

Publikasjoner fra
DET NORSKE INSTITUTT FOR KOSMISK FYSIKK
Nr. 54

THE AURORAL OBSERVATORY AT TROMSØ
($\varphi=69^{\circ} 39'.8$ N, $\lambda=18^{\circ} 56'.9$ E Gr.)

OBSERVATIONS 1963

1965
A.S JOHN GRIEGS BOKTRYKKERI, BERGEN

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OZONE OBSERVATIONS

The table of ozone values of Tromsø covers 9 months and that of Longyear, Svalbard (78.2° N.) only 7 months.

Sky-observations are possible at Tromsø the whole year and at Longyear say 10 months, but the evaluation of values during the polar night period is too doubtful to be trusted in.

All observations were taken with Dobson Spectrophotometers, at Tromsø by Steinar Berger, at Longyear we did not succeed in getting any observer till the end of the year.

TROMSØ

TABLE OF OZONE VALUES 1963

Unit 0.001 cm.

M: diurnal mean. N: number of observations. R: Diurnal range.

Day	Feb.		Mar.		Apr.		May		June		July		Aug.		Sep.		Oct.	
	M.	N. R.	M.	N. R.	M.	N. R.	M.	N. R.	M.	N. R.	M.	N. R.	M.	N. R.	M.	N. R.	M.	N. R.
1	—		—		461	1	382	1	340	2 1	324	1	279	2 0	272	1	252	1
2	472	1	—		446	1	399	2 12	366	1	322	2 0	276	1	268	2 2	—	
3	480	1	—		452	1	365	3 12	359	1	342	2 13	302	1	261	1	—	
4	479	1	—		400	1	367	1	317	2 0	343	1	283	1	265	2 16	252	1
5	—		—		408	1	302	1	385	1	339	1	265	2 0	275	1	267	1
6	457	1	—		416	1	335	2 4	348	2 8	328	1	264	2 15	296	2 1	255	1
7	404	2 12	—		419	1	359	3 15	348	1	335	1	275	1	288	1	279	1
8	—		—		412	1	367	1	333	2 5	336	2 9	294	1	272	1	339	1
9	—		—		480	1	350	2 7	355	1	327	2 13	282	1	253	2 0	269	1
10	—		—		476	1	353	3 16	373	2 9	314	2 3	276	1	283	1	289	2 5
11	—		—		435	1	356	2 4	360	2 7	310	2 0	290	1	296	2 5	314	1
12	498	1	—		390	1	345	1	370	2 8	314	2 5	305	2 7	293	2 4	321	1
13	—		—		390	1	356	3 9	350	1	339	2 7	294	2 8	267	1	287	1
14	486	1	—		375	1	337	2 9	353	2 5	—		203	2 14	299	2 6	—	
15	—		—		—		—		346	2 11	332	1	276	2 24	309	1	239	1
16	—		—		—		398	1	355	1	336	1	306	2 1	274	2 10	204	1
17	—		—		447	1	367	1	328	3 10	335	1	288	2 1	—		—	
18	—		—		485	2 11	360	2 20	337	2 16	337	1	283	1	314	1	—	
19	—		—		385	2 14	362	1	343	2 9	370	1	291	2 2	305	2 19	235	1
20	—		—		423	1	375	2 11	340	2 9	318	1	282	2 0	262	1	—	
21	—		—		476	1	386	2 15	329	1	358	1	289	2 2	—		246	1
22	—		—		389	3 19	368	2 3	—		320	1	306	2 7	234	1	292	1
23	—		456	1	379	1	385	1	348	1	328	1	302	2 0	262	1	—	
24	—		405	1	362	1	372	2 5	339	2 0	313	1	282	1	268	1	262	1
25	—		—		389	2 2	351	2 0	347	1	313	1	295	1	—		—	
26	—		390	1	367	1	344	1	325	2 9	326	1	291	2 1	—		—	
27	—		386	1	351	1	336	3 11	329	2 6	337	1	293	2 11	—		—	
28	—		417	2 2	363	1	340	3 2	325	2 10	277	1	311	1	296	1	—	
29	—		424	1	—		—		309	2 4	302	1	308	2 2	299	1	219	1
30	—		417	2 4	—		352	2 3	343	1	290	1	311	2 9	—		204	1
31	—		454	1	—		339	2 3	—		257	1	279	2 6	—		—	
Mean	468		419		415		359		348		325		290		280		265	

EARTH MAGNETISM, 1963 TROMSØ

GENERAL REMARKS

The instrumental equipment used for the magnetic measurements and registrations is the same as that previously used, a description of which is given in No. 1 and No. 33 of the present series of publications.

The observations were made by S. Berger and the calculation work by Grete Brochmann.

SCALE-VALUES

The following scale-values were determined:

D — curves:	1'.45 or 4.73 <i>y</i> per mm.
H — curves:	5.27 <i>y</i> per mm.
V — curves:	7.25 <i>y</i> per mm.

EXPLANATION OF THE TABLES

The hourly mean values of the components are centered at half hours Gr. M. T. The column headed *M* gives the diurnal means. *R* designates the range, i.e. the difference between the maximum and minimum value measured on the magnetogram. The horizontal line *M* gives the monthly means of the hourly values, and the line marked *QM* gives the monthly means of estimated quiet hourly values. In addition to the main tables, resuming tables and figures are given at the end of the year-book.

The "Storminess" tables earlier given have been omitted.

EARTH MAGNETISM 1963 BEAR ISLAND

By means of the registrations we may give some approximate annual values for 1963.

$$D = 2^{\circ}39' \text{ E}, H = 9235 \text{ } y, V = 52310 \text{ } y.$$

For comparison we print the *K* indices of Bear Island and Tromsø side by side.

K-INDICES FOR THREE-HOUR INTERVAL 1963.

Tromsø

Range 2000 y for $K = 9$. Scale values: 4,73 y . $H = 5,27 y$. $V = 7,25 y$.

Date	Jan.	Feb.	Mar.	Apr.	May	Jun.
1	3311 2433	1013 4456	4432 3254	4442 2200	6643 3436	3313 3325
2	2000 0111	2000 0031	3103 2111	0000 1243	4444 2546	3322 3331
3	0100 0122	0100 0121	1122 2134	4001 1121	5222 3346	1222 3112
4	3010 3343	0000 1243	3001 1221	1013 4455	5344 3455	2120 2100
5	1000 0123	0010 2323	0110 1154	6543 3556	5323 2443	0010 0000
6	0000 0001	1111 1212	1120 2353	5443 3345	3422 2343	0000 2265
7	3210 1342	1100 0034	1110 0036	4343 3325	0113 2234	6643 4356
8	0000 0044	0000 0000	5534 4555	5112 2342	5222 3336	4223 3236
9	1000 0000	0000 1126	4433 3336	0211 2322	3233 3245	5423 3223
10	1110 0010	6543 5465	5544 5667	0000 1020	4423 3555	3011 2243
11	0000 1344	5433 4466	7433 3365	0012 0012	6423 3355	3211 2334
12	2100 0125	5454 3356	6433 3332	4012 3244	5212 3354	2101 0224
13	6534 3456	6444 4676	0012 4333	3303 3344	5534 3356	3302 2222
14	5445 3575	5443 3354	3110 0001	5202 5546	6333 2125	4022 2332
15	5443 3254	4122 4222	1210 0110	5233 4144	3222 2134	2222 3343
16	6234 4366	1111 2411	0000 0102	4301 1353	4000 0013	1001 0223
17	4443 2345	0211 2112	1001 1355	5201 1343	2012 3231	5123 5544
18	4323 3356	1002 2120	1212 5434	3102 3456	1000 1220	4524 5466
19	5233 4556	0001 1011	4321 2336	4221 1333	0002 2345	5420 2344
20	4012 1023	1111 2135	2111 0145	5112 3420	4401 1110	6524 3344
21	1100 1021	2002 2443	2220 1000	0002 2223	2100 1242	4212 0123
22	1110 0024	1112 1235	0000 1112	5202 1266	0000 1100	2111 1122
23	4312 2134	1011 1310	2112 4334	4522 2100	0101 1010	2011 0121
24	1111 1354	0000 0013	1002 2234	0000 1032	0000 1100	0001 3433
25	5121 1231	3211 1111	4001 2113	2010 0014	1113 4233	4533 4256
26	0000 0001	1111 2103	0000 1141	3200 0055	5312 2235	7542 2245
27	0000 1011	0000 0002	0000 1110	3012 3351	4111 2225	4534 3265
28	0000 0011	2211 2104	0001 1113	0000 0112	5533 2233	5332 4434
29	0000 0245		2211 2122	0000 0121	6732 3223	3131 3444
30	4334 5566		1000 1022	0002 2445	4542 2240	5323 3365
31	5664 5653		0011 2115		0212 4344	
Date	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	4422 1000	6423 4455	6224 3443	1210 0122	2332 1334	3000 0223
2	0012 1100	5443 1254	3000 1255	0000 1113	3322 3654	2201 4445
3	1001 1000	5411 2244	5313 3243	2001 1232	5342 2046	5444 5577
4	0212 3456	4233 4445	2020 1024	2212 3312	1121 1043	4442 3466
5	4431 2226	5523 3235	3011 2245	1202 1243	1100 0000	6443 4675
6	4533 2332	4432 2335	6212 2124	0220 0232	2112 4446	5343 5555
7	4433 4323	5422 2113	2000 1144	1111 1326	3444 4676	4343 3443
8	3332 3335	4221 2200	3433 4212	4532 2443	6554 4566	4223 3455
9	4533 3245	3223 2211	4423 4143	1010 0235	6433 4676	1022 3200
10	3232 2344	1102 4510	2112 2215	4012 2366	6234 3764	0000 0000
11	3221 1122	1011 2233	4223 3475	2124 4446	5433 2255	0000 0010
12	3211 0011	1101 1242	5332 3233	6543 4676	3333 2564	1000 0025
13	2211 1201	0000 1013	1011 0146	4543 3357	2111 1224	4310 1133
14	1110 2200	2100 0100	6555 6676	7754 4664	2220 1013	2211 4553
15	2001 1101	0001 2245	4444 4766	5333 3266	3201 1121	3111 0232
16	5411 2334	1101 2322	5544 4476	4333 3553	1100 0002	3200 0223
17	5335 4535	3112 0255	7555 4556	2111 1213	1002 4552	3000 0120
18	4222 4545	3224 5445	5314 4545	3202 2133	0100 0020	0000 0011
19	4101 2230	3311 2455	5445 4554	3222 2234	0000 0001	0000 0152
20	0111 2222	6654 5455	4313 5454	4312 4456	2300 1020	4232 4364
21	0235 5453	6443 4335	4423 5664	3332 1011	0000 0343	2000 2346
22	2233 4533	5323 3326	5774 4467	0000 1100	4312 1132	3121 4365
23	3232 4466	6644 4344	8842 3311	0000 1034	0212 4567	2012 1465
24	6634 4545	5322 3332	0022 2367	6556 4446	5433 3320	5110 1354
25	3443 3245	2222 2235	7854 4775	6332 1254	0010 0000	1001 0010
26	5322 3245	4321 3334	4642 3566	4321 1222	0001 0034	0110 0223
27	6442 4435	3012 4475	5333 3377	1100 0041	1310 0000	2210 0011
28	5222 1100	4444 5566	7653 5576	0001 0365	1210 3435	3021 1354
29	0000 1234	4324 3254	5434 3366	5423 4777	4101 4244	3313 4544
30	5533 4365	4322 3446	6423 3102	6433 2111	5322 1110	3100 2224
31	6333 3336	5222 4536		0122 1101		0000 0023

