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COLLEGE JEAN-DE-BREBEUF

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ATMOSPHERIC ELECTRIC POTENTIAL AND AIR-EARTH CURRENT DENSITY AS RECORDED AT BREBEUF COLLEGE (MONTREAL)

(January - June 1964)

Ernest Gherzi, S.J.

In accordance with a recommendation of IAMAP and IAGA at a joint meeting in Montreux (May 1963), and as a contribution to the IQSY programme on the study of atmospheric electricity, continuous recordings of air-to-earth current density were started in January 1964. Atmospheric electric potential recordings were already being done since November 1956. Data of these two electric parameters for the first half of 1964 are hereby presented.

Site

The probes for both Potential and Current Density are installed about 23 meters above ground, on the roof of the Faculty Building at Brebeuf College. The College is situated in a residential area on the western slope of Mount Royal, some 110 meters above the mean level of industrial downtown Montreal.

The prevailing winds, as recorded at Dorval, located 11 kilometers WSW of the observatory, were westerly from January to April, and southwesterly in May and June. These directions are, with respect to the observatory, from non-industrialized areas, except for one site, 32 kilometers to the southwest of the College. Air pollution values are available from Summers (1961) for sites on the opposite side and on the summit of Mount Royal, but none for Brebeuf College itself.

It must be noted that the roof on which the instruments are installed is not the highest part of the College Building complex and therefore the probes are somewhat shielded from NW air currents.

The geographic coordinates of the station are:

Latitude : 45°, 30.15' N
Longitude: 73°, 37.4' W
Elevation : 133 meters above m.s.l.
23 meters above surrounding grounds.

Instrumentation

1. Atmospheric Electric Potential Apparatus

The equipment consists of a 2-cm^2 gold probe being a 75-microcurie radioactive source (Radium-D), installed on a slightly heated teflon insulator at the top of a 3.5-meter wooden mast. A highly insulated coaxial cable, 45 meters long, connects this probe to a Keithly variable-scale vacuum-tube electrometer and amplifier, Model 210. The shield of the cable is grounded at the electrometer input, where a voltage divider lowers the potential to the level required by the sensitivity of the electrometer.

Both the zero base-line and sensitivity are checked regularly.

2. Air-to-Earth Current Density Apparatus

The air-earth current density detecting and amplifying system has been built by Saxer and Sigrist (Aarau, Switzerland). It consists of a 0.5 m^2 special collecting grid supported by three rain-shielded and electrically heated teflon insulators. The top of the grid is 60 cm above roof and the supporting table is electrically grounded.

A highly insulated coaxial cable, about 45 meters long, carries the signal to a specially designed vibrating condenser amplifier of variable input sensitivities.

The choice of the Saxer-Sigrist apparatus has been dictated by the similarity between Canadian severe winter conditions and the Marchison Bay climate where such an instrument was successfully operated during the IGY.

Recording Equipment

Simultaneous recording of both atmospheric electric parameters is made by a multi-trace Elmes-10 point-recorder. Full-scale sensitivity of the recorder is 1 mA; the recording speed is 20 mm/hr, and the recording rate is 5 points per trace per minute.

Presentation of the data

The hourly averages of both parameters, electric potential and air-earth current density, are hereby presented in tabular format; the values are not corrected for the geometrical distortion of the field at the site, nor reduced to standard height, 1 meter above ground.

The downward motion of the positive charges is considered as positive. The symbol D indicates a highly electrically disturbed

period during which the value has not been evaluated; the symbol M, a missing value due to technical failure. A question mark (?) means a value that was recorded, but could not be evaluated for reasons other than a disturbance. The values as recorded have been evaluated within $\pm$ 25 volts for the electric potential and $\pm$ 2 x 10^{-13} A/m^2 for the current density, that is to say within $\pm$ 5 percent approximately for the average readings of both parameters. Sometimes, for one reason or another, such an accuracy in evaluating was impossible and the value had to be estimated; in which case, the value was starred (*).

In this present paper, only the undisturbed positive hourly averages ranging from 0 to 3,000 volts, and from 0 to 150 x 10^{-13} A/m^2 are considered as "fine weather values". All other values have been rejected in the calculation of the means. The overall monthly means were obtained by summing all the individual hourly averages and dividing the sum by the total number of hourly values.

The Time used is Eastern Standard Time (U.T. - 5 hours).

A third series of tables gives the daily weather summary for the period concerned as issued by Dorval Airport Weather Station located 11 km WSW of Brebeuf College.

SUMMERS, P.W. (1961): Air Pollution in Montreal related to local meteorological Factors. (A paper presented at the National Congress, Canadian Branch, Royal Meteorological Society, Montreal).

ACKNOWLEDGEMENT

The readings of the air-earth current density were made possible through a grant of the National Research Council of Canada.

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-1

JANUARY 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1																										
2																										
3	M	550	500	800	1700	2300	>3000	>3000	?	2600	?	2000	?	D	D	1150	250	250	150	400	100	-600	-200	-1000	13	980
4	-750	-100	650	400	450	1050	1000	900	D	D	1400	400	D	1000	1100	1000	1200	1300	1250	1150	1150	950	800	800	19	940
5	1000	1000	1050	900	900	1050	1150	1000	1550	1700	1700	1550	1750	1750	1550	1750	1650	1550	1600	1400	1500	1600	1200	1850	24	1400
6	>3000	1400	1400	1600	1200	550	750	1150	1700	1800	1550	1300	1200	500	D	D	D	D	800	D	D	0	350	600	17	1050
7	950	950	800	200	-100	-250	-250	-400	400	900	1550	1450	1350	1250	1200	1500	1550	1400	1350	1500	1450	1350	1450	1400	20	1200
8	1500	1550	1200	1000	1400	1400	1600	1550	1800	M	2700*	2600	2500	2650	2900	2300	2750*	1800	1800	1700	1800	1500	1400	1450	23	1860
9	1250	1250	1300	1300	1500	1300	1300	1450	1400	950	D	D	100	-100	>-2000	-1000	-150	-300	-700	>-2000	>-2000	?	-300	-350	11	1190
10	-500	-500	200	200	150	100	200	200	300	350	700	900	900	950	700	500	450	500	550	500	850	900	850	850	22	540
11	700	800	900	900	1050	1050	1100	1300	1400	1550	1800	1750	1450	1450	1350	1650	1350	1450	1550	1500	1500	1350	1200	1200	24	1300
12	1300	1250	1200	1150	1200	1100	1250	1650	1700	1850	1300	1650	2000	2250	2300	1950	2000	2000	1850	1700	1700	1700	1900	2000	24	1660
13	1800	1500	1850	1600	1500	1150	1050	1250	1300	1200	1300	1400	1300	1200	1000	950	1050	1350	1000	1050	800	1050	1100	950	24	1240
14	1050	800	500	-500	150	350	200	900	2400	2300	2350	1850	1800	1700	1450	1600	1800	1950	1650	1300	1200	1000	1150	950	24	1320
15	1050	1100	950	850	800	1000	1150	1200	1200	1250	1150	1150	1050	950	800	800	900	900	1200	700	250	300	500	400	24	940
16	300	200	-200	-600	-450	-250	-250	-150	100	0	-250	-300	0	-150	-300	-250	-250	50	100	150	500	600	500	600	12	370
17	500	800	900	800	550	700	800	1100	1000	550	1350	850	950	950	850	850	850	1100	1050	1150	1350	1100	950	800	24	910
18	850	1350	750	550	850	600	400	400	250	600	650	600	400	450	500	D	-50	-650	-400	-500	-250	-200	-150	150	16	580
19	150	150	650	700	650	550	550	750	1200	1500	1250	1200	950	1050	1200	1100	950	900	850	700	650	650	600	500	24	810
20	400	300	500	450	600	450	650	900	1150	1200	1050	900	800	800	700	350	D	D	D	150	150	0	-500*	-1350	19	610
21	-1000	-1100	-150	-150	-200	0	-600	-250	150	300	350	350	450	750	950	850	900	950	800	650	450	400	450	400	17	540
22	350	400	350	300	350	450	700	400	400	1200	1100	600	800	350	950	1350	1700	1900	1500	1400	1150	1000	1050	950	24	860
23	950	1050	1050	800	700	750	700	850	1000	700	900	1000	1000	1150	1050	800	850	800	200	200	150	200	500	800	24	760
24	350	-300	-200	-600	-1100	D	-100	D	D	400	1400	1200	1350	1450	1600	1600	650	0	250	-50	100	250	450	300	15	760
25	300	250	300	300	D	D	D	D	D	D	D	D	D	D	D	D	650	450	500	800	650	350	-50	350	11	450
26	350	500	D	500*	450	650	750	650	900	650	D	500*	2500	2400	1300	400	450	600	600	650	450	300	300	450	22	790
27	300	450	450	550	150	300	600	1300	1300	1150	1200	1200	1300	1250	2100	1200	1100	1200	1100	700	1300	750	500	D	23	930
28	350	400	600	750	950	1300	1400	1350	1650	1800	1900	1600	600	200	700	1000	1600	1700	1600	1650	M	M	M	M	20	1150
29	M	2200	2050	2100	2000	2000	M	M	M	M	M	M	M	M	M	M	2000	2000	1450	1200	1250	1100	1050	D	12	1700
30	-550	300	600	800	700	700	450	500	500	900	1050	1150	1150	1100	1300	1150	1300	1300	1250	1450	1400	1300	1500	1800	23	1030
31	1650	2100	2000	1550	1150	950	900	700	1100	1400	1850	2000	2600	2650	1750	1700	1450	1350	1250	1050	500	400	1500	900	24	1440
No. of Hours	22	25	25	25	24	25	22	22	24	25	23	25	25	24	23	23	24	25	26	25	25	25	23	23		
Mean	790	900	910	840	880	870	850	970	1080	1150	1370	1290	1210	1260	1270	1190	1220	1150	1050	1050	890	800	920	890		1035

D: disturbed M: missing *: estimated ?: unknown

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VERTICAL AIR-TO-EARTH CURRENT DENSITY 10^{-13} A/m^2

I-1

JANUARY 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1																										
2																										
3	M	15	10	18	32	38	50	75	50	35	45	14	D	>150	>150	D	10	4	6	26	18	-20	-12	-35	16	28
4	-25	-5	6	-4	5	12	10	14	D	D	38	D	D	D	32	38	32	8	-4	2	16	12	20	22	15	18
5	26	26	26	24	30	36	38	48	44	50	50	44	48	36	22	26	14	20	20	20	22	18	4	34	24	30
6	40	-16	16	20	4	0	10	20	30	24	16	12	14	6	D	>150	>150	>150	>150	>150	D	8	8	12	16	15
7	16	16	16	18	20	16	12	12	22	58	78	56	40	32	30	32	26	18	13	26	18	16	22	20	24	27
8	26	22	16	10	12	18	34	22	30	M	66	48	52	60	88	42	26	6	16	18	16	12	12	14	23	29
9	12	16	20	24	26	26	24	24	18	18	D	D	0	18	D	>-100	D	-20	D	>-100	>-100	D	D	>-100	12	19
10	>-100	>-100	D	-18	-24	-22	-18	-8	12	28	68	40	48	50	38	32	46	48	D	>150	80	58	62	58	14	48
11	52	56	60	56	62	58	62	68	70	68	68	66	60	64	52	60	42	42	46	46	46	40	38	38	24	55
12	44	42	42	42	42	46	44	54	54	64	62	58	70	68	64	50	52	50	44	42	40	40	46	42	24	50
13	50	48	50	36	18	16	26	30	50	84	74	50	60	48	38	44	36	64	52	26	36	28	26	20	24	42
14	26	20	14	-10	38	10	30	46	66	42	64	40	54	54	50	58	54	56	38	38	34	26	32	32	23	40
15	38	34	30	26	28	26	38	38	38	38	34	38	37	32	28	26	22	14	28	16	6	16	32	18	24	29
16	16	12	D	>150	96	100	D	>150	>150	>150	>150	>150	>150	>150	>150	>150	D	42	34	M	M	M	26	30	8	44
17	26	48	44	40	32	36	36	40	20	28	22	8	24	26	18	10	10	6	4	-10	-20	-32	-32	-34	19	25
18	-30	-20	-38	-30	-26	-38	-18	M	M	M	28	32	14	6	10	D	D	>150	60	6	8	12	12	20	11	19
19	24	24	40	36	36	32	36	40	50	66	50	48	38	36	32	16	0	0	2	-4	M	24	32	28	22	31
20	26	26	30	30	30	24	30	32	32	32	26	30	28	28	24	18	D	>150	>150	D	D	>-100	>-100	>-100	16	28
21	>-100	>-100	>-100	>-100	>-100	>-100	>-100	D	6	10	10	6	20	40	50	42	46	42	36	32	26	22	20	18	16	27
22	16	20	20	14	16	24	32	14	16	50	42	36	42	18	42	50	62	68	44	46	42	40	42	36	24	35
23	40	46	38	30	28	34	30	42	32	24	30	30	40	32	32	28	48	16	-6	24	6	6	10	18	23	29
24	-18	-24	-14	-32	-40	D	D	D	D	42	28	26	36	66	64	72	24	26	24	18	22	40	40	32	15	37
25	30	30	34	30	D	>-100	>-100	>-100	>-100	>-100	>-100	D	D	D	D	D	100	24	50	100	76	28	>150	D	10	50
26	D	D	D	D	M	M	M	M	M	M	D	>150	>150	>150	>150	>150	60	40	40	42	44	76	62	110*	8	59
27	?	50	58	58	D	>150	D	>150	D	70	58	60	56	52	D	>150	100	44	32	20	>150	>150	80*	D	13	57
28	D	64	48	84	44	48	26	30	44	50	48	36	D	D	38	40	66	62	56	50	M	M	M	M	17	49
29	M	92	88	76	76	68	M	M	M	M	M	M	M	M	M	M	72	70	50	44	42	34	34	D	12	62
30	>150	>150	>150	>150	>150	>150	70*	30	26	20	28	30	36	32	42	36	42	32	32	38	32	22	32	48	18	35
31	38	64	62	46	D	38	34	22	42	48	72	84	76	56	36	56	62	42	40	34	12	12	>150	>150	21	46
No. of Hours	18	21	22	20	20	21	20	20	21	22	24	23	22	22	21	20	24	25	23	22	21	22	22	20		
Mean	30	37	35	36	34	34	34	35	36	43	46	39	41	39	40	39	44	34	34	32	31	27	31	32		34

D: disturbed M: missing *: estimated ?: unknown

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ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-2

FEBRUARY 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	800	950	800	1000	D	D	1500	900	1000	1150	1250	650	1350	1350	1250	1150	700	650	1000	D	D	-850	-1200	-950	17	1030
2	-500	-500	-500	-600	300	700	1100	950	1050	1150	1450	1500	1450	1500	1500	1900	2350	2100	1800	1700	1650	1350	1250	1350	20	1400
3	1450	1450	1500	1400	1500	1450	1500	1650	2150	2400	2350	2400	2200	1950	1900	1700	1800	1750	1850	1800	1650	1750	1550	1750	24	1780
4	1450	1350	1350	1450	1200	1050	850	950	750	400	700	800	950	750	750	700	850	600	500	350	600	400	150	100	24	790
5	100	-100	150	D	-400	-550	-500*	1000	1300	1500	1600	1450	1200	1100	1000	1100	1450	1600	1650	1350	1150	1200	1600	1700	19	1220
6	2000	2250	2100	1950	1700	?	>3000	2250	2400	1900	2200	2450	2400	2100	1900	1650	1500	1550	1400	D	D	D	M	M	17	1980
7	M	M	M	M	-1000	50	-100	300	600	900	-100	-550	-100	200	1500	D	D	1400	1000	1300	1600	1250	-350	-650	11	920
8	-850	-300	50	650	400	650	1450	1200	1550	1600	1350	1250	1200	900	850	800	750	500	450	700	900	850	950	1050	22	910
9	1100	1150	1250	1200	1200	1150	1200	1250	1250	1360	1250	1250	1350	1550	1600	1700	1700	1800	1550	1750	1650	1350	1600	1850	24	1360
10	2200	2250	1750	2000	2200	2100	1500	2500	1900	1150	>3000	>3000	2800	2900*	2650	2150	1650	1850	1500	1300	1350	1400	1350	1000	22	1880
11	1400	1600	1350	1000	1100	1200	1300	1900	2700	M	2150	2800*	2700	2100	1450	1650	1450	1400	1050	900	900	850	850	1000	23	1510
12	1050	950	1000	1100	1200	800	750	1200	1300	1550	1650	1650	1850	1750	1700	1950	1900	1700	1600	1600	1500	1300	1200	1100	24	1390
13	1050	1050	1050	1000	750	900	1050	1400	1550	1600	1450	1500	1850	1850	D	1000*	?	850	800	700	200	-300	300	400	21	1060
14	300	150	300	150	350	450	600	1150	1000	1450	1500	1350	1300	1200	700	350	1200	1300	1850	1550	1650	1500	1700	1800	24	1030
15	2000	1650	2300	2450	?	2400	2250	2000	2100	2650	2850	2750	2300	2050	1650	1850	1450	1000	1000	900	850	750	650	550	23	1760
16	800	650	500	650	200	-200	-900	?	-1150	-1350	-500	1150	1250	750	700	600	700	1300	1250	1050	1000	1300	1100	1350	18	910
17	1200	1200	1100	1600	1500	1650	2400	>3000	2950*	2500	2300	1950	1900	1950	2150	1900	1650	1500	1750	1500	1050	900	600	650	23	1650
18	850	1150	1400	1800	1750	2400	2250	M	M	M	2100*	2200	1850	2100	2050	1900	1400	1350	1200	1000	1100	950	900	850	21	1550
19	950	750	450	900	600	200	1300	1800	1750	1800*	1850*	1500	1850	2000	2200	2000	2100	2050	1800	1200	1000	1000	900	800	24	1360
20	800	900	1000	-400	650	1200	1250	2300	>3000	>3000	1900	1950	2000	2000	1800	2050	1600	1650	1450	1550	1550	1400	1150	1050	21	1480
21	1350	1700	1600	1550	1500	1600	1700	1750	2550	2250	1700	1450	1600	1300	1300	1550	1400	1850	1500	1300	1350	1850	1850	1600	24	1630
22	2000	2200	2000	2000	2000	1800	1700	2050	2050	2350	2500	2300	2700	2750	2500	2050	1300	1150	1150	1100	1000	950	950	950	24	1810
23	1250	1200	1250	1450	1600	1800	1950	1900	M	M	2100	2150	1950	1550	1450	1150	1200	1400	1150	300	450	500	750	750	22	1330
24	250	450	350	300	700	550	-150	- 50	250	- 50	200	200	-250	1650*	>3000	>3000	>3000	2900*	2250	1200	1250	1400	1600	1550	17	1000
25	1650	1750	3000	2700	1700	1700	1550	2600*	2250	2150	1850	1650	1550	1500	1500	1450	1400	1450	1350	850	700	600	750	600	23	1530
26	600	450	200	100	300	0	250	-150	650	1500	350	850	1400	1650	1350	1150	1300	1150	950	900	800	250	-1200	-1000	21	770
27	-600	350	1100	700	-200	600	1350	>3000	>3000	>3000	2100	2100	2200	2050	2000	2350	1900	1700	1550	1500	1400	1300	1100	1000	19	1490
28	900	1000	900	750	650	700	700	850	1100	1200	1200	1500	1800	1700	1750	1500	1400	1550	1500	1100	850	900	750	750	24	1120
29	800	1050	1050	550	-200	0	50	1650	2600	2900*	>3000	>3000	>3000	2900*	2150	1300	1300	1100	950	1200	700	-200	- 50	-350	17	1310
No. of Hours	25	25	26	25	23	25	24	23	24	22	25	26	26	29	27	27	26	29	29	27	27	25	24	24		
Mean	1130	1180	1070	1220	1090	1080	1310	1540	1570	1720	1590	1640	1810	1690	1600	1500	1440	1450	1340	1170	1100	1090	1060	1060		1355

D: disturbed M: missing *: estimated ?: unknown

VERTICAL AIR-TO-EARTH CURRENT DENSITY 10^{-13} A/m^2

I-2

FEBRUARY 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	?	>150	>150	>150	>150	40	26	36	D	D	D	-12	-12	3	34
2	2	20	6	6	16	26	34	50	42	46	50	46	46	74	58	64	76	50	40	46	40	26	28	32	24	38
3	38	34	38	36	42	36	36	14	M	M	56	62	52	50	56	48	50	40	36	32	28	30	20	36	22	39
4	18	28	28	26	8	-10	M	M	M	M	60	40	52	46	>150	>150	?	50	16	30	D	36	0	36	15	32
5	46	10	26	D	D	D	D	46	50	60	64	64	62	64	50	62	44	70	62	40	36	40	54	46	20	48
6	74	94	74	66	58	100*	64	14	56	26	64	58	50	40	40	26	26	26	20	D	D	D	D	D	19	51
7	D	D	D	88	D	>150	D	50	20	24	0	D	10	D	>150	>150	D	D	D	>150	>150	>150	50	D	7	34
8	>-100	D	94	80	100*	26	42	20	38	40	36	50	D	>150	D	110*	48	16	20	60	100*	D	D	>150	16	55
9	D	108	62	62	106	60	48	44	D	>150	D	64	50	54	56	46	42	38	34	38	26	22	30	36	20	51
10	36	32	6	-10	M	M	M	M	M	20	60	64	80	82	70	52	30	46	26	20	22	30	28	D	17	41
11	M	46	36	30	36	38	40	60	70	50*	46	70	110*	120*	70	62	42	30	20	24	26	20	22	24	23	47
12	26	20	22	26	26	14	16	34	36	50	D	44	50	46	48	64	48	48	44	40	36	26	28	26	23	36
13	28	32	30	36	36	36	38	34	26	36	36	36	46	70	D	>150	D	M	M	M	M	M	14	10	16	34
14	0	-2	6	-2	8	6	10	38	36	32	38	38	50	62	D	26	44	34	50	34	40	30	36	34	21	31
15	38	20	60	60	78	50	46	38	32	60	72	64	60	48	40	50	36	20	26	20	20	18	14	14	24	41
16	12	6	8	12	2	26	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	40	26	40	9	19
17	28	38	30	46	52	56	64	70	86	82	80	66	68	130	D	D	D	D	M	D	D	D	16	20	16	58
18	12	20	30	30	40	40	30	M	M	M	D	30	20	30	D	D	16	36	28	26	38	30	26	26	18	28
19	26	18	12	32	16	D	86	46	44	M	M	58	48	44	48	42	46	42	32	18	20	22	16	12	21	35
20	38	30	20	D	34	34	38	66	74	62	48	76	78	90	72	68	70	60	56	100*	>150	D	80	D	20	60
21	D	D	D	D	D	D	D	D	D	D	D	D	>150	>150	>150	>150	M	M	M	M	M	M	M	M		
22	M	M	M	M	M	M	M	M	M	64	80	90	>150	>150	112	92	40	26	28	26	24	22	24	26	13	50
23	34	28	30	36	42	44	48	48	M	M	64	64	44	42	38	30	36	40	20	0	16	18	24	22	22	35
24	6	18	12	20	>150	>150	>150	>150	>150	>150	D	D	D	D	D	D	100	94	52	26	28	36	36	38	12	39
25	40	50	88	56	30	20	18	54	30	36	40	38	50	44	44	44	46	46	40	20	10	24	24	20	24	38
26	20	18	6	50*	>150	>150	>150	>150	>150	D	D	D	D	D	D	D	100	120	100	60	80	D	>150	>150	9	61
27	D	>150	140	40	0	80	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	120	128	136	>150	>150	120	8	100
28	120	136	120	100	100	88	96	112	140	136	144	>150	>150	>150	>150	>150	>150	>150	128	100	100	60	72	16	109	
29	80	112	100	D	D	D	48	>150	>150	>150	M	M	M	M	M	M	26	26	24	34	8	-16	-14	-12	9	51
No. of Hours	21	22	25	21	20	18	18	18	15	16	18	20	19	18	14	16	21	22	23	22	20	18	22	20		
Mean	34	42	40	45	41	43	45	47	57	51	58	56	54	61	57	55	48	45	41	43	42	32	30	34		45

D: disturbed M: missing *: estimated ?: unknown

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-3 MARCH 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	- 50	350	300	50	50	-300	-250	300	850	950	1200	1550	1750	1450	1350	1250	1000	200	-100	-400	-450	-550	-550	-400	15	840
2	-300	-200	-450	-150	200	-250	150	400	350	650	700	950	900	850	1100	1100	900	1100	1100	1100	800	700	650	600	19	750
3	700	600	600	600	700	800	700	850	800	450	50	550	500	600	1000	950	500*	400	400	200	250	300	500	550	24	560
4	-200	-300	150	550	650	1200	1200	1300	1200	1150	1400	1650	1300	1150	550	500	700	550	400	-150	0	-1000	-1100	-1150	18	870
5	-550	-350	-400	0	0	-100	500	?	500*	0	-100	150	-750	-500	600	850	200	150	150	300	250	100	100	200	16	250
6	500	- 50	300	750	750	750	750	950	1200	1100	1200	1000	1100	1050	1100	1100	1050	1150	1100	1000	950	900	1150	850	23	950
7	1000	850	900	800	600	450	500	550	600	D	600	700	500	500	800	650	400	200	250	300	400	500	350	250	23	550
8	350	600	600	600	650	650	700	850	600	650	900	900	550	500	750	950	1150	1050	1050	1050	1050	650	- 50	-150	22	760
9	150	200	D	D	D	D	D	900	0	-100	-100	-100	-300	-200	-100	-100	- 50	-100	-100	-250	-400	200	350	450	7	320
10	500	350	400	150	-150	-550	250	650	950	800	950	650	1000	1300	1000	1300	2300*	D	1500	D	500*	-600	-250	100	18	810
11	250	500	600	700	800	850	900	1100	1400	1850	1650	1450	1200	1200	950	850	-350	400	1300	900	1200	700	950	850	23	980
12	800	650	950	800	850	800	1000	1100	1500	1050	1650	1650	750	750	1050	1000	1150	700	450	100	50	200	400	0	24	810
13	0	50	350	750	1150	1100	1250	1800	?	2250	1900	2000	1950	1850	1800	1550	1850	2050	1750	1500	1400	1300	1350	950	23	1390
14	950	1000	1000	1000	900	950	800	900	900	800	850	900	50	D	-250	350	250	250	1050	550	250	200	250	-100	21	670
15	200	-100	150	-100	-400	-400	150	400	700	900	950	850	800	800	900	800	900	900	800	700	600	600	550	400	20	650
16	300	300	350	350	400	450	650	1150	1200	1000	1050	900	800	750	800	700	450	600	650	700	750	850	950	1000	24	710
17	750	1000	950	1050	850	450	D	D	D	D	D	D	650	1300	800	1250	1000	1300	1150	1100	1350	1000	1050	900	18	990
18	700	1400	150	-350	550	350	700	1000	1450	1650	1400	950	800	950	800	950	1000	750	900	700	700	600	650	700	23	860
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
20	M	M	M	M	M	M	M	M	M	M	1550	1400	950	150	350	850	1750	1250	1200	1550	1750	1700	1400	1100	14	1210
21	1500	1600	1250	1350	1400	1300	1200	1050	1200	1600	1500	1400	1200	1100	1000	0	-350	250	400	450	550	550	500	450	23	940
22	400	350	400	400	350	400	400	450	300	D	1400	800	350	300	300	150	-900	D	-550	-500	-500	-700	-800	-500	15	450
23	300	550	500	700	750	900	1100	1650	1850	1450	700	600	850	600	700	400	650	600	650	500	650	700	1150	1200	24	820
24	1050	950	1050	1300	1150	1050	1550	1800	2100	1650	1650	1350	1150	1000	900	500	550	500	500	450	550	450	600	500	24	950
25	300	300	450	450	500	500	650	1000	1850	1600	1150	950	900	900	950	1000	1000	1000	1000	650	700	750	400	350	24	800
26	350	500	550	200	150	D	D	D	D	D	D	D	D	450	0	D	D	D	D	D	250	350	450	-200	10	320
27	500	550	550	600	400	450	500	600	600	850	500	600	800	950	1000	1100	1050	1050	1150	1150	1150	950	800	700	24	770
28	650	700	650	600	600	650	850	1400	1400	1500	1400	1100	1050	1100	1000	900	900	400	-400	D	D	D	D	D	18	940
29	-100	0	0	900	D	D	200	200	M	M	950	450	550	700	900	650	700	700	700	500	400	200	100	50	19	470
30	150	100	200	250	250	450	600	1100	1650	1250	1100	1000	900	900	950	1000	1000	1100	1150	900	900	900	900	900	24	820
31	950	1050	1050	1100	1100	1000	1100	1350	1600	1300	1150	1000	900	900	850	800	750	650	800	900	1200	1000	900	850	24	1010
No. of Hours	24	24	26	25	25	21	25	26	25	23	26	27	27	27	28	28	25	26	25	23	26	25	24	23		
Mean	550	600	550	640	630	740	730	950	1070	1150	1130	1020	900	890	870	840	930	740	860	750	720	650	690	600		800

D: disturbed M: missing *: estimated ?: unknown

VERTICAL AIR-TO-EARTH CURRENT DENSITY 10^{-13} A/m^2

I-3 MARCH 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	8	14	16	2	6	-14	-2	22	34	38	50	62	74	62	56	48	34	-4	-4	-14	-12	-20	-18	-12	15	35
2	-10	-4	-18	-6	10	M	M	14	10	20	20	28	26	34	44	52	42	46	36	38	30	26	26	34	18	30
3	36	28	30	34	36	38	32	34	28	12	2	26	20	28	50	44	30	16	26	8	8	14	16	20	24	26
4	-22	D	16	30	32	36	26	20	14	14	36	38	32	32	14	28	34	26	20	-8	D	-30	D	D	17	26
5	-4	-10	-20	0	-2	-6	D	>150	D	20	0	10	>-100	>-100	D	M	M	M	M	M	M	M	76	78	6	30
6	72*	40	42	58	68	64	56	68	90	84	74	60	60	50	54	50	46	50	44	44	42	42	54	30	24	56
7	30	22	26	22	18	24	24	46	76	D	D	92	56	D	D	60	32	20	20	16	20	20	16	12	20	33
8	20	24	36	28	36	32	36	36	40	44	36*	28	18	18	30	36	42	44	50	42	42	20	-4	M	22	34
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
11	16	20	16	16	20	20	20	20	24	M	M	M	M	12	40	0	-40	44	48	32	70	M	M	M	16	26
12	M	44	36	32	32	40	28	32	32	28	50	10	50	40	50	48	40	20	20	10	12	12	24	0	23	30
13	M	M	M	50	40	40	50	60	100*	88*	78	100	94	84	76	68	78	72	58	54	44	50	50	38	21	65
14	44	50	42	36	34	34	32	34	34	30	42	38	6	D	10	20	34	38	100*	D	>150	D	D	M	18	37
15	16	D	D	D	-38	-28	16	26	42	48	50	64	68	68	70	70	74	64	52	46	50	48	44	28	19	50
16	30	30	32	32	32	36	42	60	76	68	66	58	68	68	68	48	36	38	38	36	36	38	38	32	24	46
17	20	36	38	36	30	24	D	D	>150	>150	>150	D	M	M	M	M	M	M	M	M	M	M	M	M	6	30
18	M	M	M	M	M	M	M	M	M	M	48	44	74	70	42	50	44	32	40	32	34	26	32	32	14	43
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
20	M	M	M	M	M	M	M	M	M	M	68	60	44	0	32	34	64	44	56	76	76	78	46	36	14	51
21	42	34	34	44	44	40	36	30	40	50	44	42	36	34	30	10	20	34	24	20	20	20	16	14	24	32
22	12	10	14	16	12	12	16	18	4	D	26	22	26	16	16	0	D	D	6	0	-20	D	M	M	17	13
23	M	M	M	M	M	M	M	M	M	M	40	36	42	32	36	16	26	20	26	24	30	34	36	34	14	31
24	30	28	34	42	30	36	50	46	62	50	62	40	50	46	46	24	30	44	46	48	34	32	40	20	24	40
25	16	20	32	28	28	34	42	70	82	86	86	72	68	72	56	72	72	60	50	26	38	26	10	30	24	49
26	26	24	28	30	38	D	D	D	>150	>150	M	M	M	M	M	M	M	M	M	M	M	M	M	M	5	29
27	M	M	M	M	M	M	M	M	M	M	32	20	24	28	30	36	28	30	34	22	20	20	16	16	14	25
28	16	18	16	14	12	10	18	30	32	48	44	36	48	58	50	40	34	10	D	D	D	D	D	D	18	30
29	6	6	70*	>150	>150	>150	36	10	M	M	38	20	30	36	44	40	42	42	36	24	18	6	D	>150	17	30
30	>150	24	12	10	10	26	32	52	74	60	54	50	42	44	48	54	54	54	56	42	38	40	44	36	23	42
31	38	44	46	48	50	48	48	62	110*	64	56	50	46	46	44	42	40	38	38	44	50	38	28	34	24	48
No. of Hours	18	19	20	21	21	18	19	21	20	18	24	25	24	23	24	25	23	23	23	21	20	19	18	18		
Mean	27	27	31	29	29	33	33	38	50	47	46	44	46	43	43	40	42	39	40	33	36	31	34	29		37

D: disturbed M: missing *: estimated ?: unknown

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-4 APRIL 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	800	800	1050	1000	900	900	1100	1150	1100	1000	900	800	800	800	700	750	750	900	700	750	1000	1050	1150	1150	24	920
2	1500	1450	1400	1400	1200	1300	1100	1600	1500	1250	1000	750	500	1000	1500	500	D	D	D	700	500	600	400	850	21	1050
3	300	150	100	650	500	150	100	D	D	D	D	D	-600	-500	350	650	350	1300	1500	100	550	600	650	500	17	500
4	650	700	600	750	950	900	1100	1300	1600	1500	1650	2100	1850	1100	950	900	900	1050	1300	1400	1550	1400	1350	1350	24	1200
5	1500	1650	1750	1800	1950	1850	1650	1700	1550	1550	2200	2000	1600	1600	1400	1150	1200	1150	1100	100	950	1050	1250	1200	24	1450
6	1300	1350	1350	1200	1100	1150	1350	1500	1950	1650	1350	1200	1100	1000	1000	950	400	-200	D	D	D	-100	300	250	19	1130
7	250	300	400	1250	1350	150	150	1000	650	900	500	1050	1250	1500	1250	1100	1150	600	200	D	D	D	D	D	19	790
8	850	1150	950	850	D	D	D	D	D	D	D	200	250	900	1050	1100	1000	1100	1000	700	750	750	500	300	17	790
9	350	200	250	150	-150	- 50	50	100	350	950	900	700	400	400	150	50	350	650	500	600	650	1000	1050	1050	22	490
10	1000	900	950	850	1000	1150	1200	1300	1300	1250	1550	1600	850	500	D	D	D	150	450	500	550	700	1200	1500	21	970
11	1600	1900	1900	1900	1800	1800	1950	2000	2100	1950	1750	1250	1000	950	1000	1050	1000	1100	1200	1350	1100	1200	1100	1350	24	1470
12	1300	1200	1100	1250	1250	650	850	900	950	900	900	900	600	600	700	800	500	500	500	550	600	650	550	450	24	800
13	350	350	450	500	500	500	550	650	900	750	800	850	700	450	450	500	450	500	400	300	300	300	250	300	24	500
14	250	150	-400	-900	-850	-400	300	350	400	400	450	750	1200	850	400	D	D	D	600	D	D	500	450	450	15	500
15	450	500	500	500	550	650	700	1000	1200	1200	1050	900	450	500	300	400	600	750	650	400	400	250	D	100	23	610
16	800	450	500	850	950	1150	1300	1550	1400	1250	1100	850	650	650	650	650	550	500	550	1050	D	D	1050	950	22	880
17	850	1200	1200	1000	950	850	650	850	D	D	D	D	D	D	D	1350	1150	1000	900	900	850	700	800	800	17	940
18	1100	D	800	500	900	800	700	600	600	200	50	700	500	450	550	650	500	500	500	400	350	-100	350	-300	21	560
19	200	-100	500	900	900	850	1100	1000	900	1000	700	650	850	500	350	50	250	550	300	900	1100	1050	1200	1100	23	730
20	1000	1000	1050	1100	1100	1150	1100	1450	1850	1550	1100	650	250	300	50	-100	200	600	600	650	600	700	700	800	23	850
21	700	750	800	850	750	850	900	1150	1350	1250	1200	1000	900	750	700	650	600	700	650	800	800	650	700	650	24	840
22	-100	D	-100	- 50	- 50	D	D	D	D	D	D	D	D	D	D	D	-300	-250	250	-150	-150	D	700	-100	2	470
23	200	0	D	0	100	-100	-350	150	450	250	350	300	350	200	0	-200	200	900	850	600	700	500	600	750	20	370
24	750	800	650	500	500	500	600	850	650	800	1000	850	650	600	650	600	750	650	1000	-750	D	D	450	200	21	670
25	700	800	1000	350	100	150	600	1250	950	900	900	600	800	650	700	550	500	700	800	950	1100	950	950	1050	24	750
26	1050	1300	D	D	1100	1300	1750	1500	1250	1050	1200	1100	1150	900	950	1000	950	750	700	1100	1200	1150	1000	1000	22	1110
27	1300	1000	1000	900	950	950	1050	850	750	750	800	500	600	700	550	350	400	500	500	700	450	300	350	400	24	690
28	300	400	450	600	550	500	600	650	700	850	1300	1000	750	650	600	550	500	400	400	400	350	350	500	550	24	800
29	500	500	500	500	700	950	1100	1100	1450	1350	1050	650	650	650	600	400	450	350	350	500	400	500	450	450	24	670
30	450	500	550	800	1150	1050	1550	2150	2000	1050	850	650	650	500	700	650	700	300	250	200	600	450	500	700	24	790
No. of Hours	29	27	26	27	26	25	27	27	26	26	26	27	27	27	27	25	26	26	28	25	24	24	28	27		
Mean	770	790	840	850	910	890	930	1100	1150	1060	1020	910	790	730	680	690	630	700	670	660	730	720	730	750		820

D: disturbed M: missing *: estimated ?: unknown

12

VERTICAL AIR-TO-EARTH CURRENT DENSITY 10^{-13} A/m^2

I-4 APRIL 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	36	40	48	48	44	46	50	50	48	46	42	42	42	40	40	40	38	40	28	28	38	40	46	46	24	42
2	64	64	56	64	56	60	54	74	72	66	50	38	26	>150	>150	>150	M	M	M	M	M	M	M	M	13	57
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
4	M	M	M	M	M	M	M	M	M	M	56	102	78	50	44	40	42	48	58	52	52	42	40	42	14	53
5	48	50	50	62	66	66	52	68	70	66	78	62	62	54	42	40	42	40	34	30	32	36	46	48	24	52
6	50	42	38	40	32	32	38	46	60	46	42	44	42	40	52	62	60	-10	D	>-100	>-100	D	80*	6	19	45
7	-2	0	8	26	12	-12	2	28	0	16	24	26	40	44	42	42	0	>-100	>-100	>-100	>-100	>-100	M	M	15	21
8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	44	36	28	32	34	26	16	7	30
9	20	10	46	100	30	14	36	50	94	74	54	34	28	36	20	38	20	28	22	26	32	46	40	42	24	39
10	38	36	38	28	26	40	44	52	54	58	86	80	36	30	70*	D	D	6	16	18	18	26	46	50	22	41
11	60	58	46	54	50	56	60	80	90	94	90	64	52	46	48	46	46	52	50	56	46	46	46	68	24	58
12	66	58	48	54	42	20	40	50	50	36	40	40	28	30	38	38	26	24	24	32	50	38	26	24	24	38
13	20	22	26	26	26	26	28	34	46	38	38	44	48	74	86	110*	140*	72	56	54	40	26	20	18	24	47
14	20	64	D	>-100	>-100	>-100	-16	14	16	14	14	34	64	40	20	D	D	26	D	D	30	30	36	14	30	
15	36	40	36	40	40	44	38	54	54	68	76	76	56	D	>150	>150	>150	90	70	36	20	12	D	8	19	47
16	46	26	36	44	46	60	72	88	76	68	58	64	50	50	50	44	36	26	24	42	D	26	20	20	23	47
17	20	44	64	50	40	30	28	38	>150	>150	>150	>150	>150	D	D	62	46	42	36	32	26	26	26	18	17	37
18	32	D	16	20	38	32	30	24	22	10	10	32	26	26	48	50	46	40	30	20	20	-6	20	-18	21	27
19	8	-8	32	48	40	36	52	36	38	40	26	26	44	28	16	0	14	30	16	40	36	30	40	38	23	31
20	36	46	46	50	52	52	50	62	58	40	44	32	14	16	4	-2	18	28	18	22	26	26	28	30	23	35
21	26	28	32	34	30	38	38	50	62	56	58	50	46	42	40	40	36	38	36	38	36	30	36	36	24	40
22	8	D	-6	12	90*	>150	D	>-100	>-100	D	D	D	D	D	D	D	D	D	D	D	D	D	D	-10	3	36
23	6	-6	D	0	4	-6	-16	10	24	14	18	18	16	14	-2	-12	18	50	42	32	36	28	32	40	18	22
24	36	40	30	26	42	30	30	38	26	38	58	54	38	40	44	38	32	30	30	-16	D	-18	38	20	21	36
25	36	36	30	10	0	10	26	52	22	30	36	32	66	60	64	40	32	44	48	56	58	50	52	60	24	40
26	64	70	D	54	64	74	110*	84	76	76	96	84	88	64	64	66	66	46	36	52	60	64	50	56	23	68
27	68	48	58	50	50	52	48	42	44	46	50	30	38	50	42	26	22	28	26	30	36	24	22	26	24	40
28	18	22	24	28	26	28	40	56	66	68	70	52	74	68	62	50	42	36	40	38	38	32	30	30	24	43
29	30	34	32	38	46	46	48	48	70	66	60	40	44	44	40	36	36	24	24	30	30	30	28	32	24	40
30	42	38	44	52	60	48	70	78	60	30	38	34	40	42	40	44	46	22	10	10	36	38	32	34	24	41
No. of Hours	26	23	23	26	26	23	24	26	25	25	26	26	26	24	23	21	23	24	25	23	22	23	25	25		
Mean	34	40	37	41	40	41	45	50	52	48	50	47	45	43	44	45	39	39	33	35	36	34	36	34		41

