AD 733877

AD

# ATMOSPHERIC AEROSOLS
## BETWEEN 700 AND 3000 m ABOVE SEA LEVEL
## PART V

**A Study of the Effects of Atmospheric Fine Structure Characteristics on the Vertical Distribution of Aerosols**

FINAL TECHNICAL REPORT


by

Reinhold Reiter

Rudolf Sládkovič

and

Walter Carnuth





July 1971

EUROPEAN RESEARCH OFFICE

United States Army





Contract Number DAJA-37-70C-2647





Physikalisch-Bioklimatische Forschungsstelle
der Fraunhofer-Gesellschaft
81 Garmisch-Partenkirchen, Germany
Skistadion




155

AD

# ATMOSPHERIC AEROSOLS BETWEEN 700 AND 3000 m ABOVE SEA LEVEL PART V

**A Study of the Effects of Atmospheric Fine Structure Characteristics on the Vertical Distribution of Aerosols**

FINAL TECHNICAL REPORT

by

Reinhold Reiter

Rudolf Sládkovič

and

Walter Carnuth

July 1971

EUROPEAN RESEARCH OFFICE

United States Army

Contract Number DAJA-37-70C-2647

Physikalisch-Bioklimatische Forschungsstelle
der Fraunhofer-Gesellschaft
81 Garmisch-Partenkirchen, Germany
Skistadion

Table of contents

## ABSTRACT

Our research work for the purpose of studying vertical aerosol exchange up to 3000 m a.s.l., which was explained in our previous reports, has consistently been carried on. It comprises the obtaining, to the extent possible, of uninterrupted recording data, on the one hand, and, on the other, the development of appropriate methods of electronic data processing and their application toward the derivation, for practical utilization, of relations between aerological parameters and the incremental exchange coefficient. Following are details on the investigations conducted:

Obtaining of Data: Continuous recording of RaB and RaC at 700 m, 1800 m, and 3000 m a.s.l.; computation of the main vertical exchange coefficients for the strata between these levels, and computation of the ionization rate profile. Recording of air conductivities and of the concentration as well as the particle size spectrum of Aitken nuclei at the same levels. Application of these data for computing the vertical profiles of the Aitken nucleus profiles, from the soundings of air conductivities between the said levels. Performance of more than 400 soundings between 700 m and 1800 m a.s.l., and more than 1000 soundings between 1000 m and 3000 m a.s.l., by means of the cable car telemetry systems, for obtaining the profiles of the following parameters: wind velocity, temperature, humidity, polar air conductivities, and potential gradient. Application of the profiles of aerosol particle concentration as computed from the air conductivity profiles, for computing the profile of the incremental exchange coefficients.

Data Handling: Development of computer programs for automatic computation, from the said recordings, of all essential parameters and their altitude dependence; automatic transfer of the data to parameter data tables.

Scientific Processing of Data: Derivation of significant statistical relations between aerological data such as gradients of temperature, of potential and equivalent potential temperatures, of vapor pressure, on the one hand, and the incremental exchange coefficients, on the other. Detailed analyses to investigate the interrelations between all essential parameters, and to deduce appropriate principles of classification as a basis for future improved statistical data processing.

In the appendix, numerous graphs, copies of original recordings, and parameter data tables illustrate the relations found, up to now, and afford a glimpse into our analysing workshop. The most important computer program is printed out in full.

The narrative portion is concluded by a preview of advanced studies intended for the near future.

## I. OBJECTIVES AND BACKGROUND

Our investigations carried out during the period from 1 July 1970 until 30 June 1971 are based upon the preparatory work of the preceding years of operation. The fundamental problem of the current investigations which have been greatly expanded, instrumentation-wise, by the telemetry system aboard the Zugspitze cable car, has been expounded in detail in the preceding report (1) and in a publication (2). It is assumed, therefore, that a reiteration of the final objective of our research may here be dispensed with. Earlier and more recent literature references to be considered have been thoroughly discussed in (1,2), also. New publications by other scientists of any importance have not since been added.

The subject to be presented, however, in this chapter is how does the work performed during the reporting period differ significantly from that of the preceding period up to the middle of 1970. During the latter it was our objective (a) to shield the cable car telemetry systems against all effects of the weather and to obtain by them homogeneous series of recordings; (b) to develop and apply the physical and mathematical bases for the complete numeric evaluation of the recording runs, up to and including computation of the incremental exchange coefficients; (c) to continually record at the three stations the Aitken nuclei concentrations, natural radioactivity (RaB, RaC), and polar conductivities, and to utilize them in the evaluations; and (d) to derive initial deductions from the results.

The performance of evaluating operations was predominantly based on manual processes. However, certain phases of the computations, e.g. those of Aitken nucleus concentration from the total electric conductivity of the air, and of the incremental exchange coefficients from the vertical gradients of the conductivity data, were already performed electronically with the Hewlett Packard desk computer.

Now, during the reporting period of 1 July 1970 through 30 June 1971, the entire evaluation technique was completely changed. A new computer (Intertechnique Multi 8) with 12 k words (1 word = 9 bit) affords us the possibility to perform the entirety of all computation processes in one single operation, and to print them out in tables. A considerable portion of the time, however, had to be used to develop computer programs, to test them and adopt them to the computation problem in all details. The newly acquired accessory equipment such as fast reader and fast tape perforator afforded new possibilities to optimize the computation work, however, initially required time consuming conversions of the computer programs. Furthermore, it was necessary to transfer our stock of primary data, i.e. the crude data read from the recordings, on punch tapes by means of teletype, and do this both retroactively to the greatest extent possible, and continually up until they were caught up actually with the daily soundings.

Hence, there was only a relatively short period left for a thorough statistical processing of the data material as the same can only be based upon the final tables from the computer. Nevertheless, it is possible in this report to convey some interesting - tentative - results. These as well as the detailed analyses described below are in this case based upon Zugspitze cable car soundings only. Analog processing of the Wank cable car soundings will be done later. Also the vertical wind profiles recorded by both systems shall be considered at a later date.

It is by no means gratifying to merely process the data obtained statistically, "blindly", as it were. Such a "blind statistics" is even bound - if solely relied on - to lead on to wrong tracks and into incomplete knowledge. It is rather an indispensible necessity to analyse in detail and "individually", such series of soundings as belong together. Only from such practice, i.e. from an undeniably time consuming detailed analysis, grows the foundation of experience upon which a meaningful and successful statistical evaluation may be based. Part of this report will, therefore, deal with the initial results of such detail analyses.

Our long-range objective is - beside the continuation of the soundings, computer work, and detailed analysis - (1) a complete synopsis of the existing interrelations, and (2) solution of the problem to render the disclosed interrelations applicable for practical use.

# II. OBTAINING OF DATA

## 1. Technical Facilities

### a) Cable Car Telemetry Systems

During the reporting period the telemetry system in the Wank cable car was working without any troubles. In order to obtain data by it which are comparable in every respect to those obtained by the Zugspitze cable car system, the arrangement of the instruments in the bottom of the Wank cable car was changed. The inlet tube for the measuring air flow was assimilated to that of Zugspitze cable car in length, diameter and position relative to the body of the car.

To begin with, the telemetry system of the Zugspitze cable car required some further improvements.

Due to the large altitudinal difference traversed, condensation would occur occasionally on some of the sensitive electronic parts such as resistors of extremely high ohmic value. We therefore had to resort to installing those parts into sealed cartridges which are kept dry inside through anhydrous CaO. This solved the problem, and even the most severe weather conditions during the run or during waiting period at Zugspitze peak no longer affected the functioning of the unit.

Furthermore, it was possible to completely eliminate a disturbing sensitivity of the cable car equipment as well as the relay station at St. Martin's, to nearby lightning strokes; so, interesting recordings are now available from inside the thunderclouds.

Both systems have repeatedly been tested, calibrated and compared with one another in the laboratory.

b) Recordings of Natural Radioactivity in the Air (Concentration of RaB and RaC).

Recordings of RaB and RaC concentrations at the 3 stations were made without interruption, evaluated and utilized within the scientific program. This was done, on the one hand, by computing the mean vertical exchange coefficients between 700/1800 m and 1800/3000 m a.s.l., and on the other hand by using the data in computation of the ionization rate. The results of the recordings for the reporting period are compiled in X. Appendix, Section 4.

c) Recording of Aitken Nuclei Concentration at the Stations.

Aitken nuclei concentration and particle size distribution within the Aitken nuclei range were recorded at the two stations of Wank peak and Garmisch-Partenkirchen without any interruptions or disturbances. All data have been continually analyzed. These (and many other) data are picked up and processed at the latter station by our electronic computer system. Apart from basic research studies on Aitken nuclei and their behavior, these data are primarily used as a basis at 700 m and 1800 m a.s.l., for the conversion of total conductivities into nuclei concentrations.

A new Aitken nuclei counter of the make Environment/one, USA, was installed and put into operation at the Zugspitze station. This unit is smaller and lighter than the GE units, which is essential for operation at Zugspitze peak with the limited space available. But despite considerable expenditure of repair and reequipment efforts, it unfortunately was not yet possible to obtain homogenous recording series over more than a few weeks.

### d) Recording of Polar Conductivities and Space Charge Densities at the Stations.

During the reporting period, instruments were put into operation for the recording of polar conductivities and space charge densities at 1800 m a.s.l. (Wank peak) and 700 m (valley floor). From the terminals of our cable car recording range, they furnish data, continuous in time, for direct comparison and link-up. The instruments are functioning satisfactorily, even under bad weather condition. The equipment that had been previously installed at Zugspitze peak has, without interruption, been yielding recorded data which have been evaluated.

### e) Numerical Processing of Recorded Data

The methods of numerical processing of recorded data are outlined in (1,2).

## 2. Volume of Processed Data

From 1 July 1970 through 31 May 1971, we made

413 recording runs by Wank cable car telemetry system

and 1,015 recording runs by Zugspitze cable car telemetry system.

The manual evaluation operations that were still necessary have all been completed.

During the same period 380 Wank cable car and 900 Zugspitze cable car runs were transferred to punch tapes and mathematically analyzed by computer. The final results are printed out in tabulated form. Based on the fact that each run yields roughly 500 individual data, our file presently comprises 650,000 data.

# III. DATA PROCESSING

## 1. The Physical-Mathematical Fundamentals for Data Processing

The physical-mathematical computation operations are described in every detail in (1), Chapter IV (also cf (2)). They were retained in every detail, hence there is no need for reiteration here.

## 2. Brief Description of the Overall Procedure of Technical Data Processing

Processing of the data, starting with transfer from the moving cable car up to the print-out of the completed tables is shown in Fig.1.

The sensors and the transmitter on the running cable car transmit the measured values to the receiver in codified form and in the known manner. Thereupon follows the electronic decoding of the data and their analog recording on three xy-recorders. The y-channel of each of the three recorders is fed with the analog pressure signal as parameter of altitude. The x-channels are occupied by the analog data for polar air conductivities, wet and dry temperatures and potential gradient + wind speed. The three record sheets obtained per sounding are then subject to intermediate manual processing: the relative values are read off at the main levels (vertical intervals of 100 or 200 m) and at the secondary levels in between. These secondary levels are determined by the processing scientist, based upon the given aerological fine structures of the soundings. These relative values are then compiled in a work chart (intermediate table) per sounding. Thereupon, they are punched (per sounding) on an 8-channel punch tape by means of a teletypewriter. These tapes are then checked for errors (omissions, wrong signs, logical errors) with the aid of a test program; defective tapes are corrected (rate of errors not in excess of 5%). This test process is not reflected in the diagram. After the test, the punched tapes are read via the fast reader, into the core store of the computer. The reading time per sounding is approx. 2 seconds. With the aid of the computer program meanwhile developed, which likewise has to be read into the core store of the computer, the result data are computed. The computation process takes 120 seconds. Thereupon, the result data are punched by means of a fast perforator on a punch tape (approx. 80 seconds per sounding). It is advisable to punch the data of several soundings, one after the other, on a continuous tape of 250 m length. The latter is then fed into another teletypewriter which will print out the result data in the form of clearly arranged tables. They are then furnished to the scientist who will study the mutual correlations of the data, taking into consideration any characteristic atmospheric conditions.

## 3. The Computer Program as Such

The computer program is described in full in Chapter X, Appendix, 5.

## 4. Description of Final Data Tables

In Chapter X, Appendix, 3, a number of Final Data Tables are printed, true to original, as supplements to individual runs. They are arranged as follows:

Headings: Z = Zugspitze system ( W = Wank system)
Number of run; Date; Hour of start of run.

a. Main levels (Haupt-Niveaus")

Vertical intervals 100 m for Wank system;
Vertical intervals 200 m for Zugspitze system.

b. Special levels, selected by temperature structure ("MP-Temperatur")

Vertical intervals are roughly 30 m as a minimum.

c. Special levels selected by humidity structure -- to the extent applicable -- ("MP-Feuchtigkeit")

Vertical intervals see b.

d. Special levels, selected by air conductivity structure -- to the extent applicable -- ("MP-Leitfähigkeit")

Vertical intervals see b,

Meaning of letters designating vertical columns of Tables:

| | | |
|---|---|---|
| Z | : | Number of level |
| H | : | Altitude (m.a.s.l.) |
| P | : | Pressure (mb) |
| T | : | Air temperature ($^{o}$C) |
| TF | : | Wet temperature ($^{o}$C) |
| PT | : | Potential temperature (1/10 $^{o}$K) |
| EPT | : | Equivalent potential temperature (1/10 $^{o}$K) |
| E | : | Water vapor pressure (mb) |
| S | : | Specific humidity ( g/kg ) |
| RF | : | Relative humidity (mm%) |
| +L | : | Positive polar conductivity ($10^{-14}$ 1/Ohm.m) |
| -L | : | Negative polar conductivity ($10^{14}$ 1/Ohm.m) |
| +/- | : | Ratio of both conductivities |
| L | : | Total conductivity (see above) |
| DH | : | Height difference (m) |
| TV | : | Virtual temperature ($^{o}$C) |
| G-T | : | Gradient of T |
| G-E | : | Gradient of E |
| G-S | : | Gradient of S |

G-RF : Gradient of RF
G-PT : Gradient of PT
I : Ionization rate (ions/$cm^3$ sec)
N : Number of Aitken nuclei ($cm^{-3}$)
A : Incremental exchange coefficient ( g $cm^{-1}$ $sec^{-1}$)
D : Diffusion coefficient ($cm^2$ $sec^{-1}$)

Definition of sign of gradients:

The gradients are positive when:

T : decreases with height
PT : increases with height
E : increases with height
S : increases with height
RF : increases with height

The meanings of the letters and gradients should be born in mind when later the Tables and graphs are discussed.

## IV. STATISTICAL RESULTS

### 1. Preliminary Remarks; Kind of Relations Studied; Principles of Selection

Our basic idea in the statistical analyses was to find significant relations between the fine structure characteristics of the meteorological parameters, on the one hand, and the respective value of the incremental vertical exchange coefficient $A_i$ on the same vertical interval, on the other hand. There are numerous possibilities of doing so. After preliminary tests, the following relations appeared sufficiently promising to be numerically investigated (for legend see above).

a) $A_i = f$ ( G-T ) Inversions
b) $A_i = f$ ( G-PT)

c) $A_i$ = f (G-E) Inversions and other barring layers
d) $A_i$ = f (G-PT) General relation,

There was no question, from the outset, that all values from the computer tables were not suitable to be "blindly" used for differentiation of the structure of these relations. The definition of the principles of selection, however, is a tentative one and may be varied or supplemented by other, additional ones in subsequent, more exhaustive investigations. In regard to the above defined relations, the following principles of selection were applied in the following:

a) Data of such vertical intervals only were used (no matter whether bounded by main or special levels) containing distinct temperature inversions (G-T negative). These inversion layers were required to have settled both in time and position; cases with a marked vertical movement of the inversion level were excluded, likewise such with a sudden formation or disintegration of the inversion structure. That pair of values was used at that vertical interval where the steepest negative gradient of T was reached.

b) Same definition as a).

c) Again, data of only <u>one</u> vertical interval were used per run, with the following conditions applied: if there was no negative G-T value anywhere that vertical interval having the lowest positive value was selected; if there was a vertical interval with - G-T, the latter was used; if there were several such the highest negative G-T value was used as criterion of selection. At the same time, G-E was required to show a maximum.

d) Almost all existing pairs of values were used, except such, derived from periods or layers where the structure was subject to rapid changes in time, a transformation of the local meteorological conditions was in progress, or where fog or precipitations were traversed during a run. Likewise, values from layers with distinct inversions have not been included; they belong under b).

In the following part of this we show the distribution of the individual pairs of values as dots in the graphs, on the one hand, and each time a respective statistical evaluation, on the other. The latter was made with our Hewlett Packard computer which, in the meantime, has been equipped with an extended memory. The pairs of values were keyed into the computer. The latter then separated them according to A-values. To this end, each A decade was subdivided into 10 equal intervals. The computer automatically determined the 40 mean values between $A_i = 0.1$ and $A_i = 1000$, plus the pertinent criteria of significance

$$\sigma_M = \pm \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{(n-1)\,2n}}$$

The results of these statistical investigations are presented in the form of "stepped graphs". In the discussion of the graphs below the above listed criteria of selection should be born in mind, as appropriate.

## 2. Relation $A_i = f$ (G-T), Inversions

Fig. 2 shows the scattering of the individual pairs of values for the relation $A_i = f$ (G-T) in the case of a typical inversion (see Section IV.1.a). The study covers the period of 28 July 1970 through 17 February 1971 with a total of 388 pairs of values. The graph is analogous to Fig. 23 in (1). A comparison of the result depicted in said graph with that in Fig. 2 reveals this: In principle the earlier result agrees quite well with the more recent one except that the relation $A_i =$ f (G-T) is now much more pronounced, the scattering of the values is narrower.

Fig. 3 shows the analogous result of a statistical analysis with statement of scatter $\sigma_M$. This graph clearly shows: There is a strict, significant relation between an incremental exchange coefficient in the range of $A_i$ = 0.1 through 300, and the temperature gradient in the range of - 0.1 through -10 °C/100 m, provided that the inversion in the vertical interval under consideration is a genuine, stable and largely motionless one to which the $A_i$ and G-T values apply. The relation is independent of season or time of day.

Hence, the function presented in Fig. 3 is already ripe for practical application.

## 3. Relation $A_i$ = f (G-PT), Inversions

Fig. 4 shows the scattering of the individual pairs of values for the relation $A_i$ = f (G-PT). It, again, applies to cases of typical inversions. The principle of selection is defined in Section IV.1. a) and b). The period of the study, again, stretches from 28 July 1970 through 17 February 1971 and covers a total of 289 pairs of values.

With the scattering of values not too wide a surprisingly clearly defined logarithmic relation is found between incremental exchange coefficient $A_i$ and potential temperature gradient G-PT:

If in a defined vertical interval with an inversion the potential temperature gradient increases, the intensity of exchange in the same layer is decreased. The following rule may be stated: Per 1 °C/100 m increase of G-T, $A_i$ is decreased by one decimal power.

Fig. 5 shows the analogous result of a statistical analysis with statement of scatter $\sigma_M$. True it is greater than in Fig. 3, nevertheless between $A_i$ = 100 and $A_i$ = 0.8 the relation may be considered well established. The volume of data material is to be further increased in order to make the relation come out even more clearly. This particularly applies to the value range of $> A_i$ = 150 and $< A_i$ = 1.

Aside from these statements we feel justified in claiming that this function $A_i = f$ (G-PT), too, may already be practically applied.

We consider the statement important that now we have two criteria, independent from each other, to quantitatively state the barring effect of an inversion, viz. the function in Fig. 5 <u>and</u> that in Fig. 3. From now on, the layer having the strongest barring effect may immediately be determined from the aerological data: negative temperature gradient and positive potential temperature gradient must be at maximum values.

## 4. Relation $A_i = f$ (G-E), Inversions and Other Barring Layers

In studying the relation between the incremental exchange coefficient $A_i$ and the gradient of water vapor pressure (G-E) we have dropped the demand that a genuine, stable and stationary inversion must exist. With the aid of the gradients of temperature and potential temperature we have merely searched for a barring layer in general (for definition of principle of selection see Section IV.1.c). For the layers thus defined we then studied the above described relation, using data from the period of 28 July 1970 through 17 February 1971. The graph containing the individual pairs of values is shown in Fig. 6; the results of the statistical analysis is presented in Fig. 7. Between $A_i$ = 100 and $A_i$ = 1 we find a significant logarithmic function having a relatively narrow scatter with only 263 pairs of values. It appears desirable to increase the data, particularly in the limiting zones. The rule has been established that $A_i$ will be increased by one decimal power when the negative value of G-E is increased by 1 mb/100 m - and vice versa. This is comprehensible in principle since the vertical exchange of water vapor, too, is controlled by the amount of the $A_i$ value. Nevertheless, it is probable that the graphs 6 and 7, for the first time, convey a tangible picture of the function as such as it is actually applicable in the atmosphere.

With this function, now, we have an independent third criterion by which to locate layers having a barring effect, and to determine the degree of their barring effect.

## 5. Relation $A_i$ = f (G-PT), General Cases Other tan Inversions

Within the scope of the previous studies we had limited ourselves to either typical inversions (Sections 2 and 3) or, at least, layers of such aerologic structure as to permit the inference of a barring effect, including inversions (Section 4). To the extent that criteria of selection were applicable at all, the values of one layer, at maximum two layers, per run were, in this manner, to be taken into consideration. The study now being discussed, however, covers <u>all</u> layers (any number per run) except such containing an inversion. As explained in Section IV.1.d) , the following have also been left outside of consideration: cases with a rapid transformation of the weather condition, with precipitations, or runs entirely or partly through clouds.

Preliminary studies have revealed that above all the potential temperature gradient is very well suited for this kind of a general statistics.

In order to determine whether seasonal differences might play a part in this we have subdivided the entire period from which values are available, into 28 July 1970 through 12 November 1970, and 13 November 1970 through 17 February 1971. We shall here dispense with a presentation of the distribution of individual pairs of values, even more so as, in view of the large volume of data, this kind of evaluation would have been too expensive.

The results of the statistical investigations are shown in Figs. 8 and 9, with statements as to the respective scatters. From both figures a clear and strict relation becomes apparent ($A_i$ = f (G-PT)), scattering only insignificantly in the range bet ween $A_i$ = 1000 through $A_i$ = 1. At $A_i < 1$ the relation becomes uncertain. As demonstrated by Fig. 10 the results from both periods of time are in good agreement with one another, hence there is no seasonal impact.

The relation depicted in Figs. 8 through 10 applying to those atmospheric layers which are not of the nature of an actual inversion, clearly deviates from that deduced for typical inversions (Fig.5). The reason for this deviation is yet to be clarified.

The function $A_i = f$ (G-PT) resulting from Figs. 8 through 10 is suited for deducing, in practical work, from G-PT values the strength of vertical exchange, unless typical inversions are being delt with in which case the function pursuant to Fig. 5 is to be applied.

## V. DETAILED CASE STUDIES

### 1. Preliminary Remarks

The following case studies are partly based upon the original recordings by cable car telemetry system and pertinent parameter data tables supplied by the computer. The wind profiles are not yet taken into consideration. The graphs and tables are compiled in SECTION X, APPENDIX, 3. They, at the same time, afford a glimpse into our "Analysis Workshop". The numbers of the levels in the recordings correspond to the numbers of levels in the tables. On the other hand, the case studies are based upon a study of changes in time of certain structural elements at the inversion level and pertinent numeric values of functions: $A_i = f$ (G-T), $A_i = f$ (G-E) and $A_i = f$ (G-PT). Separate graphs which are given consecutive figure numbers serve this purpose (SECTION X, APPENDIX,1). In the graphs on which the values of the aforesaid 3 functions are entered, we have also plotted the "normal progress" of each respective function, in the form of dotted areas, which also, based upon Figs. 3, 5, 7, indicate the mean scatter. The examples to be discussed hereinafter, are marked with identification letters in alphabetical order. These letters have been transferred to all graphs, recordings and tables (also those in SECTION X, APPENDIX, 3,) so no doubts may arise as to their correlation.

The runs of one and the same day bear encircled numbers in chronological sequence. These, too, are also found on all recordings, graphs and tables, hence the variations of all data in the course of time are readily recognized.

Following are some necessary remarks on the problem of equilibrium. An aerological structure, e.g. the variation of temperature across an inversion layer, and the vertical aerosol profile across the same vertical interval can be in lawful correlation to one another (as shown, e.g. in Figs, 3, 5, 7) only if there had been enough time for the setting of some stationary condition. There are two possibilities:

a) A temperature inversion is created, very rapidly, say in less than 1 or 2 hours, through some processes which are known in principle. At the moment of its formation, the aerosol profile cannot, as yet, have been accommodated by this inversion to the instantaneous barring effect. The adaptation process requires a few hours; for instance, by evacuation or coagulation of aerosol particles above the inversion and concentration below, until equilibrium has been set based upon the mere eddy diffusion process. Not until then can a lawful correlation exist, and parameters be within the normal ranges of the functions per Figs. 3, 5, 7.

b) With the barring effect of an already existing inversion being constant in time, the source strength of the aerosol in the layer below the inversion may change, or aerosol may be brought in or drawn off, through advective processes. In this case, again, the equilibrium of diffusion is temporarily disturbed and time is required for readjustment.

c) It may happen that aerosol fluxes from some a source into the lower atmospheric layers, where it will spread for the time being. At the upper boundary of the thus developed haze layer, an exradiation of heat begins. This causes continuous cooling and formation of vertical temperature structures which react back upon the vertical aerosol distribution. In this instance, again, the result may be a disturbance of the eddy diffusion equlibrium of long duration.

Other processes are possible which shall not be discussed in this context. The following studies are to show the meteorological conditions under which an equilibrium of diffusion is, as a rule, encountered, or not encountered, and what numeric relations will be found in each respective case.

2. Example A, 5 Oct 1970, Figs 11 through 14
Spontaneous formation in the medium altitude zone of a most sharply defined inversion, which from noon on descends.
Equilibrium of diffusion set from the beginning.

Looking, to begin with, at the original soundings (APPENDIX) we find that at around 1100 CET (run 0) neither T nor TF show any distinctive structure, and this is true of the entire vertical interval. The temperature gradient, however, is weak, and humidity is decreasing with height. The polar conductivities +L and -L are steadily increasing from level 11 to level 5. The causes of their variations above level 5 do not concern us in this report. At 1157 CET (run 1) already, a sharply defined inversion exists immediately below level 6, with humidity decreasing with increasing height, which is clearly reflected in the behavior of +L/-L. In the course of the day the picture of a typical temperature inversion with humidity break becomes more and more distinct. At the same time the abruptness of the break of +L and -L keeps increasing, and the aerosol concentration below the layer of the break is continually growing (the values of +L and -L are decreasing). Thus the gradient of the aerosol concentration across the layer of the break is getting steeper and steeper. From noon until night the level of the inversion is continuously descending.

Let us now take a look at the detailed analyses in Figs. 11 through 14. Fig. 11 shows changes in regard to altitude and time for:

a) the layer where the inversion is located ($-G-T_{max}$);
b) the level with a minimum value; and
c) a maximum value of the equivalent potential temperature EPT.

With regard to b) and c) the following must be added: in case of well defined, stable inversions scarcely variable in time or space, or other barring layers, a minimum of EPT is encountered above the barring layer, with a maximum within or below its level. In the absence of barring layers EPT, as a rule, decreases evently with decreasing height. Thus barring layers normally also identify themselves by an "inversion" in the course of EPT, which, however, proceeds inversely to T. The fact that this EPT inversion (signs: - and = in Fig. 11) is convected together with the temperature inversions proper (sign: ⊔) is clearly apparent from Fig. 11. This figure also reflects the time slope of $A_i$. During the descent, to begin with, $A_i$ increases. In the evening, when the inversion has settled, $A_i$ drops to a minimum value of only 0.3.

In Fig. 12 we study the variations with time in the range of the function $A_i = f(G-T)$ within the inversion layer of runs 1 through 4. The variation of the pairs of values occurs exclusively inside the (dotted) normal range. Thus, A during the descent (run 1 after 2 to 3) increases, it is true, but G-T, too, changes by a corresponding amount as the function shows. Hence, structure of inversion, and control of the vertical aerosol distribution by it are in a true-to-function relation to each other. We arrive at an analogous result if we study Fig. 13 ($A_i = f(G-PT)$). Except for run 1 the pairs of values are within the normal range of the function. Hence, the behaviour of G-PT and the pattern of the vertical aerosol structure correspond to each other. From these finding we may deduce that equilibrium of diffusion has practically existed from the beginning. No analogous conclusion may be drawn in regard to the relation $A_i = f(G-E)$, as illustrated by Fig. 14. In this instance all pairs of values are exclusively outside of the normal range. The E-gradients are much greater than would be permissible with regard to the $A_i$ values. Hence, a change must have occurred in absolute humidity (e.g. caused by advection) above or below the barring layer, which was not related, across the barring layer, to the eddy diffusion process, whereas by contrast the aerosol distribution did obviously correspond to the barring effect of the layer.

Conclusions drawn from this example:

Even in case of spontaneous formation of a very sharply defined inversion, and during a slow and constant descent of the same, the discovered "normal relations" between $A_i$ and G-T or G-PT, respectively, are being retained. Thus they adequately describe the vertical distribution of aerosol; the state of equilibrium prevailed. A deviation of the values outside of the normal range of $A_i$ = (G-E) reveals an advective change of humitidity. This emphasizes the high value of such detailed analyses. The rule that there has to be a minimum of EPT above the barring layer, and a maximum within its level, is met at all times. It may additionaly serve as an indicator of the barring layer.

We are here dealing with a case where rapid formation of an inversion and the transformation of the vertical aerosol structure went hand in hand together in such a manner, that the condition of equilibrium for the eddy diffusion was met at all times. Conditions for the occurence of this situation remain yet to be defined.

3. E ample B, 18 Nov 1970, Figs. 15 through 19.

Well-defined, spontaneously formed inversion, with height of barring layer and intensity of barring effect varying. Equilibriumof diffusion retained.

The soundings (for a selection pertaining to Example B see X., APPENDIX 3) already show that we are here dealing with a (spontaneously formed) inversion and barring layer which is subject to considerable fluctuations in time as to its structure and height. As demonstrated by Fig. 3 the maxima of -G-T and -G-E are located at the same respective altitude, which level, however, fluctuates considerably. A maximum of EPT above the inversion level and a minimum within the same cannot be found. $A_i$, too, fluctuates considerably from run to run, and the rule is confirmed: If the inversion level descends the barring effect of the inversion is temporarily reduced ($A_i$ is increased), as is demonstrated by runs 3 and 6.

As is recognized from Figs. 16 and 17 the values are fluctuating precisely within the normal range of the function $A_i$ = f (G-T) and $A_i$ = f(G-PT). So, with the exception of runs 2 through 4, diffusion equilibrium prevails as in Example A. The change from run 2 via 3 to 4 is indeed striking. Whereas $A_i$ is changed considerably, G-T and G-PT remain practically constant, the full "normal" scatter of the function is traversed. This means that during the vertical movement of the inversion from 2 via 3 to 4 the aerological structure of T and PT is retained whereas the permeability of the barring layer is reduced temporarily. A local perforation of the layer by turbulences in the early afternoon with relatively extensive insolation, is likely to be the main cause thereof. This example indicates how, by means of such a detailed analysis interfering factors may be isolated.

Considering Fig. 18 we observe that the normal range is considerably exceeded in both directions. The values are not, however, all shifted in one direction as in Example A. This rules out progressive changes of absolute humidity due to advection. Turbulence caused, forced vertical transportation of water vapor is, much rather, to be considered as a cause (transitions from 4 to 5, from 5 to 6). It is, however, a striking observation that the transition 2-3-4 again appears to be out of place: While the water vapor gradient remains constant, $A_i$ varies considerably. This means again that here a variation of the inversion had temporarily been forced, pointing toward interference with the system from the outside (e.g. heat irradiation). It is interesting that in this case a variation of the vertical aerosol structure was triggered (as a consequence whereof a higher A-value resulted for run 3), not however one of the aerological structure and of the vertical distribution of water vapor.

For the present example we have plotted the vertical profile of the incremental exchange coefficients $A_i$ and of the water vapor from run to run as a special representation in Fig. 19. This representation does not only show very impressively the variation in the fine structure of the $A_i$ profiles but also the vertical displacement of the layers having maximum barring effect ($A_i$ minima). What we want to demonstrate, however, is that just these sometimes very thin layers of highest resistance to eddy diffusion are indicated in the E profile by a peak-like dip of water vapor concentration. This is true even in the case of a splitting into two barring layers with a small difference in height (run 6). At the same time we recognize a problem in the E profile for run 3: Here it is not so much a dip but much rather a sharply confined increase of E with height that is characteristic. Such findings with the aid if detailed analyses are conductive to understanding deviations from normal behavior observed from time to time.

The gathering of such exceptions and the investigation of the conditions under which they occur is important for the following reason: In order to reduce, on a pertinent basis, the scatter in the statistical investigations it is necessary to introduce a more detailed subdivision. Most of all, the complex causal nexus of the various parameters may gradually be cleared up in this manner.

Conclusions drawn from the example:

In the case of spontaneous formation of an inversion and intensive vertical movement of the same, the discovered "normal relations" between $A_i$ and G-T or G-PT, respectively, are retained and depict the vertical aerosol distribution which corresponds to a stationary setting of equilibrium. A "breaking out" of the values from their normal distribution, insignificant for G-T and G-PT, and quite considerable for G-E, points to a convectively forced variation in the vertical aerosol distribution, which can no longer be lawfully related to the aerological structure. The vertical water vapor gradient, in this case, behaves differently from the vertical aerosol gradient. With the barring layer sharply descending, $A_i$ is temporarily increased. Barring layers are always indicated by conspicuous deviations of the E profile across very small vertical intervals.

4. Example C, 14 October 1970, Figs. 20 through 23

Sharply defined inversion with predominantly insignificant vertical variations but considerably fluctuating barring effect. Vertical aerosol gradient in stationary equilibrium on basis of aerological structure.

Example C concludes, for the time being, those cases of inversions which are distinguished by the vertical aerosol gradient being in equilibrium on the basis of the given aerological structure, in other words, where the normal relations of our function are fully or largely met.

As is shown by the original recordings in APPENDIX, 3 we are, from run 1, dealing with a sharply defined inversion the strong barring effect of which is clearly expressed by the profile of the air conductivities. Only early in the morning (run 0) an inversion is just slightly indicated, with only a very weak barring effect. The vertical movements can be clearly recognized on the original recordings, e.g. by comparison of run 6 with run 8.

To begin with, the variation as a function of time and altitude is shown in Fig. 20. In the forenoon we find that the ascent of the inversion layer from run 1 through run 3 results in a weakening of its barring effect (increase $A_i$; in Examples A and B we had found a weakening with a descent of the inversion), whereas later in the afternoon the opposite relation is found. Hence, vertical movement, no matter in which direction, may lead to either a weakening or a strengthening of the barring effect. We are thus compelled to restrict our statement to the more generalized form: Vertical movement of a barring layer results in a change to its barring effect. The nature of the individual relation is certainly depending upon the causative reasons for the movement of the inversion (advective processes, anticyclonic descent). In order to determine these, further detailed analyses will be needed. In the context of this discussion of the examples the implications of microscale and mesoscale meteorological conditions and processes are not to be discussed in any detail. A deepening of the detailed analyses in this direction is in process.