K-INDICES FOR THREE-HOUR INTERVAL 1963.

Bear Island.

Range 2000 *y* for K = 9. Scale values: D = 5,7 *y*. H = 6,0 *y*. V = 21,2 *y*.

Date	Jan.	Feb.	Mar.	Apr.	May	Jun.
1	3222 3343	24— 1141	3322 3444	3452 3221	4554 3536	— 3443
2	3322 4343	2222 1241	3222 2222	1211 1344	3534 4333	3333 3232
3	3333 3433	2222 1011	2243 2652	3122 1233	3343 3433	— —
4	3222 3333	2232 1111	2322 2222	2212 3343	4433 3334	— —
5	3433 4343	3322 3334	3433 2445	4— 3343	5433 2223	222— —
6	3323 4332	3321 2111	2232	233— 3445	3423 3255	— —1
7	— 2221	2233 2211	— 2234	333— 2433	4322 2225	2— —3
8	2343 2222	3432 1221	2432 2454	5222 2532	3233 —35	554— —3
9	4322 2112	2212 2235	3322 2554	2322 —	3632 —64	4433 3332
10	3322 1111	5544 4565	3443 5555	— —	5332 —	3112 3—
11	2332 2111	3655 3665	6433 3333	— —	— —	—223 3234
12	3443 2254	5533 2353	3543	— 5535	— —122	3223 2222
13	5544 5555	4333 2343	—3 4433	4223 6355	— 4345	4423 4323
14	4434 3445	4232 3365	3210 1233	4344 —	3434 2224	4213 3222
15	4454 3254	3222 3322	3212 0100	— 3262	4333 322—	3332 3—
16	5444 4334	2222 3322	1221 1222	3422 2443	— —	— —
17	4544 3443	2222 1002	2111 2223	3222 2342	— —31	— —
18	5353 3354	3222 2001	3522 2325	2223 3356	221— 2232	— —
19	4344 3334	3333 3133	3222 3312	2432 2442	1111 —	— —
20	5454 2232	1112 3235	3212 2224	6222 3542	— —	— —
21	2233 2322	2222 3232	3322 2232	2223 —135	— 3323	— —
22	3322 2234	4342 3202	2222 2545	3232 —444	2222 33—	— —
23	2432 —3—	442— 1332	3322 4325	5222 1111	— 3332	— —
24	2335 2222	1111 2223	2223 2543	1223 1123	2222 3322	— —
25	2332 2222	3321 2332	2223 2332	4412 1134	3323 —	— —
26	2322 —	1122 3232	2222 3353	2310 —223	— —	— —
27	— 0132	2111 1213	2221 2342	322— —102	— —	— —
28	1110 1221	3332 3112	1123 2244	13— 1223	— —	— —
29	2100 4243	— —	3321 3244	2212 2243	— —	— —
30	4321 3555	— —	3211 1143	1223 2665	— —	— —
31	463— 2101	— —	1123 2125	— —	— —	— —

Date	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	— —	4533 4445	4334 4632	3123 2343	2243 2445	3221 1245
2	— —	3554 3365	4222 3356	1112 2244	4434 3653	3333 4443
3	— —	4432 3355	4433 —55	3222 3353	4454 2256	5554 5666
4	1133 4355	4344 —	2232 3234	3323 3213	3333 3264	3543 5664
5	3552 3325	— 4256	3322 3234	22— 2254	3222 1122	4453 5666
6	5554 3344	4543 4535	5323 3334	4321 3221	4223 4465	4454 7564
7	4534 3324	5534 4223	2121 3245	3441 3443	4444 4676	4454 3354
8	4434 —	3434 3122	4333 4324	4232 1332	5544 4776	5344 4564
9	— —35	— —	2643 4334	2263 1244	5553 4666	3333 4422
10	3433 3244	— 2233	3333 4234	3223 5433	5644 35—4	0022 0000
11	4332 —344	3221 3335	3444 4554	4532 4455	4543 35—4	0110 1132
12	— 2222	2212 3344	4343 3325	5453 4786	4—43 3652	3201 1345
13	2112 1322	3121 3234	2122 3224	3553 4477	2332 2444	5432 2255
14	2122 1322	3222 3223	5556 5664	4544 5664	2432 2124	3333 —53
15	2212 2233	2022 3355	3454 5665	4434 4366	4221 3243	2333 2343
16	— 3333	2222 3243	4655 4575	5344 4753	3311 1122	4421 3345
17	3554 5423	4233 3356	6445 4473	2333 1333	1124 4442	4010 2342
18	2333 3535	3445 5335	4434 4642	3324 3454	1211 1141	1101 0133
19	3222 3243	3413 3455	5554 5664	3332 3444	1111 —	1000 1226
20	2222 3323	7654 4435	3333 —	4424 —556	— 2232	3443 4374
21	2334 7464	5454 4334	— —	3443 2332	1111 2332	2221 3556
22	3334 4543	3343 4345	3367 —	1111 2101	2111 2553	3333 4465
23	3443 4465	6554 4333	7753 3322	0111 1153	4433 2253	3233 2465
24	5545 6434	6433 4343	1111 4555	5455 4344	2333 3357	5222 3465
25	3553 3335	3333 3256	6532 4663	4444 5433	4443 3431	2122 2342
26	4533 3344	3443 3244	4554 4354	2221 2255	1011 2221	2322 2245
27	6543 4334	5223 3335	5565 4765	4332 2252	1011 2221	3332 2233
28	5433 3222	3444 4675	7643 4443	2102 1454	1122 1144	4343 2465
29	1131 3334	3434 3335	4667 4355	5433 5667	3422 1212	— —
30	5554 4344	3333 3553	4433 1232	4343 1211	1332 3336	— —
31	4444 5734	3333 5724	— —	1133 2112	4233 5453	— —

DAILY SUM OF K-INDICES 1963.

Tr. means Tromsø. B.I. means Bear Island.

Date	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sep.		Oct.		Nov.		Dec.	
	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.	Tr.	B.I.
1	20	22	24	—	27	25	18	22	35	34	23	—	13	—	33	32	29	28	8	21	21	27	10	20
2	5	24	6	16	12	17	10	17	34	28	20	—	5	—	28	34	16	16	6	17	28	32	22	27
3	6	25	5	11	16	26	10	17	27	26	14	22	3	—	23	30	—	—	11	22	26	32	41	42
4	17	21	10	13	10	17	23	20	33	27	8	—	23	25	29	—	—	21	16	20	13	27	33	36
5	7	26	11	23	13	28	37	—	26	24	1	—	24	28	28	—	—	18	15	17	2	15	39	39
6	1	23	10	14	17	—	31	24	23	27	15	—	25	33	26	33	20	26	11	18	24	30	35	39
7	16	—	9	16	12	26	27	21	16	22	37	—	26	28	20	28	12	20	16	26	38	39	28	32
8	8	20	0	18	36	26	20	23	26	—	25	—	25	—	13	22	22	26	27	20	41	42	28	35
9	1	17	10	19	29	26	13	—	25	—	24	25	29	—	16	—	25	29	12	24	39	40	10	24
10	4	14	38	38	42	34	3	—	31	—	16	—	23	26	14	—	16	25	24	25	36	31	0	4
11	12	15	35	39	34	28	6	—	31	—	19	—	14	23	13	22	30	33	27	32	29	28	1	9
12	11	27	35	29	27	—	20	—	25	—	12	28	9	—	12	21	24	27	41	42	29	27	8	19
13	36	38	41	25	16	17	23	30	34	—	16	25	10	—	5	19	14	18	34	28	14	26	16	28
14	38	31	31	38	6	15	29	—	25	—	18	19	7	15	4	19	46	42	43	38	11	20	23	20
15	26	31	19	19	6	9	26	—	19	—	21	—	6	17	14	22	39	38	31	34	11	21	13	23
16	34	31	12	18	3	13	20	24	8	—	9	—	23	—	12	20	39	41	29	35	4	14	12	26
17	29	31	10	11	16	14	19	20	14	—	29	—	33	31	19	29	42	37	12	21	19	22	6	16
18	29	31	8	12	22	24	24	26	6	—	35	—	28	27	29	32	31	31	16	28	3	12	2	10
19	33	28	4	22	24	18	19	23	16	—	24	—	13	21	24	26	—	—	20	20	1	—	8	12
20	13	27	15	18	15	18	18	26	12	—	31	—	11	19	40	38	29	—	29	30	8	—	28	32
21	6	19	17	18	7	19	11	18	12	—	15	—	27	33	32	32	34	—	14	24	4	14	17	26
22	9	21	16	20	5	24	24	22	2	—	11	—	25	29	27	29	44	19	2	8	10	20	25	31
23	20	—	8	19	20	24	16	15	4	—	8	—	30	33	35	33	30	32	8	13	17	26	21	28
24	17	21	4	13	14	23	6	15	2	18	14	—	37	36	23	30	22	30	40	34	27	29	20	29
25	16	18	11	19	12	19	8	20	18	—	32	—	28	30	20	28	47	35	26	31	23	29	3	18
26	1	—	10	16	7	22	15	13	23	—	31	—	26	29	23	27	36	34	17	21	1	26	9	22
27	3	—	2	13	3	18	18	—	18	—	32	—	32	32	26	27	34	43	7	23	8	10	7	21
28	2	9	13	18	7	19	4	—	26	—	28	—	13	24	38	37	44	35	15	19	5	16	19	31
29	11	16	4	—	13	22	4	18	28	—	23	—	10	19	27	28	34	40	39	39	19	17	27	—
30	36	28	16	16	6	16	19	27	23	—	30	—	34	34	28	28	21	22	21	19	20	24	14	—
31	40	17	11	17	11	17	17	20	20	—	30	—	30	35	29	30	21	22	8	14	14	5	—	—

MONTHLY AND ANNUAL MEANS OF THE MAGNETIC ELEMENTS 1963.