D: disturbed M: missing *: estimated ?: unknown

13

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-5 MAY 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	950	1100	1300	1100	750	1050	1150	1700	1250	1000	750	700	800	700	700	500	450	200	200	250	300	450	400	400	24	760
2	500	500	500	450	500	600	750	850	700	850	750	550	550	500	450	450	300	300	300	450	800	700	700	700	24	570
3	650	550	600	650	850	900	800	900	500	600	550	450	450	450	400	200	350	350	450	600	650	650	600	350	24	560
4	450	450	450	450	450	450	500	650	600	550	500	100	-200	150	350	550	500	450	600	800	700	500	400	350	23	480
5	350	250	300	350	400	550	750	400	650	750	900	550	350	350	200	100	100	100	50	50	100	150	150	200	24	340
6	200	200	200	250	300	350	400	500	450	250	250	250	250	200	150	200	100	50	100	150	200	350	400	350	24	250
7	300	350	350	350	250	200	300	400	400	400	300	400	500	550	300	300	250	300	350	400	350	350	100	- 50	23	340
8	M	M	M	M	M	M	M	M	M	M	300	1250	450	400	350	400	350	D	D	D	350	200	100	100	11	390
9	- 50	150	D	D	D	D	D	-350	-350	-250	D	400	D	>-2000	D	-700	-300	-250	-650	400	200	300	350	300	7	300
10	300	300	250	200	100	200	D	D	350	400	400	450	300	300	150	250	400	550	450	350	250	50	250	200	22	290
11	100	50	0	150	150	250	450	550	450	400	400	300	250	100	150	200	100	200	200	350	450	100	0	200	24	230
12	400	450	700	850	800	1050	1150	1450	1200	750	400	500	550	750	1100	750	550	600	750	900	900	850	600	600	24	770
13	600	500	600	800	600	500	500	900	1000	750	1500	1200	300	D	0	650	100	-350	150	-250	150	300	150	250	21	550
14	50	150	300	350	200	300	500	550	500	- 50	200	300	0	-100	150	250	400	50	400	1050	900	600	500	450	22	370
15	500	800	1000	1100	1050	1500	1700	1950	1950	750	500	550	350	450	800	700	500	150	250	550	200	100	400	400	24	760
16	300	250	250	D	300	100	250	450	650	D	D	D	D	D	D	D	D	D	-100	- 50	0	0	0	-200	11	230
17	200	400	550	450	450	500	450	500	600	650	750	800	800	600	500	400	D	D	D	D	250	450	100	300	20	480
18	600	700	650	600	350	350	900	1050	1200	1300	850	550	500	500	500	350	350	350	400	600	700	900	1050	950	24	680
19	850	800	450	300	D	350	D	D	D	750	550	550	550	650	500	500	650	850	850	1000	750	450	450	200	20	600
20	-250	-100	-150	-200	0	500	800	750	400	500	450	400	400	300	200	250	150	100	150	400	700	650	600	700	20	420
21	700	700	800	900	1000	800	550	750	800	950	950	900	600	650	750	550	500	50	450	500	500	450	450	400	24	650
22	650	750	400	400	350	600	850	600	D	D	D	500	550	650	600	250	300	350	400	500	550	500	400	400	21	500
23	400	500	450	300	250	400	450	350	450	650	700	500	600	600	600	500	450	450	350	500	400	300	350	450	24	460
24	400	450	D	D	150	550	400	400	400	350	300	300	400	450	400	400	450	400	250	D	200	- 50	150	50	20	340
25	-350	-200	-400	-500	-450	-300	-400	-350	250	150	0	550	600	500	500	500	500	500	550	550	550	450	450	500	16	440
26	550	500	550	600	600	700	900	950	650	550	450	400	300	350	200	350	650	750	150	D	D	D	D	-150	19	530
27	-700	-600	-250	300	650	650	1000	1000	750	600	450	D	500	D	D	D	D	D	900	500	600	450	350	350	15	600
28	500	500	450	100	550	800	1050	1100	1000	1050	1000	700	650	700	850	700	550	550	550	600	650	650	600	550	24	680
29	500	500	500	650	700	750	850	900	650	500	500	450	300	300	250	250	350	300	400	500	700	950	950	950	24	570
30	1100	750	800	850	800	850	950	1000	800	450	400	350	200	200	150	200	0	- 50	-100	50	100	50	150	350	22	480
31	400	350	400	650	700	900	1350	1350	1200	950	300	50	-150	150	50	150	250	300	250	400	700	950	750	500	23	570
No. of Hours	26	27	25	25	27	28	26	26	27	26	28	29	27	26	28	28	27	24	26	25	30	29	30	28		
Mean	480	480	510	530	490	600	760	840	730	650	550	520	450	440	400	390	360	340	380	500	460	440	400	410		505

D: disturbed M: missing *: estimated ?: unknown

VERTICAL AIR-TO-EARTH CURRENT DENSITY 10^{-13} A/m^2

I-5 MAY 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	38	36	38	32	40	60	56	66	44	56	56	52	52	48	50	38	28	14	16	16	32	38	28	26	24	40
2	30	30	24	18	24	28	38	40	36	46	42	44	42	34	34	34	26	28	28	36	38	32	30	30	24	33
3	36	38	44	48	62	76	70	54	42	44	38	32	40	50	40	24	36	38	32	32	32	32	32	20	24	41
4	28	40	32	36	34	34	38	32	32	38	38	10	-8	16	16	20	20	16	28	34	30	24	18	18	23	27
5	30	54	48	56	30	28	38	28	28	22	30	26	20	24	20	30	20	10	2	8	10	16	24	20	24	26
6	18	16	16	20	24	26	26	26	26	18	30	30	54	54	84	74	38	28	18	14	16	18	20	22	24	30
7	24	28	32	28	24	20	22	24	26	34	D	D	>150	>150	>150	>150	>150	>150	110	36	26	24	12	2	16	29
8	M	M	M	M	M	M	M	M	M	M	40	>150	130*	130*	52	66	44	D	D	D	12	10	6	16	10	47
9	16	20	D	D	D	D	D	>-100	-10	30	D	D	>150	>150	>150	D	D	D	M	M	M	20	32	32	6	25
10	36	38	38	34	26	26	D	D	34	34	26	24	16	12	6	8	12	18	16	8	10	14	22	22	22	22
11	18	18	18	24	24	32	40	32	32	28	M	M	M	M	M	M	10	18	18	28	26	2	0	18	18	21
12	32	50	72	84	66	76	78	74	62	44	24	36	40	52	M	M	46	34	32	36	40	28	20	26	22	47
13	26	26	22	26	14	2	D	8	M	16	36	20	2	D	0	40	2	-18	8	D	22	60	106	106	19	29
14	94	>150	76	40	70	36	52	88	106	102	110	110	74	66	52	40	36	16	30	52	40	32	26	26	23	56
15	32	46	46	42	40	52	44	46	58	12	26	36	40	48	68	90	64	14	24	36	22	34	36	30	24	41
16	34	28	26	D	26	18	36	32	50	D	D	D	D	D	D	D	D	D	-8	-12	M	M	M	M	8	31
17	M	M	M	M	M	M	M	M	M	38	50	48	44	34	36	32	D	D	D	D	22	2	20	10	33	
18	46	60	56	54	36	26	50	50	52	52	32	32	36	34	34	34	34	32	30	34	36	46	52	54	24	42
19	64	64	44	26	D	D	D	D	D	D	30	30	30	56	50	60	52	60	60	64	56	36	30	16	18	46
20	D	D	D	D	10	56	54	42	30	30	32	30	28	20	14	14	6	2	4	16	30	26	24	M	19	25
21	M	M	M	M	M	M	M	M	M	M	0	2	10	4	4	28	26	2	14	10	8	10	10	8	14	10
22	20	30	14	14	10	14	34	30	D	D	D	24	40	38	40	24	24	28	30	36	36	36	28	26	21	27
23	34	44	42	30	30	38	40	34	38	46	50	46	60	94	124	?	130*	100	76	64	44	34	28	36	23	55
24	32	40	D	D	D	100*	30	34	40	36	36	66	44	40	50	46	60	66	42	D	D	0	18	10	19	42
25	-22	-6	D	>-100	-74	-40	-30	-24	22	D	12	54	66	60	54	58	52	50	52	52	40	42	48	56	15	48
26	62	64	84	82	74	62	60	58	44	44	40	36	44	44	36	50	46	40	10	D	D	D	D	D	19	52
27	-60	-32	-12	32	72	64	92	76	66	54	40	D	D	D	D	D	D	D	38	40	52	38	32	42	14	53
28	50	50	52	D	62	72	80	72	64	68	70	46	44	D	D	40	38	42	38	26	14	10	2	4	21	45
29	8	14	12	16	16	14	10	8	2	0	0	-4	-10	2	-8	20	26	M	M	M	M	60	50	48	17	18
30	64	44	50	58	58	62	62	58	60	48	42	44	30	30	40	46	30	12	-4	2	16	10	16	26	23	39
31	32	38	52	72	62	70	74	78	72	54	24	10	-2	20	16	32	36	40	36	46	58	64	40	40	23	46
No. of Hours	25	24	23	22	24	25	23	24	24	25	26	24	23	24	23	24	26	23	25	23	25	29	29	28		
Mean	36	38	41	40	39	44	49	45	44	40	37	37	43	42	40	39	36	31	32	32	30	28	27	29		37

D: disturbed M: missing *: estimated ?: unknown

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-6 JUNE 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	500	600	650	700	550	500	800	950	1050	1100	750	D	D	D	D	D	D	D	D	D	-200	-200	- 50	0	12	680
2	-100	250	150	200	150	250	700	800	1100	1050	1000	700	750	650	450	400	300	300	250	400	450	500	450	650	23	520
3	650	800	750	650	700	750	1000	800	650	400	-200	D	D	D	D	650	350	750	700	500	550	550	350	-200	18	640
4	-100	- 50	50	200	200	150	150	200	500	450	450	250	D	D	D	D	D	D	D	750	700	700	750	600	15	410
5	650	700	700	800	850	950	1200	1300	900	650	450	450	350	300	450	450	400	350	450	550	800	750	850	1000	24	680
6	1000	800	800	450	500	600	950	900	700	600	600	500	550	450	350	450	450	400	400	400	400	450	600	500	24	570
7	400	300	250	200	100	100	100	200	300	300	250	150	200	300	200	100	0	250	250	350	350	300	200	300	24	230
8	400	250	200	0	-100	100	300	800	700	1000	1300	900	800	500	50	0	-100	0	250	450	550	800	700	700	22	490
9	900	1000	800	700	850	950	950	1200	1300	1050	1000	1000	700	650	800	800	700	750	750	550	450	350	250	100	24	770
10	0	50	200	150	50	100	350	D	D	750	500	50	-100	300	550	550	900	1000	900	900	1100	1150	1500	1300	21	590
11	1100	1050	950	850	900	1100	1300	1000	800	850	750	750	700	650	700	650	600	600	550	700	1200	1150	900	850	24	860
12	750	800	900	950	900	1050	1300	1200	1500	1450	1000	900	1000	600	500	500	450	500	500	650	850	1000	1200	1250	24	900
13	1000	900	700	400	500	600	600	800	800	550	600	500	650	600	650	600	550	500	900	300	D	D	600	100	22	610
14	200	300	450	500	500	550	500	450	450	450	450	450	500	600	600	550	600	600	650	850	1150	1000	1100	1250	24	610
15	1300	950	650	600	650	800	1300	1700	1200	1100	900	850	850	750	500	500	800	500	-100	-250	-200	-100	350	-400	19	860
16	0	150	300	450	600	700	800	1000	800	950	650	1050	600	400	150	-100	100	100	200	350	400	400	400	450	23	480
17	550	500	400	550	550	500	600	650	650	500	300	350	250	200	250	300	300	450	500	650	750	750	750	800	24	500
18	750	700	700	900	800	900	1100	1200	1400	1200	950	800	500	450	450	600	600	600	600	700	800	950	850	450	24	790
19	150	D	250	150	250	300	400	800	700	450	350	300	400	500	650	650	650	600	550	500	600	600	650	600	23	480
20	500	500	400	450	300	D	D	500	600	600	600	300	300	350	450	500	850	700	500	550	650	450	300	600	22	500
21	550	500	800	600	400	900	1700	1300	950	400	350	200	300	350	250	D	450	550	450	850	950	950	850	1050	23	680
22	800	700	600	350	500	800	1050	1500	1350	1350	850	550	500	150	100	200	350	350	300	450	850	850	950	950	24	680
23	1050	850	900	850	700	700	850	1100	850	650	600	500	700	650	500	500	750	700	750	900	900	600	D	D	22	750
24	600	650	550	400	250	300	400	350	400	450	450	500	600	800	750	350	300	350	550	400	0	400	600	450	24	450
25	500	600	550	650	750	1000	1200	1100	1000	950	750	650	700	650	650	600	500	500	500	550	450	550	650	550	24	690
26	700	750	750	800	900	850	900	900	800	700	500	350	M	M	M	M	400	350	D	D	D	D	D	D	14	690
27	D	-550	D	D	400	550	700	850	900	900	800	600	600	550	550	550	500	450	650	900	900	900	900	1000	20	710
28	1050	1000	800	650	700	900	800	1050	1150	1100	800	400	400	400	450	500	500	550	750	950	1200	1000	1050	24	770
29	1050	1000	900	900	800	750	850	850	750	850	800	1000	900	500	600	350	300	450	550	450	400	450	450	450	24	680
30	500	500	550	500	400	450	550	550	600	550	550	400	600	500	0	-100	200	350	400	650	650	650	400	900	23	500
No. of Hours	27	27	29	29	29	29	29	29	29	30	29	28	25	26	26	24	27	28	26	27	26	26	27	26		
Mean	650	640	580	540	540	630	810	860	860	780	670	550	580	490	440	470	480	480	520	590	680	710	680	690		625

D: disturbed M: missing *: estimated ?: unknown

VERTICAL AIR-TO-EARTH CURRENT DENSITY 10^{-13} A/m^2

I-6 JUNE 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	44	48	56	40	32	32	38	40	40	50	32	D	D	D	D	D	D	D	D	D	-16	-10	22	24	13	38
2	10	24	16	26	18	22	52	48	76	74	64	44	50	50	44	38	28	26	24	30	26	36	32	42	24	37
3	44	52	54	50	60	62	66	48	40	26	-16	D	D	D	D	40	16	38	34	26	32	32	18	D	18	41
4	D	6	18	30	28	20	14	20	38	38	46	42	D	D	D	D	D	D	D	62	52	50	62	58	16	37
5	68	78	78	78	74	68	72	70	66	60	52	50	42	32	50	50	38	34	40	34	46	42	50	60	24	55
6	64	56	60	40	50	50	74	64	56	50	56	46	50	44	38	48	46	44	40	26	26	38	40	38	24	48
7	32	20	4	-8	-4	12	14	12	28	32	32	26	30	34	26	14	8	20	22	26	28	26	20	28	22	22
8	36	32	38	68	128	112	72	42	26	46	50	48	50	28	6	6	-2	6	18	26	26	36	26	30	23	42
9	52	70	66	74	74	74	54	74	82	72	72	78	82	80	98	110	102	98	88	52	42	44	40	20	24	71
10	12	16	16	16	18	88	66	D	D	D	D	D	D	66	68	50	72	82	74	74	86	70	84	74	18	57
11	82	88	90	88	82	74	70	50	50	58	54	54	50	54	52	54	52	60	44	46	84	74	64	68	24	64
12	72	82	96	88	86	88	96	70	86	78	66	66	72	68	68	64	42	40	48	54	58	54	74	44	24	69
13	74	70	68	52	64	46	48	56	60	42	54	44	52	52	54	50	46	38	56	16	D	D	18	8	22	49
14	20	26	44	60	60	72	74	66	66	64	56	62	62	66	64	82	86	80	80	76	72	56	60	76	24	64
15	66	84	82	76	64	62	80	76	56	56	56	64	66	62	50	52	68	42	4	16	28	-4	4	-20	22	55
16	64	62	68	90	96	84	86	88	80	84	80	104	72	70	70	76	74	30	16	0	26	40	48	68	24	66
17	84	76	76	78	72	70	62	60	64	56	46	58	46	38	48	50	38	46	48	50	50	46	46	50	24	57
18	56	58	82	80	74	76	76	66	76	M	M	M	M	M	M	M	46	42	36	48	46	56	52	36	17	59
19	22	D	D	20	26	28	34	48	44	36	30	26	30	12	48	56	38	18	10	6	D	50	54	58	21	33
20	60	60	44	38	14	D	D	44	58	M	M	M	M	M	M	M	88	70	44	46	46	34	40	40	15	48
21	42	56	58	28	28	56	66	40	40	18	16	10	20	26	20	D	30	56	36	D	54	50	52	50	22	39
22	32	36	38	26	30	46	54	64	40	62	52	36	28	M	M	M	M	M	M	M	52	60	62	16	45	
23	68	74	74	60	64	64	60	70	62	58	50	50	62	60	44	46	62	62	52	50	50	42	D	D	22	58
24	40	46	42	32	16	22	34	32	22	32	42	110	>150	?	>150	>150	>150	>150	120*	64	42	-8	30	60	18	46
25	56	80	90	80	98	94	82	M	M	60	64	68	64	60	60	62	44	44	38	36	22	30	38	36	22	54
26	50	52	58	62	74	52	52	48	46	42	32	26	M	M	M	M	76	38	D	D	D	D	D	D	14	51
27	D	D	D	D	D	28	42	58	72	72	68	56	54	60	56	66	52	40	52	68	72	70	66	74	19	59
28	84	84	64	60	76	94	100	118	96	M	M	M	M	M	M	44	50	58	62	62	60	74	70	82	18	74
29	72	62	50	50	50	42	38	36	38	42	38	48	44	26	28	16	32	46	38	54	48	40	44	42	24	43
30	44	48	48	48	42	42	28	28	36	26	48	38	88	116	50	82	58	42	32	46	46	42	50	74	24	50
No. of Hours	28	28	28	28	28	29	29	28	28	26	25	24	21	21	21	22	25	27	26	26	24	26	28	26		
Mean	52	55	56	54	57	58	59	55	55	51	50	52	53	53	50	53	52	49	42	41	47	47	46	50		52

D: disturbed M: missing *: estimated ?: unknown

DAILY WEATHER SUMMARY AT DORVAL, QUEBEC

January 1964

1. Cloudy becoming overcast with snow in evening.
2. Overcast. Freezing drizzle during the night. Snow P.M. and evening.
3. Overcast. Snow P.M. Intermittent rain in evening.
4. Cloudy. Rainshowers and snowshowers A.M.
5. Cloudy during the night then clearing.
6. Overcast. Light snow mid-P.M. and evening.
7. Overcast with light snow at night then clearing.
8. Cloudy A.M. Clear at other periods.
9. Overcast. Freezing rain A.M. Rain P.M. and evening.
10. Overcast with rain during the night. Snowshowers A.M. then clearing slowly.
11. Clear.
12. Clear.
13. Clear night. Cloudy rest of the day.
14. Mainly partly cloudy.
15. Generally cloudy.
16. Overcast, snow until evening then cloudy.
17. Variable cloudiness.
18. Generally overcast. Occasional snow A.M. and P.M.
19. Generally cloudy.
20. Cloudy A.M. becoming overcast with moderate to heavy rain late P.M. and evening.
21. Overcast with rain and snow during the night then cloudy rest of the day.
22. Overcast during the night. Partly cloudy at other periods.
23. Generally cloudy. Very light freezing rain early A.M.
24. Generally overcast.
25. Generally overcast. Freezing rain early morning. Light to heavy rain A.M. Ocnl. rain P.M. Snowshowers in evening.
26. Variable cloudiness with numerous light snowshowers.
27. Cloudy with numerous light snowshowers.
28. Partly cloudy during the night then clear.
29. Increasing cloudiness. Light snow late evening.
30. Overcast with snow during the night then partly cloudy.
31. Increasing cloudiness becoming overcast with snow showers late evening.

February 1964

1. Overcast with light to heavy snow all day.
2. Overcast with light snow during the night then gradually clearing.
3. Few clouds.
4. Mainly overcast. Snowshowers A.M. & P.M.
5. Overcast with snowshowers and rainshower during the night then gradually clearing.
6. Clear becoming overcast in P.M. Snowshowers in evening.
7. Overcast. Light freezing drizzle early A.M. Snow most of the day.
8. Partly cloudy.
9. Clear.
10. Clear.
11. Clear night then cloudy. Light snow P.M.
12. Generally cloudy.
13. Overcast. Light snow P.M. and evening.
14. Cloudy during the night then clear.
15. Clear night then cloudy rest of the day.
16. Cloudy with light snow A.M. then gradually clearing.
17. Clear till late P.M. then cloudy.
18. Generally cloudy.
19. Generally cloudy.
20. Cloudy becoming overcast with snow late evening.
21. Overcast with snow all day.
22. Partly cloudy.
23. Generally cloudy.
24. Overcast with snow early morning and A.M., then clearing.
25. Variable cloudiness.
26. Overcast. Snow early morning till mid-A.M. then variable cloudiness.
27. Overcast with snowshower during the night then clear.
28. Cloudy till evening then clear.
29. Clear.

DAILY WEATHER SUMMARY AT DORVAL, QUEBEC

March 1964

1. Clear night then generally cloudy.
2. Overcast till noon then partly cloudy.
3. Variable cloudiness.
4. Clear night. Dense fog early morning. Overcast at other periods. Rainshowers late evening.
5. Generally overcast. Rain during the night. Rainshowers A.M. & P.M. Snowshowers in evening. Very strong winds.
6. Variable cloudiness at night then clear.
7. Generally cloudy.
8. Clear becoming overcast in evening. Light snow late evening.
9. Overcast. Snow during the night. Freezing rain and ice pellets A.M. Snow P.M.
10. Overcast. Snow in evening.
11. Mainly cloudy becoming overcast in evening.
12. Mainly cloudy.
13. Clear becoming overcast late evening.
14. Overcast with rain and drizzle late P.M. and evening.
15. Overcast with rain and drizzle during the night then partly cloudy.
16. Cloudy during the night then clearing.
17. Clear night becoming overcast with snow A.M. then partly cloudy.
18. Variable cloudiness, very light snow P.M.
19. Cloudy early morning then clear.
20. Clear.
21. Generally cloudy.
22. Generally cloudy. Rainshowers late P.M.
23. Clear.
24. Partly cloudy.
25. Generally cloudy.
26. Overcast. Snow with freezing rain and ice pellets A.M. Rain P.M.
27. Variable cloudiness. Snowshower A.M.
28. Clear A.M. becoming overcast P.M. Light snow evening.
29. Variable cloudiness. Rain and snow during the night. Snow in evening.
30. Generally cloudy. Light snow during the night.
31. Clear.

April 1964

1. Clear.
2. Cloudy becoming overcast with snow P.M. and evening.
3. Overcast with snow until late P.M. then cloudy. Light drizzle mixed during the night.
4. Cloudy during the night then clearing.
5. Clear.
6. Increasing cloudiness. Rainshowers P.M. Rain or drizzle in evening.
7. Overcast. Drizzle during the night. Rain in evening.
8. Dense fog early morning then overcast. Occasional showers A.M. and evening.
9. Overcast with snow till noon. Snowshowers P.M. then clearing.
10. Variable cloudiness. Rainshowers P.M.
11. Clear.
12. Few clouds P.M.
13. Few clouds becoming overcast in evening.
14. Overcast with rain during the night then decreasing cloudiness.
15. Variable cloudiness.
16. Clear.
17. Generally cloudy. Light ice pellets shower A.M.
18. Generally cloudy. Rainshowers early A.M.
19. Few clouds.
20. Generally overcast.
21. Generally cloudy.
22. Overcast with light or moderate rain.
23. Generally overcast. Rain during the night and P.M.
24. Overcast. Rain in evening.
25. Variable cloudiness.
26. Clear.
27. Clear.
28. Partly cloudy.
29. Clear.
30. Clear.

DAILY WEATHER SUMMARY AT DORVAL, QUEBEC

May 1964

1. Clear.
2. Clear.
3. Clear.
4. Variable cloudiness.
5. Clear.
6. Clear.
7. Variable cloudiness.
8. Generally cloudy. Showers in evening.
9. Variable cloudiness. Rain during the night. Showers in evening.
10. Cloudy or overcast. Showers during the night and A.M.
11. Cloudy.
12. Partly cloudy.
13. Generally cloudy becoming overcast with showers P.M.
14. Overcast till noon then gradually clearing.
15. Clear becoming cloudy in evening.
16. Mainly overcast. Showers from mid-A.M. till late evening.
17. Partly cloudy variable to cloudy. Thundershowers P.M. and evening.
18. Partly cloudy.
19. Variable cloudiness. Showers A.M. and late evening.
20. Overcast with showers at night then gradually clearing.
21. Clear night then increasing cloudiness.
22. Overcast till mid A.M. then clearing. Thundershower A.M.
23. Partly cloudy.
24. Variable cloudiness. Showers during the night and evening.
25. Overcast with showers at night then gradually clearing.
26. Clear becoming overcast with rain in evening.
27. Cloudy. Showers P.M. and evening.
28. Generally cloudy.
29. Generally cloudy.
30. Generally cloudy.
31. Few clouds.

June 1964

1. Cloudy becoming overcast with rain P.M. and evening.
2. Cloudy at night then partly cloudy.
3. Clear night then generally overcast. Occasional rain P.M. and evening.
4. Cloudy all day. Thundershowers P.M.
5. Few clouds.
6. Clear.
7. Variable cloudiness.
8. Cloudy night then clear.
9. Partly cloudy.
10. Generally cloudy all day then clearing in evening. Thundershowers A.M.
11. Clear.
12. Clear becoming cloudy in evening.
13. Overcast with shower during the night then partly cloudy.
14. Cloudy at night then clearing.
15. Clear night. Overcast at other periods. Rain in evening.
16. Generally cloudy.
17. Partly cloudy.
18. Mainly cloudy.
19. Clear A.M. Cloudy at other periods.
20. Partly cloudy.
21. Generally cloudy.
22. Cloudy night then clear.
23. Partly cloudy becoming overcast in evening.
24. Generally cloudy.
25. Clear.
26. Clear becoming cloudy with thundershowers in evening.
27. Overcast with rainshower at night then clear.
28. Clear.
29. Clear till noon then becoming overcast in evening.
30. Partly cloudy and very warm.

RADIATION SOLAIRE A MONTREAL

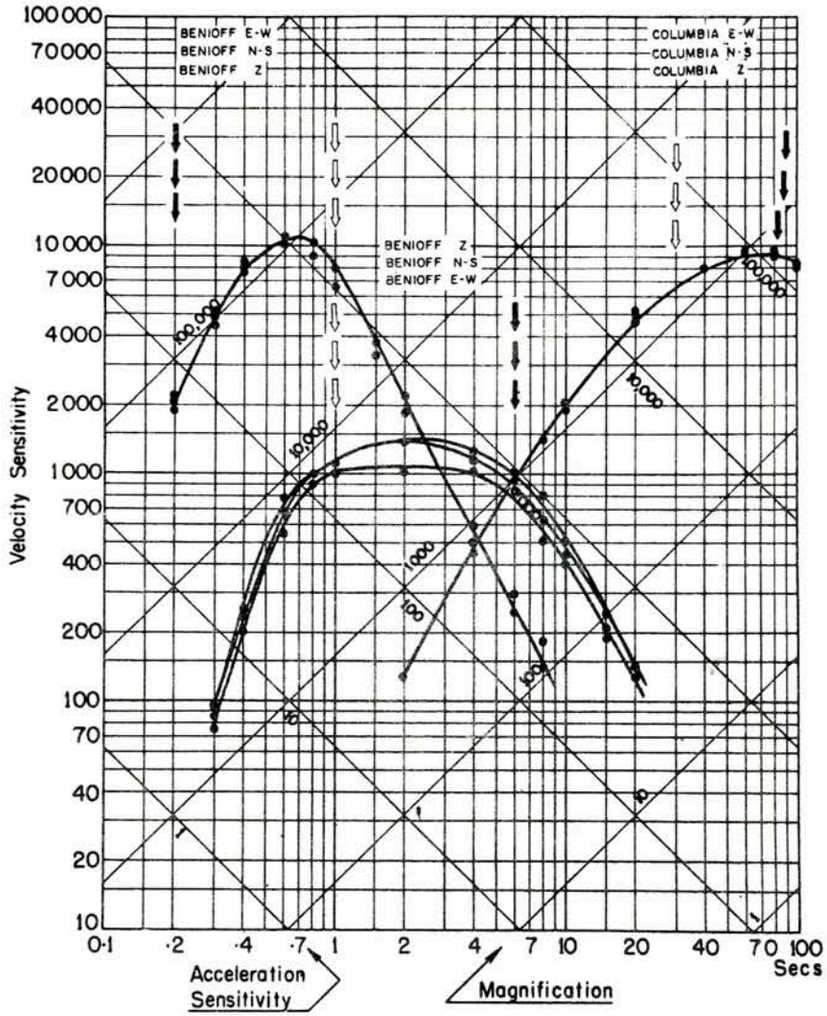
Janvier à Aout 1964

Radiation solaire globale et diffuses en calories par cm^2 par jour, reçue sur une surface horizontale. Aussi moyenne pour le mois.

Date	Janv.	Fév.	Mars	Avril	Mai	Juin
1	115	30	215	555	690	260
2	35	230	215	325	675	655E
3	50	270	220	140	705	285
4	105	65	220E	600E	M	410
5	185	175	170E	575	685	755
6	100	175	450	310	605	740
7	220	55	275	285	540	400
8	165	295	370	165	440	740
9	40	315	55	165	420	615
10	115	275	170	495	185	330
11	210	240	390	585	545	750
12	205	295	315	550	705	775
13	100	95	450	550	250	620
14	210	330	110	100	250	635
15	M	260	420	520	635	360
16	40	250	480	660	115	675
17	185	315	275	320	585	720
18	115	240	365	350	710	M
19	165	225	445	575	515	620E
20	155	275	470	175	M	605
21	110	265	435	585	490	M
22	215	345	320	40	440	695E
23	100	375	505	75	M	465E
24	115	225	385	260	630	500
25	25	M	275E	265	285	695
26	165	270	50	655	655	435E
27	M	380	445	655	465	715E
28	260	320	495	595	440	720
29	125	415	445	690	500	510E
30	265		475	690	550	670E
31	210		565		675	
Moyenne	142	250	338	417	514	584

M: enregistrement manqué E: valeur estimée

STATION : MONTREAL



ϕ = 45°30'09"N λ = 73°37'23"W Altitude 112M

Foundation : Ordovician Limestone (Trenton)

T_s T_g

Date of Calibration: April - 1962
Feb. - 1964

BENIOFF'S		BENIOFF'S		COLUMBIA'S	
S.P. - Z	Apr. 4	I.P. - Z	Apr. 4	L.P. - Z.	Feb.
S.P.H. - N.S.	Apr. 4	I.P.H. - N.S.	Apr. 4	L.P.H. - N.S.	Feb.
S.P.H. - E.W.	Apr. 5	I.P.H. - E.W.	Apr. 5	L.P.H. - E.W.	Feb.

INSTRUMENTS DE LA STATION

3 séismographes Benioff de 100 kg. avec 6 galvanomètres.
t_o=1 sec., t_g=0.2 sec. pour ZNE. Enregistreur, 60mm/min.
t_g=6 sec. pour Z'N'E'. Enregistreur, 30mm/min.
3 séismographes Sprengnether, type Columbia Z"N"E".
Avant le 13 février 1964, t_o=17 sec., t_g=100 sec.
Après le 13 février 1964, t_o=30 sec., t_g=100 sec.pour Z"N"E".
Enregistreur, 15mm/min.

Le 13 février 1964, l'amplification des Columbia a été augmentée. Cf. graphiques.

Dans notre bulletin, nous indiquons toujours sur quel séismogramme chaque phase a été lue en ajoutant après cette phase une des lettres suivantes:

ZNE pour celles données par les Benioff avec galvanomètres de 02.sec.

Z'N'E' pour celles données par les Benioff avec galvanomètres de 6 sec.

Z"N"E" pour celles données par les Columbia avec galvanomètres de 100 sec.

L'heure est inscrite à chaque minute sur les séismogrammes par la Société Radio-Canada au moyen d'une ligne téléphonique avec une précision de $\pm$ 0.1 sec. à l'année. Cette Société nous fournit en même temps un courant alternatif de 60 cycles de fréquence absolument constante, pour les moteurs des enregistreurs. De plus, le signal horaire de l'Observatoire du Dominion relayé par le poste local de radio CBF, à 01 00 00 p.m. s'enregistre automatiquement sur tous les séismogrammes.

Les positions géographiques des épicentres ainsi que l'heure d'origine et la profondeur sont toujours empruntées à U.S.C.G.S. pour les séismes éloignés. Pour les locaux, ces données nous sont fournies par l'Observatoire du Dominion, et cela est indiqué chaque fois. Pour sauver de l'espace, nous ne mentionnons pas U.S.C.G.S. à chaque séisme.

Nous indiquons aussi quelques fois, après une phase, sur la ligne suivante, la période de l'onde du sol et son amplitude en microns.

Nous tenons à exprimer publiquement notre reconnaissance à l'Observatoire du Dominion qui envoie chaque année ses techniciens refaire l'étalonnage complet de tous les séismographes et pour toute la gamme des fréquences, par la méthode de Willmore.

M. Buist, S.J.

1 jan. 4.3 S., 105.9 W.
Galapagos Isl.

h	about 33 km.			
H	14	18	53.9	
eP	14	58	40	

1 jan. 45.4 N., 151.9 E.
Kurile Isl.

h	about 45 km.			
H	17	26	43.5	
iPZ	17	38	55.1	d
eSSE"			49.0	

2 jan. 50.3 N., 159.6 E.
Kamchatka

h	about 40 km.			
H	05	01	53.5	
iPZ	05	13	13.0	d

2 jan. 54.6 N., 161.5 E.
Kamchatka

h	about 33 km.			
H	05	21	00.5	
iPZ	05	32	09.0	d

2 jan. 21.6 S., 68.2 W.
Chile - Bolivia border

h	about 110 km.			
H	06	32	58.9	
iPZ	06	44	14.2	d

2 jan. 8.4 S., 157.1 E.
Solomon Isl.

h	about 33 km.			
H	19	15	23.9	
eLZ"	20	14		

3 jan. iPZ 04 32 10.4 d

3 jan. 52.8 N., 173.1 E.
Rat Isl. Aleutian Isl.

h	about 33 km.			
H	17	20	54.0	
ePZ	17	31	41.7	

4 jan. 44.4 N., 150.8 E.
Kurile Isl.

h	about 50 km.			
H	16	17	16.5	
ePZ	17	29	47	

5 jan. 61.9 N., 149.5 W.
Central Alaska

h	about 72 km..			
H	01	31	27.0	
ePZ	01	39	36.7	

5 jan. ePZ 14 12 52

5 jan. 61.4 S., 154.9 E.
Macquarie Isl. region

h	about 33 km.			
H	16	25	52.6	
eP'Z	16	45	37.2	c

5 jan. 8.0 S., 74.5 W.
Central Peru

h	about 150 km.			
H	18	33	54.7	
iPZ	18	42	59.0	c
ipPZ		43	35.0	
iZ			41.5	
isPZ			50.0	
iPcP		45	10.8	
eSE"		50	20	

5 jan. 52.3 S., 28.6 E.
Prince Edward Isl. region

h	about 33 km.			
H	23	46	10.7	
eP'Z	00	05	27	
eSSE"		25	10	
eSSSE"		29	55	

6 jan. 50.9 N., 157.3 E.
S. Kamchatka

h	about 33 km.			
H	23	45	23.4	
iPZ	23	56	58.7	c
eSE"	00	06	28	
ePSE"		07	28	

7 jan. ePZ 05 25 48

7 jan. 58.8 S., 149.4 E.
Macquarie Isl region

h	about 33 km.			
H	05	18	24.5	
eP'Z	05	38	20	

8 jan. Dominion Observatory
1er choc 46°14'N±10';77°32'W±15'
h 18(?)km Mag 3.3 about 10 miles N.W. of Deep River, Ont.

H	08	59	27.9
iP_1E	09	00	18.1
iE			20.6
iS_nE			45
iZ			53
iS_1			55

Δ 310 km.

2e choc même endroit
h 22 km. Mag 3.9

H	10	03	25.7
e	10	04	15.0
iP_1E			16.1
iN			18.8
iS_nZ			43.1
iZ			51.7
iS_1NE			53.6

Δ 310 km.

3e choc même endroit
h 22 km. Mag 4.5

H	10	04	30.6
iP_1Z	10	05	20.6
iZ			23.3
iS_nZ			47.5
iZ			56

Δ 310 km.

8 jan. 3.7 S., 119.4 E.
Celebes

h	about 90 km.			
H	22	30	49.7	
eP'Z	22	50	05	

9 jan. 41.7 N., 141.9 E.
Off N. Coast of Hokkaido Japan

h	about 50 km.			
H	02	59	21.6	
ePZ	03	12	05.5	d

9 jan. 45.5 N., 150.9 E.
Kurile Isl.

h	about 40 km.			
H	18	31	52.4	
iPZ	18	44	05.0	c
eSE"		54	10	

10 jan. 42.0 N., 142.6 E.
Near S coast of Hokkaido, Japan,

h	about 33 km.			
H	04	50	53.4	
ePZ	05	03	37.0	c
eSKSE"		14	12	
eSE"		14	35	

10 jan. 45.4 N., 150.0 E.
Kurile Isl.

h	about 50 km.			
H	16	57	26.5	
iPZ	17	09	40.2	d

11 jan. 53.2 N., 166.3 W.
Fox Isl. Aleutian Isl.

h	about 33 km.			
H	06	00	13.2	
iPZ	06	09	54.2	c
eSE"		17	43	
ePSE"		18	07	

12 jan. 5.4 S., 146.8 E.
Near Coast of N.E. New Guinea

h	about 229 km.			
H	11	13	19.6	
eP'Z	11	31	56.0	d
iZ		34	50.5	

13 jan. 28.9 S., 66.2 W.
Catamarca Prov. Argentina

h	about 33 km.			
H	04	00	48.3	
iPZ	04	12	25.4	c

13 jan. 2.3 N., 102.0 W.
West of Galapagos

h	about 33 km.			
H	17	23	30.1	
iPZ	17	32	21.4	c

14 jan. 52.9 N., 159.6 E.
Near E coast of Kamchatka

h about 50 km.
H 01 11 12.6
ePZ 01 22 31.5 d

15 jan. 45.3 N., 150.6 E.
Kurile Isl.
h about 45 km.
H 02 23 47.4
iPZ 02 36 01.1 d

15 jan. 23.7 N., 45.0 W.
N. Atlantic Ocean
h about 33 km.
H 21 26 43.2
ePZ 21 33 06

16 jan. 50.5 N., 154.0 E.
Kurile Isl. region
h about 211 km.
H 10 50 36
iPZ 11 02 00.8 c

17 jan. 45.4 N., 151.3 E.
Kurile Isl.
h about 55 km.
H 02 54 22.6
ePZ 03 06 34

17 jan. 21.6 S., 169.9 E.
Loyalty Isl. region
h about 33 km.
H 02 54 26.8
eP'Z 03 13 21

18 jan. 23.1 N., 120.5 E.
Taiwan
h about 33 km.
H 12 04 40.0
eP'Z 12 23 26
eSKKSN" 33 10
ePPSN" 39 23

18 jan. 18.8 N., 69.4 W.
Dominican Republic
h about 95 km.
H 22 36 17.6
ePZ 22 41 52.2 d
epPZ 42 10.5
esPZ 29
iPPZ 38.6
iZ 44 09.6
iScPZ 48 50.0

18 jan. e(P)Z 23 03 37

19 jan. 9.2 S., 158.2 E.
Solomon Isl.
h about 32 km.
H 07 00 03.3
eLZ" 07 47

20 jan. 20.7 S., 169.9E.
Loyalty Isl region
h about 141 km.
H 17 08 37.4
iP'Z 17 27 15.6 d
iZ 29.0
ePPP 30 38

20 jan. eP_nZ 18 58 26.5
iP_1Z 31.1
iS_nZ 54.8
255 km.

22 jan. 13.7 S., 165.9 E.
New Hebrides Isl.
h about 33 km.
H 23 59 43.6
eP'Z 00 18 34

24 jan. 64.4 N., 126.5 W.
Mackensie Mountains Canada
h about 33 km.
H 05 31 31.2
ePZ 05 38 18

26 jan. 16.3 S., 71.7 W.
S. Peru
h about 116 km.
H 09 09 33.9
iPZ 09 19 40.6 c
iPcPZ' 20 10.8
ipPZ" 17
isPZ' 52
iSE' 27 53
iScSE" 28 57

27 jan. 00.0, 17.9 W.
Mid Atlantic Ocean
h about 33 km.
H 01 12 23.5
ePZ 01 23 13

28 jan. 6.3 S., 148.7 E.
New Britain region

h about 33 km.
H 05 43 22.1
iP'Z 06 02 22.5 d

28 jan. 36.5 N., 70.9 E.
Hindu Kush
h about 207 km.
H 14 09 17.1
iPZ 14 22 05.2 c
ipPZ 58.5
isPZ 23 13.5
iPPZ' 25 44
eZ" 26 46
ePPPZ" 27 45
eSKSN" 32 08
iN" 33 45
iPS 35 02
eE" 47 36

30 jan. 37.3 N., 29.9 E.
Near S.W. coast of Turkey
h about 41 km.
H 17 45 54.6
ePZ 17 57 19

31 jan. 61.5 N., 151.9 W.
S. Alaska
h about 33 km.
H 04 17 12.4
ePZ 04 25 35

31 jan. 0.2 S., 77.9 W.
Central Ecuador
h about 33 km.
H 21 46 31.7
ePZ 21 54 51

1 fév. 51.8 N., 170.8 W.
Fox Isl. Aleutian Isl.
h about 34 km.
H 01 47 52.1
ePZ 01 57 59 d

1 fév. 3.5 S., 78.0 W.
Peru-Ecuador border
h about 34 km.
H 11 47 28.8
ePZ 11 56 13.6 d
iZ 18.0

1 fév. 19.4 N., 66.3 W.
Off N. Coast of Puerto Rico
h about 37 km.
H 22 53 15.0
ePZ 22 59 18

2 fév. 21.9 S., 169.5 E.
Loyalty Isl. region
h about 33 km.
H 05 41 13.0
eZ" 06 48 42

2 fév. 24.2 N., 122.6 E.
Near E. coast of Taiwan
h about 28 km.
H 08 54 48.3
eLZ" 09 42

3 fév. 14.4 N., 92.6 W.
Off coast of Chiapas, Mexico
h about 34 km.
H 02 00 47.3
iPZ 02 07 36.6 d

3 fév. 31.5 N., 114.2 W.
Gulf of California
h about 14 km.
H 08 43 36.3
ePZ 08 50 33
eE" 09 04 41

4 fév. 48.2 N., 154.4 E.
Kurile Isl.
h about 40 km.
H 10 02 21.4
ePZ 10 14 15
ipPZ 27.0

5 fév. 36.5 N., 141.0 E.
Central Honshu, Japan
h about 46 km.
H 11 30 15.7
ePZ 11 43 25 d
ipPZ 39.5
eE" 54 22

5 fév. 23.7 S., 68.8 W.
N. Chile
h about 90 km.
H 21 13 19.0
ePZ 21 24 18.0 d
iZ 40.0

6 fév. 6.8 N., 73.1 W.

