THE SIX AND TEN REPORT

December 2003

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Analysis of 28 MHz reports from the UK

28 MHz reports and logs for December 2003 from G2AHU, G3IMW, G3USF, G4TMV, G4UPS, G0AEV, G0IHF, GM4WJA and packet cluster reports. Compilation and commentary by G0AEV.

Solar activity levels slipped a little lower this month and there were fewer geomagnetic disturbances: there was little discernible effect overall on the DX capacity of the 10m band. Shifts in the observed propagation patterns have more to do with season than the overall decline in sunspots and solar flux. Mid winter provides the best opportunities for contacts on paths within the Northern Hemisphere, for example from UK to Russia and to North America. Openings to USA and Canada in December were the best since the early part of 2003, and the RR9O and OH9TEN beacons were heard on nearly half of December days. However, short F2 skip to central Scandinavia, common at this time of year near solar maximum, were not attained, and there were only rare occasions when propagation on northerly paths made it as far as Japan, eastern Australia and New Zealand.

Winter sporadic E at 28 MHz was reported on 14 days - unusually 6m Es results were much poorer than those for 10m indicating that E-layer MUFs were commonly peaking at frequencies lower than 50 MHz. The normal pattern is that the majority of Es events identified at 10m are also detected at 6m.

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.

The graphs on the following page depict average daily propagation trends for all European beacons heard by 6&10 reporters in December 2004. The propagation modes involved were normal direct-path F-layer, F-layer backscatter and sporadic E. ER1AAZ, OH9TEN and SV3AQR were heard by single hop F2. OH9TEN was also heard by F-layer backscatter, and backscatter was responsible for all the results of EI0TEN and F5KCK, and contributed to the results of the DL and OK beacons. Backscatter is nowhere near as prominent these days, a direct reflection of lower levels of ionisation.

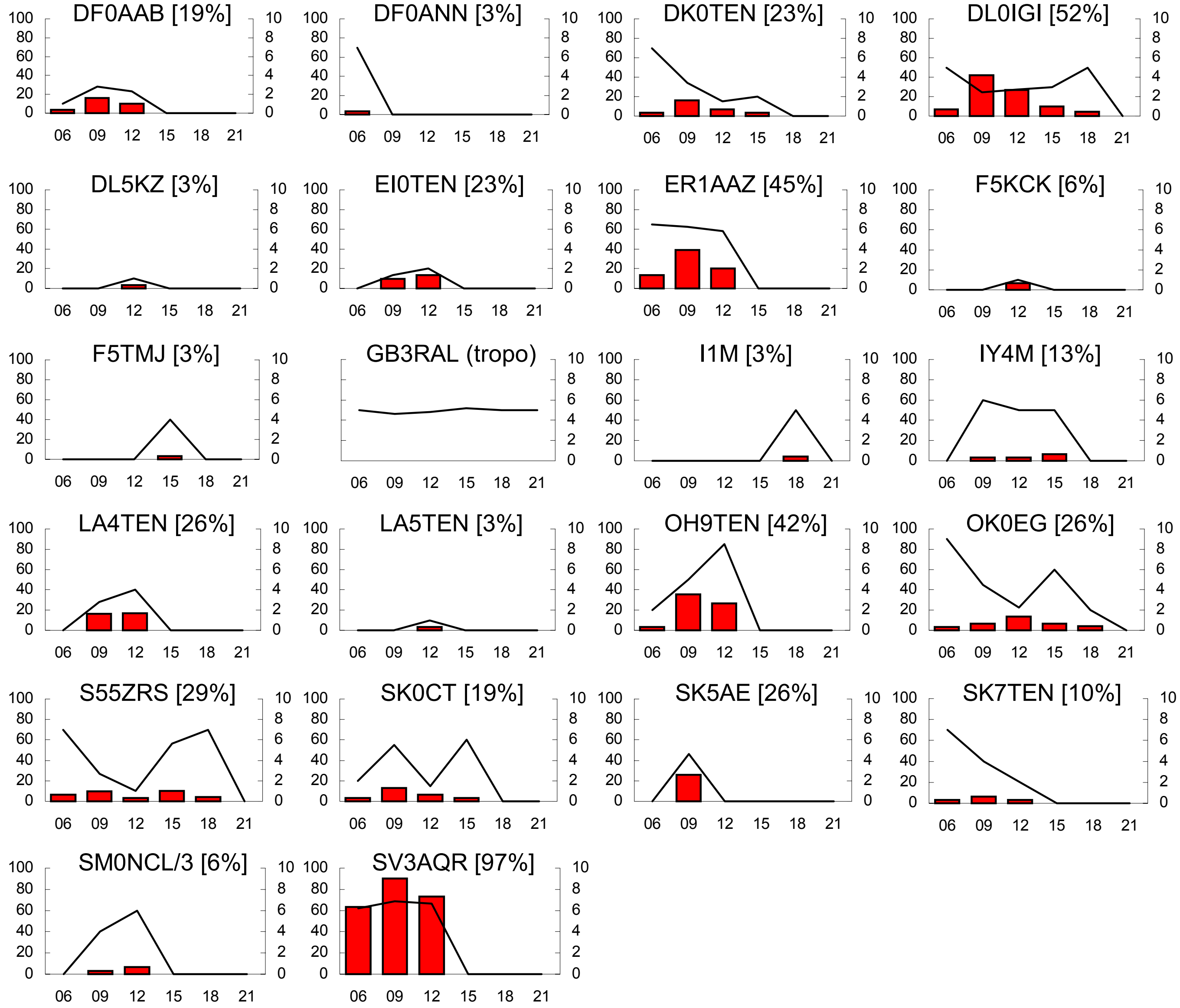
Beacon monitoring suggests that the best days for Sporadic E were 6th, 21st and 27th. Surprisingly there were no reports of 10m beacons via Es on 13th or 14th during the ARRL 10m contest when there were several very good sporadic E events, and when Es was reported at 6m. All beacons not specifically mentioned above were heard, either entirely or predominantly, by sporadic E. No aurora or auroral E propagation was noted this time. GB4RAL was heard via the troposphere at G0AEV.

European Beacon Notes.

The twenty-two beacons heard by UK reporters this month represent the majority of European beacons believed to be QRV. Of the others, DF0THD is rarely heard (and in any case is believed to be going QRT at the end of December), LA6TEN in northernmost Norway was heard in January and is QRV, while PI7ETE is only heard via short skip Es and is assumed to be operating. OH2B, however, is still QRT.

Breaking news: new European beacon EA4DAT running 5w from IN80VB (central Spain) on 28.263

European Beacon Graphs.



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

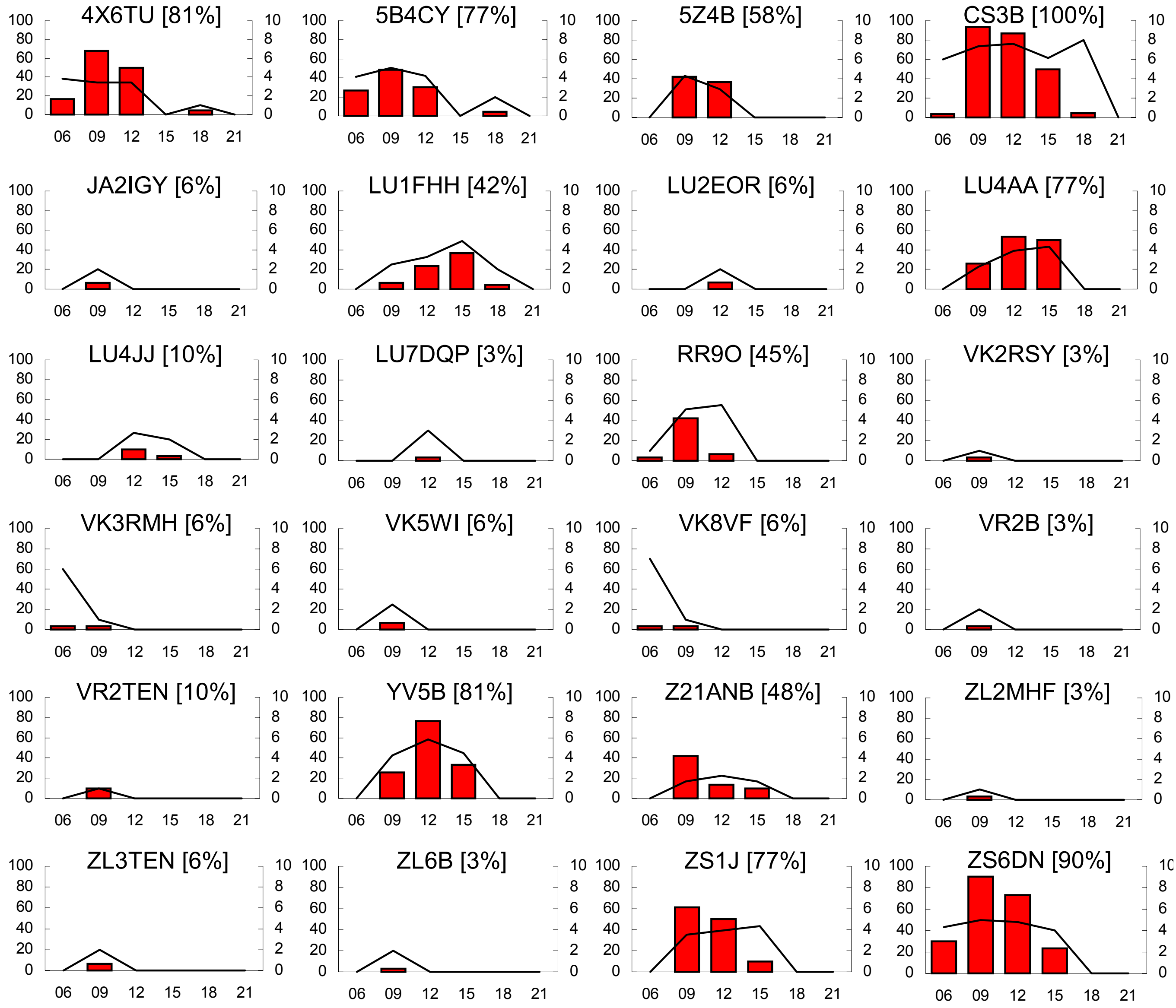
Suggested propagation modes. The graphs on the next page show monitoring results for 24 beacons via direct short path F-layer propagation. There was no indication of long path, side scatter or TEP.

Propagation held up well on F2 circuits to the south with single hop (as indicated by the CS3B) achieving a daily reliability of 100%, while multi-hop to ZS6 was detected on 90% of days. Reliability of paths to South America were a little lower than in November, except for YV5B, the most reliable beacon on this continent in December. Single hop to the Middle East (4X and 5B) also continued to do well.

Winter propagation brought an improvement for the second month running in the number of beacons heard from Australia, New Zealand, the Far East and Japan, albeit at the low reliabilities of only one or two openings per month. Still, 4 VK, 2 VR, and 3 ZL beacons represents an unexpectedly good tally. As indicated in the introduction to this section of the Report, the results from RR9O are an improvement on those from recent months, but consistent with seasonal propagation trends.

Beacon Notes. Although 4S7B was reported elsewhere as being active this beacon has not been heard in the UK. This can not be blamed on poor propagation alone. OA4B is still QRT. LU7DQP, LU4JJ and LU2EOR are all QRV but were heard at reliabilities much lower than LU1FHH and LU4AA. Once again, the absence of any reports of VK6RBP or VK6RWA does not fit with the expected patterns. VK6 propagation should be significantly superior to that for eastern Australia.

World Beacon Graphs.



