>9A,ON ZS6TWB>PA,9A ZS6DN>9A ZS6WB>9H 11-1200 ZS6GVD>9H,IS0 I3>DL ZS6WB>ON,EA5 ZS6AXT>EA7 ZS6AVR>9A 12-1300 I3,IQ4AD>S5 TR8CA>I0 16-1700 ZS6NK>I7 17-1800 C56JHF>9H,EA7 18-1900 S5>I2 9J2KC>EA7,IS0 21-2200 5T5SN>CT 22-2300 PY1RO>CT3 23-2400 OH9SIX>PA(mode?)

Nov 4 09-1000 OE6>9A 13-1400 TR0A>G 14-1500 TU2OJ>G,F,ON,PA G>F C56JHF>I4,I9,I5,I0,DL,SP6 TR8CA>EH3 no data 1446-1900 19-2000 3Ctv>SV1 2114 PY1RO>EA7 22-2300 ZP6VT,CE4WJK>CT3 PY7ZZ>CN8KD

Nov 5 0317 FX4SIX>F 14-1500 TR0A>F,G 15-1600 I9>TR8CA TR8CA>EA7 16-1700 I9>I1(Es) I9>I2,I4,HB 17-1800 IK5ZUL>EA7(Es) CN8MC>I1 CT0SIX>IS0 5T5SN>CT,I1 18-1900 5T5SN>EA5,I1,ON,PA,9H 19-2000 3Ctv>SV1(tep) 9J2KC>EA5,EA7 21-2200 PY2PAI>EA5 ZZ2TGR>CT3 ZP5PT,LU9EHF>EA7

Nov 6 0830 ON>HB 1229 9H>TR8CA 14-1500 ZS6AVP,ZS6WB,ZS6NK,ZS6DN>EA7 TR0A>SV1 3Ctv>SV1 15-1600 TR0A>I5,SV1 16-1700 TR0A>SV1 TR8CA>EA7,EA3 17-1800 TR0A>EA3,SV1 TR8CA>F,I5 OZ>PA(t) 18-1900 PA>OZ TR0A>SV1 19-2000 TR0A>SV1 3Ctv>SV1(tep) LX0SIX>F 20-2100 SM6>OZ

Nov 7 1357 9H>SV1(bs) 1404 SV1>I1 17-1800 ZP6CW>EA7,9A PY2TVI>EA7 PY1RO>IS0

Nov 8 1034 I5>S5 11-1200 I5>I2 12-1300 3Ctv,5Ztv>SV1 13-1400 TR0A>9H,I4 ZS6WB, SV1(bs) >EA7 14-1500 TR8CA>SV1,EA7,5B ZS6WB>I0 15-1600 ZS6NK,ZS6WB>EA5 ZS4NS>I0,EA7 TR8CA>EA7 16-1700 TR8CA>CT,F,I5,EA7 TR8KPJ>CT CT3>EA7,CU4 I9>EA7(bs)

Nov 9 10-1100 OE5>DL G,IS0>OE5 11-1200 OK1>DL,OE5 SM5>OH5 12-1300 TR0A>9H 5Ztv>SV1 3Ctv>9A 14-1500 V51E>CT,IS0,F,CT3 ZS6NK,ZS6AXT>EA7 17-1800 EH7>F(bs) TR8CA>EA7 18-1900 I7>9A

Nov 10 1250 3Ctv,5Ztv>SV1 1354 TR0A>I0 14-1500 SV1DH>TR8CA TR0A>EA7 TR8CA>F,HB,I1,I7 I9>TR8CA 20-2100 9J2KC,S9TX>5B

Nov 11 10-1100 I9>SP6 1242 3Ctv,5Ztv>SV1 aurora

Nov 12 0920 ZC4>5B 1250 3Ctv,5Ztv>SV1 17-1800 SP3>SP6 TR0A>EA7 aurora

Nov 13 12-1300 3Ctv,5Ztv.SV1 UA3ASZ>EA7(??) aurora 2249 P43L>EA5AX(233 lp ??)

Nov 14 12-1300 3Ctv,5Ztv,EAtv(bs)>SV1 16-1700 TR0A,ZS6TWB,ZS6NK,6W/ON5TN>EA7 EH7>IS0 17-1800 6W/ON5TN>9H,IS0,CT 4X,MEtv>SV1 1853 4X>9A 2317 ZZ2GTR>CT3

Nov 15 11-1200 I5>I2 12-1300 3Ctv>SV1 TR0A>SV1 14-1500 G,S5>I2 I3,S5>I1 15-1600 S5>I4 S5>OK1,I1 YZ1>I4 17-1800 S5>I5,I4 YZ1>I1(ms/t) 1939 YZ1>OK1 20-2100 YZ1>OM3,I4 I4>I1 S5,I3>OM3. 23-2400 S5>9A,OM3 YU7>S5

Nov 16 0010-8 F>S5,OM3 0650 OE5>S5 06-0700 S5>OM3 07-0800 OE5,S5,I3>9A S5,OE5>OK1 08-0900 S5>F,OZ(ms),OK1 YZ1>F OK1,I3>OM3 I0>OZ|(ms) I9>I8 I3>OK1 S5>PA 09-1000 I3>OZ OM3>I4 I4,I3>S5 I6>F,SP6 10-1100 LZ2>F I5>I2 YU1,I4>I1 OM3>S5 SM0>I4 OM3>YO5 I4>I5 UT5G>I1 I7>F 11-1200 TR0A>I5 W7GJ>9A(eme),PA(eme) TR8CA>SV1 12-1300 TR8CA>I0,S5,EA7 5U7BM>TR8CA TY/LZ3XV>I0,EA7,9H,SV1,5B S5>I2 3Ctv>9A TR0A,5B>SV1 T9>TR8CA 13-1400 5U7BM>SV1 OM>PA TY/LZ3XV>I5 S5>9A TR8KPJ>EA7 TR8CA>9H 14-1500 TR8KPJ>EH5 TR0A>SV1 3Ctv>SV1 15-1600 TR8KPJ,TR0A>9H 16-1700 TR8KPJ>5B 18-1900 CT0SIX>EA7(sc) 19-2000 5V7BR>EA7,EA5,9H

Nov 17 1338 TR0A>I0 1458 TR0A,3Ctv>SV1 aurora

Nov 18 08-0900 YO5>I2,F(Es) F,UU5SIX>9A F>I7 09-1000 9A,OE3XLB>F UT5G>9A,YO2 UU5SIX>DL 10-1100 UU5SIX,OE3XBL,UT5G>SP6 1129 UR>SQ9 1332 I4>I2 15-1600 TR0A,9H>EA7 16-1700 SV1>EA7 49757.5>I1(Es) 18-1900 PY1RO>F 19-2000 EA7>PA EH7>I9 PY1RO>EA3