N. Colombia

h	about 140 km.		
H	04	35	56.8
ePZ	04	43	08.2

6 fév. 52.2 N., 171.2 W.
Fox Isl. Aleutian Isl.

h	about 33 km.		
H	07	43	40.4
ePZ	07	53	43 d

6 fév. 55.7 N., 155.8 W.
Kodiak Isl region

h	about 33 km.		
H	13	07	25.2
ePZ	13	16	18.0 c
ePPZ"		18	17
iSE"		23	29
iScSN"		26	09
iSSE"		27	08

7 fév. 39.8 N., 142.8 E.
Off E. coast of Honshu, Japan

h	about 45 km.		
H	12	58	53.6
iPZ	13	11	45.5 d

7 fév. iPZ 17 05 07.0 d

7 fév. 35.3 N., 118.8 W.
Kern County, California

h	about 14 km.		
H	22	07	50.1
ePZ	22	13	18

8 fév. 14.4 N., 91.3 W.
Near S. coast of Guatemala

h	about 33 km.		
H	09	59	17.4
ePZ	10	06	00.2
iZ			27.6

8 fév. 52.3 N., 175.6 E.
Rat Isl. Aleutian Isl.

h	about 60 km.		
H	11	17	46.5
ePZ	11	28	26.3 d
iPZ			26.8 c

9 fév. iPZ 08 12 34.0 d

13 fév. 8.8 N., 102.5 W.
1700 km. N.W. of Galapagos Isl.

h	about 33 km.		
H	02	22	20.3
eLE"	02	47	

13 fév. 18.1 S., 56.8 W.
Bolivia-Brazil border

h	about 33 km.		
H	11	21	46.7
iPZ	11	32	25.6 c

15 fév. 3.1 N., 79.5 W.
Off W. coast of Colombia

h	about 33 km.		
H	10	54	15.6
iPZ	11	02	11.5 c

15 fév. 52.7 N., 168.2 W.
Fox Isl. Aleutian Isl.

h	about 50 km.		
H	13	07	26.1
ePZ	13	17	14.7 d

15 fév. 8.7 S., 157.1 E.
Solomon Isl. region

h	about 52 km.		
H	22	01	58.4
eLZ"	23	01	

16 fév. 7.6 S., 75.9 W.
Central Peru

h	about 31 km.		
H	10	03	37.7
iPZ	10	12	54.0 d

18 fév. 34.7 N., 85.4 W.
N. Georgia-Alabama border

h	about 33 km.		
H	09	31	11.6
e(P)Z	09	34	28

18 fév. 45.0 N., 150.6 E.
Kurile Isl.

h	about 40 km.		
H	22	43	52.5
ePZ	22	56	08

19 fév. 17.1 S., 70.7 W.
S. Peru

h	about 134 km.		
H	06	29	12.1

ePZ 06 39 21

19 fév. 21.4 S., 70.7 W.
Near coast of N. Chile

h	about 80 km.		
H	15	25	58.9
iPZ	15	36	42.4 c
ipPZ			57.5

20 fév. 9.5 S., 74.6 W.
Central Peru

h	about 102 km.		
H	07	22	24.7
iPZ	07	31	46.7 c

20 fév. 46.5 N., 152.5 E.
Kurile Isl.

h	about 50 km.		
H	08	35	36.2
ePZ	08	47	39.6 c

20 fév. 44.6 N., 150.0 E.
Kurile Isl.

h	about 50 km.		
H	09	53	51.1
iPZ	10	06	08.7 d
pPZ			20

21 fév. 38.3 N., 28.7 W.
Azores

h	about 33 km.		
H	17	14	45
eLZ"	17	32	

22 fév. 48.5 N., 154.9 E.
Kurile Isl.

h	about 60 km.		
H	17	50	56.2
iPZ	18	02	45.1 c

23 fév. 48.6 N., 154.7 E.
Kurile Isl.

h	about 33 km.		
H	00	06	59.0
iPZ	00	18	51.2 d

23 fév. ePZ 22 52 06

25 fév. 44.7 S., 37.5 E.
Prince Edward Isl region

h	about 33 km.		
H	00	34	32.0
eP'Z	00	53	44

25 fév. 26.5 N., 111.4 W.,
Gulf of California

h	about 33 km.		
H	21	26	57
eLZ"	21	44	

25 fév. ePZ 23 44 28 c

26 fév. 40.2 N., 124.6 W.
Near coast of Humboldt County, California.

h	about 27 km.		
H	20	32	53.6
eLZ"	20	52	

26 fév. 20.7 S., 174.4 W.
Tonga Isl.

h	about 33 km.		
H	21	17	08.1
eLZ"	22	14	

27 fév. 7.6 S., 39.6 E.
Near coast of Tanganyika

h	about 33 km.		
H	02	32	23.7
eLZ"	03	19	

27 fév. 21.7 N., 94.4 E.
Central Burma

h	about 102 km.		
H	15	10	48.4
iP'Z	15	29	14.7 d
iPPZ		30	02.0
eSKSN"		35	48
eSSE"		45	38
eP'P'N"		49	43
eGE"		57.5	

29 fév. 47.0 N., 150.9 E.
Kurile Isl.

h	about 110 km.		
H	07	04	18.3
iPZ	07	16	16.0 d

29 fév. 8.5 S., 112.7 E.
Near S. coast of Java

h	about 73 km.		
H	23	49	40.8
iPZ	00	10	03.5 d

2 mars 13.9 N., 91.1 W.
Near coast of Guatemala

h	about 130 km.			
H	12	39	17.6	
ePZ	12	45	57.0	c
ipPZ		46	16.2	
eSN"		51	24	

2 mars 12.5 N., 88.0 W.
Near S. coast of El Salvador

h	about 63 km.			
H	16	09	46.1	
iPZ	16	16	36.1	d

2 mars 1.7 S., 77.5 W.
Ecuador

h	about 82 km.			
H	17	19	58.4	
iPZ	17	28	24.6	d

2 mars 41.1 N., 142.6 E.
Off E. coast of Honshu, Japan

h	about 29 km.			
H	18	39	12.2	
ePZ	18	52	06	

2 mars 18.9 S., 174.8 W.
Tonga Isl.

h	about 105 km.			
H	19	32	41.7	
eSN"	19	59	16	
eSSN"	20	07	12	
eSSSN"		11	46	

3 mars 45.3 N., 153.7 E.
Kurile Isl.

h	about 33 km.			
H	17	03	55	
ePZ	17	16	14	

4 mars 44.1 N., 30.1 W.
Azores region

h	about 33 km.			
H	00	48	09	
eLZ"	01	00.5		

4 mars 43.9 N., 29.7 W.
Azores region

h	about 33 km.			
H	01	17	26	
ePZ	01	23	42.5	

4 mars 43.6 N., 28.9 W
Azores region

h	about 33 km.			
H	02	58	29.2	
eLZ"	03	14		

4 mars 43.6 N., 29.6 W.
Azores region

h	about 33 km.			
H	16	16	30.9	
ePZ	16	22	51.0	d

5 mars 50.6 N., 156.5 E.
S. Kamchatka

h	about 60 km.			
H	02	23	49.9	
ePZ	02	35	25.2	d

6 mars 41.1 N., 142.5 E.
Off N.E. coast of Honshu Japan

h	about 34 km.			
H	02	36	36.3	
ePZ	02	49	24	

6 mars 6.1 S., 154.4 E.
New Britain region

h	about 74 km.			
H	18	57	16.1	
eE"	19	29	25	
eSSE"		34	40	
eSSSE"		39	20	

6 mars 19.7 S., 70.5 W.
N. Chile

h	about 50 km.			
H	21	05	50.2	
iPZ	21	16	27.2	c
ipPZ			39.0	

7 mars 18.6 S., 70.4 W.
N. Chile

h	about 112 km.			
H	04	51	05	
ePZ	05	01	29	

7 mars ePZ 19 30 09

7 mars 61.6 N., 151.4 W.
S. Alaska

h	about 72 km.			

H	23	06	27.7	
ePZ	23	14	43	

8 mars 44.0 S., 168.4 E.
South Isl. New Zealand

h	about 33 km.			
H	01	35	48.1	
eP'Z	01	55	20	

8 mars Dominion Observatory

H	20	29	08	
eP_n	20	31	03	
eS_n		32	35	
Lg		33	20	
Δ	890 km.			

10 mars 18.3 S., 70.6 W.
Chile-Peru border

h	about 132 km.			
H	22	48	53.7	
iPZ	22	59	13	d

12 mars 13.5 N., 122.9 E.
Near S. coast of Luzon, Philippine Isl.

h	about 33 km.			
H	22	32	56.7	
eLE"	23	22		

13 mars 33.2 N., 83.4 W.
Central Georgia

h	about 40 km.			
H	01	20	18	
ePZ	01	23	37	
eE		27	36	

13 mars 25.5 N., 142.5 E.
Volcano Isl.

h	about 33 km.			
H	03	46	59	
eL	04	44		

13 mars 4.1 S., 105.1 W.
W. of Galapagos Isl.

h	about 33 km.			
H	04	26	23.5	
ePZ	04	36	05.5	

13 mars 52.1 N., 170.0 W.
Fox Isl. Aleutian Isl

h	about 33 km.			
H	05	51	31.2	

13 mars 12.9 N., 90.4 W.
Near coast of Guatemala

h	about 128 km.			
H	11	54	06.1	
ePZ	12	00	54.5	
eSN"		07.7		

13 mars 13.7 N., 90.7 W.
Near coast of Guatemala

h	about 64 km.			
H	18	51	15.0	
ePZ	18	58	03	
eSN"	19	04.0		

13 mars 14.5 N., 90.9 W.
Near coast of Guatemala

h	about 33 km.			
H	21	08	12.1	
ePZ	21	14	54.5	

14 mars 7.8 S., 75.4 W.
Peru

h	about 33 km.			
H	02	14	02.0	
ePZ	02	23	51	

14 mars 47.1 N., 8.3 E.
Switzerland

h	about 33 km.			
H	02	37	24.6	
eLN"	03	02.5		

14 mars 15.9 N., 60.5 W.
Leeward Isl. region

h	about 39 km.			
H	15	12	22.4	
iPZ	15	18	44.6	c

14 mars 1.9 S., 12.9 W.
Mid-Atlantic Ocean

h	about 33 km.			
H	16	36	52.1	
eLZ"	17	10		

14 mars 1.8 S., 13.2 W.
Mid-Atlantic Ocean

h	about 33 km.			
H	18	43	27.4	
eLZ"	19	17		

15 mars 49.7 N., 78.9E.
Kazakh S.S.R.

h	about 0 km.		
H	07	59	58.0
ePZ	08	12	21

15 mars 36.2 N., 7.6 W.
W. of Strait of Gibraltar

h	about 27 km.		
H	22	30	26.0
iPZ	22	39	15.8 c
ePcPZ'		40	41
iPPZ'		41	07
ePPPE'		42	14
iSN"		46	25
iScSE"		49	16

16 mars 36.9 N., 95.5 E.
Tsinghai Prov. China

h	about 33 km.		
H	01	05	17.6
ePZ	01	18	49.5 d

16 mars 38.0 N., 72.9 E.
Tadzhik S.S.R.

h	about 132 km.		
H	03	28	11.7
ePZ	03	38	43

16 mars 13.5 N., 88.3 W.
Near coast of El Salvador

h	about 92 km.		
H	06	06	51.3
ePZ	06	13	26.3 c

16 mars 44.8 N., 146.8 E.
Kurile Isl.

h	about 140 km.		
H	08	44	32.8
iPZ	08	56	44.5 c

16 mars 19.5 N., 65.3 W.
N.E. of Puerto Rico

h	about 33 km.		
H	20	40	47,9
iPZ	20	47	02.3 c
ipPZ			12.3

17 mars 53.5 N., 163.7 E.
Off E. coast of Kamchatka

h	about 20 km.		
H	02	04	58.2
ePZ	02	16	08.7

17 mars 15.8 S., 193.3 W.
Tonga Isl. region

h	about 33 km.		
H	18	05	52
eLZ"	18	57	

18 mars 52.5 N., 153.6 E.
Sea of Okotsk

h	about 440 km.		
H	04	37	20.9
iPZ	04	48	10.0 c
iPcPN			32.5
ipPZ		49	52
iSN'		57	17
eScSE"			45
esSE"	05	00	02
eSSE"		02	16

19 mars 18.6 S., 69.9 W.
N. Chile

h	about 127 km.		
H	03	28	57.0
ePZ	03	39	20.5

19 mars 14.7 N., 56.3 E.
Arabian Sea

h	about 33 km.		
H	09	42	34.9
eLZ"	10	46	

19 mars 15.1 S., 172.6 W.
Samoa Isl region

h	about 33 km.		
H	21	44	03.8
ePSE"	22	12	08
eSSE"		18	06
eLG		28.6	

19 mars 15.3 S., 72.9 W.
S. Peru

h	about 115 km.		
H	22	29	03.2
iPZ	22	38	55.5 c

20 mars 12.9 N., 89.9 W.
Near coast of El Salvador

h	about 125 km.		
H	06	35	51.6
iPZ	06	42	37.2 d
ipPZ		43	06

20 mars 2.0 S., 79.7 W.
Ecuador

h	about 71 km.		
H	06	55	28.1
iPZ	07	03	58.6 d
iZ		04	18.0
ipPZ			26.0

21 mars 6.4 S., 127.9 E.
Banda Sea

h	about 367 km.		
H	03	42	19.6
iP'Z	04	00	54.5 d
ipP'Z		02	31
iSKPZ"		03	45
iPPPZ"		06	40
iN"		15	25
iP'P'N"		22	56

21 mars 18.7 N., 103.1 W.
Near coast of Michoacan
Mexico

h	about 83 km.		
H	15	08	14.3
iPZ	15	15	10.7 d
ePPE"		16	42
iPcPZ		17	37

22 mars 54.0 N., 160.5E.
Kamchatka

h	about 30 km.		
H	00	52	38.8
iPZ	01	03	53.0 d

22 mars 61.3 N., 147.8 W.
E. of Anchorage, Alaska

h	about 62 km.		
H	06	22	15
ePZ	06	30	11

22 mars 5.5 S., 77.1 W.
N Peru

h	about 147 km.		
H	07	05	39.7
iPZ	07	14	27.5 d
iZ			44.5

22 mars 35.7 S., 72.9 W.
Near coast of Central Chile

h	about 33 km.		
H	08	35	06.4
ePZ	08	47	18

22 mars 38.7 N., 118.8 W.
Walker Lake, Nevada

h	about 21 km.		
H	16	30	55.9
eLN"	16	48	

22 mars 14.2 S., 75.6 W.
S. Peru

h	about 86 km.		
H	17	51	19.5
ePZ	18	00	43

23 mars 9.3 S., 108.2 E.
Off S. coast of Java

h	about 50 km.		
H	01	02	36.1
eP'Z	01	22	10

23 mars 16.4 N., 106.1 W.
Off coast of Mexico

h	about 33 km.		
H	06	12	25
ePZ	06	19	53

23 mars 77.0 N., 132.2 W.
Arctic Ocean

h	about 16 km.		
H	07	55	14.1
ePZ	08	02	43.3 d

24 mars 27.7 S., 68.7 W.
Catamarca Prov., Argentina

h	about 76 km.		
H	17	38	08.2
ePZ	17	49	47

25 mars 36.3 N., 140.9 E.
Near E. coast of Honshu
Japan

h	about 67 km.		
H	02	43	23.5
ePZ	02	56	43.5

25 mars 7.7 N., 75.3 W.
N. Colombia

h	about 48 km.		
H	10	08	06.8
iPZ	10	15	21.5 d

26 mars 11.3 N., 142.0 E.
Mariana Isl.

h	about 33 km.		

H 02 04 20.2
eSS 02 33.5

26 mars 5.1 S., 76.6 W.
N. Peru
h about 100 km.
H 05 25 02.8
ePZ 05 33 52.5 d
epPZ 34 22

26 mars 46.4 N., 145.1 E.
Sea of Okhotsk
h about 180 km.
H 07 13 04.5
ePZ 07 25 07.5

26 mars 4.4 S., 104.7 W.
1500 miles S.W. of Gala-
pagos Isl.
h about 33 km.
H 13 29 56.2
ePZ 13 39 45

27 mars 9.2 N., 84.0 W.
Off S. coast of Costa Rica
h about 33 km.
H 17 12 36.3
eLZ" 17 35

28 mars 43.0 N., 101.6 W.
Nebraska S. Dakota border
h about 16 km.
H 10 08 42.7
ePZ 10 13 21±1 sec

28 mars 61.1 N., 147.6 W.
E. of Anchorage, Alaska
Mag 8.4(Pas) 8-1/2 - 8-3/4
(Brk) 8.6(Pal) 8.5(C.G.S.)
114 dead. Extensive damage
from Seismic Sea waves
throughout Gulf of Alaska,
along W. Coast of N. America
and in Hawaii.
h about 20 km.
H 03 36 12.7
ePZ 03 44 22±1 sec

Toutes les secousses subséquentes d'Alaska jusqu'au 1 mai sont renvoyées à la fin du bulletin.

28 mars 0.5 N., 122.3 E.
N. Celebes
h about 140 km.
H 11 30 09.8
iP'Z 11 48 58d±1 se
iZ 49 10
iZ 52 23

29 mars 6.7 S., 155.1 E.
Solomon Isl.
h about 68 km.
H 21 40 32.7
iP'Z 21 59 22.5 d

30 mars ePZ 02 11 21

30 mars ePZ 13 12 14.5

30 mars iPZ 23 59 48.0 c

31 mars 45.3 N., 151.0 E.
Kurile Isl.
h about 60 km.
H 00 14 11.7
ePZ 00 26 23.8

31 mars iN" 09 04 59

iN" 14 34.3

1 avril ePZ 23 45 18

2 avril 5.9 N., 95.7 E.
Near coast of N. Sumatra
h about 132 km.
H 01 11 55
eP'Z 01 30 50.4 d
eSSE" 50.0

2 avril 12.5 N., 87.8 W.
Near W. coast of Nicaragua
h about 32 km.
H 03 49 00
iPZ 03 55 52.9 c

2 avril 5.8 N., 125.8 E.
Mindanao, Philippine Isl.
h about 179 km.
H 15 56 52.6
eP'Z 16 15 40.5 d
eSSE" 34 32

2 avril 12.4 N., 143.5 E.
Mariana Isl.
h about 33 km.
H 19 28 22
eSS 20 01.4

3 avril 4.0 N., 96.6 E.
Near W. coast of Sumatra
h about 70 km.
H 04 12 41.9
eP'Z 04 31 45.4 c

3 avril 8.7 S., 78.7 W.
Near coast of Central Peru
h about 82 km.
H 13 46 38.0
iPZ 13 55 55.4 c

3 avril 1.9 N., 102.2 W.
1300 km. N.W. of Gala-
pagos Isl.
h about 33 km.
H 17 21 10
ePZ 17 30 03

4 avril 12.5 N., 87.7 W.
Off W. coast of Nicaragua
h about 41 km.
H 06 43 20.2
iPZ 06 50 13.0 c

5 avril 41.9 S., 83.7 W.
Off coast of S. Chile
h about 33 km.
H 11 18 38.9
ePZ 11 31 28

6 avril 45.2 N., 150.9 E.
Kurile Isl.
h about 33 km.
H 16 10 52.2
iPZ 16 23 12.4 d

7 avril 0.1 N., 123.2 E.
N. Celebes
h about 150 km.
H 13 18 18.9
eP'Z 13 37 05

7 avril 2.2 N., 83.2 W.
Off W. coast of Colombia
h about 33 km.
H 17 50 09.4
eLN" 18 21

8 avril 46.1 N., 152.8 E.
Kurile Isl.
h about 40 km.
H 02 04 06.5
ePZ 02 16 23

8 avril 6.8 S., 68.9 E.
Chagos Archipelago region
h about 103 km.
H 08 08 11.8
eLN" 09 01

8 avril 45.8 N., 150.8 E.
Kurile Isl.
h about 40 km.
H 10 58 09.1
iPZ 11 10 20.5 c
iSE" 20 25
iSKSN" 46

8 avril 35.1 N., 24.3 E.
Near Crete
h about 71 km.
H 14 12 29.5
ePZ 14 23 41.5 d

9 avril 13.5 N., 89.9 W.
El Salvador
h about 89 km.
H 04 15 23.0
iPZ 04 22 07.0 d

9 avril 18.5 S., 71.5 W.
S. Peru
h about 39 km.
H 21 54 42.1
iPZ 22 05 09.6 c

10 avril 29.0 S., 178.9 W.
Kermadec Isl
h about 302 km.
H 01 04 30.2
eP'Z 01 22 45.0 d

11 avril 40.5 N., 25.0 E.
Aegean Sea
h about 33 km.
H 16 00 42.8
ePZ 16 11 42.0

12 avril 13.6 S., 166.0 E.
New Hebrides Isl.

h	about 33 km.		
H	06	00	46.4
eP'Z	06	19	30.7

12 avril 33.9 S., 179.8 W.
Kermadec Isl. region

h	about 89 km.		
H	11	10	54.8
eP'Z	11	29	42.7

12 avril 42.6 N., 45.2 E.
E. Caucasus

h	about 33 km.		
H	12	06	01.3
ePZ	12	17	51.5

13 avril 45.3 N., 18.1 E.
N. Yugoslavia

h	about 33 km.		
H	08	30	03.6
ePZ	08	40	13
eSN"		48	34

14 avril 49.4 N., 155.5 E.
Kurile Isl.

h	about 60 km.		
H	01	04	28.8
iPZ	01	16	12.5 d

14 avril 41.0 S., 80.8 E.
Kerguelen Isl. region

h	about 33 km.		
H	05	01	59.1
eP'Z	05	22	43.0 d

14 avril 20.8 S., 69.1 W.
N. Chile

h	about 116 km.		
H	06	07	20.3
iPZ	06	17	56.0 d

14 avril 37.0 N., 142.7 E.
Off E. coast of Honshu, Japan

h	about 38 km.		
H	01	04	34.5
ePZ	01	17	39
eSE"		28	36

16 avril 30.8 N., 113.9 W.
Gulf of California

h	about 33 km.		
H	06	20	08.2
eLE"	06	41	

16 avril 45.1 N., 151.3 E.
Kurile Isl.

h	about 33 km.		
H	06	21	32.3
iPZ	06	33	47.0 c

16 avril 31.1 N., 113.8 W.
Gulf of California

h	about 29 km.		
H	09	18	12
eLE"	09	36	

16 avril 52.1 N. 169.4 W.
Fox Isl. Aleutian Isl.

h	about 33 km.		
H	13	43	08.9
eSE"	14	01	10

17 avril 6.6 S., 154.9 E.
Solomon Isl.

h	about 85 km.		
H	06	00	00.2
eLZ"	06	57	

18 avril 45.5 N., 151.1 E.
Kurile Isl.

h	about 33 km.		
H	05	27	44.6
iPZ	05	39	59.0 d

18 avril 45.4 N., 151.5 E.
Kurile Isl.

h	about 33 km.		
H	05	55	40.5
ePZ	06	07	54

19 avril 55.1 S., 128.5 W.
S. Pacific Ocean

h	about 33 km.		
H	03	44	55
eLN"	04	37	

19 avril 41.7 S., 83.9 W.
Off coast of S. Chile

h	about 33 km.		
H	05	13	01.6
ePZ	05	25	46
eSN"		36	14
eSSN"		42	20

19 avril 5.7 N., 76.5 W.
N. Colombia

h	about 113 km.		
H	11	03	39.2
iPZ	11	11	06.0 d

19 avril 60.5 S., 58.3 W.
Near S. Shetland Isl.

h	about 33 km.		
H	14	12	21.9
eP'Z	14	31	53
ePPPN"		37	12
eSKKSN"		40	18
ePPSN"		46	04
eSSN"		51	

19 avril 13.8 S., 75.3 W.
S. Peru

h	about 96 km.		
H	19	41	31.3
ePZ	19	51	23

19 avril 22.9 S., 69.2 W.
N. Chile

h	about 78 km.		
H	10	51	13
iPZ	11	02	06.0 c
ipPZ			31.5
isPZ			44.0

21 avril 18.4 N., 98.1 W.
Puebla, Mexico

h	about 70 km.		
H	04	38	44.2
ePZ	04	45	21

22 avril 56.1 N., 34.9 W.
N. Atlantic Ocean

h	about 33 km.		
H	09	46	54.2
ePZ	09	52	28

22 avril 16.1 S. 173.4 W.
Tonga Isl.

h	about 33 km.		
H	19	37	53.2
eLZ"	20	34	

22 avril 15.5 S., 167.5 E.
New Hebrides Isl.

h	about 123 km.		
H	20	00	22.8
eL	20	54.5	

23 avril 6.7 S., 155.0 E.
Solomon Isl.

h	about 72 km.		
H	01	31	40.3
eP'Z	01	50	29

23 avril 32.1 N., 138.7 E.
South of Honshu, Japan

h	about 33 km.		
H	01	51	10.6
eLZ"	02	35	

23 avril 5.3 S., 134.0 E.
Aru Isl. region

h	about 33 km.		
H	03	32	50.3
iP'Z	03	52	06.0 d
iZ			23
ePPZ		54	31
iPKSE"		55	35
iE"			52
eSS	04	12	10

23 avril 6.6 S., 155.1 E.
Solomon Isl. region

h	about 60 km.		
H	10	32	47.9
iP'Z	10	51	38.0 d
iZ			47.5

23 avril 36.9 N., 37.9 E.
Turkey

h	about 57 km.		
H	14	23	43.2
eLE"	14	56	

23 avril 52.7 N., 160.9 E.
Near E. coast of Kamchatka

h	about 33 km.		
H	21	08	42.0
eLE"	21	46	

24 avril 52.7 N., 160.9 E.
Near E. coast of Kamchatka

h	about 33 km.		
H	00	42	33.9

ePZ 00 53 52

24 avril 5.1 S., 144.2 E.
N.E. New Guinea
h about 106 km.
H 05 56 10.1
eP'Z 06 14 56
iZ 18 18.5
ePPPZ 19 04

24 avril 13.3 N., 88.8 W.
Near coast of El Salvador
h about 158 km.
H 14 40 28.3
iPZ 14 47 03.2 c
ipP 36.5
iS 52 20

25 avril 6.7 S., 155.0 E.
Solomon Isl.
h about 72 km.
H 05 36 42.2
eP'Z 05 55 31

25 avril 35.2 N., 27.6 E.
Dodecanese Isl. region
h about 27 km.
H 12 44 09.6
ePZ 12 55 39

25 avril 24.4 N., 125.3 E.
Ryukyu Isl.
h about 33 km.
H 18 37 58.1
eLE" 19 23

25 avril 19.8 N., 71.2 W.
Near N. coast of Dominican Republic
h about 35 km.
H 21 29 30.4
ePZ 21 35 02

26 avril 14.9 N., 92.5 W.
Near coast of Chiapas Mexico
h about 45 km.
H 01 17 12
ePZ 01 23 55

26 avril 5.8 S., 105.0 E.
S. Sumatra
h about 90 km.
H 13 59 27.7
eP'Z 14 18 44

26 avril 60.4 S., 24.6 W.
S. of Sandwich Isl.
h about 33 km.
H 22 34 48.6
eLZ" 23 33

27 avril 0.3 N., 98.1 E.
Off W. coast of Sumatra
h about 33 km.
H 01 37 12.1
eLZ" 02 35

27 avril 60.1 S., 151.0 E.
Belleny Isl. region
h about 33 km.
H 06 44 25.1
eP'Z 07 04 13
eSSN" 27.2

27 avril 4.0 N., 31.1 W.
Mid-Atlantic Ocean
h about 33 km.
H 12 07 53
eLN" 12 31

28 avril 12.3 S., 165.5 E.
Santa Cruz Isl.
h about 33 km.
H 15 52 10
eLN" 16 48

29 avril 3.4 S., 77.7 W.
Peru-Ecuador border
h about 56 km.
H 04 08 01.2
ePZ 04 16 42

29 avril 39.3 N., 23.7 E.
Aegean Sea
h about 33 km.
H 04 21 06.7
ePZ 04 32 03.5
eSE" 41 04

29 avril 39.2 N., 23.7 E.
Aegean Sea
h about 32 km.
H 17 00 02.9

ePZ 17 11 04

29 avril 58.2 S., 15.7 W.
E. of Sandwich Isl.
h about 33 km.
H 17 37 43.1
eL 18 33

29 avril 17.1 S., 72.1 W.
Near coast of S. Peru
h about 44 km.
H 17 59 39.5
eLN" 18 32

29 avril 41.4 N., 124.9 W.
Off coast of Del Norte County, California
h about 33 km.
H 19 22 24
eLZ" 19 44

29 avril 41.8 N., 127.0 W.
Off coast of Del Norte County, California
h about 33 km.
H 19 46 40
eLZ" 20 08.6

29 avril 11.8 N., 87.6 W.
Off coast of El Salvador
h about33 km.
H 21 53 15
ePZ 22 00 14

30 avril 20.3 N., 121.1 E.
Off N. coast of Luzon, Philippine Isl.
h about 50 km.
H 14 54 03.3
eLZ" 16 16

1 mai 56.6 N., 151.5 W.
Alaska Aftershock
h about 30 km.
H 00 17 22
ePZ 00 26 04

1 mai 57.4 N., 151.5 W.
Alaska Aftershock
h about 30 km.
H 03 13 03.5
ePZ 03 21 29.5 d

1 mai 59.7 N., 144.1 W.
Alaska Aftershock
h about 20 km.
H 03 40 36.2
ePZ 03 48 40.5

1 mai 60.5 N., 145.6 W.
Alaska Aftershock
h about 20 km.
H 06 01 55.4
ePZ 06 09 59
eSE" 16 30

1 mai 59.7 N., 147.1 W.
Alaska Aftershock
h about 20 km.
H 07 44 44.9
eLZ" 08 08.5

1 mai 1.2 N., 85.2 W.
E. of Galapagos Isl.
h about 33 km.
H 14 04 45.1
eLE" 15 23.3

2 mai 45.5 N., 150.3 E.
Kurile Isl.
h about 35 km.
H 16 11 00.2
iPZ 16 23 15.0 d
eSE' 33 21

2 mai 59.7 N., 147.0 W.
Alaska Aftershock
h about 30 km.
H 17 08 57.6
eLE" 17 32.4

3 mai 40.3 N., 141.9 E.
Near E. coast of Honshu Japan
h about 54 km.
H 01 54 33.5
ePZ 02 07 22.5

3 mai 23.9 S., 66.6 W.
Jujuy Prov. Argentina
h about 210 km.
H 13 31 14.1
ePZ 13 42 00.5

3 mai 52.2 N., 172.1 W.

Andreanof Isl. Aleutian Isl.

h	about 30 km.		
H	15	28	50.0
ePZ	15	39	07

4 mai 56.0 N., 162.4 W.
Alaska Peninsula

h	about 199 km.		
H	02	26	35
iPZ	02	35	34.8 d

4 mai 58.2 N., 152.3 W.
Alaska Aftershock

h	about 30 km.		
H	12	04	46.1
ePZ	12	13	26.5

4 mai 55.8 S., 4.4 W.
Bouret Isl. region

h	about 33 km.		
H	17	05	20
ePSN"	17	34	52
eSSN"		41	28

5 mai 17.7 S., 68.9 W.
W. Bolivia

h	about 33 km.		
H	03	26	46.1
ePZ	03	37	24.5
ipPZ			34.0

5 mai 45.5 N., 150.1 E.
Kurile Isl.

h	about 40 km.		
H	08	01	48.4
ePZ	08	14	03.5
eSKSE"		24	09

5 mai 55.8 S., 4.3 W.
Bouret Isl. region

h	about 33 km.		
H	11	12	52
eLN"	12	02	

5 mai 58.2 N., 149.7 W.
Alaska Aftershock

h	about 25 km.		
H	16	13	44.5
eLE"	16	39	

6 mai 60.7 S., 25.2 W.
Sandwich Isl.

h	about 33 km.		
H	04	27	02.4
ePSN"	04	56.0	
eSSN"	05	02.3	

6 mai 11.1 S., 162.2 E.
Solomon Isl.

h	about 40 km.		
H	08	10	47.5
eSKSE"	08	36	40
ePSE"		41.0	
eSSE"		47.7	

6 mai 59.7 N., 142.8 W.
Alaska Aftershock

h	about 33 km.		
H	09	38	12
eLN"	10	00.7	

6 mai 56.7 N., 152.1 W.
Alaska Aftershock

h	about 15 km.		
H	15	26	35.5
ePZ	15	35	15.5
eSN"		42	13

6 mai 45.5 N., 151.6 E.
Kurile Isl.

h	about 40 km.		
H	20	45	14.0
eLZ	21	35	

7 mai 4.6 S., 153.5 E.
New Ireland region

h	about 53 km.		
H	03	49	53.8
eLE"	04	28.5	

7 mai 51.6 N., 177.3 W.
Andreanof Isl. Aleutian Isl

h	about 25 km.		
H	04	02	28.7
ePZ	04	12	55

7 mai 4.0 S., 34.9 E.
Tanganyika

h	about 33 km.		
H	05	45	29.5
ePPZ"	06	04	09
eSKSN"		10	44
eSN"		11	46

7 mai 40.4 N., 139.0 E.

Off coast of N. Honshu Japan

h	about 33 km.		
H	07	58	14.3
iPZ	08	11	10.3
iPPZ		14	49.5
eSKSN"		21	44
eSN"		22	00
iSSN"		28	00

7 mai 40.2 N., 139.4 E.
Off coast of N. Honshu Japan

h	about 15 km.		
H	08	07	04.3
ePZ	08	20	09

7 mai 40.4 N., 139.3 E.
Off coast of N. Honshu, Japan

h	about 33 km.		
H	08	26	10.7
ePZ	08	39	05

7 mai 30.6 N., 137.7 E.
Off S. coast of Honshu Japan

h	about 469 km.		
H	11	11	04.9
ePZ	11	23	55.7

7 mai 23.9 N., 108.8 W.
Gulf of California

h	about 33 km.		
H	12	56	03
eLN"	13	11	

7 mai 60.4 N., 144.8 W.
Alaska Aftershock

h	about 15 km.		
H	19	12	38
eLE"	19	34.5	

7 mai 40.5 N., 139.0 E.
Off W. coast of Honshu Japan

h	about 33 km.		
H	20	12	49.3
iPZ	20	25	25
eSKSN"		36	24
eSE"			38

8 mai 59.2 N., 159.2 W.
Alaska Aftershock

h	about 25 km.		
H	05	56	14
ePZ	06	04	49.6

8 mai 59.4 N., 149.4 W.
Alaska Aftershock

h	about 20 km.		
H	09	23	33.1
eLN"	09	45	

8 mai 24.0 N., 108.6 W.
Gulf of California

h	about 33 km.		
H	10	27	54.3
ePZ	10	34	55

8 mai 56.7 N., 154.0 W.
Alaska Aftershock

h	about 25 km.		
H	16	21	49.8
iPZ	17	30	35.0 d
eSN"		37	36

8 mai 24.2 S., 69.3 W.
N. Chile

h	about 78 km.		
H	20	36	54.1
iPZ	20	47	55.7 c
ipPZ		48	16.8

8 mai 60.8 N., 143.6 W.
Alaska Aftershock

h	about 35 km.		
H	21	34	40.6
iPZ	21	42	33.0 d
iN"		57	00

8 mai 52.2 N., 169.5 W.
Andreanof Isl. Aleutian Isl.

h	about 20 km.		
H	23	40	44.1
ePZ	23	50	42
iPZ			45.8 d
eSN"		58	52

8 mai 40.4 N., 142.2 E.
Off coast of N. Honshu, Japan

h	about 47 km.		
H	23	53	21.1

ePZ 00 06 25

9 mai 52.2 N., 169.6 W.
Andreanof Isl. Aleutian Isl.
h about 25 km.
H 02 02 28.8
ePZ 02 12 26.5 d

9 mai 8.1 N., 123.2 E.
Mindanao, Philippine Isl.
h about 60 km.
H 13 48 05.3
eLE" 14 40

9 mai 13.7 S., 166.6 E.
New Hebrides Isl.
h about 41 km.
H 18 16 17.5
eLE 19 17

9 mai 61.7 N., 152.0 W.
Alaska Aftershock
h about 25 km.
H 21 06 12.2
ePZ 21 14 35.5

9 mai 9.2 S., 156.7 E.
Solomon Isl region
h about 26 km.
H 21 07 41.6
eLE" 21 59

10 mai 29.0 N., 141.5 E.
Bonin Isl region
h about 62 km.
H 05 39 42.6
eLE" 06 25

10 mai 40.5 N., 139.0 E.
Off coast of N. Honshu, Japan
h about 33 km.
H 10 45 52.3
ePZ 10 58 55

10 mai 51.4 N., 129.2 W.
Vancouver Isl. region
h about 33 km.
H 13 44 03
eLN" 14 03

10 mai 59.9 N., 147.1 W.
Alaska Aftershock
h about 15 km.
H 14 46 15
ePZ 14 54 20

10 mai 60.1 N., 146.3 W.
Alaska Aftershock
h about 15 km.
H 15 40 53
eLE" 16 03

11 mai 60.8 N., 142.2 W.
S. Alaska
h about 33 km.
H 02 17 01.5
ePZ 02 24 50
iN" 39 08

11 mai 22.5 S., 175.8 W.
Tonga Isl. region
h about 50 km.
H 14 39 04
eLE" 15 36

11 mai 60.3 N., 146.1 W.
Alaska Aftershock
h about 33 km.
H 20 10 36
eLE" 20 33.6

12 mai 40.2 N., 76.5 W.
S.E. Pennsylvania
h about 33 km.
H 06 45 14.1
eLgZ 06 47 02.4

12 mai 19.9 S., 173.9 W.
Tonga Isl. region
h about 33 km.
H 10 02 27.1
eLE 11 00

12 mai 60.1 N., 147.0 W.
Alaska Aftershock
h about 15 km.
H 11 47 32.2
ePZ 11 55 42

12 mai 59.5 N., 144.8 W.
Alaska Aftershock
h about 33 km.
H 16 55 46.9
ePZ 17 03 54

12 mai 56.6 N., 152.4 W.
Alaska Aftershock
h about 10 km.
H 18 16 41.9
iPZ 18 25 25.0 c
iSE" 32 24

12 mai 59.4 N., 143.1 W.
Alaska Aftershock
h about 20 km.
H 23 37 50.4
eLE" 23 59

13 mai 14.8 S., 176.7 W.
Samoa Isl. region
h about 33 km.
H 00 07 01.8
eLE" 00 59

13 mai 56.2 N., 152.7 W.
Alaska Aftershock
h about 33 km.
H 00 07 42.1
eLE" 00 36

13 mai 76.0 N., 8.2 E.
Svalbard region
h about 33 km.
H 03 19 43.2
eLZ" 03 38

13 mai 32.8 S., 178.3 W.,
Kermadec Isl. region
h about 33 km.
H 05 25 26.1
eP'Z 05 44 20

13 mai 33.1 S., 178.0 W.
Kermadec Isl. region
h about 15 km.
H 08 11 00
eLZ" 09 07

13 mai 60.0 N., 145.9 W.
Alaska Aftershock
h about 33 km.
H 15 06 03
eLN" 15 28

13 mai 32.7 S., 178.6 W.
Kermadec Isl. region
h about 33 km.
H 16 42 48.3
eLN" 17 37

13 mai 32.4 S., 188.3 W.
Kermadec Isl. region
h about 70 km.
H 20 37 54
eLN" 21 31

13 mai 40.5 N., 138.6 E.
Sea of Japan
h about 33 km.
H 23 34 26.1
ePZ 23 47 22

14 mai 32.9 S., 178.3 W.
Kermadec Isl region
h about 309 km.
H 01 05 47.6
eLN" 02 00

14 mai 4.5 S., 152.9 E.
New Ireland region
h about 32 km.
H 02 30 32.2
iP'Z 02 49 25.3 d

14 mai 62.8 N., 152.3 W.
Alaska aftershock
h about 15 km.
H 11 55 28.2
iPZ 12 03 51.6

14 mai 65.3 N., 86.5 W.
Melville Peninsula, Canada
h about 33 km.
H 13 52 14.4
ePZ 13 56 55

14 mai 59.7 N., 144.4 W.
Alaska Aftershock
h about 33 km.
H 14 19 05
eLN" 14 41

15 mai 3.5 S., 149.1 E.
Bismarck Sea
h about 44 km.
H 10 50 21
eLE" 11 27.5

15 mai 31.5 N., 113.7 W.
Gulf of California

h	about 33 km.		
H	19	40	35
eLN"	19	56	
iZ"	20	01	34

16 mai 7.1 N., 73.2 W.
Venezuela

h	about 126 km.		
H	05	40	11.1
iPZ	05	47	22.0

16 mai 49.9 N., 78.3 E.
Kazakh S.S.R.

h	about 0 km.		
H	06	00	58.1
ePZ	06	13	20.3

16 mai 54.0 N., 164.1 W.
Unimak Isl. Aleutian Isl.

h	about 33 km.		
H	09	51	41
ePZ	10	01	12

16 mai 57.6 N., 151.0 W.
Alaska Aftershock

h	about 33 km.		
H	14	44	54
ePZ	14	53	23

16 mai 32.8 S., 178.3 W.
Kermadec Isl. region

h	about 33 km.		
H	16	07	46.2
eSKSE"	16	33	44
ePSE"		38	12
eSSN"		44	56

17 mai 59.4 N., 142.7 W.
Alaska Aftershock

h	about 35 km.		
H	00	50	17.9
ePZ	00	58	10
eSE"		04	36
eSSE"		07	38
M		13.6	
13 sec 90 micr.			