In the instant case we again find a minimum of EPT above the barring layer, but no marked maximum below.

Figure 21 shows the variations with time of our values relative to function $A_i = f(G-T)$. We notice that the fluctuations of the values largely remain inside the normal range. An insignificant breaking out (deviation from equilibrium) occurs from 5 through 6 to 7. This means that in Fig. 20, too, we must consider the temporary descent of the inversion level (run 6) as the expression of an interfering process. At any rate, the fact is again conspicuous that $A_i$ changes considerably, e.g. from run 5 to 6, although the aerological structure of T has been retained (G-T constant). The attenuation of the aerosol gradient encountered at the same time therefore must be due to an exterior cause, e.g. perforation of inversion by local turbulence. It is striking, however, that, as Fig. 22 indicates, the variation of the values is largely within the normal range of the function $A_i = f$ (G-E), at least the transition 5-6-7 is within. Again, aerosol and water vapor behave differently in the case on a disturbance of equilibrium. It is surprising, however, that (see Fig. 23) the values for $A_i = f$(G-PT) are almost exclusively outside of the normal range of this function. What conclusions have to be drawn therefrom is yet to be investigated, using all available meteorological data.

<u>Conclusions drawn from this example:</u>

Vertical movements of the barring layer result in variations of their barring effect and a disturbance of the diffusion equilibrium. What direction such a variation may take cannot necessarily be predicted, until such time that the causative reasons for the interfering process are known. It appears certain that detailed analyses of the demonstrated kind will lead to recognition if the causes of interference of microscale and mesoscale meteorological conditions are included in future investigations. For because three basic function are available, based on G-T, G-E, and G-TE, it is, as a rule, possible from the agreement of the individual values with two of these to isolate the one which is most of all affected by the disturbance of equilibrium. This may later lead to isolation of the interfering cause.

5. Example D, 11 December 1970, Figs. 24 through 26.

Inversion at constant height. Vertical aerosol gradient not in equilibrium on basis of aerological structure.

In Figs. 24 through 26 we are studying the case of cyclic variations (runs 1 through 4) of the value obtained, in the range of functions $A_i = f(G-T)$, $A_i = f(G-E)$, and $A_i = f(G-PT)$. All data obtained from these runs are far outside the normal ranges of the three functions. Vertical movements of the barring layer did not occur. Convective interference, also, must be excluded. To what extent persistet advective processes were determining in this case in the formation of this exception remains to be investigated. For it is striking that this low-lying inversion has been formed through the inflow of near-ground polluted cold air. But although this near-ground cold air layer was soon settled a state of equilibrium did not come about.

To begin with, our example shows that even with inversions at rest and seeming freedom from interferences we must be prepared for extraordinary results. If it were not possible to recognize and isolate these (e.g. on the basis of detailed analysis) such values would result in a considerable scattering within the data material. However, the investigation of the causative relations must not be neglected, particularly in such unclear cases. Exactly these may supply valuable insights.

6. Example E, 17 October 1970, Figs. 27 through 30.

Case of two simultaneously existing inversions one of which is suddenly formed newly and the other disintegrated. State of equilibrium is not attained.

Here we are dealing with a relatively complex case. It is remarkable for the only one initially existing inversion and barring layer descending and disintegrating. Prior to its disappearance, however, a second inversion and barring layer was forming about 400 m above which also descends and goes on existing to the end - if with a weak barring effect. From the picture of the original recordings (X., APPENDIX, 3), layer I ows its formation to a layer of haze actively conveyed to the spot at little short of 1500 m a.s.l. ( minima of +L and -L during run 1). In the following we consider the original recordings along with Fig. 27. This initially striking aerosol structure is reduced to a mere trace during run 2, but during run 3 it is suddenly sharply defined again at 1200 m a.s.l. During runs 3 through 6 layer I is disintegrating or hazily merging with layer II which has meanwhile descended and whose existence was first hinted at during runs 3 and 4. Presumably the transition was as indicated with dots in Fig. 27. As is apparent considerable instability prevails in the present case, impeding the setting of a stationary equilibrium of diffusion, as will also be seen from Figs. 28 through 30. First we cast a glance at the variation with time of $A_i$ in Fig. 27. We note that with a rapid descent of both I and II the barring effect is reduced ($A_i$ is steeply increased, runs 2 and 3 for layer I; runs 3 through 5 for layer II). A regeneration of the barring effect for both layers occurs when the descent has come to rest (runs 4 through 6 for layer I; runs 7 and 8 for layer II).

We now consider the position of the data relative to the normal ranges of our three basic functions. In doing so we go from the following sequence of values:

Runs 1 through 6 at level of layer I; runs 7 and 8 at level of II, pursuant to the merger of both layers as indicated (dotted) in Fig. 27.

The poorest agreement is found relative to function $A_i$ = f(G-PT) in Fig. 28. With regard to the G-PT values the exchange coefficients are too low. i.e. the barring effect appears "too strong". This above all applies to runs 5-6-7. But this is the very vague transition phase from I to II with disintegration of II. It is not surprising, then, if during this time interval an equilibrium situation does not prevail. The positioning of the individual values relative to the normal distribution is already notably better in Fig. 29 ($A_1 = f(G-E)$). Surprisingly, the above mentioned transition phase of runs 5-6-7, of all things, is not out of line here: water vapor gradient and aerosol gradient are here apparently triggered by the same atmospheric process. By contrast, the values of runs 1 through 3, i.e. during the descent of layer I, are outside of normal distribution: The barring effect of the layer appears to be stronger, during this time interval, for the aerosol than for the water vapor. With regard to function $A_1 = f(G-T)$, however, - see Fig. 30 - all values of our example (excepting run 5) are within its normal range. From this it would be concluded that with regard to vertical aerosol distribution, approximate diffusion equilibrium must have temporarily prevailed, after all.

Conclusions drawn from this example:

Descent movements of barring layers are coupled with a temporary reduction of their barring effect. The latter is regenerated when the vertical movement has come to rest. In case of a double inversion with disintegration of the lower layer and the suggestion of merger with the descending upper one, the diffusion equilibrium is temporarily disturbed. A discrepancy develops between vertical water vapor and aerosol distribution. A minimum of the equivalent potential temperature above the barring layers, and a maximum near the barring layers were not found which also points toward disturbed equilibrium conditions.

## 7. Example F, 30 September 1970, Figs. 31 through 34

Clearly defined inversion descents slightly, remains at constant level for some time, finally ascents steeply with simultaneous disintegration. Largely set equilibrium of diffusion.

Interest is particularly held by the phases of ascent and disintegration of the inversion or barring layer. For this reason, we have represented only runs 4 through 7 by their originals and tables in X. APPENDIX,3. As with the previous runs (from which a descending movement of the inversion is recognized), an increase of temperature and decrease of humidity with height within the inversion zone is also very distinct with run 4. Just one hour later (run 5), however, the T-inversion has temporarily disappeared whereas the humidity decrease was retained, although this structural detail has risen somewhat. During run 6, a T inversion with humidity decrease is again recognized, if at a considerably higher level than before. Hardly any structures are left for recognition during run 7, traces are derived from the tables.

In Fig. 31 we consider the variations with altitude and time. In the morning the well defined inversion descends by about 10 0 m. During this descending movement the $A_i$ values are relatively high. With the barring layer becoming stationary, however, $A_i$ reaches minimum values between no more than 0.6 and 1.5. At 1300 hours an ascent commences, immediately triggering a steep increase in the $A_i$ values which persists until disintegration of the layer. It is remarkable that in instant case, again, a minimum of the equivalent potential temperature is found above the barring layer (100 m - 200 m vertical interval), with a maximum approximately at the level of the barring layer as such. Only in the case of vertical movements of the barring layer, the EPT maximum, too, is above the barring layer (runs 2 and 7).

Fig. 32 shows that the individual values (2 through 4 ) are in just barely satisfactory relation to the normal range of function $A_i = f(G-T)$ only during the time that barring layer has nearly or fully settled. But during the vertical movement they are far outside thereof (1 to 2; 4 to 6).

The two pairs of values for a very low-lying near-ground inversion in the morning ("low"), which rapidly disintegrates thereafter, are within the normal range. The values of our example are quite satisfactory with regard to the normal distribution of $A_i = f(G-E)$, according to Fig. 33. However, we notice a contrast to Fig. 32: While the inversion has become stationary the values fall insignificantly outside of the normal distribution. The vertical aerosol gradient turns steeper, temporarily, than would correspond to the vapor pressure gradient, whereas agrement prevails during the vertical movements. The values in Fig. 34 are completely outside of the normal distribution of $A_i = f(G-PT)$. We find a cyclic sequence with extreme deviation during the stationary phase of the barring layer. No explanation can be offered therefor, as yet.

Conclusions drawn from this example:

It was confirmed again: Vertical movement (no matter whether up or down) of the barring layer results in an increase of its permeability, its becoming stationary results in a strengthening of the barring effect. The $A_i$ values of the example are in satisfactory agreement with functions $A_i = f(G-T)$ and $A_i = f\ (G-E)$, slight deviations from the former are found during the vertical movement, from the latter during the stationary phase. The superpositioned minima or maxima, respectively, of EPT are found to exist throughout, even during the vertical movements.

## 8. Example G, 28 September 1970, Figs. 35 through 38.

### Considerable vertical and structural variations of an inversion. Equilibrium of diffusion is not attained.

This example concludes our discussion of cases with vigorous vertical movements of barring layers. The original runs in APPENDIX, 3 already show that not only does a distinctive vertical unrest prevail but also the pattern of the structures is changing rapidly. We immediately pass on to Fig. 35. The variations with time of $A_i$ are particularly remarkable. Steep increases of $A_i$ are invariably found when - in accordance with our earlier experience - the level of the barring layer is rapidly changed. This is very drastically demonstrated by the transition from run 2 to 3: $A_i$ is increased by two orders of magnitude and remains persistently high during the subsequent ascent movement (3 to 4). Not until the stationary condition of the barring layer exists during runs 6 and 7, does $A_i$ arrive at a minimum. Renewed disquiet from runs 7 through 10 causes $A_i$ to increase again.

The vertical displacements of the various structural elements, according to Fig. 35, present an almost confusing picture: True, minimum and maximum of EPT are still always found and in not too great vertical distance from the inversion level (as a maximum a few 100 m, as an average 200 m), but the maximum is sometimes above, sometimes below the barring layer. Even the respective strongest gradients of T and E are not - as usual - close to each other. Vertical differences up to 150 m are encountered. Besides, maximum G-T is sometimes above, sometimes below maximum G-E.

Due to the sometimes extremely poorly developed temperature gradients Fig. 36 contains only very few individual values. As was to be expected, they are far from the normal distribution of function $A_i = f(G\text{-}T)$.

It is all the more surprising that, in Fig. 37, the individual values fit very well into the normal distribution of $A_i = f(G\text{-}E)$. Although most certainly the setting of an eddy diffusion equilibrium was not possible in our instance the variations with time of the aerosol gradient (expressed in terms of the behavior of $A_i$) and of the water vapor gradient (G-E) are in good agreement with each other. The interferences, apparent from the continuous structural changes of the aerological pattern and from the vertical variations, thus took effect, in Example G, upon aerosol and water vapor distribution analogous to and on the basis of, the normal relation of $A_i = f(G\text{-}E)$. In Fig. 38, the individual values of our example are far from the normal distribution of $A_i = f(G\text{-}PT)$: We find a cyclic sequence for runs

2 through 7 and another one from 7 through 10. We find it interesting that the first cycle, if defined only from 2 through 6, comprises exactly the first ascent, the second cycle from 7 through 10 the second ascent. It appears to be possible to describe, with the aid of these cyclic "movement graphs", the structural variations connected with processes of ascent or general vertical displacement, and later to improve our understanding of them functionally. At any rate, in retrospect we may say that the cycles in the following earlier figures were connected with vertical movements of the barring layer: Fig. 34 (runs 2 through 6, initial lingering, then rapid ascent with disintegration of the inversion); Fig. 30 (runs 4 through 8, initial descent, then merger with lower disintegrating inversion). An exception relative to all three normal functions is formed by Example D with its cycles. True, there is no vertical movement here, but a clearly cyclic loosening up of the inversion structure (runs 1 through 5) by turbulences in the course of the day. So it will be necessary to pay still more attention to such graphs with a cyclic pattern, in the future, along with further meteorological parameters.

Conclusions drawn from this example:

In the case of violent structural and vertical changes of the barring layer eddy diffusion equilibrium cannot come about. It is, however, possible that variations of the vertical aerosol profiles and water vapor profiles are running in conformity with each other and are jointly controlled by the interferences determining the complex pattern. Again it is shown that vertical movements of the barring layer are connected with a reduction of its barring effect. During vertical movements a cyclic sequence of the values is found relative to the normal distribution of the function $A_1 = f(G-PT)$.

## 9. Example H, 26 September 1970, Figs. 39 through 43.

### Analysis of (a) the upper boundary of the exchange layer, and (b) an ascending inversion located below.

With this example we leave the analysis exclusively of inversions or similar structures analogously belonging thereto. We consider parameters from the zone of the upper boundary of the exchange layer. However, in the present case there is also an inversion which we shall include in our considerations. The inverse temperature gradient is only rather poorly defined, however.

To begin with we go back to the original recordings in X. APPENDIX, 3. The position of the upper boundary of the exchange layer there has been marked with E, that of the inversion with I. In the profile of +L (partly also in that of -L) the increase by increments with height is recognized at the two levels so marked. Until evening (run 6), however, the structures disintegrate to a large extent. What clearly remains is the +L increment in the zone of the loosened-up structure of E.

In Fig. 39 we consider the variations in time and space of the two formations. From the value tables to Example H it is seen that the exchange layer is marked by a minimum and a subjacent maximum of the equivalent potential temperature EPT similar to what we had found with stationary inversions as a rule. The altitudes, of these structural details are enterred in Fig. 39. Whereas in the course of the day the upper boundary of the exchange layer perpetually descends, the - weakly defined - inversion ascends in increments, above all from run 5 to 6. The rule found confirmed for stationary inversions, according to which EPT shows a minimum above the inversion, and a maximum below it, applies in the present case, too. These EPT structure details follow suit with the vertical movement of the barring layer proper.

Now a few words on the variation with time of the $A_i$ values, considering Fig. 39: The barring effect of the inversion is the greatest in the morning, and steadily decreases in the course of the slow ascent of the layer ($A_i$ is growing). Another deterioration of the barring effect occurs in the evening as the layer ascends again. By contrast, the diffusion resistance through the upper boundary of the exchange layer increases by increments ($A_i$ decreases) as the latter descends. In conjunction with the commencing disintegration of both layers in the evening, consistently the $A_i$ values increase.

Due to the very scantily developed inverse temperature gradient a study with respect to function $A_i = f(G-T)$ is foregone. Fig. 40 merely reflects the travelling times for the runs, and the symbols for the exchange layer (E) and inversion (I).

On Fig. 41 we note that the individual values for I are within the normal range of function $A_i = f(G-E)$, even so when G-E is positive (viz. when water vapor pressure is increased with height). The values of E, too, just barely meet these requirements, however, no dependence upon the water vapor gradient is apparent. The values for $A_i = f(G-PT)$ in Fig. 42 are entirely outside of the normal distribution for this function. This is independent of whether they pertain to the exchange layer or to the inversion.

In Fig. 43 we have plotted the vertical profiles of $A_i$ for runs 3 and 6. These once more very clearly illustrate the following processes:

a) descent and increase of barring effect of the upper boundary of the exchange layer;

b) ascent and decrease of barring effect of the inversion. finally approximate mutual touching of the two layers.

Conclusions drawn from this example:

The upper boundary of the exchange layer, too, is characterized by a minimum of EPT plus a subjacent maximum of EPT. During descent of the upper boundary of the exchange layer its barring effect toward eddy diffusion is increased.

## 10. Example I, 17 September 1970, Figs. 44 through 48.

### Upper boundary of an exchange layer. Slight vertical movement.

In conclusion, we shall discuss the case of an upper boundary of the exchange layer which was sharply defined throughout the day. The original runs in APPENDIX, 3 very convincingly demonstrate the following within the zone of this layer: (a) an increase in temperature; (b) a decrease in humidity; and (c) a sharp increase in conductivity, i.e. a decrease of the aerosol concentration. These vertical variations are very distinct during runs 1,3,4; during run 2 the structure are loosened up, and the level of the layer has descended somewhat. In the following figures we have plotted, for comparison, the values of the main levels separately from the values of the special levels.

In Fig. 44 we first consider the variations with time and with altitude. To begin with it is to be pointed out that this level, too, is distinct for sharply defined minima of EPT above it, and corresponding maxima <u>within</u> its level. These EPT structural details follow suit in the slight vertical movement of the upper boundary of the exchange layer. During the temporary descent of the layer (run 2) $A_i$ arrives at a maximum, i.e. movement reduces barring effect as with a true inversion.

Fig. 45 shows that all individual values are outside of the normal range of function $A_i = f(G-T)$. If we concentrate on the main levels only, G-T changes in the course of the day, it is true, but this has little impact on $A_i$ (maximum during 2, see above). If we consider the special levels we obtain a cyclic progress which is surely coming close to the true conditions and corresponds to our experience gathered so far on the occurrence of cyclic interrelations.

In Fig. 46, using the values from the special levels we find a time slope which, it is true, keeps to the border line of the normal range of our function $A_i = f(G-E)$ but in agreement with the latter's direction. If we lean on the values from the main levels only, $A_1$ remains unaffected by the variations of G-E.

An analogous conclusion is drawn from Fig. 47. If, however, we start from the values of the special levels we are again met with a cyclic pattern, although all the values are far from the normal distribution of function $A_1 = f(G-PT)$.

In Fig. 48 we have plotted the vertical profiles of $A_1$ for runs 2,3,4. The stepped curves are based upon the values from the main levels. The $A_1$ values from the special levels within the barring layer level are indicated (solid) and identified by numerals in circles. It is seen how across 1000 m from the barring layer downwards, consistently high $A_1$ values are encountered which is appropriate for an exchange layer. The loosening-up of the structure of the barring layer is clearly recognizable.

Conclusions drawn from this example:

Values derived from the special levels afford a much deeper insight into the true interrelations. The upper boundary of the exchange layer is again marked by EPT minima and maxima, one above the other with intervals of 150 m up to 300 m (EPT maximum within the levels of the layer). These structural details join in any vertical movements of the barring layer. Vertical movements lead to a weakening of the barring effect of the layer. The vertical movement is expressed in cyclic pattern of part of the values relative to the normal ranges of our main functions.

## VI. THEORETICAL SUPPLEMENT FOR COMPUTATION OF EDDY DIFFUSION COEFFICIENTS

In (1, 2) only the asymptote solution to the stationary combined diffusion (D) and coagulation (K) equation

$$D \frac{\partial^2 N(z)}{\partial z^2} - K N(z)^2 = 0 \tag{1}$$

was used for the calculation of the eddy diffusion coefficient D (pages 25 et sequ. of (1)), i.e. that solution which extends to infinity. This presupposition without which the equation (1) is not analytically solvable applies strictly speaking only in that case where D does not vary with height. Where diffusion coefficient $D_i$ differ from layer to layer, the partial solutions $N_i(z)$ to (1) must, for reasons of continuity, be so joined together that the diffusion current $J = - D\partial N/\partial z$ is a steady one. If $N_i$ (z) and $D_i$ designate the nuclei concentration and diffusion coefficient in the vertical interval from $z_i$ through $z_{i+1}$, the following must then apply:

$$D_i \frac{\partial N_i}{\partial z}(z = z_i) = D_{i-1} \frac{\partial N_{i-1}}{\partial z}(z = z_i) \tag{2}$$

to all i's.

Under these premises the equation (1) is no longer analytically solvable. The general solution or its inverse function, respectively, has the following form:

$$z - z_0 = \pm \int_{N_0}^{N} \frac{dx}{\sqrt{(N_0')^2 + \frac{2K}{3D}(x^3 - N_0^3)}} \tag{3}$$

whereein $N_0$ and $N_0'$ designate the nuclei concentration and its derivative at position $z_0$. In the source-free stationary case, N must decrease with height, and the minus sign on the right side of (3) applies.

Solution (3) represents an elliptic integral which is solvable only through methods of approximation. In addition, this is a variation problem. Therein, D in the integrand must be selected so that both members of the equation (3) are in agreement with each other. The derivative $N'(z)$ needed for the joining condition (2) are easily obtained from the inverse function $z(N)$:

$$N' = \sqrt{(N_0')^2 + \frac{2K}{3D}(N - N_0)^3} \qquad (4)$$

The equations (2) through (4) must be solved by layers wherein it would be best to use, for the top layer, the asymptote solution, compute therefrom the diffusion current at the lower border, and use the latter to solve the equation (3) for the next lower interval. This operation is to be repeated as often as necessary.

It is true that in principle this problem is solvable with the aid of our Hewlett-Packard desk computer with extended memory. However, this procedure requires such a high expenditure of computation effort that it would hardly appear applicable to the routine analyses. At present, a computer program is being developed for this purpose, with the aid of which it is being studied on a few selected examples what size deviations are permissible from the results of the procedure now applied in a routine manner. It is noted that due to the wide range of variation of D it will not be necessary to strive for a maximum of exactitude.

The procedure can always be used on any cases of particular interest in order to obtain more exact results.

The results of such comparisons will be reported and discussed in the next report.

## VII. CONCLUSIONS

So much is certain that it would not have been possible to carry out either the statistical investigations or the detailed analyses on individual examples, without the preceding changeover of the routine evaluations and data processing to a largely electronic basis. It was only this measure that resulted in a sufficiently comprehensive mass of homogenous data from all available soundings for statistical purposes, on the one hand, and in a complete stock of all necessary parameters of the most varied kind per sounding for the detailed analyses, on the other. In practical processing of the electronically obtained data it was revealed that the most recently developed procedure of electronic data processing fully meets requirements.

The statistical analyses in logical continuation of the earlier research work revealed that there is a significant relation between the highest inverse temperature gradient and the incremental exchange coefficient, providing that there are stationary inversions with a set eddy diffusion equilibrium. The scatter of this relation is unimportant. The relation applies to an $A_i$ range from 0.1 to 300. Under the same conditions (stationary situations, barring layers)a significant relation may be derived, too, between the highest positive gradient of potential temperature and the incremental exchange coefficient. It applies to the $A_i$ range from 0.8 to 100. The scatter is not great, more data must be added.

The third of the three derived main functions for describing the behavior of $A_i$ in structural zones (inversions, barring layers, upper exchange boundary), is based upon the vertical gradient of water vapor pressure. Again, a significant relation was found with relatively insignificant scatter of values. It is valid for the $A_i$ range from 1 through 100.

Finally it was attempted to discover more general interrelations which would apply quite generally, independently of structural details (inversions, barring layers). In doing so, another relation was found to stand the test: $A_i = f(G-PT)$ whose scatter is surprisingly small and whose range of applicability is between $A_i = 1$ and 1000.

Such main functions which are to have more general validity can be derived only if certain criteria of selection are applied. Such criteria, however, can grow only from sufficient experience. With increasing experience, however, the criteria must be improved, supplemented or, if need be, essentially changed, each of which means a reprocessing of the data material. This work, this is understood, can be performed only in a step-by-step manner.

In developing criteria of classification and selection, the detailed analyses proved to be especially helpful. Systematic work according to this method has only just begun. It already resulted in a series of valuable results. Some of these are: A minimum of the equivalent potential temperature is found 100 m or not more than 300 m above an inversion or barring layer resting in eddy diffusion equilibrium, and a maximum is found within the level of the layer proper. Within the zone of the barring layer proper the gradient of potential temperature reaches a maximum, likewise the negative gradient of the vapor pressure. If the temperature gradient is positive, it assumes a minimum, if it is negative, a maximum. As a rule, a minimum of the vapor pressure, narrowly limited in space, is also found within the level of a barring layer. If barring layers get into vertical movement their barring effect is reduced for the duration of such movement. After the barring layer becoming stationary its barring effect may be regenerated. Temporary interferences leading e.g. to a vertical movement of the barring layer or triggering a loosening-up of its structure due to locally limited convection are usually expressed in cyclic patterns of the time slope of the essential parameters in the level of the barring layer.

The above discussed detailed analyses which, in the form presented, represent only an initial step, are calling, in order to be fecundated, for the use of all available microscale and mesoscale meteorological parameters (radiation, wind profiles, cloudiness) and their variations with time.

Although it is absolutely necessary to further increase the data material, to further develop and improve the scientific procedures of analysis, still some results are available even today which are possible of practical application by the meteorologist. This applies most of all where it is necessary, from the profiles of aerological data as supplied by radiosondes, to draw conclusions, quickly and directly, upon the conditions of vertical propagation of suspended matter.

## VIII. OUTLOOK ON ADVANCED STUDIES IN THE NEAR FUTURE

### 1. General

Since the methodism for recording the exchange conditions up to 3000 m a.s.l. is now completely commanded and fully developed, it would be the obvious next step to expand the investigations at least up to and including the tropopause level. This expansion is further encouraged by another fact:

A program is being carried under contract with US AEC at our institute, for the investigation of stratospheric-tropospheric exchange using the tracers Be7, P32, S35 plus fall-out heavy-metals, the concentration of which is recorded at Zugspitze station for 24 hours at a time (see (3)). The tropopause structures are analyzed with the aid of radio-sonde data from the

Atlantic Ocean and Europe, and attempts are made to calculate the trajectories.

So the following situation exists:

a) With the aid of cable-car telemetry systems we gain a precise insight into the exchange conditions obtaining between 0.7 and 3 km a.s.l.

b) With the aid of the above-mentioned tracers we can survey transportation processes from the stratosphere down to the upper troposphere.

If it were possible, now, by means of appropriate additional methods to also cover the exchange conditions between upper troposphere or, even better, between lower stratosphere and 3 km a.s.l., we would have the chance to completely investigate the overall exchange from the stratospheric deposits at 10 or 20 km down to the surface of the earth at 0.7 km a.s.l. Such an expansion of our research program would increase our yield of findings by a multiple in regard to the vital problem of the atmospheric aerosol exchange.

## 2. Procedures to be applied

### a) Lower Troposphere

The procedures per 1) - 5) will be applied without restriction during the continuation period.

### b) 3 km a.s.l. up to lower stratosphere

The only one but the most effective and useful method to present itself is a combination of Rawinsonde with Lidar. Under good weather conditions and with a powerful Lidar, aerosol structures as far as the Junge layer at approx. 15 km may be covered and observed in time. The aerological data necessary for the scientific analysis of the aerosol movements are supplied by a special Rawinsonde of our own. The technical requirements for such an essential and methodic expansion are presently being reviewed. Already now, some preparations are being made, such as the construction of a balloon filling hall adjacent to the new institute building (for radiosonde balloons), the construction of which has just begun, and the erection of a Lidar observation and set-up room on the roof platform of the institute. Negotiations with suppliers have been conducted and technical details agreed on.

## IX. REFERENCES


1) Reiter, R., R. Sládkovič and W. Carnuth:
Atmospheric Aerosols between 700 and 3000 m a.s.l., Part IV., Contract DAJA-37-69C-1357, July 1970.

2) Reiter, R., R. Sládkovič and W. Carnuth:
On Fine Structures and Control of Vertical Aerosol Exchange between 700 and 3000 m a.s.l.
Arch. Met. Geophys. Bioklim. Ser. A (in print).

3) Reiter, R., R. Sládkovič; K. Pötzl, W. Carnuth and H.-J. Kanter:
Measurement of Airborne Radioactivity and its Meteorological Application.
Contract AT (30-1)-4061, Oct. 1970,
Arch. Met. Geophys. Bioklim. Ser. A (in print).

# X. APPENDIX

1. Figures 1 - 48

2. Legends to the Figures 1 - 48

3. Individual Runs and Data Tables
   Examples A - J

4. Tables I - XII
   RaB concentration measured on the Zugspitze (Z), the Wank (W) and in Garmisch-Partenkirchen from July 1970 to June 1971

5. The Computer Program
   for computation of all necessary values from the original runs. Tables of results as examples, see 3.

1. Figures 1 - 48

Fig.1

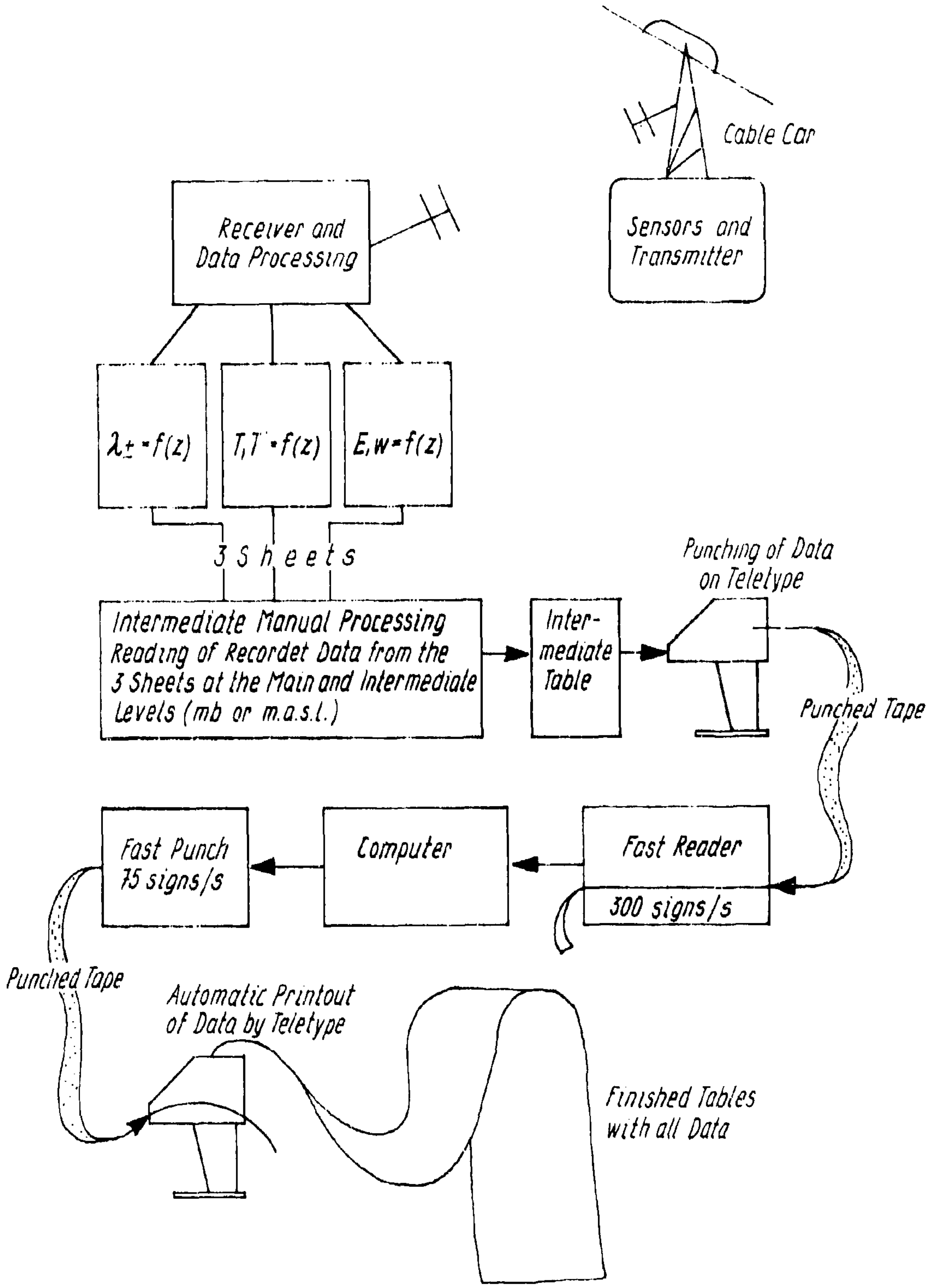

Cable Car
Sensors and Transmitter
Receiver and Data Processing
$\lambda_{\pm} = f(z)$
$T, T' = f(z)$
$E, w = f(z)$
3 Sheets
Intermediate Manual Processing Reading of Recordet Data from the 3 Sheets at the Main and Intermediate Levels (mb or m.a.s.l.)
Inter-mediate Table
Punching of Data on Teletype
Punched Tape
Fast Reader
300 signs/s
Computer
Fast Punch 75 signs/s
Punched Tape
Automatic Printout of Data by Teletype
Finished Tables with all Data