Nov 19 0352 ES0SIX>SP6(ms) 0747 G>F 09-1000 ES4>I5,I0 1057 CT0SIX>DL 1119 G>I5 12-1300 YU1>F LX0SIX,PA,ON,G,F>I0 IK5ZUL>I2 TS7N>G 13-1400 TS7N>G F>S5 I5,T7>F,I2 DL>I5 EH7>OK1 TR8CA>I0,F K6PF>F(eme) G>I0 I8LPR>TR8CA I5,IS0>PA I0,I8>DL 14-1500 OZ>I2 DL>I0 TR8KPJ>I5 TR8CA>9H TS7N>EA7,CT,9H,IS0,EH5 I7,S5>F EH9>9H I5>DL,PA CN8MC>DL,I0,F 15-1600 TS7N>EA7,F,EA5 I9,9H1SIX>EA7(Es) 5V7BR>I7 1636 TS7N>EH3 17-1800 TS7N>CT,EA5 ON>I5

Nov 20 0615 OE3XLB>S5 12-1300 aurora 5U7BR>I1,I8,DL,G,F,OZ 1606 9A>OE6 aurora

Nov 21 0807 OE3XLB>S5 12-1300 TR0A>G 13-1400 EA3>SP2 1626 TR0A>I0

Nov 22 09-1000 I1>HB T7>S5 YO5>I1 11-1200 TR0A>I5 5Ztv>SV1 TR8CA>9H,I5 12-1300 YT1>I1 I1>I5 TR8CA>9H 13-1400 TR8CA>9H TR0A>SV1 14-1500 YT1>9A(bs) EH3>9A S5>EH3 15-1600 OE8>EH3 S5>OE1 ON0SIX>PA(t) aurora

Nov 23 09-1000 GB3RMK>S5 UR>I1,I2 10-1100 UT5G>I1 12-1300 LA>SM6 CT3>PA 5V7BR>CT,G,I1 TS7N>9H 13-1400 TS7N>I8 5V7BR>G,F,9H,I1,I0 HB>TR8CA 5B>F(sc) I3>I7(bs) 5N0EVR>I5,I9 ZS6OB>F 14-1500 5N0EVR>9H,S5 5V7BM>9H 5B>I5(sc) TS7N>I5 YU1>I5 ZS6OB>I5,I9,I4 TY4JM>9H,I9 ZS6DDG>I9 15-1600 TY4JM>F,I9 TS7N>9H ZS6OB>9H ZS6DDG,ZS6AXT>EA5 ZS6NK>F,EA5 16-1700 ZS6NK>9H,CT ZS6OB>EA5,EA7 UU5SIX>SP2 Z22JE>9H 17-1800 Z22JE>I5 UU5SIX>SP2 ZS6DDG>I8 18-1900 ZS6NK>ON ZS6WB>9H I9,SP6,PA>I8 19-2000 G>I8 I9,I0,EH5>DL I0>EI S5>9A ON>I9 IS0>OZ 9H>PA F>OE1 TS7N>F,DL SP8>F 20-2100 TS7N>DL,G,PA,I4,I2,OZ,OE6,9H,ON EH5>OZ OM6>SP9 EH5>9A G>9H 21-2200 TS7N>DL,PA,ON G>EA7 ZD8VHF>DL,EA7 PY1RO>EA7 22-2300 PY2TVI>EA7 PY1RO>I2,F,I1,DL ZD8VHF>DL DL>EA7

Nov 24 1058 OE3>SP6 1138 TR0A>I5 12-1300 5V7BR>HB,CT 13-1400 5V7BR>I0,F 14-1500 TR0A>SV1 TS7N>OZ 15-1600 5V7BR>I5 21-2200 ZD8VHF,PY2CDS>EA7

Nov 25 0654 HB9SIX>OH5 07-0800 GB3LER,OY6SMC,ES0SIX,GB3RMK>SP6 LX0SIX>OH5 GB3LER>9A(Es) 08-0900 GM>SP6,DL G>OZ F>OH2,OH5 GB3RMK>S5 G,F,ON,PA>SM5(Es) OZ6VHF>I2 LA>DL(Es),I5 OY6SMC>DL SM5>F 09-1000 GB3RMK>DL,S5 EI>DL SM5,SM7>F F,I1>OZ GB3MCB>SQ2,SP6 GW,F>SQ2 GM>I4 10-1100 GM>I2,I5 G>OZ,OE6,9A GW,EI>9A F>DL,OZ,OK1 11-1200 GW>I2 EI>ON,I4 F>OE6,9A 5Ztv>SV1 TR0A>DL EH5>PA 13-1400 ZD8VHF>F CT0SIX>DL,PA F>DL 14-1500 TR0A,5Ztv>SV1 16-1700 I9>I5 17-1800 OZ>SM6 CT>I1 18-1900 SK4>LA SL0>SM6 DL>OZ OH0,OH3>DL 19-2000 OH8>OH9 OZ>PA DL>DL OH6,OH0>LY 20-2100 OH6,OH3>LY DL,SM6>OZ I9>I8 PA>OZ OH0>DL 21-2200 OZ>PA SM6>OZ OH0>DL,ON ZD8VHF>EA7,9H ZZ2TGR,PY1RO>EA7 OH6>PA

Nov 26 0950 S5>9A 13-1400 TR0A,I0(bs)>SV1 14-1500 SV1>I5,I7 16-1700 I7>I4,I8 20-2100 TS7N>DL 21-2200 TS7N>OK1,DL,G,F,PA,I4,SP3,S5 22-2300 TS7N>I3

Nov 27 09-1000 ES0SIX>SP6(ms) LX0SIX,ON0SIX>DL(t) 1235 5Ztv>SV1

Nov 28 0848 ES0SIX>SP6(ms) 09-1000 OH9SIX>SP6(ms) OE3XBL>SP6 10-1100 I5>SP6 2035 ZD8VHF>EA7

Nov 29 10-1100 I5>I1 OH7>OH2 11-1200 LX0SX>DL I5>S5 TR0A>I0,F 12-1300 TR0A>F,EA7 ON4SIX>DL 22-2300 CT3,PY2BJG>CT 2303 CE4WJK>CT

Nov 30 0759 ES9SIX>SP6(ms) 0845 OE3XBL>SP6(ms) 09-1000 SM4>SK3 1258 ON0SIX>DL 13-1400 TR0A>I5,F 14-1500 S5>I2 1611 S5>T7 1716 OE6>S5 aurora 2025 ZD8VHF>EA7

50MHz PROPAGATION REPORT FOR NOVEMBER 2003 BY SV1DH

1. Data for all days (30)
2. Relatively good days on: 2,6,16,23(+)
3. 48 MHz AF video (3C+5Z) on:1-17,29,30(3C)+22-27(5Z) (R=83%)
4. 55 MHz AF video (5N) on: NIL
5. " to ZS6 on: 2,23 (R=6%)
6. " to TR on: 6,8,10,15,16,17,19,21,22,24-26,30 (R=43%)
7. " to V5(MM) on: 6,8,9
8. " to Z2 on: 23
9. " to 9J on: 5
10. " to 5U on: 16
11. " to TY on: 16
12. " to ZD8 on: 23 (R=3%)
13. " to 5B on: 16,23,24(B)

14.	"	to 4X	on: 14(E)	
15.	"	to F	on: 2 (E)	
16.	"	to I	on: 2,14(E),5-9,16,20,23,26(B)	
17.	"	to EH	on: 8,18(B)	
18.	"	to 9H	on: 6,7,10,16,20(B)	(R=17%)
19.	"	to DL	on: 2 (E)	
20.	"	to 9A	on: 20(B)	
21.	"	to OE	on: 2 (E)	
22.	"	to HB	on: 2 (E)	
23.	"	to ON	on: 2 (E)	
24.	"	to UR	on: 1(E)	

