

Publikasjoner fra
DET NORSKE INSTITUTT FOR KOSMISK FYSIKK
Nr. 39

GURO GJELLESTAD
PER EINBU †, HELGE DALSEIDE

THE MAGNETIC STATION AT DOMBÅS

(New location: $\varphi = 62^{\circ} 04'.4$ N, $\lambda = 9^{\circ} 07'.0$ E Gr.)

DESCRIPTION OF THE NEW STATION
and
OBSERVATIONS 1952

APPENDIX

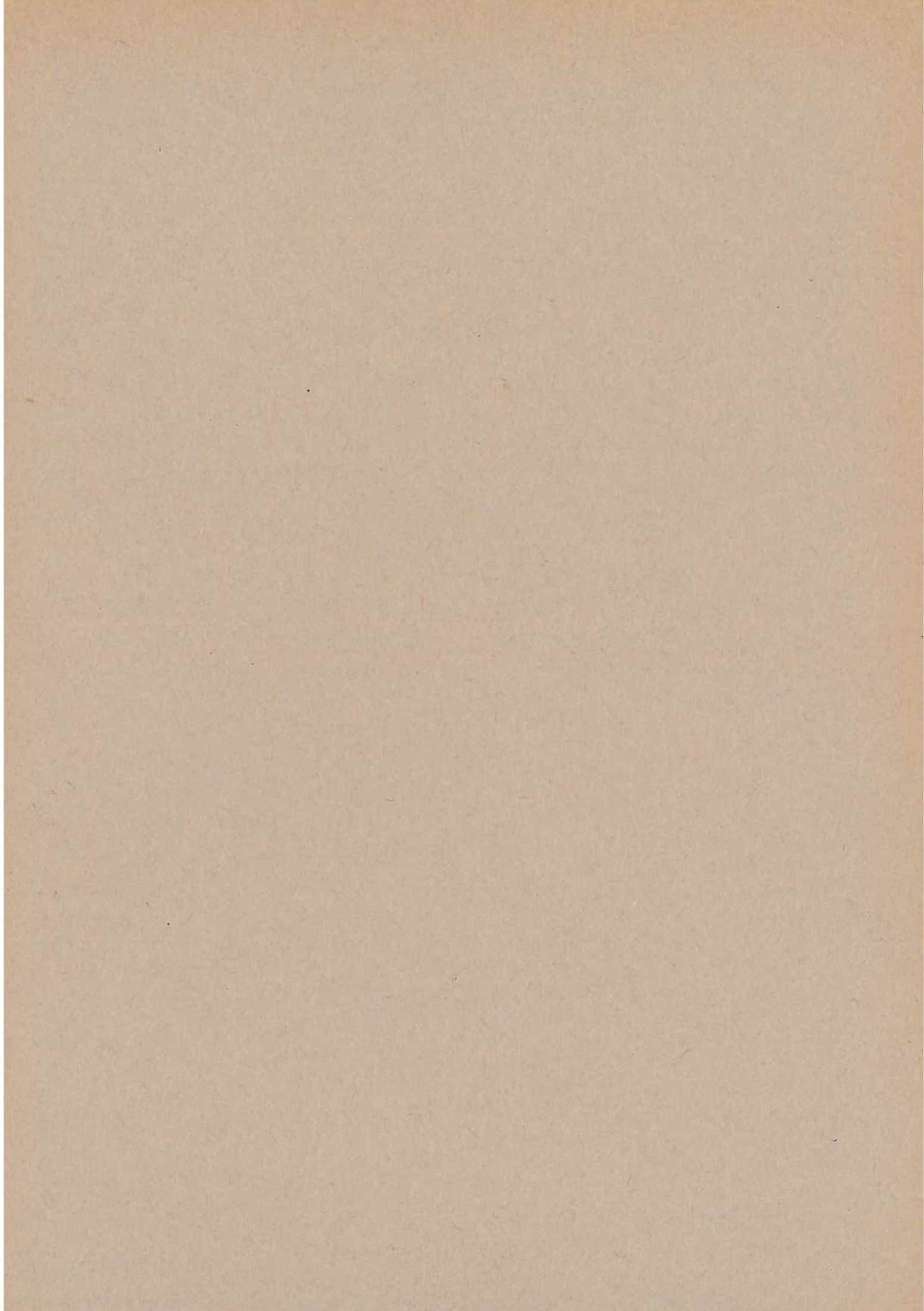
(Storminess Values for 1949—1951)

WITH A PREFACE BY
THE DIRECTOR OF MAGNETISK BYRÅ

Published by
MAGNETISK BYRÅ
BERGEN, NORWAY

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by

GURO GJELLESTAD and PER EINBU †

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PREFACE

The magnetic observatory at Dombås is operated as a mountain station. The station is administrated by Magnetisk Byrå in Bergen, while a resident of Dombås is employed as a part time assistant to supervise the installations and make necessary magnetic measurements. Magnetograms and other observations are sent to Bergen at regular intervals for reduction and publication, and then kept permanently on file at Magnetisk Byrå.

Mr. *Per Einbu* was resident observer and assistant in charge of the station until his death in December 1955, and on March 15, 1956, his brother Mr. *Knut Einbu* took over. At those periods when Mr. *Per Einbu* was not able to carry out his duties, his wife and brother shared the responsibilities for the recordings (changing and developing paper), while Mr. *J. Frøshaug*, on occasion, made some absolute measurements. As the travelling distance between Bergen and Dombås is long, responsibility for the performance of the station, magnetic measurements etc., must to a great extent lie with the resident observer, but inspections of the observatory have previously been undertaken by a representative of Magnetisk Byrå at irregular intervals, approximately once a year. During the difficult period of 1955 and 1956 the station was under the supervision of Miss *Guro Gjellestad* on behalf of the Director, and she made prolonged visits to Dombås in June and September/October 1955 and in March and May/June 1956. During these visits she made an extensive magnetic survey of the site, re-adjusted some of the variometers, made numerous magnetic measurements, and trained the new resident observer in his duties.

The new magnetic station at *Dombåshaugen* replaces the old station on the farm *Brennøy-garden*, which had been in operation since 1916. It had been felt for some time that the old station did not satisfy the modern requirements of a magnetic observatory, partly due to the location, partly to unsatisfactory instrumentation, and it had been considered whether it might not be necessary to discontinue recordings at Dombås, since sufficient funds for building a completely new observatory could not be acquired. After the Second World War, however, a solution was found. We were fortunate in finding a suitable house at a more convenient location, approximately 1½ km (1 mile) east of the old station; a house which had been built by the German Occupation Forces in Norway. A preliminary magnetic survey gave indications that the site was acceptable, and arrangements were made with the owner of the site for renting the house with surrounding grounds. After minor changes the house could be taken into use as a variometer house for continuous recordings with a set of new La Cour variometers. In 1953 the absolute house was transferred from the old station and erected on the new site. After a «running-in» period of some months, continuous recordings started at the new site in Spring 1951, and the old station was discontinued after a short interval of parallel recordings. The new station has been gradually improved when funds were made available, but more improvements are desirable.

The preparation of the present publication has been undertaken by Miss *Gjellestad* with the assistance from the late Mr. *Per Einbu* and Mr. *Helge Dalseide*. The description of the new

station in Chap. I is written by Miss *Gjellestad* after a rough out-line had been prepared jointly by her and Mr. *Einbu* in September 1955. It should be pointed out that all original installations were put in by the late Mr. *Per Einbu*, while Miss *Gjellestad* was appointed to her present position with Magnetisk Byrå in March 1955, and thus did not have an opportunity to follow at first hand developments during the installation period and the first 4—5 years of operation of the new station. On the other hand, Miss *Gjellestad* is responsible for several improvements in recent years. The *old* magnetic station at Dombås was planned for giving *relative* (storminess) values. For the *new* station *absolute* values will be given, starting with the observations in 1952, and they are presented in Chap. II. The reductions of the observations in 1952 are made by Miss *Gjellestad*, with the assistance from Mr. *Dalseide*. For the year 1951 storminess values have been calculated for the new station also, and they have been included with results from the old station for the years 1949—51 in an Appendix to the present publication. Calculations of the storminess values 1949—51 have been undertaken by Mr. *K. F. Wasserfall* with the assistance from Mr. *Dalseide*. All drawings are made by Mr. *Dalseide*.

I wish to extend my most sincere thanks to all those mentioned above, who have contributed to the results presented here. In particular, I would like to express my gratitude to Mrs. *Astri Einbu* for the assistance she gave to her husband with the installations in 1950/51 and during his periods of illness, and for her willingness to take on responsibility for the recordings after his death until Mr. *Knut Einbu* took over. I would also like to thank the staff of the *Danish Meteorological Institute* in Copenhagen for their generous assistance and advice during the installation period and later improvements of the station, for calibration of instruments etc.

Bergen February 1957.

B. Trumpy
Director.

PER KOLBJØRN EINBU

1911—1955



It is with deep sorrow we regret to announce the death of *Per Kolbjørn Einbu*, civil engineer in Chemistry, on December 28, 1955, after long periods of illness. *Per Einbu* was born on August 17, 1911, son of the well known amateur Astronomer *Sigurd Einbu* and wife *Helga Einbu*. *Per Einbu* graduated in 1935 from the Norwegian Institute of Technology in Trondheim with the degree of civil engineer in Chemistry. He was an exceptionally talented man with a remarkable aptitude for and devotion to scientific work. Unfortunately a serious illness from which he had suffered from an early age prevented him from reaching the heights of the career one might have expected under different circumstances. After graduating he continued his scientific studies at the Institute of Technology as a research assistant, collaborating with Drs. *Flood*, *Holstmark* and *Westin*, on a variety of problems in Chemistry and Physics. It was during this period he had the first serious attack of the illness from which he never completely re-

covered. His interest in research did not fail him even during periods of hospitalization. For instance, during a stay for treatment at Lyster Sanatorium he took up in 1942—45 studies of physical and chemical problems relating to his disease, doing respiration tests of the patients, and afterwards making a thorough statistical analysis of the results. After the war he returned to Dombås, and in 1946 he was put in charge of the magnetic station. When it was decided to move the station, *Per Einbu* was authorized to make the installations at the new site, and this task he undertook with great skill and accuracy, greatly helped by his wife *Astri Einbu*. Magnetisk Byrå has been most fortunate to have had such an exceptionally capable man as *Per Einbu* in charge of the station at Dombås, particularly at the time of the installation and «running-in» of the station, and there is no doubt that it was due to *Per Einbu* that the new station has reached such a satisfactory standard. One must admire his ingenuity, his patience and his skill in establishing and running the new station with limited economic support and instrumental equipment. One must also admire his courage, his devotion to his work, and his endurance in the carrying out his duties, though in poor health, during the hard Winters at this out-of-the-way observatory.

Per Einbu had various interests. He was known as a brilliant bridge- and chess-player and he was also a useful man to the small community at Dombås, and was for some time employed in survey work for the County. *Per Einbu* was a pleasant man with a dry sense of humour, and his death is a great loss to all those who met him.



Fig. 1. View to the east; variometer house to the left, absolute house to the right.
(Photo G. G., June 1955).

I. DESCRIPTION OF THE NEW STATION

by

GURO GJELLESTAD and PER EINBU †

1. INTRODUCTION

The framework of the description to be presented here was prepared jointly in September 1955, while the final manuscript was written by one of us (*GG*) when supplementary information had been obtained by studies of notes and correspondence (from *PE*) and by renewed inspections of the station. The presentation cannot be as complete as one would wish, for several reasons. Originally the variometer house was built by the German Occupation Forces, and it has not been possible to obtain detailed plans of the construction. Most of the instruments in use at the new station have been received as gifts from other institutes or laboratories or have been acquired secondhand, and their history is not known in detail. Another difficulty arises from the fact that one of the authors, who put in the original installations and who was more familiar with the station than most of us, died before the report was completed, while the other author was unable to follow developments from the start.