Fig. 2

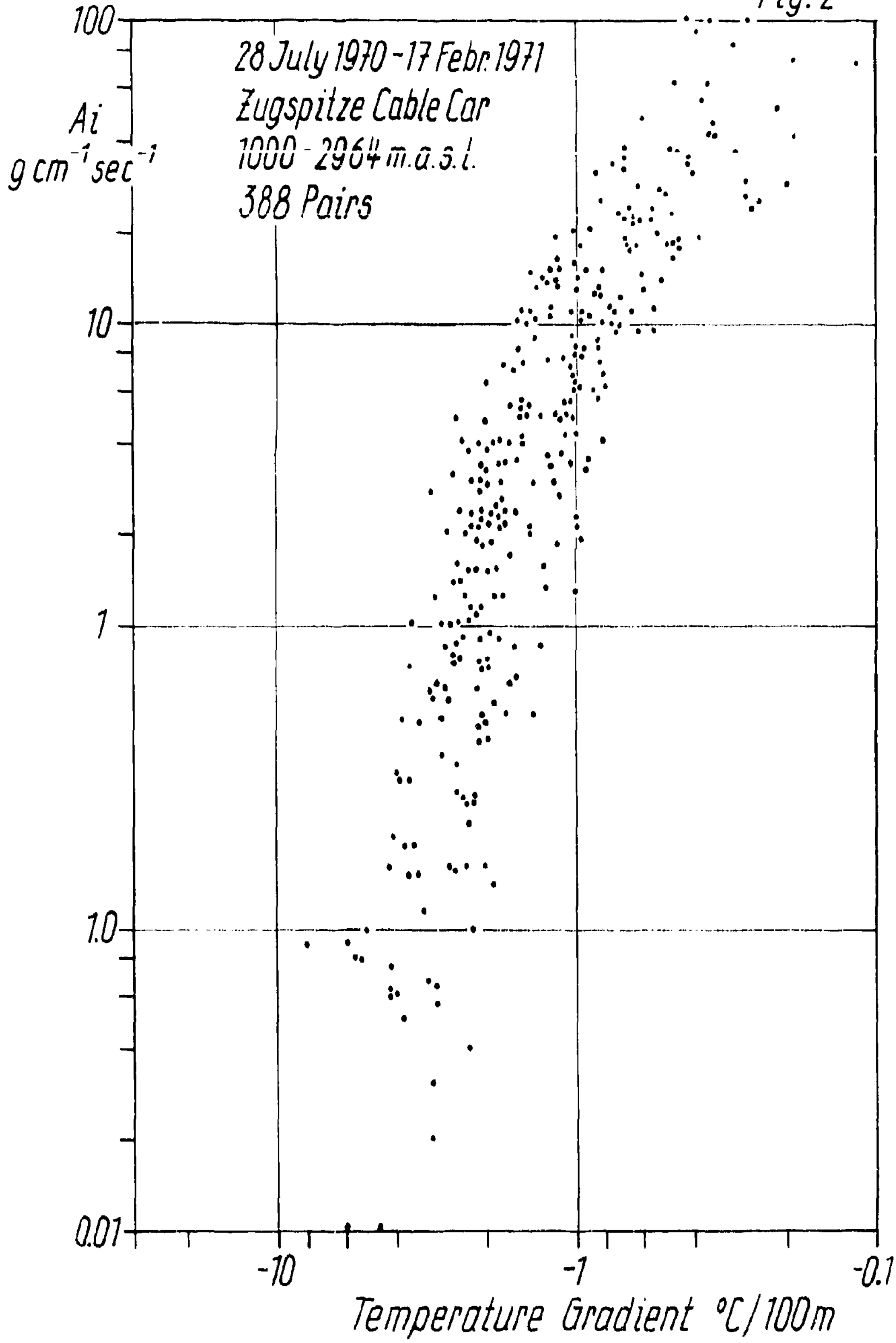
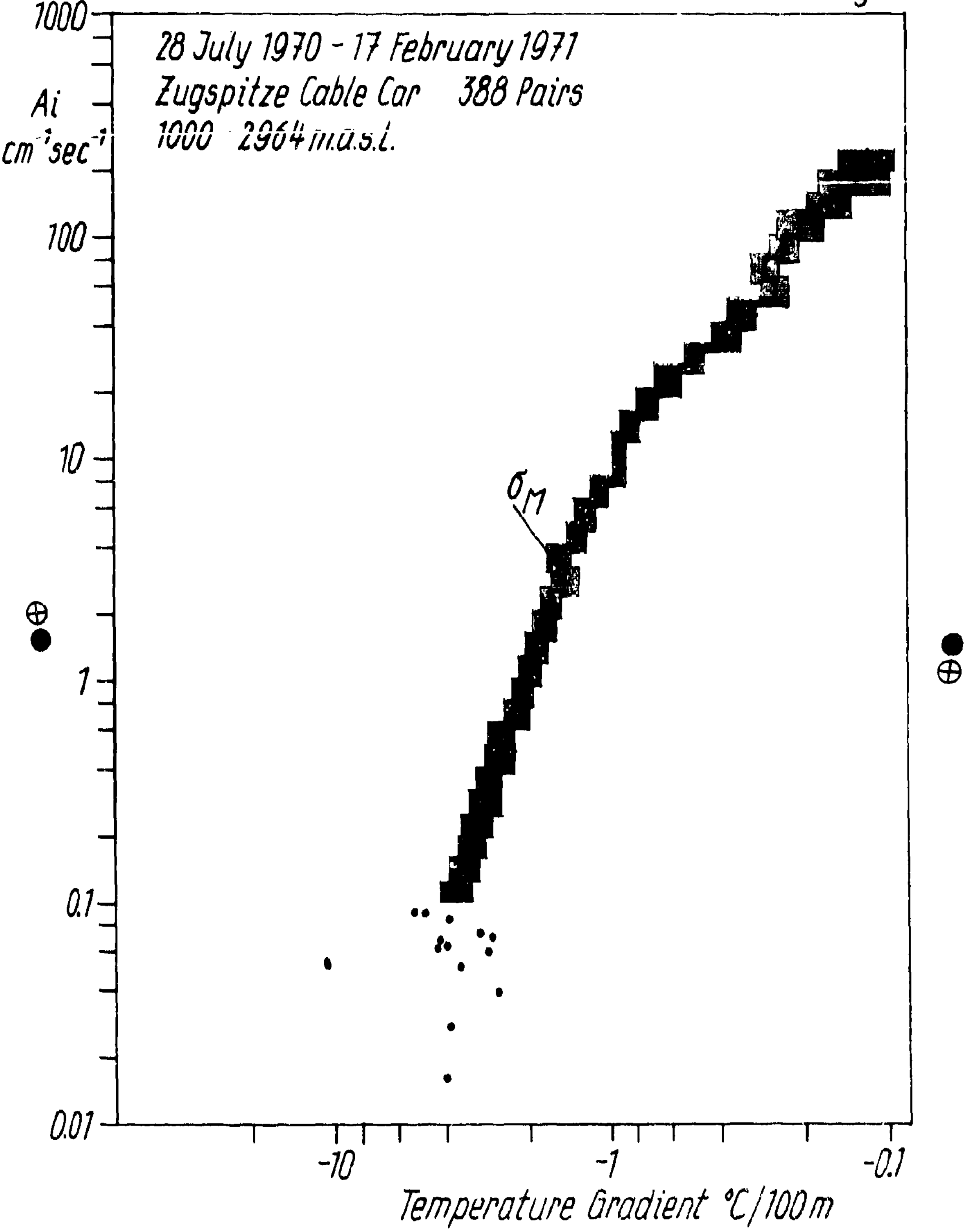
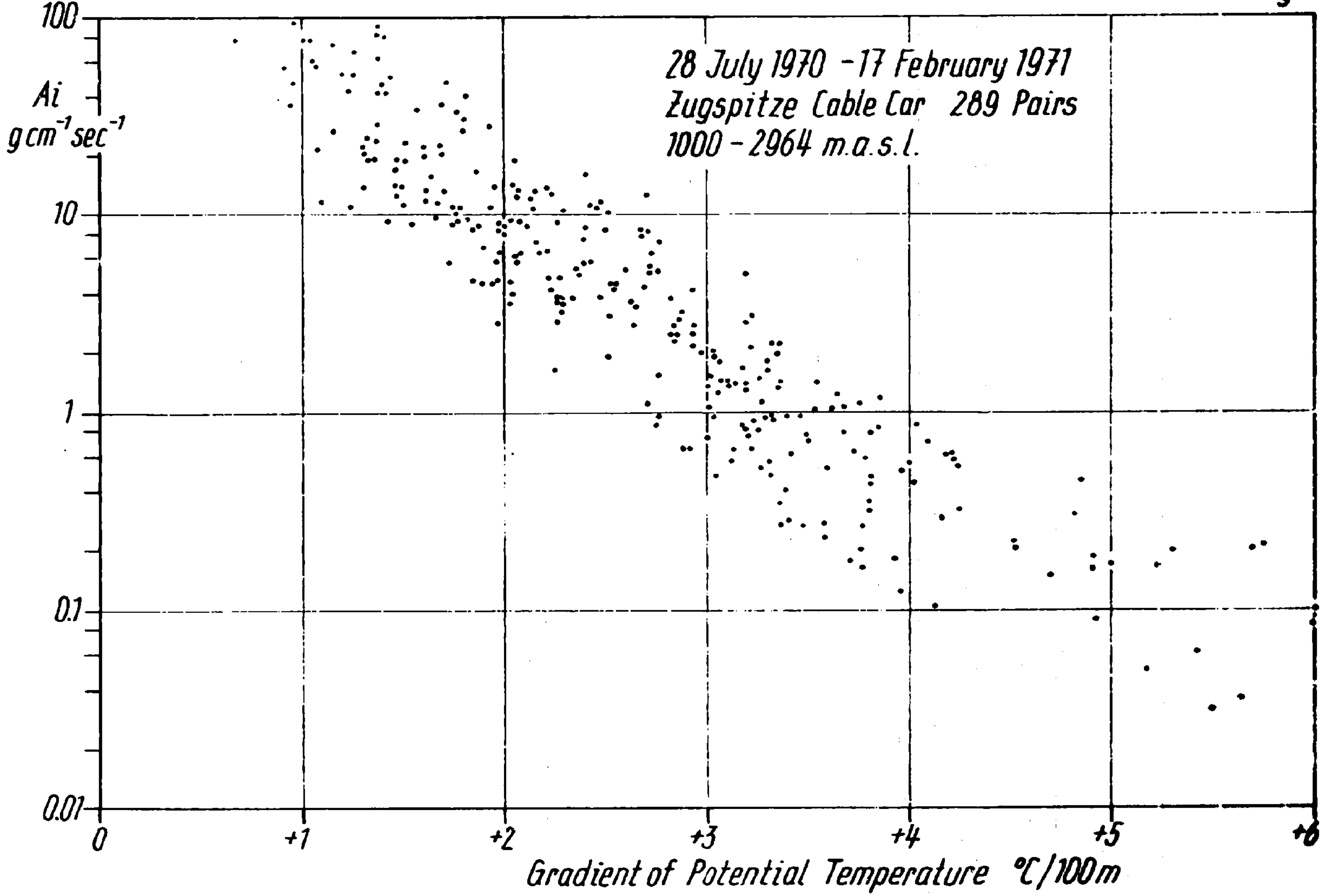

28 July 1970 - 17 Febr. 1971
Zugspitze Cable Car
1000 - 2964 m.a.s.l.
388 Pairs
Ai
g cm⁻¹ sec⁻¹
100
10
1
1.0
0.01
-10
-1
-0.1
Temperature Gradient °C/100m

Fig.3



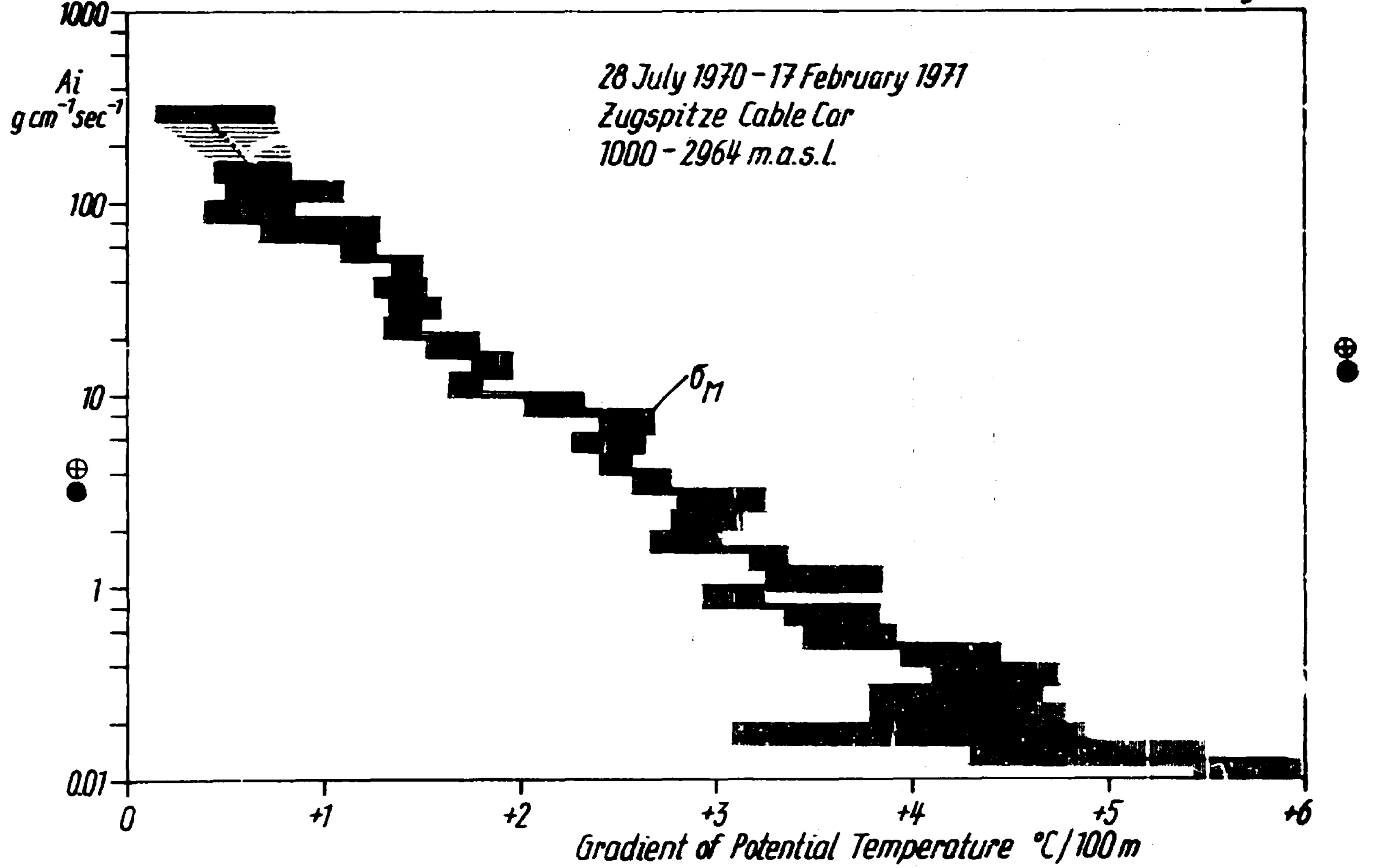
28 July 1970 - 17 February 1971
Zugspitze Cable Car 388 Pairs
1000 2964 m.a.s.l.
Ai
cm⁻³sec⁻¹
1000
100
10
1
0.1
0.01
$\sigma_M$
-10
-1
-0.1
Temperature Gradient °C/100 m

Fig.4



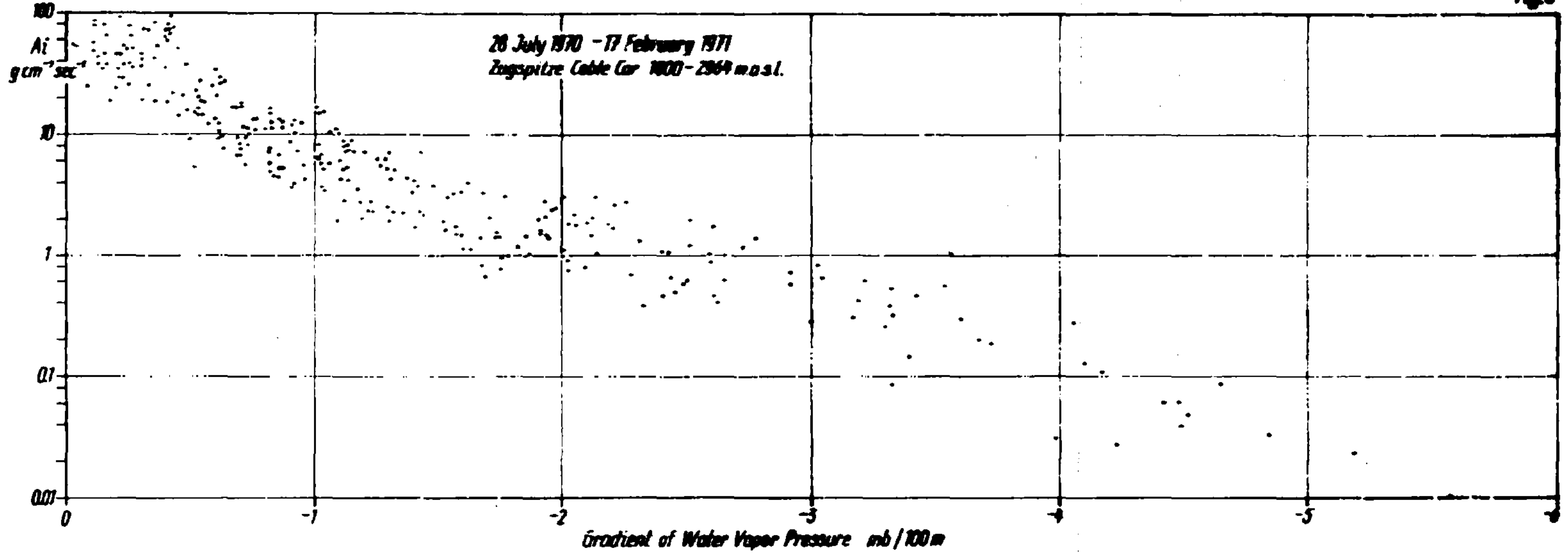
28 July 1970 - 17 February 1971
Zugspitze Cable Car 289 Pairs
1000 - 2964 m.a.s.l.
Ai
g cm⁻¹ sec⁻¹
100
10
1
0.1
0.01
0
+1
+2
+3
+4
+5
+6
Gradient of Potential Temperature °C/100m

Fig. 5



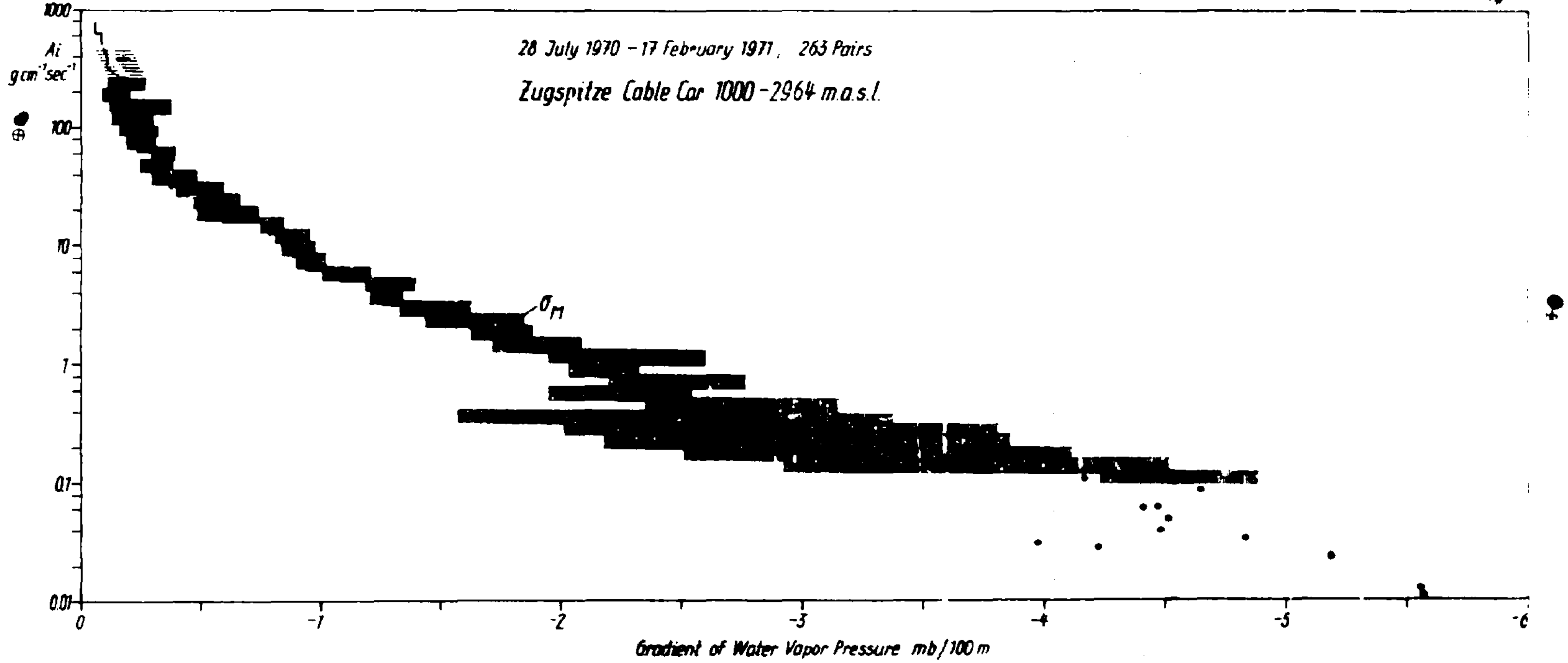
1000
Ai
g cm⁻¹ sec⁻¹
100
10
1
0.01
28 July 1970 - 17 February 1971
Zugspitze Cable Car
1000 - 2964 m.a.s.l.
σM
0
+1
+2
+3
+4
+5
+6
Gradient of Potential Temperature °C/100 m

Fig.6



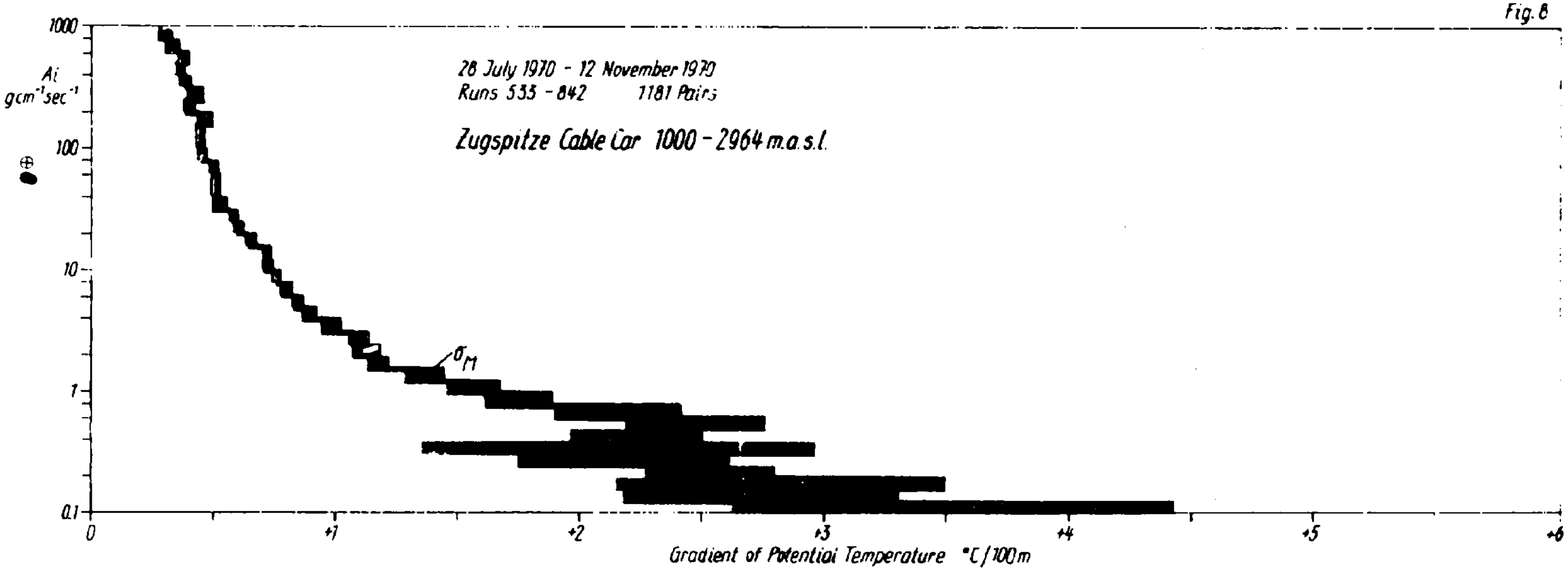
28 July 1970 - 17 February 1971
Zugspitze Cable Car 1800-2964 m.a.s.l.
Ai
g cm⁻² sec⁻¹
100
10
1
0.1
0.01
0
-1
-2
-3
-4
-5
-6
Gradient of Water Vapor Pressure mb/100m

Fig. 7



28 July 1970 – 17 February 1971, 263 Pairs
Zugspitze Cable Car 1000 – 2964 m.a.s.l.
Ai
g cm⁻¹ sec⁻¹
$\sigma_M$
1000
100
10
1
0.1
0.01
0
-1
-2
-3
-4
-5
-6
Gradient of Water Vapor Pressure mb/100 m

Fig. 8



28 July 1970 - 12 November 1970
Runs 533 - 842 1181 Pairs
Zugspitze Cable Car 1000 - 2964 m.a.s.l.
Ai
gcm⁻¹sec⁻¹
1000
100
10
1
0.1
σM
0
+1
+2
+3
+4
+5
+6
Gradient of Potential Temperature °C/100m

Fig 9

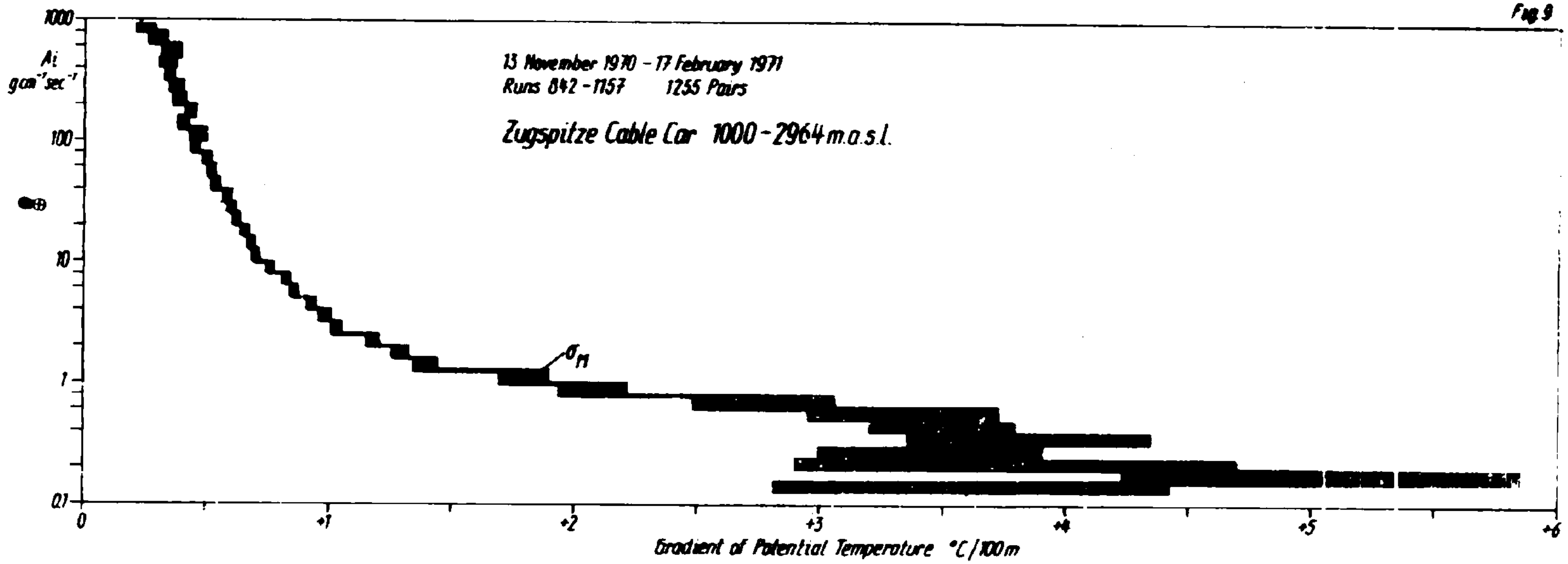
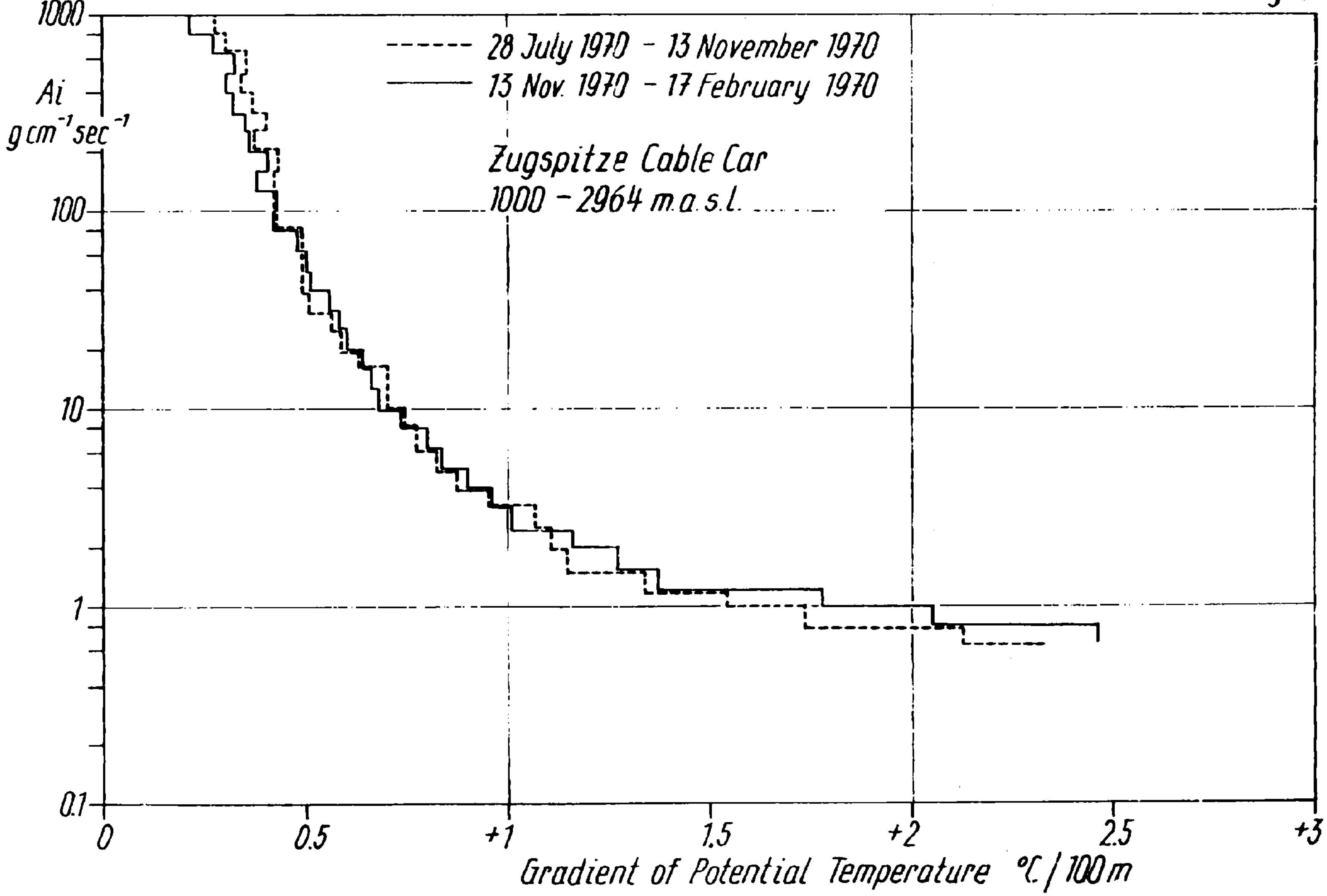
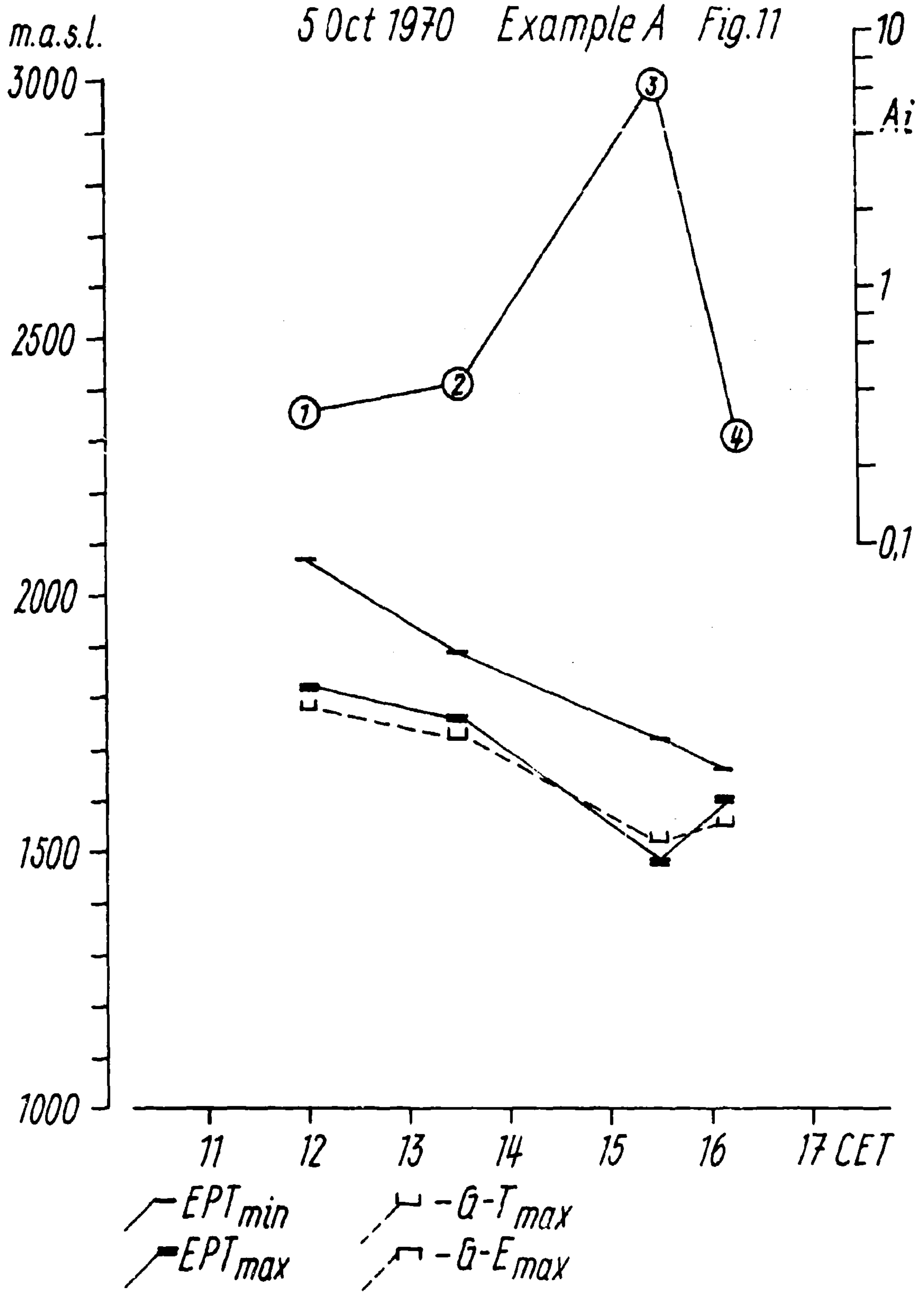

13 November 1970 - 17 February 1971
Runs 842 - 1157 1255 Pairs
Zugspitze Cable Car 1000 - 2964 m.a.s.l.
Ai
gcm⁻¹sec⁻¹
1000
100
10
1
0.1
0
+1
+2
+3
+4
+5
+6
Gradient of Potential Temperature °C/100m