25. Special events on:

1 (6C+4M,SFI=210,SSN=277,Xbgn C2)
2 (5C+3M+1X,1725 X8.3,SFI=190,SSN=174,Xbgn C2+0845 A6 to VK8)
3 (3C+1M+2X,0130X2.7+0955 X3.9,SFI=167,SSN=76!,Xbgn C3)
4 (10C+4M+1X,**1953 X28 largest ever flare!!**, Xbgn C2+SFI=168,SSN=79+1230 A6 to VK8+2130 9H to PY1)
5 (6C+2M,1052 M5.3,Xbgn C1,SFI=114,SSN=32+0815 YA to VK6+1145 A6 to VK6)
6 (0C,Xbgn B2!,SFI=98,SSN=12+0730 VU to JA+0830 YA to VK6+0800-1245 foF2>10,max 11.8Mhz at 0945)
7 (0C,Xbgn B2,SFI=91,**SSN=11 lowest since minimum**+0730-1015 foF2>10, max 11.5Mhz at 0945
8 (0C,Xbgn B1)
9 (0C+13-14z foF2>10Mhz +14-16z A6 to VQ9)
10 (0730-08+09-10z foF2>10,max 10.8 Mhz at 09z)
11 (1C+1M,1351 M1.6 flare+0800-1015 foF2>10,max 11.7/MUF=41 at 0815)
12 (1300 W on 10m)
13 (2C+2M,0501 M1.6+0929 M1.4, Xbgn B3)
14 (0745-0900 foF2>10, max 11.7/MUF=40 Mhz at 08z)
16 (0845-1115 foF2>10,max 10.8 /MUF=37Mhz+1145-1230 MUF to HZ>44Mhz)
17 (6C+2M,0134 M1.2+0901 M4.2,Xbgn C1+0845-0915 foF2>10,max 10.5 / MUF=38 Mhz at 09z)
18 (8C+4M,0752 M3.2+0825 M3.8+1011 M4.5,Xbgn C1+0930-1115 foF2>10,max 11.4/ MUF=39Mhz at 0945z+1330 MUF to NA>35Mhz+1845 F+IS to PY1+2200-2330 W+C.Am. to ZL+VK!+3CVIDEO tx off today)
19 (9C+M,0401 M1.7,Xbgn B9+0815-0915 foF2>10,max10.8/ MUF=36Mhz+1400 MUF to W>35Mhz)
20 (11C+3M,0212 M1.4+0747 M9.6+2353 M5.8, Xbgn B7+0830- foF2>10, max /MUF=3 Mhz+K=8 at 18&21z+Aurora to I0!)
21 (0815-1415! foF2>10, max 11.4/MUF=38 MHz at 1145+ 0800-0930 MUF to HZ>44Mhz)
22 (0830-1145 foF2>10, max 11.4/MUF=40 MHz at 0915z+ 1000-1030 MUF to HZ>44Mhz)
23 (0700-1015 foF2>10, max 11.5/MUF=39Mhz at 0830+ 0730-1000 MUF to HZ>44Mhz+2230 I+DL+F to PY1)
24 (0630-1015 foF2>10, max10.6 /MUF=36 Mhz at 0915+0830 YA to VK6)
25 (0730-1000+1045-1215 foF2>10,max 11.7,MUF=41Mhz at 0915+2130 9H to ZD8)
26 (0915-1400 foF2>10,max 10.9, MUF=36Mhz at 1045+SFI=171,SSN=202 +0915- foF2>10,max 10.8,MUF=35Mhz at 0930)
27 (0815-1145 foF2>10,max 11.0,MUF=36Mhz at 0930+SFI=171,SSN=209 +0815- foF2>10,max 11.0,MUF=36Mhz at 0930)
28 (2030 EH7 to ZD8+2330 ZL to XE!)
29 (1200 I0 to TR)
30 (2045 9H to ZD8)

26. DXCC entities heard/worked during November 2003 : 20 on 3 cont
27. DXCC entities heard/worked on 23rd November 2003 : 5 on 3 cont.

73 COSTAS

The Americas

Auroral-Related Propagation

Given the intensity and duration of the storm on the 20th-21st American reports are rather thin, even bearing in mind the lower geomagnetic latitudes involved. On this occasion the southern limit appears to have been around San Francisco in the west and North Carolina in the East. One would like to know more about the contact at a claimed range of around 1500 miles between W3 and W0, reported as 'a'. No reports specified AE. The event lingered rather longer on the 21st than in Europe.

Nov 11 0125 VE8BY>VE3(?) 03-0400 VE4ARM>VE6(DO33) W7>VE6(DO20) 04-0500 KL7NO>VE6(DO33 55a) VE6(DO33)>VE6(55a) KL7/KG0VL>VE6(DO33 599a) KL7(BP64)> VE6(DO33) VE7(CN88)>VE6DO20) W7(DN20)>W0(EN36) W9(EN53)>W0(EN36) VY1(CP20)> VE6(DO33 59a) VE7(CN88)>VE6(DO33 55a) 05-0600 VY1>VE6(DO33) 2330 VE8BY>VE6(519a)

Nov 12 0210 VE6(DO20)>VE6(DO33 53a)

Nov 15 0859-9 WR9L>W9(EN44 52a) N0UD>W9(EN44 52a) 0902 K0GUV>W9(EN44 51a) 2259 VE4ARM>W9(EN44 51a) 23-2400 K0KP>W9(EN44 55a) W9(EN45)>W9(EN44 55a)

Nov 16 0254 VE8BY>VE6(529a) 2155 VE4ARM>W9(EN44 52a) 23-2400 W0(EN17)>W9(EN44 53a) W0(EN33)>W9(EN44 54a) 0153 VE8BY>VE6(529a)

Nov 20 0947-51 N8PUM>W1(FN43) K0KP>W1(FN43) 11-1200 W8(EN84)>W8(EN82) 1152 W0(EN37)>W8(EN82) 1250 W9(EN55)>W0(EN36) 13-1400 W8(EN73)>W0(EN36) W2(FN03)>W0(EN36) W3(FN24)>W0(EN36) W8(EN82)>W0(EN36) VE3(EN94)>W0(EN36) VE3(EN94)>W9(EN50) W3>W1(59a) 14-1500 W0(EN22)>W0(EN36) W0(EM49)>W0(EN36) W8(EM79)>W0(EN36) WA7X>W7(CN87) W8(EN72)>W0(EN36) W8(EN81)>W0(EN36) 15-1600 W9(EN51)>W0(EN36) W9(EN52)>W0(EN36) 17-1800 W6(CM98)>W7(CN85) W6(CM98)> W7(DM09) W0(EM09)>W5 18-1900 W7(CN85)>W7(DM09)(?) W2>W4(FM16)(NC) 19-2000 W2(FN30)>W4(FM16)(?) W9>W9(?) 21-2200 WB0RMO>W0(DN70 53a) 22-2300 W9(EN52)>W0(EN36) W3(FN24)>W1(FN42) W2(FN12)>W1(FN42) W2(FN20)>W1(FN42) W3(FM28)>W0(DN70 55a 1500miles) W8(EN91)>W1(FN42) W3(FM28)>W1(FN42) W0(EN22)>W0(DN70) W4(EM78 KY)>W3(FN00) W1(FN54)>W1 23-2400 VE3(EN93)>W4 W3(FM28)>W3(FN00)(?) W1(FN32)>W3(FM19) W3(FN24)>W9(EN62)