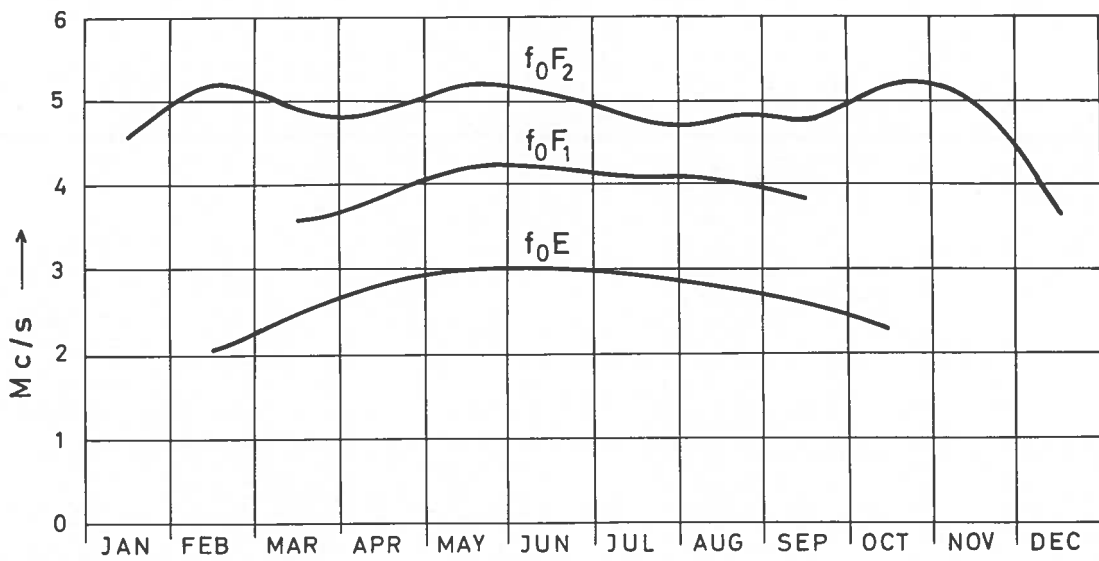
Tromsø.

Month	All days			Five Quiet			Five disturbed		
	D	H	V	D	H	V	D	H	V
	0°W+	11100y+	51000y+	0°W+	11100y+	51000y+	0°W+	11100y+	51000y+
Jan.	-1.2	120	43	1.5	135	51	-6.4	86	16
Feb.	-0.9	126	56	-0.2	136	55	-6.0	93	51
Mar.	-1.5	122	52	-1.0	132	60	-5.3	82	39
Apr.	-1.2	126	62	-0.9	135	65	-2.9	117	63
May	-2.8	119	60	-1.0	137	61	-4.9	98	66
June	-3.7	128	64	-3.9	141	58	-4.5	95	60
July	-4.9	129	57	-3.3	143	61	-6.3	111	62
Aug.	-6.1	120	63	-3.4	157	60	-9.5	84	74
Sep.	-8.5	92	78	-5.3	114	60	-13.2	39	90
Oct.	-5.4	111	82	-8.3	141	83	-9.2	55	86
Nov.	-5.6	122	81	-4.6	139	87	-9.9	73	80
Dec.	-5.4	143	76	-4.3	144	85	-6.8	121	61
Year	-3.9	122	65	-3.0	138	66	-7.0	88	62

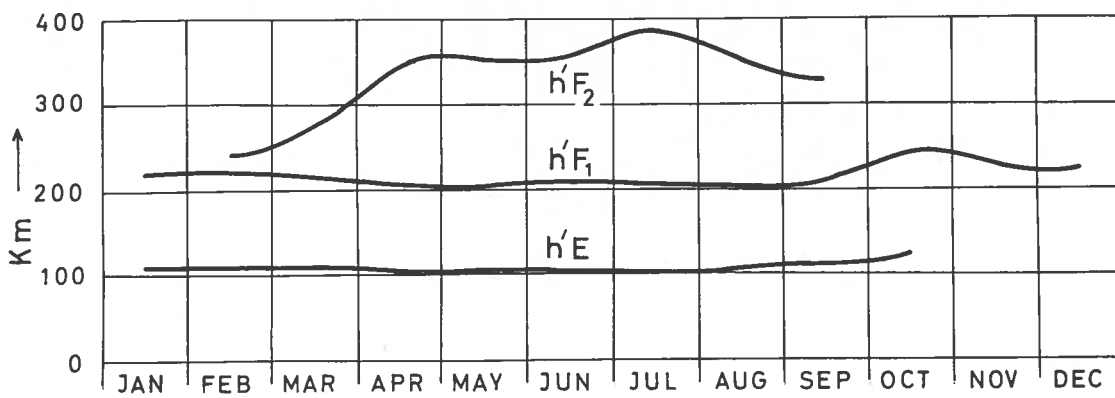
ANNUAL MEANS OF THE MAGNETIC ELEMENTS

1930-1963

Year	D	H	V
1930	4°7'.7W	115 67	—
31	3°59.6	49	501 98
32	49.0	114 99	95
33	37.3	72	502 03
34	25.9	41	23
35	14.3	07	47
36	4.8	113 79	76
37	2°53.7	50	503 08
38	44.1	25	40
39	35.0	112 97	62
40	26.6	78	81
41	16.6	56	504 17
42	10.6	44	24
43	2.5	22	49
44	1°54.3	13	67
45	45.7	111 99	505 03
46	34.6	79	54
47	26.5	74	85
48	18.4	56	94
49	10.5	53	506 12
50	3.6	52	47
51	0°54.1	43	93
52	43.9	44	507 11
53	36.0	53	24
54	29.1	65	44
55	24.0	72	76
56	18.1	73	508 25
57	15.9	82	68
58	12.7	94	509 02
59	8.1	96	35
1960	3.9	97	80
61	2.1	112 14	510 04
62	-0.1	17	35
63	-3.9	22	65



MONTHLY MEDIAN NOON-VALUES (12^h MET) FOR THE CRITICAL FREQUENCES AND THE VIRTUAL HEIGHTS FOR THE E-LAYER, F_1 -LAYER AND F_2 -LAYER.



RADIO ECHO OBSERVATIONS 1963.

Tromsø.

Declination. D = 0° W + Tabular Quantities expressed in Tenths of Minutes.

Gr. M. T.