10m DX in December 2003

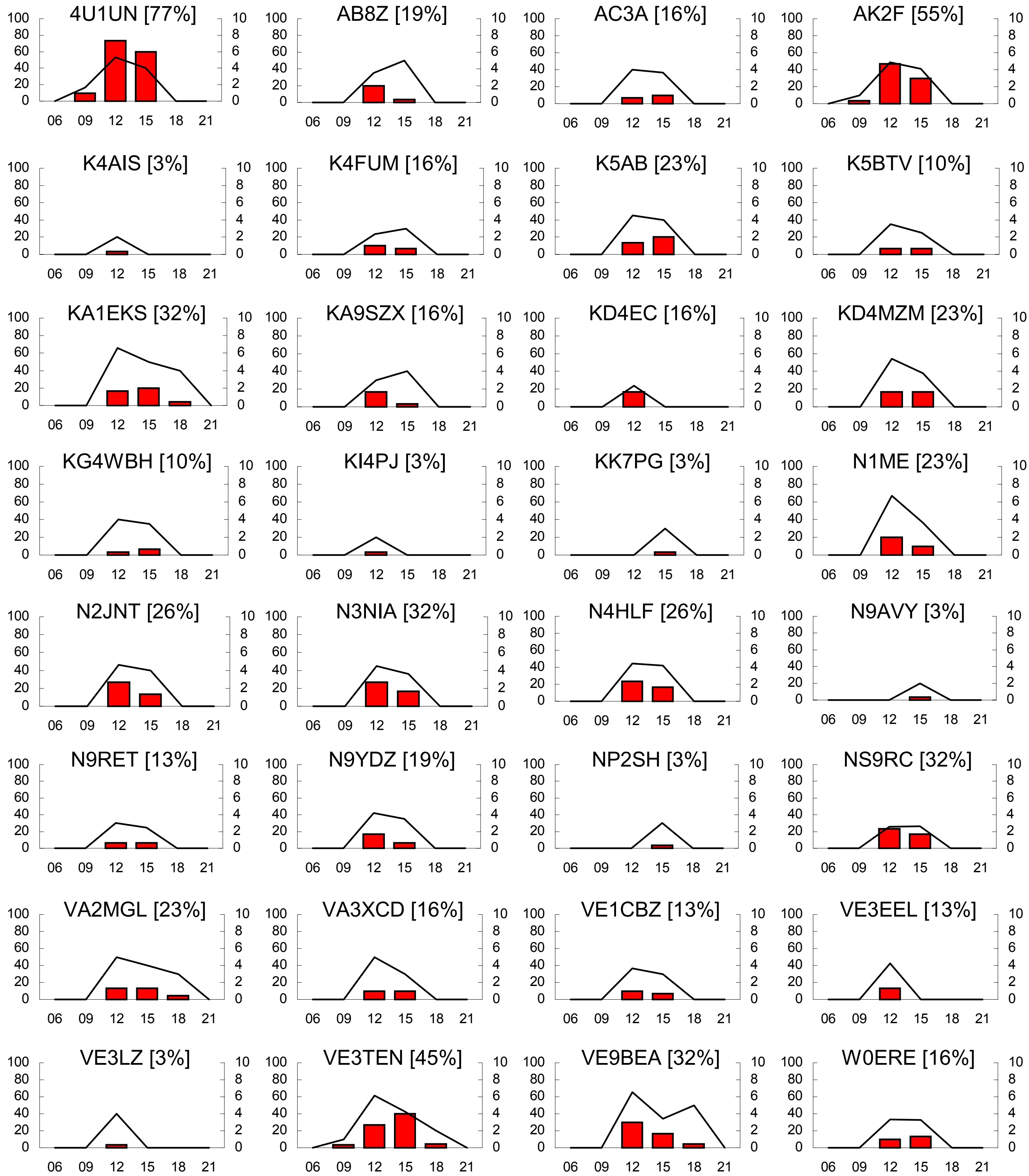
The following list of DX countries worked or heard in the UK data in December 2003 comes from packet cluster spots (DX Summit: http://oh2aq.kolumbus.com/dxs/) and from the logs of GM4WJA , G0AEV and other reporters.

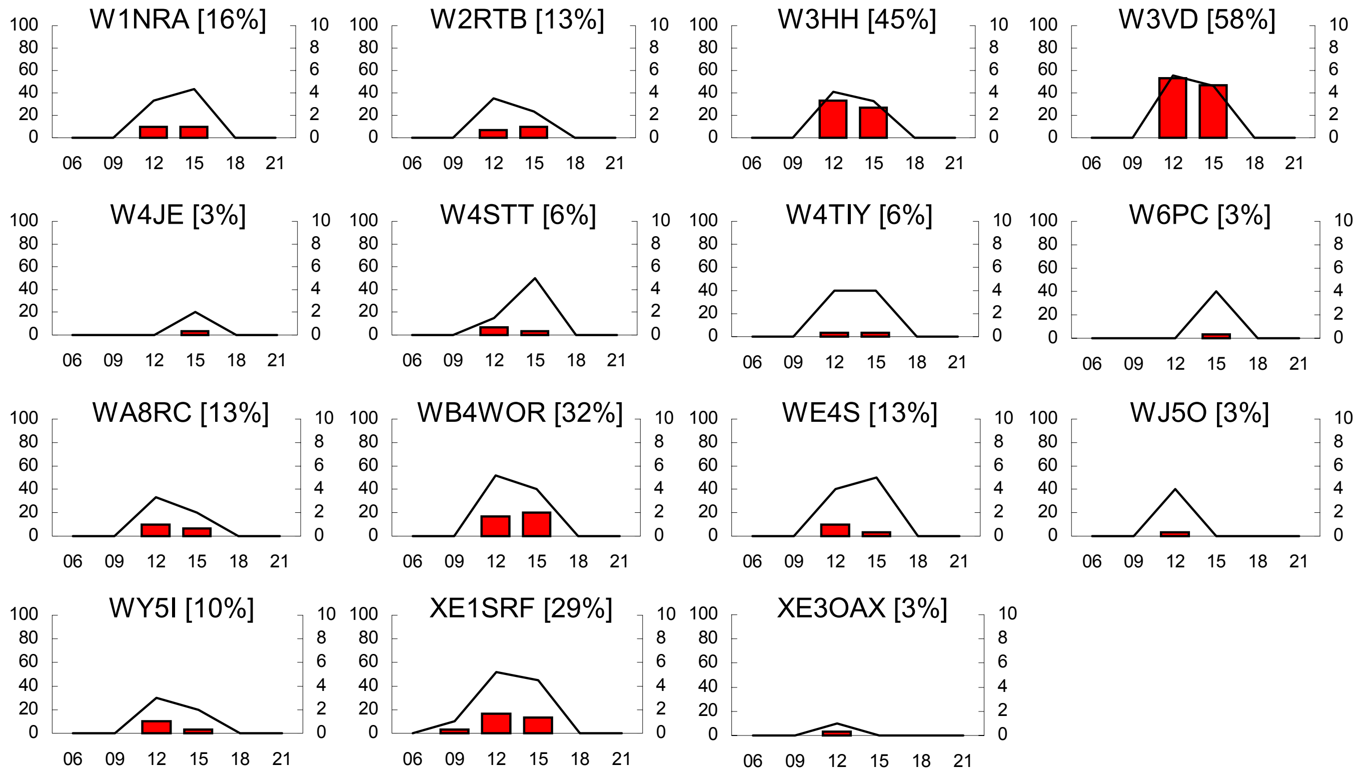
DX in December: 3B9, 4L, 4S, 4X, 5B, 5U, 5V, 7X, 9G, 9K, 9Y, A4, A6, BY, C6, CN, CO, CP, CT3, CX, DU, EA8, EK, EX, FH, FR/j, FY, HC, HC8, HI, HK, HP, HR, J8, JY, KG4, KP2, KP4, LU, OA, P4, PJ2, PJ7, PY, PZ, ST, SU, TA, TI, TG, UA9/0, UN, V3, V5, VE, VK, VK9C, VP8, VU, W, XE, YB, YN, YV, Z2, ZC4, ZD7, ZF, ZS.

December's list benefits from the additional activity generated by the ARRL 10m contest. Despite this contest taking place in the middle of the month when solar activity was at the monthly minima, propagation extended (just!) from Britain to all parts of the World except the Pacific, Japan and the NW of North America. Much of the propagation to USA and Canada was on skewed (side scatter) paths, so conditions could hardly be described as good. Interestingly, CW operators had distinctly better propagation to USA than SSB operators (working further west, and northwest) – an example, perhaps, of the advantage of a 0.5 MHz frequency difference when path MUFs are close to 28 MHz.

Propagation to North America

North American Beacon Graphs





Suggested propagation modes. All beacons reported were via normal F2, with the possibility of some side scatter from 4U1UN. As expected for mid-winter, propagation was best near the middle of the day (more accurately, midday at the path mid point – i.e. early afternoon GMT) when ionospheric critical frequencies are, on average, at their highest (see Chilton critical frequency data tabulated in Section 3). Evening propagation to North America was almost completely absent – the short winter days precipitating early band closure.

The trend towards better propagation with proximity to mid-winter that we have been charting in these pages continued in December. The improvement is represented by an increase in the total number of beacons heard and by increases in the daily reliabilities on most of the individual beacons heard. The improvement did not extent to West Coast propagation – only W6PC was heard and there was nothing at all from W6WX in December – more a function of the band closing early during short winter days (as alluded to above) than to ionospheric conditions.

The table below illustrates the North American propagation trend by showing the number of US and Canadian beacons reported in the last 4 months. Its clear that these data bear no relationship to changes in solar activity as represented by 2800MHz solar flux

Month (2003)	Number of Beacons	Monthly Solar Flux
September	34	112.3
October	37	153.1
November	46	140.8
December	47	115.1

Beacon Notes. As indicated last month, two new beacons to look out are NP2SH (28.275) in the US Virgin Isles and KP4SQ (28.250) on Puerto Rico. Several new US beacons have been placed on the air recently but none have been heard in the UK – see G3USF's beacon news in Section 5 for details.

Analysis of 50 MHz reports from the UK

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

Last month there were good aurora, some unusually good sporadic E and one or two very marginal DX openings – not outstanding by any means, but these results look rather good in comparison to December's very slim pickings. There was no DX to be had in December, the aurora were rather weak affairs and the sporadic E openings were not as good as those in November. Under these conditions perhaps the Geminids meteor shower could have attracted more attention but, with a few exceptions, only JT6M enthusiasts seemed to be interested.

Despite poor returns for their efforts, Six and Ten reporters continued to monitor 6m conditions on a daily basis. Eric G2ADR (IO93) was rewarded with only a single positive observation - Spanish stations in the 18z period on the 11th. Further south, G3HBR found a little more to report. Brian also caught the sporadic E opening to Spain on 11th (EH5 stations with S9+ signals) and he later managed LY on 21st and YU and LZ on 23rd (when conditions were better than activity levels seemed to suggest). Ted G4UPS had similar results – EH5 on 11th, 9A on 13th, LY, OZ and SP on 21st, and LZ on 23rd.

DX (F2 and TEP) Propagation

Last month I wrote "6m DX openings (to the UK) are rare under current solar activity levels and presumably only take place because of some exceptional circumstance". Unfortunately no such exceptional circumstance was operating in December 2004. Lower solar activity was not the only reason why this was so: part of the answer may have been the absence of decent sporadic E linking events.

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.

	9H (3%)	CN (6%)	CT (3%)	DL (3%)	EA (6%)	F (10%)	I (6%)	LA (3%)	LZ (3%)	OE (3%)
D	28	11 28	28	14	11 28	11 14 29	14 27	14	23	27
06							5			2
09						9 0				
12						2				
15	0	9	9		7 9		9		9	
18		5		6	9	5 2		0		
21		3								

	OZ (6%)	PA (6%)	SP (6%)	SV (3%)	YO (6%)	YU/9A/S5 (10%)	
D	14 21	11 13	21 27	13	13 23	13 23 27	
06			3			7	
09	6	0	6				
12							
15				3	3 7	9 0	
18	0	2		5	3	9	
21							

Sporadic E Summary.