Nov 21 00-0100 W0(EN36)>W9(EN43) W8>W1(59) VE3(EN93)>W1(59a) VE8BY>VE3(FN04 599) 01-0200 W1(FN31)>W9(EN52) W9(EN42)>W9 0445K0KP>W0(DN70 55a) 1034 W0>W2(FN30 59) 11-1200 K0KP>W4(FM16)

Nov 22 2054 N8PUM>W8 22-2300 W8(EN84)>W0(EN36 59a) W1(FN33)>W0(EN36) W1(FN34)>>W0(EN36) 23-2400 W8>W3(mode?) K0KP>W8(EN82)

Nov 23 0354 W0(EN48)>W9(EN43 ?) 0412 VE8BY>VE6(559a)

Other Propagation Modes

In the Americas the story is much the same as in Europe. There were no reports of propagation between Europe and North America or the Caribbean. South America worked into Europe on 8 days: Iberia on all 8 (2002 17), the Mediterranean on 3(14) and Northern Europe on 2(2), with PY the most productive path.

Europe<>Mainland South 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
Med							+											+					+							
Iberia	+				+		+											+					+	+	+				+	
North																		+					+							

Europe<>South America

	Mediterranean	Iberia	Northern Europe
PY	3 days 7,18,23	8 days 1,5,7,18,23-25,29	2 days 18(SP) 23(DL)
LU		2 days 1,5	
ZP	1 day 7	2 days 5,7	
CE		1 day 29	
ZD8	2 days 23,25	5 days 23-25 28 30	1 day 23(DL)

North<>South America

Openings between North America and the mainland of South America were reported on 10 days (2002, 14). As usual, W4 and W5 were the most favoured but all except W2 had at least one opening. No propagation was reported from VE.

	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
	+			+										+	+	+			+	+	+	+	+							

North<>South America

LU	7 days 4(W4) 6(W4,W5) 14(W4) 15(W3) 16(W1,W4) 21(W4,W5,W6,W0) 23(W4,W5)
PY	3 days 19(W3,W4) 21(W4,W5,W6,W7) 23(W4,W5)
HC	4 days 15(W5) 16(W4,W5,W0) 20(W1,W3,W4,W9) 22(W4,W9,W0)
ZP	3 days 20(W1,W4) 22(W9) 23(W4)
FY	3 days 20(W4) 21(W4) 23(W0)
HP	3 days 1(W6) 22(W4) 23(W6,W7)
YV	2 days 1(W5) 21(W4,W6,W0)
HK	2 days 22(W4) 23(W5,W7)
CX	2 days 6(W4) 21(W4)
HC8	1 day 1(W8,W0)

There were no reports of propagation between North/Central America and Africa but the5T5SN was worked from PY on the 22nd, the TR0A beacon was reported from PY on the 3rd and 23rd

Americas<>Asia/Pacific

	South America	North/Central America
KH6	8 days 1(HP) 4(PY) 9(PY) 15(PY) 18(PY) 22(HC,HK,LU,PY) 23(HC,HP) 24(PY)	4 days 2(W6) 19(P4) 21(XE) 22(TI)
JA	3 days 4(PY,ZP) 10(CX,LU) ZP(22)	1 day 1(W6)
VK	1 day 18(HP)	
ZL		2 days 18(W5) 19(XE)

`

Nov 1 1830 ZY4>PY2 1923 48250(AS)>W7 20-2100 FY5KE>HP2 21-2200 KH6IAA,NH6YK>HP2CWB ZF1DC>W4,W5,HP2 HC8GR>AB5K 22-2300 YV4YC,YV4DDK>K5CM XE2>W4 HC8GR>N0EYE TI5KD>W4,W5,HP2 XE2HWB,KG6LIG,KH6SX>HP2CWB 23-2400 ZD8VHF,W6JKV/5>YV1DIG KH7T>KB6NAN,W6EGZ VKtv>W0 JR3DVL>W6KK

Nov 2 00-0100 NH6YK>KB6NAN 0201 W4>W3

Nov 3 22-2300 5T5SN>PY1 PU2WD,ZZ2TGR,PY5IP,PY2TVI>FG1GW 9Y4AT>PU2 23-2400 PY4LH,PY2FR,PY2PA>FG1GW TR0A>PT2GE PS7>PY4,PT2,PP5 NP3S>PY4 PY3,PP5>PT2 ZD8VHF>YV1,PT2 PP5>YV1 WP4NEG>LU,PP5 ZP5>PT2 PJ2BVU>PP5 TI5KD>LU

Nov 4 00-0100 PJ2BVU>LU PZ5>PP5 9Y4AT>PP5,LU JA6JKD>PP5JD ZD8VHF>YV1 PP5JD,PU2WDX>HP2 EH8BYR>PY5 01-0200 PY1,PY2,CE4>HP2 EH8BYR,9Y4AT,XQ3SIX>PP5 12-1300 W3>W3 20-2100 W1>W1 LU3DCA>K4UTE 21-2200 LU3DCA>KP4 2330-41 HP1AVS,HP1AC>PT2

Nov 5 00-0100 LU,ZD8VHF,CE3>YV1 17-1800 VP9DUB>W4 W6>W7(Es) 1816 VP9GE>W1 1913 W5>W0 22-2300 PS7>PY2 9Y4AT>PY5 23-2400 FG5FR>PY2 FY7THF,ZD8VHF>9Y4AT CT3BD>PY2,PY4,PY5

Nov 6 00-0100 ZLtv>W9 YV5>PY4 HP1AC>PY5 1649 W2>W1(t) 22-2300 LU3DCA,CX2AQ,LU3E,LU8DIO,LU2EE,LU7YS>K5CM CX3AN>AB4GG CX2AQ>K4EA,K9HMB CX4AAJ>K9HMB,K4PI W4>W2 23-2400 LW2DDS>K4EA W4>W9 W5VAS>W2 W0>W4

Nov 7 00-0100 W0>W3,W4 W2,W3>W5 KD4NMI>5 W4,W6>W4 W5>VE3,W9 C6AGN>W9 01-0200 W5,W4,W0>W4 W5>W0 1505 VP9DUB>W4 23-2400 FM5WD>LU PJ5BVU>LU,PP5