HOURLY MEAN VALUES

JANUARY 1963																											
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	R		
1	-37	-31	-9	-31	0	9	6	15	18	15	43	28	31	40	49	67	77	28	0	0	-46	-6	-34	-61	12	303	
2	0	0	-9	-9	-6	-6	-3	0	0	15	21	18	18	9	6	9	21	6	-9	0	-25	-21	-15	-12	0	86	
3	-6	0	3	6	15	9	9	6	21	25	37	43	28	31	15	25	21	40	52	37	34	6	-15	-12	18	116	
4	-55	-34	-25	0	6	6	9	6	3	3	28	37	49	46	46	18	92	116	107	67	-31	-34	-46	-15	15	726	
5	-15	3	6	0	0	0	0	0	6	12	-9	12	28	34	37	-12	0	-18	-21	-31	-46	-58	-31	-55	-18	-6	261
6	-31	-28	-18	-15	-12	-12	-15	-12	-9	-9	0	0	0	0	0	0	0	6	0	-6	-12	-18	-15	-18	-9	116	
7	-28	-25	-92	-43	-18	-3	9	15	15	18	18	18	25	46	55	120	107	-37	190	61	0	-9	-49	-43	15	509	
8	-37	-28	-6	-9	-15	-21	-15	-12	0	3	15	28	28	18	9	3	12	15	31	61	-18	-37	-123	-58	-6	377	
9	-3	0	0	-3	-3	-3	-3	0	0	15	25	31	43	25	28	31	18	15	0	0	0	0	0	-15	9	101	
10	-15	-28	-43	-25	-12	6	12	6	15	9	37	37	37	37	52	37	34	6	0	0	0	0	0	0	15	95	
11	6	6	0	0	0	0	0	0	6	6	25	40	46	61	77	58	77	126	0	77	67	37	-46	-37	28	411	
12	40	15	-15	-28	-21	-9	-9	0	9	12	12	15	28	31	34	40	37	67	86	74	31	-116	-123	-215	0	592	
13	-107	-579	-307	-343	92	77	74	89	61	77	89	64	110	70	46	-46	77	0	-123	55	55	0	-276	-392	-49	1524	
14	-628	-276	-153	-43	-104	67	70	64	58	67	61	101	55	92	70	153	-291	-123	31	-337	-153	-104	-15	-178	-64	2045	
15	-184	-150	-83	-184	-221	-31	0	123	80	64	107	64	40	58	-28	61	92	31	-28	-12	-169	-129	-184	-107	-34	1275	
16	-52	-475	-236	-49	-25	6	34	31	31	77	58	95	43	31	-58	-107	25	89	40	-46	-398	-613	-113	-398	-95	1524	
17	-52	-116	-46	0	15	70	92	138	64	61	37	31	46	31	-28	31	70	-435	31	12	-95	-208	-162	-138	-37	1045	
18	-208	-190	-70	-6	-31	9	40	46	15	43	31	25	61	67	0	64	77	-31	37	15	-236	-276	-822	-736	-86	1827	
19	-803	-86	-61	6	15	40	31	31	0	6	46	31	70	92	61	92	129	31	144	153	0	-398	-475	-589	-52	1653	
20	-230	-15	25	21	9	12	21	15	46	31	49	67	37	0	6	15	9	9	0	-31	-25	-21	-15	9	3	189	
21	0	-21	-6	0	6	0	0	9	6	15	21	31	34	31	31	31	28	25	21	12	12	0	28	12	15	132	
22	18	21	12	15	9	25	34	21	18	25	28	31	40	37	31	34	34	31	28	43	37	15	6	-138	18	622	
23	-224	-227	-92	-77	0	31	49	46	34	40	67	64	64	74	61	43	31	49	46	-31	-9	-104	-172	-12	-9	668	
24	-6	34	25	31	34	49	46	43	15	37	40	31	61	61	55	43	80	147	92	55	-267	-307	-259	-337	-6	929	
25	-37	-147	-61	34	61	49	46	52	25	31	37	40	61	37	43	49	58	25	-61	-92	-31	15	9	9	3	197	
26	12	21	25	25	34	31	31	28	31	37	40	31	28	28	28	25	25	25	25	-9	31	31	15	25	28	159	
27	28	31	31	31	28	31	31	34	34	46	52	52	49	40	37	37	40	34	18	31	12	31	37	28	34	86	
28	25	31	31	34	31	31	31	37	55	61	58	58	61	61	58	55	58	55	46	37	31	25	37	31	43	116	
29	25	15	21	31	31	31	31	34	40	61	61	61	61	58	67	70	74	64	40	-107	-126	-190	-46	21	622		
30	-107	-138	-58	-21	0	32	21	32	86	-15	92	74	215	95	101	184	245	101	31	83	-40	-254	-9	-674	0	2232	
31	-220	-1533	-1564	-153	116	-169	-92	-178	-46	31	15	0	-61	9	31	61	-138	451	178	15	-31	-25	-31	-98	-172	2596	
M	-147	-129	-89	-31	0	12	18	25	21	31	40	40	49	46	31	43	40	31	34	12	-43	-86	-101	-132	-12	766	
QM	0	3	6	6	6	6	9	12	15	21	28	34	37	34	28	28	28	25	15	6	-3	-6	-6	-3	12		

HOURLY MEAN VALUES

FEBRUARY 1963																										
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	R	
1	-70	-46	-25	-21	-9	-6	0	15	46	83	80	86	64	101	123	129	120	89	0	34	123	-144	-138	-95	21	1450
2	-46	-37	-46	-31	-25	-15	-9	0	6	37	31	15	9	0	0	9	9	12	15	15	-92	0	0	-6	-6	435
3	-3	0	0	6	3	18	25	31	34	55	61	61	55	34	12	9	6	-12	-21	-37	-15	-9	18	9	15	159
4	9	12	9	9	6	6	6	9	9	25	31	34	31	28	34	31	40	61	67	64	-49	-61	-43	0	15	405
5	6	3	6	6	6	6	-6	-9	-6	9	28	43	46	46	61	126	40	15	6	0	-55	-77	-46	-31	9	334
6	-15	0	-3	3	9	9	-6	-9	0	6	21	31	37	58	37	92	34	18	3	0	0	-21	-6	12	218	
7	0	0	9	15	12	9	0	-6	-15	-6	3	18	18	15	-9	15	18	25	25	-55	-141	-153	-46	-9	362	
8	-12	-15	-6	-9	0	6	3	3	0	9	3	6	6	6	0	0	0	0	0	0	0	0	-3	-6	0	58
9	0	0	0	0	0	6	3	3	3	15	31	31	28	25	28	25	31	40	46	52	49	0	-92	-221	3	1146
10	-184	-218	-322	-395	-107	-80	0	6	55	64	34	58	61	46	61	52	-92	-37	-181	-224	-107	-98	-116	-132	-77	2060
11	-227	-9	-31	-28	-31	-25	-28	28	31	-6	-28	37	15	18	80	-6	-184	-31	-199	-123	-58	-153	-77	-43	1333	
12	-70	-175	0	-123	-46	9	83	15	15	37	61	31	15	15	15	15	-6	-162	-46	31	-184	-107	-276	-46	898	
13	-64	-178	-58	-107	0	40	25	101	77	64	58	34	-37	21	-28	-126	-162	0	31	-460	-230	18	-58	-215	-49	1769
14	-236	-245	-120	-101	-83	15	28	9	-12	80	61	46	31	28	-37	-61	-107	-15	-21	6	0	-37	-46	-28	-37	929
15	-43	-46	-34	-25	-21	-9	9	9	9	28	34	15	15	6	0	21	0	-28	-64	0	-9	-15	-15	-15	-9	303
16	-28	-18	-25	-15	-6	0	6	21	28	12	12	9	-25	-15	6	-101	-15	3	-3	-6	-9	-18	-12	-9	261	
17	-15	-15	-15	-9	-12	6	6	6	15	0	3	-3	6	6	0	0	-6	3	-12	6	-6	-25	-25	-3	116	
18	-18	-21	-25	-15	-18	-9	-6	0	9	25	31	31	31	18	12	25	-64	15	21	28	12	0	0	-3	3	189
19	-21	-15	-9	-6	0	6	9	21	25	25	18	12	28	28	28	31	31	28	28	31	15	6	0	0	12	74
20	0	-18	-21	-25	-15	-15	9	31	37	28	28	31	31	61	58	40	52	61	31	-28	-15	-153	-368	-147	-12	1305
21	-31	-28	-43	-31	-18	-12	0	25	31	21	28	25	25	12	9	61	9	74	49	28	9	-43	-83	-18	3	334
22	-6	-18	-9	-9	0	-6	6	31	12	31	25	31	31	28	15	15	9	15	-34	-61	-15	-58	-46	-28	-3	334
23	-15	-12	-12	-9	-6	0	6	40	31	31	34	37	6	9	0	15	-6	-40	-25	-15	-12	-9	-9	0	218	
24	-12	-25	-21	-28	-18	-12	21	18	18	37	40	31	37	31	18	28	-6	-15	-3	0	-6	-28	-46	-15	3	159
25	-83	-58	-64	-70	-46	-15	-6	-9	-6	0	9	21	37	31	6	12	0	6	-18	-18	-12	-25	-15	-9	-15	218
26	-12	-25	-21	-28	-18	-12	21	18	18	37	40	31	37	31	18	28	-6	-15	-3	0	-6	-28	-46	-15	3	159
27	-15	-25	-15	-9	-9	-6	0	6	0	12	9	12	9	6	3	0	6	0	6	0	-6	-28	-18	-34	-3	144
28	-15	-12	-28	-25	-12	-21	-15	-9	12	25	34	40	28	67	18	18	15	6	0	-6	-9	-6	-46	-189	-6	493
M	-43</																									

Tromsø.

Declination. D = 0° W + Tabular Quantities expressed in Tenths of Minutes.

Gr. M. T.

APRIL 1963

HOURLY MEAN VALUES

Table with columns DAY (1-31), 1-23, M, R for APRIL 1963. Contains magnetic declination data for each hour of the month.

MAY 1963

Table with columns DAY (1-31), 1-23, M, R for MAY 1963. Contains magnetic declination data for each hour of the month.

JUNE 1963

Table with columns DAY (1-30), 1-23, M, R for JUNE 1963. Contains magnetic declination data for each hour of the month.

Tromsø. Declination. D = 0° W + Tabular Quantities expressed in Tenths of Minutes.

Gr. M. T.

Table for July 1963 showing hourly mean values. Columns include Day (1-31), M, and R. Values range from -337 to 319.

Table for August 1963 showing hourly mean values. Columns include Day (1-31), M, and R. Values range from -337 to 828.

Table for September 1963 showing hourly mean values. Columns include Day (1-30), M, and R. Values range from -337 to 184.

Tromsø. Declination. D = 0° W + Tabular Quantities expressed in Tenths of Minutes.

Gr. M. T.

Table for October 1963 showing hourly mean values for days 1-31. Columns include Day, hours 1-24, M, and R. Values range from -154 to 511.

Table for November 1963 showing hourly mean values for days 1-30. Columns include Day, hours 1-24, M, and R. Values range from -135 to 420.

Table for December 1963 showing hourly mean values for days 1-31. Columns include Day, hours 1-24, M, and R. Values range from -111 to 457.

Tromsø.

Horizontal Intensity. H = 11100 + Tabular Quantities expressed in Gamma.

Gr. M. T.

HOURLY MEAN VALUES

APRIL 1963

Table for APRIL 1963 showing hourly magnetic intensity observations. Columns include DAY (1-30), hours (1-24), M (Magnetic Intensity), and R (Reference Value).

MAY 1963

Table for MAY 1963 showing hourly magnetic intensity observations. Columns include DAY (1-31), hours (1-24), M (Magnetic Intensity), and R (Reference Value).

JUNE 1963

Table for JUNE 1963 showing hourly magnetic intensity observations. Columns include DAY (1-30), hours (1-24), M (Magnetic Intensity), and R (Reference Value).

Tromsø. Horizontal Intensity. H = 11100 + Tabular Quantities expressed in Gamma. Gr. M. T.