The back-ground for the selection of the site for the new station has already been mentioned in the Preface. It was necessary to find a *house* that could be made into a variometer house at moderate expense, and which was not situated too far from the old station and was within walking distance from the observer's home, and reasonably free from magnetic anomalies. One of us (*PE*) inspected several of the buildings set up by the German Occupation Forces at Dombås and was fortunate in finding one that appeared to satisfy these requirements.

2. GEOGRAPHICAL LOCATION OF THE NEW STATION

Geographic co-ordinates	$\varphi = 62^{\circ}04'.4$ N.	$\lambda = 9^{\circ}07'.0$ E Gr.
Geomagnetic co-ordinates	$\Phi = + 62^{\circ}.3$.	$A = 100^{\circ}.1$.
Altitude 660 meters (2165 feet) above sea level.		

The geographic co-ordinates being known, the geomagnetic co-ordinates have been calculated according to formulæ given by Chapman and Bartels (1940, Chap. XVIII, Section 18.4). The co-ordinates of the geomagnetic North Pole used for the calculations of the geomagnetic co-ordinates are those recommended by the Committee on Observatories of I. A. G. A., $78^{\circ}.5$ N and 69° W, respectively.

The new magnetic station is located on the S-SW slopes of *Dombåshaugen*, approximately 1 km (0.6 miles) west of Dombås railway station on the Oslo—Trondheim line and approximately $1\frac{1}{2}$ km (1 mile) east of the old magnetic station at *Brennøygarden*. The rough sketch in *Figure 2* shows the relative positions of the old and new magnetic stations (*OS* and *NS*) and the railway station; also the central part of Dombås, at a distance of 600—700 meters (appr. 700 yards) and Dombås Turisthotel (*T*) are indicated. The Oslo—Trondheim and Dombås—Åndalsnes lines are shown and also the main roads. There is a narrow road running round the hill, below it, but there are no roads on the hill itself, only paths. From the Tourist hotel (*T*) there is an easy walk to the top of the hill to the magnetic station.

The hill is encircled by mountains at distance 5 to 20 km (3—12 miles). They range from heights of about 1200 meters to 2000 meters (3900—6600 feet) for those at some distance. The view from the observatory past the wide valleys towards these distant mountains deserves to be mentioned as it is beautiful and impressive, making the observatory a pleasant and inspiring place in the warmer months. It is unfortunate that the photographs only appear in black and white as the coloring of these mountains is famous and is considered one of the attractions of this wellknown skiing and hiking resort. The autumn colors are marvellous with the dark green of the pines serving as a background for the flaming oranges and reds of the fading birches and sycamores, and sometimes capped by a shining helmet of snow. The Winter, on the other hand, is long and hard and not very pleasant. Temperatures may go down to -20 to -30° C (-4 to -20° F) and remain there for months in Mid-Winter, winds may be strong all through the year and are particularly unpleasant in the cold season; snow falls heavily on the hill, and the vario-meter house may be partly covered for several months, the absolute house is cold and draughty, and altogether it is not too pleasant for the resident observer who has his daily duties at the station. Skis are essential for several months.

3. GENERAL DESCRIPTION OF THE SITE; MAGNETIC CONDITIONS

The observatory site and surrounding parts of the hill are very uneven, as may be seen in the reproduced photographs. From the absolute house the hill falls abruptly towards the south and west, somewhat less so towards the north, while it ascends slowly towards the east. The site of the magnetic station is stony, the main constituent being *Phyllite*, the soil is shallow and poor, and consequently the vegetation consists for the most part of juniper, pines, a few birches and some dry, stiff grass, typical of dry mountain ground.

The owner of the site lives at a farm 60—70 meters away to the north of the observatory, the fence round the farm and stores (mainly wooden building material) are somewhat closer,

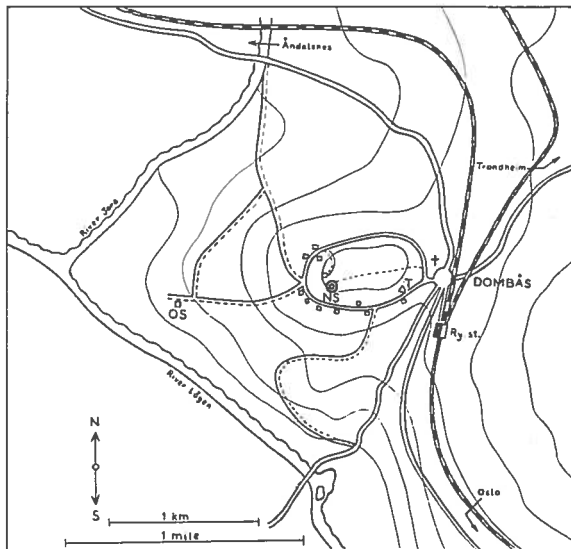


Fig. 2. Sketch of the new magnetic station (NS) with surroundings, including the village of Dombås and the railway station, the old magnetic station (OS) and Dombås Turisthotel (T).

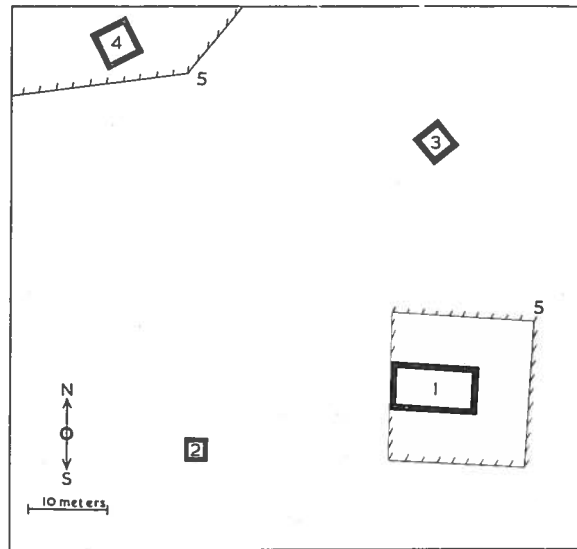


Fig. 3. Plan of observatory site with surroundings. Numbers refer to: (1) variometer house, (2) absolute house, (3) unoccupied cottage, (4) owner's new dwellinghouse, (5) fence.

and also his new dwellinghouse erected in Summer 1956. An old cottage, not in use, is at a distance of 25 meters from the variometer house. Below the hill, to the south, south-west and south-east are more farms at greater distances. Another rough sketch, *Figure 3*, shows the arrangement of the houses on the S-SW part of the hill.

The mean values of the magnetic elements at the new magnetic station appear to be roughly the same as those to be expected for the site from the latest available isomagnetic charts (1951 and 1955), when secular variations are taken into account.

As pointed out in the Preface a preliminary magnetic survey made at a few points of the site before establishing the new station, indicated acceptable magnetic conditions. In September 1954 one of us (*PE*) discovered, by chance, an anomaly in the vertical component at a point approximately 10 meters to the north of the absolute house. Joint measurements by the authors in June 1955 confirmed the anomaly, and it was decided to make a more extensive magnetic survey of the site and surroundings to establish whether more anomalies might be present and determine their significance. The survey was to be shared between us. *GG* covered the larger area of approximately 60×100 meters, centered at the variometer house, and observations were made at stations uniformly spaced over this area at 10 meters intervals, while suspicious points were surrounded by a denser net of stations. Also several points close to the two houses were measured. Unfortunately *PE*'s survey was interrupted by his illness, but he measured the region between the two houses and some grid points. Altogether 125 points were measured in *Z* and 45 points in *H*, and several series were obtained at each station. The preliminary results of the survey in 1955 establishes with some certainty that at least in *Z* (measured by *GG*), the site as a whole shows a fairly uniform distribution. From the fewer observations (by *PE*), the same also appears to be true for *H*. Further, as far as the preliminary results go, it may be fairly well established that the farm to the north, including fence, stores and the abandoned cottage, does not give any significant magnetic effect at the permanent place of our instruments. The same is true for the establishments below the hill. The survey further disclosed a few more anomalous points, some anomalous in *Z* and some in *H*, but apparently the anomalies are of small extension, and their effect cannot be traced at some distance, say, 6—8 meters. An inspec-

tion of the surface at some of these points indicates that the anomalies may have an artificial cause, and be related to activities during the construction period. Some points close to the western side of the variometer house need further inspection. Observations close to the recording room are satisfactory. Results were obtained there that were in good agreement with the mean for the whole measured area. Unfortunately the absolute house appears to be situated in a slightly anomalous region, when the mean for the whole measured area is taken as standard. Samples of stone presumed representative for the site have been studied by Dr. Kvale of the University of Bergen, and he could discover no appreciable magnetic material in the samples. The preliminary survey in 1955 confirms that the site does not satisfy the requirements stated by McComb (1952), but on the whole, the site compares favourably with most other places in this mountainous country.

With respect to possible magnetic disturbances, they are not likely to be of any importance. Dombås is primarily a rural society and a tourist center, with a small population (1000). No industry is known to be close enough to the observatory to introduce artificial magnetic disturbances, and the two railroads are not electrified. Farming was discontinued some years ago at the property to the north, and we have so far experienced no activity there or from the farms below the hill that might disturb the recordings or the absolute measurements. Occasional artificial disturbances may perhaps arise when in Winter the protecting fence round the variometer house may be partly covered by snow and skiers may pass at close distance or even use the roof for a rest. These disturbances, if present at all, are not likely to be important and in all circumstances are only sporadic.

4. THE BUILDINGS

The observatory disposes of a rented variometer house for continuous magnetic recordings and from 1953 an absolute house, which had been transferred from the old station. The distance between the two buildings is approximately 23 meters. Photographs of the buildings are reproduced in *Figures 1, 4, 5, and 11*.

The *variometer house* was erected by the German Occupation Forces in Norway during the latter part of the Second World War. It may perhaps be described as a concrete cellar with a roof, covered with slates, on a wooden construction, and is partly under ground (blasted into the sloping hill). As far as we know iron re-inforcement has not been used, but some magnetic material may be present in the original construction, for instance, iron nails. Special care has been taken that only non-magnetic material should be used in the closer vicinity of the recording instruments. The concrete floor rests on rock and stones. Size: 11×7 meters external measure, heights about 2 meters, thickness of walls 0.5 meters. A wooden floor 10—15 cm above the concrete floor carries the inner wooden partition walls. *Figure 6* shows a ground plan of the house. In the eastern part of the house is the recording room, *A*, 4×6 meters, and inside this room a smaller space, *B*, 2.55×2.75 meters, has been separated by wooden walls. The rest of the house is divided into a corridor *G* and four rooms, *C*, *D*, *E* and *F* that are at present being used for photographic darkroom, office and stores, respectively. In room *F* is all the electric equipment apart from the battery for emergency power, which is in a corner of the room *E*. The inner smaller partition *B* contains the variometers on a compact concrete pier (1) with a top plate of schist, the optical system, a thermostat (3), and an electric heater (6), while the surrounding part of the recording room holds the recorder (2), the clock (4) and another electric heater (7). The electric heaters contain very little magnetic material, while the thermostat has some magnetic effect, the effect being well defined by a small jump in the base line value of *H* at the time of installation, June 23, 1952. On the *Z*-and *D*-variometers the thermostat has



Fig. 4. View to the north-west; absolute house. (Photo G. G., June 1955).



Fig. 5. View to the north-west; variometer house. (Photo G. G., June 1955).