Fig.10

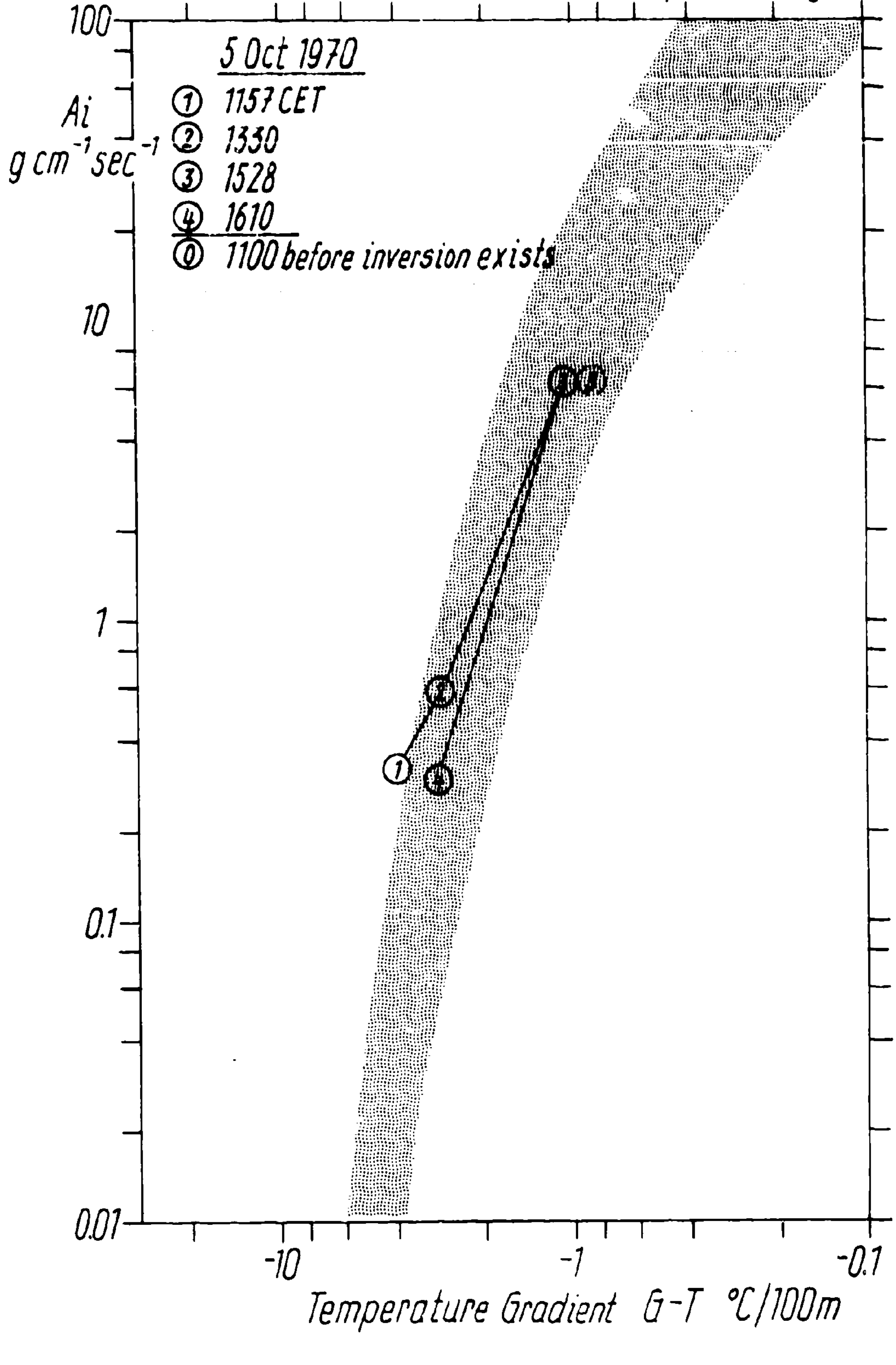


28 July 1970 - 13 November 1970
13 Nov. 1970 - 17 February 1970
Zugspitze Cable Car
1000 - 2964 m.a.s.l.
1000
Ai
g cm⁻¹ sec⁻¹
100
10
1
0.1
0
0.5
+1
1.5
+2
2.5
+3
Gradient of Potential Temperature °C / 100m

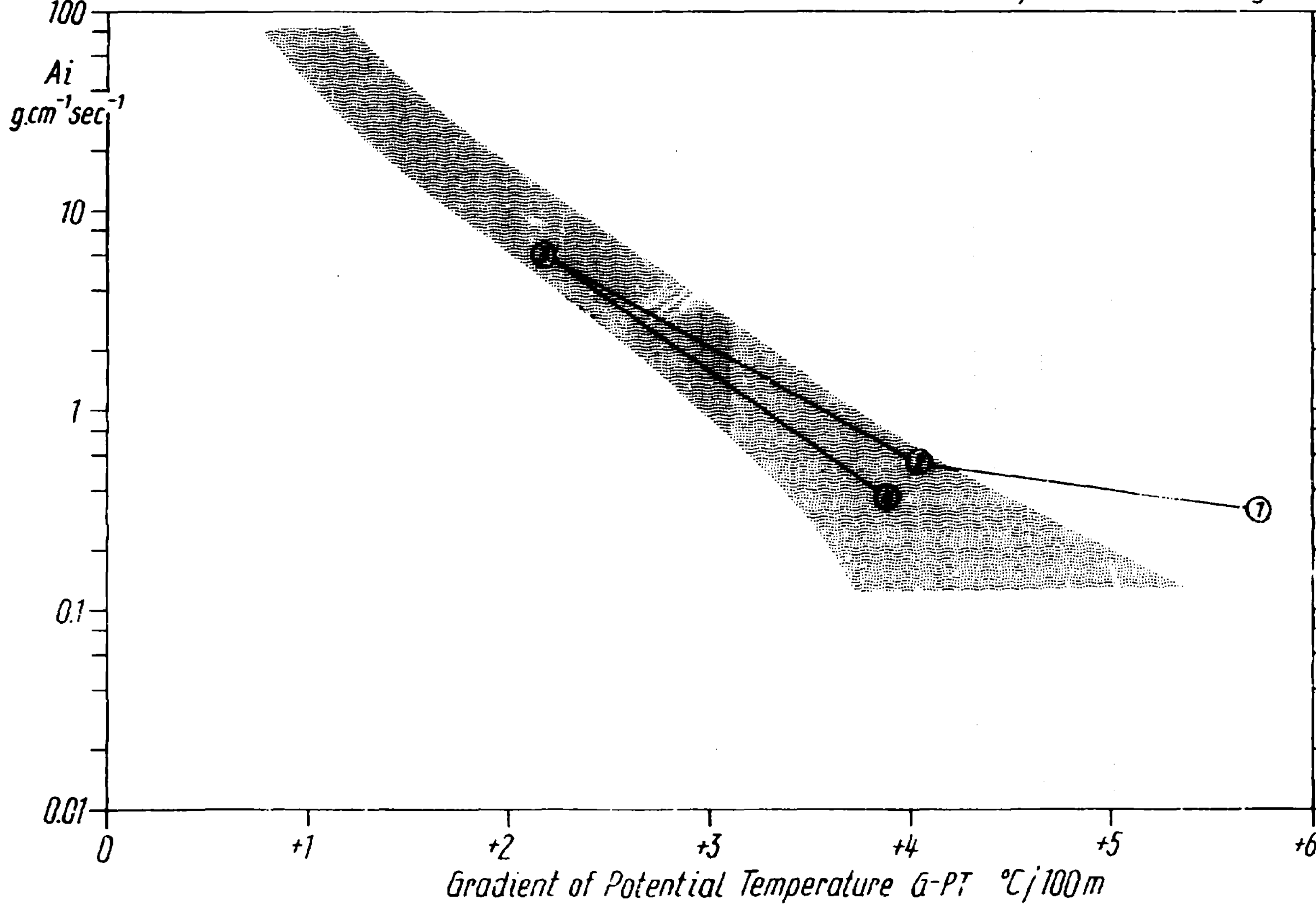


5 Oct 1970 Example A Fig.11
m.a.s.l.
3000
2500
2000
1500
1000
10
Ai
1
0,1
11
12
13
14
15
16
17 CET
EPT min
EPT max
-G-T max
-G-E max

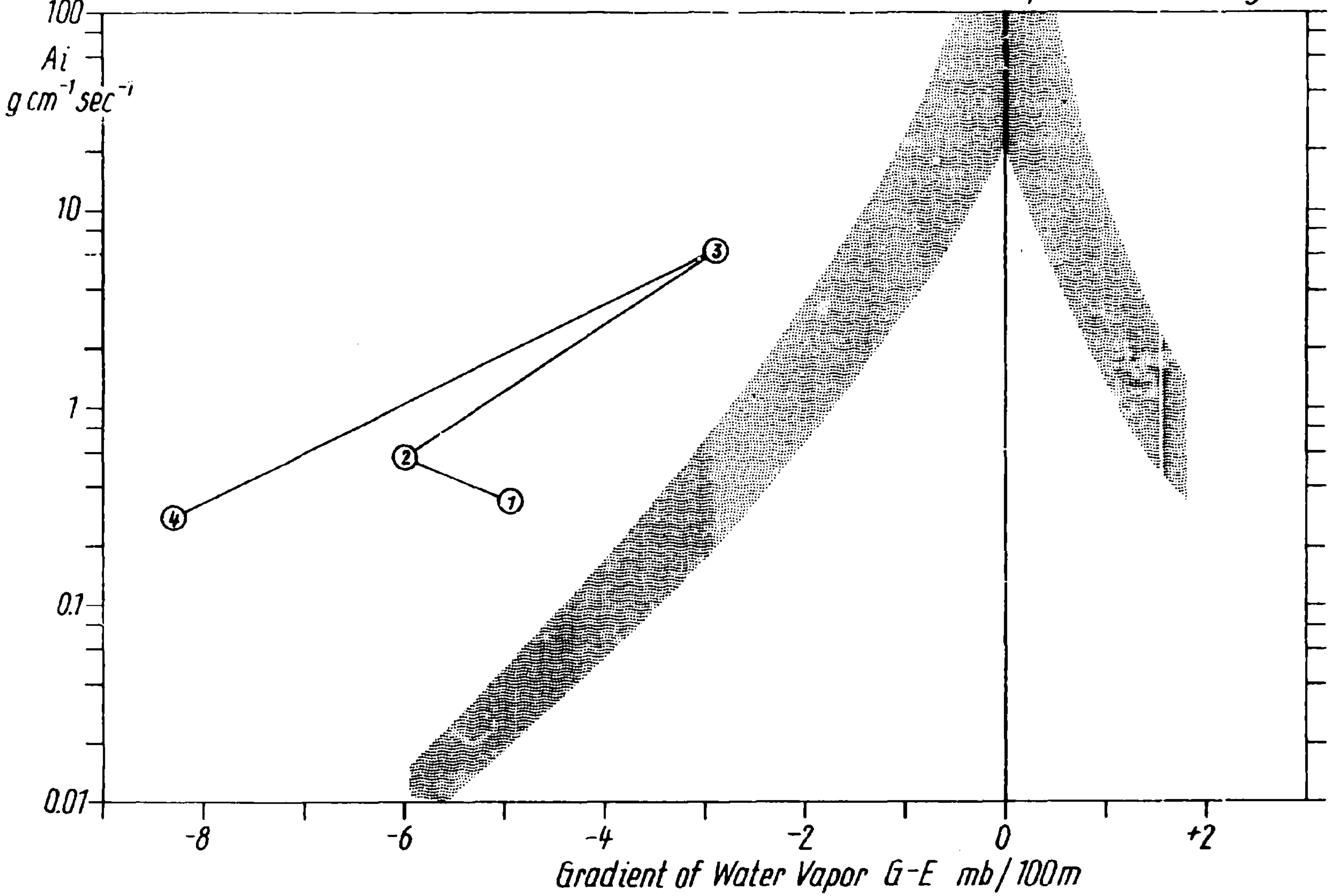
Example A Fig.12



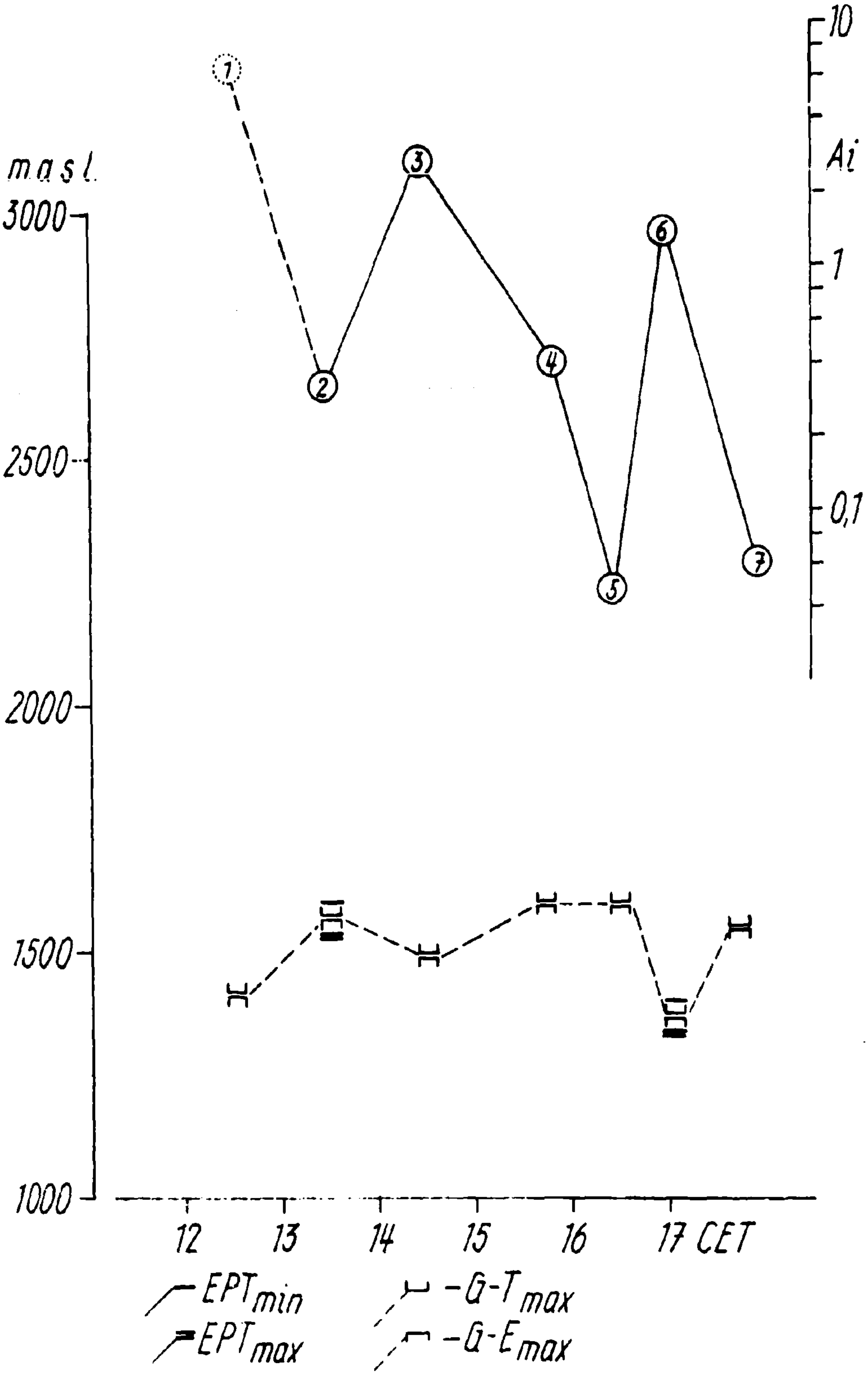
5 Oct 1970 Example A Fig.13



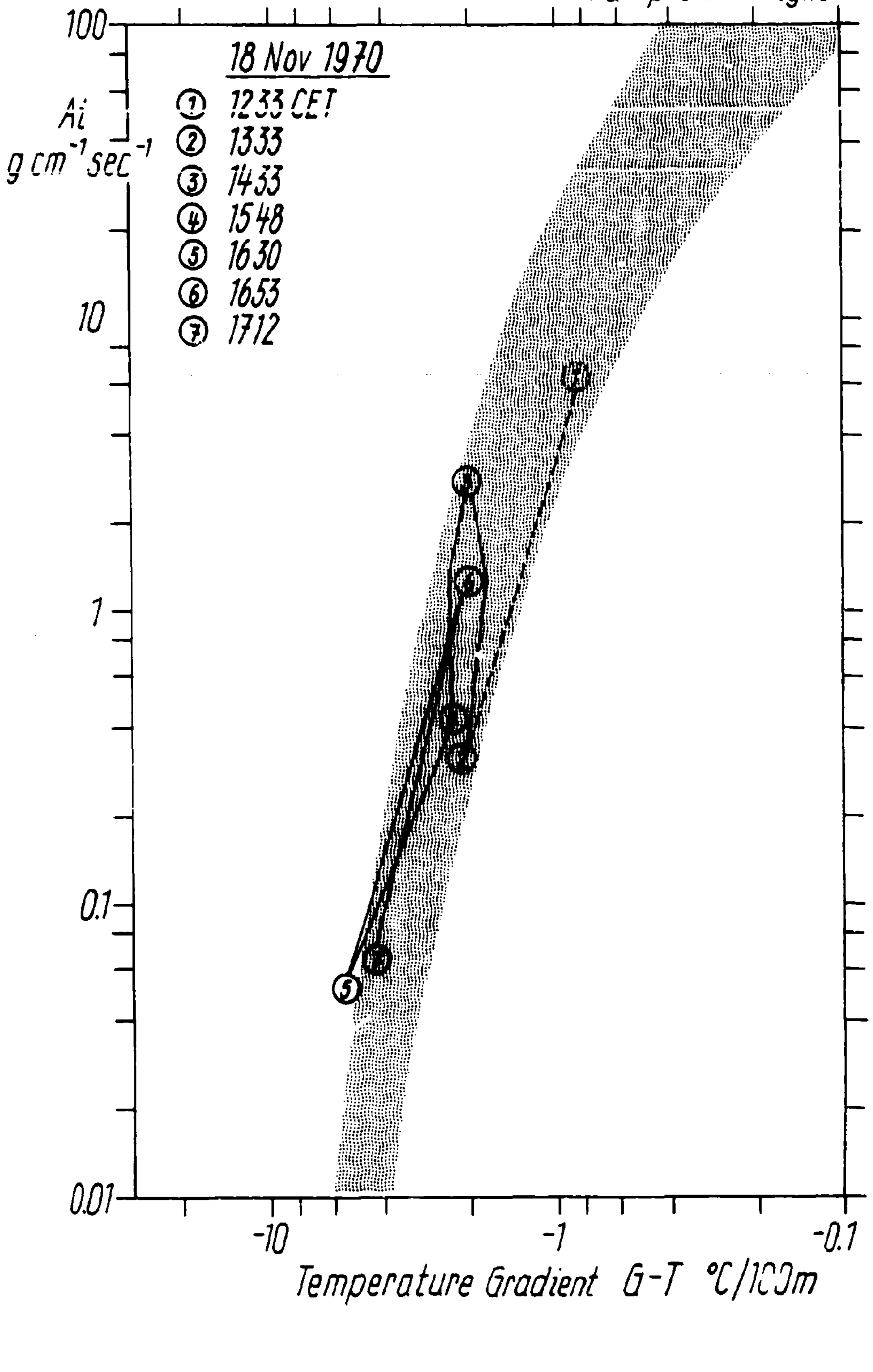
5 Oct 70 Example A Fig. 14



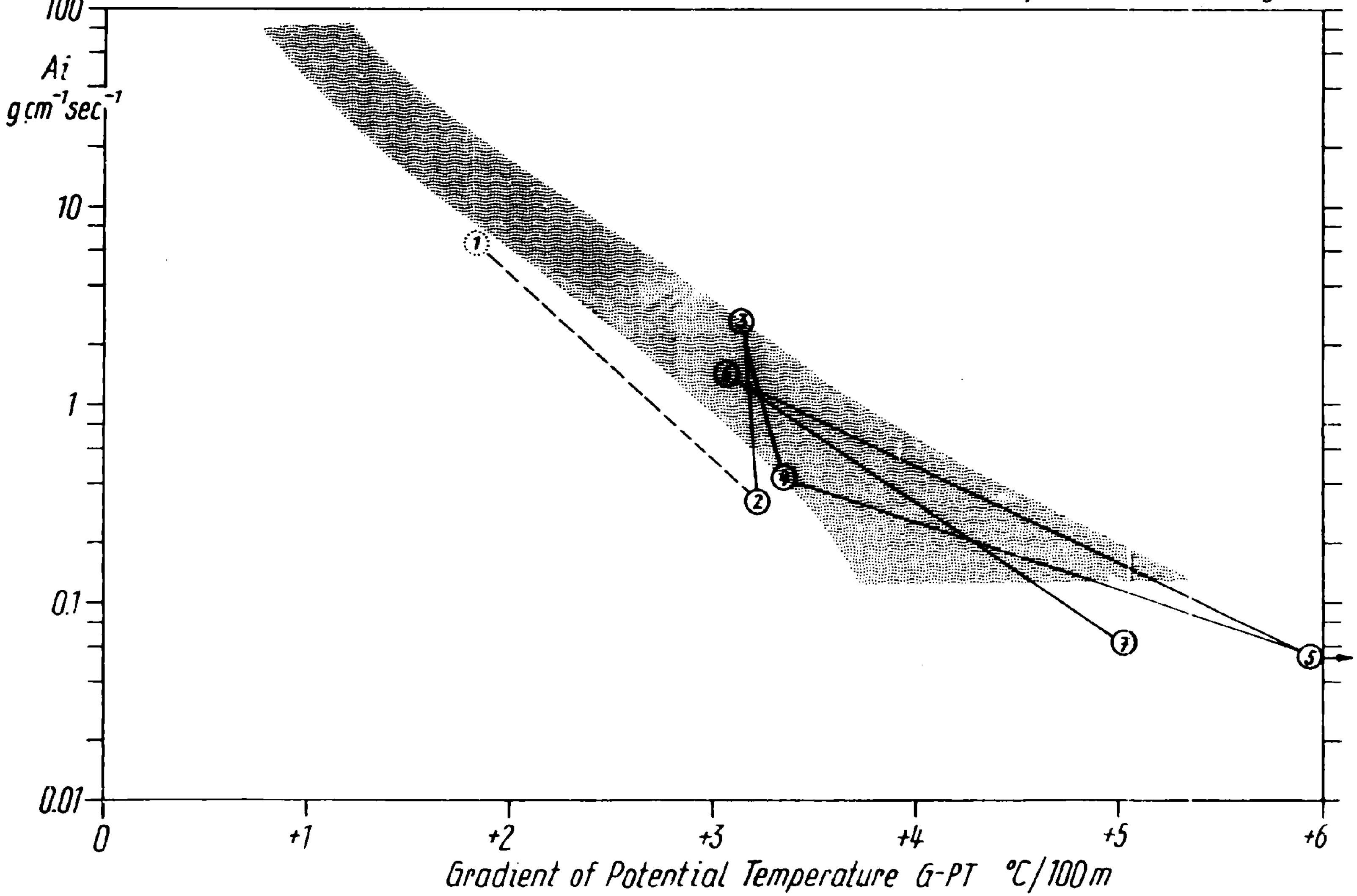
18 Nov 1970 Example B Fig.15

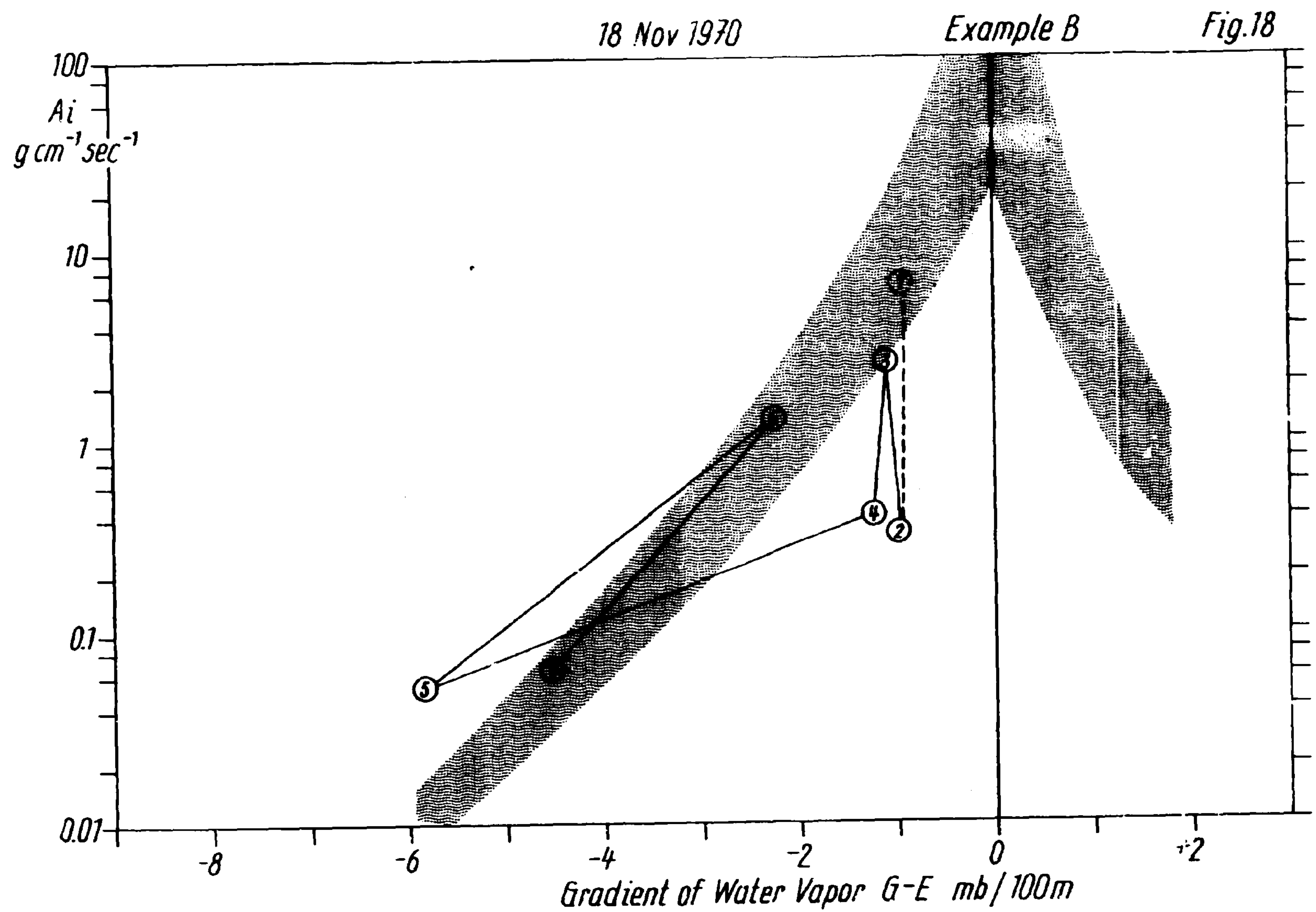


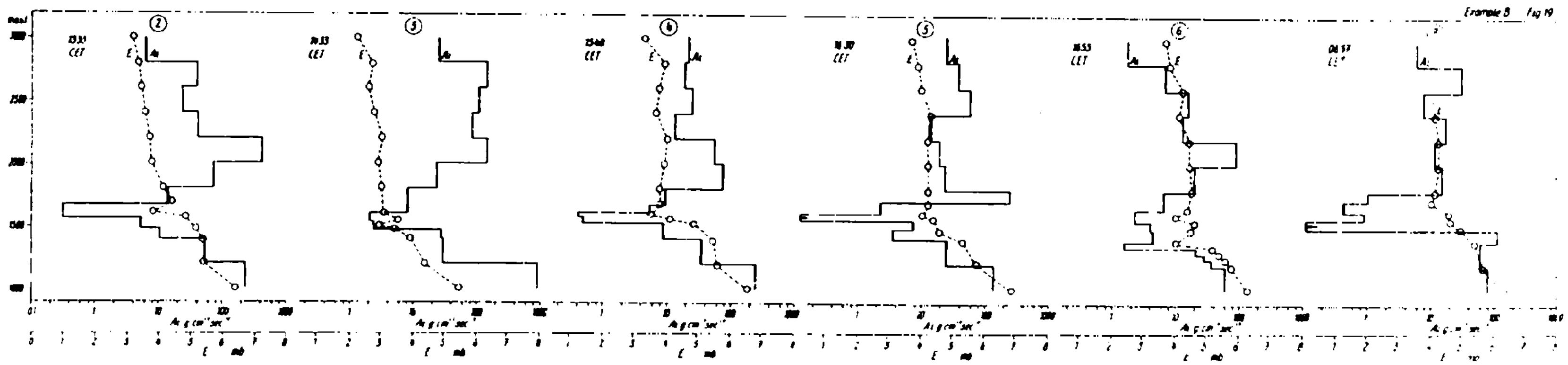
Example B Fig.16



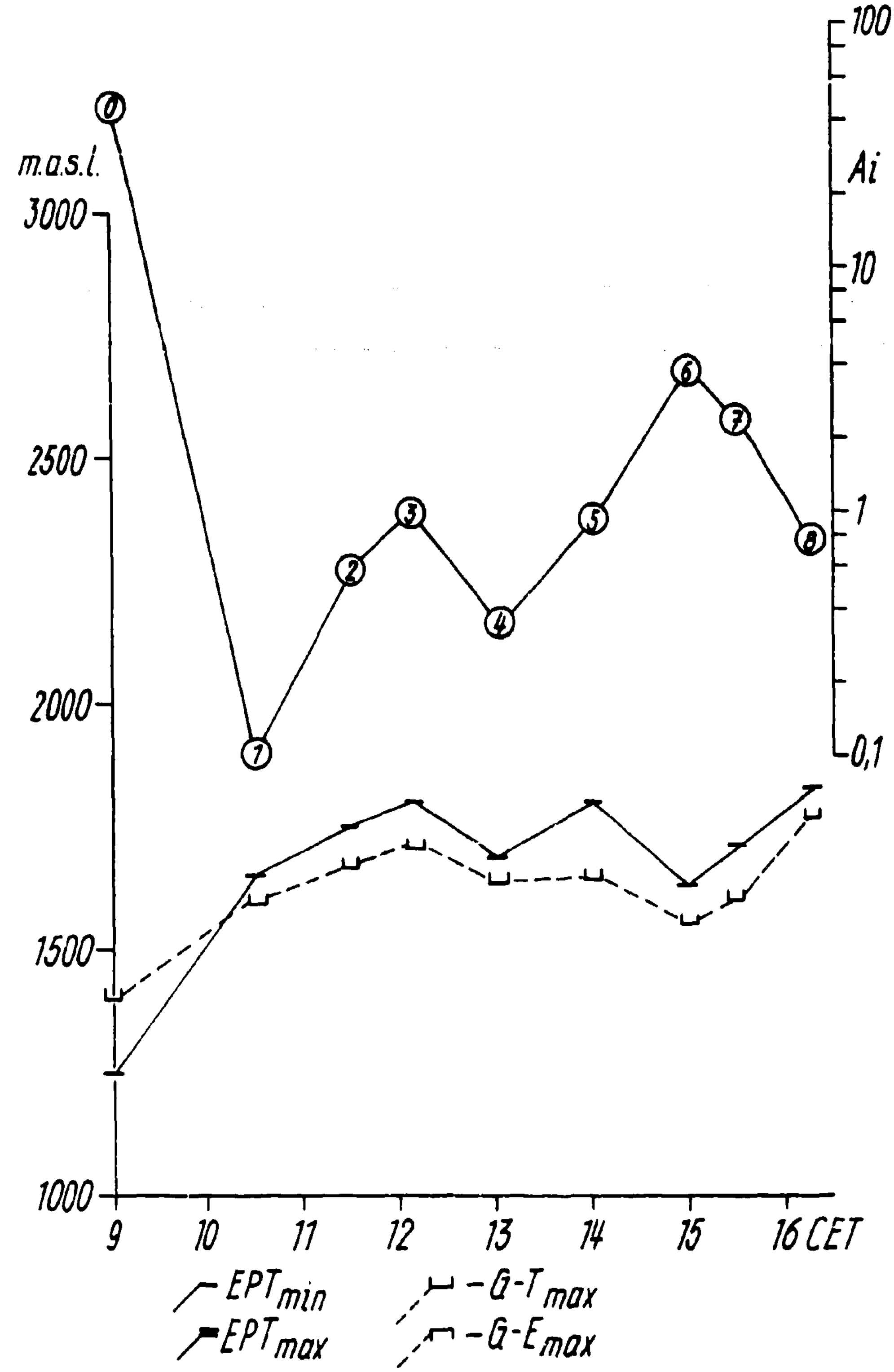
18 Nov 1970 Example B Fig.17

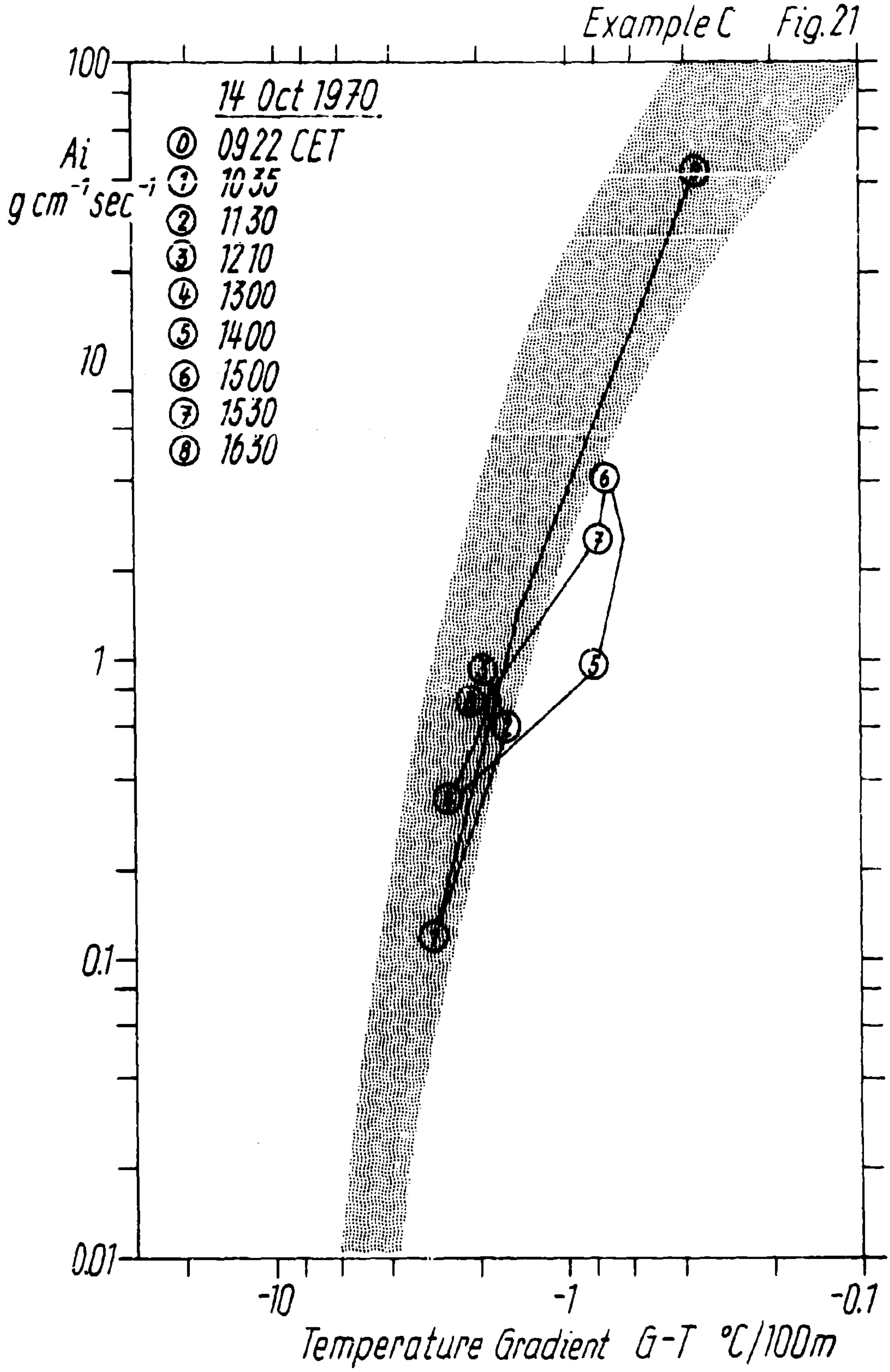



18 Nov 1970
Example B
Fig.18
100
Ai
g cm⁻¹ sec⁻¹
10
1
0.1
0.01
-8
-6
-4
-2
0
+2
Gradient of Water Vapor G-E mb/100m
5
4
2