17 mai 33.2 S., 178.4 W.
Kermadec Isl. region

h	about 33 km.		
H	17	05	24.8
eLN"	18	01	

17 mai 35.2 N., 35.9 W.
N. Atlantic ocean

h	about 33 km.		
H	19	26	20.6
iPZ	19	32	30.5 d
ipPZ			38.5
iSN"		37	33

18 mai 74.3 N., 97.4 W.
Queen Elizabeth Isl. region

h	about 15 km.		
H	01	04	30.5
ePZ	01	10	33

18 mai 12.0 S., 73.8 W.
Central Peru

h	about 91 km.		
H	04	15	08.4
ePZ	04	09	47

18 mai 60.4 N., 146.6 W.
Alaska Aftershock

h	about 33 km.		
H	13	47	22.7
eLN"	14	08	

18 mai 21.2 S., 174.5 W.
Tonga Isl. region

h	about 33 km.		
H	14	12	10.1
eLZ"	15	10	

18 mai 18.2 N., 147.3 E.
Mariana Isl. region

h	about 19 km.		
H	17	38	25.5
eLN"	18	38.6	

18 mai 59.7 N., 145.0 W.
Alaska Aftershock

h	about 25 km.		
H	21	12	46.2
ePZ	21	20	38

19 mai 60.4 N., 147.5 W.
Alaska Aftershock

h	about 15 km.		
H	01	44	34
eLN"	02	08	

19 mai 59.4 N., 145.2 W.
Alaska Aftershock

h	about 20 km.		
H	02	23	45.2
eLN"	02	46	

19 mai 19.5 S., 67.4 W.
S. Bolivia

h	about 293 km.		
H	05	30	08.0
ePZ	05	40	24
epP			51

19 mai 77.7 N., 18.3 E.
Svalbard region

h	about 33 km.		
H	06	09	04.1
ePZ	06	17	31

19 mai 45.5 N., 150.3 E.
Kurile Isl.

h	about 33 km.		
H	10	39	24.8
ePZ	10	51	39

19 mai 60.2 N., 146.3 W.
Alaska Aftershock

h	about 33 km.		
H	14	42	40.7
eLN"	15	00.5	

19 mai 57.0 N., 152.8 W.
Alaska Aftershock

h	about 25 km.		
H	15	37	35.9
iPZ	15	46	14.0 d

19 mai 0.7 S., 80.2 W.
Near coast of Ecuador

h	about 54 km.		
H	23	03	41.8
ePZ	23	12	02.5 d
iPZ			04.8 d
ePcPZ"		13	44
ePPN"			56
iSE"		18	52
eScS, SS		22	00

19 mai 48.3 N., 154.4 E.
Kurile Isl.

h	about 50 km.		
H	23	22	04.0
ePZ	23	33	56.3 d

20 mai 0.9 S., 80.4 W.
Near coast of Ecuador

h	about 33 km.		
H	03	25	05.1
iPZ	03	33	30.8 d

20 mai 58.0 N., 149.6 W.
Alaska Aftershock

h	about 20 km.		
H	05	32	13.7
ePZ	05	40	38

20 mai 2.7 S., 139.3 E.
Near N. coast of W New Guinea

h	about 61 km.		
H	06	01	14.8
eP'Z	06	20	50

20 mai 60.2 N., 147.4 W.
Alaska Aftershock

h	about 33 km.		
H	09	28	38.5
ePZ	09	36	46.5 c

21 mai 60.4 N., 145.9 W.
Alaska Aftershock

h	about 15 km.		
H	01	11	23.4
ePZ	01	19	31

21 mai 59.0 N., 153.5 W.
Alaska Aftershock

h	about 15 km.		
H	15	36	01.5
ePZ	15	44	37.5
eSN"		52	36

21 mai 17.5 N., 83.9 W.
Caribbean Sea

h	about 33 km.		
H	22	32	33.9
iPZ	22	38	35.9 c
iSN"		43	32

21 mai 44.5 N., 149.6 E.
Kurile Isl.

h	about 45 km.		
H	23	10	49.0
ePZ	23	23	08

22 mai 34.7 S., 179.6 W.
Kermadec Isl.
h about 58 km.
H 00 26 44.8
eP'Z 00 45 47

22 mai eLN" 13 09

23 mai 57.3 N., 150.7 W.
Alaska Aftershock
h about 20 km.
H 06 29 24
eLN" 06 56

23 mai 11.7 N., 86.6 W.
Near W. coast of Nicaragua
h about 93 km.
H 06 45 21
ePZ 06 52 08

23 mai 36.5 N., 90.0 W.
S.E. Missouri
h about 18 km.
H 11 25 34.2
eZ 11 31 53

23 mai 36.5 N., 89.9 W.
S.E. Missouri
h about 18 km.
H 15 00 35.2
eLZ" 15 58

23 mai 18.4 S., 69.2 W.
Bolivia-Chile border
h about 128 km.
H 21 31 03.4
iPZ 21 41 22.4

24 mai 30.1 N., 82.1 E.
Nepal
h about 33 km.
H 00 00 50.2
eLN" 01 01

24 mai 60.2 N., 148.0 W.
Alaska Aftershock
h about 15 km.
H 00 40 21.9
ePZ 00 48 34

24 mai 22.6 S., 174.1 W.
Tonga Isl. region
h about 33 km.
H 04 13 05.3
eL 04 59

24 mai 59.7 N., 148.5 W.
Alaska Aftershock
h about 20 km.
H 06 52 44.4
eL 07 16

24 mai 59.9 N., 145.5 W.
Alaska Aftershock
h about 15 km.
H 10 16 21.5
eLN" 10 36

24 mai 34.3 N., 141.1 E.
Near E. coast of Honshu, Japan
h about 33 km.
H 10 31 24.1
ePZ 10 44 42

24 mai 23.2 S., 71.6 W.
Off coast of N. Chile
h about 33 km.
H 18 01 34.8
ePZ 18 12 38

24 mai 53.0 N., 168.7 W.
Fox Isl. Aleutian Isl.
h about 52 km.
H 20 54 26.6
ePZ 21 04 09

24 mai 37.0 S., 177.8 E.
Near North Isl. New Zealand
h about 149 km.
H 22 22 27.6
iP'Z 22 41 13.0

25 mai 9.1 S., 88.9 E.
Indian Ocean
h about 33 km.
H 19 44 07.0
e(P')Z 20 03 45
eSSE" 25.0

26 mai 60.3 N., 145.5 W.
Alaska Aftershock
h about 33 km.
H 05 33 45
ePZ 05 41 46

26 mai 56.2 S., 27.8 W.
Sandwich Isl.
h about 120 km.
H 10 59 12.3
iPZ" 11 13 29
Δ 108°
ipPZ 13 56
iZ" 14 12
iP'Z 17 56
iZ" 18 24
iSKSN" 23 54
iSKKSE" 24 34
iE" 26 10
iSPN" 27 04
iPSE" 27 32
iSSE" 33 08

26 mai 56.1 S., 26.6 W.
Sandwich Isl.
h about 153 km.
H 23 43 26
eLN" 00 45

27 mai 56.1 S., 27.6 W.
Sandwich Isl.
h about 105 km.
H 00 56 42.5
eP'Z 01 15 22

27 mai 14.6 N., 93.5 W.
Off coast of Chiapas, Mexico
h about 63 km.
H 04 22 38.0
eLZ" 04 44

27 mai 56.2 S., 27.4 W.
Sandwich Isl.
h about 116 km.
H 06 30 57.7
eN" 06 58.9

27 mai 6.8 N., 73.1 W.
N. Colombia
h about 139 km.
H 11 06 22.0
iPZ 11 13 33.2 d

27 mai 56.4 S., 28.4 W.
Sandwich Isl.
h about 61 km.
H 19 02 02.4
eLZ" 19 46

28 mai 24.5 N., 122.0 E.
Near E. coast of Taiwan
h about 41 km.
H 01 56 58.9
eLE" 02 51

28 mai 0.8 S., 24.7 W.
Mid-Atlantic Ocean
h about 33 km.
H 12 33 10.2
eLN" 12 59.3

28 mai 13.4 S., 74.9 W.
S. Peru
h about 103 km.
H 12 49 57.5
iPZ 12 59 45.2 d

28 mai 58.3 N., 150.6 W.
Alaska Aftershock
h about 25 km.
H 16 18 04.2
ePZ 16 26 30.5

28 mai 1.8 S., 103.3 W.
About 1300 km. W. of Galapagos Isl.
h about 33 km.
H 17 51 13
eLN" 18 14.0

28 mai 3.6 S., 102.7 W.
1300 km. W. of Galapagos Isl.
h about 33 km.
H 21 09 09.5
eLN" 21 35

28 mai 1.6 N., 127.2 E.
Molucca Passage
h about 103 km.
H 23 28 27.9
eP'Z 23 47 46.5

29 mai 53.7 N., 167.8 W.
Fox Isl. Aleutian Isl.
h about 33 km.
H 02 47 38.0

iPZ 02 57 28.6 c

29 mai 60.1 N., 146.5 W.
Alaska Aftershock
h about 15 km.
H 03 34 51.8
iPZ 03 42 59.8 d

29 mai 44.7 N., 149.4 E.
Kurile Isl
h about 50 km.
H 05 08 02.2
iPZ 05 20 21.2 d

29 mai 60.2 N., 146.3 W.
Alaska Aftershock
h about 5 km.
H 10 17 34.5
ePZ 10 25 42
eSN" 32 18

30 mai 59.5 N., 148.5 W.
Alaska Aftershock
h about 15 km.
H 03 18 08.3
ePZ 03 26 25.5

30 mai 36.2 N., 141.1 E.
Near E. coast of Honshu Japan
h about 49 km.
H 14 30 45.3
iPZ 14 43 55.2 d

30 mai 41.3 N., 141.9 E.
Near coast of Honshu Japan
h about 57 km.
H 17 20 37.6
ePZ 17 33 22

30 mai 28.4 S., 69.8 W.
Chile-Argentina border
h about 84 km.
H 19 24 41.3
ePZ 19 36 08
ipPZ 31.8

31 mai 43.5 N., 146.8 E.
Kurile Isl
h about 48 km.
H 00 40 36.4
iPZ 00 53 04.7 c
ipPZ' 25.0
iPPPZ' 58 17
iSKSE' 01 03 26
iSE' 33

31 mai 19.2 N., 69.4 W.
Dominican Republic
h about 83 km.
H 10 30 25.0
ePZ 10 35 56.6 d

31 mai 13.6 S., 172.1 E.
New Hebrides Isl.
h about 73 km.
H 17 15 26.8
eLN" 17 51

1 juin 1.0 S., 78.1 W.
Ecuador
h about 33 km.
H 09 20 58
ePZ 09 29 24

1 juin 21.0 S., 175.7 W.
Tonga Isl.
h about 35 km.
H 13 17 20.7
eLZ" 14 10

2 juin 59.7 N., 144.4 W.
Alaska Aftershock
h about 15 km.
H 16 09 23.5
ePZ 16 17 25
eSN" 23 56

2 juin 14.7 S., 167.0 E.
New Hebrides Isl.
h about 82 km.
H 23 12 37.8
eLZ" 00 12

3 juin 25.9 N., 95.8 E.
N. Burma
h about 100 km.
H 02 49 14.9
eLN" 03 23

3 juin 19.5 N., 108.3 W.
Off coast of Jalisco, Mexico
h about 33 km.

H 11 41 54.6
eSSN" 11 58 22

3 juin 40.3 N., 126.1 W.
Near coast of N. California
h about 33 km.
H 13 50 16
eLZ" 14 08

3 juin 59.9 N., 143.9 W.
Alaska Aftershock
h about 20 km.
H 14 03 42.4
ePZ 14 11 47

3 juin 18.8 S., 173.7 W.
Tonga Isl.
h about 33 km.
H 17 54 14.7
eLZ" 18 50

4 juin 17.5 N., 100.8 W.
Near coast of Guerrero, Mexico
h about 22 km.
H 04 28 54.7
iPZ 04 35 56.3 d
ePPN" 37 24
eSN" 42 00

4 juin 9.6 S., 76.1 W.
Central Peru
h about 124 km.
H 11 46 01.7
ePZ 11 55 22.5

4 juin 4.9 S., 134.2 E.
Near S. coast of W. New Guinea
h about 33 km.
H 12 56 02.6
eLZ" 13 51

5 juin 56.2 S., 27.5 W.
Sandwich Isl. region
h about 33 km.
H 04 08 30.6
eLZ" 04 56

5 juin 60.4 N., 146.0 W.
Alaska Aftershock
h about 15 km.
H 09 50 35.0
ePZ 09 58 43
eSN" 10 05 12

5 juin 58.1 N., 152.1 W.
Alaska Aftershock
h about 15 km.
H 22 06 53.0
iPZ 22 15 28.0 d
eSN" 22 23
eScSE" 25 20
eSSN" 26 06

6 juin 8.9 S., 108.7 W.
S. Pacific Ocean
h about 33 km.
H 02 33 16.1
eLZ" 03 03

6 juin 8.3 S., 79.3 W.
Near coast of Peru
h about 47 km.
H 03 44 27.8
ePZ 03 53 49

6 juin 26.6 S., 114.4 W.
Easter Isl. region
h about 33 km.
H 19 07 51.4
ePZ 19 20 03 d
iSN" 30 18
eSSN" 35 32

7 juin 36.3 N., 141.0 E.
Near E. coast of Honshu Japan
h about 36 km.
H 14 49 31.2
ePZ 15 02 55

7 juin 30.4 S., 67.6 W.
LaRioja Prov. Argentina
h about 29 km.
H 20 10 15.9
ePZ 20 22 01

7 juin 45.3 N., 150.9 E.
Kurile Isl.
h about 33 km.
H 20 30 55.5
ePZ 20 43 11

8 juin 51.6 N., 175.9 W.
Andreanof Isl. Aleutian Isl.

h	about 27 km.		
H	04	22	30.1
eLZ"	04	54	

8 juin 6.1 S., 153.6 E.
Solomon Isl.

h	about 59 km.		
H	17	56	18.5
eLZ"	19	02	

9 juin 35.4 S., 105.9 W.
S. Pacific Ocean W. of Chile

h	about 33 km.		
H	04	22	59.8
eLZ"	05	03	

9 juin 59.6 N., 145.1 W.
Alaska Aftershock

h	about 33 km.		
H	09	24	18
ePZ	09	32	34

9 juin 0.2 S., 78.9 W.
Ecuador

h	about 48 km.		
H	18	16	13.7
ePZ	18	24	28

10 juin 5.0 N., 127.4 E.
Talaud Isl. region

h	about 146 km.		
H	22	16	44.8
eP'Z	22	35	34

10 juin 59.1 N., 153.8 W.
Alaska Aftershock

h	about 33 km.		
H	23	25	09.1
iPZ	23	33	43.9 d

11 juin 65.5 N., 168.1 W.
Bering Strait

h	about 33 km.		
H	03	11	56.6
iPZ	03	20	59.2 c

11 juin 56.0 S., 27.3 W.
Sandwich Isl.

h	about 33 km.		
H	10	55	06.2
eLZ"	11	27	

11 juin 2.0 S., 140.8 E.
Near N. coast of W. New Guinea

h	about 18 km.		
H	17	01	48.5
eP'Z	17	20	54.4
ePPSN"		35	26
eSSN"		40	36
eSSSN"		45	08

11 juin 40.3 N., 126.5 W.
Off coast of N. California

h	about 33 km.		
H	22	18	19.8
eLN"	22	37	

12 juin 2.1 S., 141.1 E.
Near N. coast of W. New Guinea

h	about 33 km.		
H	10	50	09.1
eP'Z	11	09	12

12 juin 11.4 N., 124.9 E.
Cebu Philippine Isl.

h	about 183 km.		
H	15	56	21.3
eLZ"	16	54	

12 juin 6.6 S., 154.7 E.
Solomon Isl.

h	about 80 km.		
H	22	47	47.2
eLZ"	22	53	

13 juin 58.6 N., 172.1E.
Near Isl Aleutian Isl.

h	about 33 km.		
H	04	20	53.5
ePZ	04	31	41.4

13 juin 1.9 S., 141.2 E.
Off N. coast of W. New Guinea

h	about 33 km.		
H	05	04	23.5
eLZ"	06	03	

13 juin 10.0 N., 93.0 E.
Andaman Isl.

h	about 33 km.		
H	08	23	45.6
eLZ"	09	53	

13 juin 46.4 N., 153.3 E.
Kurile Isl.

h	about 33 km.		
H	08	28	38.7
ePZ	08	40	43.4

13 juin 27.3 S., 178.0 W.
Kermadec Isl.

h	about 34 km.		
H	11	14	26.5
eLZ"	12	11	

13 juin 27.6 S., 178.3 W.
Kermadec Isl. region

h	about 94 km.		
H	22	31	53.5
eLZ"	23	17	

14 juin 48.2 N., 154.3 E.
Kurile Isl.

h	about 40 km.		
H	00	56	56.8
ePZ	01	08	51

14 juin 27.5 S., 177.5 W.
Kermadec Isl.

h	about 33 km.		
H	01	19	57.7
eLZ"	02	18	

14 juin 12.0 N., 89.2 W.
Off coast of El Salvador

h	about 33 km.		
H	05	42	04
eLZ"	06	12	

14 juin 38.0 N., 38.5 E.
S.E. Turkey

h	about 8 km.		
H	12	15	31.3
ePZ	12	27	26
eSN"		37	16

14 juin 56.7 N., 152.1 E.
Sea of Okhotsk

h	about 33 km.		
H	17	20	17.5
eLN"	17	47	

15 juin 5.4 N., 97.0 E.
N. Sumatra

h	about 33 km.		
H	00	05	31.1
eP'Z	00	24	39
eZ"		26	48
eSKSE"		32	15
eSSN"		44	20
eSSSN"		49	23

15 juin 40.1 N., 138.5 E.
Sea of Japan

h	about 15 km.		
H	10	53	06.7
eLZ"	11	16	

15 juin 62.1 N., 64.9 W.
Baffin Isl. region

h	about 33 km.		
H	22	53	04.5
ePZ	22	57	10

16 juin 38.3 N., 139.1 E.
Near W. coast of Honshu, Japan

h	about 57 km.		
H	04	01	44.3
ePZ	04	14	45.5 d
iZ'		16	00
iPPZ'		18	24
iZ'			46
iSKSN"		25	29
iSN"			50

16 juin 38.9 N., 139.1 E.
Near W. coast of Honshu Japan

h	about 13 km.		
H	04	17	38.0
iPZ	04	30	44 d

16 juin 39.0 N., 139.1 E.
Near W. coast of Honshu Japan

h	about 33 km.		
H	04	46	37.8
ePZ	04	59	40.4

16 juin 38.5 N., 138.7 E.
Near W. coast of Honshu, Japan

h	about 20 km.		

H 04 53 08.8
ePZ 05 06 16.0 d

16 juin 38.7 N., 139.1 E.
Near W. coast of Honshu
Japan
h about 15 km.
H 05 22 09.3
ePZ 05 35 16

16 juin 38.8 N., 139.0 E.
Near W. coast of Honshu,
Japan
h about 35 km.
H 05 39 24.5
ePZ 05 52 27.5

16 juin 38.4 N., 138.9 E.
Near W. coast of Honshu,
Japan
h about 28 km.
H 06 17 07.8
ePZ 06 30 13.5 d

16 juin 38.7 N., 139.0 E.
Near W. coast of Honshu,
Japan
h about 15 km.
H 06 53 05.0
iPZ 07 06 10.8 c

16 juin 38.5 N., 139.2 E.
Near W. coast of Honshu,
Japan
h about 33 km.
H 07 14 57.1
ePZ 07 28 02.5
iPZ 04.6

16 juin 38.4 N., 138.9 E.
Near W. coast of Honshu,
Japan
h about 15 km.
H 07 51 10.4
ePZ 08 04 18.5

16 juin 2.0 S., 141.1 E.
Near N. coast of New Guinea
h about 13 km.
H 11 16 03.1
eLZ" 12 16

16 juin 19.6 N., 66.8 W.
Off N. coast of Puerto Rico
h about 30 km.
H 19 54 46.5
eLZ" 20 07

16 juin 15.3 S., 172.8 W.
Samoa Isl. region
h about 33 km.
H 22 03 14
eLZ" 23 00

18 juin 47.5 N., 154.9 E.
Kurile Isl.
h about 33 km.
H 18 01 47.6
ePZ 18 13 47

18 juin 39.3 S., 74.7 W.
Off coast of Central Chile
h about 26 km.
H 20 33 53.3
ePZ 20 44 03
eSSN" 56 48

19 juin 40.7 N., 32.9 W.
Turkey
h about 33 km.
H 00 50 24.4
eLZ" 01 33

19 juin 56.8 N., 151.5 W.
Alaska Aftershock
h about 33 km.
H 01 34 10.9
eLZ" 02 01

19 juin 38.8 N., 139.3 E.
Near W. coast of Honshu
Japan
h about 30 km.
H 10 05 36.4
ePZ 10 18 39.7

19 juin 22.6 N., 121.0 E.
Taiwan
h about 33 km.
H 10 34 33.6
eLZ" 11 32

19 juin 12.4 N., 88.1 W.

Near W. coast of Nicaragua
h about 53 km.
H 17 31 56.2
iPZ 17 38 48.2 d

20 juin 19.9 S., 174.1 W.
Tonga Isl region
h about 33 km.
H 09 59 08.9
eLZ" 10 59

20 juin 3.3 S., 142.4 E.
Near coast of N.E. New
Guinea
h about 33 km.
H 16 06 44.3
eLZ" 17 31

20 juin 18.5 N., 105.5 W.
Near coast of Jalisco,
Mexico
h about 28 km.
H 17 12 15.2
ePZ 17 19 31

20 juin 18.8 N., 105.4 W.
Near coast of Jalisco,
Mexico
h about 33km.
H 19 35 23
ePZ 19 42 35

21 juin 51.0 N., 157.0 E.
Kamchatka
h about 51 km.
H 01 33 11.2
iPZ 01 44 45.0 c
ipPZ 59.2

21 juin ePZ 03 57 43.5

21 juin 14.9 S., 73.3 W.
Peru
h about 80 km.
H 06 54 46.2
iPZ 07 04 48
ipPZ 05 14

21 juin 16.3 S., 178.0 E.
Fiji Isl.
h about 18 km.
H 22 21 22.7
eLZ" 23 15

22 juin 15.7 S., 172.8 W.
Samoa Isl.
h about 33 km.
H 00 16 27.4
eLZ" 00 44.5

22 juin 10.4 S., 161.1 E.
Solomon Isl.
h about 70 km.
H 03 03 37.9
eP'Z 03 22 24.0

22 juin 24.3 S., 176.8 W.
Fiji Isl. region
h about 75 km.
H 07 42 02.5
eLZ" 08 45

22 juin 60.0 N., 146.7 W.
Alaska Aftershock
h about 33 km.
H 12 11 09.4
eLN" 12 34

22 juin 3.0 S., 139.6 E.
W. New Guinea
h about 78 km.
H 17 16 57
eLZ" 18 03

22 juin 13.6 N., 120.3 E.
Luzon, Philippine Isl.
h about 56 km.
H 21 23 33.6
eLZ" 22 33

23 juin 3.7 S., 78.1 W.
S. Ecuador
h about 33 km.
H 00 30 11.1
iPZ 00 38 55.5 d

23 juin 43.3 N., 146.1 E.
Kurile Isl.
h about 77 km.
H 01 26 37.0
iPZ 01 39 03.7 c
ipPZ' 24
iPPZ" 42 24
ePPPZ" 44 14

	iSKSN"	49	21
	iSE"		32
	iSSN"	55	00

23 juin 2.7 S., 80.0 W.
Ecuador

h	about 58 km.		
H	02	04	41.8
iPZ	02	13	18.7 c
ipPZ			36.5

23 juin 53.9 N., 163.2 W.
Unimak Isl. region

h	about 60 km.		
H	05	25	36.8
ePZ	05	35	14

24 juin 7.1 S., 155.6 E.
Solomon Isl.

h	about 123 km.		
H	14	59	58.7
eLZ"	15	36	

25 juin 43.6 N., 130.2 W.
Off coast of Oregon

h	about 33 km.		
H	17	24	55
eLZ"	17	48	

26 juin 9.2 S., 158.9 E.
Solomon Isl.

h	about 17 km.		
H	13	32	52.3
eL	14	34	

27 juin 40.4 N., 77.5 E.
Sinkian Prov. China

h	about 33 km.		
H	02	28	57.1
ePZ	02	32	05.5

27 juin 16.5 N., 85.7 W.
Near N. coast of Honduras

h	about 28 km.		
H	08	50	29.1
ePZ	08	56	46.5

27 juin 11.5 S., 13.8 W.
Ascension Isl. region

h	about 33 km.		
H	16	43	47.0
eLZ"	17	06	

27 juin 27.8 S., 65.6 W.
Tucuman Prov. Argentina

h	about 100 km.		
H	17	19	53
eLZ"	18	02.6	

28 juin 1.7 S., 149.6 E.
New Ireland region

h	about 7 km.		
H	12	51	34.6
eP'Z	13	10	32

28 juin 3.5 N., 32.4 W.
N. Atlantic Ocean

h	about 33 km.		
H	17	07	07.0
ePZ	17	16	38

28 juin 4.0 N., 32.4 W.
N. Atlantic Ocean

h	about 33 km.		
H	17	27	59.8
ePZ	17	37	29.5

28 juin 53.2 N., 162.0 W.
Unimak Isl. Aleutian Isl.

h	about 39 km.		
H	18	22	46.3
ePZ	18	32	10.7

28 juin 58.3 N., 150.2 W.
Alaska Aftershock

h	about 23 km.		
H	19	09	05.4
ePZ	19	17	32
iZ		19	05.0

29 juin 26.7 N., 110.8 W.
Gulf of California

h	about 33 km.		
H	04	43	30
ePZ	04	50	27

29 juin 62.7 N., 152.0 W.
S. Alaska

h	about 33 km.		
H	07	21	32.8
ePZ	07	29	52.5 c

29 juin 56.7 N., 151.4 W.
Alaska Aftershock

h	about 33 km.		
H	10	42	46.1
eLZ"	11	09	

29 juin eLZ" 13 57

29 juin 61.0 N., 143.7 W.
Alaska Aftershock

h	about 33 km.		
H	19	04	50
eLZ"	19	30	

30 juin 59.1 N., 154.0 W.
Alaska Aftershock

h	about 33 km.		
H	05	46	53
eLZ"	06	15	

30 juin 44 N., 149.6 E.
Kurile Isl.

h	about 33 km.		
H	10	17	51.1
eLZ"	11	13.8	

30 juin 23.3 S., 66.6 W.
Jujuy Prov. Argentina

h	about 353 km.		
H	11	28	58
iPZ	11	39	30.3 c
iPcPZ			58.5

30 juin 0.8 S., 122.5 E.
N. Celebes

h	about 36 km.		
H	13	46	21.6
eP'Z	14	05	37.5
iPPZ		09	07.5
iPKSZ		10	06
eE		26	40

30 juin 44.7 N., 150.4 E.
Kurile Isl.

h	about 33 km.		
H	15	47	41.1
iPZ	15	59	59.5 d

30 juin 45.9 N., 150.4 W.
Kurile Isl.

h	about 33 km.		
H	15	48	43
iPZ	16	00	58.8

30 juin 46.6 N., 144.6 E.
Sea of Okhotsk

h	about 383 km.		
H	20	08	28.5
ePZ	20	20	09

1 juil. 12.0 N., 86.7 W.
Near W. coast of Nicaragua

h	about 108 km.		
H	00	42	55.4
ePZ	00	49	38.0 d

1 juil. 46.3 N., 146.9 E.
Kurile Isl.

h	about 33 km.		
H	02	47	33.9
iPZ	02	59	50.5 c

1 juil. 45.2 N., 150.3 E.
Kurile Isl.

h	about 75 km.		
H	09	46	49.6
ePZ	09	59	01.5 d
ipPZ			17.5

1 juil. 44.6 N., 149.9 E.
Kurile Isl.

h	about 33 km.		
H	09	52	31.8
ePZ	10	04	52

Secouses subséquentes du tremblement de terre d'Alaska du 28 mars.

					Lat.	Long.	h.	
28 mars	H	04	54	07.9	59.8	149.4	25	
	iPZ	05	02	28.5d				±1 sec
28 mars	H	06	08	44.2	60.1	148.6	20	
	iPZ	06	17	00 d				±1 sec
28 mars	H	06	41	28.0	59.9	147.8	15	
	iPZ	06	49	42 d				±1 sec
28 mars	H	06	43	57.4	58.3	151.3	25	
	iPZ	06	52	27 d				±1 sec
28 mars	H	06	50	48.9	57.1	152.3	33	
	ePZ	06	59	25				±1 sec
28 mars	H	07	09	12.0	60.0	147.5	33	
	ePZ	07	17	24 d				±1 sec
28 mars	H	07	10	21.4	58.8	149.5	20	
	iP	07	18	44 d				±1 sec
28 mars	H	07	30	29.6	57.4	151.7	15	
	iPZ	07	39	05				±1 sec
28 mars	H	07	48	47.8	57.0	153.3	15	
	ePZ	07	57	31				±1 sec
28 mars	H	08	30	11.7	60.5	147.0	33	
	ePZ	08	38	17				±1 sec
28 mars	H	08	33	47.0	58.1	151.1	25	
	ePZ	08	42	17				±1 sec
28 mars	H	08	39	54.9	57.5	151.6	20	
	iPZ	08	48	29 d				±1 sec
28 mars	H	08	42	31.3	60.3	147.2	33	
	ePZ	08	50	39				±1 sec
28 mars	H	08	55	22.8	56.7	151.9	25	
	ePZ	09	03	58				±1 sec
28 mars	H	08	59	03.7	57.4	151.8	33	
	ePZ	09	07	38				±1 sec
28 mars	H	09	01	00.5	56.5	152.0	20	
	ePZ	09	09	39				

28 mars	H	09	05	56.4	56.6	153.2	25	
	ePZ	09	14	33				±1 sec
28 mars	H	09	13	56.6	59.4	151.2	35	
	iPZ	09	22	23 c				±1 sec
28 mars	H	09	17	52.6	57.4	151.6	25	
	ePZ	09	26	28				±1 sec
28 mars	H	09	26	16.5	61.3	148.8	33	
	ePZ	09	34	30				±1 sec
28 mars	H	09	34	01.5	56.8	152.3	20	
	ePZ	09	42	42				±1 sec
28 mars	H	09	52	55.7	59.7	146.6	30	
	ePZ	10	01	42				±1 sec
28 mars	H	10	33	00.2	57.7	152.2	35	
	iPZ	10	41	34 c				±1 sec
28 mars	H	10	35	31.2	60.9	143.7	25	
	ePZ	10	43	21 d				±1 sec
28 mars	H	10	35	38.9	57.2	152.4	33	
	iPZ	10	44	16 d				±1 sec
28 mars	H	10	57	18.1	60.6	144.7	33	
	ePZ	11	05	18				±1 sec
28 mars	H	10	59	16.3	57.4	151.6	30	
	ePZ	11	07	50 d				±1 sec
28 mars	H	11	08	26.0	60.1	148.4	15	
	ePZ	11	16	43				±1 sec
28 mars	H	11	50	01.9	58.2	149.8	25	
	ePZ	11	58	28				±1 sec
	iZ	12	00	03				
28 mars	H	12	03	16.5	60.3	146.6	15	
	iPZ	12	11	26 d				±1 sec
28 mars	H	12	20	49.8	56.5	154.0	25	
	iPZ	12	29	36				±1 sec
28 mars	H	13	01	14.2	60.1	147.0	20	
	ePZ	13	09	25 c				±1 sec
28 mars	H	13	27	38.5	60.3	147.1	15	
	ePZ	13	35	59				±1 sec

28 mars	H	13	54	19.9	62.1	147.1	15
	ePZ	14	02	37 d			
28 mars	H	14	01	57.6	56.5	154.4	25
	ePZ	14	10	43			
28 mars	H	14	47	37.1	60.4	146.5	10
	ePZ	14	55	44			
	eS	15	02	23			
28 mars	H	14	49	13.7	60.4	147.1	10
	iPZ	14	57	21 d			
28 mars	H	15	22	36.4	60.4	146.8	15
	ePZ	15	30	44.7d			
28 mars	H	15	39	44.1	56.0	159.7	33
	ePZ	15	48	32 d			
28 mars	H	16	26	16.9	57.5	150.9	30
	iPZ	16	34	46.5			
28 mars	H	16	44	35.9	59.3	147.8	25
	iPZ	16	52	49 c			
28 mars	H	17	47	17.0	60.4	145.7	15
	ePZ	17	55	22.2			
28 mars	H	19	21	38.8	61.6	146.7	45
	ePZ	19	29	40.5d			
28 mars	H	20	29	08.6	59.8	148.7	40
	ePZ	20	37	22 c			
	eSN'		44	06			
28 mars	H	22	22	03.1	60.3	145.3	15
	ePZ	22	30	07			
28 mars	H	23	46	22.0	57.5	151.1	33
	iPZ	23	54	51.5c			

Ondes de surface de 7 minutes

29 mars	H	01	09	36.4	59.8	149.2	20
	iPZ	01	17	54.2d			
29 mars	H	01	29	33.7	57.5	151.3	20
	iPZ	01	38	14.6c			
29 mars	H	02	14	02.4	59.5	149.1	20
	ePZ	02	22	30			

±1 sec

29 mars	H	02	25	25.1	57.0	151.7	20
	ePZ	02	34	00.4d			
29 mars	H	03	07	19.5	59.7	148.8	30
	ePZ	03	15	34.5c			
29 mars	H	03	38	38.1	60.7	149.1	40
	ePZ	03	46	51.1			
29 mars	H	04	12	15.7	60.2	145.5	15
	iPZ	04	20	20.0d			
29 mars	H	05	37	47.4	56.9	153.3	25
	iPZ	05	46	28.5d			
29 mars	H	06	04	44.5	56.1	154.3	30
	ePZ	06	13	31.1			
29 mars	H	07	18	08.0	57.0	151.8	25
	ePZ	07	26	43			
29 mars	H	07	52	46.4	56.1	154.2	25
	ePZ	08	01	34.5			
29 mars	H	10	08	02.4	60.0	149.6	20
	ePZ	10	16	17.2			
29 mars	H	10	49	40.3	58.2	150.4	25
	ePZ	10	58	07.1			
29 mars	H	10	49	40.3	58.2	150.4	25
	ePZ	10	58	11			
	PP		59	46			
29 mars	H	11	56	33	58.0	151.6	20
	iPZ	12	04	04.3d			
29 mars	H	12	03	03.8	10.9	143.2	20
	ePZ	12	10	58			
29 mars	H	12	33	10.1	59.2	153.8	20
	ePZ	12	41	46.7			
29 mars	H	14	24	15.7	57.5	152.4	25
	ePZ	14	32	50.3			
29 mars	H	15	07	13.1	54.3	157.0	20
	iPZ	15	16	16.7c			
	ipPZ			26.4			

29 mars	H	16	09	15.3	60.3	146.6	15
	iPZ	16	17	28.3			
	iPPZ		19	12			
29 mars	H	16	16	22.4	58.8	150.5	25
	ePZ	16	24	43.7			
29 mars	H	16	18	29.3	60.4	146.0	15
	ePZ	16	26	34			
29 mars	H	16	40	57.9	59.7	147.0	15
	iPZ	16	49	09.0d			
	iPPZ		50	54			
	eSN'		55	48			
29 mars	H	16	45	33.6	59.8	146.9	20
	ePZ	16	53	46.3			
29 mars	H	16	53	26.6	60.3	146.1	15
	ePZ	17	02	32.8d			
29 mars	H	17	53	02.2	59.9	146.1	15
	ePZ	18	01	09.4d			
29 mars	H	17	55	30.2	60.0	146.1	15
	ePZ	18	03	37.1			
29 mars	H	18	58	37.1	59.8	146.7	15
	ePZ	19	06	07			
29 mars	H	19	09	03.3	60.1	146.0	15
	ePZ	19	17	09.5			
29 mars	H	19	31	46.1	59.9	148.2	15
	ePZ	19	39	58			
29 mars	H	23	40	54.8	61.1	151.0	25
	iPZ	23	49	15.0c			
29 mars	H	23	49	28.6	59.9	147.1	20
	ePZ	23	57	47.5			
30 mars	H	00	53	55.8	60.0	146.3	15
	ePZ	01	02	05			
30 mars	H	01	32	09.5	59.8	146.6	15
	ePZ	01	40	18			
30 mars	H	02	18	06.3	56.6	152.4	25
	iPZ	02	26	46.0d			
	iPPZ		28	27			
	iSSN"		36	46			

30 mars	H	07	09	34.0	59.9	145.7	15
	ePZ	07	17	39.0			
	iPZ			39.8d			
	iPPZ		19	26.0			
	eSN"		24	08			
30 mars	H	07	56	29.1	56.3	154.4	20
	ePZ	08	05	15.6			
30 mars	H	09	57	32.5	60.9	145.1	15
	ePZ	10	05	33			
30 mars	H	11	35	18.8	61.5	147.9	25
	ePZ	11	43	27			
30 mars	H	11	48	40.4	56.4	152.5	20
	iPZ	11	57	20 c			
30 mars	H	12	05	43.5	60.1	147.0	25
	ePZ	12	13	52.5c			
30 mars	H	12	38	16.0	59.7	146.9	30
	iPZ	12	46	23.9d			
30 mars	H	13	32	18.5	56.4	152.6	15
	iPZ	13	40	01.7d			
30 mars	H	14	10	48.6	57.4	152.3	30
	iPZ	14	19	22.8c			
30 mars	H	15	07	49.3	58.7	149.6	25
	ePZ	15	16	10.5			
30 mars	H	16	09	28.4	56.6	152.1	25
	iPZ	16	18	05.2d			
	eSN"		25	05			
	eSSN"		28	07			
30 mars	H	16	53	07.7	56.6	146.5	15
	ePZ	17	01	56			
30 mars	H	17	22	06.2	60.7	145.5	15
	ePZ	17	30	07.5			
30 mars	H	22	21	25.2	60.3	146.9	15
	ePZ	22	29	34 d			
30 mars	H	23	03	34.5	57.3	152.7	20
	ePZ	23	12	11			
30 mars	H	23	51	46.0	59.6	147.4	33
	iPZ	23	59	55.8d			

31 mars	H	04	20	16.3	60.3	146.3	5
	ePZ	04	28	24.5			
31 mars	H	08	40	52.2	59.8	148.6	36
	iPZ	08	49	04.5			
31 mars	H	11	03	35.4	58.9	149.9	20
	ePZ	11	11	58.8			
31 mars	H	11	19	18	60.0	146.5	15
	iPZ	11	26	59.2c			
31 mars	H	11	53	14.4	56.5	152.3	20
	ePZ	12	01	18.0			
1 avril	H	00	01	10.6	60.4	146.4	10
	ePZ	00	09	18.0			
	iPPZ		11	03.5			
1 avril	H	03	05	49.9	60.1	146.1	15
	ePZ	03	14	07.0			
1 avril	H	03	23	17.2	57.2	151.3	25
	ePZ	03	32	07.0			
1 avril	H	05	33	02.9	59.9	146.0	15
	ePZ	05	41	09.8d			
1 avril	H	06	16	21	60.2	147.1	15
	iPZ	06	24	31.6d			
1 avril	H	11	01	25.5	60.4	146.5	10
	ePZ	11	09	34.0d			
1 avril	H	16	29	09.0	59.7	146.5	15
	ePZ	16	37	17			
2 avril	H	07	57	18	60.1	147.9	33
	ePZ	08	05	28.0d			
2 avril	H	09	04	51.9	57.9	151.1	33
	ePZ	09	13	20.5			
2 avril	H	09	57	54.5	56.5	152.8	20
	ePZ	10	05	35.3			
2 avril	H	11	41	10.7	58.8	149.6	20
	ePZ	11	49	31.7d			
	ePPZ		51	09.0			
2 avril	H	18	25	21.0	60.0	147.8	40
	ePZ	18	33	30.3			

2 avril	H	19	40	19.9	59.6	144.8	20
	ePZ	19	48	22			
2 avril	H	20	09	42.0	59.8	147.0	10
	iPZ	20	17	54.0c			
3 avril	H	00	37	38.5	58.2	148.9	33
	ePZ	00	46	03.0d			
3 avril	H	08	38	42.8	59.6	144.7	10
	ePZ	08	46	45.8c			
	eSN"		54	16			
	eSSN"		57	28			
3 avril	H	08	46	27	57.9	150.5	15
	ePZ	08	54	46			
3 avril	H	19	57	53.3	60.1	148.0	20
	ePZ	20	06	05.0c			
3 avril	H	22	33	42.2	61.6	147.6	40
	ePZ	22	41	46			
	ePPN"		43	43			
	iSE"		48	21			
	eSSE"		51	24			
4 avril	H	04	34	56.9	60.3	146.5	5
	iPZ	04	43	06.5d			
4 avril	H	04	54	01.7	60.1	146.7	40
	iPZ	05	02	07.0c			
	iPPZ		03	52.2			
4 avril	H	06	53	25.9	60.4	146.0	15
	ePZ	07	01	32			
4 avril	H	08	40	29.8	56.5	152.6	15
	ePZ	08	49	11.8			
	iSE"		56	11			
4 avril	H	09	10	55.1	56.9	152.7	15
	iPZ	09	19	35.0c			
4 avril	H	15	08	12.3	59.6	146.9	15
	eLE"	15	29				
4 avril	H	17	46	08.6	56.3	154.4	25
	ePZ	17	54	55			
	iSN"	18	02	00			
4 avril	H	17	59	43.3	56.4	154.5	25
	iPZ	18	08	31.9c			

4 avril	H	22	16	54.5	59.4	145.2	10
	ePZ	22	25	02			
	eSSN"		34	50			
5 avril	H	01	22	13.3	56.2	153.5	25
	ePZ	01	30	58			
	eSN"		38	00			
	eSSN"		40	48			
5 avril	H	01	41	45.0	56.2	153.3	35
	ePZ	01	50	27			
	iPZ			28.8d			
5 avril	H	02	36	10.8	60.1	145.8	15
	ePZ	02	44	16.5			
5 avril	H	17	42	07.4	59.6	144.9	15
	ePZ	17	50	39.7			
5 avril	H	19	28	18.1	60.2	146.7	15
	iPZ	19	36	26.7c			
	eSN"		43	11			
6 avril	H	08	21	25	57.4	152.3	5
	ePZ	08	30	03			
6 avril	H	10	42	36.3	59.9	145.6	15
	ePZ	10	50	40			
6 avril	H	17	35	50	59.9	147.8	15
	iPZ	17	44	03.8c			
7 avril	H	01	43	28.7	58.5	154.5	30
	ePZ	01	52	09			
7 avril	H	04	54	42	58.1	157.4	33
	ePZ	05	03	32			
	eZ		04	07.5			
7 avril	H	18	02	24.7	57.3	151.1	20
	ePZ	18	11	03			
7 avril	H	19	28	24.7	55.7	151.9	20
	ePZ	19	37	04.5d			
8 avril	H	18	58	50.5	56.9	149.9	35
	ePZ	19	07	21			
8 avril	H	19	33	19.0	59.6	147.0	15
	e(P)Z	19	41	26			

8 avril	H	19	50	16.8	60.4	145.9	10
	PZ	19	58	25			
9 avril	H	13	06	15.2	59.6	146.1	15
	ePZ	13	14	22			
10 avril	H	01	08	00.2	58.4	150.6	15
	iPZ	01	16	28.3c			
10 avril	H	19	05	52.6	59.7	148.2	15
	iPZ	19	14	07.7d			
	eSN"		20	43			
10 avril	H	21	44	06.7	60.1	153.7	10
	iPZ	21	52	42.0d			
	iZ			46.5			
	eSN"	22	00	43			
11 avril	H	09	23	51.5	56.4	152.2	33
	ePZ	09	32	28			
11 avril	H	11	36	00.5	60.4	146.4	15
	ePZ	11	44	07			
11 avril	H	22	02	38.2	60.2	146.9	20
	ePZ	22	10	41.5c			
11 avril	H	23	11	22.8	60.1	146.5	20
	ePZ	23	19	29.6d			
12 avril	H	01	24	31.2	56.6	152.2	22
	iPZ	01	33	09.0d			
	eSE"		40	00			
	iSSE"		43	00			
12 avril	H	09	34	44.1	56.6	152.1	20
	ePZ	09	43	21			
12 avril	H	12	31	23	56.4	151.4	30
	ePZ	12	44	59			
12 avril	H	12	48	02.2	56.6	151.3	33
	ePZ	12	56	34			
12 avril	H	14	35	29.2	61.2	151.1	28
	iPZ	14	44	00 d			
	ipPZ			09.5			
12 avril	H	17	22	02.2	62.5	145.6	20
	ePZ	17	30	05.0d			

13 avril	H	08	41	53.9	58.4	151.2	35
	ePZ	08	50	19			
13 avril	H	12	25	36	59.4	143.9	40
	ePZ	12	33	35			
	eSE"		41	12			
13 avril	H	14	05	00.0	57.6	151.2	25
	ePZ	14	13	30			
13 avril	H	16	14	06.3	56.6	152.1	33
	ePZ	16	22	42			
13 avril	H	21	25	33.0	57.5	153.7	30
	iPZ	21	34	13.0d			
13 avril	H	21	43	16.5	59.4	143.1	33
	ePZ	21	51	09			
14 avril	H	15	55	10.9	61.3	147.3	30
	ePZ	16	03	16			
14 avril	H	16	59	30.1	61.4	150.8	35
	iPZ	17	07	48 c			
14 avril	H	22	55	31.3	58.0	152.6	30
	iPZ	23	04	05.0d			
	eSN"		11	02			
	eSSN"		14	54			
15 avril	H	08	23	27.4	57.4	149.5	15
	ePZ	08	31	54			
15 avril	H	15	30	47.1	56.5	154.4	35
	ePZ	15	39	31 d			
	eSN"		46	35			
	eSSN"		49	23			
16 avril	H	03	19	34.8	57.2	151.4	10
	ePZ	03	28	09 d			
16 avril	H	19	26	57.4	56.4	152.9	30
	ePZ"	19	35	44			
	iSN"		42	40			
	iSSN"		45	30			
17 avril	H	04	03	55.9	59.6	147.7	20
	eN"	04	26.5				
17 avril	H	04	16	59.4	59.6	144.7	33
	eN"	04	39				

17 avril	H	04	49	30.5			
	eSN"	05	05	13			
	eSSN"		08	02			
17 avril	H	09	09	07.8	57.7	151.4	20
	eSN"	09	24	38			
17 avril	H	09	59	52.4	60.4	145.9	20
	eLZ"	10	19				
18 avril	H	00	13	24.4	59.6	144.8	33
	eLE"	00	37.5				
18 avril	H	01	32	18.4	56.4	152.8	33
	eLN"	02	00.0				
18 avril	H	03	06	43.5	56.7	148.8	33
	eLE"	03	31				
18 avril	H	07	47	03.3	57.4	149.3	30
	ePZ	07	55	28.5			
18 avril	H	20	08	19.7	56.1	153.7	15
	ePZ	20	17	05			
18 avril	H	20	16	16.3	56.1	153.7	30
	ePZ	20	25	02			
19 avril	H	18	51	10.9	60.2	148.6	33
	ePZ	18	59	25			
20 avril	H	03	34	45.1	59.7	144.6	30
	ePZ	03	42	44			
20 avril	H	11	56	41.6	61.4	147.3	30
	ePZ	12	04	47.5d			
	iPZ			48.5c			
	ipPZ'		05	01			
	isPZ'			19			
	ePPZ'		06	44			
	eSE"		11	20			
	eSSE"		14	42			
21 avril	H	15	40	28.0	61.5	147.3	30
	ePZ	15	48	33.0d			
20 avril	H	16	18	26.4	60.7	145.3	15
	ePZ	16	26	28			
21 avril	H	05	01	35.7	61.5	147.4	40
	iPZ	05	09	41.3d			
	iPPZ		11	25.8			
	eSN		16	14			

22 avril	H	20	29	20.3	58.6	150.0	33
	eLE	20	54				
23 avril	H	14	56	30.9	57.3	151.9	25
	eLN''	15	18				
24 avril	H	03	51	05.0	59.5	144.5	33
	ePZ	03	59	05			
25 avril	H	09	43	30.7	59.9	144.9	30
	iPZ	09	51	31.0d			
25 avril	H	16	10	01.3	59.9	146.1	33
	ePZ	16	18	04			
28 avril	H	12	21	25.6	59.0	138.7	33
	ePZ	12	29	07			
28 avril	H	13	34	10.4	57.6	150.0	33
	eLN''	13	56				
28 avril	H	22	56	18.8	56.7	152.0	33
	eLN''	23	22.5				
30 avril	H	03	49	57.6	58.0	137.0	20
	eLN''	04	08				
30 avril	H	04	01	26.1	41.7	127.0	33
	eLN''	04	21				
30 avril	H	17	26	30	60.1	142.2	33
	ePZ	17	34	29			
30 avril	H	23	51	28	58.0	150.9	33
	eLZ''	00	41.5				

M. Buist, S.J.

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SOMMAIRE

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IONOSPHERIC CAVITY RESONANCES

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Sommaire. - Grâce à une décomposition des champs solénoïdaux qui interviennent dans la théorie de la dynamo, les équations vectorielles des ondes électro-magnétiques sont transformées en équations scalaires pour les modes poloïdaux et toroïdaux. Pour les parois parfaitement conductrices d'une cavité, les conditions aux limites sont particulièrement simples. Une seule approximation basée sur le fait que l'épaisseur de la cavité est petite comparée au rayon de la terre est introduite dans le but de simplifier la dérivation des deux modes de basse et de haute fréquences. On trouve que les modes magnétiques toroïdaux possèdent des solutions à la fois de haute fréquence (dans la région des sifflements) et de basse fréquence (résonance de Schumann); tandis que, pour les modes magnétiques poloïdaux, seules les solutions de haute fréquence sont possibles.