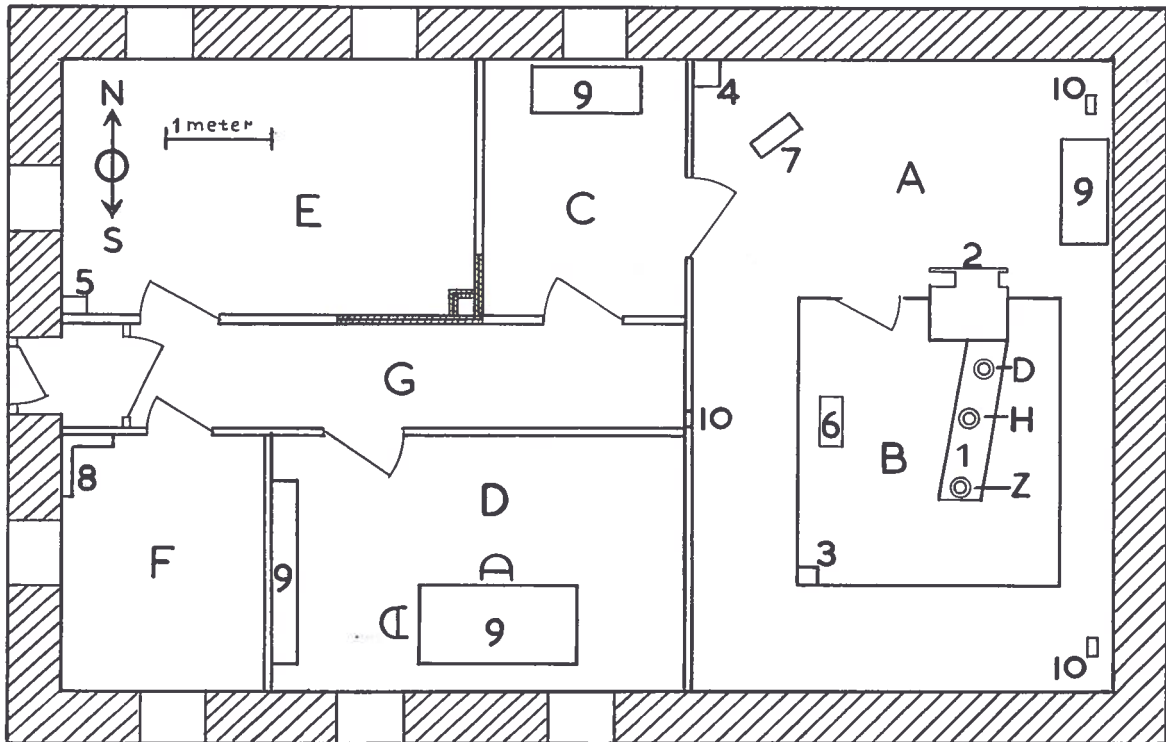


Fig. 6. Ground plan of variometer house. Capital letters refer to: (A) and (B) recording room, (C) photographic darkroom, (D) office, (E) and (F) stores, electric equipment, (G) corridor. — Numbers refer to: (1) pier with variometers, (2) recorder, (3) thermostat, (4) clock, (5) battery for emergency power, (6) and (7) electric heaters, (8) electric equipment (transformer, relay etc), (9) tables and shelf, (10) ventilators.

no appreciable effect. Special care has been taken in insulation of the recording room. Stones and soil have been piled up against the external walls in the eastern part of the house, all up to the roof (refer to *Figure 5*) and internally layers of wooden chips above the ceiling and between double partition walls secure a fair amount of protection against the cold. A double door in the western wall is the only entrance to the house and wooden covers are available for all windows. A system of adjustable ventilators (10) and a reasonable amount of electric power has made it possible to keep the recording room fairly free from moisture and at a constant temperature for long periods of time. In earlier years the temperature was kept at $+ 10^{\circ} \text{C}$ during the Winter months and at $+ 15^{\circ} \text{C}$ the rest of the year, while from December 1955 when more electric power has been available, the temperature is kept at $+ 15^{\circ} \text{C}$ ($\pm 0.1^{\circ}$) all the year round. — A wooden fence has been put up round the variometer house to prevent traffic close to the recording instruments.

The *house for absolute measurements* is a simple wooden construction, approximately 3×3 meters. For economy reasons no cellar could be built under the house, and it does not therefore rest directly on the rock; the soil was removed to some depth and refilled by stones, on which the house and three wooden observation poles were erected. Care is taken that there should at no time be contact between the observation poles and the wooden floor. The house has been tied to some of the larger stones by non-magnetic wires. The heavy winds that are not unusual at this place may at times shake the house quite considerably due to its light construction. The house is not insulated, and no artificial heating can be used. The white-painted wooden window covers may be turned down to an approximate horizontal position to serve as reflectors for lights for the instruments, but in Winter time and on rainy days the lights may be extremely poor.

5. RECORDING EQUIPMENT

A set of *La Cour variometers* (D , H , and Z) have been installed. Apart from minor details the arrangement is almost identical with the «insensitive arrangement» at *Thule*, and we refer to description by V. Laursen (1943). The D -variometer («Le Déclinomètre de Copenhague»), the H -variometer («Le Variomètre de Copenhague») and the Z -variometer («La Balance de Godhavn») have been described in detail by V. Laursen (1943), by D. La Cour and V. Laursen (1930) and by D. La Cour (1930), respectively.

Orientation of the variometers:

D -variometer, magnetic axis *in* the magnetic meridian,

H -variometer, magnetic axis *in the plane normal* to the magnetic meridian, north end of magnet towards east,

Z -variometer, magnetic axis *horizontal* and approximately *in the plane normal* to the magnetic meridian, north end of magnet towards west.

Scale values are of the order:

D , 9.6 gammas per mm or 2.4 minutes of arc per mm,

H , 9.0 gammas per mm,

Z , 7.6 gammas per mm.

The above values refer to the time of installation. Please refer to *Table 1* in § 7 for details.

The H - and Z -variometers are equipped with optical temperature compensators. Determination of the *temperature coefficients* were made by one of us (*PE*) in 1951 and are:

$$\tau_H = 0.06 \pm 0.10 \text{ gammas per degree Celcius,}$$

$$\tau_Z = 0.01 \pm 0.10 \text{ gammas per degree Celcius.}$$

The *recorder* and the *two recording lamps* are of the types described by V. Laursen (1943). *Speed of recording* is 15 mm per hour. Three small scale lamps, one for each element, controlled by a clock, give *vertical hour mark lines* across the curves, approximately 9—10 cm long for each element. The hour marks may be generally correct within ± 1 minute. A new clock-work was installed in Fall 1956.

In *Figures 7* and *8* are reproduced photographs from the recording room, showing the arrangement of the variometers, the optical system, including prisma, recording and hour mark lamps. To the left in *Figure 7* is seen an adjustable resistance for one of the recording lamps. Another resistance for the second lamp is installed in the room marked *F* in *Figure 6*.

An *electric transformer* and a *rectifier* of commercial type in the room marked *F* (8) in *Figure 6* transforms the commercial 220 V ac-current into proper dc-current for the recording and hour mark lamps, while an electric *relay* (room *F*, (8)), automatically connects the 6 V battery to the recording system when the commercial power is cut off. Installed are a «Bell transformer» (produced in England), a «Noratel» transformer and rectifier (produced in Norway) and a «Selen Rectifier», produced by Standard Telefon og kabelfabrik A/S (Norway). The Mercury relay has been delivered by Elektrisk Bureau.

A double set of full-drawn curves are recorded to secure recordings if one lamp should happen to burn out. This is necessary since the resident observer will usually inspect the station only once day, and only one set of recorders is installed.

As a demonstration we have in *Figure 9* reproduced in natural size a three-hour section of a magnetogram from the new station. The section is in the interval 11^h 30^m to 15^h 00^m GMT on October 13, 1952. The chosen interval is slightly disturbed ($K=1$). Two sets of curves and base

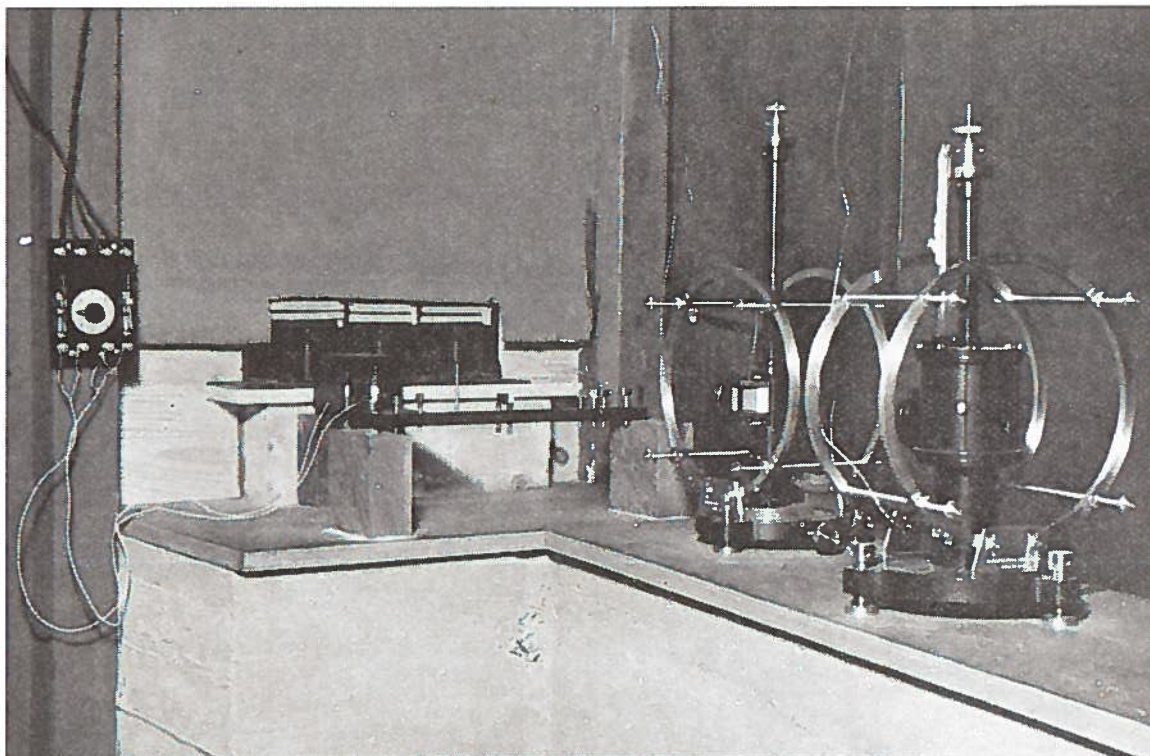


Fig. 7. North end of pier with *D*-(left) and *H*-varionometers, optical system. On the wall to the left may be seen the adjustable resistance for one of the recording lamps. (Photo Wikran).