Example 8 Fig 19
m a.s.l.
3000
2500
2000
1500
1000
13.31 CET
16.33 CET
15.48 CET
18.30 CET
16.53 CET
06.57 CET
Ai
E
Ai g cm⁻² sec⁻¹
E mb

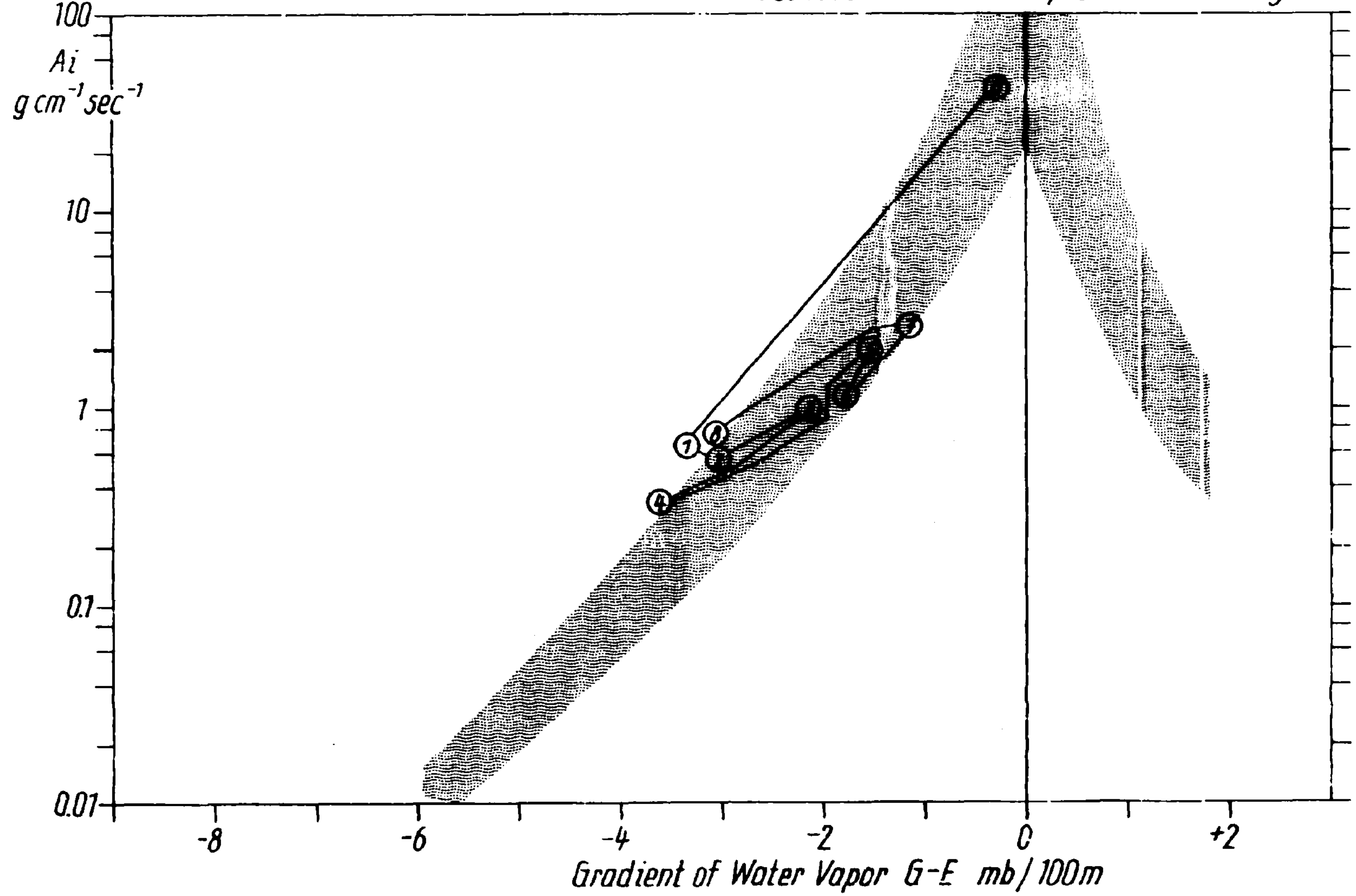
14 Oct 1970  Example C  Fig. 20



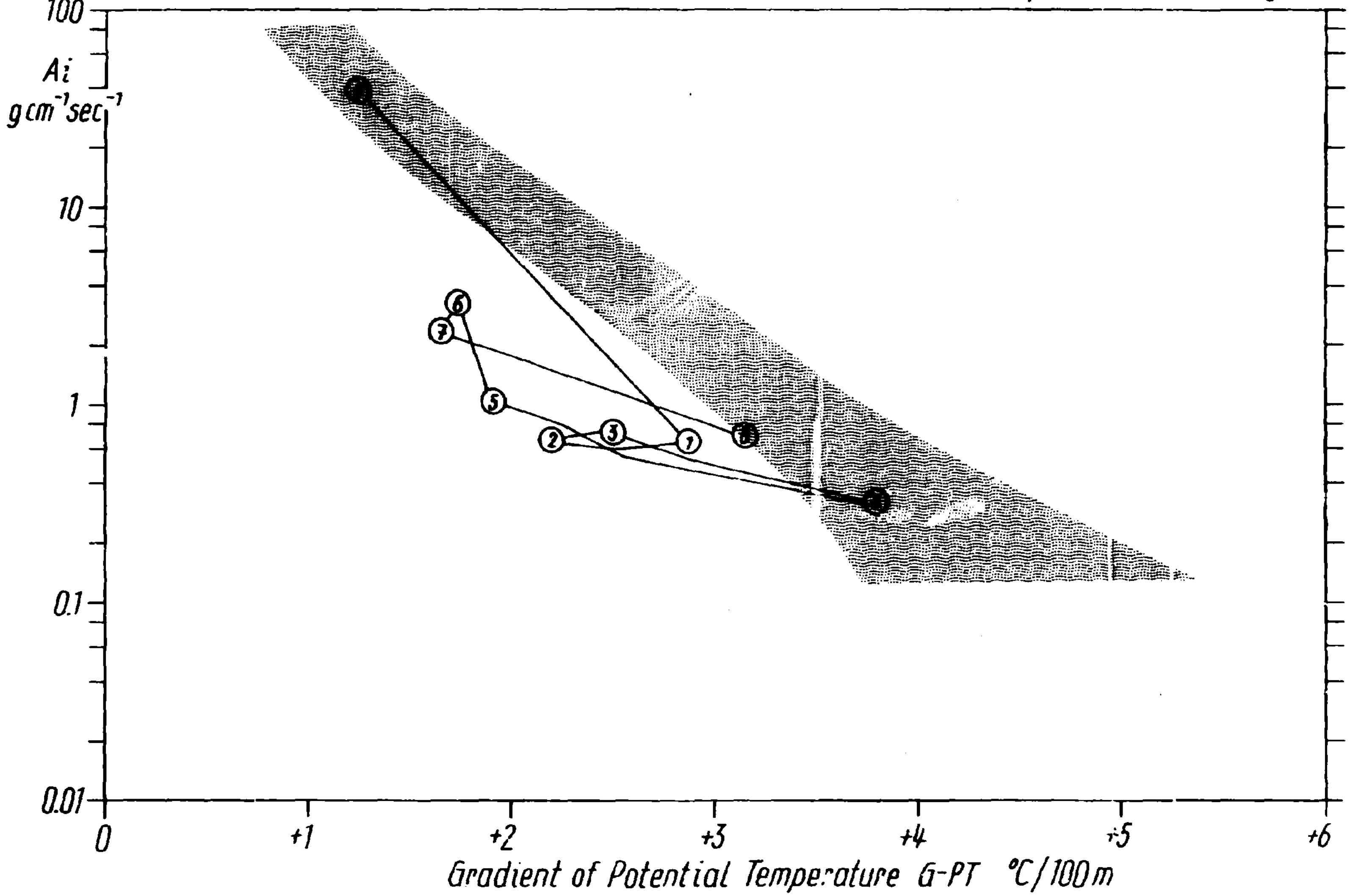


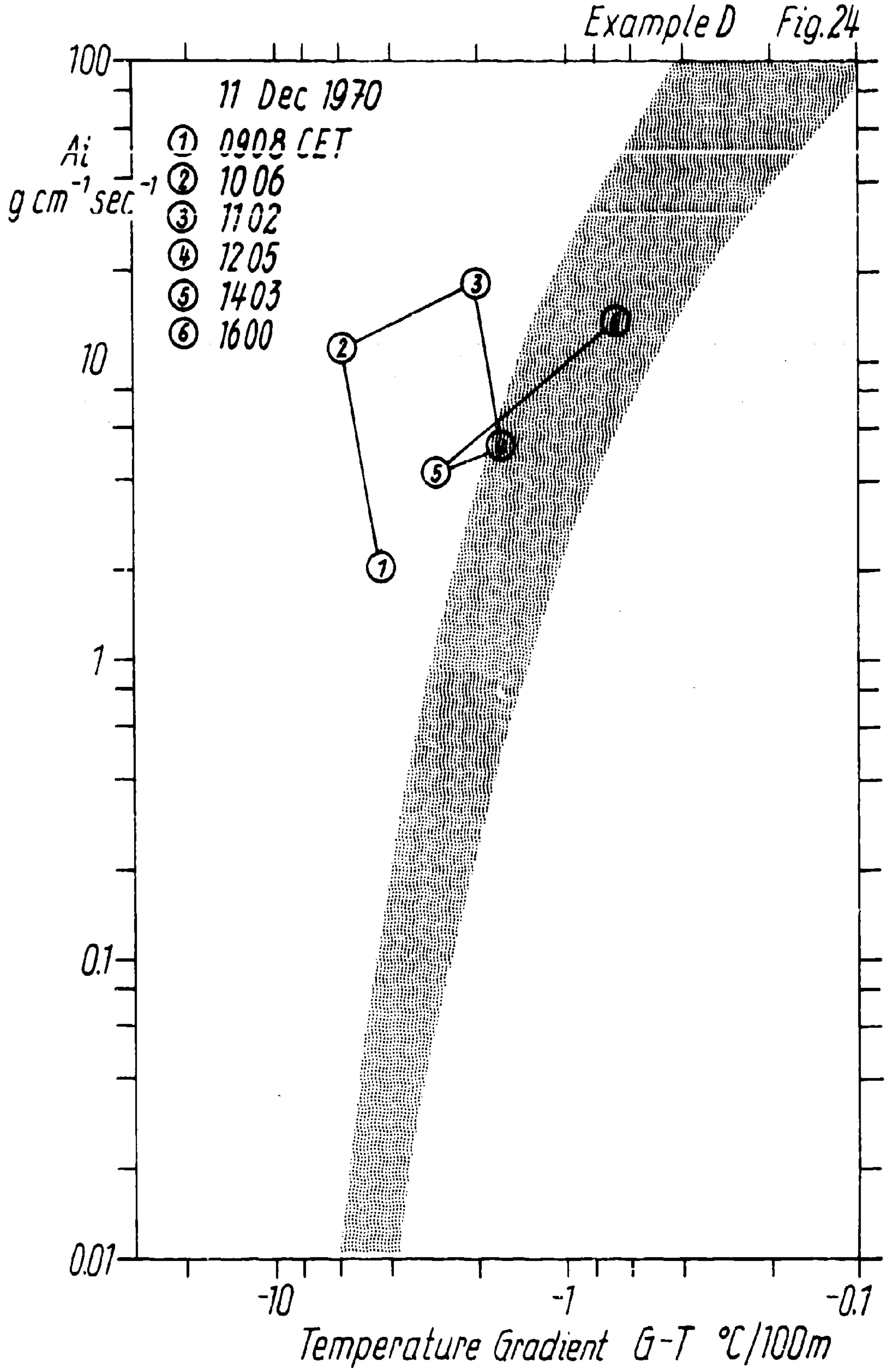
Example C Fig.21
14 Oct 1970
0 0922 CET
1 1035
2 1130
3 1210
4 1300
5 1400
6 1500
7 1530
8 1630
Ai
g cm⁻¹ sec⁻¹
100
10
1
0.1
0.01
-10
-1
-0.1
Temperature Gradient G-T °C/100m

14 Oct 1970 Example C Fig. 22



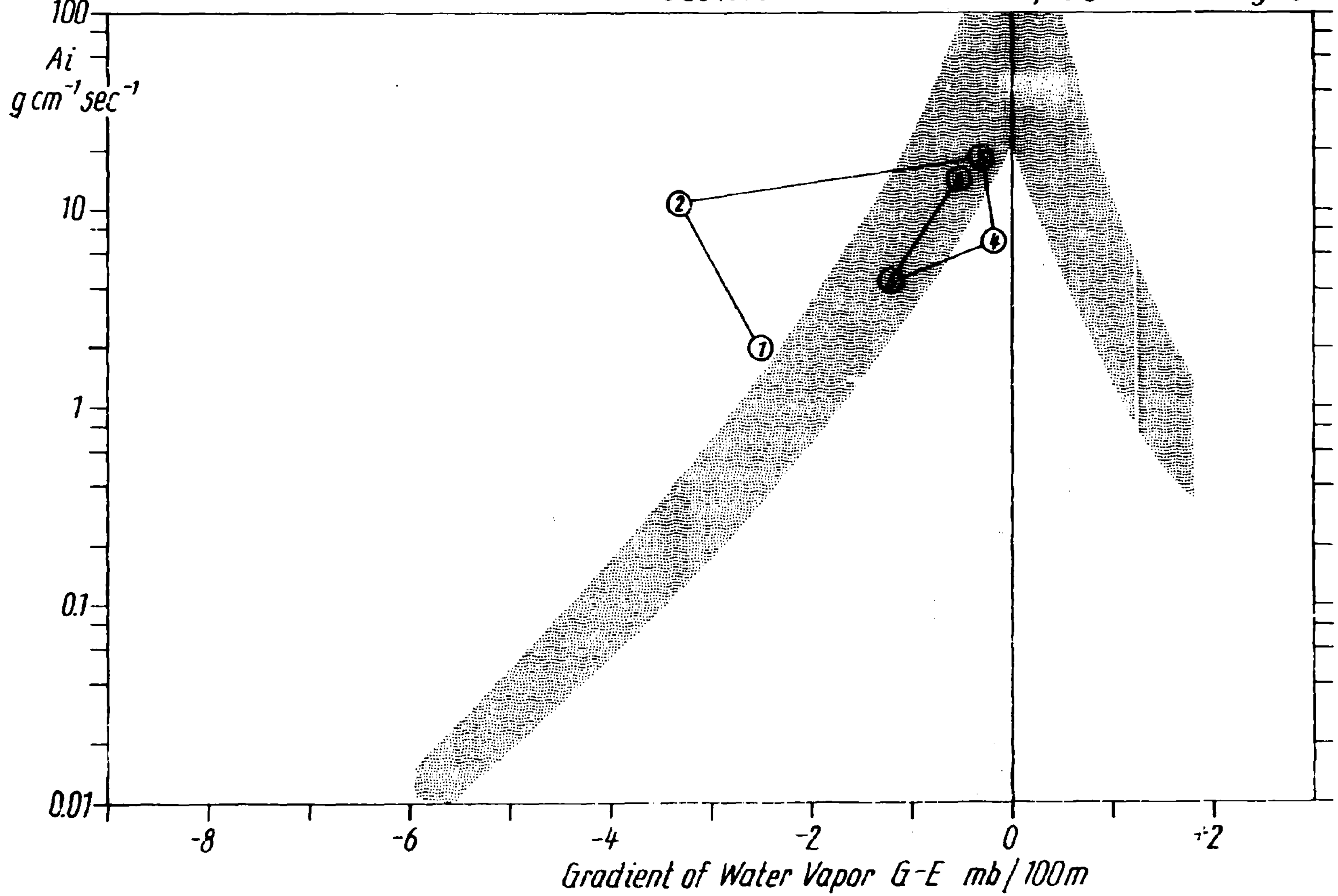
14 Oct 1970 Example C Fig.23



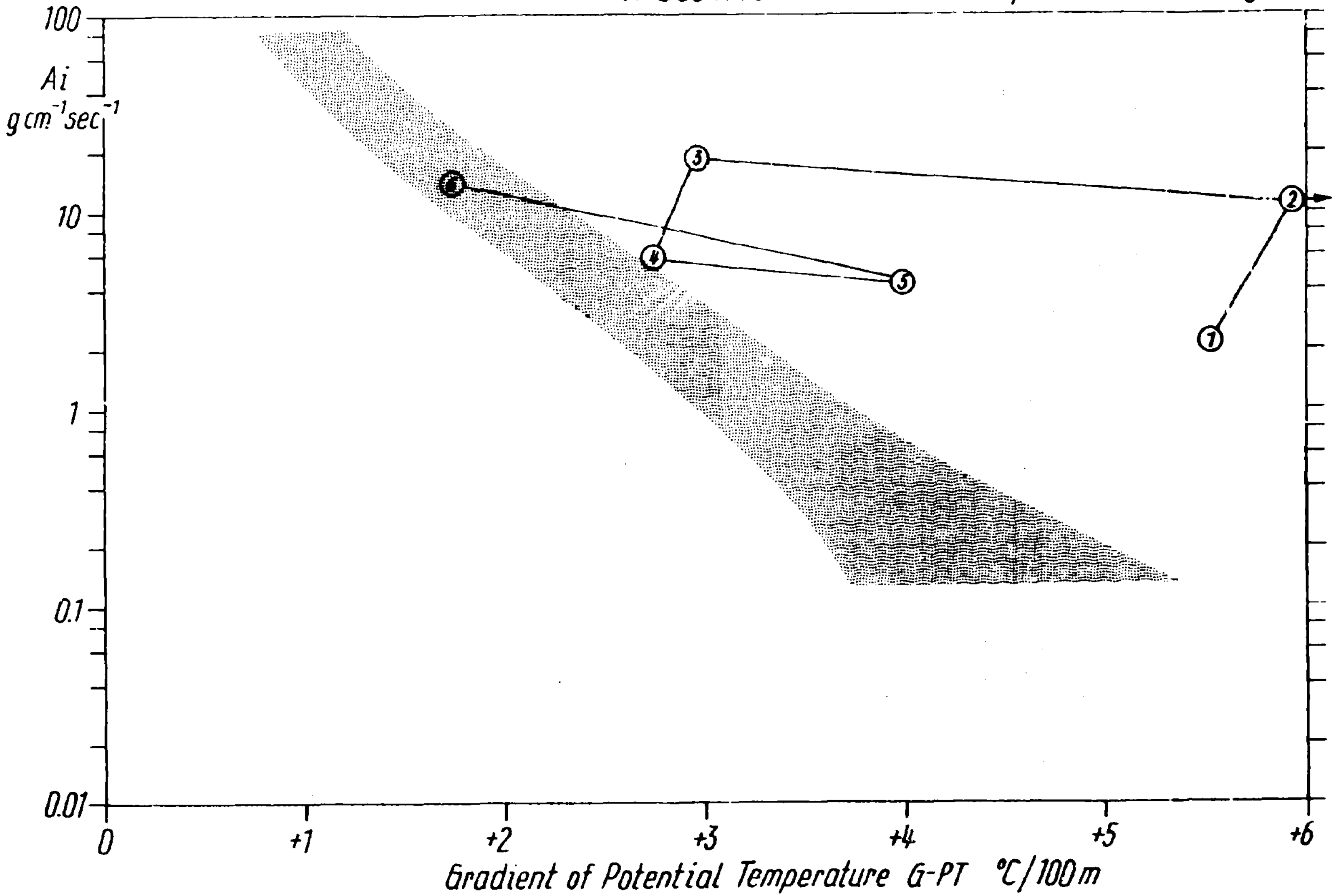


Example D Fig.24
11 Dec 1970
① 0908 CET
② 10 06
③ 11 02
④ 12 05
⑤ 14 03
⑥ 16 00
Ai
g cm⁻¹ sec⁻¹
100
10
1
0.1
0.01
-10
-1
-0.1
Temperature Gradient G-T °C/100m