Table for October 1963 showing hourly mean values. Columns include Day (1-31), Hourly values (1-23), M, and R. Summary row QM: 142 143 144 145 145 144 142 139 135 132 131 133 136 139 142 145 148 150 150 148 145 143 142 141 142 383

Table for November 1963 showing hourly mean values. Columns include Day (1-30), Hourly values (1-23), M, and R. Summary row QM: 139 140 141 142 143 144 143 141 139 138 138 139 141 142 144 144 142 141 141 142 142 141 140 139 141 291

Table for December 1963 showing hourly mean values. Columns include Day (1-31), Hourly values (1-23), M, and R. Summary row QM: 145 146 147 149 150 151 150 149 148 147 146 147 148 149 150 150 149 149 149 148 146 145 144 144 147 316

Tromsø.

Vertical Intensity. $V = 51000 \pm$ Tabular Quantities expressed in Gamma.

Gr. M. T.

JANUARY 1963

HOURLY MEAN VALUES

Table with columns: DAY, 1-23, M, R. Rows include hourly data for January 1963, including monthly totals (M, R) and quarterly totals (QM).

FEBRUARY 1963

Table with columns: DAY, 1-23, M, R. Rows include hourly data for February 1963, including monthly totals (M, R) and quarterly totals (QM).

MARCH 1963

Table with columns: DAY, 1-23, M, R. Rows include hourly data for March 1963, including monthly totals (M, R) and quarterly totals (QM).

Tromsø.

Vertical Intensity. $V = 51000 +$ Tabular Quantities expressed in Gamma.

Gr. M. T.

APRIL 1963

HOURLY MEAN VALUES

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	R		
1	30	80	90	40	10	-13	-90	-20	-35	60	65	60	55	80	80	85	80	65	60	60	65	60	60	60	45	268	
2	60	60	60	55	55	59	59	60	65	60	60	60	60	70	75	60	40	30	40	30	40	35	30	55	56	109	
3	55	40	59	60	57	60	63	65	65	70	65	60	60	64	60	60	70	85	75	70	55	50	50	65	62	181	
4	60	55	45	43	49	49	50	45	55	45	55	40	100	85	85	75	25	-10	-120	-40	90	90	180	57	406		
5	150	80	20	-10	20	20	35	30	50	75	90	80	85	85	105	75	40	65	-40	-50	15	140	160	40	57	486	
6	5	20	35	50	65	60	65	65	105	80	70	110	80	78	110	75	95	85	45	45	-5	50	-120	-50	50	181	
7	25	55	60	45	60	65	65	70	90	85	85	80	95	98	80	90	100	90	85	75	60	55	90	140	77	435	
8	-30	40	55	65	65	65	70	70	74	70	75	75	80	70	65	70	75	45	-5	40	50	55	50	58	232		
9	50	60	55	55	45	40	53	70	75	75	65	65	65	80	75	75	80	80	60	65	55	15	35	50	60	181	
10	65	65	65	70	70	65	65	65	60	60	60	65	70	90	75	75	75	75	75	75	45	50	60	60	67	123	
11	60	65	65	65	65	65	65	65	60	65	70	65	60	60	65	70	70	65	60	60	55	55	55	55	62	36	
12	5	-40	20	50	60	60	65	65	70	60	73	85	55	50	100	100	70	80	65	45	70	50	35	50	58	116	
13	55	60	50	45	30	35	60	65	65	70	85	105	115	120	85	95	80	50	36	45	90	90	70	70	74	145	
14	150	5	10	55	70	75	70	70	70	90	95	100	105	115	10	-80	15	65	90	80	100	150	150	140	75	268	
15	130	110	120	5	15	35	50	75	90	90	80	90	100	100	110	90	95	100	80	30	40	70	80	100	79	326	
16	110	25	30	20	50	60	55	65	70	75	75	70	75	70	75	70	65	85	80	80	70	120	25	75	65	145	
17	130	40	25	60	60	60	60	65	60	85	80	75	80	90	85	80	70	40	60	80	65	50	30	20	64	348	
18	20	55	60	60	55	60	65	65	65	65	65	65	80	80	90	98	75	45	50	30	80	100	50	120	64	544	
19	70	20	53	55	50	35	50	45	35	80	75	70	70	70	70	75	83	65	60	48	35	35	30	56	203		
20	15	15	60	60	55	55	50	60	60	70	65	65	75	125	120	70	100	121	105	85	75	70	65	71	181		
21	65	65	70	70	70	70	65	65	65	65	65	65	85	105	110	100	80	70	80	70	70	65	50	30	71	102	
22	25	15	-50	0	47	60	65	70	60	60	65	65	73	70	63	80	90	90	75	70	130	45	10	12	56	355	
23	15	10	-40	70	15	-3	5	40	60	55	60	75	110	110	125	100	85	80	65	65	65	65	60	65	58	87	
24	65	65	70	70	70	70	65	70	65	60	55	60	65	70	70	65	60	60	60	30	20	15	30	50	58	87	
25	5	25	45	55	65	55	55	55	55	50	55	55	60	65	75	73	70	60	70	75	55	40	25	55	54	87	
26	50	25	20	40	50	45	45	60	60	60	55	55	60	60	60	60	65	70	75	75	70	65	55	-30	52	174	
27	-18	25	45	50	45	45	50	50	50	50	70	83	60	110	135	80	85	100	80	30	90	80	70	70	65	428	
28	65	65	70	70	70	70	70	70	65	65	65	65	65	60	60	60	65	70	65	70	80	63	45	70	65	58	
29	65	70	70	60	50	50	50	50	50	50	50	50	50	60	65	65	70	70	60	60	30	40	50	55	59	51	
30	60	60	60	55	60	57	55	55	55	55	60	53	55	55	55	50	10	115	115	10	220	120	110	150	75	645	
M	54	44	47	50	52	51	51	58	61	67	68	70	74	85	80	72	72	73	61	49	63	62	55	66	62	233	
QM	60	61	62	63	62	61	61	61	61	60	60	61	62	64	66	68	69	68	66	64	62	61	60	60	63		

MAY 1963.

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	R		
1	90	75	280	110	10	50	70	65	90	85	110	90	90	125	85	90	10	30	95	90	70	140	60	-40	82	362	
2	40	170	50	15	55	65	75	80	75	95	120	110	90	95	105	75	50	-80	60	55	75	110	100	60	73	507	
3	-20	40	65	55	55	65	65	65	65	65	65	70	80	80	110	90	75	85	75	55	10	30	205	90	69	145	
4	100	150	-80	-10	35	50	75	80	90	80	65	85	75	85	110	90	60	5	10	70	150	170	-60	66	399		
5	-135	-50	0	15	40	40	65	80	85	80	80	85	95	90	90	75	85	50	70	75	45	20	50	55	43	254	
6	50	45	45	15	10	10	35	45	55	65	65	75	70	75	95	95	105	90	75	50	-10	-20	30	60	51	87	
7	65	70	70	65	60	60	65	60	65	65	80	85	90	75	90	75	75	85	65	40	30	40	30	50	65	109	
8	50	-10	15	15	25	65	75	75	80	75	65	60	80	100	90	90	85	85	75	60	50	120	-40	10	59	167	
9	30	40	60	60	60	70	75	45	60	65	65	75	100	100	75	80	95	85	70	60	15	40	-20	65	399		
10	5	40	10	70	10	65	75	65	75	85	65	70	75	80	90	85	-10	-20	-65	-100	-40	10	60	140	39	435	
11	150	100	-80	25	35	70	85	85	85	80	90	85	120	90	80	100	85	80	75	50	-10	40	90	-50	64	254	
12	20	60	-25	15	40	50	60	70	75	80	70	75	90	70	120	95	80	75	75	90	160	150	140	100	76	217	
13	30	-10	-120	-15	-10	25	45	60	70	105	110	95	95	110	110	70	100	85	40	-35	110	110	20	-90	41	625	
14	-40	-95	-80	-40	-15	-5	45	65	75	110	105	95	90	85	85	85	85	70	80	80	95	50	-50	45	181		
15	-40	40	65	65	60	55	55	65	75	70	65	80	95	95	80	85	80	85	60	45	55	40	30	40	60	130	
16	35	30	35	50	65	70	75	75	70	70	65	65	70	70	70	70	70	70	70	70	65	55	60	40	62	73	
17	50	60	65	70	65	65	65	60	60	60	70	80	105	95	120	130	25	90	75	95	85	80	70	75	70	80	
18	75	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	70	87	
19	70	70	70	70	65	60	60	60	60	50	55	55	75	90	85	100	100	80	75	75	60	140	210	200	86	544	
20	150	30	-25	-30	-15	0	35	45	65	70	60	60	75	85	80	75	60	60	55	60	60	60	55	55	51	471	
21	55	45	50	55	60	50	60	50	55	55	50	55	60	50	55	60	60	50	40	-30	15	20	45	60	47	160	
22	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	44
23	60	60	60	65	65	60	55	50	50	55	50	50	50	45	45	60	60	60	60	60	60	60	60	60	60	60	44
24	60	60	65	65	60	60	55	55	60	45	45	50	50	50	60	65	70	65	50	50	50	50	50	55	55	225	
25	55	55	55	60	60	60	55	50	50	45	45	30	70	75	130	95	70	70	50	10	-15	40	50	45	55	225	
26	60	-70	-110	-70	-10	25	60	65	60	60	50	50	50	65	60	70	60	80	80	60	50	30	20	30	35	305	
27	-20	15	35	50	50	55	65	65	60	60	60	70	70	60	100	95	75	70	60	65	65	65	65	160	64	218	
28																											

Tromsø.

Vertical Intensity. $V = 51000 +$ Tabular Quantities expressed in Gamma.

Gr. M. T.

HOURLY MEAN VALUES

JULY 1963.