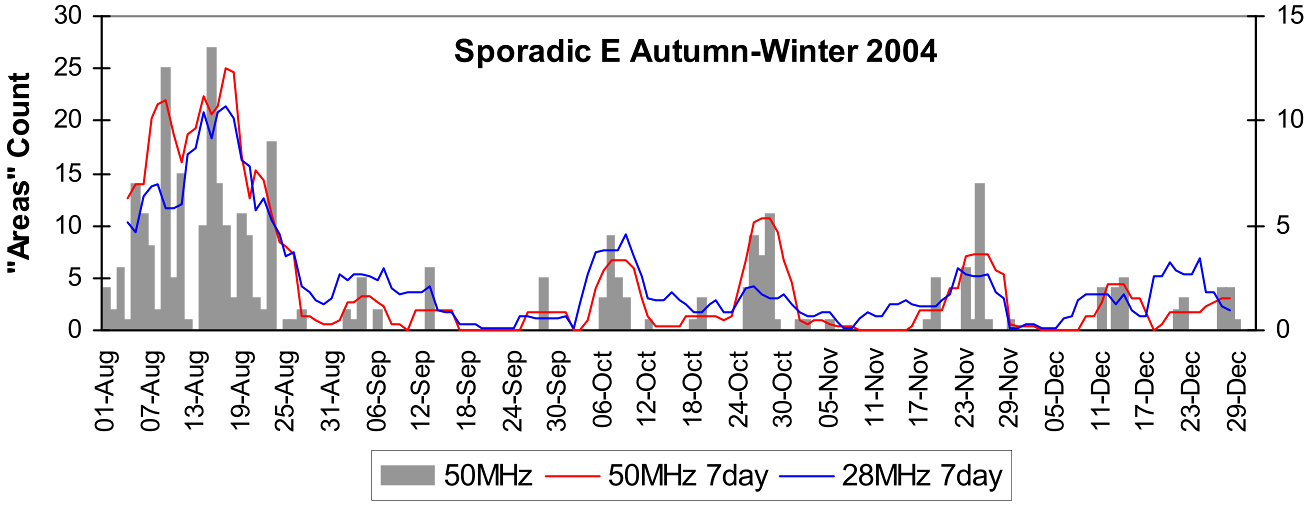
The table below displays total counts of country areas heard/worked, a summary of the detailed tables.

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
06																											4				
09											2										2								1		
12											1																				
15											1		3	1									3					4			
18											3		4	4																	
21											1																				

It's difficult to identify any sensible trends with so little data. However, Es events appear to be "concentrated" in the period 11-14 and again, less evidently, towards the end of the month. The former concentration occurred within a period of moderate geomagnetic disturbances.

Putting December's openings into context, the graph below shows 50 MHz sporadic E country/area counts for each day from 1st August to 31 December 2004 (grey graph bars, left hand y-axis). Also shown in this graph are two lines (right-hand y-axis) showing the 7-day moving average of areas via sporadic E on 50 MHz and 28 MHz.



The end of the summer Es season in late August is followed by a period of no propagation in mid September. Subsequently there were small peaks of Es activity centred on 8th October, 27th October, and 25th November (the latter possibly including events related to auroral activity). The December Es events have no convincing centres of activity – not only that, but 28 and 50 MHz data diverge in December. A ten metre Es "peak" in mid December has no real manifestation in the 50 MHz data. Geomagnetic disturbances might have had some controlling influence on the timing of Es events but was difficult to see in a preliminary comparison with Ap data. Sporadic E activity appears not to show any distinct autumn-winter seasonal peak, and in this respect 2004 is somewhat atypical.

Tropospheric propagation

Assuming my mode-interpretation is correct, some good DX via "tropo" was worked in December

15th	0054	M0BCG (IO91) > LX0SIX (JN39) 559 (*presumed tropo*)
	0113	M0BCG > PI7SIX/BCN "in/out" (*could be meteor scatter - Geminids?*)
26th	1404	M0BCG > GM8BBA (*no details – tropo in absence of other propagation?*)
28th	1502	MW1MFY (IO81) > ON4IQ (JO20)>jo20
	1528-1556	M0CTP (IO93) > OZ3CR, OZ1DPR 57 (JO45), < DL8YHR (JO41) (*tropo?*)
29th	1529	PA2DB (JO22) > M1MHZ (IO92) 52

Meteor Scatter

Meteor scatter by via traditional (CW, Phone) modes was again poorly reported. Even during the Geminids shower there seems to have been little activity apart from JT6M. There was less confusion between JT6M used via meteor scatter and JT6M via other modes because the other modes were not so prevalent! However, I have retained my existing policy of restricting comments to the traditional meteor scatter modes to avoid the uncertainties that still exist. The reports on the 14th represent activity in the Geminids shower.

6th	1835	G1XUU (JO01) spotted bursts from IV?
14th	1805	M0BCG > YU1DG and SP6NVN/3 calling (m/s)
	1958	SM5LE reports many pings from GB3LER ("559 QSB")
	2152	G4VPD > F1JG "ms bursts of CQ call"

Aurora

Aurora were detected on many days, especially in the middle part of the month when geomagnetic disturbances were related to coronal hole activity. Events were largely "Scottish type" and had little impact on general activity. Northern GM stations see many more aurora than the rest of us. John GM4WJA (IO87) writes "I have noted quite a bit of Auroral activity this month but most (*events*) have been weak affairs with only beacons being heard. Note that to log an Aurora I have to hear an amateur beacon or person on 10, 4, 6, or 2m - if I was to go by Norwegian TV signals I would be logging Auroras most (if not all) evenings".

5th	15z	1610-16.20	OZ4LP > GM4ILS, SM7AED > GM4ILS
	18z	1845-18.50	M0BCG > GB3RMK and GB3LER both 55a, PA0O > GB3LER 53a
6th	15z	1722	LA4CQ spots GB3LER 53a. GM4WJA also had aurora in the evening
7th	15z		Aurora in late afternoon as well as all evening de GM4WJA
	18z	1830-19.10	M0CTP > GB3RMK, GB3LER, EI7IX > GB3LER 51a, OZ1DPR > GB3LER
8th	15z and 18z		Aurora in late afternoon then back again in mid to late evening (GM4WJA)
9th	18z		GM4WJA detects aurora in early to mid evening.
10th	15z	1712-1733	G4KCT > GB3LER 51a, M0BCG > GB3RMK 55a, GB3LER 52a, G4KCT > G1XYM 51a
11th	00z	0030-0040	GM4WJA > JW9SIX 51a, G4FVP > GB3LER 52a
	15z and 18z		Aurora in mid afternoon and all evening at GM4WJA
12th	21z		Late evening aurora
13th	18z	2043	OZ0JX > GB3LER "au sound, QTF direct". GM4WJA also has aurora
14th	18z	1807	EI7IX > GB3LER 51a. GM4WJA also heard aurora in late afternoon
		1913-1932	MM0AMW > GM4ILS 53a, EI7IX > GB3LER "still aurora here"
20th	18z and 21z		"Aurora all evening" (GM4WJA)
21st	15z-21z		GM4WJA notes aurora in late afternoon and all evening.
22nd	15z-21z		Aurora in late afternoon to late evening de GM4WJA
27th	21z		GM4WJA notes aurora in late evening.
30th	21z		Ditto! GM4WJA notes aurora in late evening.
31st	15z	1630-1650	MM5AJW > GB3LER 44A, GB3RMK 57A, 2M0AVY > GB3LER 55A

Auroral E

8th	21z	2200	GM4WJA > TF3SIX 529 via auroral E.
14th	18z	1730-1845	GM4WJA > JW9SIX, JX7SIX peaking 559, > JW5RIA briefly at 519
		1947	SP6MLK (JO80) > GB3LER 519 (*possible auroral E*)
	21z	2345	GM4WJA > TF3SIX 519
21st	18z	2030	JW5RIA heard very weakly via auroral E at GM4WJA
22nd	21z	2345	GM4WJA > TF3SIX 529 via auroral E.
31st	21z	2110-2134	MM0AMW (IO75) > JX7SIX 579, LA5QFA (JQ90) 55, TF3SIX 599; GM4WJA > TF3SIX 599, JX7SIX 559

Solar and Geomagnetic Data for December 2003

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

Sunspot numbers (SEC)	Mean 75.7	Max 159 (1st)	Min 15 (30th)
Solar Flux (28 MHz)	Mean 115.1	Max 143 (1st)	Min 86 (11th)

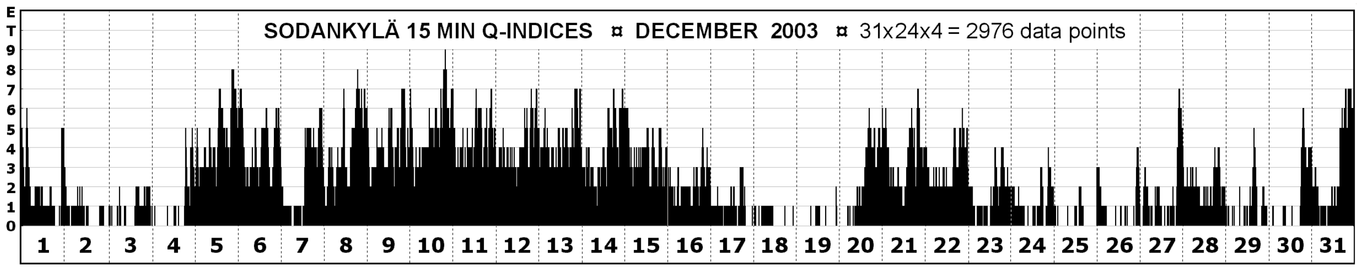
Solar data for December 2003 are presented in the table at the end of this section. Numbers in the 28 and 50 MHz columns of this table are the total daily "areas" worked/heard from the UK, a summary of the data presented in the first sections of this Report. On 28 MHz "areas" refer to the number of beacons 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).

After the excitement of the last couple of months the sun seems to have regained a rather quieter aspect. There were no X-class flares in December and relatively few energetic events in total.

3rd	1247-1322	M1.4
	2250-2307	M1.5
7th	1058-1128	M1.3
	1539-1553	M2.0
26th	1913-1933	M1.5 1N
31st	1821-1826	M1.0

Q-indices from Sodankylä, Finland (Thanks OH2LX)



Vaino OH2LX notes the following from the Finnish observatories

Sodankylä monthly Ak average = 28.8
Nurmijärvi monthly Ak average = 14.8

The most disturbed day:

Sodankylä: 10 Dec, Ak = 86
Nurmijärvi: 10 Dec, Ak = 41

[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 December when the UK K index or Kp was 5 or greater. 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 grey 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	31
00	2	3	1	2	2	4	2	2	3	5	5	4	5	4	4	3	2	1	2	1	4	3	2	1	2	2	3	3	1	2	3
03	3	2	2	1	5	4	2	5	4	4	5	4	4	3	4	3	3	3	1	2	3	3	2	2	1	2	3	3	1	1	2
06	3	3	2	2	6	4	3	5	5	5	6	4	4	3	4	3	3	2	1	2	4	3	1	2	1	2	2	2	2	3	2
09	3	2	2	3	5	4	3	6	5	6	5	3	4	4	5	3	3	3	2	4	4	4	3	2	2	3	3	3	3	2	3
12	3	3	2	3	5	3	3	6	5	5	4	4	5	4	4	3	3	3	3	3	3	3	3	3	2	3	3	3	2	2	4
15	3	2	3	3	5	4	4	5	5	5	5	3	5	5	4	3	3	3	3	4	4	3	3	3	3	3	3	3	2	3	5
18	2	3	2	3	4	4	4	4	4	5	3	4	4	4	3	3	3	2	2	4	4	3	3	3	2	2	3	3	2	3	4
21	2	1	2	3	4	3	3	4	4	4	4	5	3	4	3	2	1	1	2	4	3	2	2	2	2	3	4	2	1	2	3
Σ	21	19	16	20	36	30	24	37	35	39	37	31	34	31	31	23	21	18	16	24	29	24	19	18	15	20	24	22	14	18	26