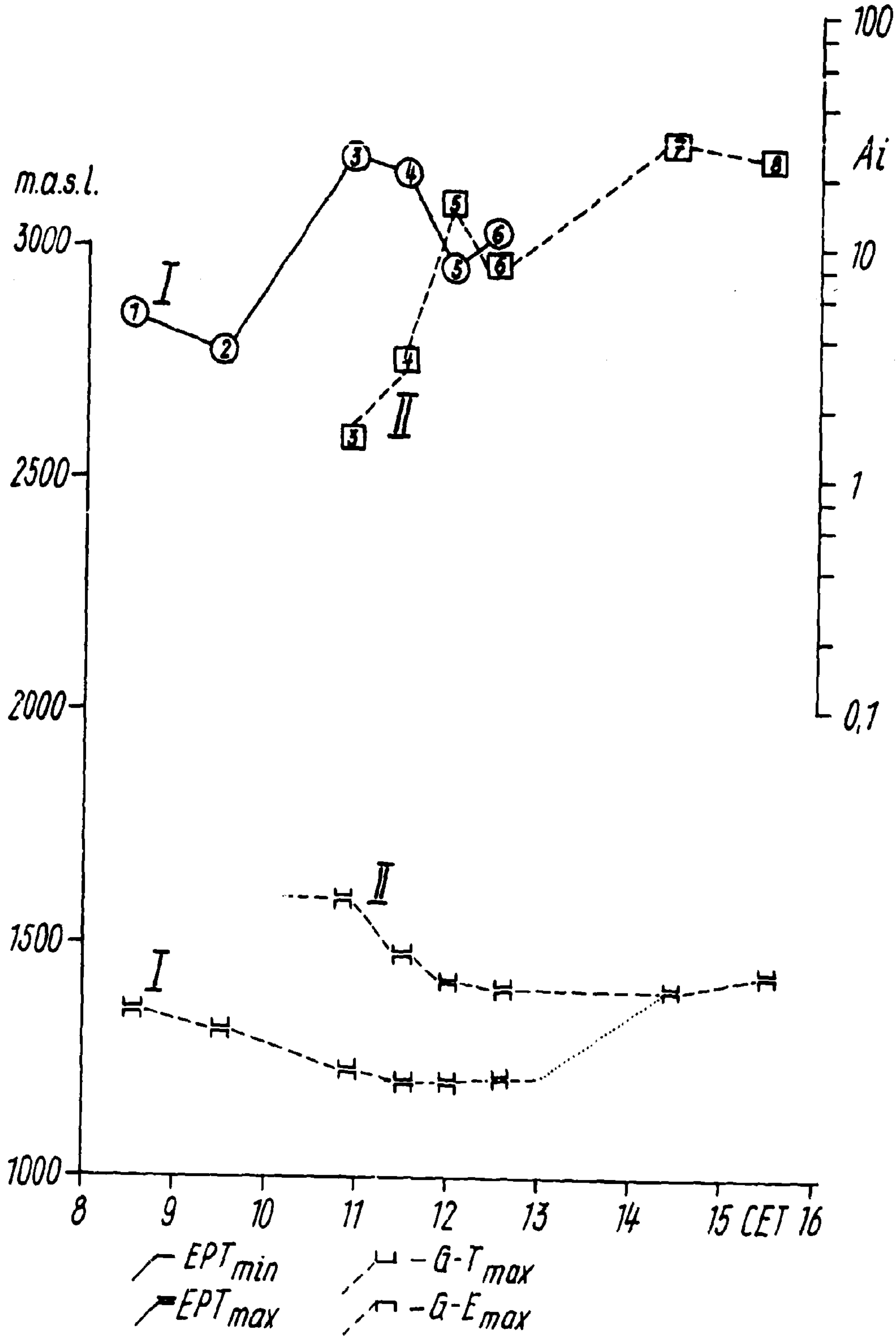
11 Dec 1970 Example D Fig. 25



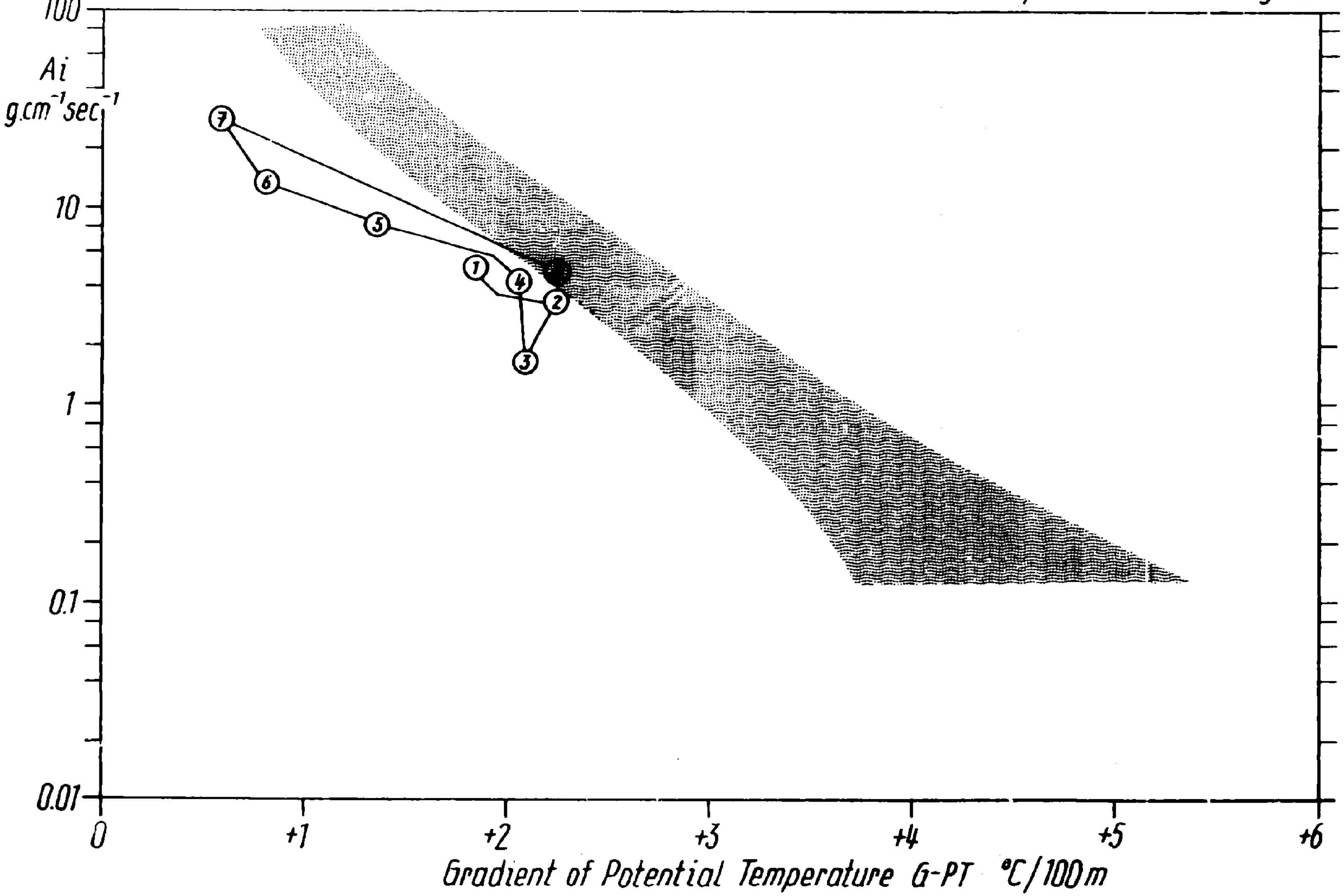
11 Dec 1970 Example D Fig. 26

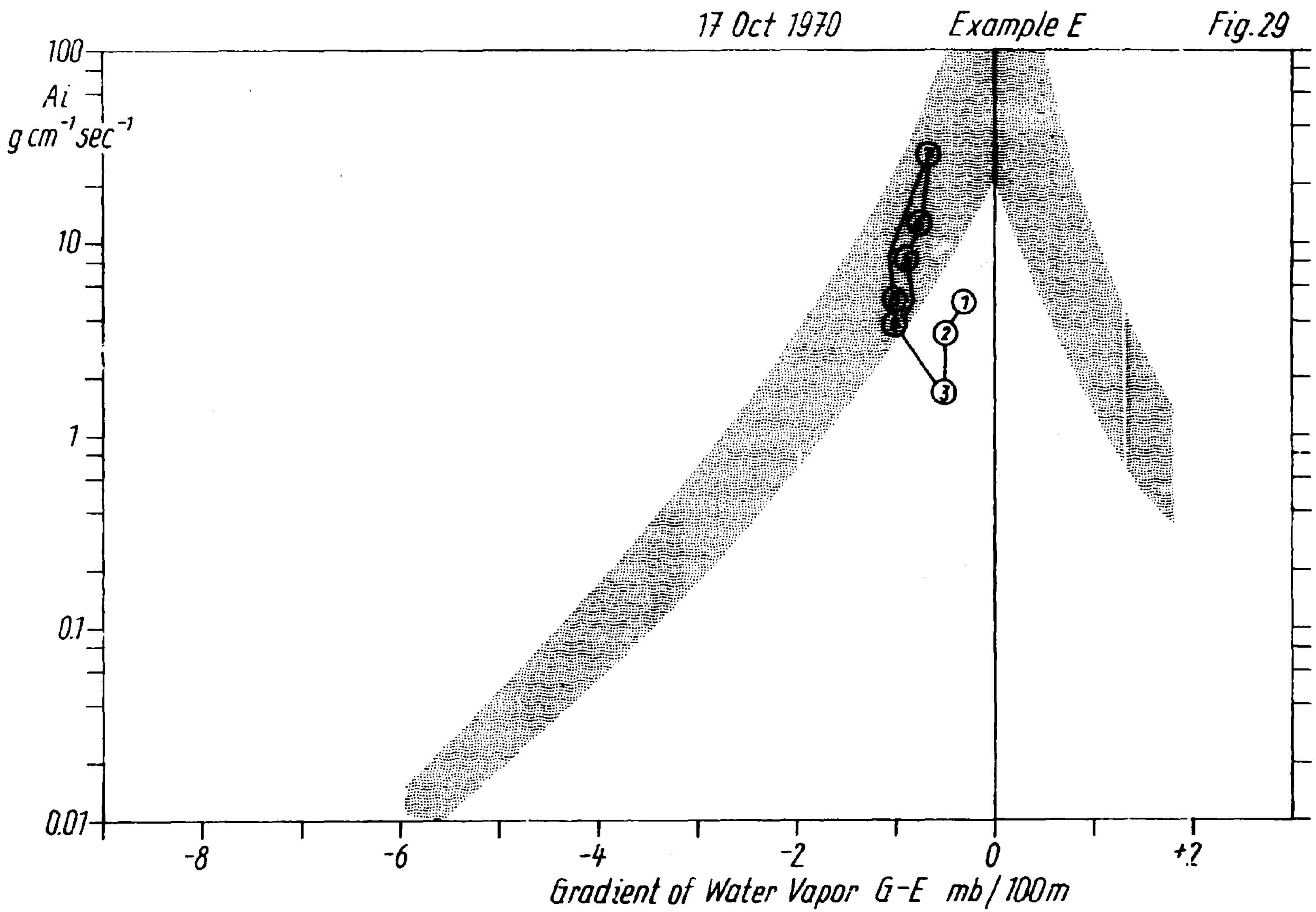


17 Oct 1970 Example E Fig. 27

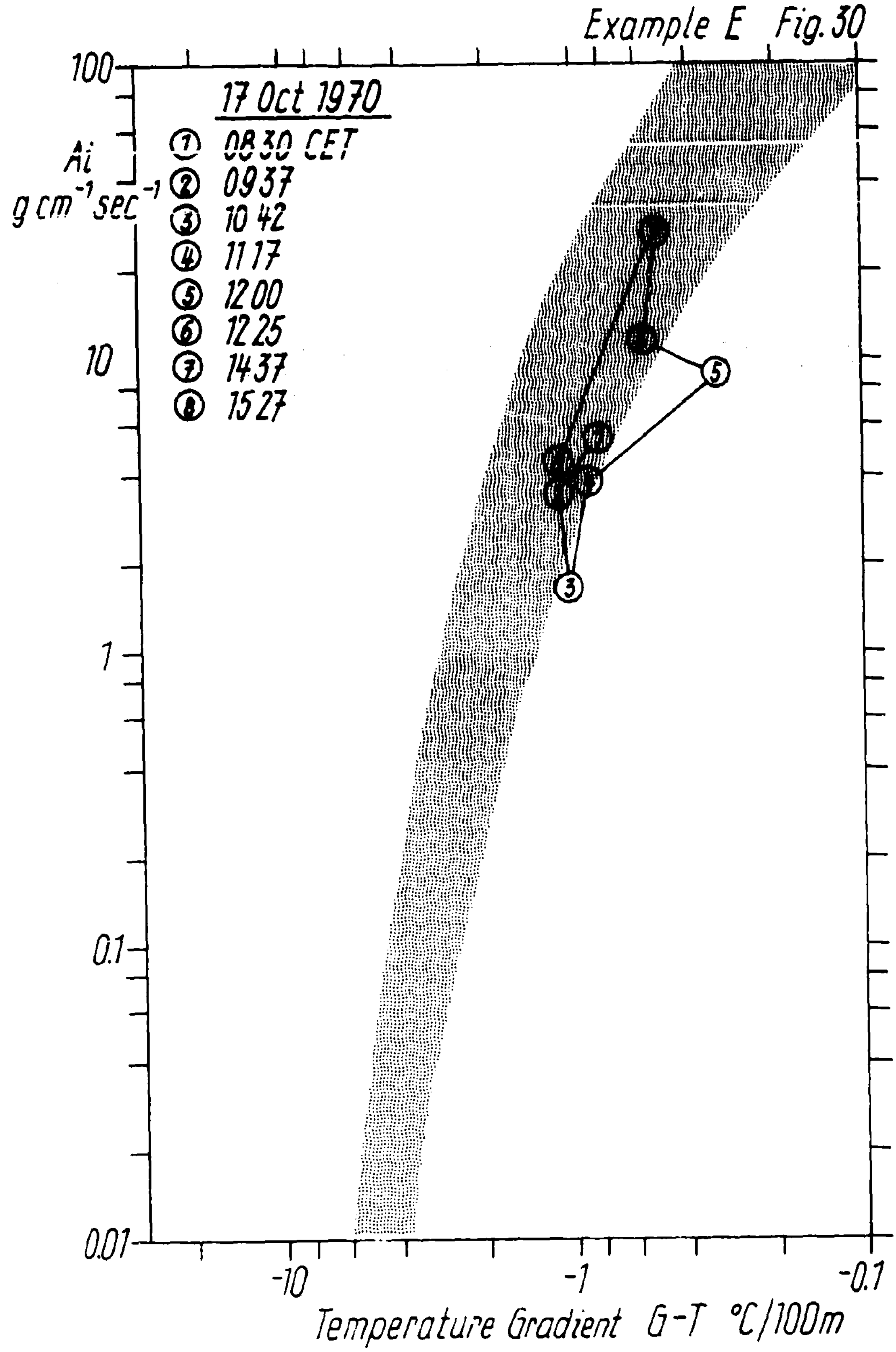


17 Oct 1970 Example E Fig.28

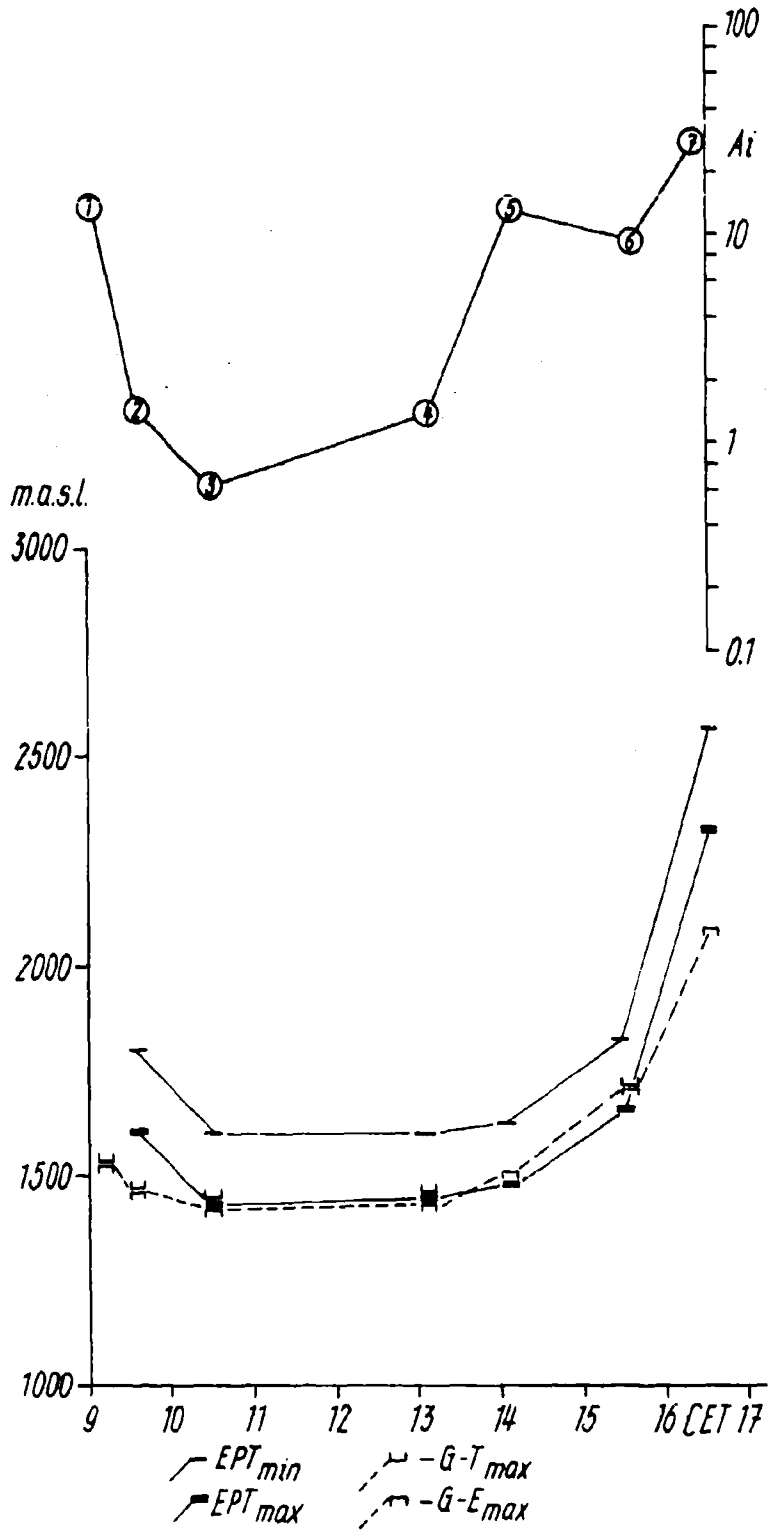


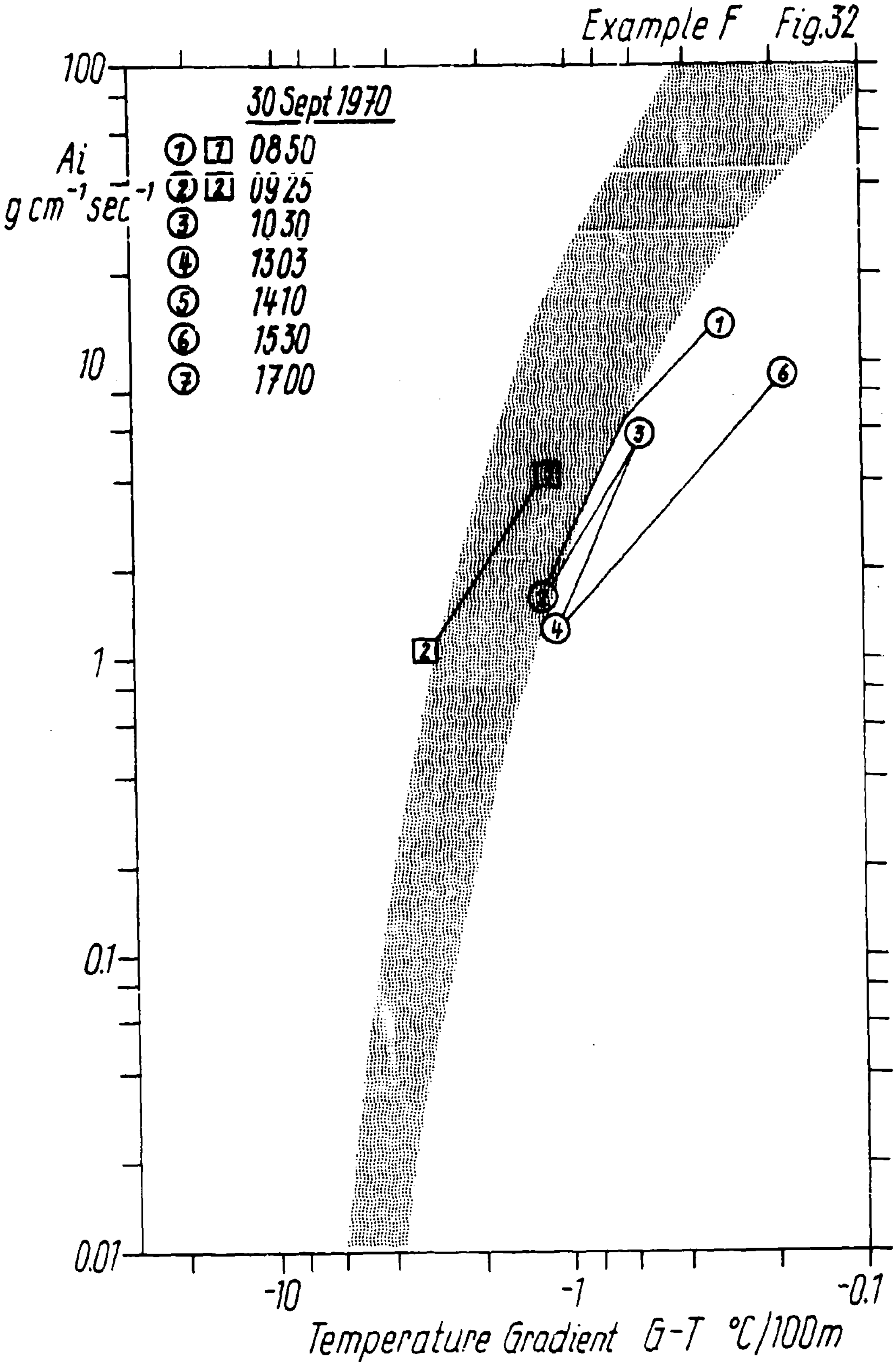


17 Oct 1970
Example E
Fig.29
100
Ai
g cm⁻¹ sec⁻¹
10
1
0.1
0.01
-8
-6
-4
-2
0
+2
Gradient of Water Vapor G-E mb/100m
1
2
3

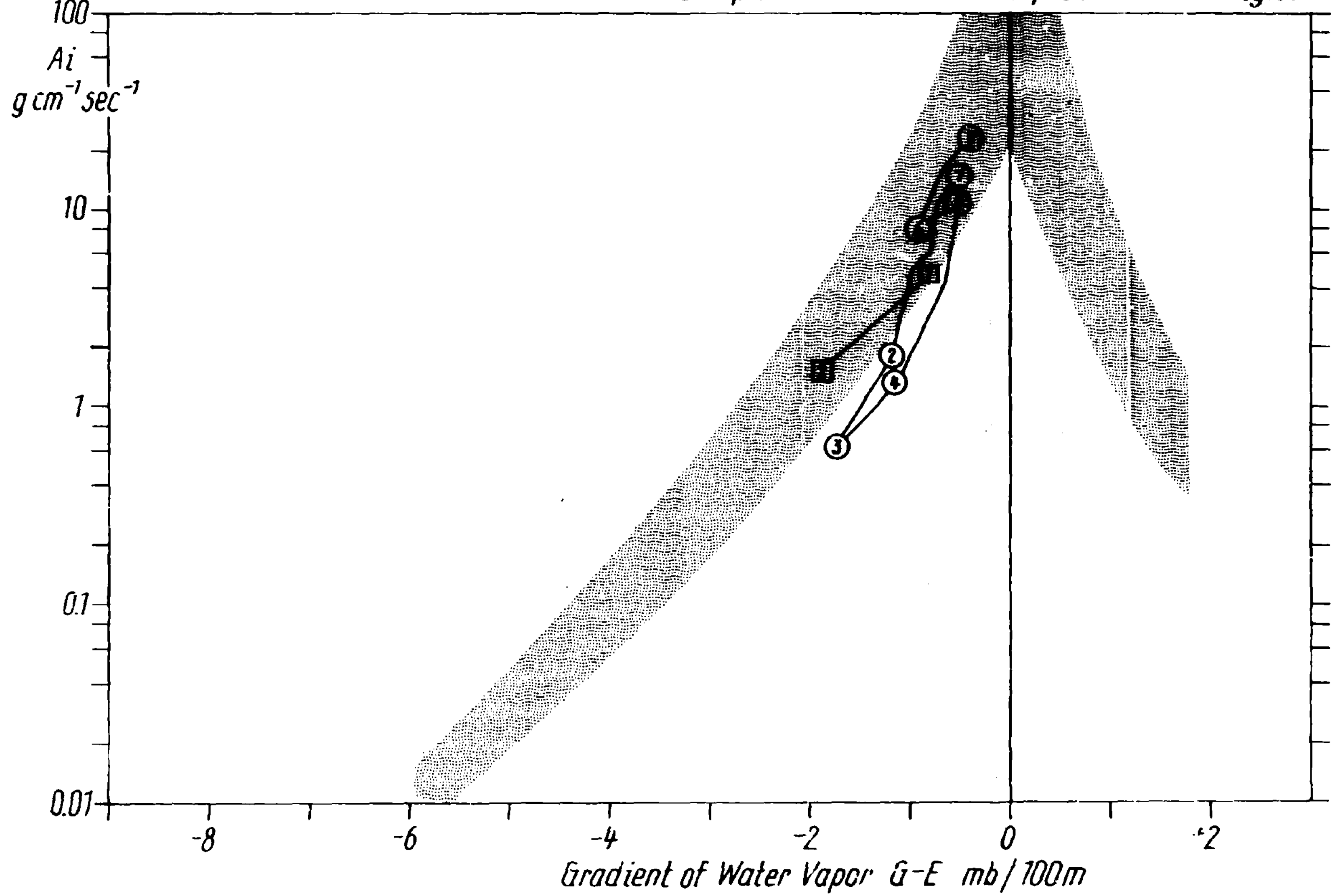

Example E Fig. 30
17 Oct 1970
① 08 30 CET
② 09 37
③ 10 42
④ 11 17
⑤ 12 00
⑥ 12 25
⑦ 14 37
⑧ 15 27
Ai
g cm⁻¹ sec⁻¹
100
10
1
0.1
0.01
-10
-1
-0.1
Temperature Gradient G-T °C/100m

30 Sept. 1970 Example F Fig. 31

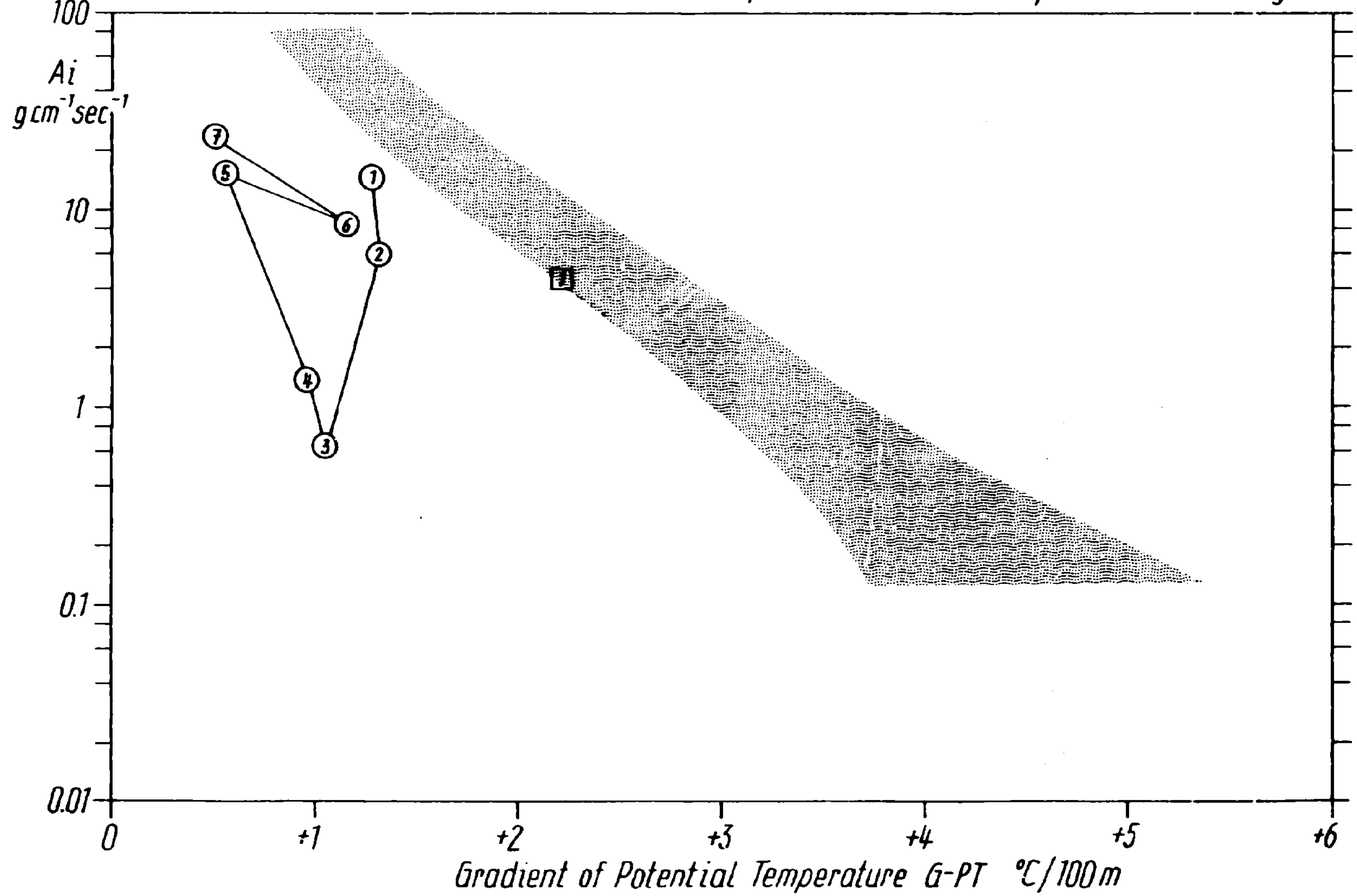



Example F Fig.32
30 Sept 1970
1 1 0850
2 2 0925
3 1030
4 1303
5 1410
6 1530
7 1700
Ai
g cm⁻¹ sec⁻¹
100
10
1
0.1
0.01
-10
-1
-0.1
Temperature Gradient G-T °C/100m

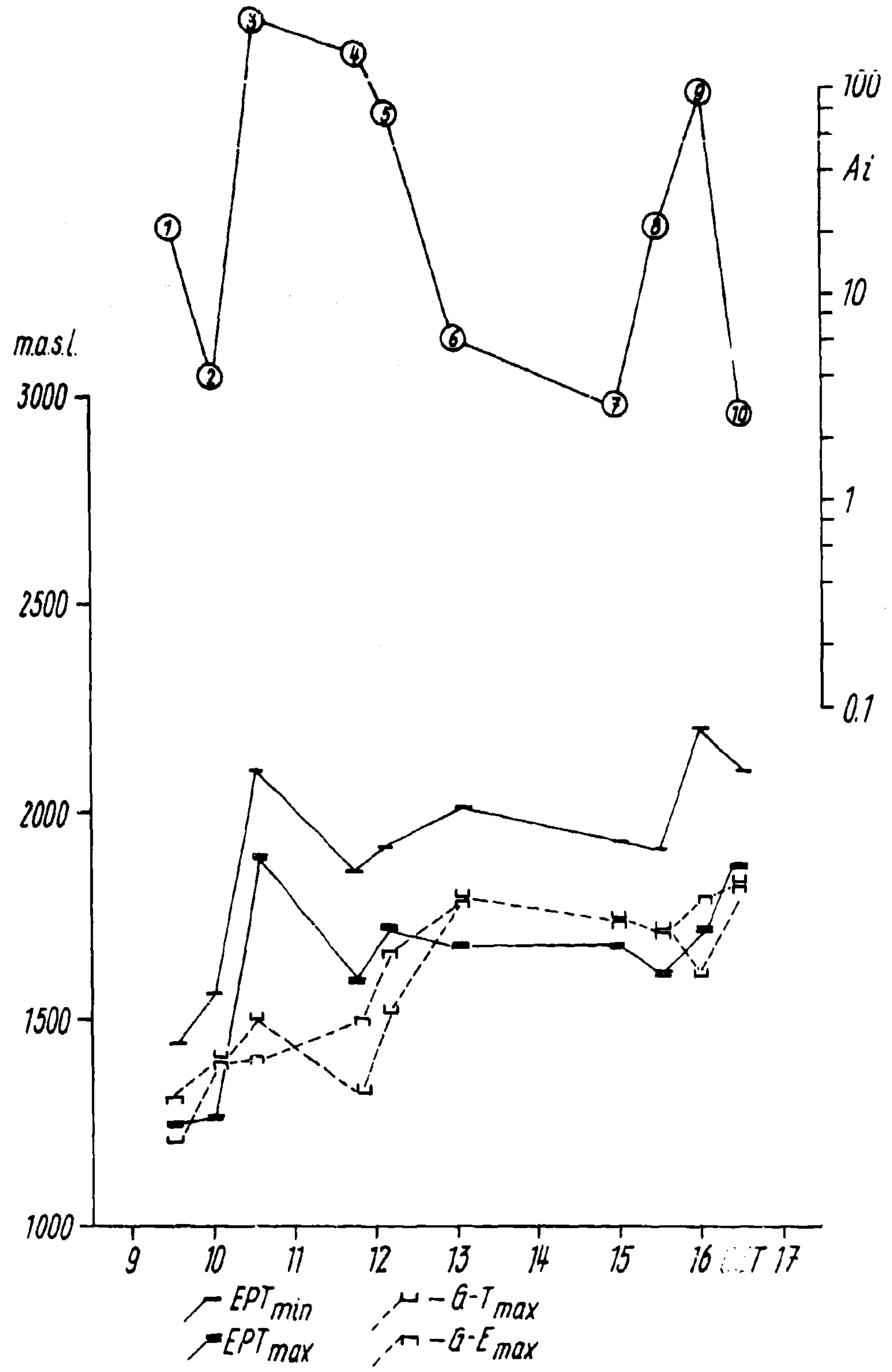
30 Sept. 1970 Example F Fig. 33



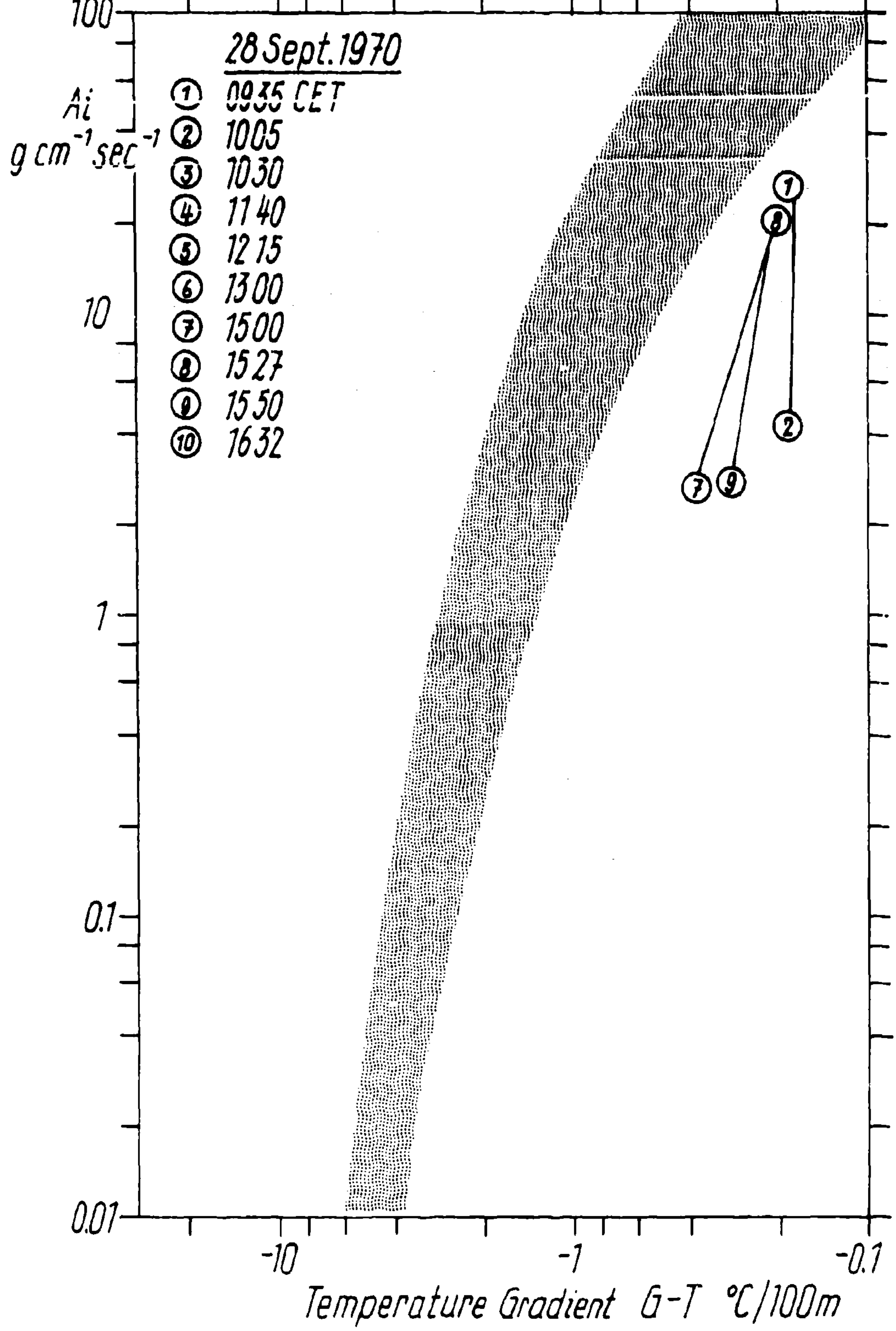
30 Sept. 1970 Example F Fig.34

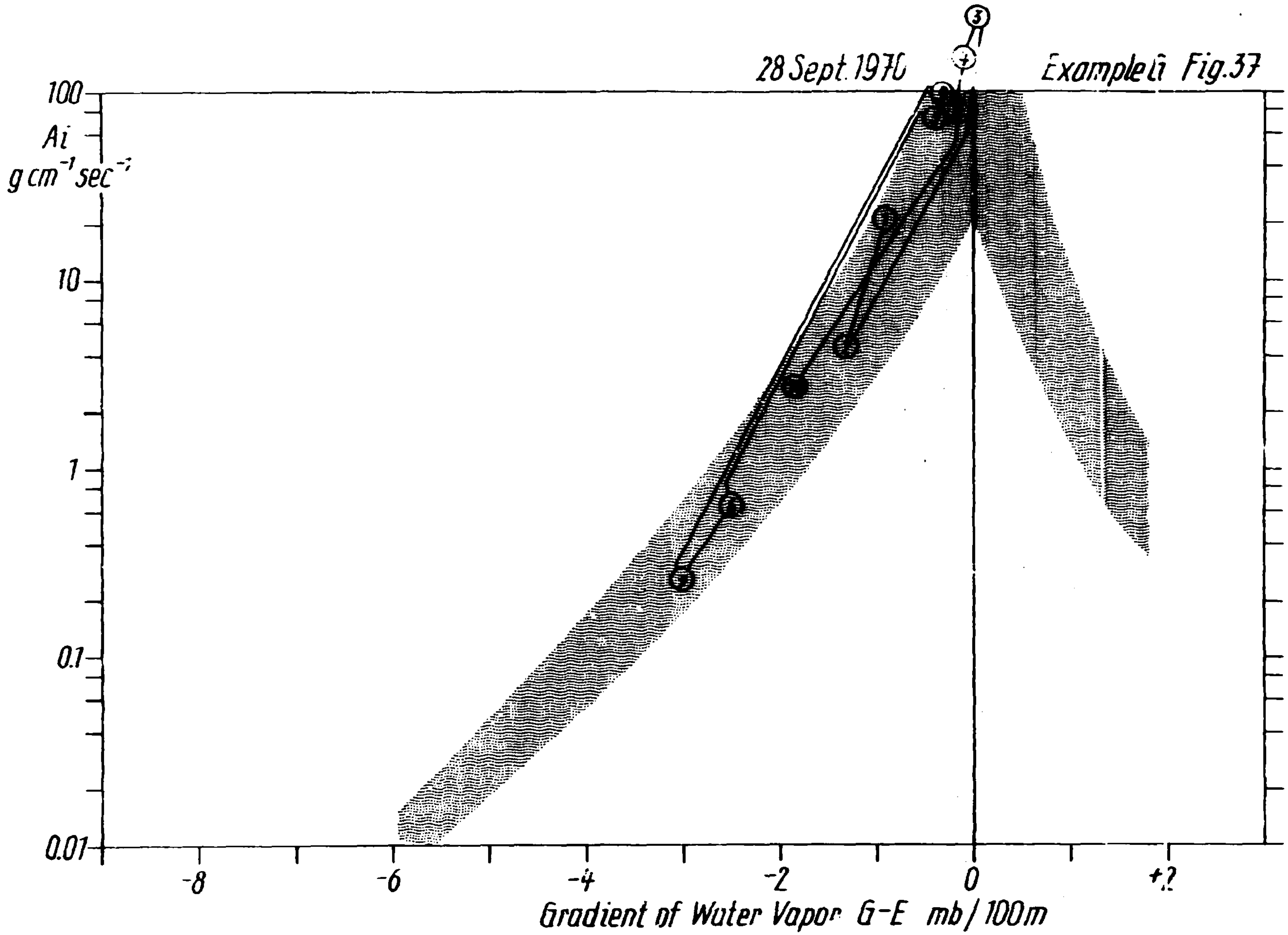


28 Sept. 1970 Example G Fig. 35



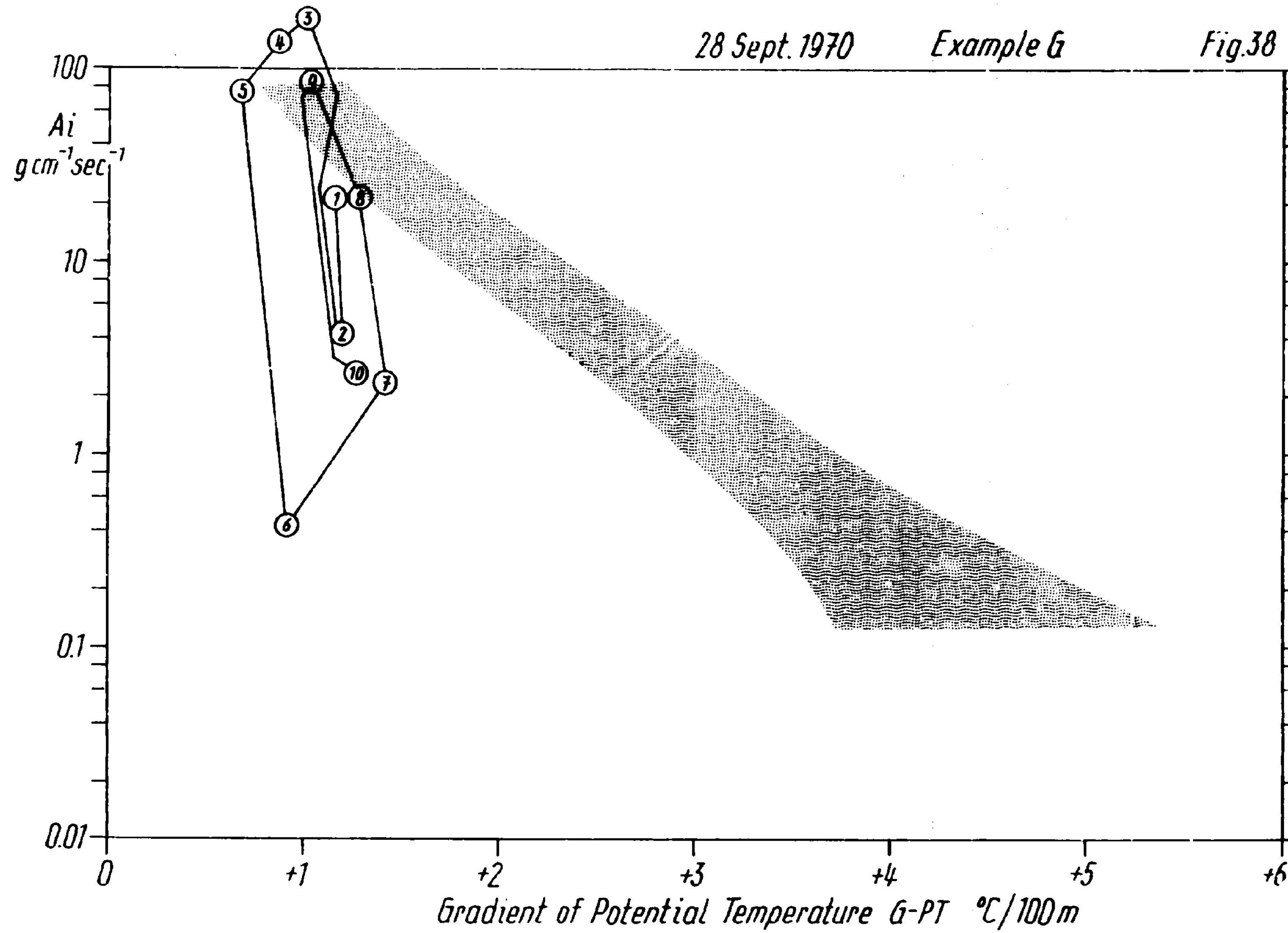
Example G Fig.36



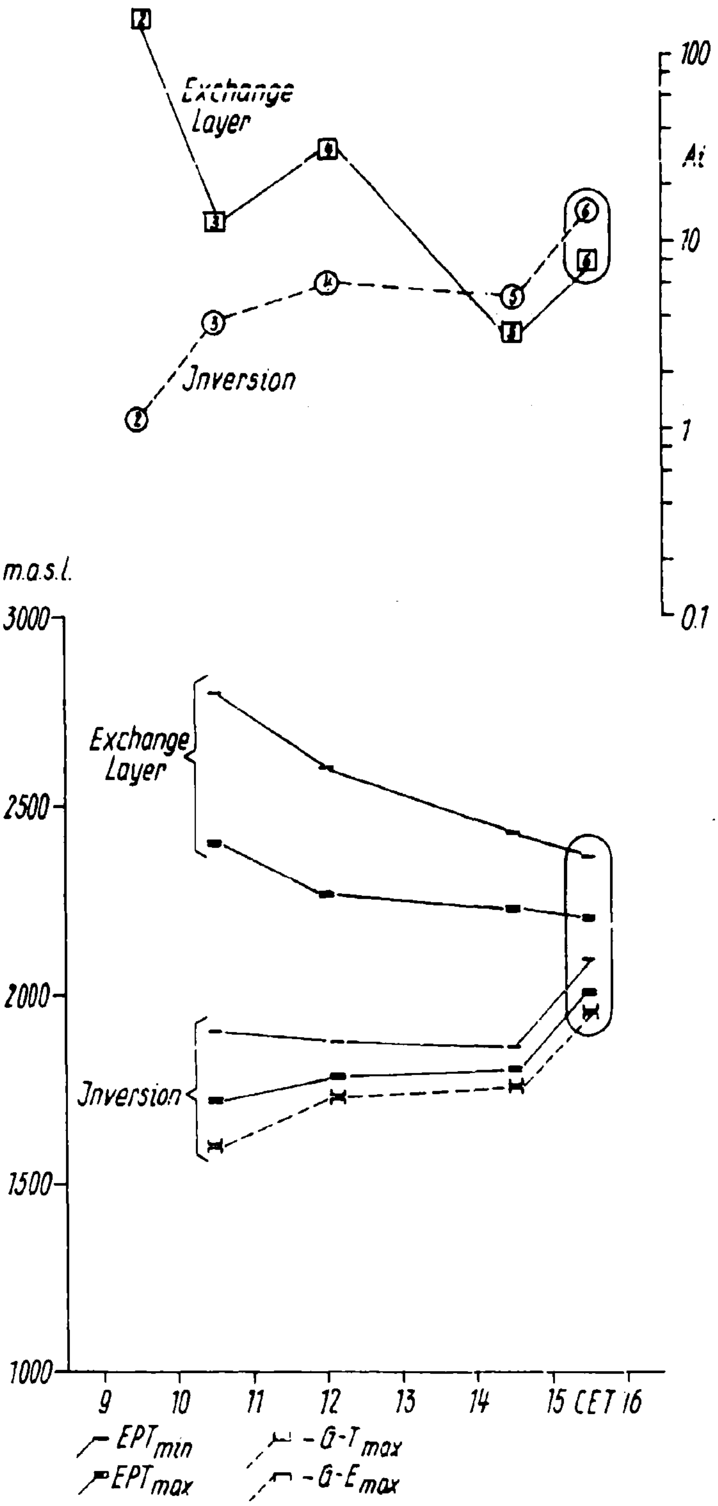


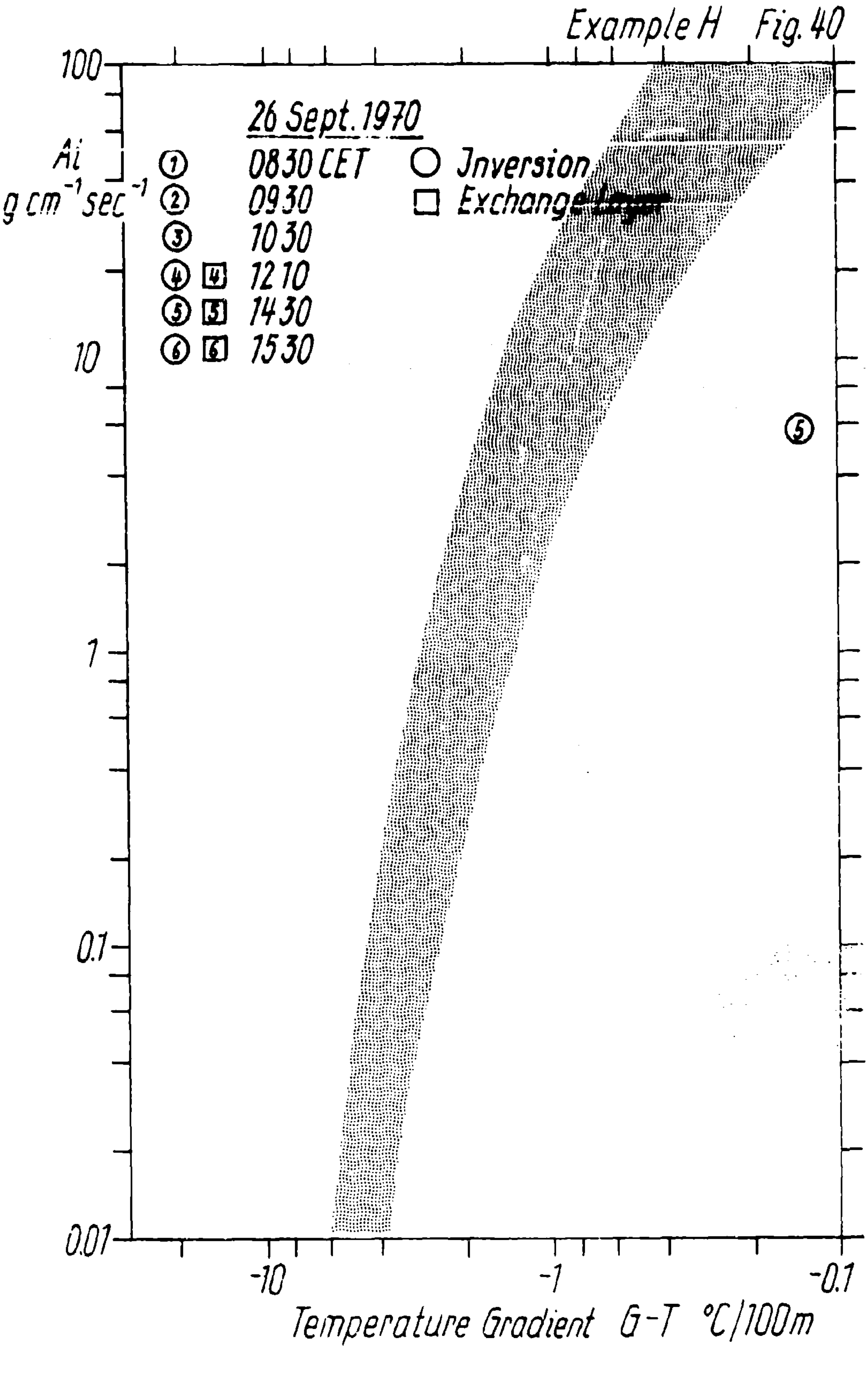
28 Sept. 1970
Example ii Fig. 37
100
10
1
0.1
0.01
Ai
g cm⁻¹ sec⁻¹
-8
-6
-4
-2
0
+2
Gradient of Water Vapor G-E mb/100m
3