Abstract. - Employing a decomposition of solenoidal fields useful in dynamo theory, the electromagnetic vector wave equations are transformed into scalar wave equations for the poloidal and toroidal modes. For perfectly conducting cavity walls the boundary conditions are particularly simple. A single approximation based on the fact that the cavity thickness is small compared to the radius of the earth is made to simplify the derivation of both the low and high frequency modes. It is found that the magnetic toroidal modes have both high frequency (in the whistler range) and low frequency (Schumann resonance) solutions; while for magnetic poloidal modes only high frequency solutions are possible.

1. INTRODUCTION

When the earth and the ionosphere are considered as a resonating cavity, two distinct sets of eigenmodes are possible. The low frequency modes (Schumann, 1952, 1957) are of the order of 10 c/s while the high frequency modes (Schumann, 1954) are of the order of Kc/s. In this paper a method of reducing the vector equations to scalar equations, due to G. Backus (1958) in considering the problem of self-sustaining core dynamos, is used to calculate the cavity resonances. The scalar fields, called Debye potentials, used by Wait (1963) in studying the fields excited by an electric dipole in the earth-ionosphere cavity, are analogous to the poloidal and toroidal fields of dynamo theory. When use is made of the fact that the earth-ionosphere cavity thickness is small compared to the radius of the earth, the radial field equation reduces to that of a simple harmonic oscillator and the solution for both sets of eigenmodes is readily obtained.

2. BASIC EQUATIONS

Maxwell's wave equations in vacuum for the magnetic field $\overline{B}$ and electric field $\overline{E}$ have the form

$$\nabla \times (\nabla \times \overline{B}) = k^2\overline{B},\ \nabla\cdot\overline{B} = 0 \tag{1}$$

$$\nabla \times (\nabla \times \overline{E}) = k^2\overline{E},\ \nabla\cdot\overline{E} = 0 \tag{2}$$

where the fields are assumed to oscillate as $e^{j\omega t}$, and $k = \frac{\omega}{c}$ is the wave number. Since both $\overline{E}$ and $\overline{B}$ are solenoidal they may be represented by two scalar functions (Backus, 1958)

$$\overline{B} = \nabla \times \overline{L}P + \overline{L}T \tag{3}$$

$$\overline{E} = \nabla \times \overline{L}P' + \overline{L}T' \tag{4}$$

where P and P' are defined as the poloidal fields and T and T' are the toroidal fields. The operator $\overline{L}$ (proportional to the angular momentum operator) is defined as

$$\overline{L} = \overline{r} \times \nabla \tag{5}$$

where $\overline{r}$ is the radius vector. Using these definitions of the fields in the wave equations and employing the operator identity

$$\nabla \times (\nabla \times \overline{L}) = -\overline{L}\nabla^2 = -\nabla^2\overline{L} \tag{6}$$

results in the scalar wave equation

$$\nabla^2 H + k^2 H = 0 \tag{7}$$

where H is any of the functions P, T, P', T'. The electric and magnetic fields are related by the Maxwell equation

$$\nabla \times \overline{B} = jk\overline{E} \tag{8}$$

Using the representation of (3) and (4) with the identity (6) and the result (7) for the poloidal magnetic field, the above relation becomes

$$P' = -jT/k \tag{9}$$

$$P = jT'/k \tag{10}$$

Thus the poloidal (toroidal) magnetic field is proportional to the toroidal (poloidal) electric field.

In a spherical coordinate system (r, θ, ϕ) the electric and magnetic fields of (3) and (4) become

$$\overline{B} = \left[\hat{r}\frac{L^2}{r} - \frac{1}{r}\frac{\partial}{\partial r}r\left(\hat{\theta}\frac{\partial}{\partial\theta} + \frac{\hat{\phi}}{\sin\theta}\frac{\partial}{\partial\phi}\right)\right]P(r,\theta,\phi) + \left(\hat{\phi}\frac{\partial}{\partial\theta} - \frac{\hat{\theta}}{\sin\theta}\frac{\partial}{\partial\phi}\right)T(r,\theta,\phi) \tag{11}$$

$$\overline{E} = -\frac{j}{k}\left[\hat{r}\frac{L^2}{r} - \frac{1}{r}\frac{\partial}{\partial r}r\left(\hat{\theta}\frac{\partial}{\partial\theta} + \frac{\hat{\phi}}{\sin\theta}\frac{\partial}{\partial\phi}\right)\right]T(r,\theta,\phi) - jk\left(\hat{\phi}\frac{\partial}{\partial\theta} - \frac{\hat{\theta}}{\sin\theta}\frac{\partial}{\partial\phi}\right)P(r,\theta,\phi) \tag{12}$$

where $\hat{r}$, $\hat{\theta}$, $\hat{\phi}$ are unit vectors. The fields in the wave equation (7) may be expanded in spherical harmonics $Y_\ell^m(\theta, \phi)$ as

$$H(r,\theta,\phi) = H(r)Y_\ell^m(\theta,\phi) \tag{13}$$

Noting that the Laplacian in spherical coordinates is

$$\nabla^2 = \frac{1}{r}\frac{\partial^2}{\partial r^2} r + \frac{L^2}{r^2} \tag{14}$$

where

$$L^2 Y_\ell^m = -\ell(\ell+1)Y_\ell^m \tag{15}$$

the equation for the radial functions H(r) becomes

$$\frac{1}{r}\frac{d^2}{dr^2} rH(r) + \left[k^2 - \frac{\ell(\ell+1)}{r^2}\right]H(r) = 0 \tag{16}$$

The exact solutions of the above equation are the spherical Bessel and Neumann functions $j_\ell(kr)$ and $n_\ell(kr)$, where

$$j_\ell(kr),\ n_\ell(kr) = \sqrt{\frac{\pi}{2kr}}[J_{\ell+1/2}\ (kr),\ N_{\ell+1/2}\ (kr)]$$

and $J_{\ell+1/2}$ and $N_{\ell+1/2}$ are the cylindrical Bessel and Neumann functions of order $\ell + 1/2$, respectively. The use of these functions will be reserved for Section 6 where the exact result for the earth-ionosphere cavity will be compared with the approximate solution. If in (16) the substitutions $z = kr$ and $H(r) = \frac{f(r)}{r}$, are made, the form of the radial equation that will be used in the following analysis is obtained as

$$\frac{d^2}{dz^2} f(z) + \left[1 - \frac{\ell(\ell+1)}{z^2}\right]f(z) = 0 \tag{17}$$

3. BOUNDARY CONDITIONS

Perfect conductor. For a perfect conductor, the transverse component of $\overline{E}$ and the normal component of $\overline{B}$ must be zero at the boundary. For the ideal earth-ionosphere case

of two concentric spherical conductors of radii a and b, (b > a), these conditions become for the magnetic toroidal field

$$\frac{\partial}{\partial r} rT = 0, \quad \text{at} \quad r = a \quad \text{and} \quad r = b \tag{18}$$

or in the notation of (17),

$$\frac{\partial}{\partial z} f(z) = 0, \quad \text{at} \quad z = ka \quad \text{and} \quad z = kb \tag{19}$$

For the magnetic poloidal field

$$P = 0, \quad \text{at} \quad r = a \quad \text{and} \quad r = b \tag{20}$$

or in the same dimensionless notation

$$f(z) = 0, \quad \text{at} \quad z = ka \quad \text{and} \quad z = kb \tag{21}$$

Boundaries of finite conductivity. Although the case in which the cavity is bounded by stationary regions of isotropic conductivity σ will not be treated in detail in this paper, the equations and boundary conditions governing the poloidal and toroidal fields will nevertheless be given. In conducting regions the equation describing the fields becomes

$$\nabla^2 H + j\alpha^2 H = 0 \tag{22}$$

where α is the reciprocal of the skin depth,

$$\alpha^2 = \frac{4\pi\sigma\omega}{c^2}$$

and, in Maxwell's curl $\overline{B}$ equation, the radiation term $\frac{1}{c}\frac{\partial \overline{E}}{\partial t}$ has been neglected in favor of the conduction current $\overline{J} = \sigma\,\overline{E}$. The continuity of $\overline{E}$ and $\overline{B}$ imply that at the spherical boundaries

$$P^- = P^+ \tag{23}$$

$$\frac{\partial}{\partial r} rP^- = \frac{\partial}{\partial r} rP^+ \tag{24}$$

$$T^- = T^+ \tag{25}$$

$$\frac{\partial}{\partial r} rT^- = j\left(\frac{k}{\alpha}\right)^2 \frac{\partial}{\partial r} rT^+ \tag{26}$$

at r = a and r = b, where the minus sign refers to the vacuum region and the plus sign refers to the conducting region.

4. EIGENMODES

For the case of the earth-ionosphere cavity the solution of the radial equation (17) is particularly simple since the dimension of the cavity is small compared to the radius of the earth, i.e.

$$\frac{b - a}{a} \approx 10^{-2}$$

Therefore in (17) z^2 may be approximated by

$$z^2 \approx z_0^2 = k^2a^2 \tag{27}$$

with an anticipated error no worse than one part in a hundred. The effect of this approxiamtion will be treated in Section 6, where the exact solutions are considered. When this approximation is made, (17) becomes a simple harmonic oscillator equation whose solution is

$$f(z) = C_1e^{s_1 z} + C_2e^{s_2 z} \tag{28}$$

where C_1 and C_2 are constants and

$$s_{1,2} = \pm j\left[1 - \frac{\ell(\ell + 1)}{z_0^2}\right]^{1/2} \tag{29}$$

For the toroidal modes the derivative of f must vanish at the boundaries (19). Hence, the eigenfrequencies will be determined by

$$e^{2j\left[1 - \frac{\ell(\ell + 1)}{z_0^2}\right]^{1/2}(b - a)k} = 1 \tag{30}$$

This relation has both a high and low frequency solution. The low frequency solution will be

$$k^2a^2 = \ell(\ell + 1),\ T(r,\theta,\phi) = \frac{C}{kr}Y_\ell^m(\theta,\phi) \tag{31}$$

and the high frequency solution will be

$$k(b - a) = n\pi\left[1 + \frac{\ell(\ell + 1)}{(n\pi)^2}\left(\frac{b - a}{a}\right)^2\right]^{1/2}$$

$$T(r,\theta,\phi) = \frac{C \cos k(r - a)}{kr} Y_\ell^m(\theta,\phi) \tag{32}$$

where C is a constant. Except for large ℓ values, the ℓ dependent term in the eigenfrequency is negligible since

$$\left(\frac{b - a}{a}\right)^2 \approx 10^{-4}$$

Hence the high frequency modes will be determined by $k(b - a) = n\pi$, where n is an integer. For the poloidal fields, f(z) itself must vanish at the boundaries (21). The same dispersion relation (30) will be obtained. However, the low frequency modes will have zero amplitude since for these frequencies f(z) must be linear in z. Hence, the magnetic poloidal fields have only the high frequency solutions

$$k(b - a) = n\pi,\ P(r,\theta,\phi) = \frac{C \sin k(r - a)}{kr} Y_\ell^m(\theta,\phi) \tag{33}$$

where C is a constant.

5. DISCUSSION OF RESULTS

The magnetic and electric fields corresponding to the poloidal and toroidal scalar functions of Section 4 are derived from the definitions (11), (12), and the solutions (31), (32) and (33). For the low frequency toroidal fields there results

$$\overline{B} = \frac{B_0}{kr}\left(\hat{\phi}\,\frac{\partial}{\partial\theta} - \frac{\hat{\theta}}{\sin\theta}\,\frac{\partial}{\partial\phi}\right) Y_\ell^m(\theta,\phi) \tag{34}$$

$$\overline{E} = \frac{j\ell(\ell+1)B_0}{(kr)^2}\, Y_\ell^m(\theta,\phi)\hat{r} \tag{35}$$

while the high frequency toroidal fields are

$$\overline{B} = \frac{B_1 \cos k(r-a)}{kr}\left(\hat{\phi}\,\frac{\partial}{\partial\theta} - \frac{\hat{\theta}}{\sin\theta}\,\frac{\partial}{\partial\phi}\right) Y_\ell^m(\theta,\phi) \tag{36}$$

$$\overline{E} = \frac{j\ell(\ell+1)B_1 \cos k(r-a)}{(kr)^2}\, Y_\ell^m(\theta,\phi)\hat{r} - \frac{j\,B_1 \sin k(r-a)}{(kr)}\left(\hat{\theta}\,\frac{\partial}{\partial\theta} + \frac{\hat{\phi}}{\sin\theta}\,\frac{\partial}{\partial\phi}\right) Y_\ell^m(\theta,\phi) \tag{37}$$

The high frequency poloidal fields are found to be

$$\overline{B} = \frac{\ell(\ell+1)\,B_2 \sin k(r-a)}{(kr)^2}\, Y_\ell^m(\theta,\phi)\hat{r} + \frac{B_2 \cos k(r-a)}{(kr)}\left(\hat{\theta}\,\frac{\partial}{\partial\theta} + \frac{\hat{\phi}}{\sin\theta}\,\frac{\partial}{\partial\phi}\right) Y_\ell^m(\theta,\phi) \tag{38}$$

$$\overline{E} = j\,\frac{B_2 \sin k(r-a)}{(kr)}\left(\hat{\phi}\,\frac{\partial}{\partial\theta} - \frac{\hat{\theta}}{\sin\theta}\,\frac{\partial}{\partial\phi}\right) Y_\ell^m(\theta,\phi) \tag{39}$$

B_0, B_1, B_2 are the constant amplitudes of the magnetic field for a particular mode. It is clear that for the poloidal modes only the magnetic field can be observed at the surface of the earth since the poloidal electric fields, being totally transverse, vanish. However, the toroidal modes will always have non-vanishing radial electric fields as well as transverse magnetic fields.

The eigenfrequencies are obtained from (31) and (32). Taking the radius of the earth to be 6.4×10^8 cm, the first four low frequency modes are approximately 10.5, 18.3, 25.9, 33.5 c/s. For an earth-ionosphere thickness of 100 km the first three high frequency modes will be 1.5, 3.0 and 4.5 Kc/s, while for a thickness of 60 km they will increase to 2.5, 5.0 and 7.5 Kc/s. Only approximate agreement with observation can be expected for the simple, perfectly conducting case considered. The earth is hardly an isotropic perfect conductor and the ionosphere has the further complication of being a magnetized plasma whose propagation characteristics are changing in both the low and high frequency ranges. For example, as the frequency increases above about 25 c/s the ion cyclotron resonance of the left-hand polarized plasma wave is encountered or there is a transition from region 12 to 10 according to the Allis' classification of plasma waves (Allis, 1963). While for frequencies above about 15 Kc/s the cut-off for both the left-polarized and extraordinary plasma waves is met or, again in Allis' notation, there is a transition from region 8 to 6. Furthermore, the effects of collisions in the plasma and curvature of the earth's magnetic field lines still have been neglected.

The observations for the low eigenfrequencies indicate that the first four modes have the values 8, 14.1, 20.3, 26.4 c/s (Balser and Wagner, 1960). The theoretical result (31) would approximate these frequencies if the radius of the earth were increased by a factor of about 1.3, namely to 8.3×10^8 cm. Simple consideration of the wave equation (22) with the boundary conditions (25) and (26) indicates that the first order effect of finite skin depth will be to multiply the radius of the earth in (31) by a factor which is greater than unity by an amount depending on the ratio of the skin depth to the ionospheric thickness.

Although a wide and melodious variety of phenomena are observed in the kilocycle range, such as whistlers, sferics, tweeks, dawn chorus, and hiss, the author is unaware of any specific experimental identification of the high frequency earth-ionosphere cavity resonances.

6. COMPARISON WITH EXACT SOLUTIONS

In this section the approximate eigenfrequencies will be compared with the lowest order exact solutions, i.e. for $\ell = 1$. As mentioned following (16), the exact solution of the radial equation (16) has the form

$$H(r) = C_1 j_\ell(kr) + C_2 n_\ell(kr) \tag{40}$$

where C_1 and C_2 are constants. When the toroidal boundary condition (18) is applied at $r = a$ and $r = b$, the dispersion relation for $\ell = 1$ becomes

$$\tan k(b-a) = \frac{k(b-a)(1+abk^2)}{(1-a^2k^2)(1-b^2k^2)+abk^2} \tag{41}$$

For the low frequency modes, k (b - a) is small and tan k (b-a) $\approx$ k (b-a). In place of the approximate frequency (31), $k^2a^2 = 2$, there results

$$k^2a^2 \approx 2\left[1 - \frac{(b-a)}{a}\right] \tag{42}$$

Hence for low frequencies the approximation is correct to order $\frac{b-a}{a} \approx 10^{-2}$. For the high frequency toroidal modes the substitution $k(b-a) = n\pi + \beta$ is made in (41), where β is considered small. The result for β is that

$$\beta \approx \frac{1}{n\pi}\left(\frac{b-a}{a}\right)^2 \tag{43}$$

Hence, for high frequencies the approximation is correct to order $\beta \approx \left(\frac{b-a}{a}\right)^2 \approx 10^{-4}$. When the poloidal boundary condition (20) is applied at $r = a$ and $r = b$, the dispersion relation for $\ell = 1$ becomes

$$\tan k(b-a) = \frac{k(b-a)}{1+abk^2} \tag{44}$$

For the low frequency modes there is no solution since, when k (b-a) is small, the right side of (44) is less than k (b-a) while the left side is greater than k (b-a). For the high frequency poloidal modes the same first order correction as in (43) results. Hence, the approximation made in Section 4 that $r^2 \approx a^2$ is valid for both the high and low frequency modes of the toroidal and poloidal fields.

7. CONCLUSIONS

A representation of solenoidal fields useful in dynamo theory has been found applicable to the problem of earth-ionosphere cavity resonances. Using only the physical approximation that the earth-ionosphere cavity thickness is small compared to the radius of the earth, the low and high frequency eigenmodes for the poloidal and toroidal fields have been obtained. This approximation is found to be valid when its results are compared to the lowest order exact solutions.

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ATMOSPHERIC ELECTRIC POTENTIAL AND AIR-EARTH CURRENT DENSITY

(July - December 1964)

Hourly averages of the electric potential and of the air-earth current density, as recorded at Brebeuf College during the last six months of 1964, are presented in the following tables. Another set of tables gives the daily weather summary for the period concerned, as issued by Dorval Airport Weather Station. Information about the recording site, the instrumentation and data presentation, can be found in the previous issue (No. 16) of this Bulletin.

For this second half of the year, just a slight modification has been brought in the recording and presentation of the data. Due to relatively high values of air-earth current density, which were recorded mainly in October and November, various sensitivity levels were used in the recording, which led to maximum scale values higher than the usual 150 X 10^{-13} amperes per square meter. However, all values superior to that amount, even though they could be evaluated, were considered as "disturbed" values and were not therefore used in the calculation of the "fine weather" means which appear in the last column and row of each table.

The grant of the National Research Council of Canada, which permitted the purchase of the air-earth current recording equipment, is gratefully acknowledged.

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-7 JULY 1964

Time LST Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	700	800	700	750	650	600	600	750	1050	1150	950	700	650	550	300	500	400	400	300	300	500	600	500	500	24	620
2	600	550	650	900	850	750	1000	1350	1600	2250	1250	1000	450	50	1200	1850	1700	850	150	300	500	500	400	400	24	880
3	500	D	50	-50	0	150	550	750	850	750	700	450	600	650	700	600	D	D	D	950	350*	D	D	800	17	550
4	850	950	550	450	800	750	600	300	250	700	650	500	600	D	D	450	600	500	450	500	650	600	550	550	22	580
5	500	500	600	450	450	350	100	150	-100	150	250	D	D	700	600	D	D	100	800	950	750	400	350	200	19	440
6	350	300	150	D	D	D	D	D	-1250	D	100*	800	1150	D	D	700	300	500	400	600	1050	1350	1300	1200	15	680
7	1150	900	250	850	1050	350	1050	1500	1400	1350	1200	1250	D	D	D	D	D	D	1400	1450	1100	1400	950	1050	18	1090
8	1300	1350	1700	700	1700	D	D	D	2000	2250	1300	1050	1250	1050	500	650	1300	950	500	550	900	800	950	950	21	1130
9	900	700	650	800	1050	1850	2350*	1850*	1300	1550	750	300	150	-50	150	100	-50	0	200	800	900	650	450	950	22	840
10	1000	550	650	800	1050	950	900	1850	2050	1900	1350	950	600	150	D	D	D	650	650	700	750	700	750	700	21	940
11	500	450	600	650	900	750	900	800	650	750	1200	950	750	500	300	350	300	200	250	D	D	D	300	500	21	600
12	D	500	550	650	700	700	500	450	500	600	650	550	450	400	500	400	400	400	450	450	450	450	400	400	23	500
13	400	550	650	650	650	650	850	950	900	900	1050	850	850	1000	D	D	D	650	250	250	250	200	150	150	21	610
14	200	350	500	350	850	850	1150	950	900	1300	550	850	650	700	700	550	500	550	550	700	750	750	550	250	24	670
15	300	400	150	D	D	600	900	1050	900	950	900	950	750	650	450	350	450	800	800	900	850	600	550	500	22	670
16	400	400	250	300	250	350	450	600	450	450	650	650	650	600	450	250	350	500	500	550	600	600	600	600	24	480
17	500	450	500	500	450	450	750	650	750	800	950	750	850	800	700	750	800	800	700	750	650	450	500	650	24	660
18	600	650	650	600	350	550	200	850	950	1000	950	900	850	950	650	600	750	850	800	600	500	D	D	650	22	700
19	500	450	500	350	350	600	700	550	950	600	50	200	950	1000	950	950	900	850	750	800	900	950	950	1150	24	700
20	1200	1550	1650	1650	1450	1550	1750	2100	1750	1450	1450	1000	1050	1300	1250	1250	1200	950	950	800	1000	1050	950	800	24	1300
21	650	300	200	750	750	850	950	850	1000	900	650	650	650	750	300	700	1000	1250	750	650	D	D	D	D	20	730
22	D	D	D	800	750	450	1150	1250	1000	1100	1000	800	900	D	D	D	1050	900	900	1050	550	850	900	300	18	870
23	600	650	650	400	550	650	950	1000	1000	1250	1250	750	1100	900	1200	1050	1550	1300	1000	1050	1300	500	450	500	24	900
24	250	300	300	400	250	600	950	1000	1100	1350	1550	950	1200	1200	1150	950	950	900	750	800	750	600	550	550	24	810
25	600	600	500	400	150	150	300	650	650	550	500	500	650	700	750	750	750	650	600	700	650	500	400	300	24	540
26	300	250	300	250	200	300	400	250	250	450	300	200	600	700	450	350	600	600	350	500	650	550	400	450	24	400
27	450	400	200	250	200	200	650	850	750	500	500	400	D	150	350	450	450	350	250	D	D	250	300	200	21	390
28	250	300	150	150	250	300	350	400	350	400	350	300	400	450	550	400	450	650	600	650	500	450	350	300	24	390
29	250	250	350	450	500	500	500	450	D	D	D	1350	D	D	550	850	900	950	1000	1000	1000	1000	700	650	19	690
30	600	550	550	550	650	750	900	850	700	650	550	600	600	700	650	D	D	800	850	1100	1150	1400	1400	1300	22	810
31	1200	1050	1000	1000	950	1050	1350	1250	1000	800	650	350	350	450	350	450	350	500	650	850	950	900	1000	950	24	810
No. of Hours	29	29	30	28	29	29	29	29	28	29	30	30	27	25	25	25	24	29	30	29	28	27	28	30	676	
Mean	610	590	540	600	650	640	820	910	960	960	810	720	720	680	630	650	750	670	620	730	750	710	630	610		705

D: disturbed M: missing *: estimated ?: unknown

16

VERTICAL AIR-TO-EARTH CURRENT DENSITY (10^{-13} A/m^2)

I-7 JULY 1964

Time LST Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	46	60	76	76	68	66	44	50	72	70	60	44	44	30	18	42	30	26	18	20	30	32	28	40	24	45
2	44	46	48	54	48	38	46	D	D	D	56	22	22	D	76	D	72	M	M	M	M	M	M	M	12	48
3	M	M	M	M	M	M	M	M	M	66	62	40	48	50	62	62	D	D	D	D	D	D	D	D	7	56
4	D	D	116	106	D	140*	120*	D	>150	>150	78	62	60	D	D	58	60	52	56	66	68	74	86	118	16	82
5	140*	134	124	114	96	66	D	114*	D	>150	114*	D	D	102	D	D	D	D	D	106	134	112	76	56	14	106
6	126	140*	>150	D	D	D	D	D	D	D	D	100	86	D	D	56	22	36	30	46	78	90	98	100	13	78
7	D	98	104*	>150	>150	>150	>150	D	64	D	70	88	D	D	D	D	D	D	124	D	D	D	D	D	6	86
8	>150	>150	>150	>150	>150	D	D	>150	>150	D	50	50	50	36	30	36	60	60	22	40	48	40	60	72	14	47
9	96	86	M	M	150	D	D	62	62	66	24	10	16	8	16	12	0	2	20	42	44	30	26	52	19	35
10	56	84	M	>150	D	90	60	70	66	62	50	40	40	22	D	D	>150	D	38	D	D	34	42	46	15	53
11	58	54	64	80	88	74	82	76	60	D	76	46	38	26	22	36	36	38	26	D	D	>150	D	D	18	54
12	D	22	44	26	-10	-34	16	32	38	34	42	38	28	36	30	32	34	32	28	D	D	36	24	28	19	32
13	28	40	40	46	40	40	44	46	48	50	70	66	72	78	D	D	D	68	50	26	24	18	20	44	21	46
14	24	28	44	28	66	62	72	88	74	96	46	70	66	76	M	64	56	62	58	50	46	44	48	28	23	56
15	40	42	D	>150	D	D	64	66	52	58	58	60	56	60	40	36	56	50	58	62	72	88	D	M	18	57
16	>150	>150	>150	>150	>150	>150	>150	106	62	46	56	50	54	52	42	34	34	36	40	36	40	46	56	58	17	50
17	46	46	52	56	58	52	62	48	56	58	62	56	60	56	52	62	58	52	56	52	38	36	38	42	24	52
18	42	44	40	42	44	50	50	62	58	66	100*	100	D	D	D	150	D	112	74	64	72	D	D	78	17	65
19	56	58	48	46	32	28	36	32	22	40	24	D	D	42	52	42	48	60	82	76	76	62	76	82	22	51
20	72	70	72	72	76	80	72	76	70	60	56	38	50	62	60	78	68	56	54	48	56	64	50	54	24	63
21	58	72	68	70	66	58	52	66	56	44	50	52	60	20	46	74	76	50	44	D	D	D	D	D	19	57
22	D	D	D	>150	D	D	80	90	62	54	68	64	76	D	D	D	34	46	56	56	16	46	40	20	15	54
23	44	40	38	34	40	36	42	40	48	54	46	34	48	46	62	48	92	76	78	64	64	66	44	30	24	51
24	24	38	42	38	28	36	44	38	34	54	68	44	62	60	64	52	76	82	70	66	58	48	40	40	24	50
25	38	38	40	44	40	38	50	50	54	40	36	32	40	42	50	50	54	46	40	42	28	-10	-30	-34	21	42
26	M	M	M	M	M	M	M	M	M	M	M	30	D	D	D	64	42	66	64	32	38	36	38	40	50	11	45
27	58	54	44	52	66	56	58	62	56	44	38	42	M	M	M	48	44	40	46	D	D	44	30	18	19	47
28	22	34	36	38	38	32	34	32	30	38	42	38	44	50	68	92	120	98	60	56	50	44	40	36	24	49
29	38	40	44	52	52	44	60	66	D	D	D	D	D	D	D	94	100	100	78	88	88	62	64	78	17	68
30	76	82	76	80	84	74	80	70	56	68	60	52	54	76	74	D	D	68	68	76	66	84	80	90	22	72
31	110	100	92	108	100	94	100	88	82	68	54	32	34	38	34	38	30	46	M	M	M	M	M	M	18	69
No. of hours	23	25	22	21	19	21	23	24	23	22	29	27	24	22	20	23	24	26	27	22	22	23	22	23	557	
Mean	58	62	61	60	59	60	59	64	56	56	57	51	50	49	48	52	55	56	52	55	56	54	50	55		56

D: disturbed M: missing *: estimated ?: unknown

17

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-8 — AUGUST 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	1000	950	700	900	1150	1300	1700	1350	1250	1150	850	800	600	700	650	700	650	550	500	500	450	500	-300	800	23	860
2	250	-150	-250	-350	0	50	D	D	200	200	550	700	300	250	500	550	650	600	500	700	1000	850	500	750	19	480
3	900	800	900	950	1100	1450	1750	1750	1600	1350	1150	750	950	1100	950	900	1000	900	1050	1100	1150	1000	850	950	24	1100
4	750	750	900	1100	1450	1800	2100	1800	1450	800	500	400	300	650	850	750	700	950	1000	750	600	450	400	250	24	890
5	100	250	300	D	D	450	300	50	-450	-550	-700	-500	-250	-300	-100	500	200	200	50	50	150	450	650	700	15	290
6	850	950	950	800	850	1050	1450	1350	950	950	700	550	450	450	400	400	350	450	500	600	850	900	750	800	24	760
7	750	900	950	850	1050	750	1050	1250	1150	950	950	700	500	500	450	600	450	650	500	550	500	450	300	350	24	710
8	D	D	D	550	300	350	700	500	650	750	M	M	350	D	D	D	D	700	650	700	700	650	500	500	15	570
9	600	650	500	500	550	600	600	500	350	650	700	450	200	300	400	500	600	550	650	850	1000	1000	900	900	24	600
10	850	1000	900	550	650	550	900	850	850	550	650	450	150	250	150	300	300	50	250	500	700	900	650	650	24	570
11	600	850	1000	950	800	900	1200	1150	900	850	850	600	400	550	650	500	450	300	300	350	400	300	300	250	24	640
12	200	50	0	100	D	D	D	D	D	D	550	1000	900	700	550	600	650	750	650	600	900	800	700	650	18	570
13	550	500	650	650	650	750	1000	1050	1050	800	500	300	500	450	650	750	750	750	700	700	1000	900	900	800	24	720
14	750	800	950	800	900	1300	1100	1250	1250	1100	800	400	D	D	D	750	850	900	900	900	350	100	250	M	20	820
15	M	M	M	M	M	M	M	M	M	M	D	D	D	1050	D	D	900	750	850	800	450	550	550	750	9	740
16	800	700	800	650	550	550	800	650	800	800	650	500	450	450	350	350	400	300	400	500	500	450	400	350	24	550
17	700	250	250	250	300	300	200	550	350	300	300	D	500*	600	D	D	D	750	850	750	D	D	450	400	18	430
18	500	500	550	600	650	950	1100	1300	1250	1050	750	550	600	650	650	850	750	850	750	800	900	850	900	950	24	800
19	800	650	600	600	700	900	1100	1200	1250	1200	850	600	650	650	650	D	750	-150*	1100	950	900	900	900	1000	22	860
20	1050	1000	1200	1250	1050	1100	1300	1200	900	1000	750	D	D	-750	700	D	D	650	600	650	800	800	850	950	19	900
21	500	350	400	500	600	750	850	750	1100	1050	850	550	500	500	500	650	550	500	500	650	700	850	950	800	24	660
22	600	650	600	450	250	400	250	300	450	650	M	800	1500	400	150	400	650	550	550	400	350	500	-100	-100	21	520
23	M	M	M	M	M	M	M	M	M	M	M	350	500	700	600	650	200	M	M	M	M	M	M	200	7	460
24	200	200	250	300	350	300	450	~~100~~	550	650	550	500	500	400	400	350	400	500	650	950	1000	950	900	900	24	540
25	850	850	500	750	750	950	1300	1250	1100	1000	650	650	600	650	700	850	1000	800	500	150	D	D	M	M	20	790
26	M	M	M	M	M	M	M	M	650	1350	850	900	800	700	650	450	500	500	550	800	700	850	550	450	16	700
27	300	200	250	250	150	500	1750	2150	1400	1550	1300	950	850	600	700	650	500	450	350	850	750	700	650	700	24	770
28	600	600	650	750	650	500	600	1350	1250	1050	1000	950	900	850	650	800	550	500	450	450	450	450	400	300	24	700
29	350	400	400	400	400	350	400	450	500	400	200	M	M	M	M	M	M	M	M	M	M	M	M	M	11	390
30	M	M	M	M	M	M	200	500	850	900	900	950	1050	1000	1000	1000	550	650	500	650	600	550	500	250	18	700
31	100	100	-50	-50	50	50	50	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	5	350
No. of Hours	26	25	24	24	25	26	26	25	26	26	25	25	25	25	23	25	26	26	28	28	26	26	25	26	612	
Mean	580	600	630	640	640	730	930	1010	920	890	730	640	600	600	570	620	590	600	600	650	680	680	630	630		685

D: disturbed M: missing *: estimated ?: unknown

18

VERTICAL AIR-TO-EARTH CURRENT DENSITY (10^{-13} A/m^2)

I-8 — AUGUST 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	M	M	M	M	M	M	M	M	M	96	84	80	66	60	60	74	78	78	64	54	26	30	D	D	13	65
2	26	-8	-20	-34	0	14	D	M	D	40	40	32	14	12	24	26	30	26	34	40	56	50	40	50	18	31
3	54	50	64	60	58	60	64	80	96	88	72	50	64	70	64	66	70	70	76	70	62	62	56	60	24	66
4	48	56	64	74	106	98	D	98	92	56	38	30	24	66	74	60	60	64	52	44	38	32	36	24	23	58
5	D	28	26	D	D	D	10	D	D	D	D	D	-36	D	-26	34	20	8	4	22	18	42	60	68	12	28
6	80	78	90	74	76	68	68	60	56	52	48	44	38	40	34	32	32	38	36	40	50	50	60	74	24	55
7	80	82	92	78	76	D	D	68	60	64	64	64	58	56	48	56	42	56	40	40	36	36	32	26	22	57
8	D	D	D	D	28	D	44	46	62	60	M	M	>150	D	D	D	>150	>150	106*	76	76	68	60	64	11	63
9	90	100	98	90	106	100	82	80	54	58	58	48	16	26	44	24	M	M	M	M	M	M	M	M	16	67
10	M	M	M	M	M	M	M	M	M	38	44	34	20	20	10	24	20	0	14	26	38	40	40	34	15	27
11	60	60	58	D	58	56	50	44	44	52	50	40	28	38	34	46	36	24	26	30	20	M	M	M	20	43
12	M	-36	16	0	D	D	D	D	D	D	64	76	70	62	48	46	58	66	58	46	74	68	68	70	16	56
13	80	80	90	78	84	84	92	78	76	62	40	24	38	32	50	62	60	60	56	54	64	58	60	26	24	62
14	66	68	94	80	90	110	66	80	80	70	50	26	D	D	D	D	74	74	84	78	40	28	46	M	19	69
15	M	M	M	M	M	M	M	M	M	M	D	M	M	M	M	D	80	68	70	26	8	18	D	32	7	43
16	28	28	30	24	24	20	16	20	22	26	52	50	36	24	16	20	20	16	26	30	38	28	24	26	24	27
17	32	26	26	32	26	26	D	36	46	34	D	D	40*	40	D	D	D	D	58	D	D	D	D	34	13	35
18	40	46	64	72	76	74	84	82	74	64	64	56	64	58	62	76	68	76	64	66	64	60	66	68	24	67
19	54	62	66	70	76	96	78	70	76	84	62	58	66	74	76	D	68	D	108	74	70	74	70	80	22	73
20	86	78	110	94	80	84	D	66	54	70	62	54	D	D	D	16	D	D	D	32	38	44	50	66	17	64
21	56	58	72	74	70	70	92	72	76	68	74	48	46	48	46	56	54	50	62	44	40	36	38	36	24	58
22	38	40	38	42	38	94	30	26	34	M	M	62	D	D	52	38	64	46	44	28	24	50	D	D	18	44
23	D	D	D	-8	D	D	D	38	M	M	26	26	26	60	24	32	10	20	D	D	D	12	D	D	10	27
24	30	28	26	30	36	32	36	50	50	58	50	50	54	42	40	40	40	54	48	64	58	54	58	70	24	46
25	66	76	66	68	74	72	82	76	64	74	58	68	78	104	110	78	84	62	40	D	D	D	D	D	19	74
26	-6	0	22	24	30	36	40	50	70	96	72	64	78	70	64	54	52	54	54	62	54	60	38	38	23	51
27	38	34	42	58	70	76	96*	104*	84	100	80	74	68	66	68	66	48	54	38	48	38	38	36	44	24	61
28	42	62	76	80	74	68	76	80	74	56	54	52	50	52	74	80	74	40	38	38	46	36	30	30	24	58
29	36	38	40	42	40	34	34	38	40	30	D	D	D	0	64	62	62	52	46	46	46	42	44	50	21	42
30	48	50	54	46	40	46	44	54	76	76	70	70	80	84	90	84	76	54	46	40	42	34	32	36	24	57
31	44	40	30	D	D	24	22	D	D	D	36	44	48	50	84	90	50	46	44	48	46	50	42	48	19	47
No. of hours	23	24	25	22	24	23	21	24	23	25	25	26	24	25	25	26	27	26	28	27	27	27	23	24	594	
Mean	53	53	58	59	60	63	57	62	63	63	56	51	49	51	54	52	53	48	51	47	45	44	47	48		53

D: disturbed M: missing *: estimated ?: unknown

19

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-9 SEPTEMBER 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	M	M	M	M	M	M	M	M	250	500	300	350	250	450	200	250	300	300	M	M	M	M	M	M	10	310
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
4	M																									
5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
6	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	500	500	500	650	600	600	500	500	500	9	540
8	500	550	650	550	450	600	400	500	500	550	500	400	450	D	M	M	M	M	M	M	M	M	M	-100	13	510
9	-350	200	350	400	M	M	M	D	D	1100	1150	1250	1350	750	450	1250	1550	1700	1400	1450	1300	1350	1300	1250	18	1090
10	1150	1100	1100	D	1200	950	1300	1400	1150	D	1350	1050	1000	1000	900	750	650	600	550	500	550	550	600	600	22	910
11	600	750	600	500	550	500	550	600	600	650	950	1050	1300	1400	1400	1400	D	1450	1400	1400	1600	900	-100	500	22	940
12	1100	1250	1600	1650	1250	1050	1250	1450	1900	M	M	M	M	M	M	M	M	300	400	650	650	650	600	450	16	1010
13	500	650	500	400	400	500	500	700	750	1050	800	500	500	550	500	550	650	500	550	450	500	500	500	650	24	570
14	550	600	550	600	650	750	950	1350	1200	1050	1050	1050	850	950	1000	750	600	600	400	400	250	200	150	0	24	690
15	200	-200	-200	0	150	400	700	900	500	350	300	300	350	300	300	250	250	550	650	450	500	450	450	500	22	400
16	500	300	250	350	350	400	200	1150	1200	450	150	50	-50	-50	50	150	200	150	200	250	350	300	250	250	22	340
17	300	300	250	350	750	750	1150	1600	1500	1350	250	D	850	950	700	500	350	150	150	150	250	400	500	300	23	600
18	250	150	100	200	300	50	200	300	400	300	200	100	100	50	-150	100	300	500	500	600	600	500	450	500	23	290
19	500	600	650	700	650	600	850	950	1250	1200	850	950	500	500	500	450	350	300	300	450	400	300	300	350	24	600
20	400	400	400	350	300	250	300	300	400	350	M	M	M	300	350	D	450	450	400	400	350	300	300	300	20	350
21	300	300	300	250	300	450	600	700	700	700	300	100	550	800	1050	1050	950	800	700	500	450	400	500	700	24	560
22	600	500	450	500	500	650	700	850	1000	1100	1150	850	1000	1050	1000	1000	950	850	650	500	500	450	350	200	24	720
23	200	200	150	300	400	300	500	900	1150	1450	1850	1500	1400	1050	1050	1050	1150	800	450	0	M	M	M	M	20	790
24	M	M	M	M	M	M	700	1000	900	700	650	D	D	D	500	500	650	50	100	100	100	50	100	150	15	420
25	200	300	300	350	100	100	50	100	450	350	600	800	750	700	900	750	750	750	800	750	700	800	1000	950	24	550
26	750	850	650	750	650	0	0	350	600	900	900	950	900	650	600	550	300	400	450	500	450	250	300	400	24	550
27	500	550	500	400	400	500	650	500	400	0	-50	250	500	650	350	-300	-400	0	-50	0	150	400	500	250	20	370
28	500	450	500	500	600	650	1000	1250	950	850	850	750	650	600	650	600	600	650	750	850	700	750	800	800	24	720
29	700	900	500	800	600	300	500	1650	1500	1700	1450	1550	1650	850	700	600	500	450	350	250	150	100	150	300	24	760
30	0	0	100	0	-50	-50	-50	-50	50	400	600	600	350	100	450	150	900	1000	950	1150	950	1050	1000	1000	20	540
No. of Hours	21	21	21	21	20	20	21	21	23	22	21	20	20	20	21	21	21	24	22	23	22	22	21	22	511	
Mean	490	520	500	470	530	490	620	880	840	770	770	720	760	680	650	630	600	570	580	540	550	510	480	500		610