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	2	0	1	3	4	3	2	3	5	6	4	4	3	3	1	1	1	0	0	3	2	2	1	1	2	1	3	0	1	3
03	3	1	0	0	3	4	1	3	3	3	3	2	2	2	3	1	1	1	0	1	3	2	1	1	0	1	2	2	0	1	2
06	1	2	0	0	4	2	1	2	3	2	3	2	2	2	2	1	0	0	0	0	2	2	1	1	0	0	1	1	0	0	0
09	2	1	0	0	3	2	1	3	2	3	3	2	3	2	2	1	1	0	0	2	2	2	1	0	0	0	2	1	0	0	1
12	1	1	1	1	4	3	2	3	3	3	3	3	3	3	3	1	1	1	0	2	2	3	1	1	1	1	1	2	1	1	2
15	1	0	1	1	4	4	2	4	3	5	5	3	4	5	3	2	2	0	0	5	3	3	2	2	1	1	1	2	2	1	4
18	0	0	0	1	4	3	4	5	4	5	4	5	4	5	3	2	2	0	0	3	4	3	2	1	0	0	2	3	0	3	5
21	3	1	1	4	5	3	4	5	5	4	5	4	4	3	3	2	0	0	1	4	3	3	1	2	0	3	4	2	0	1	4
Σ	13	8	3	8	30	25	18	27	26	30	32	25	26	25	22	11	8	3	1	17	22	20	11	9	3	8	14	16	3	8	21

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	2	2	1	1	3	4	3	3	3	4	5	4	4	3	4	2	2	1	0	0	4	2	2	1	1	3	2	3	1	2	3
03	3	2	0	0	3	3	1	4	3	3	3	3	3	3	3	2	2	1	0	1	4	3	1	1	0	2	2	2	0	1	2
06	2	2	0	0	4	3	1	3	3	3	4	3	2	2	3	2	1	0	0	0	3	3	1	1	0	0	1	1	1	0	1
09	2	2	0	0	3	3	1	3	3	3	4	3	3	3	3	2	1	0	0	2	3	2	1	0	0	1	2	1	1	0	1
12	1	2	1	1	4	3	2	4	4	3	4	3	4	3	4	1	2	1	1	3	2	3	2	2	2	1	1	2	1	2	2
15	2	0	2	1	4	4	3	4	3	5	4	3	4	5	4	3	2	0	0	5	3	4	2	3	1	1	2	2	3	1	4
18	1	0	1	2	3	3	3	5	4	5	4	4	4	4	3	3	2	0	0	3	4	3	3	1	0	1	2	3	1	3	5
21	3	1	2	4	4	3	4	4	5	4	4	5	4	4	3	2	1	0	1	4	3	3	2	2	1	3	4	2	0	2	4
Σ	16	11	7	9	28	26	18	30	28	30	32	28	28	27	27	17	13	3	2	18	26	23	14	11	5	12	16	16	8	11	22

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	2	2	1	1	2	5	3	3	3	4	5	4	4	4	4	2	2	1	0	0	4	3	2	1	1	3	2	4	1	2	3
03	3	2	1	0	4	3	1	4	4	3	4	3	3	3	3	2	2	1	0	1	4	3	2	2	1	2	3	3	0	1	2
06	2	2	1	1	4	3	2	3	3	3	4	3	2	2	3	2	1	1	0	1	3	2	1	1	1	1	1	1	1	1	1
09	2	2	1	0	4	3	1	3	3	4	4	3	3	3	3	2	1	1	1	3	3	3	2	1	1	1	2	2	1	0	1
12	1	2	1	1	4	3	3	4	4	3	4	3	4	3	4	1	1	1	1	3	3	3	2	2	2	1	1	3	2	2	2
15	2	1	2	1	4	4	3	5	4	6	5	3	4	5	4	3	2	1	0	5	4	4	2	3	2	1	2	2	3	2	5
18	1	0	1	2	4	3	4	6	4	5	4	5	4	5	3	3	2	0	0	4	4	3	3	2	0	1	2	3	1	3	5
21	4	1	1	4	4	3	4	4	5	5	4	5	5	4	3	2	1	0	1	4	4	3	2	3	1	3	4	2	1	3	4
Σ	17	12	9	10	30	27	21	32	30	33	34	29	29	29	27	17	12	6	3	21	29	24	16	15	9	13	17	20	10	14	23

December	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-Dec	0	29	0	0	0	0	143	159	98	3	10	17	B5.8	9.8	14	1.9	06	1.5E+07	3.1E+05	1.2E+04
02-Dec	0	23	0	0	0	0	139	119	72	3	9	14	B8.1	10.3	11	2.4	22	2.4E+07	4.0E+06	5.8E+05
03-Dec	0	11	0	0	0	0	124	100	78	3	7	9	B4.1	8.8	12	2.3	04	2.6E+07	2.8E+07	1.5E+06
04-Dec	1	18	0	0	0	0	116	115	66	3	9	13	B3.2	8.3	11	2.4	22	4.0E+07	1.6E+07	2.9E+05
05-Dec	0	11	0	0	2	0	112	88	59	6	43	65	B3.1	10.3	12	2.1	06	6.2E+06	9.5E+06	8.7E+04
06-Dec	0	26	0	0	1	0	109	87	45	4	22	39	B4.7	9.5	13	2.0	06	5.9E+07	3.7E+06	2.4E+04
07-Dec	0	9	0	0	3	0	92	53	32	4	15	29	B2.1	9.3	10	n.a	n.a.	1.0E+08	1.3E+06	1.5E+04
08-Dec	0	8	0	0	0	1	94	49	26	6	39	65	B1.2	9.3	11	1.9	06	2.3E+07	1.4E+06	1.3E+04
09-Dec	3	13	0	0	0	0	92	23	16	5	31	54	B1.0	8.8	13	2.0	05	3.2E+08	8.3E+06	1.3E+04
10-Dec	1	9	0	0	2	0	89	46	25	6	42	67	A8.7	8.8	13	1.6	06	3.5E+08	8.7E+06	1.2E+04
11-Dec	6	7	4	0	2	0	86	35	25	6	40	64	A7.7	6.9	14	1.7	06	6.2E+08	9.9E+06	1.2E+04
12-Dec	2	9	0	0	0	0	87	36	23	5	23	43	A7.4	7.4	12	n.a.	n.a.	6.3E+08	5.1E+06	1.2E+04
13-Dec	0	5	4	0	1	0	88	40	28	5	28	45	A9.7	7.5	12	n.a.	n.a.	5.7E+08	7.2E+06	1.3E+04
14-Dec	0	6	5	0	2	4	92	48	31	5	24	48	B1.3	7.2	12	n.a.	n.a.	7.1E+08	6.2E+06	1.3E+04
15-Dec	0	15	0	0	0	0	101	42	30	5	25	38	B2.0	8.3	13	1.7	07	8.4E+08	6.3E+06	1.3E+04
16-Dec	0	9	0	0	0	0	106	71	39	3	11	19	B2.4	9.1	13	2.1	04	9.0E+08	2.4E+06	1.1E+04
17-Dec	4	8	0	0	0	0	118	92	68	3	10	14	B3.8	8.3	13	2.1	06	1.0E+09	2.4E+06	1.2E+04
18-Dec	1	10	0	0	0	0	123	114	71	3	8	6	B5.2	8.1	12	2.0	23	1.3E+09	2.9E+06	1.2E+04
19-Dec	0	5	0	0	0	0	123	113	71	3	7	4	B4.6	7.9	11	2.1	21	1.2E+09	4.4E+06	1.3E+04
20-Dec	0	23	0	0	0	0	130	104	74	4	16	39	B4.1	10.0	13	2.4	00	2.3E+08	4.7E+06	1.3E+04
21-Dec	13	20	2	0	0	1	133	105	60	4	21	45	B4.0	9.8	12	1.9	06	1.5E+07	7.1E+05	1.2E+04
22-Dec	0	26	3	0	0	1	138	152	74	4	15	35	B3.8	9.6	13	2.1	06	2.9E+07	1.2E+06	1.2E+04
23-Dec	5	25	0	0	0	0	142	144	76	3	9	15	B4.6	8.9	11	2.1	01	4.4E+07	8.1E+05	1.1E+04
24-Dec	1	20	0	0	0	0	139	100	59	3	8	17	B3.8	8.4	11	2.2	20	7.8E+07	5.2E+05	1.2E+04
25-Dec	0	28	0	0	0	0	139	58	44	3	6	12	B4.5	8.8	13	2.0	20	6.5E+07	5.7E+05	1.2E+04
26-Dec	0	46	0	0	0	0	137	65	40	3	9	14	B3.5	8.8	13	2.1	20	2.8E+07	4.7E+05	1.1E+04
27-Dec	5	38	4	0	0	0	127	47	31	4	12	21	B2.8	10.0	13	1.9	04	1.7E+07	5.7E+05	1.1E+04
28-Dec	2	48	4	0	0	0	119	47	34	3	12	25	B2.5	8.8	13	2.1	20	1.1E+07	3.4E+05	1.1E+04
29-Dec	0	42	1	0	0	0	115	56	28	3	6	11	B2.7	9.9	14	2.1	07	1.4E+07	3.5E+05	1.1E+04
30-Dec	0	21	0	0	0	0	108	15	17	3	8	15	B2.8	8.5	13	2.1	07	1.0E+07	3.8E+05	1.2E+04
31-Dec	0	21	0	0	1	3	106	25	16	5	17	39	B3.9	8.8	14	2.1	07	4.5E+06	8.8E+05	1.3E+04
Sum	44	589	27	0	14	10														
Average	1.4	19.0	0.9	0.0	0.5	0.3	115.1	75.7	47.0	4.0	17.5	30.4	B3.2	8.8	12	2.1	03	3.0E+08	4.5E+06	9.0E+04
Maximum	13	48	5	0	3	4	143	159	98	6	43	67	B8.1	10.3	14	2.4	07	1.3E+09	2.8E+07	1.5E+06
Minimum	0	5	0	0	0	0	86	15	16	3	6	4	A7.4	6.9	10	1.6	20	4.5E+06	3.1E+05	1.1E+04

50 MHz Outside Britain

Compilation and Commentary by G3USF

Europe

Auroral-Related Propagation

Another month when the geomagnetic index was fairly active but infrequently reached storm levels. We have reports relating to 22 days but only a handful on which openings were down to 53°N, and then only briefly. There were at least eleven days when there was evidence or a strong presumption of auroral E(AE), predominantly at high geomagnetic latitudes. We have yet another instance of the VE8BY beacon being heard in Europe with no QSO. Given that this beacon runs fairly modest power and path losses for auroral backscatter (if this indeed was the mode) this is very frustrating. However, although the European end in the Netherlands, in this instance, has a substantial active amateur population, VE8 covers a vast, under populated area. Indeed, it is a long while since the last report of 50MHz activity from anywhere reasonably near this beacon. And it is a much longer way further to the VE6s or KL7s. Some day, perhaps, some dogged soul will get lucky.

There were again many reports where the propagation mode ('a' or 'AE') was uncertain, though it is reasonably certain that they were in some way auroral-related. Some contacts that were in fact auroral-related may have strayed into the 'other modes' section.