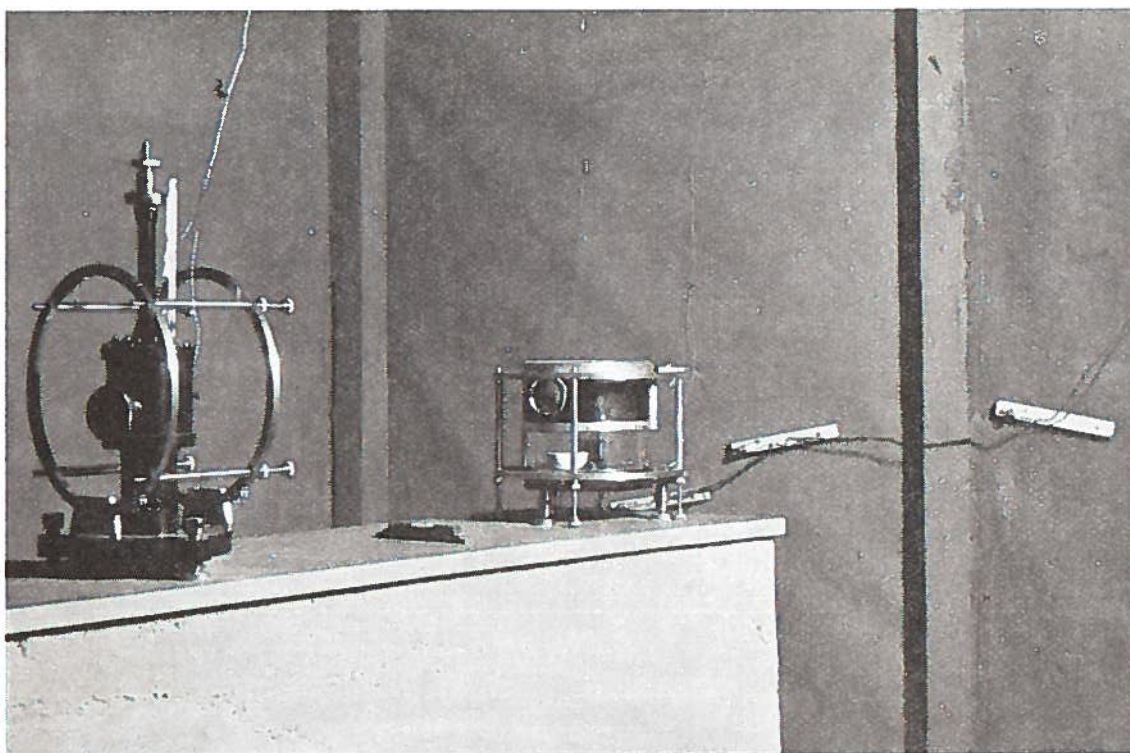


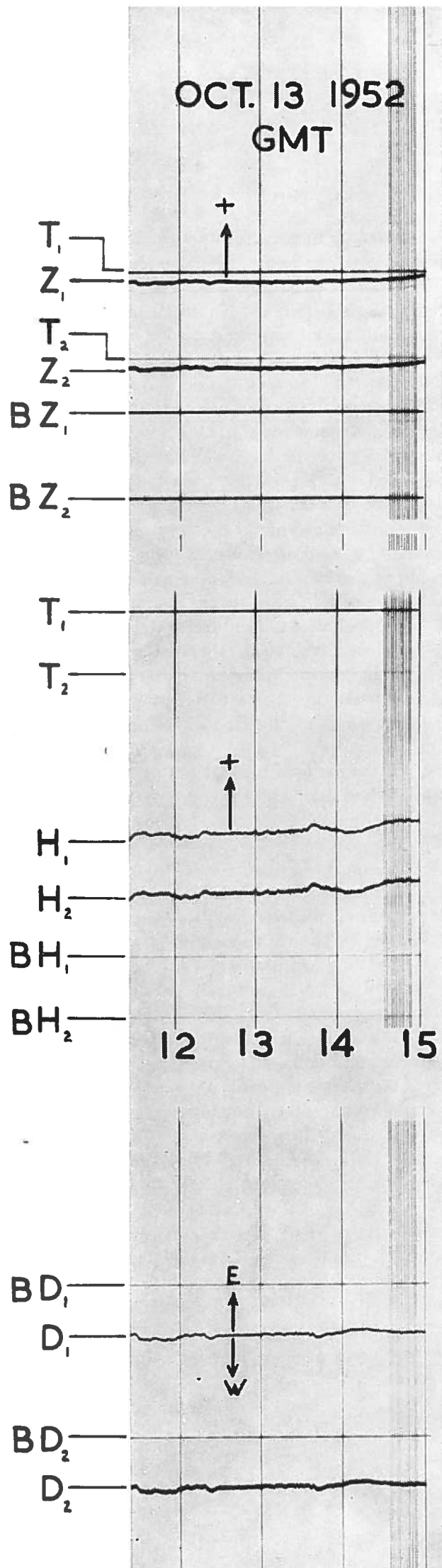
Fig. 8. South end of pier with the *H*-(left) and *Z*-varionometers. On the wall in the back-ground may be seen the three hour mark scale lamps. (Photo Wikran).

Fig. 9. To the right — natural size reproduction of a three-hour section of a magnetogram from the new station (1952, October 13, 11^h 30^m — 15^h 00^m GMT). Explanations to the curves are given on the reproduction in conventional notations. Additional time traces appear in the interval 14^h 34^m—14^h 53^m GMT when absolute measurements were made. The reproduced section is representative for a slightly disturbed interval (K = 1.)

lines are shown for all three elements and temperature curves for *H* and *Z*. Explanations to the curves are given in the Figure in conventional notations. For accurate timing of absolute measurements vertical time traces are produced on the magnetogram. Some of these traces are also seen in the Figure, in the interval 14^h 34^m — 14^h 53^m GMT. — During storms some of the curves may move out of the space reserved for an element, but then a storm curve comes in from the opposite side to secure recordings.



Fig. 10. View to the south. Field measurements at a point just below the absolute house. Azimuth mark is a break in the skyline; the pole in the foreground points just to the right of the mark. Stormy day in September 1955. (Photo G. G.)



6. ABSOLUTE MEASUREMENTS

Absolute measurements were for some time made on an out-door post at the place of the present absolute house, that was erected in September/October 1953.

Absolute observations of H are made with QHM 15 and 78. The two theodolites (Tesdaorf No. 2179 and Bamberg No. 9631) are old, but reliable, if not perfect. Observations of Z have been undertaken with BMZ 16 and on occasion a BMZ has been borrowed from other institutes for a check. A supplementary BMZ (No. 160) has been purchased, and has been installed in February 1957. Some attempts have been made to employ an old Bamberg declinometer and QHM for absolute observations of D , but for various reasons these instruments are not suitable for use at the new station. Our base line values for declination rely therefore almost entirely on observations made with a magnetometer produced by Elliott Bro.'s, London (No. 38), now equipped with a telescope from the Bamberg No. 9631 declinometer. The optical parts of this combined instrument are very good and suitable for our use, but the scales on the Elliott base are somewhat worn and the readings are not entirely satisfactory. The great scatter in the D -measurements is probably to some extent due to the unsatisfactory condition of the scales. Some improvements have been made recently in the observations after the silk thread has been substituted by a thin, strong nylon thread with negligible torsion.

For technical reasons (refer to §§ 2 and 3) no fixed azimuth mark could be erected on the hill, and we have had to rely on objects already present in the landscape. Due to distances these objects have to be quite large, and some houses on the other side the valley have been used, especially during the experimental stage at the new site. For some years we have now been using as an azimuth mark a distinct feature (V -shaped) on a distant mountain (distance: 10 km or 6 miles).

By means of a contact-button in the absolute house electric signals may be sent to the clock in the variometer house, and time traces are produced on the magnetogram, facilitating accurate timing of the observations.

The *precision of the absolute measurements* is not easy to define, but we suppose we are not much in error if we state it in the following way: The scatter in H - and Z -measurements *with respect to a mean value* (adopted base line value) may run to ± 5 gammas when longer periods of time are considered, say, one week or two, while the scatter in measurements made on the same or, say, two consecutive days, may under favourable conditions be ± 1 gamma. The corresponding results for D may be perhaps ± 2.4 minutes of arc (± 10 gammas) and ± 1 minute of arc (± 4 gammas), respectively. The uncertainty stated above is probably due to a complex of circumstances. In addition to unavoidable uncertainties in the actual measurements, some uncertainty will always be entered during the reduction of the observations, for instance, in scaling of the magnetograms, particularly during disturbed periods, and also through incomplete knowledge of possibly variable instrumental coefficients. The latter is, in particular, true for the semi-absolute instruments employed for H - and Z -measurements, which have to be calibrated at an observatory where absolute instruments are available. The constants of QHM 15 and 78 have not changed appreciably during the time they have been in our possession. The instrumental «constants» of BMZ 16, however, appear to have varied with time; part of this variation may have an artificial cause and may have been introduced in connection with field work, while part of the variation apparently is of intrinsic origin. This fact together with a quite considerable change in the actual base line values of Z (refer to § 7) has at times made it difficult to establish the correct (adopted) base line values. The scatter in the D -measurements may, as mentioned above, be partly due to unsatisfactory scales, but probably some errors are introduced by the azimuth mark. Due to meteorological conditions and the large distance, the azimuth mark often is unsharp when seen through the telescope, and at times it appears displaced, pro-

bably due to turbulence in the air. Further, the azimuth mark is at an altitude of approximately 1100 meters (3600 feet) as compared to the observatory at 660 meters (2165 feet), and it is feared that this may introduce systematical errors in the observations. On the other hand, when meteorological conditions are good, the chosen azimuth mark can be seen clearly against the sky. The photograph reproduced in *Figure 10* is taken on a stormy day during field measurements in September 1955 from a point 20 meters south of the absolute house, at a 10 meters lower level, and gives the view towards the south. The azimuth mark is a break in the skyline and the pole in the foreground points a little to the right of the mark. The fixed azimuth mark can just be seen on the original photograph, and it is feared that it may perhaps not be visible in the reproduction. We have been considering trying to find some other arrangement for azimuth mark in connection with a movement of the absolute house, but the problem is not a simple one, and we do not know yet whether a better solution may be found. — As will be apparent when the results of the observations are presented, we have preferred to keep the base line values of the declination constant during long periods of time, rather than following the «up-and-downs» of the real measurements.

The semi-absolute instruments (QHM 15 and 78, BMZ 16) have in the past been calibrated at irregular intervals at Rude Skov Observatory, and on occasion at Lovø and Tromsø. In the future we are planning to have some of our instruments calibrated at least once a year.

7. SCALE VALUE DETERMINATIONS, ORIENTATION TESTS

Scale value determinations and orientation tests are made according to standard electromagnetic methods (see, for instance, McComb (1952, Chaps. 11,12)). Several improvements have been made in the equipment recently. In Spring 1956 three Helmholtz-Gaugain coils were installed, while previously only one coil was available. Then, to simplify the observations an adjustable electric resistance was made and a simple device for damping the oscillations of the variometer magnets when deflected by a strong artificial magnetic field. The damping device was suggested by Dr. V. Laursen of the Danish Meteorological Institute. Finally a new and more accurate amperemeter has been purchased.

Series of *scale value determinations* in all three elements were made by one of us (*PE*) in 1950 and 1951, but due to special circumstances no more determinations were made until Spring 1956, apart from occasional checks during magnetic disturbances. In Spring 1956 one of us (*GG*) with the assistance of Mr. *Knut Einbu* obtained several series of good values for *Z* and *D*, but unfortunately only one series for *H* was acceptable, due to magnetic disturbances. The values obtained were in good agreement with those obtained in 1950 and 1951. From May 19 until June 2 recordings in *Z* were made with a borrowed magnet, and scale values were obtained for this magnet also. After re-installing the repaired Dombås magnet, new series of scale values were determined. Scale values are now being determined at least once every third month in each element, and several series are made if magnetic conditions permit. In recent months Mr. *Knut Einbu* has obtained more good series in all elements. Based on observations in 1950—51 and in 1956 the scale values given in *Tab'e 1* have been adopted. In *Table 1* the scale values for *D* are equivalent to 2.4 minutes of arc per mm. The scale values are believed to be correct within a few per cent.

Careful *orientation tests* were made by one of us (*PE*) during the installations in 1950 and 1951, but no more tests were made until June 1956. Then one of us (*GG*) with the assistance of Mr. *Knut Einbu* tested the *H*- and *D*-variometers for orientation, and the *H*-variometer was re-adjusted on June 6 and finally tested for correct orientation. The base line values of *Z* had been increasing at an average rate of 11 gammas per month since 1951, and at the same time the *Z*-curve had moved vertically on the magnetograms. This variation was puzzling, but it

was believed that the most likely cause might be that the recording magnet in the Z -variometer changed its magnetic moment. It was hoped for some time that the magnet might gradually stabilize without interference, but eventually it was decided that one could not wait for this to take place. A magnet was kindly put at disposal by the Danish Meteorological Institute to replace the Dombås magnet while the latter could be sent to Copenhagen to be repaired and subjected to a stabilizing process. Unfortunately the substitution could not be made according to plans in September 1955, but eventually was made on May 19, 1956 by one of us (*GG*), and on June 2, the Dombås magnet was replaced and the variometer properly adjusted. Before the adjustment it was apparent that the variometer magnet was far out of the horizontal plane, and it is likely that the mis-orientation has been quite considerable for some time and that some errors may have been introduced. However, the degree of mis-orientation in the period 1951—56 is not known and cannot be corrected for by direct methods. We may perhaps return to this question at a later stage. The stabilizing process appears to have had a good effect on the magnet, judging from the results of the absolute measurements, but there is still some unexplained increase in the Z base-line values. It is quite possible that this may be due to the magnet not having become completely stable or perhaps to the settling of the ground. — It is planned in the future to make orientation tests and if necessary adjust the instruments once a year when a representative of Magnetisk Byrå will be inspecting the observatory.