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	R	
1	70	5	35	-5	30	35	60	70	70	65	55	60	65	60	60	70	65	60	60	55	55	60	60	60	57	36
2	60	60	55	55	55	55	55	45	50	55	55	45	55	60	60	70	70	65	55	55	55	55	55	55	53	44
3	55	60	50	50	50	50	50	50	50	55	60	50	60	70	65	60	60	55	50	50	50	50	50	55	54	29
4	60	60	60	60	55	35	30	25	35	30	30	35	40	100	105	115	95	30	15	100	180	160	150	60	69	326
5	90	90	10	30	20	-30	-10	15	20	45	45	40	55	70	75	75	55	60	65	60	60	55	120	90	50	189
6	90	80	30	-70	-60	-40	-10	55	70	50	40	40	55	70	65	70	60	45	5	-5	20	45	55	55	40	109
7	55	55	20	-45	-25	25	30	45	60	75	90	110	80	65	80	90	75	85	85	75	65	64	45	15	55	196
8	5	25	40	30	10	45	60	60	70	65	60	50	65	65	55	70	60	70	50	45	45	20	35	30	47	218
9	50	90	70	-30	-20	10	25	45	50	70	60	65	80	75	80	75	70	55	60	55	40	55	50	130	55	239
10	30	10	40	40	40	35	50	60	65	0	-15	60	70	80	75	80	75	65	65	45	65	40	50	50	50	167
11	50	40	40	45	50	60	60	50	55	55	50	45	50	55	60	60	55	60	60	55	45	50	30	15	50	51
12	25	30	35	40	50	55	60	65	65	55	45	50	50	55	60	60	55	60	70	70	60	60	60	50	54	44
13	35	35	20	25	30	40	50	55	55	60	60	50	50	50	55	50	65	70	60	55	55	55	50	50	49	58
14	50	55	60	55	60	60	60	55	55	55	50	45	50	55	55	60	85	75	60	55	55	55	55	55	57	73
15	55	35	40	45	45	45	50	50	50	60	55	50	60	70	65	60	50	50	59	55	55	50	50	55	53	44
16	55	65	30	-25	20	30	40	40	40	55	50	50	60	65	80	90	90	80	75	80	70	60	70	120	55	123
17	120	140	-5	-20	-15	-20	-20	20	55	90	130	95	30	55	-50	-130	-10	40	35	60	75	75	120	120	41	471
18	120	80	35	20	40	55	60	35	50	60	70	70	80	105	95	70	-20	65	75	85	70	60	115	80	66	384
19	100	55	50	60	55	60	55	50	55	55	50	60	60	75	85	70	60	50	55	10	25	20	60	60	57	218
20	65	60	60	60	60	50	55	50	50	50	50	40	35	40	50	50	55	60	55	60	60	55	40	45	52	36
21	45	50	55	55	55	40	50	60	70	75	80	110	40	105	75	-70	-40	20	50	60	10	35	55	70	48	384
22	60	60	55	55	60	60	60	60	60	60	60	50	100	95	105	55	-30	10	35	55	65	60	65	85	59	355
23	115	65	55	40	50	55	40	50	55	55	60	55	70	85	95	30	55	50	100	90	250	170	340	430	103	244
24	10	160	180	-120	-200	-65	20	60	65	80	70	60	110	100	60	60	10	-50	40	70	50	170	30	45	42	573
25	45	40	45	5	-20	10	30	50	70	60	55	65	80	75	90	100	90	80	80	80	75	60	40	50	56	247
26	20	20	15	15	15	10	30	50	65	65	65	95	75	105	105	90	80	65	70	50	50	110	120	110	62	290
27	250	150	-120	-70	10	30	70	90	90	80	70	75	75	90	100	90	90	80	85	75	55	40	160	120	75	616
28	130	-50	-70	-10	36	45	55	65	75	70	70	65	65	70	90	85	75	65	60	90	60	70	70	70	56	181
29	70	55	65	65	65	65	65	60	55	60	50	55	60	70	75	65	80	90	90	75	80	70	140	280	79	283
30	160	150	-35	20	-110	-100	-10	40	65	55	60	60	100	130	150	85	55	75	20	50	-40	-10	80	120	49	276
31	270	120	-60	-40	55	50	60	45	65	70	70	65	115	105	75	75	75	65	45	50	30	15	90	180	70	595
M	78	63	31	14	17	27	41	51	58	59	58	60	66	76	74	58	55	57	58	60	60	64	81	91	57	239
QM	55	56	57	58	58	57	56	55	54	53	52	52	53	55	57	58	59	59	57	56	55	54	53	54	56	

AUGUST 1963.

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	R	
1	100	-20	60	45	40	30	55	60	75	65	65	70	90	100	105	70	55	35	60	60	70	140	140	70	68	311
2	100	90	30	30	50	80	40	60	85	70	85	70	75	65	75	90	55	55	40	20	-60	-30	110	70	56	225
3	-60	-10	5	0	15	50	45	60	60	60	55	50	50	65	70	90	75	65	60	35	-30	15	60	120	42	218
4	90	-10	10	45	65	65	65	60	65	65	65	90	95	90	85	110	95	80	75	60	40	50	55	110	68	254
5	60	-40	20	25	10	45	60	60	65	75	75	90	120	80	70	70	80	75	40	-50	20	20	110	52	283	
6	40	70	25	-45	-85	-60	10	60	60	50	55	65	70	90	90	90	80	35	20	90	75	-15	-50	60	37	218
7	120	120	-70	-60	5	35	60	60	65	70	65	70	115	80	80	80	75	65	70	70	70	60	45	59	254	
8	25	35	-10	20	30	50	65	70	65	65	65	75	85	90	95	105	110	85	80	70	65	60	60	64	145	
9	60	50	10	5	35	20	30	40	50	50	50	50	65	74	75	75	70	60	60	65	60	55	55	40	50	73
10	55	55	55	60	60	60	60	55	55	60	55	65	80	110	115	90	115	95	85	70	70	60	65	65	71	102
11	60	60	65	70	70	65	65	60	60	60	65	70	70	75	100	105	95	90	70	45	30	25	55	66	145	
12	70	65	60	60	60	60	65	65	60	60	65	75	65	65	65	70	75	70	65	10	20	35	50	58	58	
13	55	50	55	55	60	60	60	60	60	55	55	60	70	60	60	55	60	60	60	60	60	55	35	56	44	
14	35	50	50	50	55	60	65	60	55	60	55	60	60	60	60	55	60	60	55	60	70	60	65	65	57	36
15	60	60	60	60	60	55	55	50	50	55	50	50	50	40	70	80	75	80	75	20	20	70	90	20	56	363
16	60	55	60	55	60	60	55	55	55	55	55	55	70	80	85	65	80	60	55	50	60	60	55	61	65	
17	30	10	20	45	45	60	55	55	55	60	75	65	70	75	65	60	55	80	70	60	-10	60	20	10	50	53
18	50	45	45	5	-15	-5	25	55	85	85	105	105	40	-70	-180	60	75	85	75	140	220	30	110	52	580	
19	45	75	50	50	50	55	55	55	55	55	55	50	70	75	105	90	40	120	90	170	190	150	190	83	595	
20	250	170	120	160	60	250	170	45	40	75	70	70	40	60	100	95	50	20	75	60	100	50	-10	20	89	616
21	150	10	-40	30	40	45	50	100	85	90	95	80	95	100	115	105	80	90	75	70	90	110	120	50	76	580
22	35	50	65	70	75	75	70	80	95	75	70	80	95	95	105	85	85	65	50	60	60	70	140	-30	72	181
23	-60	60	120	30	30	40	20	30	80	65	105	120	90	70	105	95	95	105	85	85	85	75	80	110	72	689
24	150	50	-120	-65	50	60	60	70	80	95	90	80	80	90	120	105	80	75	75	75	50	30	50	55	62	508
25	55	55	55	50	40	50	50	55	60	75	70	70	65	65	70	70	75	75	75	70	-15	-30	70	80	56	290
26	140	50	35	50	50	40	50	65	65	70	70	60	65	65	65	95	80	60	50	60	75	75	50	-10	61	116
27	-10	55	55	60	65	65	60	60	60	60	60	70	90	90	85</											

Tromsø.

Vertical Intensity. $V = 51000 +$ Tabular Quantities expressed in Gamma.

Gr. M. T.