Dec 4 2010 Au>OH5IY

Dec 5 1200-10 Au>OH5 1400-1750 Au>OH55 1430-1620 AuFM>OH5IY 15-1600 OH33>OZ(JO55 59a) ES1>OZ(JO55) 16-1700 GM>OZ(JO55) SM5>DL 17-1800 49750(UA)>SM0(59a) OH9SIX>SM2(KP15 57a) 18-1900 JW5SIX>SM3(559) JW9SIX>SM2(53a) GB3LER>PA(53a) JX7SIX>SM2(559) 19-2000 SM5>PA(53a 350) 2150-2300 Au>OH5 2205 JW9SIX>SM3(539 AE)

Dec 6 0250-0300 Au>OH5 0730-40 Au>OH5 1520-40 Au>OH5 1610-30 Au>OH5 1640-50 Au>OH5 1722 GB3LER>LA(JP20 53a)

Dec 7 1440-1500 Au>OH5 1550-1600 Au>OH5 1640-50 Au>OH5 1730-1800 Au>OH5 18-1900 SM0(JO99)>SM2(55a) OH9SIX>SM2(57a) TF3SIX>SM3)539 AE) GB3RMK>EI(51a) 1820-1940 Au>OH5 19-2000 49750>OH6(KP02 57a) GB3LER>OZ(JO45 53a)

Dec 8 1042 49750>SM2(AE?) 1140-1240 Au>OH5 1201-20 AuFM>OH5 1610-1730 Au>OH5 1653 49750,760>OZ(57a) 19-2000 JW9SIX>SM2(599 AE) JW9SIX>OH6(KP02 529) JW9SIX>SM3(539) JX7SIX>OH6(KP02 529 AE) 1940-50 Au>OH5 2050-2100 Au>OH5 2200-10 Au>OH5 2240-50 AuFM>OH5

Dec 9 1310-40 Au>OH5 1350-1520 Au>OH5 20-2100 OH9SIX>SM2(57a) OH9SIX>LA(549 AE)

Dec 10 1150-1220 Au>OH5 1450-1550 Au>OH5 1650-1730 Au>OH5 18-1900 OH3(KP20) >OZ(JO54 57a) TF3SIX>OH6(KP02)(?) JW9SIX>LA(549) 1820-20 Au>OH5 1840-1940 Au>OH5 1050-2110 Au>OH5 20-2100 JX7SIX>SM3(599 AE) JX7SIX>SM0(JO99) JX7SIX>SM5(579) SM4>SM5(?) 2120-50 Au>OH5 2200-10 AuFM>OH5

Dec 11 0030-50 Au>OH5 1240-1320 Au>OH5 1340-1420 Au>OH5 1406 49750>OH6(KP02 59a) 1450-1550 Au>OH5 1640-50 Au>OH517-1800 JW5SIX>OH6(KP02 559) JW9SIX>OH6(KP02 599) JW9SIX>LA(529) JW9SIX>SM5(559)

Dec 12 17-1800 JW9SIX>SM3(599 AE) JW5SIX>SM3(599 AE) 18-1900 JW9SIX>SM0(559) JW9SIX>LA(579) 19-2000 JX7SIX>SM3 20-2100 OH3>OH6(?) TF3SIX>SM2(KP15 579) 2121 JX7SIX>OH6(KP20)(?) 22-2300 LA7SIX>LA(JO59 579) JW9SIX>OZ(JO54 519) TF3SIX>SM3(52a)

Dec 13 1430-40 Au>OH5 1630-50 Au>OH5 1800-10 Au>OH5 20-2100 JW9SIX>SM5(AE) OH9SIX>LA(579) LA7SIX>LA(529) JW9SIX>LA(559 JO59) GB3LER>OZ LA7SIX>OZ(JO54 539) LA7SIX>SM0(JO99 559) OH9SIX>OZ(AE?) 21-2200 JW9SIX>OZ(529) OH9SIX>PA(?) LA7SIX>PA(559) LA7SIX>OZ(599)

Dec 14 1540-50 Au>OH5 16-1700 JW9SIX>LA(579) TF3SIX>SM2(559) 1630-50 AuFM>OH5 17-1800 JX7SIX>LA(549) JW5SIX>SM2(599) JW9SIX>SM2(599) TF3SIX>SM2(599) JX7SIX>SM2(599) JX7SIX>OH6(KP20) 18-1900 GB3LER>EI(51a) JW5SIX>LA(AE) JW5SIX>SM0(559 JO99) JW5RIA>SM2(?) LY2>SM2(?) 1800-10 Au>OH5 19-2000 OH3SIX>SM2 JW9SIX>OZ(519) GB3LER>EI GB3LER>SP6(JO80 519) 20-2100 GB3LER>DL(JO51 559) OH9SIX>OZ(JO54 539) GB3RMK>DL(JO51 569) OH9SIX>SP6(519 JO80) OH7>OZ(?) SM0(JO89)>OZ(JO54 55a) SM5>SP6(?)

Dec 15 1350-1410 Au>OH5

Dec 17 1047 GB3LER,OY6SMC>DL(JO62 579)

Dec 18 0842 JW5SIX>OH5(KP30)

Dec 20 1503 OH9SIX>SM2(KP36 56a) 1630-1730 Au>OH5 1700-30 AuFM>OH5 1732 LA>LA(57a) 1940-2030 Au>OH5 2031-2 JW5SIX>SM2(569) JX7SIX>SM2(559) 2250-2300 Au>OH5

Dec 21 1630-1730 Au>OH5 1700-30 AuFM>OH5 2000-10 Au>OH5

Dec 22 1620-1720 Au>OH5 1812 JW5SIX>OH6(AE KP02) 1920-30 Au>OH5 1940-50 Au>OH5

Dec 23 00-0100 TF3SIX>PA(529) VE8BY>PA(419) OY6SMC>PA 559) 1521 49750>OH6(KP02 52a) 1907 OH6>SM3(?)

Dec 27 2120-30 Au>OH5 2224 OH9SIX>SM2(KP15 55a) 2350-2400 Au>OH5

Dec 28 1736 49750>SM2(KP15)

Dec 29 0752 LA7SIX>OH6 1550-1610 Au>OH5

Dec 31 1600-1620 Au>OH5 1608 49750>OH6(KP02 55a) 1650-1730 Au>OH5 19-2000 LA7SIX>OZ(JO45 599) OH9SIX>OZ(579 AE) 2040-50 Au>OH5 21-2200 LA(JQ90)>OZ(JO45 59) LA(JQ90)>OZ(JO45 59) LA>LA(55) LA(JP99)>OZ(JO45 59) LA7SIX>OZ(JO56 539) 2110-2210 Au>OH5

Other Modes

Little call for tables and boxes this month, though not all Europe experienced G0AEV's 'no DX' summing up of British experience. However, propagation from Africa was confined to ZS6 into SV and EA on the 2nd, 9J into SV also on the 2nd, TR into EA and I on the 2nd, I again on the 6th and EA on the 12th. From South America, there was PY into EA on the 1st and ZD8VHF into 9H and EA on the 1st and EA on the 2nd, 26th and 27th. Further north, nothing apart from the VE8BY into PA report mentioned previously.

Within continental Europe, Es was reported on several days, on two occasions even extending to OH. The 11th, 13th, 14th and 23rd were among the better days, as G0AEV has already noted with respect to Britain. Costas, SV1DH, would probably add the 6th, and there were several other days when south-eastern Europe experienced Es. That said, the Christmas season sub-peak was not very much in evidence this year.

There was a sprinkling of ms contacts, though the Geminids appear not to have been particularly fruitful. Overall, though, as the detailed listings below eloquently show, activity was at times extremely low, with many operators having apparently decamped to easier pickings elsewhere, leaving a committed core, many working mainly with JT6M, and often not indicating the likely propagation mode, although as G0AEV noted earlier, meteor scatter looks the most likely mechanism.

As always in this section beacon callsigns are given in full.

Dec 1 0526 ES0SIX>SP6(ms) 0658 OE3XLB>SP6(t/ms) 13-1400 GW>PA 1855 3Ctv>SV1 2123-30 ZD8VHF>9H,EH3 23-2400 PY2WBC,PY2WDX>EA7

Dec 2 0545 ES0SIX>SP6(ms) 1128 S55ZRS>OE6 1307 3Ctv>SV1 15-1600 I8LPR>TR8CA TR8CA>F 1615 TR0A,3Ctv>EA7 19-2000 ZS6TWB>EA7 ZS6NK>SV1,EA7 5Ntv>SV1 2147-51 ZD8VHF,PY1RO>EA7

Dec 3 0528 ES0SIX>SP6(ms) OH9SIX>SP6(ms) 1322 3Ctv>SV1 1859 3Ctv>SV1

Dec 4 2037 G>OZ(ms)

Dec 5 15-1600 3Ctv>SV1 aurora

Dec 6 11-1200 YT1>DL I5,IS0>S5 15-1600 I0>SV1(Es) 3Ctv>SV1 SV1SIX>I5,I2,HB TR0A>I5 4N1ZNI>9H 16-1700 SV1SIX>9A,DL(Es)

Dec 7 nil

Dec 8 1450 3Ctv>SV1 1916 OE5>DL

Dec 9 1616 OD5SIX>SV1 2133 PA>ON

Dec 10 1631 OD5SIX>I9 19-2000 CN8MC>I4,I0 20-2100 CN8MC>I2

Dec 11 0941 GB3LER,GB3RMK>F 11-1200 GB3LER>PA 1449 CT0SIX>I5 15-1600 CT0SIX,EA3VHF>I5 CN8MC>I4 16-1700 CN8MC>I5 EH5>I7,I4 LZ2CM>5B EH7>I4,PA 18-1900 EH4>DL,PA EI>I5,I1,I2 EH7>9H,DL,PA,I5 CN8MC>PA EH8,CT,EH4>DL OD5SIX>SV1 CT>ON,F,SP6 EI>I1 4X>I7 19-2000 EH5>OZ,DL CT>ON,S5,SP6,I2,I1,PA,HB EH8>DL PA>ON EH4,CN8MC>PA EH3>F,G EI>EH3 20-2100 CT>DL,I1

Dec 12 1441 TR0A>EA7 1537 UT5G>I5 18-1900 EH5>I5 EA3VHF>9H

Dec 13 10-1100 CT0SIX>ON 1234 4X>I8 13-1400 4X>I0 SV1SIX>I5(Es) 1548 F>OZ 1643 SM5>9A(ms) 17-1800 SP8>SV1 UX0>I9,I8 OD5SIX>I5 SV1SIX>PA,SP6 YU1>PA 18-1900 I9>I8 9H>DL YU1>SP6(ms) G>YO5 SV1>EA1,PA SV8>DL,OZ,ON YKtv,OD5SIX,F,YU1>9A S5,SP8>F 9H1SIX>OE5 OK1>YT8 SV1SIX>OE5,OK1,OZ 19-2000 YU1,4N1ZNI>F GB3LER>PA(Es) YT1>DL 21-2200 I9,SV1SIX>I1 9H>9A 22-2300 9H1SIX>9A

Dec 14 09-1000 G>9A(ms) I9>I8 9A>SM5(ms) 10-1100 9A>I0(ms) LY>I5(eme)17-1800 YU1>F,DL I4>9A SV1SIX,I5>F EH9>I9 18-1900 EH7,EH9>I8 YU1>OZ,SP6,PA(Es),F,DL EA3VHF>I9 SP6>PA G>I2(ms) 1855-1900 UAfm>OH9(Es) 19-2000 SP8>OZ G>I2(ms) OH7>PA(?) PA>LA(?) SM5>PA(?) SM5>9A(MS) 1909 SPfm>OH9(Es) 1910-20 UAfm>OH9(Es) 1947-55 SPfm?OH9 21-2200 PA>LA SM3>DL PA>LA(bs) F>I1 22-2300 G>I5

Dec 15 0954 YT1>9A 1811 UU5SIX>SV1 all day UA,DL,SPfm/ms>Sodankyla (Geminids)

Dec 16 0815 UU5SIX>SP6 1139 OE5XBL>SP6 12-1300 EA5>DL

Dec 17 nil

Dec 18 1059 UT5G>SM0 1748 GB3RMK>ON

Dec 19 nil

Dec 20 1057 F>OE5(ms) 13-1400 W7GJ>F,G(eme)

Dec 21,Dec 22 nil

Dec 23 0811 EPtv>9A 0911 S5>9A 16-1700 UT5G>PA(Es),DL,HB YO7>OZ,PA LZ1>DL YO6> PA, DL OZ>9A YU1`>DL I0>PA YO5>ON 17-1800 I0>SM0 4N1ZNI>DL,PA SV1SIX> DL,PA,SP3 SV9SIX>PA LZ2CM,YO5,UR,LZ1>DL YO5>ON,I4 I1>YO5 SP3>I0 I8>SP3 18-1900 YO5>I5 DL>OZ SV1SIX>I4,OE3,PA 19-2000 OH6>SM3 20-2100 OZ>OH6 OZ>LA 21-2200 OZ>LA

Dec 24 0955 EA1>PA 15-1600 LZ2>9H SV1SIX>I4,SP6 SV8>I1 16-1700 ON1SIX>PA

Dec 25 10-1100 DL>I1(ms) DL>I0(ms) G>S5 11-1200 F>S5 S5>I0 OE3XLB>SP6 1705 YU1>OK2