TABLE 1
ADOPTED SCALE VALUES

Interval starting	Interval ending	D γ/mm	H γ/mm	Z γ/mm
1951, Jan 1	1951, Dec 31	9.59	8.97	7.59
1952, Jan 1	1952, Dec 31	»	»	»
1953, Jan 1	1953, Dec 31	»	»	»
1954, Jan 1	1954, Dec 31	»	»	»
1955, Jan 1	1955, Dec 31	»	»	»
1956, Jan 1	1956, May 19	9.60	9.00	7.60
1956, May 20	1956, Jun 2	»	»	7.40
1956, Jun 3	1956, Jul 31	»	»	6.45
1956, Aug 1	1956, Oct 31	9.70	9.15	6.55
1956, Nov 1		»	9.25	»

8. REFERENCES

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Fig. 11. View to the north-east; absolute house in foreground, variometer house in background. (Photo G. G., June 1955).

II. OBSERVATIONS 1952

by

GURO GJELLESTAD and HELGE DALSEIDE

9. INTRODUCTORY REMARKS

We refer to Chap. I, in which has been given general information on instruments and installations at the new station, evaluation of the performance of the instruments and accuracy of observations and other information of more general character for the period 1951—56.

At Dombås the late Mr. *Per Einbu* in 1952 supervised the instruments and made magnetic measurements, while Mr. *J. Frøshaug* made some absolute observations in August. Scalings of the magnetograms for hourly mean values were undertaken by Mr. *Per Einbu*. In charge of reductions of recordings and observations and arrangement of the results for publication was author I.

No scale value determinations were made in 1952, and the scale values determined in 1951 were retained. They are given in *Table 2*. In *Table 2* the scale value $9.59 \gamma/\text{mm}$ (for *D*) is equivalent to 2.38 minutes of arc per mm.

Absolute measurements were in 1952 undertaken at irregular intervals, mostly 2—4 times a month in each element. During the most severe Winter months fewer observations were made; in November only one series was obtained and in December none. All absolute measurements were in 1952 made on an out-door post. In *Tables 3—5* are given adopted base line values, while the diagram in *Figure 12* gives both observed and adopted base line values. Each point in the diagram, with few exceptions, represents means of 2—6 series of measurements. The adopted base line values have, in accordance with usual procedure, been established by a graphical method. Some personal judgement has been employed, and less weight has been given to observations made under difficult circumstances. — Due to the large scatter in the *D*-mea-

TABLE 2
ADOPTED SCALE VALUES 1952

<i>D</i> γ/mm	<i>H</i> γ/mm	<i>Z</i> γ/mm
9.59	8.97	7.59

surements discussed elsewhere (Chap. I, § 6), a constant value has been chosen for 1952. The large increase in the *Z* base-line values has been discussed elsewhere (Chap. I, § 7) and is probably to a large extent due to changing magnetic moment of the recording magnet, while the irregularities in the curve may be partly due to incomplete knowledge of the instrumental coefficients of the semi-absolute instrument BMZ 16 (refer to Chap. I, § 6), partly due to possible disturbance of BMZ 16 in connection with field work. The jump in the *H* base-line value on June 23 is well defined and is caused by the installation of a thermostat in the recording room.

Temperature corrections are negligible. *Possible mis-orientation* of the variometers and *possible shrinking* of the photographic paper are not known.

In accordance with recommendation from IATME we are for the new station giving Tables of *absolute hourly mean values* in three elements, *D*, *H*, and *Z*, and *daily* and *hourly means* for all days and for the 5 international quiet and disturbed days. In a separate Table are given *monthly* and *annual means* for all days and for the 5 international quiet and disturbed days.

Scalings of the magnetograms for hourly mean values have been centered around half-hours, and Universal Time (GMT) has been used consistently in the Tables.

Magnetisk Byrå and the magnetic station at Dombås co-operate with the international central institute at De Bilt regarding K-indices and C-data for activity, sudden commencements, solar flare effects, etc., and for those data we refer to the IATME Bulletins.

To save labour and expedite reductions we have, starting with the observations in 1952, put the calculations and printing of magnetic tables on punched-card IBM machines in co-operation with the Geophysical Institute of the University of Bergen. We are indebted to Mr. *John B. Hannisdal* for assistance in arranging the observations for the machine.

MONTHLY AND ANNUAL MEANS

1952	All days			Quiet days			Disturbed days		
	<i>D</i>	<i>H</i>	<i>Z</i>	<i>D</i>	<i>H</i>	<i>Z</i>	<i>D</i>	<i>H</i>	<i>Z</i>
Jan	5° 24'.1 W	13869 γ	47504 γ	5° 25'.1 W	13874 γ	47502 γ	5° 23'.6 W	13872 γ	47501 γ
Feb	23.3	863	489	25.6	878	497	21.1	855	479
Mar	22.1	856	482	23.8	877	497	18.0	806	453
Apr	21.8	859	482	22.7	878	497	20.1	834	453
May	21.3	867	482	21.8	882	499	18.5	828	458
Jun	21.5	883	495	21.9	887	498	20.6	866	483
Jul	21.0	885	505	20.6	884	506	21.1	886	501
Aug	20.3	879	503	20.0	879	507	20.0	877	499
Sep	19.0	866	508	19.8	878	517	18.6	844	483
Oct	18.5	869	515	19.7	878	522	16.3	850	503
Nov	18.3	877	520	18.8	883	523	16.3	862	515
Dec	18.3	883	519	19.0	891	517	17.2	877	518
Mean	5° 20'.8 W	13871 γ	47500 γ	5° 21'.6 W	13881 γ	47507 γ	5° 19'.3 W	13855 γ	47487 γ

TABLE 3
ADOPTED BASE LINE VALUE
DECLINATION 1952

Jan 1 — Dec 31	5°01'.2
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TABLE 4
ADOPTED BASE LINE VALUES
HORIZONTAL INTENSITY 1952

Interval starting	γ	Interval starting	γ
Jan 1	13680	Aug 6	13668
Jun 24	675	9	667
Jul 6	674	11	66
10	673	14	665
14	672	24	664
18	671	Sep 13	663
22	670	17	662
Aug 3	13669	21	13661

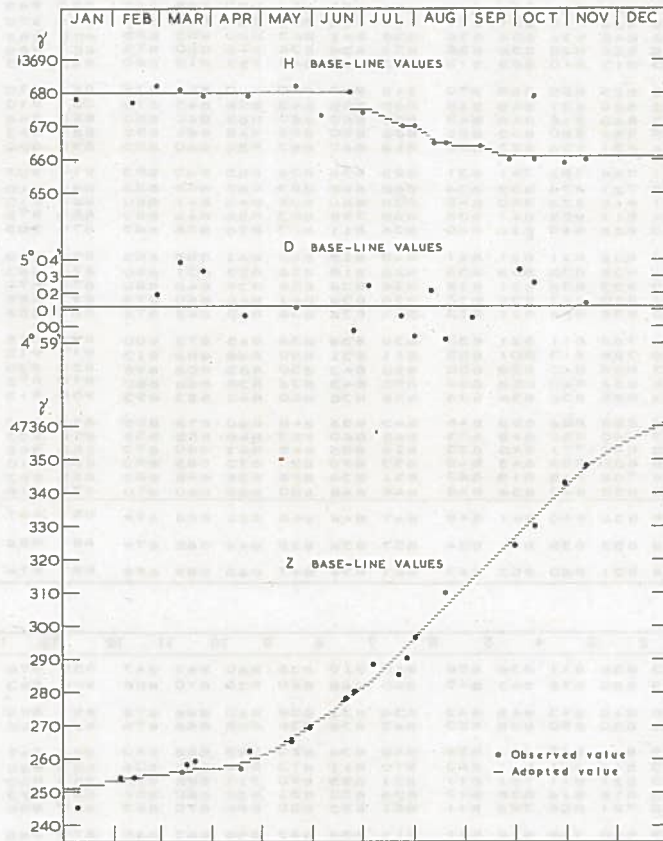


Fig. 12. Observed and adopted base-line values 1952.

TABLE 5
ADOPTED BASE LINE VALUES VERTICAL INTENSITY 1952

Interval starting	γ	Interval starting	γ	Interval starting	γ	Interval starting	γ	Interval starting	γ	Interval starting	γ
Jan 1	47251	May 30	47270	Jul 17	47289	Aug 24	47308	Oct 1	47327	Nov 8	47346
11	252	Jun 2	271	19	290	26	309	3	328	10	347
26	253	5	272	21	291	28	310	5	329	12	348
Feb 7	254	8	273	23	292	30	311	7	330	15	349
18	255	11	274	25	293	Sep 1	312	9	331	18	350
Mar 6	256	14	275	27	294	3	313	11	332	21	351
20	257	16	276	29	295	5	314	13	333	24	352
Apr 8	258	18	277	31	296	7	315	15	334	27	353
18	259	21	278	Aug 2	297	9	316	17	335	30	354
24	260	24	279	4	298	11	317	19	336	Dec 4	355
30	261	26	280	6	299	13	318	21	337	8	356
May 5	262	29	281	8	300	15	319	23	338	12	357
9	263	Jul 2	282	10	301	17	320	25	339	16	358
12	264	5	283	12	302	19	321	27	340	20	359
15	265	7	284	14	303	21	322	29	341	24	360
18	266	9	285	16	304	23	323	31	342	28	47361
21	267	11	286	18	305	25	324	Nov 2	343		
24	268	13	287	20	306	27	325	4	344		
27	47269	15	47288	22	47307	29	47326	6	47345		

Dombås

Declination. D = 4° W + Tabular Values expressed in Tenths of Minutes.

JANUARY 1952

HOURLY MEAN VALUES.

GMT

Table for January 1952 showing hourly mean values for Dombås. Columns include Day, Hour (1-24), and Mean. Rows are grouped by day (1-31) and month (M, MQ, MD).

FEBRUARY

Table for February 1952 showing hourly mean values for Dombås. Columns include Day, Hour (1-24), and Mean. Rows are grouped by day (1-29) and month (M, MQ, MD).

MARCH

Table for March 1952 showing hourly mean values for Dombås. Columns include Day, Hour (1-24), and Mean. Rows are grouped by day (1-31) and month (M, MQ, MD).

Dombås

Declination. D = 4° W + Tabular Values expressed in Tenths of Minutes.

APRIL 1952

HOURLY MEAN VALUES.

GMT

Table for April 1952 showing hourly mean values for Dombås. Columns include Day, Hour (1-24), and Mean. Rows are labeled D 1-25, M, MQ, MD.

MAY

Table for May 1952 showing hourly mean values for Dombås. Columns include Day, Hour (1-24), and Mean. Rows are labeled D 1-31, M, MQ, MD.

JUNE

Table for June 1952 showing hourly mean values for Dombås. Columns include Day, Hour (1-24), and Mean. Rows are labeled D 1-30, M, MQ, MD.

Dombås

Declination. D = 4° W + Tabular Values expressed in Tenths of Minutes.