HOURLY MEAN VALUES

OCTOBER 1963																											
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	R		
1	75	89	90	79	67	73	75	80	82	85	89	90	93	95	97	97	95	98	97	75	63	62	50	78	82	44	
2	85	90	89	89	87	85	85	83	83	83	83	87	84	95	97	95	95	90	93	85	70	75	25	25	82	109	
3	35	58	70	75	80	80	80	83	90	100	95	93	95	100	117	130	109	90	90	89	40	35	55	72	81	109	
4	82	80	78	55	45	60	70	73	82	95	100	82	70	100	120	130	125	127	105	95	95	63	63	87	102		
5	89	75	80	90	90	85	85	85	87	125	98	95	93	103	105	110	83	55	-35	40	25	7	65	76	167		
6	80	75	60	40	50	60	80	80	80	88	80	85	85	83	83	85	90	100	113	97	75	63	45	50	76	94	
7	65	70	73	75	70	83	80	80	80	87	80	84	80	80	90	92	37	95	100	90	85	60	-110	-83	64	174	
8	5	35	85	120	7	13	55	85	90	87	100	105	115	127	105	90	63	47	85	100	90	35	43	63	73	254	
9	87	80	78	70	75	80	85	85	90	93	87	90	94	87	85	84	93	90	79	56	75	189	10	85	290		
10	13	56	70	72	78	76	73	73	82	85	90	103	110	113	110	109	110	93	25	80	120	30	-33	9	73	457	
11	25	35	65	67	70	65	65	90	125	118	113	137	75	125	118	112	65	45	35	50	93	110	210	60	86	435	
12	30	34	-137	-175	-60	10	55	95	100	120	140	163	45	65	45	-30	-150	-65	20	70	250	-35	100	100	33	653	
13	100	85	63	55	50	70	85	90	115	110	95	90	115	100	120	115	105	85	40	-125	70	120	-185	150	72	500	
14	100	56	-120	-10	25	45	65	135	115	120	110	105	95	20	20	-60	-95	250	30	20	53	115	120	57	529		
15	85	105	20	35	65	65	80	100	105	93	105	132	120	113	125	98	95	100	20	-10	20	125	-50	-30	72	595	
16	175	120	60	53	65	75	85	123	122	115	105	106	125	130	140	135	75	-100	20	60	-125	75	60	50	77	370	
17	70	87	93	89	83	70	65	73	85	85	80	93	103	95	95	95	100	102	95	87	85	60	63	45	85	65	
18	20	35	65	65	46	55	70	75	89	95	100	112	130	105	100	115	119	105	70	90	85	65	30	45	79	123	
19	25	53	60	50	15	20	35	60	75	95	121	130	133	130	140	150	149	130	103	90	75	40	25	15	80	174	
20	-20	7	3	10	40	60	65	82	90	105	100	120	100	150	155	135	65	20	140	175	305	300	280	10	104	363	
21	30	20	-13	-10	50	65	75	83	85	103	110	100	95	90	96	103	102	104	105	98	90	79	72	89	76	51	
22	90	85	85	83	74	80	80	83	82	85	85	85	80	80	80	80	80	80	80	80	80	73	75	100	60	80	152
23	80	80	78	75	75	75	75	75	75	85	85	87	83	85	83	84	82	80	80	80	80	73	75	100	60	80	152
24	140	250	270	170	80	70	40	40	-140	-180	53	54	15	18	-50	-60	30	35	20	65	210	150	120	60	979	60	
25	140	60	35	45	50	50	70	83	95	100	110	103	105	110	105	100	103	105	89	95	45	-15	-10	75	77	240	
26	95	98	83	60	70	75	85	95	90	87	100	102	105	113	110	105	105	110	95	110	110	80	95	73	94	73	
27	85	95	90	90	90	90	90	93	95	100	100	100	100	100	110	105	100	100	85	25	30	82	83	90	89	138	
28	95	95	90	90	89	85	85	85	90	92	95	100	90	90	92	90	95	70	10	5	32	33	35	60	75	406	
29	35	5	15	-18	-40	6	60	75	100	125	125	115	85	120	135	95	150	380	220	300	510	470	320	270	152	761	
30	230	180	180	187	90	125	150	135	105	103	100	110	105	110	105	110	110	110	110	110	110	105	110	110	110	127	479
31	110	110	110	105	103	103	100	100	100	95	93	90	95	98	95	93	98	100	100	90	90	89	83	85	97	29	
M	76	78	63	61	57	66	76	87	92	156	91	101	95	97	100	93	79	82	86	74	92	89	67	65	82	262	
QM	81	82	82	81	80	80	81	82	83	84	85	87	88	90	91	90	89	88	87	85	84	83	82	81	84	84	

NOVEMBER 1963																											
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	R		
1	80	70	55	52	60	45	43	62	60	95	95	100	100	103	131	125	105	59	75	108	60	40	60	60	77	138	
2	75	90	105	98	74	83	90	87	95	93	95	96	110	109	120	115	-70	-130	-20	20	-50	65	90	145	66	689	
3	110	35	53	40	34	30	50	75	100	95	95	95	100	125	105	100	100	100	60	35	55	145	-10	45	140	537	
4	65	80	85	90	85	80	80	93	93	95	95	95	95	98	103	95	100	102	100	5	-5	35	80	50	79	297	
5	55	70	80	85	90	90	90	92	90	90	90	90	90	90	90	90	92	90	90	90	90	85	80	70	86	15	
6	70	50	50	80	85	82	78	80	85	90	94	110	110	135	120	125	145	135	65	35	-20	60	25	-50	77	537	
7	82	70	53	30	20	60	13	45	85	95	125	130	95	55	60	60	-130	-250	30	350	200	50	130	250	71	856	
8	400	180	10	60	10	75	230	130	80	90	95	120	125	120	105	45	-40	-70	-10	85	-120	-80	85	160	79	530	
9	280	200	-50	-35	65	70	100	115	115	115	115	115	115	105	120	-40	20	10	150	55	150	-40	230	320	100	645	
10	310	50	-90	-25	-15	70	93	105	110	140	145	115	120	130	120	100	35	5	-5	55	70	55	130	80	79	674	
11	5	65	40	20	5	55	90	130	140	130	125	120	105	103	95	120	133	165	60	-40	10	40	85	30	76	326	
12	25	35	45	70	35	45	75	90	125	115	125	125	100	100	95	110	-15	-65	100	65	100	70	60	50	70	442	
13	75	90	92	95	90	100	100	95	92	95	97	103	110	112	110	115	120	133	120	110	105	90	60	10	97	392	
14	60	80	90	80	75	45	60	85	85	95	95	95	100	100	95	98	98	98	92	95	90	70	42	45	82	73	
15	35	20	65	75	80	80	80	82	82	90	90	92	95	100	105	110	120	103	95	85	75	75	80	80	83	58	
16	80	80	65	60	80	85	85	87	85	90	90	90	95	95	95	95	92	90	92	95	95	95	75	60	55	84	44
17	62	75	80	80	80	85	87	85	85	75	80	85	90	80	10	-125	-150	-156	-100	75	110	110	100	96	46	377	
18	90	90	80	87	90	80	80	86	85	90	90	90	90	90	90	90	90	92	82	90	90	90	90	90	90	90	58
19	90	85	85	85	85	83	80	80	80	87	90	90	90	90	89	90	89	86	90	86	90	85	80	86	15	80	86
20	85	90	55	10	45	75	80	80	80	80	80	80	80	85	90	90	85	89	90	90	96	90	85	85	79	80	
21	85	80	80	80	80	80	78	80	80	85	85	83	83	85	105	103	105	112	130	120	117	98	85	82	92	65	
22	90	90	90	90	85	85	83	80	80	86	90	93	90	85	85	80	95	30	-30	45	74	60	85	95	77	181	
23	105	50	-15	15	65	75	75	75	80	85	89	93	91	100	100	108	109	100	98	83	45	65	90	78	116	90	
24	85	85	75	75	55	60	79	80	95	115	115	103	-25	-15	-90	-50	-135	-45	150	250	300	240	100	73	856		
25	140	150	50	50	100	98	105	140	175	130	105	105	106	140	125												

Resuming Tables.

Diurnal Variation.
QUIET VALUES.

Tromsø.

Declination. Unit Gamma. + West.

1963	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
JANUARY	-5	-4	-2	-2	-2	-1	0	1	3	5	7	8	7	5	5	5	4	1	-2	-5	-6	-6	-5	
FEBRUARY	-6	-6	-5	-4	-3	-2	-1	1	3	5	6	7	6	5	4	3	2	2	0	-2	-3	-4	-5	
MARCH	-9	-10	-11	-11	-11	-10	-9	-7	-3	1	7	13	15	14	9	5	3	5	7	5	2	0	-2	-3
APRIL	-11	-14	-16	-18	-19	-19	-17	-13	-8	0	7	13	14	12	9	5	3	4	5	3	0	-2	-4	-7
MAY	-12	-16	-20	-24	-26	-25	-19	-12	-4	4	11	18	21	19	12	8	8	10	13	12	8	2	-3	-7
JUNE	-10	-14	-17	-20	-21	-20	-15	-10	-3	3	10	15	18	17	14	11	9	9	11	11	7	3	-2	-6
JULY	-9	-13	-17	-20	-21	-21	-19	-15	-10	-2	5	14	18	16	13	11	12	14	14	13	9	5	0	-5
AUGUST	-6	-10	-14	-18	-21	-23	-20	-13	-2	7	15	19	17	13	10	9	10	10	9	7	5	2	0	-3
SEPTEMBER	-12	-14	-16	-18	-19	-19	-17	-13	-7	1	9	10	8	6	4	2	3	4	4	2	-2	-6	-9	-12
OCTOBER	-6	-7	-8	-9	-9	-8	-6	-4	-1	3	7	10	9	7	5	4	4	5	4	2	0	-2	-4	-6
NOVEMBER	-5	-5	-4	-3	-1	0	0	0	1	3	5	6	6	5	4	4	4	3	1	-1	-3	-4	-5	-5
DECEMBER	-7	-6	-5	-4	-3	-2	-1	0	2	4	6	7	6	5	4	4	3	2	0	-1	-3	-4	-5	-6
MEAN	-8	-10	-11	-13	-13	-13	-10	-7	-3	3	8	12	12	11	8	6	6	6	6	4	1	-1	-4	-6

Horizontal Intensity. Unit Gamma.

JANUARY	-4	-4	-3	-2	-1	0	1	1	0	-2	-2	-1	-2	1	1	1	1	2	2	2	1	-1	-2	-3
FEBRUARY	-3	-3	-2	-1	0	1	1	0	-1	-2	-3	-2	-1	-1	-1	0	1	2	3	2	1	0	-1	-2
MARCH	-1	0	1	2	3	2	0	-4	-9	-14	-14	-11	-7	-3	1	5	8	9	9	7	4	2	0	-1
APRIL	4	6	7	6	2	-2	-6	-11	-16	-20	-19	-15	-9	-3	2	7	10	12	12	10	6	2	1	2
MAY	8	10	10	8	3	-3	-10	-18	-22	-24	-22	-19	-13	-7	0	8	13	16	17	15	12	9	7	7
JUNE	2	5	7	6	3	-2	-9	-15	-20	-22	-19	-12	-4	5	11	14	16	15	13	9	5	2	0	0
JULY	0	2	4	4	1	-2	-7	-13	-16	-18	-17	-13	-7	0	6	11	13	15	15	13	10	6	2	-1
AUGUST	2	4	6	6	4	-3	-11	-18	-20	-18	-13	-8	-3	1	5	8	11	12	11	9	7	5	3	2
SEPTEMBER	2	4	6	6	4	0	-3	-7	-10	-11	-9	-5	-1	2	5	7	8	9	8	6	4	2	1	1
OCTOBER	0	1	2	3	3	2	0	-3	-7	-10	-11	-9	-6	-3	0	3	6	8	9	6	3	1	0	-1
NOVEMBER	-2	-1	0	1	2	3	2	0	-2	-3	-3	-2	0	1	3	3	1	0	0	1	1	0	1	-2
DECEMBER	-2	-1	0	2	3	4	3	2	1	0	-1	0	1	2	3	3	2	2	2	1	-1	-2	-3	-3
MEAN	1	2	3	3	2	0	-3	-7	-10	-12	-11	-8	-4	-1	3	6	7	9	9	7	4	2	1	0

Vertical Intensity. Unit Gamma.