Dec 26 2037 ZD8VHF>EA7 2300 ZD8VHF>EA7

Dec 27 08-0900 GB3LER>I4,I1 GB3MCB>OE5,SP6 GB3RMK>I2,9A,I1 09-1000 F>OE5(ms) OE3XLB>9A(t) F>I0(ms) DL>9A 10-1100 OE3XLB>SP6 11-1200 OE3XLB>SP6 1236 OE3XLB>OE6 I3>9A LY>SM5

Dec 28 10-1100 OZ>OE5(ms) OE3>OZ(ms) 11-1200 G>I2(ms) 1252 F>PA(ms) 1332 I5>I2(ms) 15-1600 G>OZ F>S5 16-1700 G>OZ GB3MCB>EA6(Es) I5>F(ms) 17-1800 G>EA5 EI>EA7 9H>I1(Es) 2029 W7GJ>PA(eme)

Dec 29 15-1600 G>PA

Dec 30 16-1700 4X>HB,I1

Dec 31 15-1600 F>HB(t) 17-1800 F>S5 2048 CN8MC>F

50MHz PROPAGATION REPORT FOR DECEMBER 2003 BY SV1DH

1. Data for 1-18 and 29-31, internet data 19-28th
2. Relatively good days on: 2,6,11,13,23,24
3. 48 MHz AF video (3C+5Z) on: 1-6,8,9 (R=26%)
4. 55 MHz AF video (5N) on: 1,2 (R=6%)
5. “ to ZS6 on: 2(1930) (R=3%)
6. “ to 9J on: 2
7. “ to ZD8 on: 1 (R=3%)
8. “ to 5B on: 11(E) (R=3%)
9. “ to 4X on: 10,11,30(E) (R=10%)
10. “ to OD on: 9,10,11(E) (R=10%)
11. “ to F on: 13,24(E)
12. “ to I on: 6,14,23,24(E) (R=13%)
13. “ to IS on: 6(E)
14. “ to EH on: 13(E)
15. “ to DL on: 6,23(E)
16. “ to SP on: 13,14,24(E)
17. “ to OK on: 13(E)
18. “ to 9A on: 6(E)
19. “ to OE on: 23(E)
20. “ to HB on: 6(E)
21. “ to PA on: 13,23(E)
22. “ to G on: 13(E)
23. “ to UR on: 13,15(E)
24. “ to YO on: 3(E)

25. Special events on:
- 2 (9C+2M,1308 M1.4+2300 M1.5 flares+0915-1030 foF2>10, max 11.0/ MUF=38Mhz at 1000z)
- 4 (0945-1030 foF2>10,max 11.1 / MUF=38Mhz at 1000z)
- 5 (0830-1030 foF2>10,max 12.5 / MUF=42Mhz at 0915)
- 6 (10C+2M,1120 M1.3+1546 M2.0)
- 7 (0845-1100 foF2>10, max 11.5 / MUF=40Mhz at 1030)
- 8 (0745-0900 foF2>10, max 12.0 / MUF=47Mhz at 0845)
- 9 (0815-0900 foF2>10, max 11.0 / MUF=41Mhz at 0845)
- 10 (0830-1030 foF2>10, max 11.0 / MUF=40Mhz at 1015+2130 ZL to XE)
- 11 (0815-0915 foF2>10, max 11.0 / MUF=42Mhz at 0900+1900 NEU to EH8 2Es+2100 ZL to XE)
- 12 (0900-0915 foF2>10, max 10.4 / MUF=38Mhz at 0915)
- 13 (0815-0915 foF2>10, max 10.9 / MUF=40Mhz at 0845)
- 14 (0145 ZL+VK2 to W5+XE)
- 15 (2300-0300! ZL to W+0145-0315 VK2to W+XE)
- 17 (0130 ZL to W6)
- 30 (1700 F to 4X 2Es)

26. DXCC entities heard/worked during December 2003 : 20 on 3 cont
27. DXCC entities heard/worked on 13th December 2003 : 7 on 1 cont.

73 COSTAS

The Americas

Auroral-Related Propagation

Dec 5 2243 K0KP>W9
Dec 6 0220 VE8BY>VE6(559a) 0307 VE8BY>VE6(559a)
Dec 7 0138 W8>W3
Dec 20 22-2300 W8(EN84)>W9(EN44 55a) W9(EN54)>W9(EN84 51a) VE4ARM>W9(EN44 52a) 23-2400 W3>W1(55a)
Dec 21 01-0200 VE8BY>VE9(FN65)(?) VA2MGL>VE9(FN65) N8PUM>W1(57a)
Dec 27 22-2300 VA2MGL>VE9(FN65) 23-2400 VE4ARM>W9(EN44 52a) W8>W9(FN44 56a)

Other Modes

The Americas had a livelier and more interesting month than Europe. There was propagation to South America on eleven days, mostly favouring southern states, but occasionally ranging further (but not as far as VE). There was a gap mid-month which is not wholly explained by the solar flux and geomagnetic figures - the 18th and 19th produced no reports but were relatively quiet with slightly above average flux, for instance. By contrast, the 5th was a relatively good day although the flux was slightly below the month's average and the Ap was 43. Possibly this was one of those days when heightened ionization concentrates in southerly areas during the build-up to a storm.

	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
					+		+	+	+	+	+	+	+													+	+		+		

North<>South America

HC8 6 days 5(W3,W4,W5,W7) 7(W4) 8(W5) 9(W5) 12(W5,W6) 13(W7,W0)
PY 5 days 5(W4) 11(W4) 26(W3,W4) 27(W1) 29(W4)
LU 1 day 8(W5)
HK 1 day 10(W4)
CE 1 day 8(W5)

However, during that otherwise blank period, there were excellent openings across the Pacific in the course of the UT days 14-16, with lesser openings on the 28th and 31st, principally involving ZL at one end and W4/W5 at the US end, though W0 was involved on the 16th and ZL3<>4A1AC (=XE) was reported on the 15th. KH6<>W6 contacts were made on the 8th

These long-range openings apart, there was a fairly steady stream of openings between the US and Central America and the Caribbean and between those areas and South America. Some appear to have been by Es, which also brought good openings within the United States, which enjoyed a better winter season than Europe. However, identification of propagation modes in many cases can only be speculative. There continues to be little evidence of JT6M/ms working, though this may mean no more than that such activity often goes unreported.

Dec 1 1857 W0>W5 2245 LU7YA>KP4 23-2400 ZP6>PY2 KP4,FG5FR>PY2 K0ETC>W0(Es)

Dec 2 02-0300 PY4>PY8

Dec 3 0025 TI5/N0KE>PY4 0449 9Y4AT>HC2 2128 T44DX>HC1AJQ 2257 ZW0S>PY4 2344-53 ZW0S>PY4,PY2,PP5,LU

Dec 4 23-2400 FS/KF2HC>CX2AQ,PY2HN TI5AA>PY4

Dec 5 00-0100 W4>W5 FS/KF2HC>PY8 W7>W5 01-0200 P49MR>PY8 FS/KF2HC>PY2 1507 HC8GR>K8WW/4 19-2000 HC8GR>NA4M/5 HC8GR>N3DB,K3KTJ 2025 HC8GR>K7ZD 23-2400 PY8AZT>NW5E/4 FG5GR>PY8 ZW0S,FS/KF2HC>PY2

Dec 6 00-0100 TI5AA>PP5,PY4 PJ2BVU>LU ZW0S>PY4 PY2>HP2 01-0200 WP4NE,PJ2BR>PY2 1805 N8PUM>VE6

Dec 7 01-0200 XE2ED>W0(Es) 0208 W7>W5 1816 W7>W0 2158 W4>W4 23-2400 HK4BKB,PY2BB>KP4 HC8GR>W8WW/4 XE1KK>ZF

Dec 8 00-0100 W8,XE1KK,VE3>W4 ZF1DC>W5 01-0200 XE1>W4,W5 FY7THF>YV1 LU8MB,XE1KK>K5IX ZS6NK>W7GJ(eme) 0214 W4>W4 0619 W3>W3 1540 VP9DUB>W4 1918-51 47.9(CE)>W3 XQ3SIX>K5CM 20-2100 KH6SX>W6 HG8GR>N0RQ/5 W9>W9 21-2200 KH6IAA>W6

Dec 9 1620 HC8GR>K5CM 1754-5 XE2ED,W6>W5 1809 XE2ED>W5 2243 47,9(CE)>W4

Dec 10 21-2200 50.75(SA),KP4>W4 22-2300 PJ2/W8TK,CO8LY,V44KAI,9Y4AT>W4 23-2400 KP2,PJ2BVU,CO8LY,9Y4AT>W4 HK3JRL>W4GDC N4GFO>HP2

Dec 11 1956 47.9(CE)>W0 23-2400 W4>KP4 PU2WDX,HK4CZE>HP2 LU1FA>KP4 ZZ2TGR>K4RX

Dec 12 00-0100 KP4>W4 NW5E/4>PY1RO 15-1600 W5,W9,W0>W4 W3>W5 W4>W0 16-1700 W4>W5 W0>W4 HC8GR,XE1KK>K5CM W7>W5 K0ET>W4 17-1800 XE2ED>W0 W0IJR,K0EC>XE2 XE1KK>W0 W5>W6 W4,W7>W5 W6>W7 TI5AA,TI2NA>W0 18-1900 XE2ED>W5 W6,W5>W4 19-2000 W4>W5 22-2300 XE1>W5,W6 XE1KK,HC8GR>N6XQ XE2>W5,W6 XE1KK>W0 23-2400 XE2,XE1>W5 PT7VB>KP4 XE1>W7

Dec 13 0220-41 XE1KK,HC8GR>AA7A 04-0500 W5>W0 W3>W8 W0MTK>W5 05-0600 WA7X>W5 W5>W6 15-1600 HC8GR,XE1KK,XE2HWB>K0GU K0UO>W4 16-1700 XE2HWB,K5AB,K4AHO>W5 W4,W5(Es)>W0 17-1800 XE2HWB,K4AHO>W5 TI2NA>W0(2xEs) W4>W4 18-1900 XE2HWB>W5,W6 W5,K0ETC>W5 J8DX,K5AB>W0 HC8GR,XE1KK>KR7O 19-2000 W4>W5 XE1KK>W6 20-2100 W6,W7>W0 XE2ED>W4 21-2200 VP9DUB>VE1 2238 XE2HWB>W0 23-2400 W4>W3 VE1SMU>W3 PJ2BVU>PU2 VP9UB>W4

Dec 14 00-0100 VP9GE>W4 CO8DM>W3,W4 LU1DMA>YV1 01-0200 C6AFP>W3 W1>W1 ZL4AAA,VK2ZXC>NW5E/4 02-0300 W4>W3,W1 N0UD>VE6 VE9>W4 W2>W3 03-0400 W3>W4(sc) VE1SMU,VY2>W3 W0>W2 W4>W5 04-0500 W0>W1,W4,W3 W3>W9 W6>W0 0532 KD4NMI>W3(t) 06-0700 KD4HLG,W5VAS,K4AHO,K4TQR,KD4AOZ>W1 W4>W3 XE2ED>W0(ES) 07-0800 W1,W2>W4 14-1500 W0,W9>W2 15-1600 W2>W1 W4>W4 W7>W51935 VP9DUB>W8 2256 XE1>W4 23-2400 VP9GE>W4,W1 C6AFP>W2

Dec 15 00-0100 W4>W2 VP9GE>W8 02-0300 VP9DUB>W4 0345 W2>W8 04-0500 N0LL,W5VAS,K0UO>W4 W9>W9 23-2400 ZL3JT>K4RX

Dec 16 00-0100 ZL2TPY,ZL3AAU,ZL3JT,ZL3TY>K5CM XE1>W5 ZL2TPY>KY5N 01-0200 ZL3SIX>KY5N ZL3TY>K5IX,K5UIC ZL3JT,ZL2TPY,ZL3TY>AA5XE W5>W5 02-0300 W7>W4 XE2ED>W0(Es) ZLtv>W6 03-0400 ZL2TPY>K0GU VK2ZXC>K4RX W0>W6(Es) ZL2TPY>N0JK W7>W7 VA7SIX>W0 04-0500 W5>W4 K0EC,W0MTK,W5,W7>W6 W6,K0UO>W4 W3>W3,W8 W0>W9 W7>W7 W0>W2 05-0600 W0>W4 XE2ED,K0UO,W7>W6