JULY 1952

HOURLY MEAN VALUES

GMT

Table for July 1952 showing hourly mean values for Dombås. Columns include Day (1-31), Hour (1-24), and Mean. Rows are labeled with letters D, M, MQ, MD.

AUGUST

Table for August 1952 showing hourly mean values for Dombås. Columns include Day (1-31), Hour (1-24), and Mean. Rows are labeled with letters D, M, MQ, MD.

SEPTEMBER

Table for September 1952 showing hourly mean values for Dombås. Columns include Day (1-30), Hour (1-24), and Mean. Rows are labeled with letters D, M, MQ, MD.

Dombás

Horizontal Intensity. H = 13000 γ + Tabular Values.

JANUARY 1952

HOURLY MEAN VALUES.

GMT

Table for January 1952 showing hourly mean values for days 1-31 and stations D, M, MQ, MD. Columns represent hours 1-23 and a MEAN column. Values range from approximately 80 to 95.

FEBRUARY

Table for February 1952 showing hourly mean values for days 1-29 and stations D, M, MQ, MD. Columns represent hours 1-23 and a MEAN column. Values range from approximately 80 to 95.

MARCH

Table for March 1952 showing hourly mean values for days 1-31 and stations M, MQ, MD. Columns represent hours 1-23 and a MEAN column. Values range from approximately 80 to 95.

Dombás

Horizontal Intensity. H = 13000 γ + Tabular Values.

APRIL 1952

HOURLY MEAN VALUES.

GMT

Table for April 1952 showing hourly mean values for days 1 through 31. Columns include Day, Hour (1-24), and Mean. Rows are categorized by day type (D, M, MD).

MAY

Table for May 1952 showing hourly mean values for days 1 through 31. Columns include Day, Hour (1-24), and Mean. Rows are categorized by day type (D, M, MD).

JUNE

Table for June 1952 showing hourly mean values for days 1 through 30. Columns include Day, Hour (1-24), and Mean. Rows are categorized by day type (D, M, MD).

Dombås

Horizontal Intensity. H = 13000 γ + Tabular Values.

JULY 1952

HOURLY MEAN VALUES.

GMT

Table for July 1952 showing hourly mean values for Dombås. Columns include DAY (1-31), hours (1-24), and MEAN. Rows are grouped by day (D 1-31) and month (M, MQ, MD).

AUGUST

Table for August 1952 showing hourly mean values for Dombås. Columns include DAY (1-31), hours (1-24), and MEAN. Rows are grouped by day (D 1-31) and month (M, MQ, MD).

SEPTEMBER

Table for September 1952 showing hourly mean values for Dombås. Columns include DAY (1-31), hours (1-24), and MEAN. Rows are grouped by day (D 1-31) and month (M, MQ, MD).

Dombås

Horizontal Intensity. H = 13000 γ + Tabular Values.

OCTOBER 1952

HOURLY MEAN VALUES.

GMT

Table for October 1952 showing hourly mean values for Dombås. Columns include Day, Hour (1-23), and Mean. Rows are labeled with day numbers and letters (D, O, M, MQ, MD).

NOVEMBER

Table for November 1952 showing hourly mean values for Dombås. Columns include Day, Hour (1-23), and Mean. Rows are labeled with day numbers and letters (D, O, M, MQ, MD).

DECEMBER

Table for December 1952 showing hourly mean values for Dombås. Columns include Day, Hour (1-23), and Mean. Rows are labeled with day numbers and letters (D, O, M, MQ, MD).

Dombås
JANUARY 1952

Vertical Intensity. Z = 47000 γ + Tabular Values.

HOURLY MEAN VALUES.

GMT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN	
1	386	473	491	501	501	511	508	515	522	517	512	521	521	516	518	531	517	512	525	491	505	501	497	486	503
2	489	486	499	501	501	503	506	505	505	507	501	504	506	507	506	504	508	511	521	505	511	511	506	491	504
3	489	491	500	500	498	501	503	502	502	500	498	499	501	504	505	501	503	502	501	504	531	521	473	471	500
4	461	431	447	478	491	495	500	501	501	501	501	500	501	511	528	533	541	547	526	524	524	474	471	490	499
5	475	471	458	341	381	414	446	501	521	554	578	560	561	606	551	539	576	594	547	534	508	463	356	456	500
6	483	426	401	431	426	426	461	491	509	516	521	516	516	518	520	531	636	558	571	548	518	505	501	484	501
7	494	501	498	501	504	502	512	506	501	501	502	502	516	547	576	571	566	541	558	561	491	418	471	488	514
8	474	476	490	462	481	491	498	501	504	508	513	523	528	517	516	517	524	541	528	517	508	505	504	504	505
9	501	501	501	500	498	489	493	493	497	500	499	501	503	504	504	503	512	526	569	591	551	533	521	534	514
10	534	518	507	498	461	451	471	470	483	495	501	504	512	518	531	533	606	608	571	541	519	463	431	411	507
11	432	430	465	465	462	490	499	501	496	500	500	499	513	528	532	522	584	622	522	536	522	482	472	462	502
12	445	460	463	412	432	462	482	492	502	506	513	527	517	525	546	562	597	537	549	519	487	452	422	337	489
13	448	427	447	472	485	492	492	497	502	507	507	537	552	542	692	562	592	542	562	547	382	367	387	382	497
14	397	417	441	423	420	476	502	511	508	506	518	522	517	530	562	542	597	572	512	520	457	342	442	452	487
15	452	474	487	484	452	467	487	502	522	522	517	514	522	532	642	627	622	577	537	582	527	502	492	507	523
16	517	512	500	501	502	507	504	509	508	512	514	518	518	519	522	525	528	522	522	512	508	507	517	496	513
17	492	492	502	495	489	498	499	502	502	502	502	502	506	511	512	512	511	510	517	506	502	514	509	511	504
18	507	507	507	509	508	498	505	504	505	502	505	504	502	506	507	507	505	507	509	506	511	506	503	502	506
19	502	502	502	502	501	501	501	501	498	498	498	497	501	504	509	503	508	512	522	512	504	512	508	502	504
20	502	500	501	498	497	497	497	501	501	498	497	498	499	502	502	503	505	512	521	511	512	512	502	498	503
21	492	499	492	489	494	497	497	498	499	501	494	494	496	500	502	507	507	512	514	520	524	516	507	502	502
22	492	487	492	492	492	495	492	492	489	485	487	492	496	500	502	510	507	516	520	522	557	572	522	534	508
23	527	506	502	496	498	498	495	495	495	495	499	507	501	504	521	545	556	529	512	519	503	494	455	441	495
24	432	457	472	478	482	492	494	498	497	498	499	499	501	504	521	519	519	532	524	519	505	485	492	493	500
25	448	458	462	491	494	496	494	499	499	502	502	503	498	499	502	499	495	496	497	501	501	498	493	493	496
26	493	495	496	496	496	495	496	496	493	493	493	497	498	499	502	499	495	496	497	501	501	498	493	493	496
27	490	493	488	479	479	473	471	473	479	485	488	489	503	496	633	623	650	668	593	523	496	483	418	388	512
28	438	473	489	483	500	483	484	495	503	506	508	513	514	528	533	514	526	533	505	509	513	503	463	483	501
29	486	493	499	502	499	498	494	488	493	503	512	519	535	543	598	540	621	613	483	483	413	453	413	488	507
30	487	478	453	442	454	451	473	493	505	508	510	510	517	521	517	513	512	513	533	513	508	510	473	493	495
31	500	500	500	501	502	500	498	495	493	494	495	496	498	504	525	538	533	593	518	514	517	509	503	493	509
M	476	479	482	478	480	486	492	498	501	504	506	509	514	519	538	532	549	549	533	527	505	488	471	473	504
MQ	499	501	500	499	499	499	499	500	499	498	497	498	499	502	504	504	504	508	513	510	510	509	503	499	502
MD	459	460	467	443	453	471	481	494	501	511	521	525	540	543	607	561	609	598	539	521	451	422	403	433	501

FEBRUARY

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN	
1	477	471	474	487	493	495	493	487	493	493	505	543	553	510	543	588	583	543	528	438	473	413	483	497	503
2	503	495	460	468	492	493	503	503	507	512	513	506	503	512	519										499
3	495	489	496	498	495	495	497	496	494	495	496	495	499	502	503	500	498	499	507	508	503	501	499	496	498
4	497	496	494	493	493	493	493	493	493	493	493	493	493	493	494	496	493	492	490	492	492	492	492	492	493
5	488	489	488	484	479	474	471	473	476	474	481	482	503	508	503	539	636	513	520	448	408	438	458	423	484
6	464	467	454	459	464	486	480	508	498	510	524	554	533	539	549	524	544	554	544	449	481	454	339	364	484
7	368	404	484	484	484	477	467	474	495	494	504	511	510	510	530	596	524	515	524	419	431	451	454	417	480
8	414	454	486	464	427	457	486	494	498	504	511	511	518	514	549	589	554	541	524	444	479	461	376	394	485
9	434	476	484	488	490	494	495	492	499	495	502	504	506	511	514	527	604	577	547	404	404	384	324	274	476
10	204	244	339	294	469	488	494	497	499	500	514	534	534	514	509	514	525	529	530	454	464	428	454	324	482
11	358	449	459	484	437	424	461	475	485	488	495	510	528	561	539	576	544	517	524	525	454	404	354	454	479
12	364	446	479	480	485	484	491	495	484	494	496	504	517	524	544	609	534	522	534	534	514	414	354	416	489
13	461	444	481	489	494	495	496	498	497	500	501	497	498	507	524	517	527	554	509	484	504	484	454	474	495
14	491	488	485	480	485	485	487	486	486	484	495	495	498	499	504	510	509	503	503	501	500	500	492	461	493
15	434	426	447	444	448	404	387	432	469	494	496	524	519	624	594	554	558	574	549	531	454	454	404	404	486
16	424	406	444	494	504	504	504	501	499	500	498	504	504	504	510	508	512	510	510	520	524	516	504	495	496
17	468	415	465	485	490	492	493	495	491	488	490	501	505	502	514	519	515	511	515	545	499	488	494	481	494
18	330	410	363	436	485	489	504	495	505	500	501	507	519	519	515	521	517	551	567	550	365	315	385	395	469
19	425	440	458	480	475	477	478	487	497	510	515	514	519	523	526	530	526	515	513	511	507	505	496	487	496
20	486	493	495	490	490	494	495	495	495	495	495	495	495	504	501	500	505	505	505	505	505	495	495	490	497
21	494	495	495	495	495	492	492	487	485	485	485	482	495	495	495	495	502	505	505	505	505	495	495	495	497
22	486	480	483	487	490	489	485	484	485																

Dombás

Vertical Intensity. Z = 47000 γ + Tabular Values.

APRIL 1952

HOURLY MEAN VALUES.

GMT

Table for April 1952 showing hourly mean values for vertical intensity. Columns include DAY, 1-24, and MEAN. Rows include D 1-15, M, MQ, MD.

MAY

Table for May 1952 showing hourly mean values for vertical intensity. Columns include DAY, 1-24, and MEAN. Rows include D 1-31, M, MQ, MD.

JUNE

Table for June 1952 showing hourly mean values for vertical intensity. Columns include DAY, 1-24, and MEAN. Rows include D 1-30, M, MQ, MD.

Dombås

JULY 1952

Vertical Intensity, Z = 47000 γ + Tabular Values.

HOURLY MEAN VALUES.