28 Sept. 1970 Example G Fig. 38



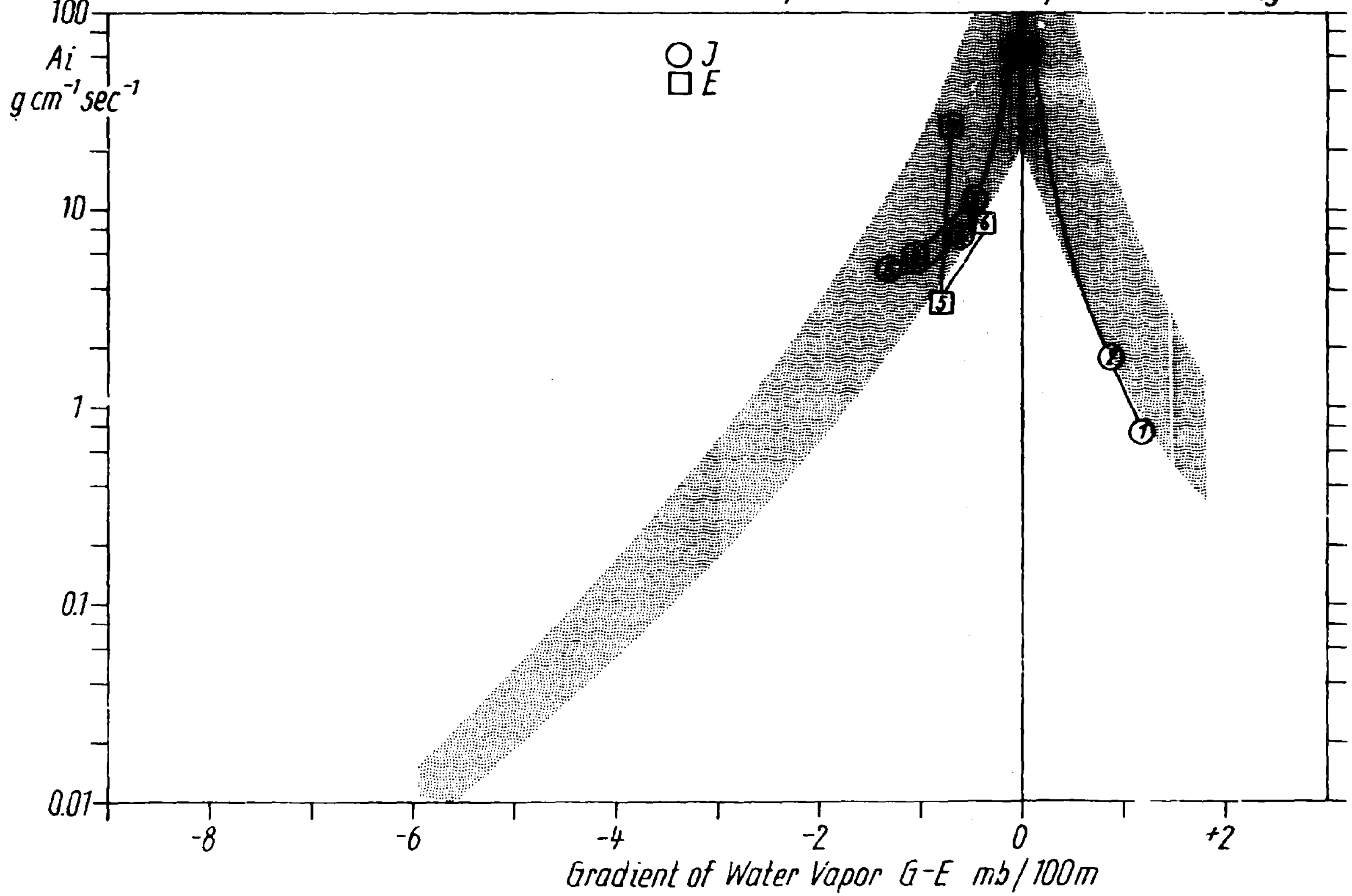
26 Sept. 1970 Example H Fig.39



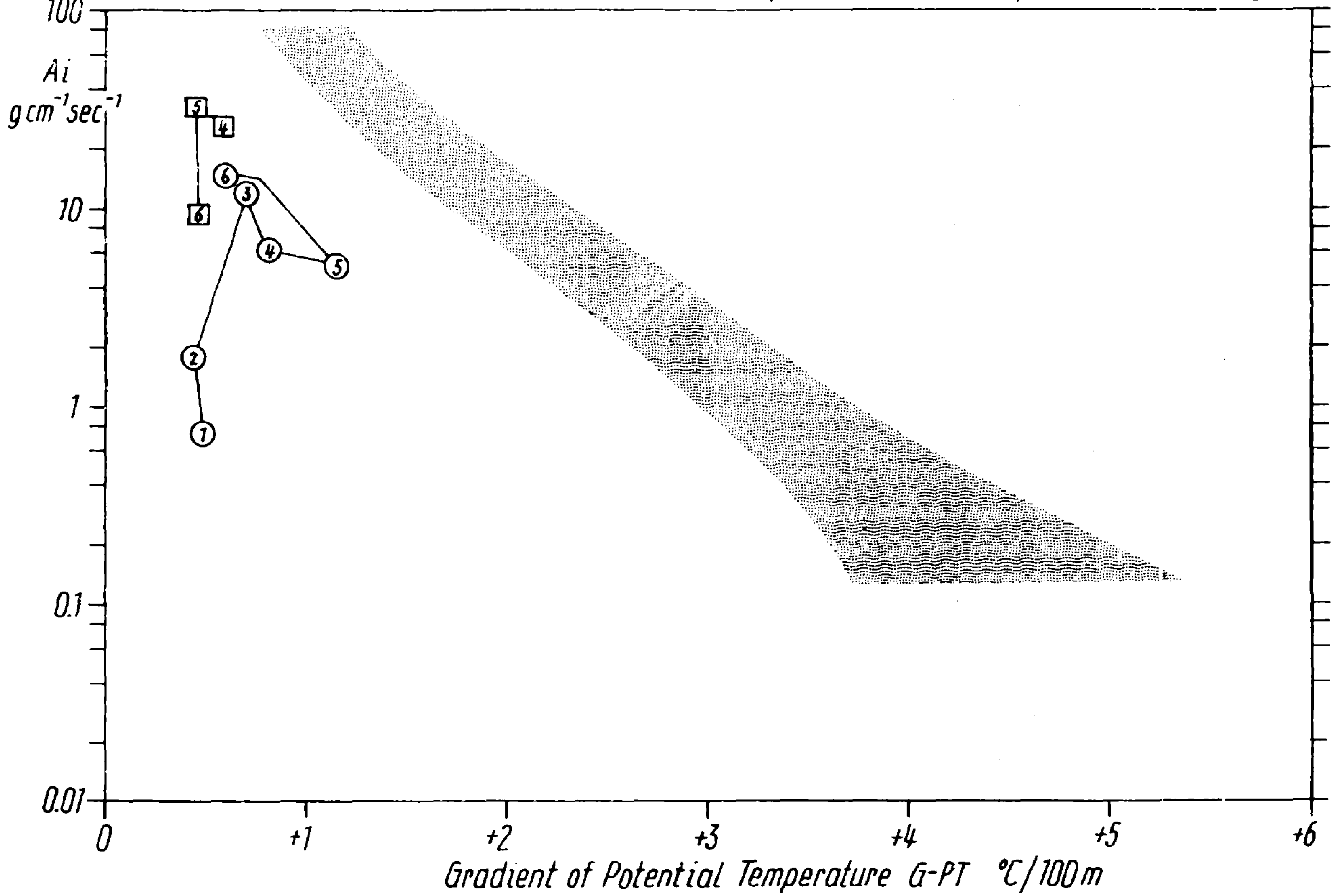


Example H Fig. 40
100
10
1
0.1
0.01
Ai
g cm⁻¹ sec⁻¹
26 Sept. 1970
① 0830 CET
② 0930
③ 1030
④ 4 1210
⑤ 5 1430
⑥ 6 1530
○ Jnversion
□ Exchange Layer
⑤
-10
-1
-0.1
Temperature Gradient G-T °C/100m

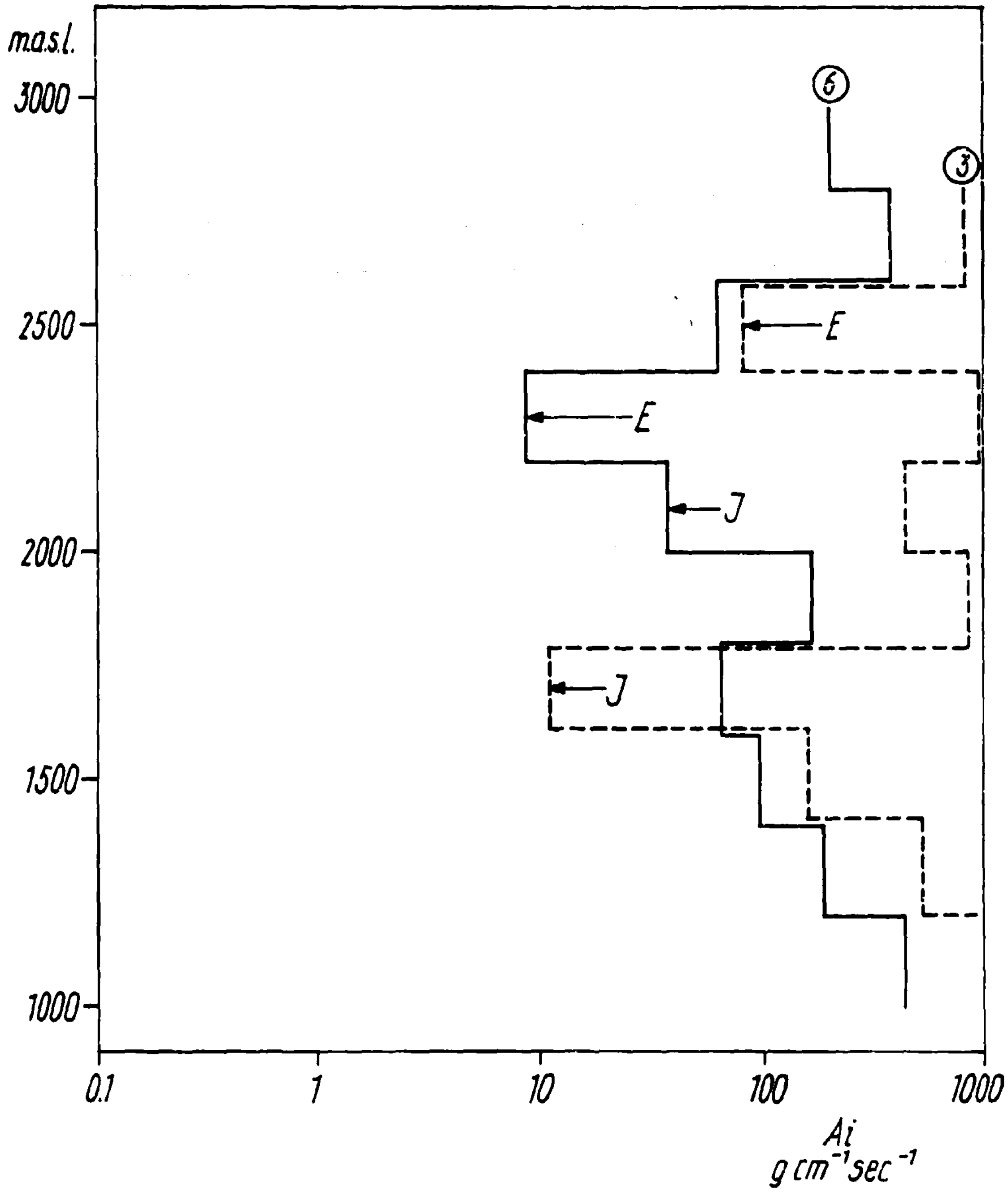
26 Sept. 1970 Example H. Fig. 41

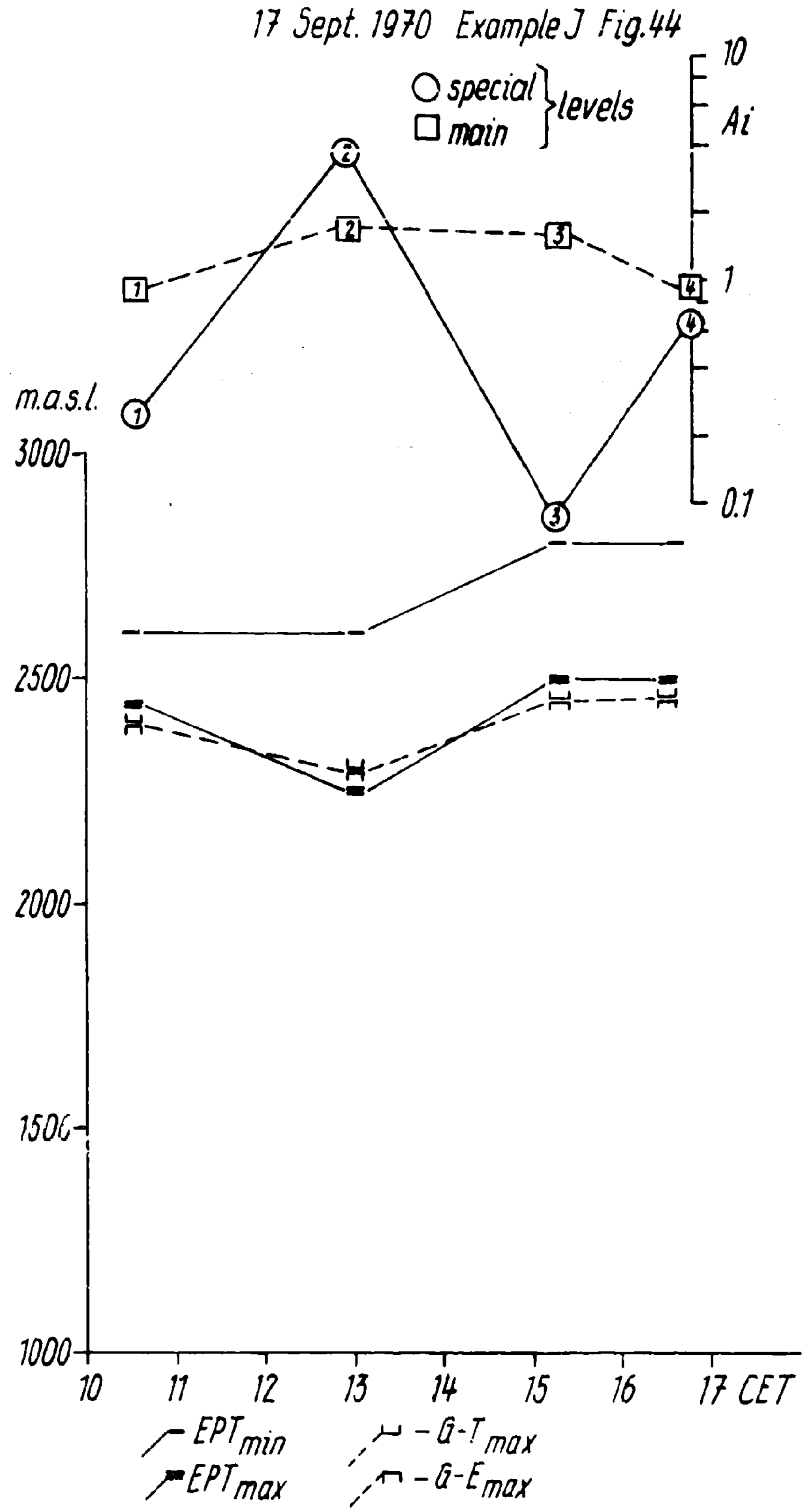


26 Sept. 1970 Example H Fig. 42



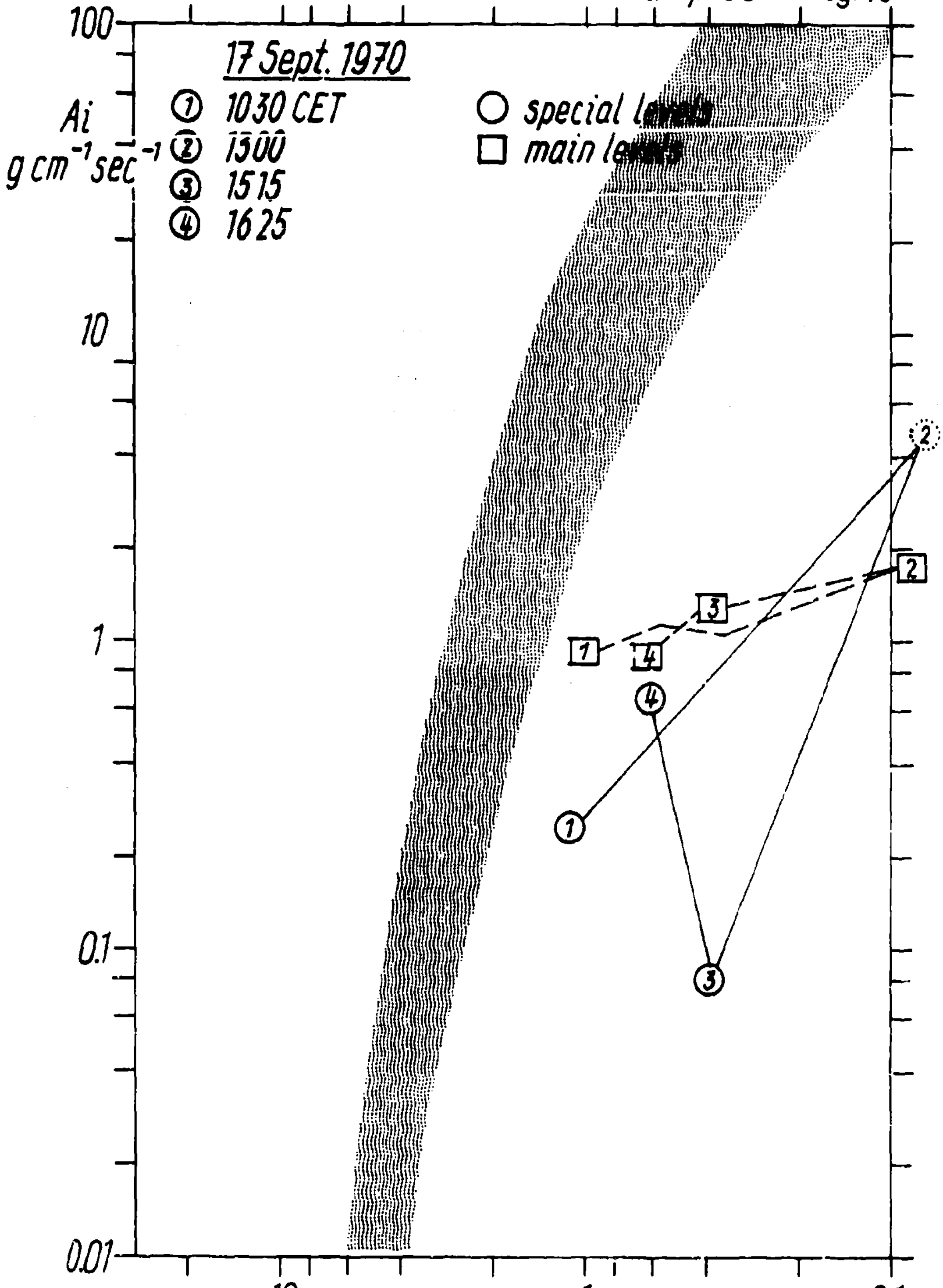
26 Sept. 1970 Example H Fig. 43



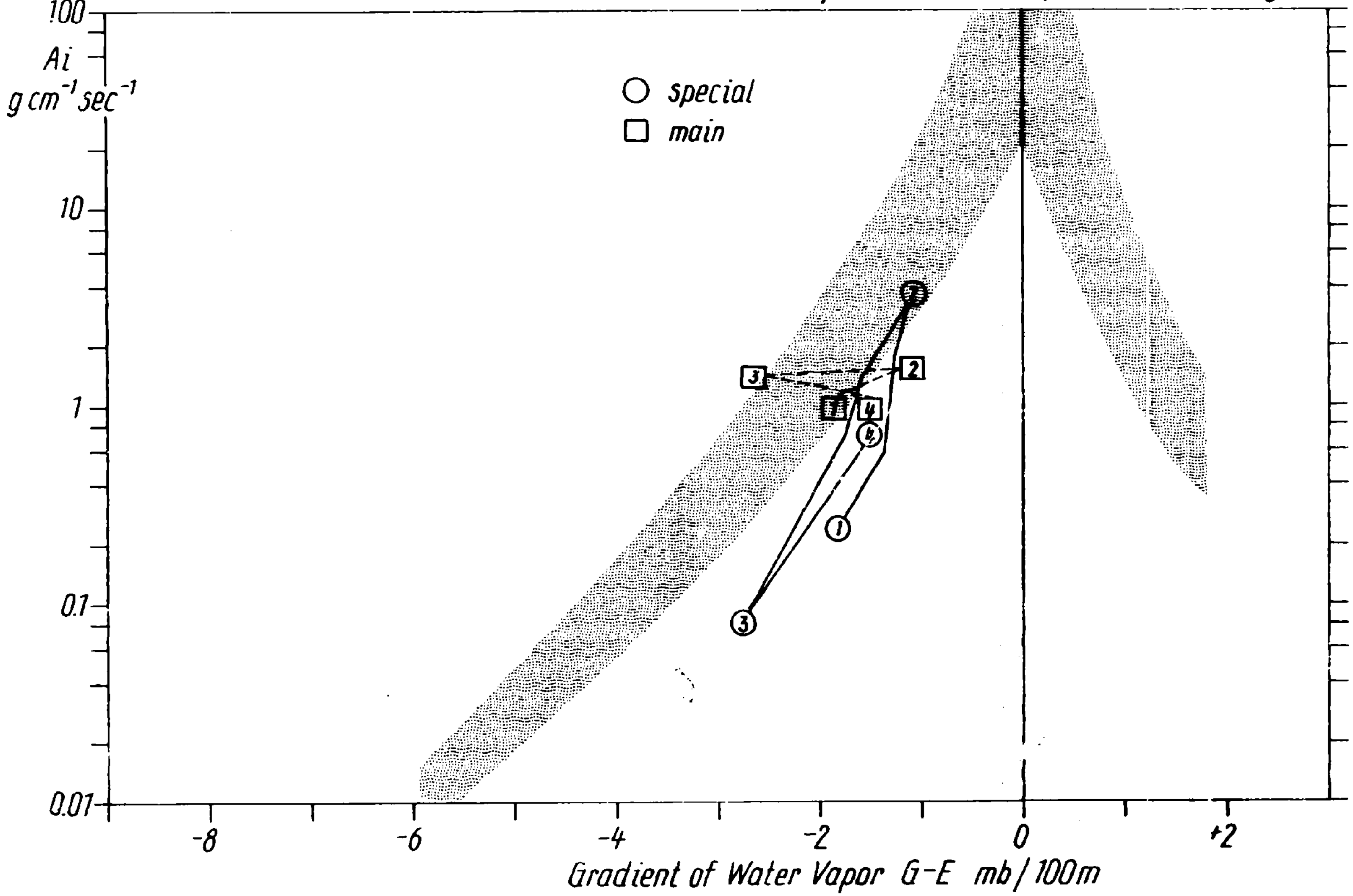


17 Sept. 1970 Example J Fig.44
special
main
levels
10
Ai
1
0.1
m.a.s.l.
3000
2500
2000
1500
1000
10
11
12
13
14
15
16
17 CET
EPTmin
EPTmax
G-Tmax
G-Emax

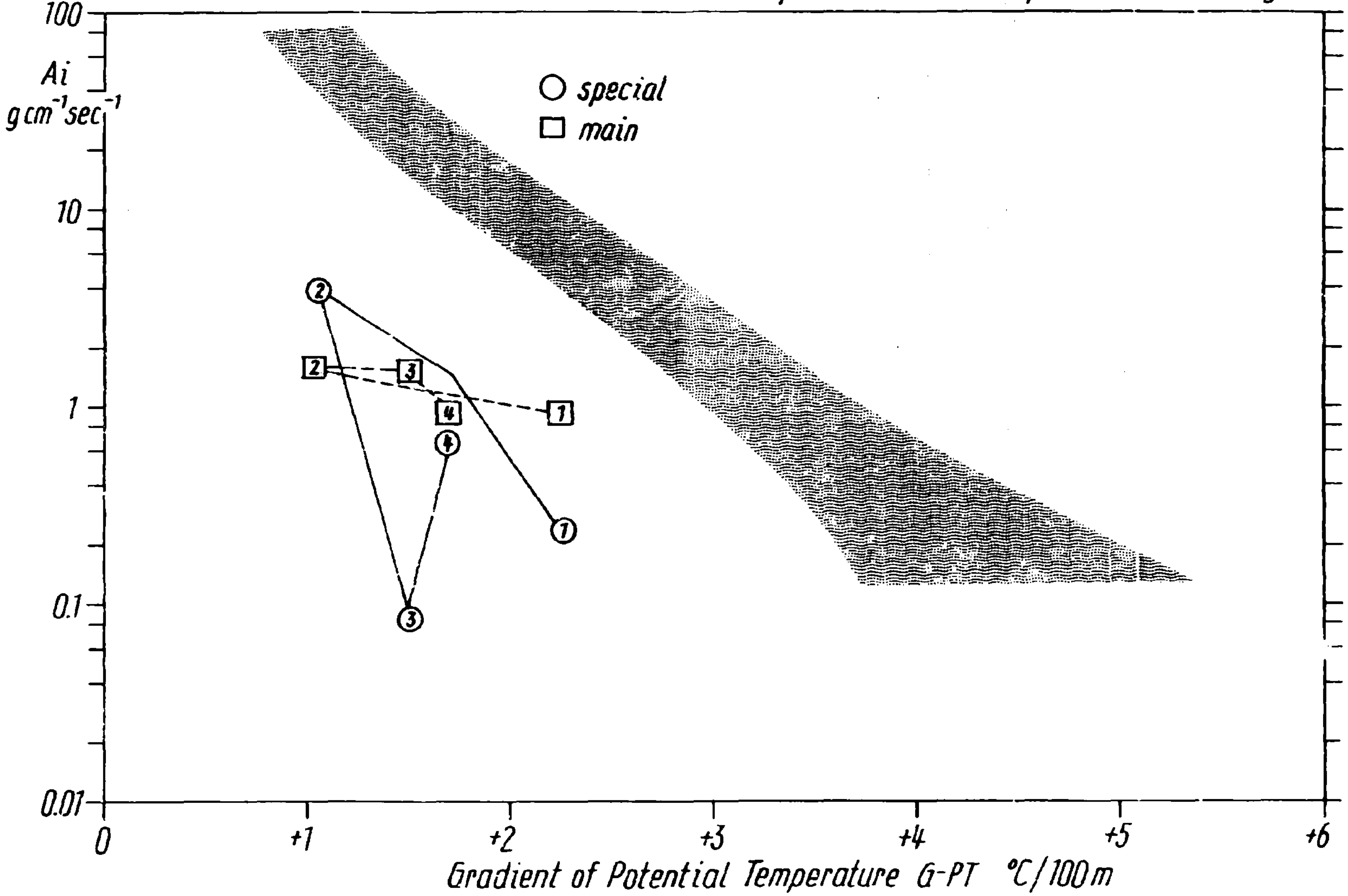
Example J Fig. 45



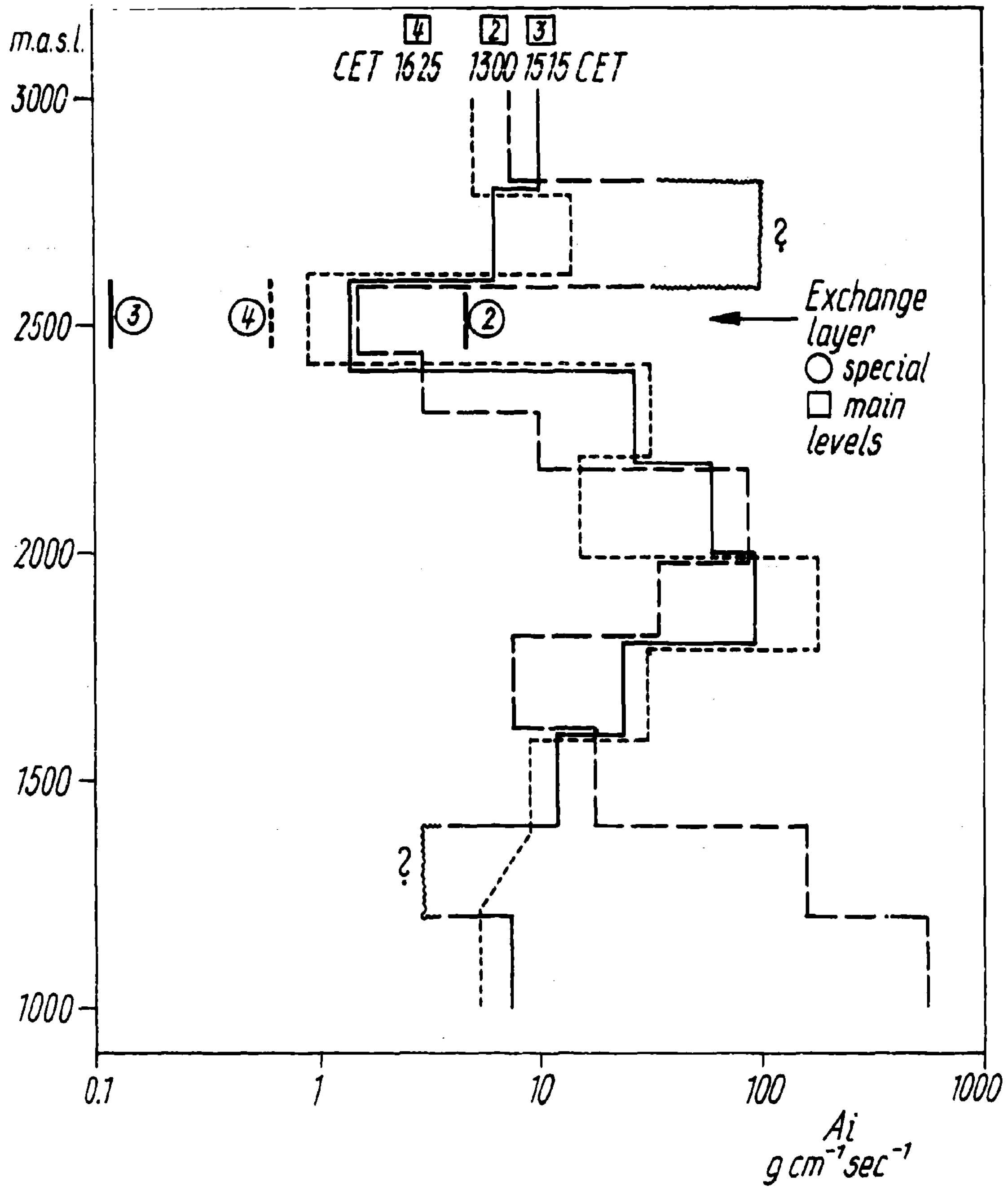
17 Sept. 1970 Example J Fig. 46



17 Sept. 1970 Example J Fig. 47



Example J Fig. 48



# 2. Legends to the Figures 1 - 48

## Legends to Figures

Fig. 1:
Chart on the processing of the recordings transmitted from the moving cable car, up to the final results: the completed tables printed out by teletype.

Fig. 2:
Relation between incremental exchange coefficient $A_i$ and temperature gradient G-T. Representation of the relation by the individual pairs of values. The relation applies to real inversions exclusively (stationary equilibrium of the eddy diffusion).

Fig. 3:
Result of statistical analyses of Fig. 2 with indication of scatter (red).

Fig. 4:
Relation between incremental exchange coefficient $A_i$ and gradient of potential temperature G-PT expressed in degrees centigrade per 100 m. Representation of the individual pairs of values. Valid for real inversions (stationary equilibrium of eddy diffusion).

Fig. 5:
Same as Fig. 4, however, result of statistical investigation with indication of scatter (red).

Fig. 6:
Relation between incremental exchange coefficient $A_i$ and gradient of water vapor pressure G-E in mb/100m. Individual pairs of values. Valid for aerological structures having a G-T minimum with stationary equilibrium.

Fig. 7:
Same as Fig. 6, however, result of statistical investigation with indication of scatter (red).