Nov 8 23-2400 LU1DMA,PY2SFY,LU9EHF>YV5

Nov 9 0009 PJ2BVU>PY4 21-2200 W1>W4(sc) W3>W4 23-2400 C6AGN>W4 NH7RO>ZZ2TGR,PY2EX

Nov 10 0109 YV4AB>PY2 18-1900 KQ4E>W4

Nov 11 00-0100 HK3>PP5,PY5,PT2 ZP5AA,LU9EHF,LU1DMA,LU8DCH,PJ2BVU,HP1AC>PT2 01-0200 HK3,HC3>YV1 HI8ROX>PY5

Nov 12 0116 W5VAS>W5 2227 CE4WJK>KP4

Nov 13 00-0100 KQ4E>W2 W4>W1,W2,W3 01-0200 W4>W3 W5>W5 1423 YN4SU>KP4

Nov 14 00-0100 PJ2BVU,PJ2BR>PY4 C6AFP>W4 01-0200 C6AFP>W0 W4>W5 1416 W5>W5 23-2400 W4>W1 C6AFP,K4AHO>W1 LU3EO>N3DB/4

Nov 15 00-0100 LU1DMA>W3 VE3>W4 W4>W1 01-0200 K4AHO>W1 YV4AB,KH6SX, TI2NA>PY2EX 1338 ZL3NW>W7GJ(eme) 15-1600 W8>W1 16-1700 9Y4AT>W5 17-1800 HC3AP>AB5A,KA5NEZ 18-1900 W5>W4 23-2400 CX4AAJ,CX3AN,PY2DSC,PJ2BV>FG1GW

Nov 16 00-0100 CX3ET>FG1GW PY7>PY4 1355 W0>W2(ms) 1446 W8>W0 18-1900 HC3AP>N3DB/4,K5CM HC2FG>N0JK 20-2100 ZLtv>W4 21-2200 LU1DMA>K7BV/1 LW3EX>W4SO 22-2300 LU3EX,CX5BW>FG1GW 23-2400 PJ7/K2GSJ>PY2 aurora

Nov 17 0137 W9>W9

Nov 18 00-0100 PJ2BVU>PY8,PY4,PY5 01-0200 PJ7/K2GSJ>PY5 02-0300 KH6IAA>PY2EX,PU2WDX W5>W5 15-1600 W4>W1(ms) 19-2000 IS0GQX,SP8SWL>PY1 2241 W3>W1 23-2400 PJ2BVU>PY4 VK2ZXC,FY1FL>HP2CWB

Nov 19 00-0100 W4>W3 W2,C6AFP>W8 01-0200 PJ2BVU>PY5 W2,W4>W4 W2,W4>W8 0645-8 W4>W4 14-1500 W3,W4>W1 15-1600 K6FV>W7 21-2200 TI5KD>W4 2255 FJ5DX>PY4 23-2400 PY1RO>N3DB/4,W3JO C6AFP>W3

Nov 20 00-0100 WP4NEG,P49MR>PY5 VP9GE>W4 01-0200 ZP6CW>N3DB/4,K7BV/1(150) FJ5DX>PU2 0319 V44KAI>HC2 04-0500 TI2NA>PY1 9Y4AT>HC2 aurora 19-2000 HC3AP>N1GC,AK3E 20-2100 HC3AP>KQ4QMI,K9SM XE2,XE1>W1 W5>W2 HP1AC>W1 21-2200 PJ4/PA3CNX>W3 FS/W3ARS>W0(bs),W8,W9 PJ4/PA3CNX>W1,W3,W9 FM5WD>W9,W5 KP4>W8 9Z4BM>W8,W4 KP2L>W9,W0 W3,W2>W3 FY1FL>N4GFO 22-2300 FY1FL>KD4K, N4NDR W2,W3>W3 W4>W4

Nov 21 00-0100 W4>W4 1359 W8>W5 14-1500 C6AFP>W1,W3 W4>W0,W5 W5>W8 W1>W4 VP9GE,VP9DX>W4 15-1600 W3>W1 VP9GE>W4,W5,W1 W4>W0,W5 YV4AB>N3DB/4 C6AFP,XE1KK>W1 W3>W3 W4>W6 PP5TO>W7GJ,K5CM 16-1700 PU2WDX>K5CM, K7YK,K6QG PP5TO>K5CM,K5YY,WD5K 9Y4AT>W3 LU1DMA>N3DB/4 47.9(CE)>W0 LW3EX>K0GU,N6KK LU2DEK>K5XX,K5CM LW3DX>W5GAI LU8EMH>WD5K 17-1800 LU9AEA,LU1DMA>N6KK PJ2/K8MFO>W6 9Y4AT>W4,W6,W0 YV4AB>K0GU,N6CA 18-1900 P49MR>W0,W4 TI5KD>W0,W6,W4 FY1FL>NW5E/4 PP5TO>NW5E/4 CO8LY,9Y4AT>W4 20-2100 TI5KD,TI5RVV,PJ2/K8MFO>W4 21-2200 LU3DCA,LU8DCH,CX5BW,HI8ROX>NW5E/4 22-2300 PJ2BVU>W4 W4>W1 W4SO>PY1RO 23-2400 W4>VE3,W3 9Z4BM>PY4 PJ2BVU,PY2FR,PY2TVI>HP2

Nov 22 00-0100 W5VAS,VE3>W4 W4>W3 ZP6CW>W9PJ KH6SX>LU2NI 01-0200 W4>W0,W9 W5VAS>W4 BYtv>PY1 02-0300 KH6IAA,KH6SX,8P9HW>HC3AP 03-0400 TI2NA,HP1AC> HC3AP 04-0500 W5>W4 1116 W7>W5 12-1300 N8PUM>W4 W9>W4 W5>W1 13-1400 W9>W4 W0>W1,W5 W5HN>W3 W7>W5 14-1500 K5AB,W0>W4 W2>W1 15-1600 WA7X>W0 W9>W6 W5>W4 VE3CDP/W9,K4RX,KM0A>HC3AP 16-1700 XE1JP,KA9CFD>HC3AP W5>W4 HC2FG>K0GU HC3AP>K4RX,K5CM,AA5XE K5AB>W0 K0UO>W4 17-1800 W5>W0 18-1900 XE1>KP4 19-2000 KP4>W4 20-2100 W1>W1 9Y4AT,PJ2/K8MFO>W4 HK4BKB>K4CIA 9Y4AT,HK4JRL,NL7AU/4>HP2CWB 21-2200 FY1FL,PJ2BVU,YY5,FY5KE>HP2 22-2300 PJ4/PA3CNX,NH7RO,KH6IAA,TI2NA>HP2 NH7RO>HK3JRPJ4/PA3CNX>HK3JRL 23-2400 HR1>KP4

Nov 23 00-0100 NH7RO>HP2CWB,HC3AP PY8>HP2 V31MD>W4 PY8AZT>N4WD,K5CM LU5VV>AE5B,AB4GG PT7VB>NW5E/4 YV1>PY8 KP4,VP5VAC>W4,W9 ZP6CW>NW5E/4 01-0200 W3,W4,W9>W9 HI3TEJ>W9,W4 PY8AZT>K4RX W4>W1,W2,W5 ZF1DC>W4 W2,KP3>W3 C6AFP>W4,W2 W5>W2 KP4>W4,W5 02-0300 W4>W0,W5 C6AFP>W8 KP3>W5,W4 14-1500 W8>W4 HC3AP>K5CM 15-1600 XE1>HP2 HC1AJQ>W5DN 16-1700 XE1>W5