GMT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	518	517	517	519	518	517	513	511	507	500	497	502	506	507	507	508	511	507	508	499	460	460	492	505
2	502	512	508	507	508	510	512	514	511	508	508	504	506	513	515	514	512	510	511	509	510	511	508	510
3	504	508	508	514	513	508	504	508	508	511	513	512	514	522	530	553	584	592	565	554	534	522	510	506
4	514	512	510	508	508	508	508	508	506	506	508	511	518	524	538	556	544	528	518	517	521	528	514	504
5	491	479	489	491	486	462	449	483	509	526	519	534	572	714	659	539	606	559	459	504	299	374	451	506
6	479	499	509	509	494	500	496	504	496	500	511	509	515	521	515	523	515	514	516	514	516	519	506	484
7	484	491	502	507	507	507	503	506	508	508	502	501	507	507	511	517	524	547	539	527	517	517	513	512
8	511	507	507	507	505	501	505	507	507	508	504	507	513	528	556	581	567	537	520	519	514	509	499	467
9	471	488	484	480	474	492	494	492	492	508	517	518	521	518	543	588	593	535	518	519	531	512	508	501
10	494	498	498	490	484	484	508	508	508	516	517	528	541	532	547	567	575	568	562	558	538	512	473	465
11	409	395	441	482	466	475	496	499	499	503	509	509	509	519	529	525	519	523	515	514	511	512	510	509
12	501	474	449	459	459	474	489	499	505	505	506	509	518	519	513	513	509	508	506	508	509	515	509	504
13	506	507	509	509	510	510	505	500	498	498	500	500	500	504	520	545	540	530	530	510	512	510	506	502
14	500	480	460	460	470	495	503	499	495	496	498	506	526	544	550	540	575	544	525	523	512	510	490	506
15	441	471	485	482	476	478	487	496	497	499	501	501	505	507	521	517	513	511	511	517	511	509	495	428
16	474	496	501	505	505	504	501	511	507	504	507	514	515	521	521	528	523	523	524	521	521	511	511	511
17	509	509	509	509	495	490	490	489	495	499	499	499	499	503	515	531	539	540	535	522	521	514	505	503
18	499	502	502	499	479	478	485	489	489	489	493	499	512	515	520	533	533	515	506	503	506	506	495	489
19	499	501	504	510	510	510	505	501	500	496	489	490	496	507	506	508	510	514	520	509	508	506	500	490
20	460	469	484	493	490	487	490	488	482	484	484	494	515	521	542	638	610	571	540	542	520	440	365	340
21	327	364	395	391	371	461	475	496	495	503	521	531	532	593	565	636	556	546	548	504	493	431	413	385
22	394	448	471	478	495	498	506	507	507	511	511	521	511	511	511	518	520	517	517	524	481	471	475	456
23	479	495	500	507	495	502	499	496	495	496	492	494	498	502	515	524	522	526	518	516	509	474	469	472
24	444	442	442	488	498	502	504	506	502	502	498	492	498	509	511	515	525	532	524	516	515	502	465	472
25	489	501	505	507	508	507	508	509	505	499	495	495	503	515	529	540	521	520	518	523	501	483	480	443
26	408	437	406	393	457	484	497	500	496	500	503	503	513	520	526	516	523	523	519	513	513	509	507	502
27	499	487	491	506	514	514	510	506	501	500	500	494	510	504	510	517	514	518	517	517	519	498	437	459
28	484	488	435	500	499	503	504	504	501	497	493	494	502	504	504	504	504	504	504	505	509	513	509	509
29	510	510	509	511	514	515	516	515	511	505	505	498	501	508	511	510	511	513	508	510	513	514	510	508
30	506	502	502	505	505	503	508	508	505	503	503	502	502	508	501	502	505	508	515	535	515	510	508	506
31	506	505	496	489	492	494	493	497	502	497	507	519	526	526	546	560	560	579	562	559	516	503	516	519
M	478	484	488	490	490	496	499	502	502	502	504	506	513	524	529	539	537	531	522	519	506	497	488	479
MQ	501	503	503	507	507	508	509	508	506	502	500	498	502	506	507	508	508	510	512	510	511	511	507	505
MD	446	460	472	471	463	480	481	493	495	504	510	518	531	572	565	595	574	545	516	517	472	455	449	432

AUGUST

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	505	498	502	488	468	478	488	499	496	503	502	503	506	509	509	509	507	506	513	531	516	506	501	486
2	472	452	464	497	500	500	503	503	503	504	505	507	512	520	527	527	534	547	580	543	527	520	492	457
3	490	500	503	497	457	432	433	451	464	492	501	494	514	567	621	692	622	554	544	551	530	497	497	493
4	478	463	462	484	501	505	495	498	494	496	496	499	498	508	509	523	528	523	533	512	480	479	468	358
5	348	413	450	478	490	494	498	501	504	513	516	519	504	502	504	523	553	563	548	528	514	509	508	498
6	469	304	359	406	421	463	488	497	510	506	510	519	519	529	542	545	531	531	535	522	519	518	514	483
7	389	369	433	459	488	499	499	507	519	519	515	510	519	525	531	541	540	540	543	533	522	516	502	476
8	474	494	503	508	503	500	501	514	514	516	517	519	532	548	530	517	514	510	511	513	526	506	500	505
9	510	511	513	511	508	508	513	513	510	509	510	506	514	520	520	515	510	521	520	503	513	502	483	476
10	424	361	383	425	443	468	481	491	500	503	505	512	534	601	569	569	601	611	578	526	522	511	461	444
11	461	474	431	458	485	495	501	504	501	501	506	511	514	520	522	516	512	514	511	521	523	511	446	471
12	389	337	439	488	502	498	502	508	517	512	519	522	520	533	548	577	589	552	537	542	470	502	500	499
13	498	508	514	516	517	516	513	512	505	507	511	512	512	519	527	532	537	534	529	524	522	521	510	504
14	503	507	513	513	510	506	510	513	506	503	501	503	501	513	521	523	523	520	523	528	519	513	513	513
15	507	495	494	503	507	509	506	503	501	499	497	496	501	503	507	515	517	513	508	508	503	499	504	507
16	504	504	499	496	489	486	494	494	490	490	490	497	504	506	512	514	514	514	514	515	514	514	511	511
17	508	504	503	500	497	494	494	488	480	472	472	494	518	529	545	542	538	575	531	528	515	505	415	437
18	377	423	433	450	449	454	489	500	507	504	502	504	495	501	510	532	533	545	523	518	515	509	500	485
19	468	471	418	445	457	484	505	506	505	504	496	491	546	634	526	516	516	517	531	526	519	496	461	456
20	484	486	476	492	481	459	461	481	500	508	506	540	496	497	502	510	516	516	513	516	516	510	510	509
21	486	490	490	498	505	502	503	506	503	496	487	488	496	497	502	510	516	516	513	516	516	510	510	509
22	510	508	508	512	511	511	510	506	506	505	505	505	488	500	510	510	510	510	512	507	507	512	500	496
23	460	407	412	472	472	454	507	507	503	497	487	483	488	508	500	517	510	513	517	512	507	507	508	493
24	5																							

Dombás

Vertical Intensity. Z = 47000 γ + Tabular Values.

OCTOBER 1952

HOURLY MEAN VALUES.

GMT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN	
1	447	437	487	497	496	507	514	523	524	524	521	517	519	524	527	534	537	527	530	528	516	513	493	481	509
2	504	506	501	497	502	507	512	518	517	520	513	521	527	540	548	536	527	531	542	544	457	489	502	509	515
3	506	468	450	458	480	478	490	504	510	511	508	510	523	524	550	533	630	603	618	614	388	298	263	373	494
4	413	323	423	486	471	438	438	488	538	548	524	518	524	544	573	633	608	586	668	423	343	393	243	243	470
5	399	477	503	506	466	422	453	509	549	602	632	637	642	567	572	604	629	579	504	334	464	484	469	468	520
6	397	445	426	450	484	477	496	509	523	549	544	535	543	565	586	599	564	559	509	532	529	509	518	524	516
7	524	524	524	524	524	521	520	526	528	529	530	535	539	550	554	555	540	550	550	542	537	490	495	500	530
8	507	490	455	463	503	510	511	515	519	520	523	524	526	533	545	537	552	555	562	564	538	526	516	510	523
9	486	426	450	496	511	517	521	525	526	521	521	521	531	527	525	529	530	529	529	528	547	521	511	461	512
10	486	501	506	511	511	517	517	521	521	519	518	517	520	521	522	526	526	541	532	546	467	488	517	517	515
11	518	504	482	502	513	514	518	518	519	519	518	516	525	525	527	531	536	552	572	502	526	532	524	382	516
12	372	442	449	422	424	449	499	512	514	512	513	518	515	532	527	532	532	532	542	536	518	507	520	507	497
13	473	499	515	517	518	518	522	523	520	518	519	517	517	518	522	529	529	529	523	527	525	523	523	494	517
14	505	513	514	513	512	506	496	509	514	516	516	519	519	519	521	523	523	533	530	529	532	527	528	527	519
15	514	514	517	517	519	519	520	523	521	516	514	514	518	518	521	524	524	530	520	521	525	521	520	520	520
16	518	516	518	517	516	514	516	520	519	514	510	514	514	514	518	518	524	521	524	523	521	523	534	524	519
17	518	511	435	439	461	489	509	515	516	519	520	521	525	525	528	531	543	605	575	555	530	505	466	486	515
18	495	498	505	492	492	508	505	513	528	532	525	521	525	535	539	555	579	600	575	525	510	511	500	492	523
19	496	516	518	520	523	523	524	525	528	540	540	540	545	545	545	540	532	527	526	525	525	526	521	518	525
20	513	505	502	510	506	512	515	516	516	516	516	520	525	532	541	553	568	576	550	532	526	521	521	516	525
21	519	521	521	521	520	521	522	521	519	516	504	512	522	550	551	722	647	612	644	672	617	552	547	537	558
22	519	521	521	521	520	521	522	522	520	520	520	521	526	527	527	523	522	522	522	522	522	522	523	522	524
23	523	522	522	521	521	521	521	522	522	518	518	519	523	520	519	522	532	529	528	528	528	528	518	514	522
24	516	518	519	518	518	518	519	520	519	518	518	518	522	526	522	518	518	518	520	520	521	522	521	519	519
25	519	519	519	519	519	517	516	516	516	511	511	519	518	520	527	529	534	614	579	551	504	479	366	394	513
26	393	309	189	377	441	484	499	509	521	522	520	539	575	644	699	689	699	649	579	562	504	484	464	484	514
27	410	440	470	492	505	516	520	520	526	529	530	529	530	530	530	530	529	520	535	531	534	534	523	497	513
28	495	490	470	493	503	510	510	515	518	519	520	520	527	530	530	530	530	520	530	524	520	534	523	516	516
29	511	509	510	515	517	521	522	524	525	524	526	528	532	535	551	589	594	611	608	561	451	401	401	356	518
30	301	298	361	346	386	464	511	516	521	530	527	527	531	531	551	641	706	651	596	461	426	416	261	331	473
31	385	442	342	375	462	489	509	539	527	519	526	544	592	672	652	672	632	575	575	537	506	482	409	447	517
M	474	475	472	486	494	501	509	517	523	525	524	526	533	541	547	563	565	561	551	529	505	495	476	473	515
MQ	521	518	517	518	518	519	520	521	520	518	517	518	523	525	527	528	533	535	528	525	524	523	521	518	522
MD	378	370	364	523	439	459	482	512	535	544	546	553	573	592	609	648	655	608	564	463	449	423	369	395	503

NOVEMBER

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN	
1	392	442	467	494	502	507	517	522	522	522	529	537	538	544	602	588	590	567	562	512	485	457	445	327	507
2	403	473	493	499	508	518	523	527	529	527	527	533	533	540	575	568	562	573	553	507	473	511	518	523	521
3	513	508	497	502	513	513	516	523	523	526	533	535	535	542	565	569	549	543	533	532	533	533	523	503	528
4	493	504	513	522	524	525	524	524	524	524	524	524	527	530	530	529	530	528	528	528	527	527	526	524	523
5	522	520	518	520	524	524	524	524	524	524	524	524	524	524	528	530	534	533	537	540	537	530	524	509	526
6	511	518	521	519	505	498	495	502	511	513	515	517	530	538	532	529	540	542	565	550	535	530	524	506	523
7	475	470	498	508	505	505	505	514	515	515	514	516	517	521	529	541	539	532	565	549	560	527	420	449	518
8	486	509	517	519	516	516	515	516	521	520	520	522	523	530	537	535	536	532	540	457	496	426	442	457	508
9	498	506	476	496	506	513	518	520	518	520	517	520	522	526	526	535	526	529	512	523	530	516	517	519	516
10	522	521	521	522	522	522	522	523	522	521	521	522	522	523	524	524	524	528	530	527	524	523	522	519	523
11	520	521	521	522	522	522	521	522	522	519	517	520	521	523	523	523	527	539	557	550	537	531	527	509	526
12	509	515	521	523	523	524	523	521	521	518	518	522	523	523	523	523	522	525	524	524	525	523	524	524	522
13	519	514	518	518	521	521	520	521	523	523	523	522	521	520	519	519	520	522	528	520	519	518	518	518	520
14	518	518	517	517	513	512	510	512	513	514	514	515	515	518	518	518	518	518	518	518	523	528	508	498	510
15	519	525	521	519	516	515	514	516	519	519	522	525	531												

Appendix

 STORMINESS VALUES FOR THE PERIOD 1949-1951 FOR D, H, AND V

Based on recordings made at BRENNÖYGARDEN from January 1, 1949 until February 28, 1951, and on recordings made at DOMBÅSHAUGEN for the rest of the year 1951 are in the following presented Tables of monthly means of storminess hourly values and Tables of diurnal sums of positive, negative and absolute storminess (PS, NS, and AS). Due to the short distance between the two sites and the relative character of the storminess values, no distinction has been made between the two stations in the Storminess Tables.