D: disturbed M: missing *: estimated ?: unknown

20

VERTICAL AIR-TO-EARTH CURRENT DENSITY (10^{-13} A/m^2)

I-9 SEPTEMBER 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	34	M	M	M	M	70	46	36	26	48	30	40	34	M	M	M	M	M	M	M	M	M	M	M	9	40
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	52	56	66	64	4	59
3	76	76	66	76	88	86	100	86	64	60	42	46	52	58	40	38	40	44	54	54	48	30	20	36	24	57
4	22	30	26	18	-4	14	D	D	D	D	?	?	?	?	?	40	D	D	D	D	D	62	32	D	8	30
5	D	D	D	36	36	42	72	40	56	68	68	58	62	50	D	D	>150	>150	>150	>150	72	60	60	64	15	56
6	72	68	64	68	80	70	68	70	88	114	94	60	68	70	76	60	54	64	76	46	66	66	54	64	24	70
7	62	68	D	60	64	82	90	D	76	70	52	46	58	32	42	48	48	50	40	42	36	24	64	30	22	54
8	52	52	D	70	58	D	>150	56	30	38	40	30	36	M	M	M	D	D	90	M	M	M	M	D	11	50
9	-6	18	50	16	24	D	32	40	60	40	42	48	48	14	D	36	64	54	56	54	46	50	48	46	21	42
10	46	50	48	56	56	44	40	54	46	D	>150	50	52	50	46	46	42	28	26	38	26	20	22	26	22	41
11	30	26	34	D	D	D	D	D	-10	44	64	66	96	76	80	74	76	70	58	68	44	40	D	10	17	56
12	20	26	M	M	M	28	54	40	64	50	44	32	46	44	48	54	54	52	52	58	52	66	62	50	21	47
13	50	50	44	44	46	46	48	62	72	90	74	58	56	62	58	62	62	50	40	38	48	46	40	52	24	54
14	52	54	52	62	64	60	66	82	78	86	96	84	88	102	90	70	50	50	42	40	64	66	44	24	24	65
15	D	30	50	66	74	76	74	72	58	56	54	50	48	52	46	M	48	46	64	56	50	44	44	48	22	55
16	60	50	48	60	50	54	74	80	64	54	36	30	18	26	32	46	44	32	36	40	28	22	22	26	24	43
17	30	34	32	44	64	60	76	60	52	40	-6	D	82	70	68	62	42	26	22	22	22	34	36	36	22	46
18	60	100	>150	>150	>150	>150	>150	>150	38	36	32	32	34	24	24	10	36	48	64	52	50	48	44	48	18	43
19	62	68	70	106	60	60	64	66	50	68	66	96	88	72	66	64	64	50	46	38	40	40	40	40	24	62
20	38	40	50	48	46	44	44	44	48	44	44	52	54	42	42	42	48	38	32	30	32	32	28	26	24	41
21	24	28	30	30	22	24	28	30	34	38	40	16	8	48	48	60	60	48	38	30	26	22	26	30	24	33
22	48	36	36	36	38	40	44	46	48	48	68	48	66	66	70	76	64	50	40	36	36	40	62	116	24	52
23	>150	>150	>150	>150	>150	>150	>150	88	64	62	76	46	64	48	56	70	66	44	38	40	M	M	M	M	13	59
24	M	M	M	M	M	M	122	116	>150	130	>150	D	D	D	>150	D	>150	>150	>150	>150	>150	>150	>150	>150	3	123
25	>150	>150	>150	>150	>150	>150	>150	>150	M	>150	>150	96	86	78	106	88	76	76	80	78	>150	>150	>150	>150	9	86
26	>150	>150	>150	>150	>150	>150	>150	>150	>150	D	96	90	72	52	52	40	24	36	74	108	>150	>150	110	80	12	69
27	68	70	72	68	60	54	90	64	106	>150	>150	>150	>150	90	D	D	D	D	D	>150	>150	>150	74	50	12	72
28	76	76	84	72	94	100	100	D	58	54	62	58	52	48	56	50	48	52	48	38	26	32	32	38	23	59
29	46	36	54	76	136	>150	>150	>150	98	D	58*	M	68	66	60	42	34	36	96	>150	>150	>150	>150	>150	14	65
30	>150	>150	>150	>150	>150	>150	>150	>150	>150	114*	64	50	36	20	38	18	78	70	48	60	52	50	48	40	15	50
No. of hours	21	22	18	20	19	19	20	20	23	23	23	24	26	25	22	23	23	23	24	22	21	22	23	23	529	
Mean	49	49	51	56	61	55	67	62	60	63	58	53	57	54	57	52	53	48	52	48	44	43	47	45		53

D: disturbed M: missing *: estimated ?: unknown

21

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-10 OCTOBER 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	1100	1300	1050	950	900	1000	1350	1850	2650	2950	2150	1800	1350	1250	1050	1050	1000	900	900	800	750	700	600	550	24	1250
2	550	M	M	450	400	350	450	400	500	500	350	400	500	550	600	650	550	450	400	150	-50	-100	-50	D	18	460
3	-50	600	650	100	100	50	350	700	950	850	700	1000	750	600	650	550	450	750	450	700	M	M	500	450	21	570
4	400	400	350	350	350	400	400	500	600	600	400	200	150	150	300	500	800	650	600	300	300	400	400	450	24	410
5	0	100	150	250	150	250	500	600	700	600	100	-100	0	50	-100	0	0	50	100	150	450	500	550	250	22	250
6	700	700	650	800	750	850	1000	1100	900	650	750	500	300	450	650	950	D	D	D	0	-100	0	150	300	20	610
7	600	550	500	800	850	800	1050	1550	1300	1200	1000	650	450	500	950	850	900	700	650	800	800	850	950	850	24	840
8	700	700	750	800	1050	1050	1150	1400	1750	2150	1850	1350	1300	1100	950	900	1150	1100	1000	850	900	850	650	700	24	1090
9	700	700	600	450	400	350	400	450	400	400	450	350	650	500	250	D	50	100	150	200	50	-50	-100	-50	20	380
10	300	500	500	350	300	300	200	400	500	400	250	-100	-150	-200	-250	-250	-150	-50	0	-250	300	350	500	550	16	360
11	600	900	850	900	950	1150	1100	1000	800	800	700	650	650	650	650	650	600	600	550	600	750	800	850	650	24	770
12	600	150	100	100	100	400	500	600	600	600	750	700	700	750	650	500	D	D	450	200	50	100	-350	-300	20	430
13	-150	-150	0	-50	-100	50	200	100	0	50	0	-50	-50	-50	-50	50	-50	-50	-50	-200	-250	-150	-100	-650	8	60
14	-400	400	350	200	500	750	2400	1900	1450	1150	1050	1050	950	950	1050	1150	1200	1250	800	750	750	650	650	700	23	960
15	700	500	450	150	150	150	150	150	0	400	850	1050	1050	1200	1300	1500	1200	1050	1000	950	850	850	1050	1150	24	740
16	1300	1200	1100	900	900	750	1050	1200	1200	1150	1200	1200	1300	1450	1500	1500	1400	1350	1350	1250	1000	1100	1000	1000	24	1180
17	1500	1000	900	1000	1000	1000	650	1000	1200	1050	1300	1400	1650	1850	2100	1800	1550	950	900	950	850	700	600	650	24	1150
18	1250	950	750	1100	850	650	300	750	1150	450	1200	1600	1400	1050	1000	850	1150	1100	850	450	200	0	0	0	24	790
19	0	0	0	0	0	0	0	0	0	-100	-200	-300	150	250	1000	1850	2050	400	550	150	D	-1000	-150	-150	17	380
20	50	0	100	250	300	0	500	750	200	600	1300	1400	1450	1450	1300	1450	1600	1550	1350	1200	1100	1100	1100	1050	24	880
21	1100	1050	600	700	-650	450	500	500	1050	850	1100	900	800	800	900	750	850	1000	850	800	850	1750*	2000*	500	22	940
22	350	D	D	D	250	-400	50	-650	-750	-300	650	950	700	750	1050	1050	1350	1200	1350	900	700	900	1100	950	17	840
23	950	1250	1150	1150	1150	1250	1250	1500	200	400	450	700	1100	650	650	800	1100	1300	1100	1100	1000	1050	1050	950	24	970
24	1200	1250	1300	1250	1050	1200	1550	1450	1400	1450	1300	1400	1250	1500	1250	1000	850	850	900	900	600	500	300	300	24	1080
25	400	400	550	450	400	350	150	400	650	950	1050	950	850	850	800	950?	900	850	800	650	600	550	400	450	24	640
26	200	250	300	100	500	500	400	450	1100	1300	1750	1550	1150	1050	950	1000	1050	1000	800	650	650	500	350	150	24	740
27	100	100	100	100	100	150	150	250	500	600	500	850	900	1100	1100	1050	950	900	750	600	550	>3000	>3000	>3000	21	540
28	>3000	>3000	>3000	>3000	>3000	>3000	>3000	650	900	700	1150	1200	1250	1250	750	1050	750	800	850	0	250	250	500	650	17	760
29	250	250	350	450	450	300	200	200	200	200	100	0	50	0	50	500	100	0	-200	-100	-150	-250	-300	-200	18	200
30	-250	-750	-1250	-600	300	200	450	650	1050	1650	1700	1600	1400	1450	1350	1300	1300	1550	1300	1200	1200	1200	1150	1050	20	1150
31	950	1000	950	1000	850	900	1000	1250	1100	1300	1450	1300	1200	1200	1200	1050	1000	1200	1750	1800	1650	1850	2500	1850	24	1300
No. of hours	26	26	27	27	28	29	30	30	30	29	30	27	29	29	28	29	27	27	28	28	25	23	24	24	660	
Mean	640	620	560	540	540	540	650	790	830	890	920	990	880	870	930	940	960	870	800	680	690	760	790	670		765

D: disturbed M: missing *: estimated ?: unknown

22

VERTICAL AIR-TO-EARTH CURRENT DENSITY (10^{-13} A/m^2)

I-10 OCTOBER 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	34	48	32	46	44	64	70	78	80	92	72	66	70	84	80	70	56	60	40	30	30	38	42	32	24	57
2	42	M	M	>150	>150	>150	>150	>150	>150	136	128	100	70	74	74	>150	132	96	78	68	78	D	D	>150	12	90
3	>150	>150	>150	>150	>150	>150	>150	>150	>150	100	90	110	86	86	86	62	40	40	42	44	M	M	50	44	13	68
4	42	42	40	40	38	40	42	50	94	106	96	90	66	84	98	108*	96	70	70	92	106	66	46	46	24	69
5	24	24	44	>150	>150	>150	>150	>150	58	30	16	10	20	18	0	8	4	10	8	12	24	44	100	50	19	26
6	80	94	108	>150	>150	142	>150	88	50	52	54	36	0	38	46	42	D	D	D	>150	>150	>150	>150	>150	13	64
7	>150	>150	>150	>150	>150	>150	>150	>150	112*	52	40	30	12	26	36	36	48	36	30	30	30	40	40	38	16	40
8	30	36	44	46	58	>150	>150	84	74	78	56	42	58	60	58	50	56	50	48	26	34	30	26	30	22	49
9	38	52	44	62	>150	>150	>150	>150	>150	100	68	56	62	44	66*	>150	>150	>150	>150	>150	>150	>150	>150	>150	10	59
10	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	100	1	100
11	52	72	72	72	90	116	124	70	56	52	58	48	40	38	38	42	30	30	30	34	52	>150	>150	>150	21	58
12	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	108	>150	>150	D	D	M	M	>150	>150	>150	>150	1	108
13	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150		
14	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150		
15	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150		
16	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	130	116	108	104	>146	>150	>150	>150	>150	>150	>150	4	114
17	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	1	134
18	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	134	>150	>150	>150	>150	>150	>150	>150	>150	>150		
19	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>300	>300		
20	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>280	M	M	M	M	M	M	M	M	M	>300	>300	>300	>300		
21	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>260	D	48	46	46	52	50	50	48	30	D	D	100	9	52
22	200	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	80	60	172	120	80	120	132	128	140	180	200	>300	8	107
23	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	140	60	50	80	150	260	120	88	88	84	100	136	164	11	100
24	228	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300		
25	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	>300	M	M	M	M	M	M	M	M	M	M	M		
26	M	M	M	M	M	M	M	M	M	10000	3600	2000	2200	>3000	>3000	>3000	>3000	>3000	>3000	>3000	7400	9000	>14500	>15000		
27	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	9000	6600	D	3000	1800	1400	1000	5000	>300	D	236	>280	>300	>300	3000	3200		
28	5400	7600	12000	>15000	>15000	>15000	>15000	>15000	>12000	3600	1000	400	100	200	1800	1800	1200	1800	1800	D	>13000	7000	6600	>11000	1	100
29	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	10200	>12000	D	>15000	>15000	>15000	>15000	>15000	>15000		
30	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	5200	2000	800	200	200	200	200	200	M	94	90	116	>150	>150	>150	>150	3	100
31	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	D	74	66	58	50	64	90	104	138	>140	>150	>150	>150	>150	8	80
No.of hours	8	7	7	5	4	4	3	5	7	10	10	12	14	16	15	13	12	13	13	12	10	6	7	8	221	
Mean	43	53	55	53	57	90	79	74	75	80	68	67	56	63	67	69	66	68	64	60	61	53	63	55		64

D: disturbed M:missing *: estimated ?: unknown

23

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-11 NOVEMBER 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	2000	1950	1500	1250	1200	1450	1300	1200	1100	1100	950	900	900	750	600	800	950	950	950	1100	1150	1250	1350	1350	24	1170
2	1400	1300	1300	1550	1400	1350	1400	1950	1900	1600	1150	1300	1400	1200	1350	1150	1650	1800	1400	1400	1300	1300	1450	1300	24	1430
3	1200	1200	1100	1000	750	750	650	700	1300	1750	2200	2200	1950	2050	1850	1900	2100	2200	1750	1500	1600	1000	950	1100	24	1450
4	850	1250	1200	1250	1200	1300	1500	2300	2400	2450	2450	2400	2000	1400	1200	1500	1100	1350	1700	1750	1450	1650	1600	1250	24	1600
5	1000	1000	800	1050	750	200	500	600	1000	600	150	50	100	100	100	100	50	-50	-50	50	-50	-250	-400	-150	18	460
6	-100	-50	0	50	100	100	100	150	400	800	1150	1450	1300	1150	1200	1100	900	700	450	600	700	600	650	500	22	640
7	600	600	500	450	550	700	900	1150	1400	1500	1800	1200	1000	950	800	800	1050	1300	1300	900	700	700	600	700	24	920
8	900	200	0	0	50	100	0	100	200	400	700	800	950	950	1000	950	950	850	650	650	650	600	350	250	24	510
9	300	150	100	100	100	100	150	200	400	750	950	950	1000	1150	1100	1100	1250	950	600	450	250	250	300	450	24	550
10	800	900	650	450	500	650	500	450	50	0	300	0	150	800	1550	1550	2000	1600	1200	1000	1200	1500	1600	1700	24	880
11	1850	1800	1500	1350	1400	1300	1300	1600	1500	1200	650	550	200	0	0	0	-50	-150	-50	0	0	0	-100	-100	19	850
12	-150	-100	-200	0	50	150	150	0	50	200	150	150	0	50	50	?	>3000	>3000	>-2000	>-2000	-100	100	200	200	15	100
13	-250	250	200	200	300	400	500	750	D	950	1050	?	?	450	-100	0	-200	500	800	800	800	850	800	750	18	570
14	750	850	900	800	800	600*	400*	400	400	D	M	M	M	M	M	M	M	M	M	M	M	M	M	M	9	660
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	1500	1450	1200	1000	950	1050	1300	7	1210
19	1600	1200	800	550	900	1200	1850	1600	2400	>3000	2050	2300	1700	650	150	D	100	D	0	D	-600	-1000*	0*	-200	17	1120
20	-350	-400	-200	-100	-150	-100*	50*	0	150	800	1250	1500	1700	1750	1650	2050	2150	2200	2500	2550*	2300	2050	1150	1450	18	1510
21	1300	D	D	D	1900	650	D	D	550	1550	1000	750	550	900	950	950	900	950	D	-50*	D	D	D	D	13	990
22	350	650	M	M	M	M	M	M	M	M	1500	1650	2300	1400	1650	1100	1400	1350	1250	1150	1400	1850	2050	1500	16	1410
23	1750	1800	1400	950	950	550	150	200	900	>3000	600	600	450	50	-150	-100	0	200	400	400	600	950	1600	1750	21	770
24	1900	2150	2700	2450	2350	2400	1650	>3000	2700*	>3000	>3000	>3000	>3000	>3000	>3000	>3000	2450	2250	2150	1550	1400	1000	1150*	1300	17	1910
25	1100	1250	1000	900	1150	1000	1050	1150	1500	1700	1800	1900	1800	1500	1150	250	350	250	550	500	550	800	900	550	24	1030
26	250	-1000	-650	D	>-3000	200	800	1150	D	-100*	350	700	900	2300	>3000	D	D	D	D	-750	-450	-500	-250	-100	8	830
27	250	600	950	1150	1100	1150	1500	2450*	2850*	2350	2500	1650	1800	1650	1500	1550	1850	2300	2350	2700	2700	2300	2300	1900	24	1810
28	2100	2000	1800	1750	1750	1700	1750	1850	2200	2650	2400	2600	1650	1550	1300	1200	1050	850	150	0*	200	-150	-400	0	22	1480
29	-400	-300	-450	D	300	-450	400	750	900	1450	1450	1250	D	650	850	800	1200	1200	1200	1100	1050	950	950	1150	18	980
30	1800	1750	1650	1700	1700	1800	1100	1200	1400	1600	800	1850	1200	850	800	750	1050	1100	950	-200	750	400	1000	650	23	1210
No. of Hours	21	20	20	21	23	23	24	23	23	20	24	23	22	24	21	21	21	21	21	21	21	21	21	21	521	
Mean	1150	1140	1000	900	920	860	820	950	1200	1270	1220	1250	1140	1010	990	1050	1160	1250	1160	1010	1020	1010	1050	990		1060

D: disturbed M: missing *: estimated ?: unknown

VERTICAL AIR-TO-EARTH CURRENT DENSITY (10^{-13} A/m^2)

I-11 NOVEMBER 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	M	720	580	360	400	520	960*	1300	>1400	>1500	>1500	>1500	>1500	>1500		
2	>1500	>1500	>1500	>1500	>1500	>1400	1000	480	180	60	M	54	62	50	52	46	72	82	76	86	100	112	>140	>150	12	71
3	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	130	74	60	52	50	72	86	66	74	86	36	90	D	12	73
4	>150	>140	66	50	70	60	60	D	D	D	D	68	48	24	44	44	42	40	50	50	40	46	34	32	18	48
5	48	38	38	60	54	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	5	48
6	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>13400	11200	9400	12000	13600	11200	10400	10000	11000	12000	12200	14000	14000	>14000		
7	>15000	>15000	13600	13600	>14400	>15000	>15000	>15000	12200	6000	2000	800	200	200	200	200	>150	>150	>150	>150	>150	>150	>150	>150		
8	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>1500	>1500	>1500	>1500	>1500	>1500	>15000	>15000		
9	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>11000	5400	3000	1200	1200	1600	2000	5000	8400	13000	>15000	>15000	>15000	>15000	>15000		
10	>9000	600	200	200	200	1800	3000	8000	>15000	>15000	>15000	>14600	11000	4200	3800	3000	4000	4800	5000	6200	3600	2600	2200	1800		
11	1000	1000	1000	800	800	800	1000	1600	1800	2800	5000	6000	>12000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000	>15000		
12	>15000	>14800	>14800	14000	13600	13000	>14800	13400	12200	>14000	>15000	>15000	>15000	>15000	>15000	>15000	7600	-1000	-7000	D	D	D	4000	8000		
13	>11000	12000	11400	2600	1000	1000	800	600	400	D	D	D	D	D	>15000	>14000	D	1200	800	600	0	0	0	200	3	0
14	0	0	0	0	400	400	400	200	0	D	D	70	66	62	62	66	56	82	106	>144	>150	>150	>150	>150	13	44
15	>150	>150	>150	>150	>150	>150	>150	>150	>120	D	D	48	30	26	20	58	54	38	38	64	76	68	50	36	13	47
16	56	66	>116	86	>150	>150	>150	>150	>150	>150	D	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	D	260	3	69
17	360	660	>700	200	220	500	700	D	D	D	120	128	126	140	>140	>150	>150	>150	>150	>150	>150	>1500	>1500	D	4	128
18	D	>1300	200	120	200	160	D	D	D	D	64	58	52	52	52	46	56	76	100	100	100	124	>150	>150	13	77
19	>150	>146	120	110	130	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	D	2	115
20	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	?	-400	-400	-400	-400	-400	?	66	64	96	70	70	60	34	7	66
21	50	D	D	D	D	D	D	D	D	D	D	-200	-200	-200	-200	?	38	44	D	D	D	D	D	D	3	44
22	M	M	M	M	M	M	M	M	M	M	M	>150	>100	50	44	46	60	54	92	104	74	64	86	134	11	73
23	>130	>140	>150	>150	72	32	72	>150	>136	D	92	>130	>150	>140	>144	>140	70	92	>140	>150	>150	>120	80	76	8	73
24	80	86	100	100	124	118	100	D	D	112	76	88	82	98	92	80	100	86	98	108	120	>150	>150	>150	19	97
25	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>144	138	>146	>146	128	2	133
26	>140	136*	72	D	D	94	90	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	-58	-40	-52	-44	-28	-18	14	80	>140	6	81
27	>150	>150	>150	>150	>150	>150	>150	>150	100	94	80	58	56	48	54	54	70	70	72	80	94	92	110	114	16	78
28	>140	>150	>150	>150	>150	>150	>150	>150	>150	>150	122	140	150	150	150	150	150	150	150	150	150	150	D	150	1	122
29	>150	M	M	D	124	118	>150	>150	>150	D	D	>300	>300	>300	>300	204	148	140	140	144	140	>150	>150	>150	7	136
30	>150	>150	>150	>150	>140	148*	>150	>146	124*	D	120	110	100	76	78	70	78	70	50	52	100	92	68	62	16	87
No. of hours	5	5	6	7	5	6	4		3	3	7	10	10	11	10	10	13	14	12	11	13	11	10	8	194	
Mean	47	65	66	75	89	95	80		75	89	96	81	70	62	55	56	70	73	79	87	88	65	66	77		74

D: disturbed M: missing *: estimated ?: unknown

ELECTRIC POTENTIAL IN VOLTS AT 23 METERS ABOVE GROUND

V-12 DECEMBER 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of hours	Mean
1	1000	450	1150	1250	1350	1650	1850	2300	2600	2600	2150	1650	1600	1650	1650	1650	1700	1550	1650	1450	1300	1250	1300	1250	24	1580
2	1250	1200	1150	1100	1150	1300	1650	1850	2000	2250	2000	1750	1900	2050	2150	2250	2450	2100	>3000	1950	2050	1200	1200	1350	23	1710
3	1050	900	1150	1200	1300	1600	1850	1950	2450	2400	1850	1000	400	1450	950	2000	1550	1900	1700	1100	900	800	500	450	24	1350
4	500	500	500	-150	-50	550	150	250	250	450	>3000	>3000	2450	2850	2500*	2000	1850	2450	1900	1250	D	650	-700	D	17	1240
5	D	D	D	2200	700	D	500*	D	>3000	>3000	2250	1300	-800	1200	1300	400	0	-200	-200	-300	-350	-250	-300	-300	9	1090
6	-400	-400	-250	-300	-400	-600	-750	-200	-150	1100	1300	1500	1900	1800	1350	650	150	350	300	600	850	1600	1700	1450	15	1110
7	1450	1850	1800	2600	2650	2550	2600	>3000	>3000	2400	2250	>3000	>3000	>3000	2900	2800	2100	2400	2250	1850	1850	1350	700	800	19	2060
8	850	500	1000	1250	1400	1250	1000	1400	1350	1500	1900	1800	1700	1750	1800	1350	1350	850	450	D	D	D	D	D	19	1290
9	800	1750	1300	1000	1650	-150	-500	-50	D	D	300	650	850	1800	1950	1700	1300	1200	450	-350	450	650	250	550	18	1030
10	350	400	200	250	550	950	1100	1500	2000	1900	2150	2200	2800	>3000	>3000	>3000	900	1300	450	1550	1700	1500	1550	1750	21	1340
11	2150	2450	2150	2100	2150	2150	1700	2250	2400	2100	2050	2350	1650	D	D	M	-2000	-350	D	-600	-250	D	150	250	15	1870
12	D	D	350	-100	-150	150	200	1000	1800	1750	1300	1400	1700	1900	2150	1900	2000	2450	2250	2050	2050	1600	1350	1350	20	1530
13	1250	1400	1200	1200	1150	900	1000	750	650	700	900	800	850	850	1150	1100	1250	400	50	50	400	D	-400	-400	21	860
14	0	300	400	700	700	950	1350	1550	1750	1800	2000	1800	1550	1200	1300	1500	1650	1200	D	D	D	-150	0	-150	19	1140
15	250	750	1000	1150	1050	850	800	1100	1200	1800*	1600	1500	1150	1250	1500	1700	1750	1750	1700	1650	1550	1550	1600	1600	24	1320
16	1850	2200	2250	2400	2450	2750	>3000	>3000	>3000	>3000	>3000	>3000	>3000	>3000	>3000	2800	2550	2250	1800	1200	850	850	850	900	15	1860
17	700	1100	1050	850	500	400	50	100	-50	950	500	700	850	-350	-750	-1000	D	D	0	250	750	1150	1150	1100	18	670
18	1050	1250	1300	1650	1350	1400	1700	2000	2300	2400	2450	2450	2300	2100	2100	2050	2250	2100	1750	1600	1550	1350	1400	1550	24	1810
19	1800	2100	1850	800	700	1050	1000	1150	1000	1550	1650	1600	1300	1500	1300	1000	1100	1000	1050	1100	1050	900	800	800	24	1170
20	700	1100	1150	1100	1100	900	800	1650	-650	-600	0	100	450	-50	-1500	-1300	-1000	-50	200	-1150	-1000	50	-450	-650	13	720
21	-450	-450	-150	-450	-450	-300	-100	300	250	450	1000	0	400	1650	1550	1950	1750	1450	1150	950	750	800	850	1100	17	960
22	700	900	1000	1050	500	-450	D	D	D	-350*	250	300	500	750	650	700	500	350	500	750	350	450	250	300	19	570
23	850	D	D	D	D	D	350	750	1000	1000	750	850	100	-150	100	600	650	100	550	450	250	150	300	50	18	490
24	200	350	0	50	50	400	250	300	550	-150	D	-750	-100	-550	-400	-650	200	400	300	200	450	200	300	500	17	280
25	450	450	550	350	200	100	400	850	900	800	550	500	500	1000	450	-500	0	D	>1500	D	-50	200	600	900	19	510
26	750	550	350	800	800	1250	950	1100	1200	1100	1100	1050	1000	300	-200	450	400	-100	150	-550	-500	-200	0	550	19	730
27	1000	1150	1250	1350	1500	1650	1800	1700	2100	2300	2150	2100	1850	1650	1400	1800	1400	900	850	800	650	-100	100	800	23	1400
28	750	150	150	D	D	D	D	D	D	D	D	1000	1500	2600	?	2600	1000	1750	1350	1100	700	1200	550	500	15	1130
29	400	600	1000	1000	1450	1700	1900	2100	2350	2300	2950	>3000	>3000	>3000	>3000	>3000	>3000	?	2400	D	1500	1050	1700	1900	16	1640
30	1000	900	?	150	150	-200	-150	-400	0	-300	100	500	650	300	600	1000	1500	1800	1100	600	400	400	400	400	19	630
31	400	350	-350	-200	700	400	-500	-1000	-700	-350	200	-800	400	750	400	900	1650	1400	1100	1450	1500	1000	800	800	17	840
No. of hours	27	26	25	24	25	23	23	22	21	22	27	25	26	22	22	24	27	24	26	22	23	24	26	25	581	
Mean	870	980	1010	1150	1090	1170	1080	1270	1430	1620	1390	1230	1240	1470	1420	1540	1290	1390	1090	1090	1040	870	780	920		1180

D: ~~distrubed~~ M: missing *: estimated ?: unknown

VERTICAL AIR-TO-EARTH CURRENT DENSITY (10^{-13} A/m^2)

I-12 DECEMBER 1964

Time LST / Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	No. of Hours	Mean
1	80	54	74	80	90	94	92	102	100	88	68	62	68	68	56	62	74	56	54	92	102	98	94	70	24	78
2	74	70	74	82	108	>140	>150	>150	>150	>150	120	68	66	66	66	66	62	50	40	78	50	48	24	32	19	65
3	44	50	68	72	88	128	130	>150	>150	>150	>140	108	132*	>142	124	140*	>3000	136	138	138	142	134	112	128	140	19	113
4	126	62	64	50	70	74	98	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	7	78
5	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>15000	14000*	D		
6	11400	11000	13200	13400	13000	10600	8400	8200	9400	8600	6600	5000	4000	4400	6400	7600	8000	9000	9400	10000	9600	7600	8000	7000		
7	6000	5000	4000	3000	2000	1800	1600	1600	2800	>2600	>150	>150	>150	>150	>150	>150	>150	1100	1000	1000	600	>150	>150	>150		
8	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	500	300	280	200	200	200	230	250	300	>1100	>1500	>1500	>1500	>1500		
9	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	700	250	200	150	86	136	140	130	>150	>150	>150	>150	5	128
10	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>140	114	112	112	92	76	120	>150	>150	>150	>150	>150	>150	>150	6	104
11	>150	>150	>150	>150	>150	142	136	>150	>150	>150	>150	>150	>150	>150	>150	D	14	-30	-60	>-100	>-100	>-100	>-100	>-100	3	97
12	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	-66	-32	-8	6	22	40	50	64	80	72	78	92	100	10	60
13	114	122	122	126	138	>150	>150	144*	82	16	52	14	32	28	34	46	14	74	104	84	24	-150	-140	-68*	19	72
14	24	24	100	138	>150	>150	>150	>150	>150	>150	>150	>150	136	>146	130	120	118	108	D	D	>150	>150	>150	>150	9	100
15	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	76	90	64	60	50	48	58	58	60	64	62	56	56	64	14	62
16	70	78	84	90	88	92	90	84	>130	90	90	78	84	104	100	98	100	100	104	94	92	112	108	124	23	94
17	126	140*	>150	>150	>150	>150	>150	>150	>150	>150	D	144*	>150	>150	76	0	72	D	118	144	82	78	58	52	11	86
18	46	46	50	62	52	58	60	64	60	100	70	66	62	60	60	62	64	56	46	50	52	48	50	52	24	58
19	60	70	70	>140	>150	>150	>150	>150	>150	>150	138	120	108	108	100	108	118	124	130	118	112	116	>146	>150	15	107
20	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150		
21	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150		
22	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>15000	>15000	>15000	D	>-10000	D	400	600	D	>15000	?	14	52	>100	2	33
23	D	>150	>150	>150	>150	>150	>150	D	>-100	>-100	>-90	-48	-18	0	12	22	28	26	44	52	54	56	58	54	11	37
24	4	10	16	36	24	30	22	44	-12	-58	D	-32	-4	-60*	-100	-100	-34	-50	-20	-10	-10	-10	-14	-16	8	23
25	-20	-14	-28	-20	0	18	36	54	64	58	62	60	70	68	38	-50	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	11	48
26	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-100	>-90	-50	-10	-12	-100	-100	-100	-100	-100	-100	-100	-70	4	62	2	33
27	98	116	128	144	148	150*	132*	102	120	120	122	122	110	90	114	118	102	98	88	72	74	78	112	102	24	111
28	112	134	122	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	3	123
29	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	>150	D	>150	>150	>150	>150	D	>150	>150	>150	>150		
30	>150	>150	D	>150	>150	>150	>150	122*	90	78	74	60	50	38	34	22	6	-16	-32	-50	-50	-42	-24	-16	10	57
31	-6	-26	D	-20	D	D	38	56	140	118*	130	132	124	D	>-100	>-100	>-100	>-80	62	118	122	126	122	122	12	106
No. of hours	13	13	12	10	10	9	10	9	6	8	11	14	14	12	16	16	17	13	14	13	13	13	13	12	291	
Mean	75	75	81	88	81	87	83	86	86	83	91	88	87	67	68	72	71	83	85	90	79	78	74	81		80

D: disturbed M: missing *: estimated ?: unknown

DAILY WEATHER SUMMARY AT DORVAL, QUEBEC

July 1964

1. Few clouds and very warm.
2. Generally overcast. Rain P.M.
3. Cloudy all day. Heavy thundershower P.M.
4. Variable cloudiness.
5. Cloudy all day. Showers P.M. and early evening.
6. Overcast with rain during the night and early A.M. Afternoon shower.
7. Generally cloudy. Thundershowers P.M. Dense fog late evening.
8. Dense fog during the night. Few clouds at other periods.
9. Clear.
10. Clear except cloudy with thunder P.M.
11. Increasing cloudiness becoming overcast with heavy thundershowers in evening.
12. Generally partly cloudy. Thunder in evening.
13. Mainly overcast. Rain P.M. till mid-evening.
14. Overcast with drizzle or rain till mid-A.M. then clearing.
15. Generally cloudy. Thundershower at night. Few showers at other periods.
16. Clear.
17. Few clouds.
18. Clear till mid-A.M. then increasing cloudiness.
19. Cloudy till noon then clearing.
20. Clear.
21. Increasing cloudiness. Thunder and heavy showers late evening.
22. Generally cloudy. Thundershowers at night and P.M.
23. Clear.
24. Variable cloudiness. Shower P.M.
25. Overcast early morning then partly cloudy.
26. Variable cloudiness. Rain late A.M. Shower late P.M.
27. Clear night and A.M. then cloudy.
28. Cloudy till mid-A.M. then clearing.
29. Cloudy with thundershowers A.M. Clear at other periods.
30 Cloudy A.M. and P.M. with whowers. Clear at other periods.
31. Clear.

August 1964

1. Clear till noon then cloudy.
2. Overcast till mid-A.M. with occasional rain then clearing slowly.
3. Few clouds.
4. Generally cloudy.
5. Cloudy or overcast. Occasional rain or drizzle.
6. Cloudy at night then a few clouds.
7. Few clouds.
8. Generally cloudy.
9. Generally cloudy. Showers A.M. and P.M.
10. Generally cloudy.
11. Generally cloudy.
12. Overcast with thundershower early morning. Showers A.M. Cloudy at other periods.
13. Cloudy all day.
14. Generally cloudy.
15. Overcast till mid-A.M. Cloudy at other periods.
16. Generally cloudy.
17. Generally cloudy. Heavy thundershowers P.M.
18. Partly cloudy.
19. Partly cloudy at night. Cloudy at other periods.
20. Generally cloudy. Thundershower with hail early P.M.
21. Clear night and A.M. Cloudy other periods.
22. Overcast. Showers during the night. Drizzle P.M. rain in evening.
23. Overcast and foggy all day. Rain and drizzle during the night and evening.
24. Cloudy A.M. Clear other periods.
25. Increasing cloudiness becoming overcast with showers late evening.
26. Partly cloudy.
27. Clear.
28. Few clouds.
29. Cloudy at night. Overcast with rain A.M. then clearing slowly.
30. Few clouds.
31. Thundershowers early morning and A.M. Partly cloudy at other periods.

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DAILY WEATHER SUMMARY AT DORVAL, QUEBEC

September 1964

1. Generally cloudy.
2. Partly cloudy A.M. Clear at other periods.
3. Clear night becoming cloudy in evening.
4. Generally cloudy. Showers A.M. Thundershowers P.M. and evening. Dense fog late evening.
5. Dense fog during the early night then cloudy. Showers P.M.
6. Cloudy A.M. and P.M. Few clouds other periods.
7. Clear.
8. Increasing cloudiness becoming overcast with showers mid P.M. and early evening.
9. Cloudy at night with dense fog then clearing.
10. Variable cloudiness.
11. Cloudy with showers early morning then gradually clearing.
12. Clear.
13. Clear.
14. Sunny. Cloudy with very light rain late evening.
15. Overcast with light rain early night. Few clouds rest of day.
16. Variable cloudiness A.M. and P.M. Few clouds evening.
17. Cloudy to overcast clearing late evening. Haze A.M. Light rainshower P.M.
18. Variable cloudiness, clearing in evening.
19. Few clouds.
20. Few clouds.
21. Few clouds during the night. Cloudy rest of day.
22. Few clouds.
23. Cloudy. Rainshower in evening.
24. Few clouds till noon. Cloudy rest of day. Rainshowers P.M. Gusty winds all day.
25. Cloudy clearing in evening. Very light rain A.M.
26. Few clouds to noon. Cloudy to overcast rest of day. Rainshowers evening.
27. Cloudy to overcast, clearing in evening. Gusty winds evening and P.M. Rainshowers A.M. and P.M.
28. Few clouds.
29. Few clouds.
30. Clouding over during the night. Cloudy A.M. and P.M. clearing in evening.

October 1964

1. Clear.
2. Increasing cloudiness becoming cloudy with showers late evening.
3. Overcast with rain early part of the night then clearing.
4. Clear becoming cloudy in evening.
5. Variable cloudiness.
6. Clear night becoming overcast with showers late P.M. and early evening.
7. Clear.
8. Clear.
9. Cloudy till mid P.M. then overcast. Showers mid P.M. till mid evening.
10. Generally overcast. Rain P.M. Very light snow in evening.
11. Partly cloudy till mid P.M. then clear.
12. Clear becoming overcast mid P.M. with P.M. and evening showers.
13. Overcast with rain till late P.M. Occasional drizzle in evening.
14. Generally overcast or cloudy clearing late evening.
15. Clear and warm.
16. Clear and warm.
17. Dense fog early morning then cloudy rest of the day.
18. Cloudy night then clear. Dense fog late evening.
19. Dense fog early part of the night. Overcast with rain till mid A.M. then cloudy. Showers in evening.
20. Dense fog during part of the night then cloudy.
21. Generally cloudy.
22. Cloudy to overcast till mid A.M. Scattered clouds P.M. Cloudy late evening. Light rain early night.
23. Few clouds during the night. Cloudy rest of day. Very light snow flurry mid A.M.
24. Few clouds during the night. Cloudy to overcast rest of day.
25. Cloudy to overcast till P.M. Clearing P.M.
26. Fog during the night and early A.M. Haze all day. Cloudy P.M. Very light rainshower mid P.M.
27. Haze night and A.M. Cloudy A.M. Few clouds to clear rest of day.
28. Cloudy to overcast all day. Haze, fog and smoke A.M. and P.M. Rainshowers P.M. and evening.
29. Cloudy to overcast all day. Fog A.M. Light rain P.M. and evening.
30. Ovr. with rain during night then partly cloudy.
31. Cloudy till mid-A.M. then clear.

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DAILY WEATHER SUMMARY AT DORVAL, QUEBEC

November 1964

1. Cloudy A.M. Overcast P.M. Clear at other periods.
2. Dense fog the later part of the night then clear rest of the day.
3. Generally partly cloudy.
4. Clear.
5. Cloudy night then overcast with rain and drizzle.
6. Cloudy daylight hours, overcast at other periods.
7. Overcast at night, cloudy till mid P.M. then clear.
8. Clear.
9. Clear night then partly cloudy.
10. Cloudy night. Overcast light rain and snow A.M. then clearing.
11. Clear night becoming overcast. Rain A.M. till mid-P.M.
12. Overcast and fog all day. Dense fog at certain periods
13. Clear night then cloudy. Showers mid-P.M.
14. Few clouds.
15. Clear night then generally cloudy.
16. Generally overcast. Freezing rain and ice pellets part of the night. Freezing rain P.M.
17. Generally cloudy becoming overcast with very light rain and snow late evening.
18. Partly cloudy or cloudy. Occasional snowflakes.
19. Partly cloudy at night then overcast. Snow P.M. till mid evening then freezing rain and rain.
20. Overcast with rain all night then partly cloudy becoming overcast with snow late evening.
21. Generally overcast. Snow during the night and evening.
22. Generally cloudy till mid-P.M. then clearing. Snow A.M.
23. Overcast with occasional snow A.M. till mid P.M. Partly cloudy at other periods.
24. Clear night. Partly cloudy A.M. Overcast P.M. and evening.
25. Clear night then increasing cloudiness becoming overcast with occasional rain in evening.
26. Overcast, frequent rain or drizzle periods till early evening then cloudy.
27. Partly cloudy.
28. Partly cloudy becoming overcast with rain late eve.
29. Overcast with rain during the night. Cloudy A.M. and P.M. Showers at noon. Clear in the evening.
30. Clear night then generally cloudy. Light snowshower P.M.

December 1964

1. Partly cloudy clearing in evening.
2. Clear night then partly cloudy.
3. Generally overcast.
4. Overcast. Continuous snow beginning mid A.M. and lasting the rest of the day.
5. Overcast with continuous snow all day.
6. Overcast or cloudy with continuous snow all day.
7. Cloudy becoming overcast with snow late evening.
8. Overcast all day. Snow during evening.
9. Cloudy daylight hours; overcast at other periods.
10. Overcast at night then a few clouds.
11. Cloudy night becoming overcast with freezing rain P.M. and rain in evening.
12. Overcast or cloudy. Rain early night.
13. Generally overcast. Rain late evening.
14. Overcast with snow early evening; partly cloudy at other periods.
15. Cloudy A.M., clear at other periods.
16. Clear till mid-A.M. then cloudy.
17. Generally overcast. Snow A.M. Rainshowers P.M.
18. Clear.
19. Variable sky. Light snowshower during the night.
20. Overcast. Snow early morning and A.M.
21. Generally partly cloudy.
22. Overcast. Snow most of the day.
23. Overcast. Snow during the night. Drizzle in evening.
24. Overcast. Drizzle A.M. Rain P.M.
25. Cloudy night then overcast. Rain mid P.M. and evening.
26. Overcast. Rainshowers P.M.
27. Clear night then increasing cloudiness becoming overcast in evening.
28. Overcast with snow and blowing snow most of the day. Clearing late evening.
29. Partly cloudy becoming overcast in the evening.
30. Overcast. Freezing drizzle AM., PM. and part of the evening.
31. Overcast with snow till mid A.M. then clearing.

RAYONNEMENT SOLAIRE A MONTREAL

(1 juillet au 31 décembre, 1964)

On trouvera dans les tableaux qui suivent les sommes quotidiennes et les moyennes mensuelles du rayonnement solaire total et diffus, tel qu'enregistré sur une surface horizontale au Collège Brébeuf du 1 juillet au 31 décembre 1964. L'unité est la calorie-gramme par centimètre carré.