Dec 17 00-0100 W4>W4 9Y4AT,KP4>PY2 P43L,PJ2BVU,P49MR>PU2

Dec 18 0101 W4>W8 19-2000 VP9DUB>W1,W3,W2 20-2100 VE1SMU>W3 2313 W4>W4

Dec 19 0008 PJ2BVU>LU

Dec 20 0018 PJ2BVU>PY2 0313 W8>W8 13-1400 IW5DHN>KR7O(eme) M0BCG>KR7O(eme)

Dec 21 nil

Dec 22 1616-27 W9>W9

Dec 23 0022 LU1DMA,PY4>YV1 0100 LU>YV1 0321 W0>W9 02-0400 W5VAS,KD4NMI>W4 04-0500 W2>W6 1410-23 W1,W2>W4 16-1700 W3HH,W4>VE1 18-1900 K4TQR,KQ4E,KD4HLG,VE1>W4 C6AFP>W1 19-2000 W8>W8 VP9DUB>W8,W4 VE4VHF>W0 20-2100 VP9DUB,KQ4E>W4 21-2200 VP9DUB>W4 22-2300 VE3UBL>W4 C6AGN>W1 W2>W4 LU>CX2

Dec 24 0345 W4>W4 13-1400 W4>W8 48250>W4 WR9L>W2 1841 W4>W8 19-2000 W4>W1,W8 2051 VP9DUB<W8 2253 W1>W1

Dec 25 13-1400 W4>W8(Es) W4>W2,W1 14-1500 W4>W2,W1,W3 C6AFP>W2,W3 W4>W2,VE3,W8,W4

Dec 26 00-0100 W3VD>W1(t) 14-1500 V44KAI>W4 W5VAS,K4TQR>W1 15-1600 W4,W5>W2 KP4,V44KAI,KP2,W1>W4 VP9DUB>W8 16-1700 W4>VE3,W1,W5 KP4>W4 W9FZ>W9 17-1800 W4>W1 C6AGN>W2 20-2100 P49MR>W5 C6AFP,K4AHO>W5 21-2200 W5,W4,V44KAI>W4 22-2300 CO8DM,W4>W4 C6AGN,W4>W1 W4,K4AHO,C6AFP>W3 W3VD>W4 PJ7/K2GSJ>PY4 C6AFP>W2 23-2400 FG5FP>PY4 W4>W2,W3,W1,W4 PY2XB>K4AR,N3DB,N3II LU8DCH>YV1

Dec 27 00-0100 PY2XB>W1 VP9DUB,WR9L,K0UO,W4,K5AB>W4 W4>W9 W4CHA>W5 01-0200 KD4NMI,W5RP>W4 02-0300 W4>W5 XE1KK>W4 15-1600 W8>W4(t) W4>W9,W3 16-1700 W4>W0 22-2300 XE1KK>W5 2316 XE1KK>W4

Dec 28 00-0100 ZL3NW>K4RX ZL2WMB,ZL2TPY,ZL3NW>K5IX XE1>W5 01-0200 XE1>W4,W5 XE2>W5 16-1700 W4>W4(t) 18-1900 KQ4E>W4 W4CHA>W3 W1>W1 W2>W4 19-2000 W5VAS>W2,W1,W3 W4>W8,W9,W3,W5 W1,W9,W3HH,W3VD>W4 C6AFP>W0 20-2100 W8>W4,W0,ZF1DC C6AFP>W9 W3,W4>W4 W5>W2,W4 K4TQR>W3 W3>W5 KD4HLG>W3 21-2200 W4>W1,VE9,W4,W8 W5>W4 22-2300 XE1KK>ZF 23-2400 XE1KK,W4AHO>W4

Dec 29 00-0100 WR9L,K2ZD>W4 W4>W9,W3 C6AFP>W3 XE1KK,K4AHO,W4CHA>W4 CO8DM>W6 01-0200 C6AFP>W3 W4>W0,W4,W5 W4CHA>W3 C6AFP>W2 1035 W5>W2 15-1600 K4AHO>W1 16-1700 W4>W5 1922 LU1DMA>PP5 2050 VP9DUB>VE9 21-2200 VP9DUB>W3,W4 22-2300 VP9DUB,W5HN,W4>W4 KQ4E,K4TQR>VE9 W4>W1,W8 23-2400 W4>W0 VP9DUB>W1 C6AFP>W5 W8>W8 W4WXE>PY4OY W5VAS>W3 ZZ2TGR/P>NW5E/4 PY2DSC,PY2PVT,PY4OY>K4RX W5>W5,W9 W4>W2,W0

Dec 30 00-0100 V44KAI,W4,W8>W4 W4>W9,W2,W5 NL7A>W5 W5VAS,C6AFP>W9 01-0200 W5,VE1CSM>W4 W4>VE9,W0 C6AFP>W9,W09 XE2,XE1,W4>W4 02-0300 XE1KK>W0 XE2,W0>W4 W4>W2 XE1>W8,W5,W0 W5>W0 03-0400 W5>W1,W4,W5 XE1>W5,W0,W9,W7 C6AFP,KD4HLG>W1 W4>W7 W0>W5 W5RP>W9 04-0500 XE2ED>W0 W5,W7>W4 W5>W5 0458 K0UO>W6 05-0600 WA7X,W0IJR>W6 1354 W4>W4(t) 14-1500 W4>W1 VP9DUB>W3,W8 15-1600 VP9DUB>W8 1637 W5>W4 1756 XE2HWB>W5 22-2300 VP9DUB>W2,W4,W3 23-2400 W9>W4,W5 W5VAS,C6AFP>W8 W7>W5 W4CHA>VE9 W3,W4>W1 W8>W8 C6AGN>VE3

Dec 31 00-0100 W4,W5>W3 W0,W2,W4,W9>W4 K5AB,W4>W8 01-0200 W4>W5 W5>W3,W1,VE3 W0>W4 W5RP,K5AB>W8 K4TQR>W0 02-0300 W3,W2>W5 XE2ED>W6,W0,W7 W5RP,K5AB,W5VAS,W4CHA>W0 W4,W5>W4 W4>W7 W5>W9 03-0400 W9>W9 W5>W0,W6,W9 W6,W4,W5>W7 W4,XE2ED,W7>W6 W4CHA>W8 04-0500 W7>W6 W5VAS>W3,W5 K5AB>W0 W6>W5 05-0600 W5>W4 W6>W5 W4>W6 06-0700 W5VAS>W3 W4,W5>W6 13-1400 K0KP>W1 N8PUM>W1 W1>W0,W9 VP9DUB>W4 K2ZD,W3>W9 W4>W4 W0>VE3 21-2200 PJ2/WB9Z>W5 23-2400 XE1>W4,W5 ZL3NW>K4RX W1>W1

Asia/Pacific

Japan

JA1VOK's report shows that propagation from Japan was confined to the rest of Asia and the Pacific, including openings to VK/ZL on 18 days - VK on 14 (including all call areas) and ZL on 15 - with a gap between the 19th and 28th, a period when the solar flux was above the monthly average while geomagnetic activity was mostly below the monthly average.

	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
VK		+	+	+			+	+	+		+		+		+			+								+	+		+	+	
ZL	+	+	+	+		+	+	+	+		+		+		+	+	+												+	+	

Japan<>Australia/New Zealand

VK1 2 days 27, 30
VK2 8 days 2, 7, 9, 11, 15, 18, 27, 30
VK3 9 days 2, 3, 4, 7, 11, 18, 27, 29, 30
VK4 7 days 7, 11, 13, 18, 26, 27, 30
VK5 4 days 7, 8, 18, 27
VK6 7 days 2, 6, 7, 11, 12, 17, 23
VK7 2 days 2, 18
ZL 15 days 1-4, 6-9, 11, 13, 15-17, 29, 30

6m DX results in JA during December '03 from JA1VOK

DATE	TIME(UTC)	STATIONS
12/ 1	0350-0530	V73SIX/B, ZL3JT,3NW,3SIX/b
2	0430-0900	DU1EV/B, FK8SIX/B, KG6DX, V73SIX/B, ZL3NE/1,1VHF/b, ZL3NW,3SIX/b
3	0300-0740	DU1EV/B, V73SIX/B, VK2,3,6,7RST/b, ZL1VHF/b
4	0130-0200	C21SIX/b, V73SIX/B
	0255-0400	ZL1VHF/b
	0540-0900	DU1EV/B
	2300-2330	V73SIX/B
6	0140-0200	V73SIX/B
	0555-0900	VK6RSX/b,8RAS/b,ZL1BQ,1RD,1TMF,1VHF/b,2GK,2AAA,2TFK, ZL2TPY,3GS,3JT,3NW,3TJZ,4WA
	2230-2300	V73SIX/B
7	0220-0830	VK2-7,8RAS/b, ZL3NE/1,1VHF/b,3TY,4LV
	0810-0830	DU1EV/B
	0909-0920	HL1LTC
8	0350-0500	VK5ZMB, ZL1VHF/b
9	0730-0745	VK2BPL,2FHN
10	0110-0140	DU1EV/B
	0500-0540	DU1EV/B
11	0110-0300	C21SIX/b, DU1EV/B, VK2-4,6RPH/b, ZL1VHF/b
12	0750-0830	VK6RPH/b,6RSX/b
13	0050-0100	HL1LTC
	0250-0500	C21SIX/b, V73SIX/B, VK4BLK, ZL1VHF/b,2TPY,3SIX/b
	0730-0820	DU1EV/B
15	0051-0100	HL1LTC
	0235-0600	C21SIX/b, FK8CA,GX,SIX/B, VK2ZXC, ZL1VHF/b,3TY,3SIX/b
16	0153-0700	N7ET/DU7, FK8SIX/B, V73SIX/B, ZL3JT,3TY,3SIX/b,4LV
17	0440-0500	DU1EV/B
	0615-0630	HL1LTC
	0725-0900	DU1EV/B, KG6DX, VK6RSX/b, YB7AZJ, ZL3NE/1,1VHF/b
18	0410-0500	HL1LTC 0530-0800 DU1EV/B, VK3-5,7AN,7RST/b
23	0610-0700	DU1BP,1EV/B,, VK6RSX/b
26	0315-0430	9M2TO/B, VK4
27	0125-0730	9M2TO/B, C21SIX/b, DU1EV/B, FK8SIX/B, VK1-2,4-5
28	0156-0205	VR2XMT
	0230-0320	C21SIX/b, V73SIX/B, VK2,4
29	0200-0630	3W22S, 9M2TO/B, C21SIX/b, DU1EV/B, VK2, ZL3NW
	1003-1010	HL1LTC
30	0119-0130	V73SIX/B
	0220-0710	9M2TO/B, DU1ZV,1EV/B, VK1-2,4,8RAS/b, ZL1UF,3NE/1 ZL1VHF/b,2AGI,2TPY,2MHF/b,3GS,3JT,3MH,3NW,3TY,3TIC,4LV
31	0600-0700	9M2TO/B

Elsewhere

The volume of reports from VK/ZL has the greatest in some time. They included not only the trans-Pacific contacts already noted but a substantial number attributable to a better-than-average summer sporadic-E season.