AA7A,K6LIG>HP2CWB HK4BKB>AA7A,AA5XE XE2>HP2CWB,HK4BKB HC1HC>AA5XE,K5XX 17-1800 CO8DM>W4 18-1900 V44KAI>W0 KP4>W0,W6,W4 FY1FL,9Z4BM>K0GU 21-2200 KP3,PJ2BVU>W4 CEbc>W0 22-2300 TI2RPT>W4,ZF 47.9(CE),XE1KK>W4 PZ5>HP2 W0>W4

Nov 24 12-1300 KQ4E,VP9DUB>W1 13-1400 W4,W3>W1 C6AFP>VE3,W1 W9FZ,W3>W4 14-1500 C6AFP,VP9DUB>W1 W4>W2 15-1600 W0>W4 17-1800 W5,W0>W4 18-1900 W2>W3 CT3>PY4 23-2400 FS/W3ARS>PU2,PY2 P49MR>PP5

Nov 25 00-0100 FY1FL>PY2 YY5>PT2 W0>W4 1328 W9>W1 14-1500 W4,W5,W9>W2 16-1700 W5>W6 17-1800 W5>W6 18-1900 47.9(CE)>W4 2142 VP9GE>W4 2335 VP5JM>W4 LU1FA>KP4

Nov 26 0024 W3>W1 0151 W0>W4 02-0300 W0>W4,W0 23-2400 CX3AN>KP4 FS5UQ>PU2,PY4 W4>W4

Nov 27 00-0100 ZZ2TGR>KP4 FS5UQ>PY8,W7 01-0200 W4>W4 0232 W0>W0 1448 W8>W8 1514 47.9(CE)>W4 16-1700 W1>W8 17-1800 W8>W1 W3>W4 1858 TI2NA>HC3AP 19-2000 HP1AC>HC2FG

Nov 28 01-0200 W0>W8,W2 W9>W8 TI5XP>PU2 9Y4AT>PY4 03-0400 W8,W9>W4 W4>W0 1648 W4>W3 1740 FS/N7DD>W2 2330 W4>W4

Nov 29 0000 W0>VE6 0216 W4>W4 04-0500 W9>W4,W9 22-2300 FJ5DX>FG1GW 23-2400 CT3EN>PY4 CT3DL>ZP6

Nov 30 00-0100 W0>VE6 W9>W0 01-0200 K0KP>VE6 W7>W5 WB0RMO>W0 1705 N8PUM>VE6 19-2000 K5AB(Es),48.0(CE),W5RP(Es)>W0

Asia/Pacific

Japan

JA(all call areas)<>VK(all call areas)

	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
	+	+	+	+	+	+	+			+	+		+	+	+	+	+	+	+	+		+	+	+		+	+	+		

A notable feature of this month's results is that VK was heard/worked from JA on 23 days, compared with reports on 17 days in 2002. However, openings were often limited to one or two call areas, with none accounting for more than 15 days. New Zealand dropped from 14 days to 11.

Japan<>VK,ZL

VK2	7 days 4 13 17 23 24 28 30
VK3	6 days 1 13 19 22 24 28
VK4	12 days 1 2-5 13 14 16-18 20 28
VK5	1 day 27
VK6	15 days 1 3-7 10 11 15 16 18 20 26-28
VK7	3 days 13 19 20
VK8	10 days 1 3 4-7 15 18 20 27
ZL1-2	5 days 1 3 19 20 25
ZL3-4	10 days 1 3 11 12 14 16 19 2022 26

6m DX results in JA during November from JA1VOK

DATE	TIME(UTC)	STATIONS
11/	1 0000-0500	C21SIX/b, DU1BP, AH7G,KH6SX,KH7R,NH7RO,KH6/K9FD, KH6HI/B,KH6HME/B, V73MJ, VK3SIX,4ABW,8MS,8RAS/b, ZL1VHF/b,2AAA,3TY,3DAC,3TJZ,4AAA
	0510-1400	9M2TO, 9M6OO,9M6AAC, BD7OH, BV7JG, DU1BP,1EV,M7ET/DU7, FK8FZ,8HA,8SIX/B, KG6DX, VK4,6, VR2XMT,ZXP, VU2LO,VVP,XU7ACE, YB5QZ
	0736-0745	5B4FL (JR6(PL24)
	1020-1100	S21YY (JA6(PL47)/JR6)
	2300-0100	XQ3SIX (JA8), CX4CR, LU6DRV,1DMA/b,9EHF/b, AH6RE,KH6SX, KH7T, KH6/K9FD,KH6HME/B, K6LIG,N6XQ,W6KK,W6YM,W6QUV, V73SIX/B
	2320-1500	9M2/JI1ETU/b, C21SIX/b, DU1BP,1EV,N7ET/DU7, FK8CA,8EB,8FZ,8GZ,8SIX/B, FO5RA, S21YY, V73MJ,SIX/B, VK,4,6,8, VU2LO, VR2XMT, XV3AA, YB5QZ, ZL3NE/1,1VHF/b,ZL2TPY,4AAA
2	1100-1130	9J2KC (JA6(PL47)/JR6)
3	0155-0930	3W22S, 9M2TO, 9M6OO,9M6AAC, FK8EB,8SIX/B, V73SIX/B, VK4, ZL3NE/1,1VHF/b,2AAA,2ACE,2AGI
	1315-1430	9M2/JI1ETU/b, VK6RSX/b,VK8 (JA6/JR6)
	2325-0000	V73SIX/B
4	0020-0200	PP5JD,PU2WDX,PY5IP, ZP6CW (JA6/JR6)
	0130-1300	9M6AAC, 4F8BOF,DU1EV/B,N7ET/DU7, FK8EB,8SIX/B, V73SIX/B, VK2,4,6RSX/b,8RAS/b, XV3AA, YB1BGI,0PH
	0256-0330	KH6SX,NH7RO,KH6HME/B
5	0030-0400	FK8SIX/B, VK4,8RAS/b
	0640-0700	VU2LO (JA6/JR6)
	0810-1030	VK6RSX/b, XV3AA
	1150-1600	9M2TO/B, 9M6AAC, DU1EV,N7ET/DU7, KG6DX, VK6RSX/b
	1300-1310	VU2LO (JA6/JR6)
6	0210-0600	DU1EV/B, FK8SIX /B, V73GOD,SIX/B, VK8RAS/b
	0714-1230	9M6AAC, DU1EV, VK6RSX/b
	0715-0800	VU2LO (JA5-6/JR6)
7	0020-0110	KH6SX,KH6/K9FD, V73SIX/b
	0420-0600	DU1EV, VK8RAS/b
	0750-1050	VK6RSX/b
8	0155-0600	DU1EV/B, FK8SIX/B, V73SIX/B
	1045-1500	9M2TO/B,9M2/JI1ETU/b, DU1EV/B,DU1/GM4COK,N7ET/DU7, YC1EHR,YF1OO/B (JA6/JR6)
9	0240-0800	BG9BA, DU1EV,N7ET/DU7, FK8SIX/B,FK8HA/MM, V73SIX/B
	0505-0600	VU2LO (JA6/JR6)
10	0315-0530	DU1EV/B, V73SIX/B, VK6RSX/b
	0830-1000	VK6RSX/b
	2232-2315	CX2LI,4AAJ,9BBG, LU2DEK,9DTC,9EHF/b,LW3EA
11	0210-0330	DU1EV/B, HL1LTC, ZL3TY,3SIX/b
	0730-0830	DU1EV, VK6RSX/b
	2145-2300	V73SIX/B
12	0145-0400	DU1EV/B, FK8SIX/B, V73SIX/B, ZL3SIX/b
	0700-0730	YB0ASG,YF1OO/B
	2300-0015	KH6HME/B, V73SIX/B
13	0320-0845	DU1EV/B, V73SIX/B, VK2,3,7RST/b 1000-1010 VK4ABW
	2230-2330	V73SIX/B
14	0225-0330	VK4BLK, ZL3NW,3TY,3SIX/b