JANUARY	-4	-4	-3	-2	-1	0	1	1	0	-2	-2	-1	-2	1	1	1	1	2	2	2	1	-1	-2	-3
FEBRUARY	-3	-3	-2	-1	0	1	1	0	-1	-2	-3	-2	-1	-1	-1	0	1	2	3	2	1	0	-1	-2
MARCH	-1	0	1	2	3	2	0	-4	-9	-14	-14	-11	-7	-3	1	5	8	9	9	7	4	2	0	-1
APRIL	4	6	7	6	2	-2	-6	-11	-16	-20	-19	-15	-9	-3	2	7	10	12	12	10	6	2	1	2
MAY	8	10	10	8	3	-3	-10	-18	-22	-24	-22	-19	-13	-7	0	8	13	16	17	15	12	9	7	7
JUNE	2	5	7	6	3	-2	-9	-15	-20	-22	-19	-12	-4	5	11	14	16	15	13	9	5	2	0	0
JULY	0	2	4	4	1	-2	-7	-13	-16	-18	-17	-13	-7	0	6	11	13	15	15	13	10	6	2	-1
AUGUST	2	4	6	6	4	-3	-11	-18	-20	-18	-13	-8	-3	1	5	8	11	12	11	9	7	5	3	2
SEPTEMBER	2	4	6	6	4	0	-3	-7	-10	-11	-9	-5	-1	2	5	7	8	9	8	6	4	2	1	1
OCTOBER	0	1	2	3	3	2	0	-3	-7	-10	-11	-9	-6	-3	0	3	6	8	8	6	3	1	0	-1
NOVEMBER	-2	-1	0	1	2	3	2	0	-2	-3	-3	-2	0	1	3	3	1	0	0	1	1	0	1	-2
DECEMBER	-2	-1	0	2	3	4	3	2	1	0	-1	0	1	2	3	3	2	2	2	1	-1	-2	-3	-3
MEAN	1	2	3	3	2	0	-3	-7	-10	-12	-11	-8	-4	-1	3	6	7	9	9	7	4	2	1	0

Monthly Means.

DECLINATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
DIRECT VALUES $D = 0^{\circ}W + \dots$	-1'.2	-0'.9	-1'.5	-1'.2	-2'.8	-3'.7	-4'.9	-6'.1	-8'.5	-5'.4	-5'.6	-5'.4	-3'.9
QUIET VALUES $D = 0^{\circ}W + \dots$	1'.2	0'.3	-0'.3	-0'.7	-0'.4	-3'.1	-3'.2	-3'.3	-3'.3	-1'.8	-4'.2	-4'.0	-1'.9
RANGE (UNIT MINUTES)	77	57	63	65	80	77	84	81	118	51	42	46	70
QUIET RANGE (UNIT γ)	14	13	26	33	47	38	38	42	29	19	-11	-14	23
HORIZONTAL INTENSITY													
DIRECT VALUES $H = 11100 \gamma + \dots$	120	126	122	126	119	128	129	120	92	111	122	143	122
QUIET VALUES $H = 11100 \gamma + \dots$	135	136	134	136	140	142	143	146	136	142	141	147	140
RANGE (UNIT γ)	381	360	372	413	457	458	413	422	580	383	291	316	404
QUIET RANGE (UNIT γ)	6	6	23	31	41	38	33	32	15	19	5	6	21
VERTICAL INTENSITY													
DIRECT VALUES $V = 51000 \gamma + \dots$	43	56	52	62	60	64	57	63	78	82	81	76	65
QUIET VALUES $V = 51000 \gamma + \dots$	51	56	56	63	58	56	56	62	69	84	87	85	65
RANGE (UNIT γ)	280	239	243	233	254	238	239	303	453	262	300	249	274
QUIET RANGE (UNIT γ)	14	10	15	9	19	17	7	8	9	9	10	9	11

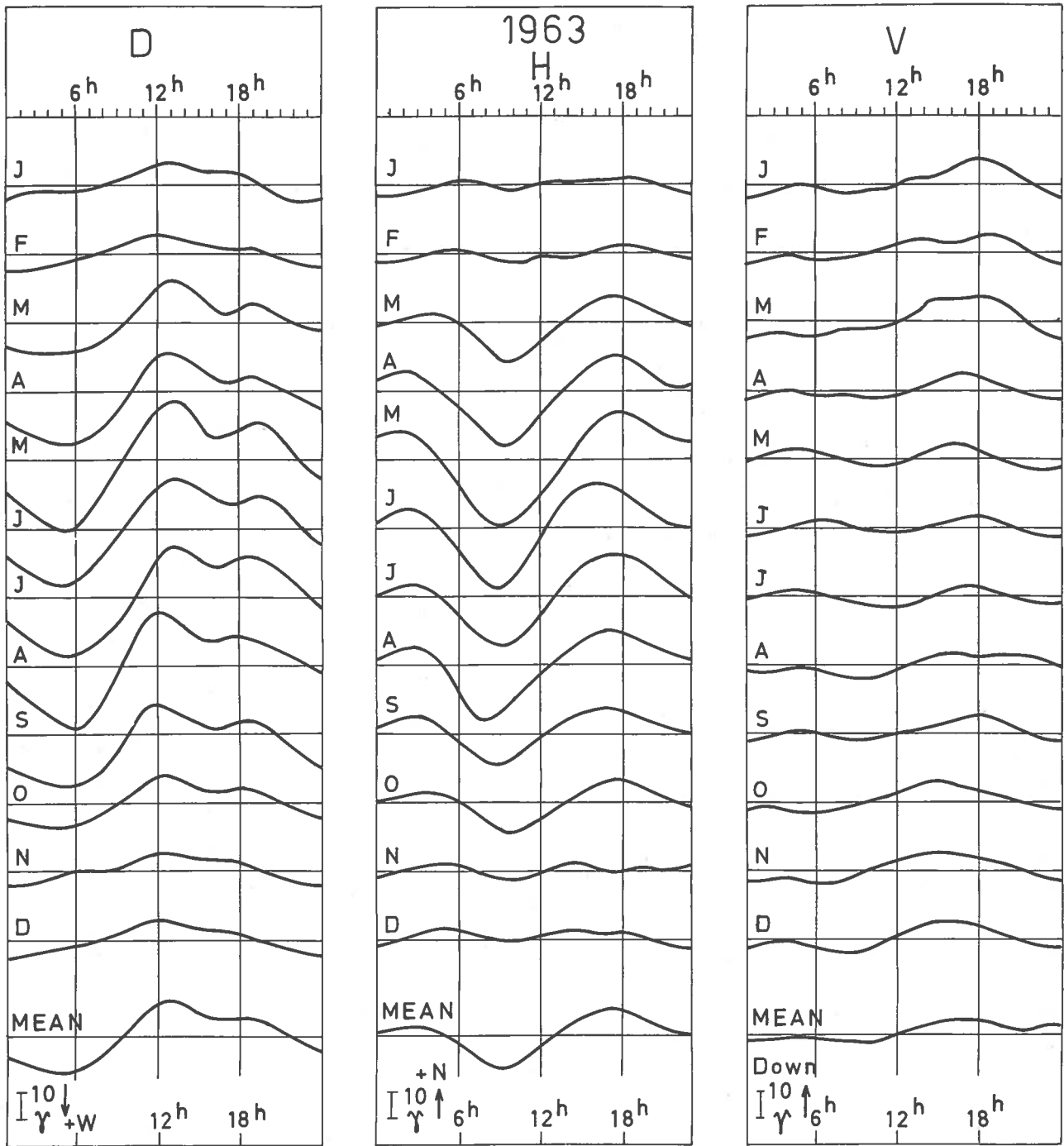


Fig. 1. The Quiet Diurnal Variation, smoothed Values.

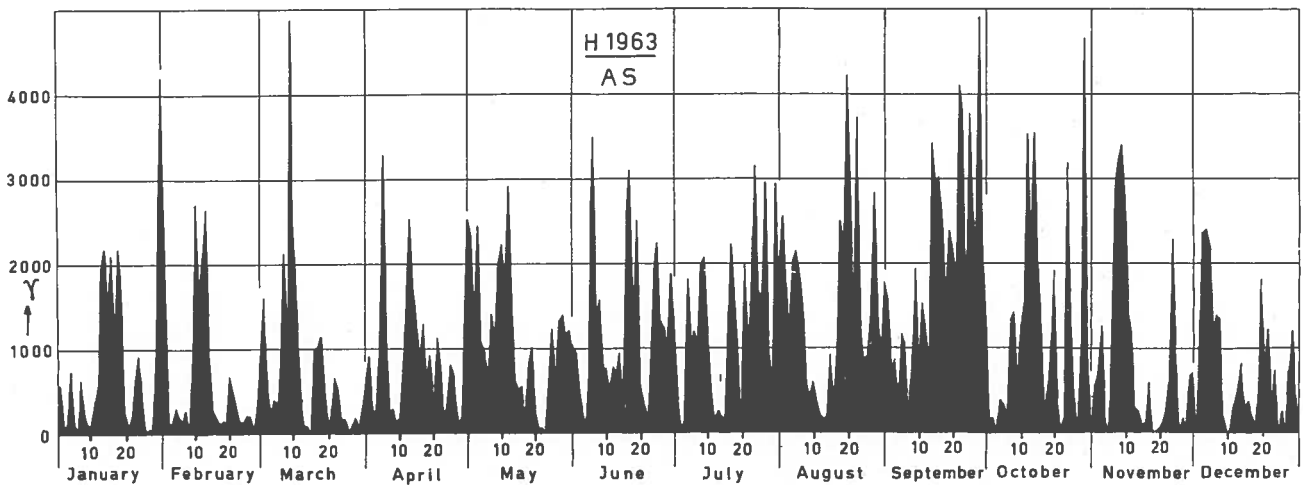


Fig. 2. The Diurnal sum of the Absolute Storminess of H.