In charge of the magnetic stations was the late MR. PER EINBU, who made the necessary magnetic measurements and scaled the magnetograms for hourly mean values. Scalings were centered round half-hours GMT. Calculations of the storminess values were undertaken by MR. K. F. WASSERFALL with the assistance of MR. HELGE DALSEIDE according to methods outlined in No. 9 of the present series.

ADOPTED SCALE VALUES and TEMPERATURE COEFFICIENTS

ϵ_D δ/mm	ϵ_H δ/mm	ϵ_V δ/mm	τ $\delta/^\circ C$	τ $\delta/^\circ C$	STATION
7.0	5.7	4.7	5.38	5.96	Old
9.59	8.97	7.59	0.06	0.01	New

The results presented below represent the completion of the formal presentation of results from the old magnetic station at BRENNÖYGARDEN, that had been in operation for 35 years, 1916 - 1951.

Storminess Mean Values.

Dombås.

Declination. (+ W). Unit Gamma.

1949	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN	
JAN	-16	-25	-13	-5	-1	10	8	6	3	0	-1	-1	0	0	-1	4	0	-10	-3	-17	-14	-13	-3.9		
FEB	-17	-16	-11	-11	-8	2	5	8	2	2	3	4	5	4	4	4	6	2	-2	-2	-13	-11	-15	-2.2	
MAR	-11	-15	-11	-5	3	4	4	6	6	5	6	6	3	6	5	5	6	5	-1	-6	-9	-16	-12	-7	-1.1
APR	-11	-8	-7	-6	-4	-1	0	2	2	2	0	-1	1	-1	2	5	5	3	2	-1	-3	-6	-5	-11	-1.8
MAY	-8	-1	-6	-3	-2	-2	0	-3	-8	-7	-3	-4	-4	-8	2	7	9	3	5	3	-3	3	-4	-5	-1.6
JUN	-10	-7	-6	-2	-2	0	1	0	1	1	0	1	-3	-3	0	3	8	6	8	5	2	3	-3	-3	-0.1
JUL	1	3	4	3	4	5	5	3	2	0	0	1	-1	-2	0	0	-2	-3	0	-1	-1	-1	-3	-1	0.6
AUG	-1	0	-1	0	5	9	3	4	-1	-5	-5	-5	-5	-1	-1	2	1	0	1	2	-1	-3	-6	-4	-0.5
SEP	-9	-9	-3	-2	0	5	4	4	5	1	0	0	0	0	2	4	2	1	-3	-4	-5	-8	-7	-10	-1.3
OCT	-9	-12	-9	-6	5	3	2	1	-2	-7	-2	1	5	2	3	1	1	4	5	2	-6	-12	-22	-14	-2.8
NOV	-11	-6	-4	-1	4	6	4	2	1	3	5	7	7	9	8	4	9	4	-3	-9	-7	-10	-7	0.5	
DEC	-6	-7	-6	-2	1	2	3	2	3	4	3	2	2	1	1	4	4	2	4	-2	-8	-5	-4	-5	-0.2

Horizontal Intensity. (+ N). Unit Gamma.

1949	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN	
JAN	-62	-75	-72	-82	-50	-29	-14	-8	-9	-5	-5	0	4	7	11	16	9	1	-7	-25	-27	-26	-37	-20.5	
FEB	-44	-42	-30	-16	-15	-11	-4	-1	-2	2	2	6	5	9	14	14	11	1	2	0	-6	-19	-33	-6.3	
MAR	-41	-34	-26	-29	-27	-29	-14	-6	-3	-3	-1	11	16	20	21	25	31	32	21	7	-8	-15	-22	-30	-4.3
APR	-35	-27	-24	-24	-20	-8	-5	-3	0	-1	-4	-2	10	15	15	18	26	27	12	5	-1	-6	-8	-27	-2.7
MAY	-56	-50	-32	-29	-17	-8	-8	-5	-8	-8	-5	-1	9	33	19	18	27	14	10	6	-9	-18	-29	-52	-8.2
JUN	-36	-24	-21	-16	-12	-9	-9	-11	-8	-2	3	7	14	27	37	40	41	31	18	5	-5	-22	-34	-26	-0.6
JUL	-3	-4	-5	-3	-3	-4	-4	-3	-3	-1	0	1	6	14	12	10	11	9	9	3	-1	-3	-2	0	1.5
AUG	-21	-18	-17	-13	-12	-5	2	5	0	2	4	6	8	20	30	17	20	16	9	6	0	-5	-9	-9	1.6
SEP	-11	-25	-16	-12	-6	-4	-4	-6	-7	-2	0	2	8	20	20	13	12	13	8	-1	-7	-6	-9	-9	-1.2
OCT	-49	-42	-34	-21	-10	-7	-6	-4	-9	-8	7	14	16	32	38	50	39	24	-2	-16	-59	-56	-53	-44	-8.4
NOV	-38	-24	-13	-6	-2	-2	-1	3	1	3	2	3	5	15	22	19	30	34	28	6	2	-12	-12	-28	1.6
DEC	-4	-3	-2	-3	-3	-2	-2	-2	-3	-2	0	1	0	0	0	0	0	-1	1	3	0	0	-1	0	-0.9

Vertical Intensity. (+ Down). Unit Gamma.

1949	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN	
JAN	-8	-12	-15	-17	-7	-9	-4	0	3	4	4	4	6	9	12	13	11	8	4	9	9	6	-11	-7	0.4
FEB	-32	-28	-23	-24	-22	-11	-11	-6	-3	-1	-1	2	4	5	6	9	9	5	4	4	4	-4	-21	-29	-6.5
MAR	-20	-30	-22	-23	-33	-22	-16	-8	-4	1	4	7	9	12	13	18	25	19	14	13	6	-7	-14	-20	-3.2
APR	-24	-13	-21	-17	-13	-9	-5	0	1	3	5	7	9	13	10	9	12	11	4	0	-2	-7	-10	-21	-2.4
MAY	-11	-22	-27	-29	-17	-11	-5	-3	0	-2	0	1	7	7	-1	-2	4	2	0	1	-9	-12	-13	-27	-7.0
JUN	-27	-23	-21	-17	-12	-8	-4	-2	1	4	5	7	7	17	14	14	9	10	6	5	4	1	-12	-17	-1.9
JUL	-5	-8	-8	-9	-8	-7	-6	-5	-3	-2	-5	-3	-2	0	3	4	3	3	1	1	0	-1	-3	-4	-2.9
AUG	-14	-16	-18	-24	-24	-14	-8	-4	0	2	5	7	7	9	14	16	16	13	9	7	3	-4	-10	-17	-1.9
SEP	-28	-35	-31	-23	-19	-15	-8	-5	-2	1	3	5	8	11	12	13	13	13	13	4	-6	-9	-18	-25	-5.3
OCT	-19	-26	-30	-22	-21	-20	-6	-2	2	5	6	11	13	19	24	26	26	21	14	8	10	-9	-11	-9	-0.4
NOV	-29	-32	-22	-17	-13	-12	-6	-4	-1	2	3	5	10	14	21	25	28	18	8	6	0	-7	-10	-18	-1.4
DEC	-4	-5	-8	-7	-7	-4	-3	-3	-2	0	1	1	1	2	3	3	5	4	3	7	5	3	-1	-1	-0.1

Dombás.

Declination. (+ W). Unit Gamma.

Table with 24 columns (1-23) and 13 rows (JAN to DEC) showing declination data for 1950. Includes a MEAN column on the right.

Horizontal Intensity. (+ N). Unit Gamma.

Table with 24 columns (1-23) and 13 rows (JAN to DEC) showing horizontal intensity data for 1950. Includes a MEAN column on the right.

Vertical Intensity. (+ Down). Unit Gamma.

Table with 24 columns (1-23) and 13 rows (JAN to DEC) showing vertical intensity data for 1950. Includes a MEAN column on the right.

Dombás.

Declination. (+ W). Unit Gamma.

Table with 24 columns (1-23) and 13 rows (JAN to DEC) showing declination data for 1951. Includes a MEAN column on the right.

Horizontal Intensity. (+ N). Unit Gamma.

Table with 24 columns (1-23) and 13 rows (JAN to DEC) showing horizontal intensity data for 1951. Includes a MEAN column on the right.

Vertical Intensity. (+ Down). Unit Gamma.

Table with 24 columns (1-23) and 13 rows (JAN to DEC) showing vertical intensity data for 1951. Includes a MEAN column on the right.

Storminess Diurnal Sums

Dombds.

Declination.

Unit Gamma

Table with columns for months (JAN to DEC) and sub-columns for PS, NS, AS. Rows represent days 1-31 and a monthly total row 'M'.

Dombds.

Horizontal Intensity.

Unit Gamma.

Table with columns for months (JAN to DEC) and sub-columns for PS, NS, AS. Rows represent days 1-31 and a monthly total row 'M'.

Dombds.

Vertical Intensity.

Unit Gamma.

Table with columns for months (JAN to DEC) and sub-columns for PS, NS, AS. Rows represent days 1-31 and a monthly total row 'M'.

Storminess Diurnal Sums

Dombås.

Declination.

Unit Gamma.

Table with columns for months (JAN to DEC) and sub-columns for days (AS, NS, AS). Rows represent days of the year from 1 to 31, with a summary row 'M' at the bottom.

Dombås.

Horizontal Intensity.

Unit Gamma.

Table with columns for months (JAN to DEC) and sub-columns for days (AS, NS, AS). Rows represent days of the year from 1 to 31, with a summary row 'M' at the bottom.

Dombås.

Vertical Intensity.

Unit Gamma.

Table with columns for months (JAN to DEC) and sub-columns for days (AS, NS, AS). Rows represent days of the year from 1 to 31, with a summary row 'M' at the bottom.

Storminess Diurnal Sums

Table with columns: Dombds., Declination, Unit Gamma, and months (JAN to DEC). Rows represent days 1-31 and monthly totals (M).

Table with columns: Dombds., Horizontal Intensity, Unit Gamma, and months (JAN to DEC). Rows represent days 1-31 and monthly totals (M).

Table with columns: Dombds., Vertical Intensity, Unit Gamma, and months (JAN to DEC). Rows represent days 1-31 and monthly totals (M).