15 0800-1000 DU1EV,DU1/GM4COK, K8VR/KH2, VK6,8RAS/b
16 0145-0800 BN0F,BV2NT,BW0IR, FK8SIX/B, P29KFS, V73SIX/B, VK4,6, ZL3TY
2210-2300 V73SIX/B
17 0029-0140 6K2DHP,HL1LTC
0150-0630 DU1EV/B, FK8BG,8GX,8SIX/B, V73SIX/B, VK2,4
2229-0000 V73SIX/B
18 0520-0730 VK4,6,8RAS/b
0940-1135 9N7SZ, DU1EV/B,VK6RSX/b
19 0130-0630 V73SIX/B, VK3DUT,7BBW,7RST/b, ZL1TMF,3NE/1,1VHF/b,
ZL2AGI,2TPY,3JT,3TY,3TJZ,3SIX/b
20 0344-0700 VK4,7AN,7RST/b,8RAS/b, ZL2TPY,3NW,3TJZ,3SIX/b
1020-1330 BG9BA, DU1EV/B,DU1/GM4COK,N7ET/DU7, VK4,6,8MS, VR2XMT
22 0130-0700 C21SIX/b, DU1EV/B, V73SIX/B, VK3SY,3OT, ZL3TY,3SIX/b
0157-0200 KH6SX, ZP6CW (JR6)
23 0230-0730 N7ET/DU7, DS4DBF,HL5BMX, VK2DN,2QF 2320-2340 C21SIX/b, V73SIX/B
24 0400-0530 VK2DN,BHO,BPL,FHN,3DUT
25 0250-0600 C21SIX/b, V73SIX/B, ZL1VHF/b
26 0545-0930 9M2TO/B, VK6JQ, XV3AA, YB0CBI,YB5QZ,YF1OO/B ZL3JT,
27 0530-0930 VK5ZMB,6RSX/b,8RAS/b, XV3AA, YF1OO/B
28 0450-0930 3W22S, 9M2TO/B, VK2,4,6, XV3AA
29 0400-0430 C21SIX/b
0912-1000 3W22S, HL5BMX, XV2NA,2XAY
30 0420-0530 V73SIX/B
0620-0800 VK2,3XQ,3AMK
0932-0945 XV2NA

Elsewhere

Auroral reports from Australasia are relatively uncommon, not least because of the lower geomagnetic latitude of the land-masses. By VK standards this was a substantial event. It looks as if this aurora should have been workable from at least the south island of ZL but there were no reports - nor were there from northern Asia.

Nov 1 1056 VU2VVP>VR2 12-1300 A61AH,VU2LO,JA6>VR2
Nov 2 03-0400 FK8EB,FK8SIX>HL1 0424 KH6SX>VR2 0526 ZL4AAA>HL1
Nov 3 13-1400 A61AH>VR2 16-1700 FR1GZ>A61AH 23-2400 DS1>VR2
Nov 4 01-0200 PY2WDX>NH7RO 08-0900 JA6YBR>9M6AAC
Nov 5 0813 VK6JQ>YA1D 1155 VK6RSX>A61AH 1232 VU2VVP>VR2
Nov 6 0730 9M6AAC>HL1
Nov 7 0031 JA6>KH6
Nov 8 0653 VU2LO>VR2
Nov 9 1400-1552 VQ9SIX>A61AH
Nov 14 00-0100 VK4>VK3 0146 49752>VK3(sc) 0404 VK4RGG>VK3 2306 V73SIX>KH6
Nov 15 VK6HK>KH6,VK3
Nov 16 0923 KH2/K8VR>VR2
Nov 17 0025 JE7YNQ>HL1 0104 JA1ZYK>HL1 02-0300 FK8SIX,VK4,FK8GX>HL1 0315 JA1>HL1
Nov 18 2214 W5OZI>ZL3JT
Nov 19 05-0600 VK3>KH6 0818 VK4>ZL2 21-2200 VK3,XE1/KG6UH>ZL3 VK2>VK3(bs) P49MR>NH7RO ZL3SIX>VK3 2253-4 ZL3SIX,ZL4,VK2>VK3 2315 ZL2>VK3
Nov 20 0051 ZL2>VK3 01-0200 ZL1VHF,VK4RGG,ZL2MHB>VK3 0252 VK2>VK4 04-0500 FK8SIX,FK8CA,VK4RGG,VK5,VK7,ZL3>VK3 FK8CA>VK7 05-0600 KH6,VK7,FK8>VK3 KH6>VK7 07-0800 49750,FK8SIX>VK3 08-0900 49750,9M2tv>VK3 1012-5 VK2tv>VK3(55a 125) 2100 VK7RST>VK3OT(57a/AE 150) 2109 VK3DUT>VK3OT(57a) 2110 VK7JG>VK3OT(59a/AE! 150) VK7RST>VK3(557 AuEs!?) 2156 VK7AN>VK3(59a 160)

Nov 21 06-0700 VK2ZXC>VK3OT(AE/bs) VK7VK>VK2APG VK7KRR(QE38)>VK3OT(57a) VK7RST>VK3OT(57a 165) VK2APG>VK3OT(42a) VK7BBW>VK3OT(57a) VK7JG>VK3OT 21-2100 TG9SO,PY2PA,PY2CDS/2,PY1RO,PY2SFY>NH7RO 2252 XE1BEF>NH7RO

Nov 22 00-0100 PY2TVI,PY2AIM,PP5TO/5,PP5VB>NH7RO 01-0200 VK8RAS,VK4,JR0YEE,JE7YNQ>VK3 VK4>VK2 02-0300 JA2>HL1 JA1>VK3 VK5>KH6 04-0500 VK8RAS,NH7RO>VK3 05-0600 VK4>KH6 KG6DX>HL1 2257-8 HK4BKB,TI5XP>NH7RO 2335-43 TI2NA,TI5RVV>NH7RO