Du 1 juillet au 7 octobre inclusivement, les données furent enregistrées par l'actinographe à bilames de Robitzsch utilisé jusqu'ici depuis avril 1956. A partir du 8 octobre les données furent enregistrées au moyen de deux pyranomètres Eppley (modèles à 50 soudures), l'un pour le rayonnement total (direct et diffusé par la voûte céleste) et le second pour le rayonnement diffus seulement. Ce dernier instrument est utilisé avec le montage régulier d'anneau protecteur du réseau canadien; la bande qui masque le soleil a 3.5 pouces de largeur et couvre un angle de 2.5 degrés comme demi-ouverture. Chaque Eppley est relié à un enregistreur Honeywell, équipé lui-même d'un intégrateur et d'un imprimeur.

Toutes les données furent évaluées par l'équipe de la Section météorologique du Ministère des Transports du Canada.

Le lecteur intéressé dans les valeurs horaires pourra les obtenir dans le bulletin "Monthly Radiation Summary" publié par la même agence gouvernementale mentionnée plus haut.

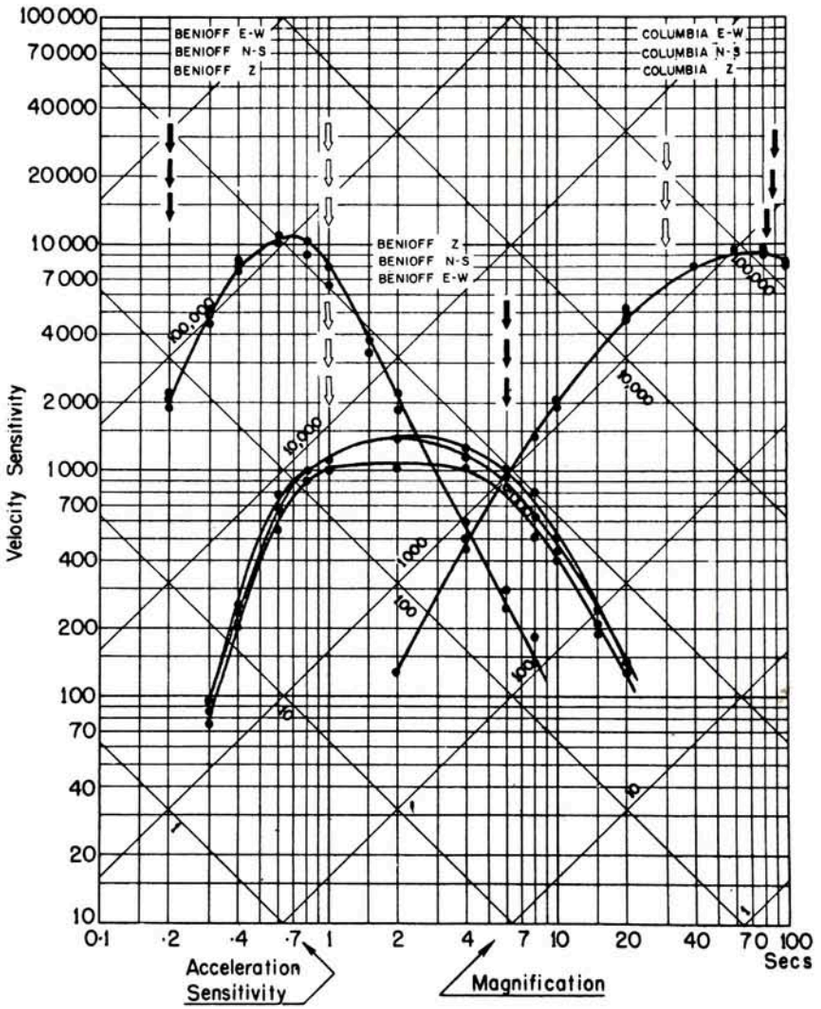
Il nous fait plaisir de mentionner que les deux pyranomètres Eppley et l'un des enregistreurs Honeywell furent acquis grâce à une subvention du Conseil National de Recherches du Canada. Le reste de l'équipement récemment installé est un prêt gracieux de la Section météorologique du Ministère des Transports du Canada.

RAYONNEMENT SOLAIRE 1964

DATE	Rayonnement total						Rayonnement diffus					
	Juillet	Août	Septembre	Octobre	Novembre	Décembre	Juillet	Août	Septembre	Octobre	Novembre	Décembre
1	620E	545	495	430	84	177					79	78
2	260E	365	565	255	266	191					59	48
3	M	630	335	425	206	109					91	89
4	M	365	195	420	252	32					58	28
5	290E	100	305	180	24	34					24	29
6	385E	650	370	175	66	75					62	74
7	275	665	540	385	172	198					123	76
8	640E	470	235	390	239	89				71	70	88
9	535	340	485	143	184	122				138	121	90
10	505E	540	380	59	90	153				57	76	80
11	540E	425	270	380	32	55				78	30	53
12	605	330	510	197	88	50				160	87	48
13	185E	280	545	29	107	49				27	75	44
14	290	405	505	151	239	168				136	47	44
15	325E	335	505	334	150	124				82E	97	87
16	600E	385	380	342	30	132				75	24	79
17	650E	195	255	191	178	22				155	84	21
18	555E	525	325	326	163	174				96	75	58
19	485	495	495	57	55	119				52	53	74
20	710	315	385	245	164	90				130	92	86
21	455	535	295	244	103	147				94	88	85
22	585	70	455	260	154	43				117	126	41
23	720	200	315	164	26	30				115	26	30
24	480	525	350	80	119	14				73	99	14
25	490	540	180	252	166	18				154	M	18
26	225	575	345	194	35	55				132	35	M
27	640	600	90	199	189E	87				115	44	M
28	630	540	440	110	165	77				101	56	76
29	400	165	400	36	110	170				35	61	54
30	380	585	200	M	114	12				M	83	12
31	710	450		228		119				78		95
Moyenne	489	424	372	229	133	95				98	69	60

Unité de mesure: 1 langley (= 1 calorie-gramme par cm^2) M : manquant E: une (plusieurs) heure (s) durant le jour fut (furent) estimée (s).

STATION: MONTREAL



ϕ = 45°30'09"N λ = 73°37'23"W Altitude 112M

Foundation : Ordovician Limestone (Trenton)

T_s ⇑ T_g ⇑

Date of Calibration: April - 1962
Feb. - 1964

BENIOFF'S		BENIOFF'S		COLUMBIA'S	
S.P. - Z	Apr. 4	I.P. - Z	Apr. 4	L.P. - Z.	Feb. 13
S.P.H. - N.S.	Apr. 4	I.P.H. - N.S.	Apr. 4	L.P.H. - N.S.	Feb. 12
S.P.H. - E.W.	Apr. 5	I.P.H. - E.W.	Apr. 5	L.P.H. - E.W.	Feb. 11

INSTRUMENTS DE LA STATION

3 séismographes Benioff de 100 kg. avec 6 galvanomètres.
t_o=1 sec., t_g=0.2 sec. pour ZNE. Enregistreur, 60mm/min.
t_g=6 sec. pour Z'N'E'. Enregistreur, 30mm/min.
3 séismographes Sprengnether, type Columbia Z"N"E".
Avant le 13 février 1964, t_o=17 sec., t_g=100 sec.
Après le 13 février 1964, t_o=30 sec., t_g=100 sec.pour Z"N"E".
Enregistreur, 15mm/min.

Le 13 février 1964, l'amplification des Columbia a été augmentée. Cf. graphiques.

Dans notre bulletin, nous indiquons toujours sur quel séismogramme chaque phase a été lue en ajoutant après cette phase une des lettres suivantes:

ZNE pour celles données par les Benioff avec galvanomètres de 02.sec.

Z'N'E' pour celles données par les Benioff avec galvanomètres de 6 sec.

Z"N"E" pour celles données par les Columbia avec galvanomètres de 100 sec.

L'heure est inscrite à chaque minute sur les séismogrammes par la Société Radio-Canada au moyen d'une ligne téléphonique avec une précision de $\pm$ 0.1 sec. à l'année. Cette Société nous fournit en même temps un courant alternatif de 60 cycles de fréquence absolument constante, pour les moteurs des enregistreurs. De plus, le signal horaire de l'Observatoire du Dominion relayé par le poste local de radio CBF, à 01 00 00 p.m. s'enregistre automatiquement sur tous les séismogrammes.

Les positions géographiques des épicentres ainsi que l'heure d'origine et la profondeur sont toujours empruntées à U.S.C.G.S. pour les séismes éloignés. Pour les locaux, ces données nous sont fournies par l'Observatoire du Dominion, et cela est indiqué chaque fois. Pour sauver de l'espace, nous ne mentionnons pas U.S.C.G.S. à chaque séisme.

Nous indiquons aussi quelques fois, après une phase, sur la ligne suivante, la période de l'onde du sol et son amplitude en microns.

Nous tenons à exprimer publiquement notre reconnaissance à l'Observatoire du Dominion qui envoie chaque année ses techniciens refaire l'étalonnage complet de tous les séismographes et pour toute la gamme des fréquences, par la méthode de Willmore.

M. Buist, S.J.

1 juil. 52.7 N., 168.2 W.
Fox Isl. Aleutian Isl.

h	about 33 km.		
H	13	31	06.2
ePZ	13	40	56

1 juil. 30.9 N., 41.5 W.
N. Atlantic Ocean

h	about 33 km.		
H	20	09	31.2
ePZ	20	15	29

1 juil. 17.1 S., 69.1 W.
Peru-Bolivia Border

h	about 147 km.		
H	20	20	56.6
iPZ	20	31	05.6 c
iPZ			06.0 d
ipPZ			48.7

1 juil. $e(P_n)Z$ 21 42 55
eS_nZ 43 58.5

1 juil. 31.1 N., 139.6 E.
S. of Honshu, Japan

h	about 147 km.		
H	22	46	18.7
ePZ	22	59	36.5 d

1 juil. 14.3 S., 73.1 W.
S. Peru

h	about 139 km.		
H	22	49	23.4
iPZ	22	59	14.0 d

2 juil. 60.1 N., 146.0 W.
Alaska Aftershock

h	about 14 km.		
H	01	19	02.7
iPZ	01	27	09.8 d

2 juil. 53.4 N., 167.8 W.
Fox Isl. Aleutian Isl.

h	about 45 km.		
H	06	35	18
ePZ	06	45	03

2 juil. 11.6 S., 74.4 W.
Central Peru

h	about 28 km.		
H	09	09	39.8
iPZ	09	19	24.6 d

2 juil. 47.6 N., 128.7 W.
Off Coast of Washington

h	about 33 km.		
H	15	09	13.5
eLZ"	15	27	

2 juil. 47.7 N., 128.3 W.
Off Coast of Washington

h	about 33 km.		
H	17	03	42.4
ePZ	17	10	51
eSE"		16	42

3 juil. 19.4 N., 104.3 W.
Jalisco, Mexico

h	about 102 km.		
H	05	05	33.8
ePZ	05	12	29.5

3 juil. 33.9 N., 74.5 E.
Kashmir

h	about 94 km.		
H	14	10	33.0
eLZ"	14	56	

4 juil. 11.7 N., 144.5 E.
Mariana Isl.

h	about 33 km.		
H	10	49	28.8
ePSE"	11	18.5	

4 juil. 15.5 S., 72.5 W.
S. Peru

h	about 148 km.		
H	12	13	56.9
ePZ	12	23	55.8 d
iPZ			56.2 c

5 juil. 60.8 N., 144.9 W.
Alaska Aftershock

h	about 30 km.		
H	03	14	33.3
iPZ	03	22	32.0 c
eSE"		28	59

5 juil. 60.2 N., 146.2 W.
Alaska Aftershock

h	about 27 km.		
H	17	58	59.7
ePZ	18	07	05 d

5 juil. 26.2 N., 110.2 W.
Gulf of California

h	about 29 km.		
H	19	07	57.8
iPZ	19	14	49.0 d
ePPZ"		16	12
iSN"		20	26

5 juil. 10.0 S., 75.0 W.
Central Peru

h	about 93 km.		
H	22	14	55.8
ePZ	22	24	33.7 d

5 juil. 44.8 N., 149.6 E.
Kurile Isl.

h	about 54 km.		
H	23	36	01.5
ePZ	23	48	19
iSE"		58	32

5 juil. 44.7 N., 149.6 E.
Kurile Isl.

h	about 48 km.		
H	23	39	10.3
iPZ	23	51	28.3 D

6 juil. 26.5 N., 110.2 W.
Gulf of California

h	about 33 km.		
H	02	08	19.2
ePZ	02	15	08.5

6 juil. 26.2 N., 110.2 W.
Gulf of California

h	about 33 km.		
H	02	10	42.1
ePZ	02	17	33

6 juil. 26.2 N., 110.4 W.
Gulf of California

h	about 33 km.		
H	02	14	36.0
ePZ	02	21	26
ePPZ"		22	52
iSE"		27	01

6 juil. 26.5 N., 110.3 W.
Gulf of California

h	about 33 km.		
H	03	06	09.6
ePZ	03	13	02

6 juil 18.3 N., 100.4 W.
Guerrero, Mexico

h	about 100 km.		
H	07	22	11.7
ePZ	07	28	57.0 d
iPZ			57.3 c
0.7 micr. 1 sec.			
ipPZ'		29	19.0
isPZ'			36.0
iPPZ'		30	13.5
iPcPZ'		31	20
iSE"		34	24

6 juil. 6.3 S., 154.7 E.
Solomon Isl.

h	about 49 km.		
H	10	06	02.3
eP'Z	10	25	07

6 juil. 18.7 N., 100.5 W.
Guerrero Mexico

h	about 108 km.		
H	10	38	41.0
iPZ	10	45	23.0 d

6 juil. 6.9 S., 129.6 E.
Banda Sea

h	about 100 km.		
H	14	19	46.3
eP'Z	14	38	59

6 juil. 18.7 N., 100.3 W.
Guerro, Mexico

h	about 81 km.		
H	19	21	12.7
ePZ	19	27	56.5

6 juil. 21.2 S., 173.8 E.
New Hebrides Isl. region

h	about 22 km.		
H	19	50	42.1

eLZ" 20 47

7 juil. 43.4 N., 127.2 W.
Off Coast of Oregon

h	about 7 km.		
H	13	44	40
ePZ	13	52	02
eSE"		57	50

7 juil eLN" 15 56.5

7 juil 11.2 S., 163.2 E.
Solomon Isl. region

h	about 13 km.		
H	16	28	42.9
eLN"	17	26	

8 juil. 15.3 S., 173.1 W.
Tonga Isl

h	about 33 km.		
H	01	35	02.5
eLN"	02	24	

8 juil. 3.2 N., 128.4 E.
Molucca Passage

h	about 50 km.		
H	07	45	48.6
eP'Z	08	05	05.5
eSSN"		24.8	

8 juil. 5.5 S., 128.9 E.
Banda Sea

h	about 165 km.		
H	11	55	39
eP'Z	12	14	29 d
iZ			44
ipP'Z'		15	30
iPPZ		17	20
iSKPZ			52
iPPPZ		19	19
iSKSN"		21	34

9 juil. 15.4 N., 119.8 E.
Near W. Coast of Luzon
Philippine Isl.

h	about 53 km.		
H	05	47	07.2
eZ	06	07	05
ePSN"		17.3	

9 juil. 23.3 S., 175.7 W.
Tonga Isl.

h	about 43 km.		
H	11	22	05.4
ePPZ"	11	41	50
eSKSE"		47	28
eSKKSE"		48	38
iN"		49	28
eSSN"		57	26
eSSSE"	12	01	24

9 juil. 15.5 S., 167.6 E.,
New Hebrides Isl.

h	about 121 km.		
H	16	39	49.3
ePZ"	16	54	58
eP'Z		58	27
iZ		59	59
ePPPZ"	17	02	24
eSKSE"		05	16
iSKKSN"		06	47
iSN"		07	40
iN"		16	16

9 juil. 49.4 N., 153.5 E.
Sea of Okhotsk

h	about 140 km.		
H	18	45	32.9
iPZ	18	57	11.0 d

9 juil. 1.8 S., 141.6 E.
Off Coast of N.E. New Guinea

h	about 33 km.		
H	21	43	46.3
eLN"	22	42	

10 juil. 0.6 S., 19.8 W.
Mid-Atlantic Ocean

h	about 33 km		
H	01	17	53.3
eSSSN"	02	44.8	

10 juil. 26.5 N., 109.7 W.
Gulf of California

h	about 33 km.		
H	11	50	46.8
eLZ"	12	08.7	

10 juil. 16.0 S., 71.6 W.
S. Peru

h	about 134 km.		
H	19	16	43.5
iPZ	19	26	45.2
ipPZ		27	22.5

10 juil. 53.4 N., 167.8 W.
Fox Isl. Aleutian Isl

h	about 33 km.		
H	22	23	51.5
iPZ	22	32	13.5 d

11 juil. 53.2 N., 168.6 W.
Fox Isl. Aleutian Isl.

h	about 61 km.		
H	00	15	52
ePZ	00	25	39

11 juil. 7.3 S., 148.0 E.
Near coast of N.E. New Guinea

h	about 58 km.		
H	01	36	16.3
eLZ"	02	36	

11 juil. 41.6 N., 142.3 E.
Near E. Coast of Honshu
Japan

h	about 50 km.		
H	04	45	28.6
ePZ	04	58	12.5

11 juil. 49.3 N., 129.0 W.
Vancouver Isl. region

h	about 33 km.		
H	14	33	06.9
eLZ"	14	52	

11 juil. 66.4 N., 19.7 W.
N. Iceland

h	about 19 km.		
H	17	44	29.8
eLZ"	18	02	

11 juil. ePZ 20 31 58

11 juil. 59.7 N., 146.2 W.
Alaska aftershock

h	about 40 km.		
H	20	25	40.3
iPZ	20	33	44.4 d
ePPN"		35	32
eSN"		40	20

12 juil. eP_1Z 00 01 15.2
eS_1Z 01 37
Δ 216 km.

12 juil. 38.6 N., 139.2 E.
Near W. Coast of Honshu,
Japan

h	about 13 km.		
H	01	45	25.6
ePZ	01	58	37.3 c
eSKSE"		09	08
eSE"			28

12 juil. 53.1 N., 168.6 W.
Fox Isl. Aleutian Isl.

h	about 33 km.		
H	11	23	29
ePZ	11	33	19

12 juil. 24.5 S., 66.9 W.
Chile-Argentina border

h	about 164 km.		
H	16	48	21.7
iPZ	16	59	16.2 c
ipPZ	17	00	02.5

13 juil. 42.5 N., 126.7 W.
Off Coast of Oregon

h	about 33 km.		
H	11	54	50.7
eLZ"	12	14.5	

13 juil. 53.7 N., 35.2 W.
N. Atlantic Ocean

h	about 33 km.		
H	16	22	26
eLZ"	17	34.6	

13 juil. 7.7 N., 34.7 W.
N. Atlantic Ocean

h	about 33 km.		
H	21	02	33.3
ePZ	21	11	32
eSN"		17	48

14 juil. 53.6 N., 172.0 E.
Near Isl. Aleutian Isl.

h	about 33 km.		
H	04	04	18.2
ePZ	04	15	07

14 juil. 19.0 N., 66.5 W.
Puerto Rico

h	about 46 km.		
H	09	55	24.4
ePZ	10	01	04

14 juil. 41.8 N., 125.7 W.
Near coast of N. California

h	about 33 km.		
H	12	47	25.6
eLZ"	13	04.5	

14 juil. 53.3 N., 159.7 E.
Near coast of Kamchatka

h	about 40 km.		
H	13	58	28.5
iPZ	14	09	46.0 c

14 juil. 45.3 N., 150.2 E.
Kurile Isl.

h	about 33 km.		
H	17	19	23.3
ePZ	19	31	39.0 d

14 juil. 59.5 N., 144.8 W.
Alaska aftershock

h	about 20 km.		
H	22	59	09.2
eSN"	23	13	42

15 juil. 52.1 N., 170.6 W.
Fox Isl. Aleutian Isl.

h	about 30 km.		
H	07	26	01.4
iPZ	07	36	02.8 d

15 juil. 35.2 N., 4.5 E.
Algeria

h	about 39 km.		
H	09	49	05.8
ePZ	09	59	02.8

16 juil. 8.5 N., 82.9 W.
Panama-Costa Rica border

h	about 34 km.		
H	17	51	50.4
iPZ	17	59	05.2 d

17 juil. 38.2 N., 23.7 E.
S. Greece

h	about 150 km.		
H	02	34	26.9
iPZ	02	45	14.6 c
iPcPZ			50.5
iZ			55.5
iZ		46	05.5
iSE"		54	06
eScSE"			48
eSSE"		58	28

17 juil. 49.3 N., 158.6 E.
Kurile Isl.

h	about 50 km.		
H	04	41	05.1
iPZ	04	52	42.7 d

17 juil. 44.6 N., 149.2 E.
Kurile Isl.

h	about 33 km.		
H	22	54	42.2
ePZ	23	07	03.0 d

18 juil. 36.3 N., 26.1 E.
Dodecanese Isl.

h	about 115 km.		
H	03	40	21.5
iPZ	03	51	50.3 d

18 juil. 18.4 S., 70.9 W.
Near coast of N. Chile

h	about 40 km.		
H	11	13	14.2
iPZ	11	23	44.0 c

18 juil. 0.2 N., 123.5 E.
N. Celebes

h	about 97 km.		
H	12	45	47.7
eP'Z	13	04	52

18 juil. 11.0 N., 87.0 W.
Off W. coast of Nicaragua

h	about 33 km.		
H	20	37	36
ePZ	20	44	36.8 d

18 juil. 60.0 N., 143.4 W.
Alaska Aftershock

h	about 33 km.		
H	23	36	21.0
ePZ	23	44	16

19 juil. 15.1 S., 173.4 W.
Tonga Isl. region

h	about 33 km.		
H	13	40	06.6
eLZ"	14	30.5	

20 juil. 13.6 N., 87.9 W.
El Salvador

h	about 87 km.		
H	08	27	26.6
ePZ	08	33	59
iZ		34	05

20 juil. 35.2 S., 179.8 W.
N.E. of North Isl. New Zealand

h	about 108 km.		
H	10	22	53.4
eLZ"	11	32	

20 juil. 19.8 N., 109.0 W.
Revilla Gigedo Isl. region

h	about 33 km.		
H	18	49	43.5
ePZ	18	58	15
eSN"	19	03	10

20 juil. 35.5 S., 179.7 E.
Off N. coast of North Isl. New Zealand

h	about 233 km.		
H	22	43	15
eP'Z	23	01	56.5

21 juil. 19.8 N., 108.8 W.
off Coast of Jalisco, Mexico

h	about 31 km.		
H	01	09	25.8
ePZ	01	16	55
ePPE"		18	18
eSN"		22	49

21 juil. 26.0 S., 178.0 W.
Fiji Isl. region

h	about 222 km.		
H	03	48	59.1
eP'Z	04	07	19.0
eSN"		16	18
eSSN"		24	36

21 juil. 13.1 N., 88.4 W.
Near coast of El Salvador

h	about 68 km.		
H	07	01	59.3
iPZ	07	08	44.4 d
ipPZ		09	01.4

21 juil. 20.0 S., 69.8 W.
Near coast of N. Chile

h	about 84 km.		
H	07	33	19.6
iPZ	07	43	52.2 c
ipPZ		44	16.0

21 juil. 72.1 N., 130.2 E.
Laptev Sea

h	about 33 km.		
H	09	56	16.6
ePZ	10	06	31.5

21 juil. 11.5 N., 121.9 E.
Panay, Philippine Isl.

h	about 34 km.		
H	13	13	00.2
eN"	13	36	

21 juil. 4.6 S., 153.3 E.
New Britain region

h	about 60 km.		
H	21	01	49.5
eLZ"	21	58	

22 juil. 31.7 N., 114.1 W.
Gulf of California

h	about 33 km.		
H	10	34	11.9
eLN"	10	52	

23 juil. 28.8 S., 70.3 W.
N. Chile

h	about 37 km.		
H	01	53	11.4
ePZ	02	04	48.5

23 juil. 0.7 S., 16.3 W.
about 800 km. N. of Ascension Isl.

h	about 33 km.		
H	09	40	29.2
eLZ"	10	12	

23 juil. 57.1 N., 150.4 W.
Alaska Aftershock

h	about 33 km.		
H	14	19	01.1
eLE"	14	45	

23 juil. 59.9 N., 149.2 W.
Alaska Aftershock

h	about 55 km.		
H	19	08	06.6

ePZ 19 16 20

23 juil. 27.8 S., 66.4 W.
Catamarca Prov. Argentina
h about 130 km.
H 19 18 56.8
ePZ 19 30 57

24 juil. 14.2 N., 91.6 W.
Near W. coast of Guatemala
h about 65 km.
H 01 39 39.0
ePZ 01 46 24

24 juil. 46.9 N., 153.9 E.
Kurile Isl.
h about 33 km.
H 06 50 52.8
ePZ 07 02 54.0
eSE" 12 48

24 juil. 47.2 N., 153.8 E.
Kurile lsl.
h about 33 km.
H 08 12 40.0
ePZ 08 24 40.0
iSE' 34 37

24 juil. 46.8 N., 154.1 E.
Kurile Isl.
h about 33 km.
H 09 17 00.5
ePZ 09 29 02

24 juil. 46.9 N., 154.0 E.
Kurile Isl.
h about 33 km.
eSE" 12 57 56

24 juil. 47.0 N., 153.7 E.
Kurile Isl.
h about 33 km.
H 13 25 18.3
ePZ 13 37 19.5
eSE" 47 14

24 juil. 6.6 S., 154.8 E.
Solomon Isl.
h about 62 km.
H 13 47 48.6
eP'Z 14 06 38

24 juil. 47.2 N., 153.9 E.
Kurile Isl.
h about 33 km.
H 16 34 29.2
ePZ 16 46 28

24 juil. 47.1 N., 153.6 E.
Kurile Isl.
h about 33 km.
H 17 02 49.2
ePZ 17 14 50.5
iSE" 24 46

24 juil. 57.7 N., 152.2 W.
Alaska Aftershock
h about 10 km.
H 21 54 54.0
iPZ 22 03 30 c

25 juil. 1.8 S., 141.0 E.
W. New Guinea region
h about 48 km.
H 02 24 38.9
eLZ" 03 22

25 juil. 27.9 S., 70.9 W.
N. Chile
h about 26 km.
H 19 31 07.0
ePZ 19 42 36.5
iPZ 39.0 c
iSE" 52 05
eSSE" 56 44

25 juil. 2.9 N., 128.2 E.
N. of Halmahera
h about 22 km.
H 21 29 33.2
eP'Z 21 48 44

26 juil. 12.7 N., 87.6 W.
Off coast of El Salvador
h about 65 km.
H 03 58 29.6
ePZ 04 05 21.0 d

26 juil. 3.6 S., 153.5 E.
New Ireland region

h about 239 km.
H 13 02 50
eLN" 14 18

26 juil. 11.8 N., 88.2 W.
Off coast of Nicaragua
h about 9 km.
H 13 53 25.1
iPZ 14 00 27

26 juil. 2.6 N., 78.5 W.
Ecuador
h about 38 km.
H 13 55 37.4
iPZ 14 03 35.0 c
i 47
i 58.8

26 juil. 46.8 N., 153.8 E.
Kurile Isl.
h about 33 km.
H 18 34 34.6
ePZ 18 46 36.8 d

27 juil. 61.5 N., 163.9 E.
N. Kamchatka
h about 8 km.
H 00 15 44.7
ePZ 00 26 18.3 d

27 juil. 1.7 S., 77.9 W.
Peru-Colombia border
h about 164 km.
H 04 03 33.2
iPZ 04 11 31.2 d

27 juil. 46.8 N., 153.8 E.
Kurile Isl.
h about 33 km.
H 23 00 36.3
eSE" 23 22 36

28 juil. 51.2 S., 130.0 E.
About 1000 km. S.W. of Tasmania
h about 33 km.
H 18 40 04.3
eP'Z 19 00 03.5
eSSN" 24.2
eSSSN" 30.3

28 juil. 14.3 N., 96.2 E.
Andaman Isl.
h about 33 km.
H 21 38 43.5
ePPZ" 21 59.0
eSSN" 22 15 48

29 juil. 11.1 N., 86.2 W.
Near W. coast of Costa-Rica
h about 42 km.
H 05 16 03.3
ePZ 05 23 01.5
iPZ 02.8 d
ePPZ' 24 20
iSN" 29 08
eSSN" 31 30

31 juil. 44.6 N., 151.6 E.
Kurile Isl.
h about 53 km.
H 04 05 06.2
iPZ 04 17 20.5 c
ipPZ 36.5

31 juil. 6.1 S. 149.4 E.
New Britain
h about 63 km.
H 05 52 18.8
eP'Z 06 11 09

31 juil. 86.4 N., 38.5 E.
Arctic Ocean
h about 33 km.
H 21 22 24.3
eLZ" 21 45

31 juil. 86.3 N., 40.5 E.
Arctic Ocean
h about 10 km.
H 23 45 55.2
ePZ 23 53 43

1 août 27.7 S., 70.9 W.
Near coast of N. Chile
h about 118 km.
H 13 54 54.8
ePZ 14 06 10.0

1 août 19.9 S., 66.4 E.
Mascarene Isl. region
h about 33 km.

	H	21	33 28
	eLZ"	22	42

2 août 52.9 N., 162.3 E.
Near E. coast of Kamchatka

h	about 33 km.		
H	00	15	34.5
ePZ	00	26	49.4

2 août 56.1 N., 156.1 W.
Alaska Aftershock

h	about 33 km.		
H	03	04	16.9
ePZ	03	13	09.5

3 août 10.9 N., 86.3 W.
Near W. coast of Costa Rica

h	about 32 km.		
H	04	00	45.1
ePZ	04	07	47.0 d

2 août 17.3 S., 69.8 W.
Peru-Bolivia border region

h	about 5 km.		
H	08	14	06
ePZ	08	24	38
epPZ			48

2 août 56.2 N., 149.9 W.
Alaska Aftershock

h	about 31 km.		
H	08	36	16.9
ePZ	08	44	45.5 d
eSN"		51	29
eSSN"		55	06

2 août 49.9 N., 156.8 E.
Kurile Isl.

h	about 58 km.		
H	21	39	54.3
iPZ	21	51	32.0 d

3 août 19.8 N., 70.7 W.
Dominican Republic region

h	about 7 km.		
H	01	48	23.3
iPZ	01	53	56.6 c
iSN"		58	30

3 août 60.0 N., 148.0 W.
Kenai Penin. Alaska

h	about 18 km.		
H	02	32	14.6
ePZ	02	40	21

3 août 22.6 N., 121.3 E.
Near S. coast of Taiwan

h	about 33 km.		
H	07	44	44.3
eLZ"	08	24	

3 août 53.8 N., 132.1 W.
Queen Charlotte Isl. region

h	about 33 km.		
H	18	54	54.9
eLN"	19	14	54

4 août 46.5 N., 151.1 E.
Kurile Isl.

h	about 101 km.		
H	17	24	29.2
iPZ	17	36	30.3 d
ipPZ			51
iSKSN"		46	27

5 août 32.1 S., 179.8 E.
S. of Kermadec Isl.

h	about 235 km.		
H	11	06	02.6
iP'Z	11	24	31.7 d
ePPZ"		26	14
iSKSE"		31	08
eSPZ"		35	44

5 août 41.1 S., 74.9 W.
Off coast of S. Chile

h	about 33 km.		
H	22	23	13.0
iPZ	22	35	52.1 d
iPPZ'		39	21
iSKSN"		46	16
iPSN"		47	24
eSSN"		51	44

6 août 9.1 S., 120.8 E.
Sumba Isl. region

h	about 58 km.		
H	07	12	01.1
eP'Z	07	31	26

6 août 43.4 N., 126.7 W.
Off coast of Oregon

h	about 33 km.		
H	10	46	28.9

	eLZ"	11	06.5

6 août 56.9 N., 152.1 W.
Alaska Aftershock

h	about 39 km.		
H	18	24	50.5
iPZ	18	33	34
iSN"		40	28
eScSN"		43	22
eSSN"		44	13

6 août 19.2 S., 167.6 E.
New Hebrides Isl. region

h	about 43 km.		
H	23	42	45.7
eP'Z	23	59	01

7 août 56.8 N., 152.3 W.
Alaska Aftershock

h	about 33 km.		
H	05	37	25.1
ePZ	05	46	02

7 août 11.8 N., 86.9 W.
Near coast of Nicaragua

h	about 130 km.		
H	08	21	03
ePZ	08	27	48.5

7 août 14.0 N., 91.9 W.
Near S. coast of Guatemala

h	about 89 km.		
H	15	31	18.0
ePZ	15	38	03

8 août 31.7 N., 140.2 E.
S. of Honshu, Japan

h	about 110 km.		
H	14	59	41.2
iPZ	15	13	03.0 c

8 août 12.5 N., 87.7 W.
Off W. coast of Nicaragua

h	about 63 km.		
H	15	45	10.9
iPZ	15	51	59.5 c
ePPZ"		53	20
eSN"		57	28

8 août 18.0 N., 74.0 W.
Near S. coast of Haiti

h	about 10 km.		
H	20	06	51
iPZ	20	12	46.0 c

9 août 53.4 N., 153.4 E.
Sea of Okhotsk

h	about 511 km.		
H	05	20	32.7
iPZ	05	31	09.6 c

10 août 19.1 N., 67.3 W.
Mona Passage

h	about 33 km.		
H	01	10	12.4
ePZ	01	15	53

10 août 16.7 S., 70.8 W.
S. Peru

h	about 92 km.		
H	07	34	49.9
iPZ	07	45	02.0 c

10 août 9.2 N., 62.0 W.
Near coast of Venezuela

h	about 51 km.		
H	16	58	44.0
ePZ	17	05	56.3

10 août 45.1 N., 149.9 E.
Kurile Isl.

h	about 40 km.		
H	17	52	02.5
ePZ	18	04	20

10 août 6.2 S., 154.5 E.
Solomon Isl.

h	about 105 km.		
H	21	40	10.4
eP'Z	21	58	55

11 août 3.0 N., 84.3 W.
Off coast of Central America

h	about 33 km.		
H	14	12	35.9
eLZ"	14	34	

12 août 48.9 N., 153.7 E.
Kurile Isl.

h	about 127 km.		
H	06	51	49.9
iPZ	07	03	32.2 d

13 août 5.4 S., 154.3 E.
Solomon Isl.

h	about 383 km.		
H	00	31	14.1
iP'Z	00	49	25.3
iPPZ		51	00.5
ipPZ		52	29
iN"		55	54
iN"		57	26
iN"		58	30
iSSN"	01	07	00

13 août 42.2 N., 126.1 W.
Off coast of Oregon

h	about 33 km.		
H	06	35	39.0
eLN"	06	54	

13 août 42.3 N., 125.5 W.
Off coast of Oregon

h	about 33 km.		
H	08	50	46
eLN"	09	02	

13 août 10.5 S., 13.3 W.
Ascension Isl. region

h	about 33 km.		
H	18	26	30.7
ELZ"	19	02.5	

14 août 7.4 N., 36.8 W.
Central Mid-Atlantic Ridge

h	about 33 km.		
H	21	27	41.6
eSN"	21	43	38
eSSSN"		48	44

15 août Rockburst at Kirkland Lake Ont.

H	03	51	57
iP_nZ	03	53	10.5 c
iS_nZ		54	12
△ 570 km.			

15 août 6.7 N., 73.4 W.
N. Colombia

h	about 175 km.		
H	21	22	03.8
iPZ	21	29	11.4 c

16 août 12.0 N., 88.6 W.
Off coast of Central America

h	about 33 km.		
H	12	34	34.8
ePZ	12	41	33.3

17 août 35.0 N., 26.0 E.
Crete

h	about 18 km.		
H	00	17	40.9
ePZ	00	29	06

17 août 52.0 N., 30.0 W.
N. Atlantic Ridge

h	about 42 km.		
H	09	07	03.8
ePZ	09	14	03
eLZ"		21	

17 août 46.3 N., 151.9 W.
Kurile Isl.

h	about 33 km.		
H	11	51	19.3
ePZ	12	03	28

17 août 42.6 N., 142.8 E.
Hokkaido, Japan region

h	about 33 km.		
H	14	54	01.4
ePZ	15	06	42

17 août 72.2 N., 1.7 E.
Norwegian Sea

h	about 33 km.		
H	15	15	18.9
ePZ	15	23	16
eSN"		29	42

17 août 51.5 N., 177.8 E.
Rat Isl. Aleutian Isl.

h	about 42 km.		
H	16	38	44.4
ePZ	16	49	23

17 août 52.1 N., 30.1 W.
N. Atlantic Ridge

h	about 36 km.		
H	22	47	32.4
eLN"	23	01	

18 août 7.2 S., 74.4 W.
Peru-Brazil border region

h	about 156 km.		
H	00	26	51.8
iPZ	00	35	51.0 d
ipPZ		36	25.0
iZ			33.5

18 août 26.4 S., 71.5 W.
Off coast of N. Chile

h	about 8 km.		
H	04	44	58.0
iPZ	04	56	21.2 c
ipPZ			29.2
iSN"	05	05	41
eSSSN"		15	30

19 août 28.2 N., 52.6 E.
S. Iran

h	about 50 km.		
H	09	33	10.0
ePZ	09	46	15

19 août 6.9 S., 75.5 W.
N. Peru

h	about 14 km.		
H	14	00	38
ePZ	14	10	50.8 d

19 août 28.2 N., 52.7 E.
S. Iran

h	about 52 km.		
H	15	20	13.9
eLN"	15	57.6	

20 août 72.1 N., 1.4 E.
Norwegian Sea

h	about 33 km.		
H	02	08	15.8
ePZ	02	16	14

20 août 63.9 N., 20.5 W.
Iceland

h	about 33 km.		
H	03	56	29.2
ePZ	04	03	17

20 août 28.2 N., 52.6 E.
S. Iran

h	about 52 km.		
H	05	39	47.7
eLN"	06	23	

20 août 11.7 N., 87.2 W.
Near coast of Nicaragua

h	about 25 km.		
H	08	26	52
iPZ	08	33	49.5 d

20 août 14.9 N., 60.4 W.
Windward Isl.

h	about 65 km.		
H	08	37	47.1
ePZ	08	44	18

20 août 11.0 N., 87.5 W.
Near coast of Nicaragua

h	about 33 km.		
H	09	12	54
ePZ	09	19	55

20 août 37.4 S., 78.3 E.
Mid Indian Rise

h	about 33 km.		
H	12	48	47.7
eLN"	13	53	

20 août 72.3 N., 1.7 E.
Norwegian Sea

h	about 33 km.		
H	16	29	58.5
eLN"	16	52	

21 août 13.9 N., 93.0 W.
Near coast of Chiapas Mexico

h	about 33 km.		
H	03	29	19
eLZ"	03	47	

21 août 28.3 N., 52.5 E.
S. Iran

h	about 54 km.		
H	07	59	17.0
eLN"	08	39	

21 août 30.6 N., 113.8 W.
Gulf of California

h	about 15 km.		
H	19	41	38

eLZ" 20 02.8

21 août ePZ 23 31 05

21 août eLN" 23 52

21 août 12.2 S., 110.5 E.
N.W. Australia
h about 35 km.
H 23 58 58.6
eLN" 01 10

22 août ePZ 01 18 38.7 d

22 août 31.5 N., 114.3 W.
Gulf of California
h about 15 km.
H 03 03 20.7
ePZ 03 10 10.5

22 août 34.9 S., 15.1 W.
Tristan da Cunha
h about 33 km.
H 05 42 39
eLZ" 06 27

22 août 32.0 N., 113.8 W.
Gulf of California
h about 15 km.
H 07 34 17
eLN" 07 52.6

22 août e(P)Z 19 12 03
eLZ" 27

22 août 51.9 N., 30.0 W.
N. Atlantic Ridge
h about 33 km.
H 17 04 31.2
ePN 17 10 07

23 août 59.4 N., 30.3 W.
N. Atlantic Ocean
h about 33 km.
H 02 56 13.3
eL 03 11.9

23 août 59.4 N., 30.2 W.
N. Atlantic Ocean
h about 33 km.
H 04 47 46.4
eLZ" 05 01

23 août 6.9 N., 73.0 W.
N. Colombia
h about 161 km.
H 12 23 37.9
ePZ 12 30 42

23 août 21.6 S., 69.6 W.
N. Chile
h about 71 km.
H 13 26 25.4
ePZ 13 37 31

23 août 6.1 S., 149.4 E.
New Britain region
h about 63 km.
H 15 24 05.3
ePPZ" 15 44 52
eN" 46 20
eZ" 56 32
eN" 57 24
eSKKSN"16 01.8

24 août 1.5 S., 78.1 W.
Ecuador
h about 173 km.
H 10 37 23.4
iPZ 10 45 38.6 c
ipPZ 46 16.6

24 août 86.9 N., 52.0 E.
N. of Fraug Josef Land
h about 11 km.
H 21 24 48.0
ePZ 21 33 20
eSN" 41 16

24 août 58.4 N., 150.3 W.
Gulf of Alaska
h about 22 km.
H 21 56 54.2
ePZ 22 05 21
eSN" 12 08

25 août 36.1 N., 28.7 E.
Dodecanese Isl.
h about 50 km.
H 11 11 53.6
ePZ 11 23 20.0
eSN" 32 47

25 août 78.2 N., 126.6 E.
E. of Severnaya Zemlya
h about 50 km.