Dec 1 0503 VK7>ZL3

Dec 3 0346-8 JA1ZYK,JA8>VK3 04-0500 JA1,JA7,JA8,HL1,JA6YBR,JA4>VK3 0446 VK3XQ>HL1

Dec 4 0104 VK2>ZL3 0414-7 VK8RAS>VK5 JA6YBR,VK8RAS>VK3

Dec 5 2239 ZL3>ZL3 4A1AC>ZL3NW

Dec 6 0529 VK2>VK5 0650 ZL3>ZL3 0717 VK5VF>VK6

Dec 7 02-0300 VK2>ZL3 03-0400 JA1ZYK>VK3 VK4ABP>VK3 04-05090 VK1,JA3,JA6YBR>VK3 0722 JA2>VK2,VK3,VK4,VK5 0902 JE7YNQ>HL1

Dec 11 00-0100 JA6YBR,JA2IGY>HL1 JE7YNQ,JA2>DS1 01-0200 JE7YNQ>VK3 02-0300 JA1>VK3 09-1000 ZL2MHB,ZL3>ZL2

Dec 12 01-0200 FK8SIX,VK5>VK3 06-0700 FK8CA,VK4RGG,FK8SIX,DUtv,BYtv>VK3 1045 VK4>VK3

Dec 13 0044 JA1ZYK>HL1 01-0200 VK4ABP,VK4RGG,VK4RTL>VK3 0528 JA7>VK3 0923 VK8RAS>VK3

Dec 15 00-0100 VK4RGG,VK4RTL,VK5>VK3(bs) FK8SIX>VK3 JA7,JA1ZYK>HL1 01-0200 JH8ZND>HL1 VK5,49750>VK3 02-0300 VK3>VK3(bs) FK8SIX>VK3(3000km Es) VK5>VK5 2332 K4RX>ZL3JT VK2>ZL3 4A1AC>ZL3JT

Dec 16 00-0100 W5LUA>ZL3JT 01-0200 K5UR>ZL3JT

Dec 17 00-0100 JE7YNQ>HL1(Es) 22-2300 VK2>ZL3 ZL2>ZL3(Es,bs)

Dec 18 00-0100 VK2>ZL3 ZL1VHF>VK3 VK9NS,VK9NL>ZL2 VK9NS>VK3 0106 VK4RGG>VK3 0217 ZL3>ZL3(Es) 04-0500 JE7YNQ,JA1ZYK>HL1 05-0600 JA6YBR>HL1(Es) VK4RGG>VK3 06-0700 FK8SIX>VK3 JA6>HL1 49750>VK3 07-0800 JA2IGY,JE7YNQ,VK7(bs)>VK3 VK3>HL1 VK3>VK3(200m) JA2,FK8FZ,VK4RTL,VK5(bs)>VK3 08-0900 VK4ABP>VK3 0954 VK7RST>VK3(t) 2316-58 VK4>ZL3 ZL3SIX,ZL4>VK3

Dec 19 00-0100 ZL1VHF>VK3 01-0200 ZL1VHF,ZL3>VK5 0252 ZL3>ZL2 0832 ZL3>ZL3 10-1100 ZL4>ZL3,VK5 VK3>ZL2,ZL4 1039-57 VK7,VK3>ZL3 1100-06 VK2,VK4>ZL3 1422-3 VK6RPH,VK6RBU>VK5 2233 ZL3SIX>VK3

Dec 20 010 ZL3SIX>VK3

Dec 23 0027 VK8RAS>VK3 0209 VK6RPH>VK5

Dec 25 2157-2400 ZLfm>VK3

Dec 26 00-0100 VK8VF>VK5 ZL3>VK3 01-0200 ZL3SIX>VK3 02-0300 ZL3SIX>VK3

Dec 27 0053 JE7YNQ>HL1 02-0300 JA8,JA1>VK1 03-0400 VK2>HL1,JA VK5>HL1 JA8>VK2,VK3 04-0500 VK2>HL1 0759 ZL3>ZL3

Dec 29 0952 JE7YNQ>HL1 1000 JA1ZYK>HL1

Dec 30 00-0100 VK4,ZL3>ZL3 0359 ZL1VHF>HL1 04-0500 JA8,HL1,JA7>ZL2 0500 ZL3,ZL1>HL1

Dec 31 2355 VK7>ZL3

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Compilation and Commentary by G3USF

Beacon News

28169.6	N8CPA with 10 watts from EN80KA (N7OR) nothing further known
28222.0	KF6MWA Granite Bay CA (CM98JR) new beacon running 1 watt to GP (KF6MWA)
28227	KC6WGN Las Vegas. New beacon no further information
28238.6	K5UNY new beacon from EM12NW Dallas TX with 4 watts of a1a into AR10 vertical running 24/7 email AlexQRP@aol.com (K5UNY)
28242	W2IK now QSY to San Antonio TX, runs 10 watts (W2IK)
28250	KP4SQ Ceiba (FK78HE) new beacon (G0AEV, KP4F)
28287	W7HDD Wenatchee WA (CN97TK) will run 5 watts to vertical. (Has tested on 28298.5) (W7HDD)
50025	VE4SPT reported here several times. No further information.
50074	FG1JD reported here; status not known
50091	KP4F Toa Alta PR (FK68WF) running 5 watts to 5/8 a1a 24/7 (KP4F)

28 MHz Worldwide

In some ways the December results have the appearance of a year or so back, when the solar flux chased 200. Aided by a happy blend of relatively high solar flux, relatively low geomagnetic indices and operators with lots of free time, the Christmas period was a notably lively time on 28MHz. Not all the month was quite so favoured; geomagnetic activity disrupted east-west paths on several days, though for the most part north-south paths stayed open - albeit below their best for seasonal reasons. Activity was buoyant, influenced by the ARRL contest, and attractive DX such as T32ZA, T30Z, 3D2AD, VK9CV, VK9NS and the TO4E expedition, as well as holiday leisure. There was propagation between some part of Europe and Africa and South America every day, with North America every day but one, and at least the nearer parts of Asia on all but two days. There was propagation within Europe every day, a mixture of F2 (though ranges did not come down as low or as often as a year back) and Es.

North America had propagation into South America every day and into Africa, and within North America itself every day but one. (Always remember, we are writing about *reported* propagation, so propagation possibilities may well have been rather better, as by no means every opening is reported.) The results for the best time-periods were down little or not at all over December 2002. So, Europe<>Africa in the morning and at noon was at or as close to 100% as makes little difference. However, average flux figures in December 2003 were now down to around 115. If we look at off-peak time slots, cyclical deterioration becomes clear: Europe<>Africa dropped from 90 per cent in the afternoon to 68 per cent and the evening figures go from 40 per cent to 19. A more difficult path, such as North America<>Asia, is down from 84 per cent in the morning (US) to 13 per cent and in the (US) evening from 90 per cent to 29 per cent. There was almost no reported propagation to Oceania during the European evening, down from 80 per cent in 2002. Indeed, not surprisingly, cyclical deterioration was most marked during the local evening period. It is also probable that, roughly speaking, the higher the latitude the greater the erosion of 28MHz performance, though the nature of the available data does not provide conclusive demonstration.

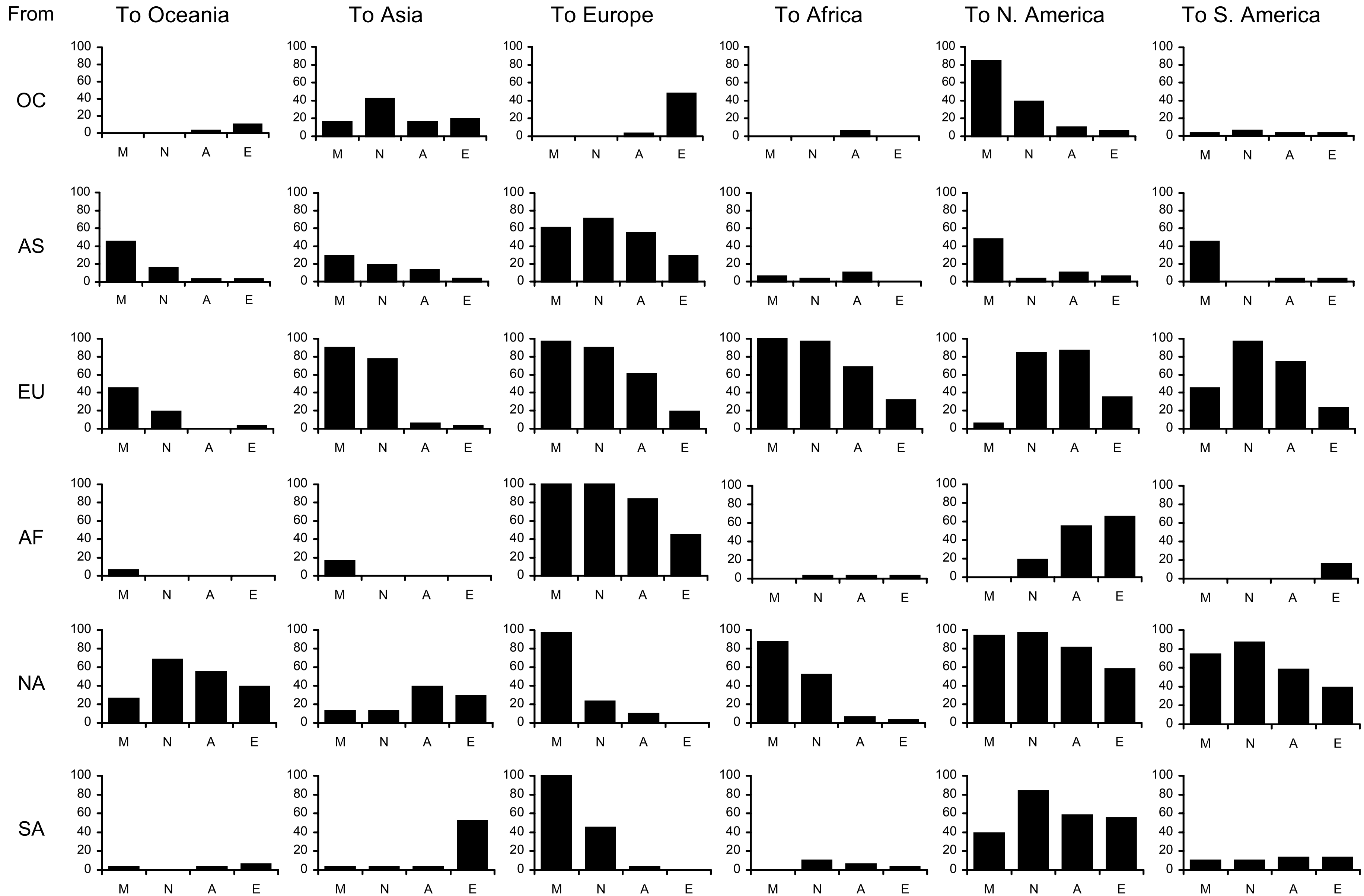
As always, some reports were exceptions to such downbeat observations - and as always the exceptions were as likely as not to be found on contest weekends. Thus, during the ARRL contest, some US stations were making skip contacts up to almost 0100 local time. On the 13th (flux 88, Ap 28), already noted as one of the better days for Es at 50MHz, there were many intra-European contacts by Es during in the evening.

However, in addition, IZ3EYZ reported K1RX at 2001, by what appears to have been side-scatter (qtf 150), with LO7H, VE3AT and K1AM between 2003 and 2019, also on skewed paths. At 2015 I4LCK reported ZF2AT, IK7LYL had TI5A also at 2015, and EA1WX reported K4JO, NE4AA, K0LUZ and N2OW between 2026 and 2030. At 2224 EA7WA reported NE4AA. Among other reports that, in this context, appear rather more than run-of-the-mill, would be a contact between W4WS and OH1XX at 1934 on the 14th and one between K4MA and UA1ARX at 1938 the same evening - both being late in the day and from a relatively high latitude. The same would be true of LY2ZZ<>K0SR at 2214 on the 29th. AF4Z<>IT9RJE at 2031 on the 6th was also late, though at lower latitude. PY4OY<>3D2AD at 0821 (0421LT) on the 6th looks exceptionally late. JE6DOI>OK2BKV at 0851 on the 6th and ZS6JPY<>ON4DSQ at 0919 on the 25th were both reported as long path, though one would have liked further details.

Finally, aurora on the 8th brought reports of reception of SK5AE by SM2CEW at 2047 by auroral E, followed by the DF0AAB beacon. At 2118 DD3SP heard the OH9TEN beacon, again presumably AE. And at 1439 on the 9th OH5TEQ reported OH9TEN 57a.

(*Graphs showing Worldwide 10m activity are on the following page*)

28 MHz Worldwide - December 2003



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