Nov 23 0017 HP1AC>NH7RO 0220 JA1>VK3

Nov 24 01-0200 PY2BT>NH7RO 07-0800 VK6RSX>YA1D

Nov 26 0024 ZL2tv>VK3 09-1000 VK4RGG,ZL1VHF,ZL2,ZL3>VK3 VK2>ZL3 10-1100 VK3,VK5>ZL3

Nov 28 05-0600 VK2,XV3AA,VK4>HL1

Nov 30 2250 ZL2MHB>VK3

Beacon News and 28 MHz Worldwide

Compilation and Commentary by G3USF

Beacon News

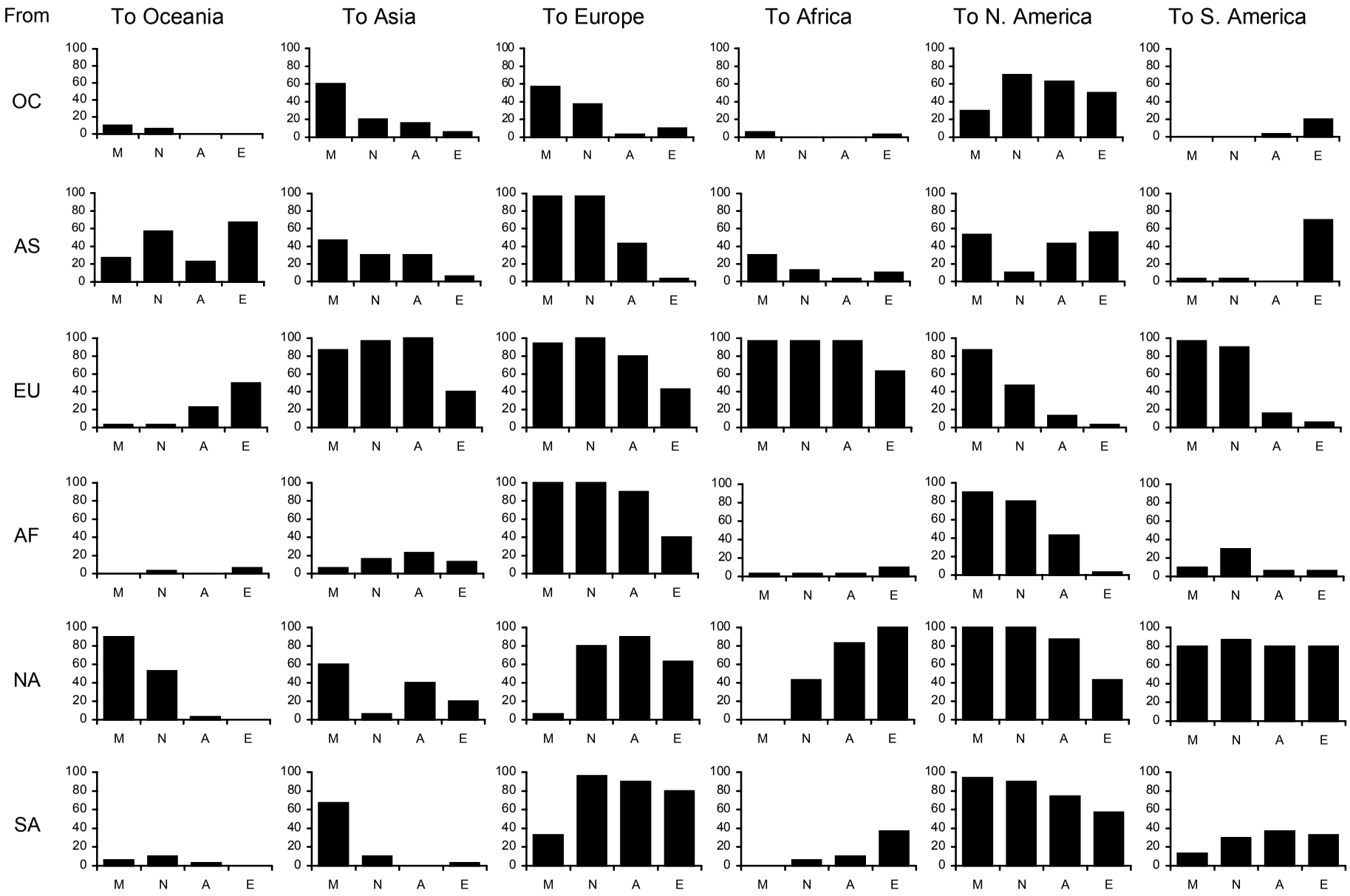
3602.000 ZL3JE Pareora another 'precision beacon' testing propagation at weekends with 4 watts to 1/2 dipole with transmissions every ten minutes
50288 VK2RVH now back and running 25 watts to turnstile from Mt Sugarloaf near Newcastle NSW, locator unchanged.

28 MHz Worldwide

It is not clear whether there actually was more auroral-related propagation on 28MHz in November, or whether, after the big October event, more stations were aware of the possibilities. At all events, there were reports on several days, where usually we have had few or none. On the 28th, between 0943 and 0945, DJ7KG reported ZL6B, RR9O, VR2B and DL0IGI auroral, noting particularly a 'spread' of about 200Hz on VR2B. On the 20th tone A or what must surely have been AE propagation stretched over many hours from around 1549 in Europe and from 1817 in North America. A plus point for 28MHz is that, unlike 50MHz, it is possible to identify coverage into parts of the former Soviet Union which as yet do not authorise Six-metre operation. Countries reported included OH, SM, G, GM, DL, SP, LA, OK, OZ, PA, OE, EW, HB, OY, EU, LY, GW, EA, YL, UA1, UA6, UA9 and S5. Noted particularly were KD4MZM<>EA7UU 'very strong' just after 1900, LA6BB<>EA1WX at 1953 OH6HOW<>UA6LV(loc?) at 1955 and UA1AKJ<>UA6LV at 1957, followed by ON4UN<>NY4A 559a at 2102. OZ5MJ reported a contact with PP5TO/p at 2119 (no report). There followed DL1IAQ<>W4ZV, W2UP<>DJ3XD, W1MK<>ON4IA, W1ME>RA9CO, W2UP<>OZ8ABE, NY4A<>G5LP(579a) between 2123 an 2214. Ws were then reported into PA, OZ, SM, DL and LP until around midnight UTC. However, John, GM4WJA, an ace spotter in matters auroral, noted that none of the North Americans reached his location. He notes similarities between this event and openings discussed here a year or so back. Within North America there were very few specifically auroral-related reports, though KL7FDQ/7 in Montana reported several beacons with flutter around local noon (GMT -7) and WJ5O noted 'backscatter' on a number of beacons during his afternoon in Texas. In similar vein, SK5AE reported DF0AAB and SK7TEN auroral 2213-18 on the 21st and LA4TEN, LA5TEN by auroral E on the evening of the 22nd. Also on the 22nd UA1ALI reported OH9TEN 59+20 at 1835 - almost certainly by AE. DJ7KG had DL0IGI auroral on the morning of the 18th, at 569a at 1244 on the 25th and auroral 1050-1305 on the 30th.

In all, with its combination of geomagnetic activity but relatively high flux levels, November turned out better than might have been expected. Paths to Africa and South America were open at some part of every day, and there was also propagation within Europe every day (if au and AE are included), as there was within North America. Europe<>North America was workable on 25 days, with results not all that different from 2002, thanks in part to the easier paths from southern Europe. Europe<>Asia was also workable daily, though there was a marked falling off in the evenings - observable over several other intercontinental paths. Europe<>Oceania was down on 2002, particularly long path, where geomagnetic activity took a heavier toll, the results again being bolstered by easier Southern and Eastern Europe routes. Paths from North America held up quite well, though North America<>Asia remained notably weak.

28 MHz Worldwide - November 2003



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