H 13 47 20.6
ePZ 13 56 56
ipPZ" 58 57
iSN" 14 04 48
iSSN" 08 28

25 août 35.7 N., 29.1 E.
E. Mediterranean Sea
h about 24 km.
H 14 37 32.5
ePZ 14 49 03.5

26 août 52.1 N., 30.1 W.
N. Atlantic Ridge
h about 33 km.
H 03 18 44.1
ePZ 03 24 42.5

26 août 47.2 N., 148.4 E.
N.W. of Kurile Isl.
h about 308 km.
H 05 40 27.1
iPZ 05 52 06.5 d

26 août 57.3 N., 152.7 W.
Kodiak Isl. region
h about 18 km.
H 23 45 04.5
eLZ" 00 12.5

27 août 23.7 N., 143.6 E.
Volcano Isl. region
h about 39 km.
H 01 34 26.7
eLN" 02 09.0

27 août 17.5 S., 173.0 W.
Tonga Isl.
h about 33 km.
H 07 53 54.8
eLN" 08 45

27 août 65.3 N., 133.8 W.
N. Yukon Territory, Canada
h about 33 km.
H 08 53 51.0
iPZ 10 01 03.0 d

27 août 27.5 N., 55.9 E.
S. Iran
h about 33 km.
H 12 56 46.1

eLN" 15 37

27 août 35.5 N., 28.7 E.
E. Mediterranian Sea
h about 33 km.
H 19 31 56.9
ePZ 19 43 29
eSN" 53 00

29 août 57.8 N., 156.0 W.
Alaska Peninsula
h about 78 km.
H 04 08 03.2
ePZ 04 16 45

29 août 19.3 S., 66.3 W.
S. Bolivia
h about 232 km.
H 06 05 24.2
iPZ 06 15 40.8 c
ipPZ 16 42

29 août 3.2 S., 92.2 W.
Galapagos Isl. region
h about 33 km.
H 17 17 34
ePZ 17 27 03

29 août 11.4 N., 87.2 W.
Near coast of Nicaragua
h about 33 km.
H 20 51 55
ePZ 20 58 53.5

30 août 5.0 S., 144.5 E.
New Guina
h about 93 km.
H 08 47 34.7
eP'Z 09 06 30.5

30 août 12.6 N., 88.5 W.
Off coast of Central America
h about 54 km.
H 15 20 50.7
iPZ 15 27 41.3 c
epPZ 57

30 août 29.2 N., 114.4 W.
Baja, California
h about 33 km.
H 21 03 58
eLZ" 21 31

30 août 13.7 S., 172.5 E.
New Hebrides Isl. region

h	about 33 km.		
H	22	30	24.8
eLZ"	23	25	

31 août 35.2 S., 106.0 W.
Easter Isl. Cordillera

h	about 33 km.		
H	02	14	20.3
ePZ	02	26	58

31 août 59.5 N., 145.9 W.
Gulf of Alaska

h	about 33 km.		
H	19	36	38
eLN"	19	59	

31 août 52.4 N., 170.7 W.
Fox Isl. Aleutian Isl.

h	about 33 km.		
H	23	20	19.4
iPZ	23	30	19.0 d

1 sept. 27.2 N., 92.3 E.
India-China border region

h	about 33 km.		
H	13	22	36.6
eSKSN"	13	47	30
eSKKSN"		48	18
eSSN"		56	24

1 sept. 51.2 N., 170.6 W.
Fox Isl. Aleutian Isl.

h	about 25 km.		
H	17	16	40.4
iPZ	17	26	46

2 sept. 7.8 N., 73.3 W.
N. Colombia

h	about 112 km.		
H	18	12	22.9
iPZ	18	19	26.0 d

3 sept. 50.5 N., 129.5 W.
Vancouver Isl. region

h	about 29 km.		
H	05	31	15.0
eLN"	05	48	

3 sept. 30.9 S., 68.4 W.
San Juan Prov., Argentina

h	about 113 km.		
H	10	06	55.9
iPZ	10	18	35.0 c

3 sept. 59.4 N., 145.2 W.
Gulf of Alaska

h	about		
H	12	32	00.6
eLN"	12	58	

5 sept. 24.4 S., 68.2 W.
Chile-Argentina border region

h	about 64 km.		
H	02	09	21.4
iPZ	02	25	28.0 c

5 sept. 5.8 S., 154.0 E.
Solomon Isl.

h	about 69 km.		
H	02	53	50.6
eP'Z	03	12	39.5
ePPZ"		14	20
eSPZ"		23	08

5 sept. 0.6 N., 25.9 W.
Central Mid-Atlantic Ridge

h	about 33 km.		
H	12	27	22.2
eSN"	12	46	07
eSSSN"			52.4

5 sept. 19.2 S., 69.3 W.
N. Chile

h	about 103 km.		
H	15	15	10.9
iPZ	15	16	05.6 d

6 sept. 21.5 S., 66.8 W.
S. Bolivia

h	about 233 km.		
H	16	13	23.2
iPZ	16	23	51.8 d
epPZ		24	51

6 sept. 63.1 N., 147.7 W.
Central Alaska

h	about 33 km.		
H	17	36	44.3
iPZ	17	44	47.8 d

6 sept. 6.0 S., 107.1 W.
N. Easter Isl. Cordillera

h	about 33 km.		
H	21	05	48
ePZ	21	15	50

7 sept. 58.3 N., 152.0 W.
Kodiak Isl. region

h	about 33 km.		
H	07	42	02.3
ePZ	07	50	32.2

7 sept. 4.1 S., 151.7 E.
New Britain region

h	about 246 km.		
H	11	29	17.6
eLZ"	12	17	

9 sept. 58.9 N., 154.5 W.
Alaska Penin.

h	about 33 km.		
H	02	41	46
eLN"	03	06	

9 sept. 58.9 N., 152.8 W.
Kodiak Isl. region

h	about 33 km.		
H	03	36	43
eLN"	04	00.8	

10 sept. 16.4 N., 96.0 W.
Oaxaca, Mexico

h	about 59 km.		
H	09	15	47.0
ePZ	09	22	29

10 sept. 33.0 S., 69.4 W.
Mendoza Prov. Argentina

h	about 80 km.		
H	17	37	08.7
iPZ	17	49	01.5 c

11 sept. 23.9 S., 66.6 W.
Jujuy Prov. Argentina

h	about 195 km.		
H	04	23	56.0
iPZ	04	34	43.5 c
ipPZ		35	36

12 sept. 4.4 S., 144.0 E.
Near N. coast of New Guinea

h	about 120 km.		
H	12	43	19.0
iP'Z	13	02	11.3 d
ipP'Z			40.0
ePPZ"		03	58

12 sept. 18.5 S., 67.0 W.
Bolivia

h	about 237 km.		
H	17	08	38.1
ePZ	17	18	49

12 sept. 11.2 N., 86.9 W.
Near coast of Nicaragua

h	about 33 km.		
H	19	05	47.4
iPZ	19	12	48.2 d

12 sept. 45.4 N., 149.7 E.
Kurile Isl.

h	about 53 km.		
H	20	25	53.5
ePZ	20	38	08

12 sept. 12.5 N., 89.1 W.
Off coast of Central America

h	about 125 km.		
H	21	19	39
iPZ	21	26	31.5 c

12 sept. 49.1 S., 164.2 E.
Auckland Isl. region

h	about 33 km.		
H	22	07	03.2
eP'Z	22	26	21
iPKSN"		29	40
iN"		30	16
iPSE"		39	47
iN"		48	18

13 sept. 12.4 N., 89.2 W.
Off coast of Central America

h	about 51 km.		
H	07	27	29
ePZ	07	34	23

14 sept. 56.7 N., 157.4 W.

Alaska Peninsula

h	about 61 km.		
H	10	17	46.6
ePZ	10	26	39.8

14 sept. 15.0 N., 93.2 W.
Near coast of Chiapas Mexico

h	about 64 km.		
H	13	33	33.7
ePZ	13	40	27

14 sept. 15.5 N., 90.8 W.
Guatemala

h	about 38 km.		
H	15	45	22.2
ePZ	15	52	00.5

14 sept. 45.2 N., 150.3 E.
Kurile Isl.

h	about 33 km.		
H	20	40	26.5
ePZ	20	52	43

14 sept. 16.0 N., 99.9 W.
Near coast of Guerrero, Mexico

h	about 33 km.		
H	21	41	17.2
iPZ	21	48	22.5 d

15 sept. 8.9 N., 93.1 E.
Nicobar Isl. region

h	about 37 km.		
H	15	29	32.2
iP'Z	15	48	29.8 d

15 sept. 60.0 N., 147.1 W.
Gulf of Alaska

h	about 29 km.		
H	01	50	33.9
ePZ	01	58	42 c
iPZ			48.8 d
iSN"	02	05	18

16 sept. 5.9 S., 152.0 E.
New Britain region

h	about 29 km.		
H	05	20	46.1
eP'Z	05	39	53.8 d

16 sept. 22.9 N., 45.1 W.
N. Atlantic Ridge

h	about 33 km.		
H	22	23	36.3
ePZ	22	30	05

16 sept. 56.3 N., 162.8 E.
Near E. coast of Kamchatka

h	about 29 km.		
H	22	37	26.5
ePZ	22	48	24 d

17 sept. 15.6 S., 72.9 W.
S. Peru

h	about 118 km.		
H	07	41	13.9
iPZ	07	51	15.3 d
ipPZ			44.6

17 sept. 44.5 N., 31.3 W.
N. Atlantic Ridge

h	about 24 km.		
H	15	02	00.9
ePZ	15	08	08
eSN"		13	03

17 sept. 38.7 N., 71.9 W.
Off E. coast of United States

h	about 0 km.		
H	22	07	40
ePZ	22	09	23.0

Accidental Chemical Explosion

18 sept. 35.4 N., 28.8 E.
E. Mediterranean Sea

h	about 18 km.		
H	00	08	42.6
ePZ	00	20	22

18 sept. 39.8 N., 29.7 W.
Azores Isl.

h	about 20 km.		
H	13	12	42.3
ePZ	13	19	20
eSN"		24	35

19 sept. 15.3 N., 94.0 W.
Near coast of Oaxaca, Mexico

h	about 42 km.		
H	05	08	15.1
ePZ	05	15	02.5
eSN"		20	42

20 sept. 49.6 S., 116.2 W.
Easter Isl. Cordillera

h	about 33 km.		
H	04	33	29.4
eN"	05	00	40

21 sept. 5.0 N., 76.0 W.
Colombia

h	about 116 km.		
H	00	10	36.8
iPZ	00	18	08.3 c

21 sept. 21.8 S., 179.6 W.
Fiji Isl. region

h	about 609 km.		
H	04	23	19.7
iP'Z	04	40	54.0 c

21 sept. 7.2 S., 74.3 W.
Peru-Brazil border region

h	about 150 km.		
H	13	27	32.9
ePZ	13	36	33

22 sept. 23.9 S., 70.7 W.
Near coast of N. Chile

h	about 33 km.		
H	09	05	06.4
iPZ	09	16	19.6 d

23 sept. 53.6 N., 163.9 W.
Unimak Isl. region

h	about 29 km.		
H	04	59	47.4
ePZ	05	09	18
eSN"		17	00
eSSSN"		22	20

24 sept. 43.5 N., 127.5 W.
Off coast of Oregon

h	about 14 km.		
H	13	59	36.8
eLN"	14	17	

25 sept. 50.3 N., 176.6 E.
Rat. Isl. Aleutian Isl.

h	about 30 km.		
H	15	42	17.9
ePZ	15	53	08

26 sept. 4.9 S., 153.5 E.
New Ireland region

h	about 34 km.		
H	22	55	14.8
eLN"	23	47	

27 sept. 11.3 S., 116.6 E.
S. of Sumbawa Isl.

h	about 33 km.		
H	15	24	17.2
iP'Z	15	43	53.5 c

27 sept. 56.6 N., 152.0 W.
Kodiak Isl. region

h	about 27 km.		
H	15	50	54.7
ePZ	15	59	33
eSN"	16	06	30

27 sept. 21.4 S., 68.7 W.
Chile-Bolivia border region

h	about 132 km.		
H	22	58	29.3
iPZ	23	09	07.0 c
ipPZ			41.5

28 sept. 10.5 N., 60.1 W.
Trinidad

h	about 63 km.		
H	01	05	35.2
ePZ	01	12	29

28 sept. 1.2 S., 24.1 W.
Central Mid-Atlantic Ridge

h	about 37 km.		
H	05	04	55.5
eSN"	05	24	00

28 sept. 43.5 N., 127.1 W.
Off coast of Oregon

h	about 33 km.		
H	15	43	13.6
eLN"	16	01	

28 sept. 61.0 N., 147.4 W.
S. Alaska

h	about 89 km		
H	18	30	20.2
eLN"	18	52	

29 sept. 20.4 S., 174.4 W.
Tonga Isl.

h	about 29 km.		
H	14	00	14.9

eSSN" 14 35.0
eSSSN" 39 20

30 sept. 34.5 N., 23.4 E.
Crete
h about 43 km.
H 04 39 44.0
eLN" 05 15

1 oct. 43.5 N., 126.9 W.
Off coast of Oregon
h about 33 km.
H 11 00 48.3
eLZ" 11 18

1 oct. 49.3 N., 128.8 W.
Vancouver Isl. region
h about 9 km.
H 18 30 01.9
ePZ 18 37 12

2 oct. 51.9 N., 142.9 E.
Sakhalin Isl.
h about 33 km.
H 00 58 39.2
ePZ 01 10 36

2 oct. 10.5 S., 162.4 E.
Solomon Isl.
h about 68 km.
H 13 00 39.7
e(P')Z 13 19 26
eN" 28 56
eSSE" 37.4

2 oct. 21.7 S., 67.7 W.
Chile-Bolivia border region
h about 49 km.
H 16 52 06.4
ePZ 17 02 58
iZ 03 31.6

2 oct. 59.7 N., 144.5 W.
Gulf of Alaska
h about 22 km.
H 22 23 32.4
ePZ 22 31 32

3 oct. 10.7 S., 75.3 W.
Peru
h about 154 km.
H 12 49 31.5
ePZ 12 58 54.6

3 oct. 61.4 N., 147.1 W.
Gulf of Alaska
h about 48 km.
H 13 39 39.9
ePZ 13 47 42.7

4 oct. eLZ" 01 33

4 oct. 8.9 S., 129.2 E.
Timor Sea
h about 78 km.
H 09 11 23
eLZ" 09 48

5 oct. 42.6 N., 142.6 E.
Hokkaido, Japan region
h about 38 km.
H 03 35 08.4
ePZ 03 47 48.8 d

6 oct. 56.5 N., 152.7 W.
Kodiak Isl. region
h about 33 km.
H 01 37 21
eLN" 02 15

6 oct. 18.6 N., 119.6 E.
Philippine Isl. region
h about 33 km.
H 06 11 32.6
eLZ" 07 10.5

6 oct. 36.2 S., 100.9 W.
S. Pacific Ocean
h about 33 km.
H 07 17 57.1
ePZ 07 30 30
eSN" 41 00
ePSN" 41 58
eSSE" 46.5

6 oct. 40.2 N., 28.1 E.
Turkey
h about 10 km.
H 14 29 55.6
ePZ 14 41 07 d

6 oct. 40.3 N., 28.2 E.
Turkey
h about 10 km.

H 14 31 19.2
iPZ 14 43 30.3 d
iSE" 51 43
iE" 56 20
eSSE" 58 30

7 oct. 53.0 N., 36.2 W.
N. Atlantic Ocean
h about 33 km.
H 00 54 18.0
eLN" 01 07.0

7 oct. 6.8 S., 155.2 E.
Solomon Isl.
h about 70 km.
H 03 52 11.3
eLE" 04 57

8 oct. 27.3 N., 110.9 W.
Gulf of California
h about 33 km.
H 12 35 35
eLN" 12 54.3

8 oct. 52.8 N., 168.0 W.
Fox Isl. Aleutian Isl.
h about 33 km.
H 16 53 23.0
ePZ 17 03 19

9 oct. 57.0 N., 151.9 W.
Kodiak Isl. region
h about 17 km.
H 19 55 34.7
eLN" 20 20

9 oct. 16.2 S., 171.9 W.
Samoa Isl. region
h about 33 km.
H 21 34 09.2
eLN" 22 18.8

10 oct. 60.4 N., 146.1 W.
S. Alaska
h about 44 km.
H 19 38 47.7
ePZ 19 46 50

10 oct. 60.5 N., 145.4 W.
S. Alaska
h about 31 km.
H 20 06 39.8
ePZ 20 14 43
eSN" 21 12

11 oct. 16.2 S., 168.2 E.
New Hebrides Isl.
h about 17 km.
H 00 13 13.4
eLZ" 01 15

11 oct. 19.1 N., 156.6 W.
Hawaii region
h about 33 km.
H 10 06 44.9
iPZ 10 18 05.8 d

11 oct. 13.6 S., 166.6 E.
New Hebrides Isl.
h about 68 km.
H 11 10 33.6
eLE" 12 08

11 oct. 17.9 S., 71.5 W.
Near coast of Peru
h about 35 km.
H 14 19 11.5
iPZ 14 29 38.3 d

11 oct. 0.6 S., 121.7 E.
N. Celebes
h about 33 km.
H 21 15 03.9
eP'Z 21 34 16
ePPZ" 36 46
ePKSN" 37 47
ePPPN" 39 52

12 oct. 56.6 N., 152.6 W.
Kodiak Isl. region
h about 33 km.
H 06 06 08.0
eLN" 06 33

12 oct. 3.0 N., 126.7 E.
Talaud Isl.
h about 59 km.
H 15 42 54.7
eP'Z 16 01 46
eE" 21 24

12 oct. 31.3 S., 110.8 W.
Easter Isl. region
h about 25 km.

H	21	55	33.2
ePZ	22	08	02.7
eSSE"		18	27
eE"		24	08

12 oct. 44.4 N., 151.6 E.
Kurile Isl. region

h	about 33 km.		
H	02	20	49.3
ePZ	02	33	06

13 oct. 3.3 S., 149.9 E.
Bismark Sea

h	about 59 km.		
H	10	38	59.3
eLE"	11	30	

13 oct. iPZ	20	14	58.8

14 oct. 33.4 N., 141.8 E.
Off E. coast of Honshu Japan

h	about 33 km.		
H	03	04	59.6
eLE"	03	48	

14 oct. 5.0 N., 75.9 W.
Colombia

h	about 63 km.		
H	11	50	28.7
ePZ	11	58	04.4 d

15 oct. 6.6 S., 154.8 E.
Solomon Isl.

h	about 62 km.		
H	02	07	06.4
eLZ"	03	12	

15 oct. 44.7 N., 149.8 E.
Kurile Isl.

h	about 49 km.		
H	20	26	53.5
iPZ	20	39	10.0 d
iZ			26.0
iSKSE"		49	22

15 oct. 56.8 N., 151.9 W.
Kodiak Isl. region

h	about 33 km.		
H	22	59	43.6
eLE"	23	23	

16 oct. 44.3 N., 149.5 E.
Kurile Isl.

h	about 33 km.		
H	06	59	38.6
iPZ	07	11	59.9 d
iSKSE"		22	14

16 oct. 44.2 N., 149.4 E.
Kurile Isl.

h	about 33 km.		
H	07	21	42.7
ePZ	07	34	06

16 oct. 44.5 N., 149.6 E.
Kurile Isl.

h	about 33 km.		
H	07	37	19.6
ePZ	07	49	41

16 oct. 44.6 N., 149.4 E.
Kurile Isl.

h	about 33 km.		
H	08	18	28.3
iPZ	08	30	48.8 d

16 oct. 44.5 N., 149.1 E.
Kurile Isl.

h	about 33 km.		
H	09	18	16.6
ePZ	09	30	39

16 oct. 44.3 N., 149.4 E.
Kurile Isl.

h	about 33 km.		
H	12	37	28.8
eLE"	13	13	

17 oct. 7.0 S., 155.8 E.
Solomon Isl.

h	about 58 km.		
H	01	38	36.0
eP'Z	01	57	40

17 oct. 59.5 N., 145.5 W.
Gulf of Alaska

h	about 33 km.		
H	02	00	03.3
ePZ	02	08	06

17 oct. 0.7 N., 119.3 E.
N. Celebes

h	about 62 km.		
H	03	17	28.1
eP'Z	03	36	39

17 oct. 35.0 N., 25.4 E.
Crete

h	about 33 km.		
H	09	50	29.5
ePZ	10	01	55

17 oct. 26.7 N., 44.6 W.
N. Atlantic Ridge

h	about 33 km.		
H	14	48	10.9
eLZ"	15	02	

18 oct. 2.8 N., 78.0 W.
Near W. coast of Colombia

h	about 68 km.		
H	02	49	16.8
iPZ	02	57	10.0 c

18 oct. 44.4 N., 149.7 E.
Kurile Isl.

h	about 33 km.		
H	06	16	35.2
ePZ	06	28	56.3 c

18 oct. 2.9 N., 65.7 E,
Carlsberg Ridge

h	about 33 km.		
H	09	06	26.0
eLZ"	10	02	

18 oct. 12.2 N., 89.3 W.
Off coast of Central America

h	about 33 km.		
H	10	45	15.5
ePZ	10	52	12.5

18 oct. 7.0 S., 124.0 E.
Banda Sea

h	about 574 km.		
H	12	32	24.1
eP'Z	12	50	38
ipP'Z"		53	08
iPPZ			30.0
isPZ			48.5
iPKSE"		54	26
ePPPN"		56	32
iZ"	13	08	44

18 oct. 7.1 N., 144.4 E.
Caroline Isl. region

h	about 33 km.		
H	21	38	28.8
eLE"	22	49	

19 oct. 59.7 N., 148.7 W.
Kenai Penin. Alaska

h	53 km.		
H	16	29	49.1
eLE"	16	52	

21 oct. 44.8 N., 111.6 W.
Hebgen Lake region

h	about 33 km.		
H	07	38	31.0
ePZ	07	44	09
eSE"		48	48

21 oct. 28.1 N., 93.8 E.
India-China border region

h	about 37 km.		
H	23	09	18.8
epPZ"	23	27	54
eSN"		34	06
eN"		38.0	

22 oct. eZ	16	06	15

23 oct. 19.8 N., 56.0 W.
N, Atlantic Ocean

h	about 31 km,		
H	01	56	03.2
iPZ	02	02	07.0 c

23 oct. 44.0 N., 147.5 E.
Kurile Isl.

h	about 45 km.		
H	21	06	24.2
iPZ	21	18	49.0 d

24 oct. 44.4 N., 130.0 W.
Off coast of Oregon

h	about 33 km.		
H	06	44	38
eLZ"	07	03	

24 oct. 19.1 S., 169.7 E.
New Hebrides Isl.

h	about 33 km.		
H	09	51	27.3
eLZ"	10	50	

25 oct. 5.0 N., 82.5 W.
S. of Panama

h	about 33 km.		
H	03	43	20.0
iPZ	03	51	03.0

25 oct. 2.0 S., 77.2 W.
Ecuador

h	about 100 km.		
H	06	25	48.6
iPZ	06	34	09.1
ipPZ			46.4

25 oct. 73.5 N., 53.7 E.
Novaya Zemlya

h	about 0 km.		
H	07	59	58.8
ePZ	08	09	42

25 Oct. 2.0 S., 79.0 W.
Ecuador

h	about 57 km.		
H	22	56	32.8
iPZ	23	05	04.2 c

26 oct. 8.9 N., 83.9 W.
Costa Rica

h	about 33 km.		
H	00	55	22.3
ePZ	01	02	38

26 oct. 2.2 S., 126.8 E.
Malacca Passage

h	about 48 km.		
H	14	22	57.8
eP'Z	14	42	04

26 oct. 56.8 N., 152.3 W.
Kodiak Isl. region

h	about 33 km.		
H	14	32	49.3
eLZ"	14	59.5	

27 oct. 47.8 N., 16.1 E.
Austria

h	about 39 km.		
H	19	46	12.0
eLZ"	20	17	

27 oct. 45.6 S., 96.1 E.
S.E. Indian Rise

h	about 33 km.		
H	21	24	31.2
eP'Z	21	44	41

28 oct. 29.6 S., 70.7 W.
Central Chile

h	about 45 km.		
H	00	22	07.3
ePZ	00	33	46

28 oct. 17.7 N., 94.2 W.
Chiapas Mexico

h	about 159 km,		
H	01	34	54.5
iPZ	01	41	13.0 c

30 oct. 35.0 S., 107.3 W.
Easter Isl. Cordillera

h	about 33 km,		
H	02	10	37.6
eSE"	02	33	50

30 oct. 56.6 N., 152.2 W.
Kodiak Isl. region

h	about 33 km.		
H	17	13	13.8
eLE"	17	40	

1 nov. 51.8 N., 130.8 W.
Queen Charlotte Isl region

h	about 33 km.		
H	04	55	47.4
eLE"	05	15.4	

1 nov. 51.7 N., 175.4 W.
Andreanof Isl. Aleutian Isl.

h	about 20 km.		
H	06	46	54.1
ePZ	08	57	14

1 nov. 3.1 N., 128.1 E.
N. Halmahera

h	about 65 km.		
H	12	26	06.2
eP'Z	12	45	10.5

2 nov. 4.1 S., 76.9 W.
N. Peru

h	about 91 km.		
H	06	50	58.2
eP	06	59	42

4 nov. 19.7 S., 69.2 W.
N. Chile

h	about 102 km.		
H	02	11	24.9
iPZ	02	21	55.7 d
ipPZ		22	22.3

5 nov. 5.5 S., 147.2 E.
E. New Guinea region

h	about 197 km.		
H	04	19	39.5
eP'Z	04	38	21

5 nov. 18.2 N., 68.4 W.
Mona Passage

h	about 183 km.		
H	08	47	06.3
eZ	08	53	20

6 nov. 44.4 N., 149.0 E.
Murile Isl.

h	about 60 km.		
H	09	53	22.4
iPZ	10	05	41.3 c

7 nov. 12.0 N., 88.0 W.
Off coast of Central America

h	about 33 km.		
H	01	36	56.5
iPZ	01	43	54.8 c

7 nov 45.5 N., 150.3 E.
Murile Isl.

h	about 33 km.		
H	14	49	13.4
iPZ	15	01	28.3 d

7 nov. 0.4 N., 100.1 E.
N. Sumatra

h	about 107 km.		
H	18	37	43.7
eLE"	19	42	

8 nov. 49.0 S., 163.7 E.
Auckland Isl. region

h	about 33 km.		
H	02	43	57
eP'Z	03	03	27
ePSE"		16.5	
eSSE"		25.7	

9 nov. 7.2 S., 128.2 E.
Banda Sea

h	about 129 km.		
H	04	44	19.9
eP'Z	05	03	29.5

9 nov. 39.8 N., 48.4 E.
N.W. Iran - USSR border region

h	about 65 km,		
H	08	05	48.9
ePZ	08	18	11

9 nov. 19.3 N., 121.0 E.
Philippine Isl. region

h	about 33 km.		
H	18	43	38.6
eLZ"	19	43	

10 nov. 59.4 N., 144.6 W.
Gulf of Alaska

h	about 10 km.		
H	08	01	26.1
ePZ	08	09	29

11 nov. 56.6 N., 161.4 E.
Near E. coast of Kamchatka

h	about 33 km.		
H	13	17	37.5
iPZ	13	28	36.0 c

11 nov. 20.0 N., 108.9 W.
Revilla Gigedo Isl Region

h	about 33 km.		
H	16	45	09
ePZ	16	52	37

11 nov. 56.6 N., 166.4 E.
Near E. coast of Kamchatka

h	about 33 km		
H	17	28	50.5
ePZ	17	39	49

11 nov. 56.5 N., 161.3 E.
Near E. coast of Kamchatka

h	about 33 km.		
H	17	53	19.3
ePZ	18	04	22

11 nov. 13.4 S., 75.0 W.
Peru

h	about 99 km.		
H	18	48	56.6
iPZ	18	58	44.5 c

11 nov. 56.5 N., 161.3 E.
Near E. coast of Kamchatka

h	about 33 km.		
H	19	06	57.1
iPZ	19	17	56.0 d

11 nov. 56.6 N., 161.3 E.
Near E. coast of Kamchatka

h	about 33 km.		
H	19	13	39.3
ePZ	19	24	39

12 nov. 47.1 N., 146.6 E.
N.W. of Kurile Isl.

h	about 328 km.		
H	05	16	26.2
iPZ	05	28	07.0 d

12 nov. 18.0 S., 69.9 W.
N . Chile

h	about 80 km.		
H	12	13	34.6
iPZ	12	23	58.5 c

13 nov. 13.0 N., 89.6 W.
Off coast of Central America

h	about 86 km.		
H	08	02	38.5
ePZ	08	09	22
ipPZ			43.0

13 nov. 29.2 S., 178.1 W.
Kermadec Isl. region

h	about 77 km.		
H	21	57	30
eP'Z	22	16	17

14 nov. 33.6 N., 131.6 E.
Kyushu, Japan

h	about 60 km.		
H	03	56	06.6
iPZ	04	09	37.0 d
pPZ			55

14 nov. 18.2 N., 105.5 W.
Off coast of Jalisco Mexico

h	about 33 km.		
H	12	52	46.3
eP	13	00	02

15 nov. 24.0 N., 122.2 E.
Taiwan region

h	about 42 km.		
H	15	52	21.5
eLZ"	16	50	

15 nov. 34.9 N., 5.2 W.
Morocco

h	about 3 km.		
H	20	03	49.6
ePZ	20	13	03

15 nov. 47.2 N., 147.3 E.
N.W. Kurile Isl.

h	about 297 km.		
H	23	57	21
iPZ	00	09	03.4 d

16 nov. 36.9 N., 121.8 W.
Central California

h	about 33 km.		
H	02	46	43
ePZ	02	53	49

16 nov. 1.0 N., 118.8 E.,
Borneo

h	about 33 km.		
H	22	40	44.0
eLZ"	23	54	

17nov. 16.3 S., 173.7 W.
Tonga Isl.

h	about 33 km.		
H	00	01	17.1
eLZ"	00	57	

17 nov. 5.7 S., 150.7 E.
New Britain

h	about 45 km.		
H	08	15	39.3
ePZ"	08	31	12
iP'Z		34	35.5 c
iPPZ"		36	18
eSKKPZ"		47	42
eSSE"		53	45
eSSSE"		56	52

17 nov. 13.2 N., 89.6 W.
El Salvador

h	about 54 km.		
H	16	17	03.0
ePZ	16	23	51

17 nov. 12.7 N., 144.9 E.
S. of Mariana Isl.

h	about 43 km.		
H	19	00	10.4
eLZ"	20	00	

18 nov. 13.1 S., 75.0 W.
Peru

h	about 80 km.		
H	04	03	58.0
ePZ	04	13	48

18 nov. 31.2 S., 67.6 W.
San Juan Prov. Argentina

h	about 8 km.		
H	05	01	41.4
ePZ	05	13	34.6 d

18 nov. 6.0 S., 148.2 E.
New Britain region

h	about 49 km.		
H	14	34	54.5
eP'Z	14	53	53

18 nov. 20.2 S., 174.1 W.
Tonga Isl.

h	about 33 km.		
H	22	21	01.9
eLE"	23	17	

19 nov. 6.0 S., 150.8 E.
New Britain region

h	about 3 km.		
H	23	35	06.0
iP'Z	23	54	10.0 c
ePPZ"		56	00
iZ"	00	07	38
eSSE"		13	00
iZ		13	45

19 nov. 6.9 S., 149.9 E.
New Britain region

h	about 33 km.		
H	23	55	06.8
iP'Z	00	14	11.0 d

20 nov. 44.6 N., 149.5 E.
Kurile Isl.

h	about 33 km.		
H	23	33	08.9
iPZ	23	45	29.0 d

21 nov. 1.0 N., 124.0 E.
N. Celebes

h	about 248 km.		
H	02	16	44.5
eP'Z	02	35	30

21 nov. iPn 05 30 24.0
iSN 39.0

21 nov. 6.2 S., 150.5 E.
New Britain region

h	about 153 km.		
H	12	41	47.8
eLZ"	13	49	

21 nov. 12.8 N., 145.2 E.
S. of Mariana Isl.

h	about 35 km.		
H	15	34	13.2
eLZ"	16	35	

21 nov. 5.7 S., 150.8 E.
New Britain region

h	about 59 km.		
H	23	26	22.3
eLZ"	00	17	

22 nov. 24.0 N., 45.4 W.
N. Atlantic Ridge

h	about 33 km.		
H	00	02	33.3
ePZ	00	08	55.5

22 nov. 22.9 S., 65.7 W.
Jujuy Prov. Argentina

h	about 135 km.		
H	05	24	01.6
iPZ	05	34	53.0 d

22 nov. 6.2 S., 150.4 E.
New Britain region

h	about 47 km.		
H	05	46	33.3
iP'Z	06	05	30.0 d

24 nov. 6.3 S., 150.9 E.
New Britain region

h	about 33 km.		
H	01	38	49.6
eLZ"	02	44	

24 nov. 6.7 S., 107.4 E.
Java

h	about 125 km.		
H	10	41	33.5
eZ	11	00	34
iZ		04	17.6

24 nov. 13.1 N., 124.7 E.
Luzon, Philippine Isl.

h	about 5 km.		
H	12	40	51.4
eP'Z	12	59	47
ePPZ"	13	01	10
eSPZ"		10	49
eSSE"		17	28

25 nov. 37.4 N., 81,5 W.
Coal mine disturbance in Virginia

h	about 0 km.		
H	02	50	05
ePN	02	52	36

25 nov. 4.3 S., 122.2 E.
Celebes

h	about 610 km.		
H	09	24	08.9
eZ	09	45	00

26 nov. 24.9 N., 122.0 E.
Taiwan region

h	about 33 km.		
H	10	21	07.2
eP'Z"	10	40	10

27 nov. 54.2 N., 150.9 E.
Kurile Isl.

h	about 33 km.		
H	05	36	01.5
iPZ	05	48	16.1 d

27 nov. 62.6 N., 151.5 W.
Central Alaska

h	about 113 km.		
H	07	47	06.7
iPZ	07	55	17.0

27 nov. 37.9 N., 138.3 E.
Near W. coast of Honshu Japan

h	about 36 km.		
H	13	47	42.7
ePZ	14	00	51

28 nov. iPZ 15 31 24.0
eSN 32 21

28 nov. 7.7 S., 71.2 W.
W. Brazil

h	about 626 km.		
H	16	41	33.4
iPZ	16	49	55.6 d

28 nov. 8.0 S., 71.4 W.
W. Brazil

h	about 655 km.		
H	16	49	30.3
iPZ	16	57	51.0 d

29 nov. 6.8 N., 73.2 W.
N. Colombia

h	about 171 km.		
H	09	11	05.8
iPZ	09	18	14.9 d

30 nov. 6.9 N., 94.8 E.
Nicobar Isl. region

h	about 33 km.		
H	12	27	38.6
eP'Z	12	46	44
ePPZ"		48	44
ePSN"		58	45
eSSE"	13	05	44
eSSSN"		11	00

30 nov. 53.7 N., 167.7 W.
Fox Isl. Aleutian Isl.

h	about 69 km.		
H	22	40	46.0
iPZ	22	50	26.0 d

1 déc. 79.5 N., 3.9 E.
Greenland Sea

h	about 33 km.		
H	07	39	50.2
iPZ	07	47	52.0 d

2 déc. 22.4 S., 70.3 W.
Near coast of N. Chile

h	about 79 km.		
H	08	17	41.9
iPZ	08	28	29

2 déc. 53.8 N., 165.4 W.
Fox Isl. Aleutian Isl.

h	about 35 km.		
H	13	18	29.0
iPZ	13	28	13.0 c

3 déc. 15.0 S., 66.8 E.
Mid-Atlantic Rise

h	about 46 km.		
H	03	50	01.2
eLZ"	04	56	

4 déc. 7.8 N., 102.7 W.
Off coast of Mexico

h	about 33 km.		
H	01	54	49.3
eLZ"	02	16	

4 déc. 77.3 N., 6.4 E.
Svalbard region

h	about 33 km.		
H	07	43	47
ePZ	07	51	56

4 déc. 6.4 S., 150.7 E.
New Britain region

h	about 101 km.		
H	15	48	43.4
eLZ"	16	42	

6 déc. 15.4 S., 70.5 W.
S. Peru

h	about 164 km.		
H	03	15	37.7
ePZ	03	25	32.5 d

6 déc. 2.3 S., 138.3 E.
W. New Guinea

h	about 33 km.		
H	04	27	16
eLZ"	05	32	

6 déc. eLZ" 09 11

7 déc. 5.4 S., 151.3 E.
New Britain region

h	about 54 km.		
H	08	58	43.8
iP'Z	09	17	36.5

7 déc. 6.4 S., 76.2 W.
N. Peru

h	about 177 km.		
H	15	55	56.8
iPZ	16	04	49.0 d

7 déc. 51.7 N., 158.0 E.
Near E. coast of Kamchatka

h	about 50 km.		
H	18	30	17
ePZ	18	41	44

7 déc. 6.7 N., 82.2 W.
S. of Panama

h	about 30 km.		
H	18	52	47.6
ePZ	19	00	18

7 déc. 18.9 S., 69.6 W.
N. Chile

h	about 127 km.		
H20	20	41	42.0
ePZ	20	52	04

8 déc. 37.4 N., 139.2 E.
Near S. coast of Honshu Japan

h	about 19 km.		
H	17	49	46.3
ePZ	18	03	08

9 déc. 27.5 S., 63.2 W.
Santiago del Estero Prov.

h	about 585 km.		
H	13	35	42.4
iPZ	13	46	16.5 d
iPcPZ			28.1
ipPZ		48	17.3
iPPZ		49.	08
iSN		55	00

9 déc. 20.4 S., 68.0 W.
S. Bolivia

h	about 80 km.		
H	16	44	02.2
ePZ	16	54	41

9 déc. 1.1 S., 77.4 W.
Ecuador

h about 242 km.
H 19 12 21
iPZ 19 20 27 c

10 déc. 40.4 N., 138.9 E.
E. Sea of Japan
h about 33 km.
H 15 11 05.5
ePZ 15 24 00.8
iPZ 01.7 d
ePPZ 27 48
eSKSN" 34 34
eSN" 50

12 déc. 6.9 S., 150.6 E.
New Britain region
h about 33 km.
H 07 20 00.0
eP'Z 07 39 02

12 déc. 52.6 N., 169.3 W.
Fox Isl. Aleutian Isl.
h about 33 km.
H 10 10 17.0
ePZ 10 20 10

13 déc. 64.9 N., 165.7 W.
Alaska
h about15 km.
H 00 33 24.7
iPZ 00 42 27.4 d
eSN" 49 48

13 déc. 20.1 N., 122.0 E.
Philippine
h about 33 km.
H 13 15 49.8
eLZ" 14 10.5

13 déc. eLN" 22 48

14 déc. 54.3 S., 2.4 W.
S. Atlantic Ridge
h about 33 km.
H 01 59m05.6
ePPSN" 02 28 36
eN" 35
eN" 39.2

14 déc. 55.8 N., 160.1 W.
Alaska Penin.
h about 33 km.
H 17 16 47.7
eLN" 17 46

14 déc. 13.9 N., 90.5 W.
Near coast of Guatemala
h about 33 km.
H 21 29 06
eL 21 46

15 déc. 20.8 N., 106.6 W.
Off coast of Jalisco, Mexico
h about 33 km.
H 03 40 16.5
ePZ 03 47 20

15 déc. 7.1 N., 73.2 W.
N. Colombia
h about 119 km.
H 08 24 20.7
ePZ 08 31 31.5

15 déc. 14.7 N., 91.7 W.
Guatemala
h about 118 km.
H 12 13 25.8
iPZ 12 20 02.5 c
ipPZ 21.5
eSN" 25 27

15 déc. 7.2 S., 76.9 W.
N. Peru
h about 33 km.
H 16 20 11
ePZ 16 29 29

15 déc. 51.0 N., 169.6 W.
Fox Isl. Aleutian Isl.
h about 33 km.
H 22 34 07.7
iPZ 22 44 08.3 c

16 déc. 3.2 S., 147.5 E.
Bismarck Sea
h about 33 km.
H 02 21 30.7
eLN" 03 17

16 déc. 3.2 S., 147.3 E.

Bismarck Sea
h about 33 km.
H 03 08 12.1
eLN" 04 04

16 déc. 6.0 N., 125.3 E.
Mindanao Philippine Isl.
h about 121 km.
H 03 55 17.4
eP'Z 04 14 07

17 déc. 45.4 N., 150.1 E.
Kurile Isl.
h about 17 km.
H 05 18 34.8
iPZ 05 30 52.9 d
eSN" 41 20

17 déc. 16.0 N., 96.9 W.
Oaxaca , Mexico
h about 36 km.
H 13 59 25.3
ePZ 14 06 18.5

17 déc. 51.4 N., 177.9 W.
Andreanof Isl. Aleutian Isl.
h about 57. km.
H H 23 44 46.2
ePZ 23 55 11
eSN" 00 03 54

20 déc. 37.5 N., 141.6 E.
Near E. coast of Honshu Japan
h about 40 km.
H 13 31 54.7
ePZ 13 45 10

20 déc. 22.2 S., 69.1 W.
N. Chile
h about 100 km.
H 15 45 25.3
ePZ 15 56 11.2
1Z 48.8

21 déc. 60.5 N., 146.8 W.
S. Alaska
h about 43 km.
H 17 36 29.0
iPZ 17 44 35.0 c

21 déc. 63.1 N., 150.3 W.
Central Alaska
h about 111 km.
H 18 22 03.0
ePZ 18 40 08.0 c

22 déc. 9.5 S., 71.3 W.
Peru-Brazil border region
h about 614 km.
H 00 24 48.7
iPN 00 33 23.6 d

22 déc. 18.4 N., 68.8 W.
Mona Passage
h about 115 km.
H 08 01 12.6
ePN 08 06 51
epPN 07 10.3
isPN 17.5
eSE' 11 32

22 déc. 31.9 N., 117.1 W.
Off coast of Baja California
h about 14 km.
H 20 54 35.3
iPZ 21 01 38.0
eSN" 07 22

23 déc. 27.4 S., 63.1 W.
Santiago del Estero Prov.
Argentina
h about 580 km.
H 06 30 38
iPZ 06 41 12.0 c

23 déc. 51.1 N., 175.5 W.
Andreanof Isl. Aleutian Isl.
h about 33 km.
H 09 16 52.9
ePZ 09 27 17.5

23 déc. 30.3 N., 131.1 E.
Kyushu, Japan
h about 33 km.
H 19 47 59.3
eLE" 20 34

24 déc. 4.4 S., 153.1 E.
New Ireland region

h	about 93 km.		
H	18	45	45.5
iP'Z	19	04	33.5 d

25 déc. 18.8 S., 69.0 W.
N. Chile

h	about 117 km.		
H	08	48	37.7
iPZ	08	59	00.7
ipPZ			33.9

25 déc. 32.3 N., 113.7 W.
W. Arizona

h	about 33 km.		
H	14	09	48
eLE"	14	35	

25 déc. 18.0 N., 101.2 W.
Near coast of Guerrero Mexico

h	about 71 km.		
H	16	30	01.9
ePZ	17	36	54.5

25 déc. 34.8 N., 139.3 E.
Near S. coast of Honshu, Japan

h	about 33 km.		
H	17	01	32.2
ePZ	17	14	53

25 déc. 25.3 S., 68.1 W.
Chile-Argentina border region

h	about 101 km.		
H	17	56	50.1
iPZ	18	07	48.0 c

26 déc. 16.7 N., 99.6 W.
Near coast of Guerrero, Mexico

h	about 33 km.		
H	08	16	28.9
iPZ	08	23	30.2 d
eSN"		29	27

26 déc. 51.8 N., 156.8 E.
Kamchatka

h	about 136 km.		
H	14	30	29.1
iPZ	14	41	49.4 c
ipPZ		42	23.3
iSE"		51	06
eScSN"			42

26 déc. 59.3 N., 152.9 W.
S. Alaska

h	about 35 km.		
H	23	50	23.8
ePZ	23	58	57

27 déc. 12.9 N., 125.4 E.
Samar, Philippine Isl.

h	about 33 km.		
H	17	43	21.4
ePPZ"	18	03	36
ePSN"		13	04
eSSE"		17	37

28 déc. 22.1 S., 179.6 W.
S. of Fiji Isl.

h	about 611 km.		
H	16	16	11.0
iP'Z	17	33	47.1 c
isN"		42	06
iN"		46	00
eSS		50	32
eP'P'E"		54	04
eSKPN"		57	45

29 déc. 51.5 N., 175.0 W.
Andreanof Isl. Aleutian Isl.

h	about 38 km.		
H	01	40	08.4
ePZ	01	50	27.7

29 déc. 51.4 N., 174.9 W.
Andreanof Isl. Aleutian Isl.

h	about 22 km.		
H	06	35	02.2
iPZ	06	45	22.7 d

29 déc. 51.5 N., 174.8 W.
Andreanof Isl.

h	about 33 km.		
H	06	39	08.0
iPZ	06	49	26.0 d

29 déc. 51.8 N., 175.1 W.
Andreanof Isl.

h	about		
H	10	09	42.4
ePZ	10	19	54.8 d

30 déc. 8.7 S., 109.3 W.
N. Easter Isl. Cordillera

h	about 33 km.		
H	09	58	01
ePZ	10	08	30

30 déc. 31.3 N., 138.8 E.
S. of Honshu, Japan

h	about 261 km.		
H	15	27	25.8
iSE"		51	35

31 déc. 35.8 N., 25.6 E.
Crete

h	about 86 km.		
H	16	18	01.7
iPZ	16	29	14.5d

31 déc. 4.6 S., 153.0 E.
New Britain region

h	about 77 km.		
H	23	13	30.9
eP'Z	23	32	20

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