Fig. 8 and 9:
Relation between incremental exchange coefficient $A_i$ and gradient of potential temperature G-PT, divided into two intervals of time. Result of statistical investigation with indication of scatter. Relation of general applicability.

Fig. 10:
Mutual comparison of results from both intervals of time.

## Re - Example A

Fig. 11:
Variations in space and time of important structural elements of the inversion newly formed at 1200 CET.

Fig. 12:
Time slope within the range of function $A_i$=f (G-T).
Numerals 1 through 4 identify the runs.

Fig. 13:
Same as Fig. 12, but relation $A_i$=f (G-PT).

Fig. 14:
Same as Fig. 12, but function $A_i$=f (G-E).

The following figures to Examples B trough H basically correspond to the figures of example A; hence separate legends are not needed.

Fig. 19:
Vertical profiles of the incremental exchange coefficients

$A_i$ and water vapor pressure E for runs 2 through 7.

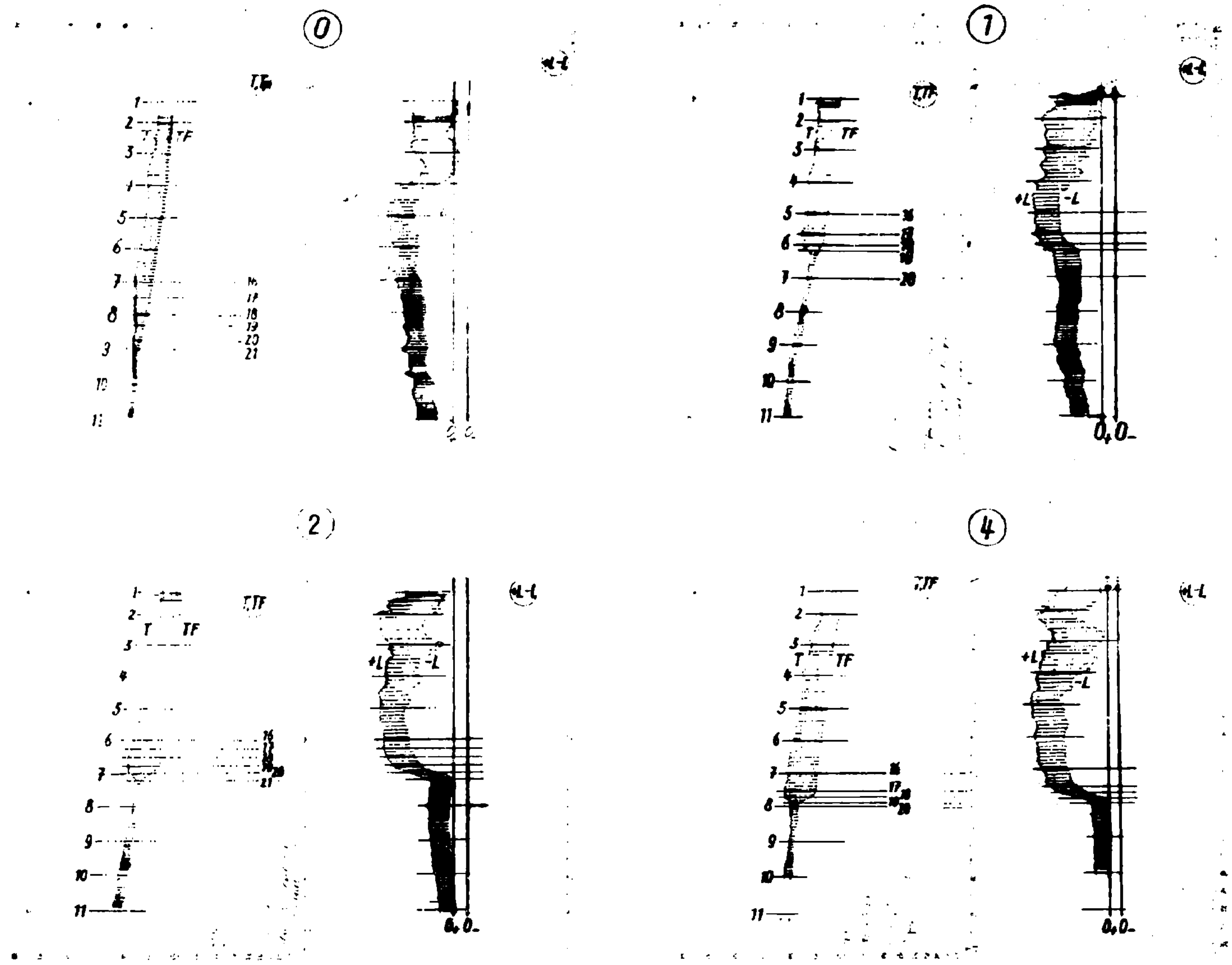
Fig. 43:
Vertical profiles of the incremental exchange coefficients
$A_i$, recorded during runs 3 and 6.
E: upper boundary of the exchange layer
I: level of inversion.

Fig. 48:
Vertical profile of the incremental exchange coefficients
$A_i$ for runs 2, 3 and 4.

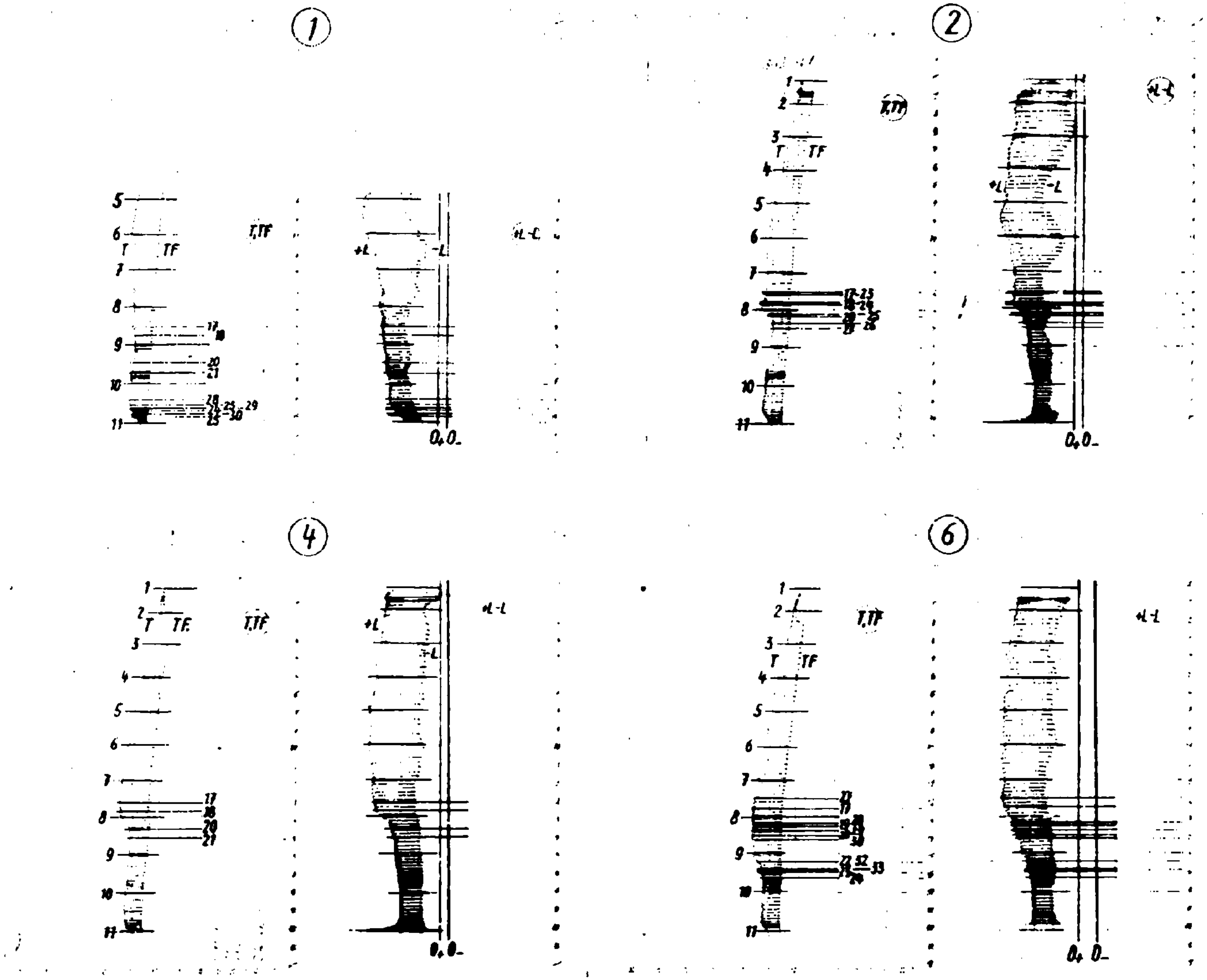
## 3. Individual Runs and Data Tables

### Examples A - J

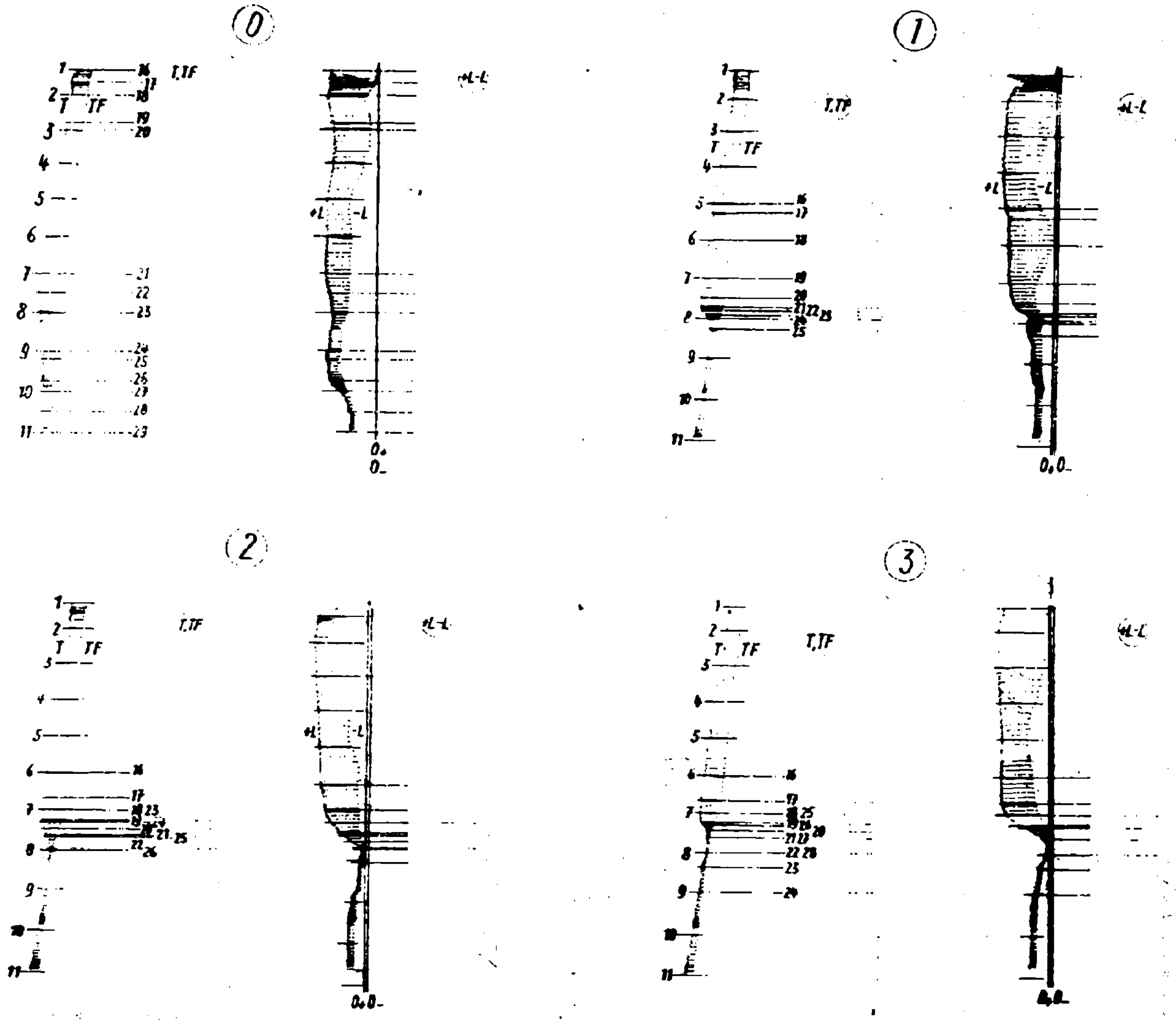
Example
A
5 Oct. 1970



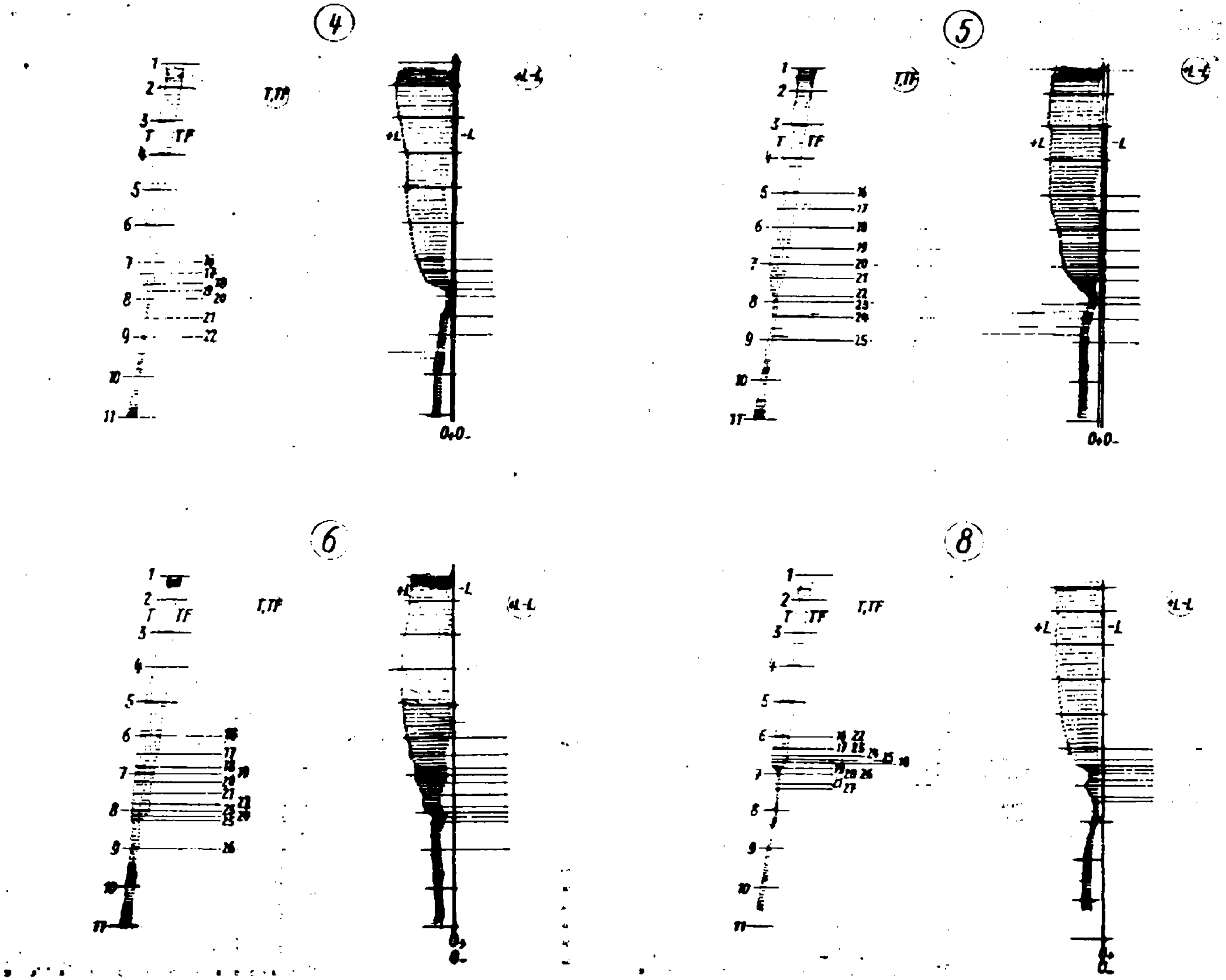
Example
B
13 Nov. 1970



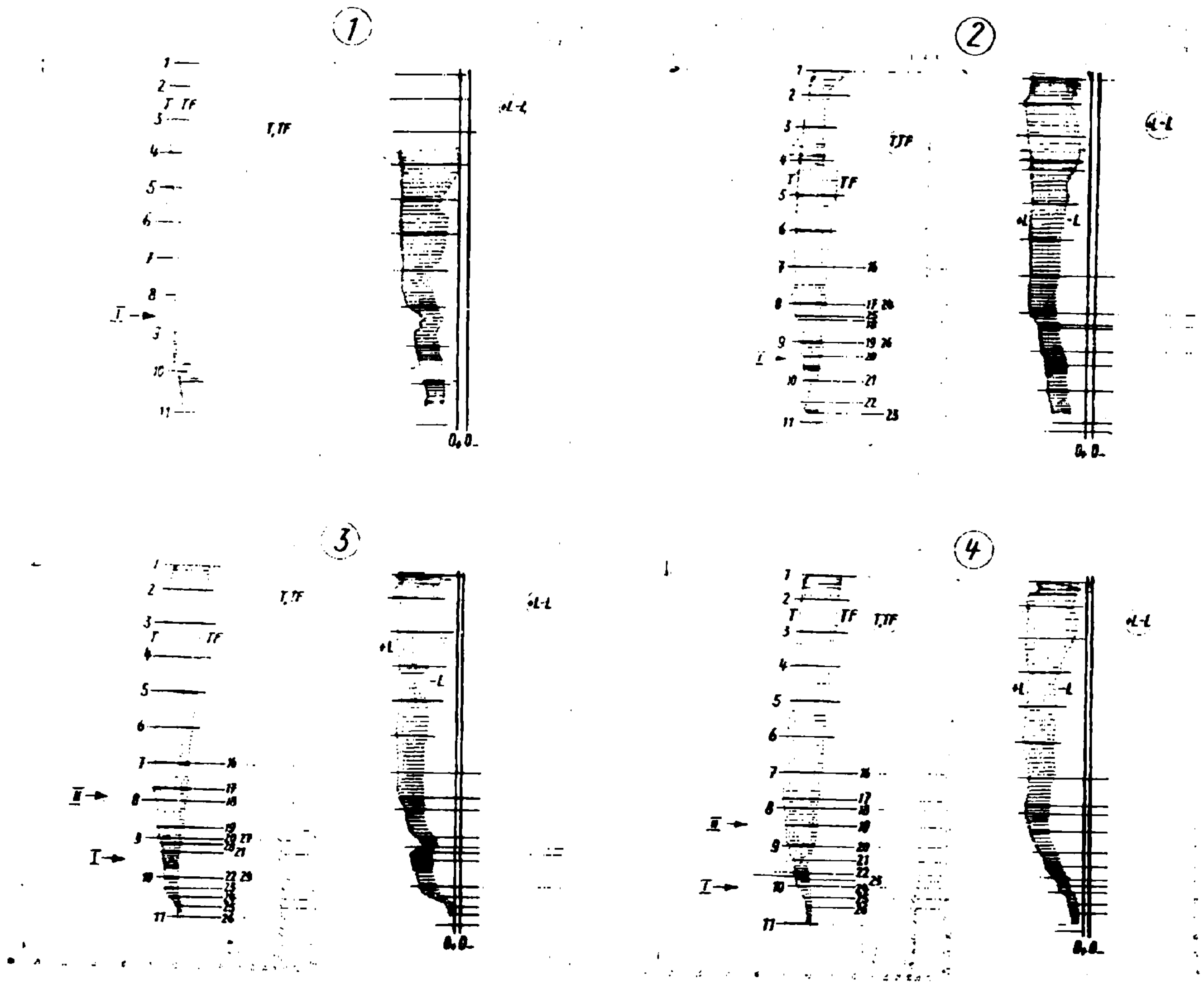
Example
$C_1$
14 Oct. 1970



Example
$C_2$
14 Oct 1970

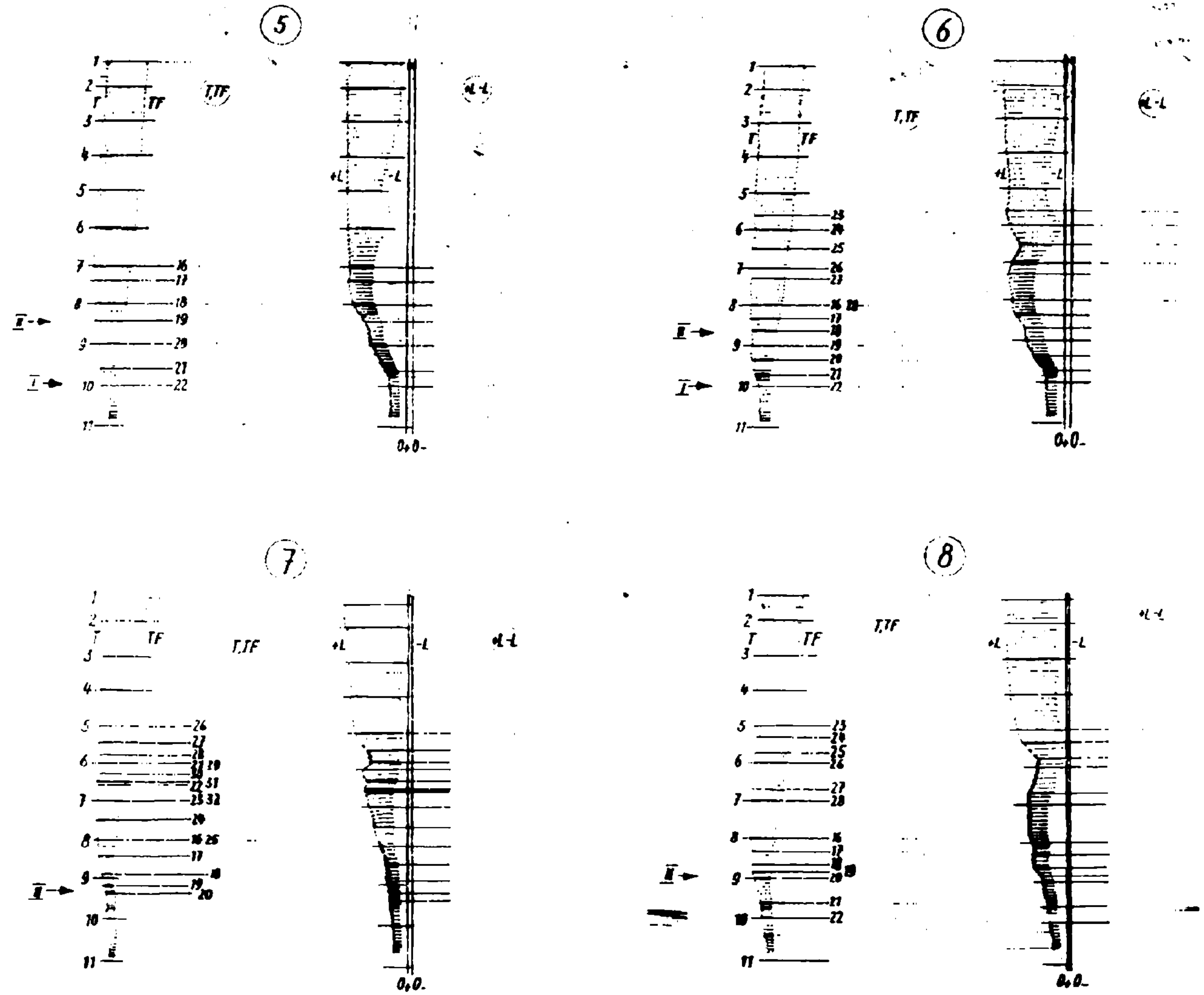


Example
$E_1$
17 Oct. 1970

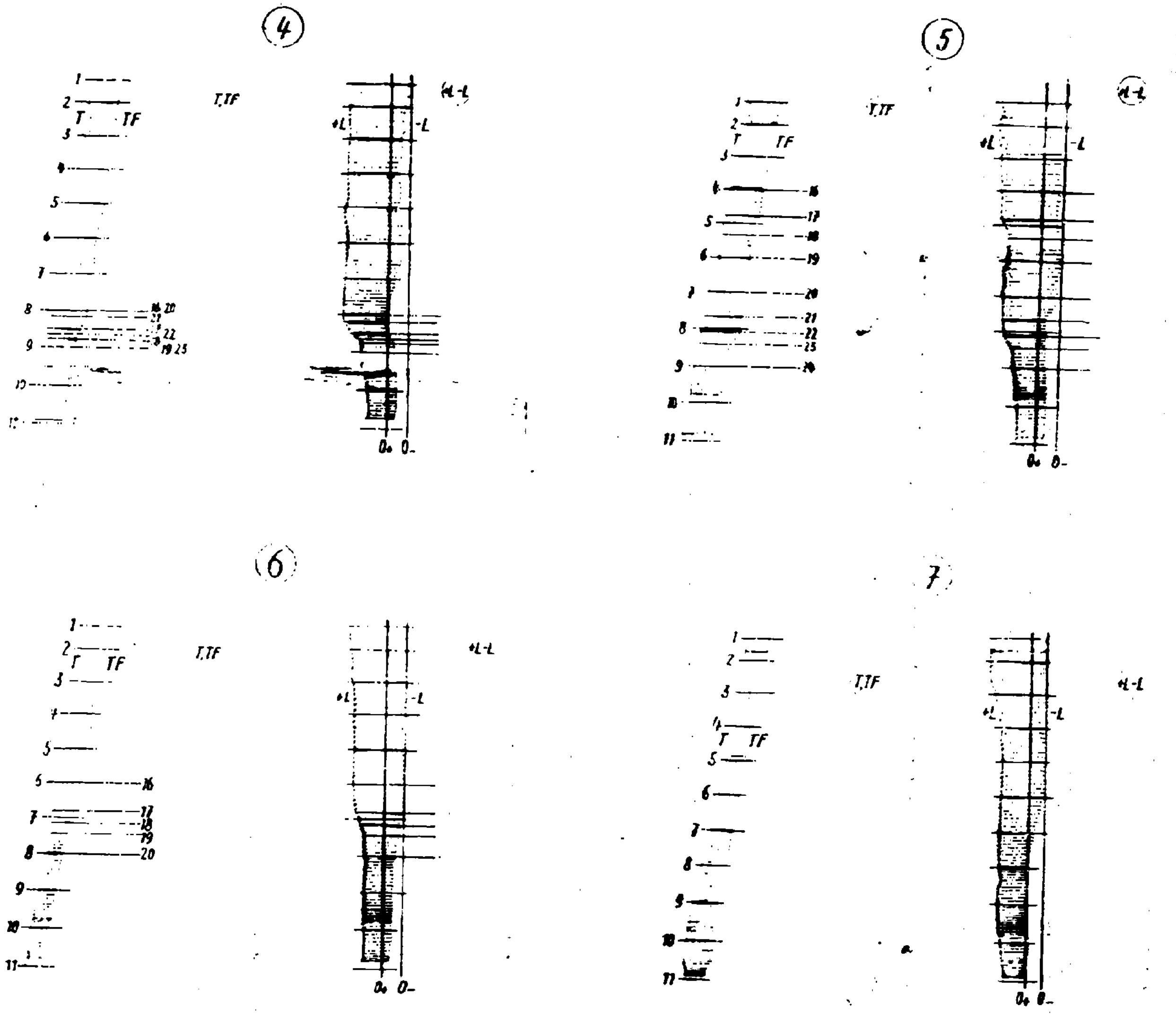


Example $E_2$

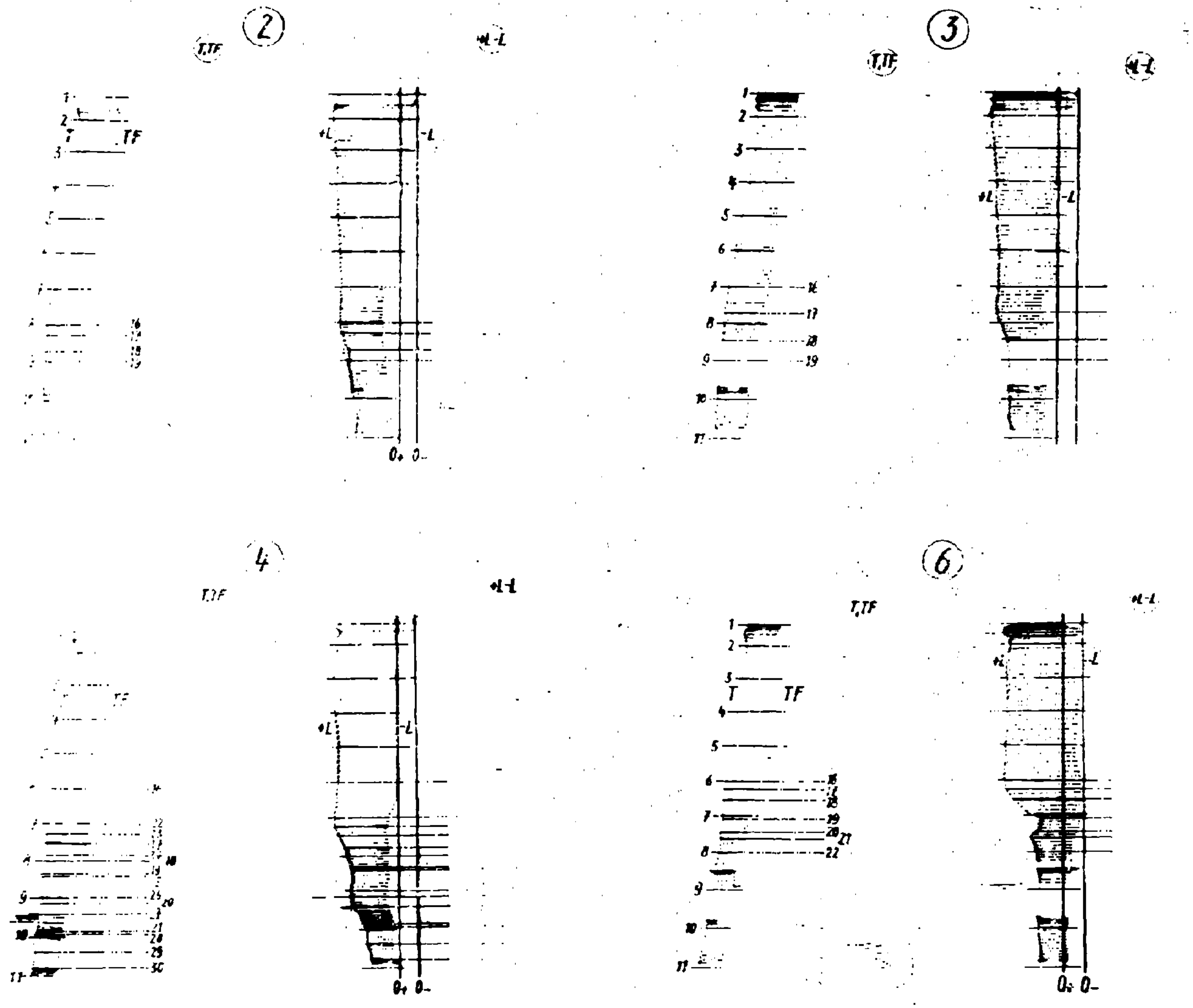
17 Oct. 1970



Example
F
30 Sept. 1970

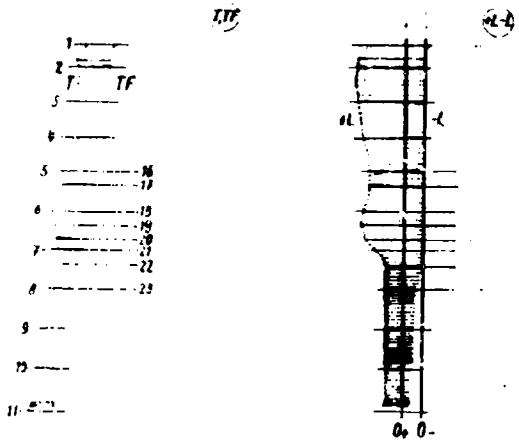


Example
$G_1$
28 Sept. 1970

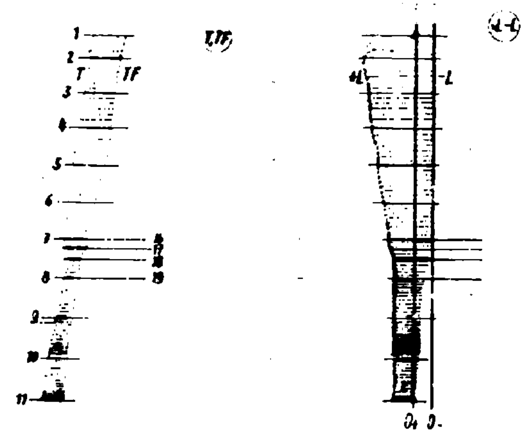


Example
$G_2$
28 Sept. 1970

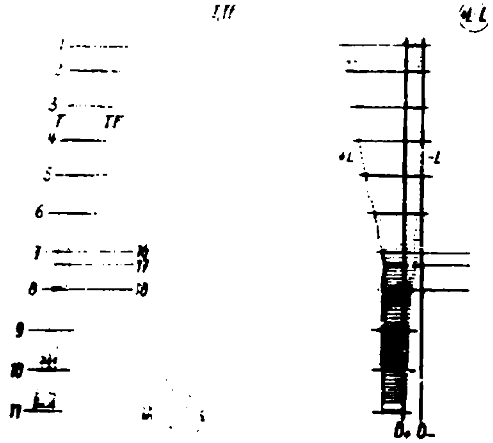
7



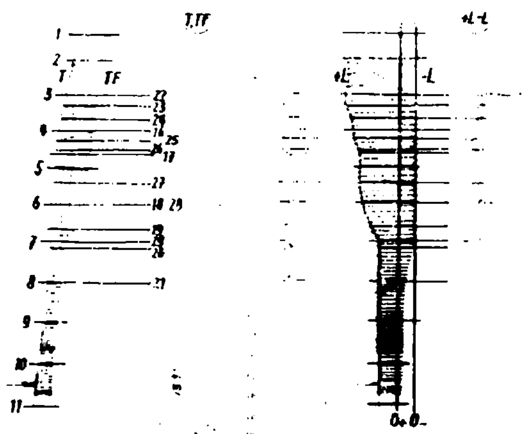

8




9

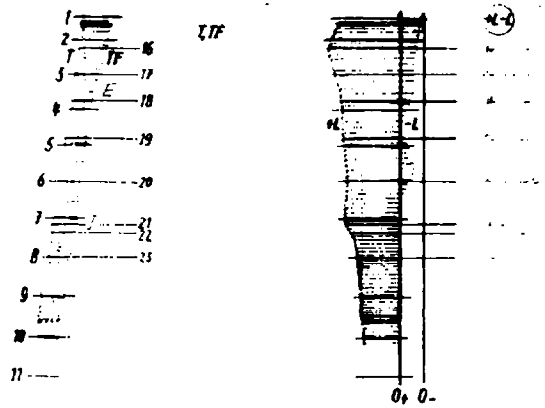



10

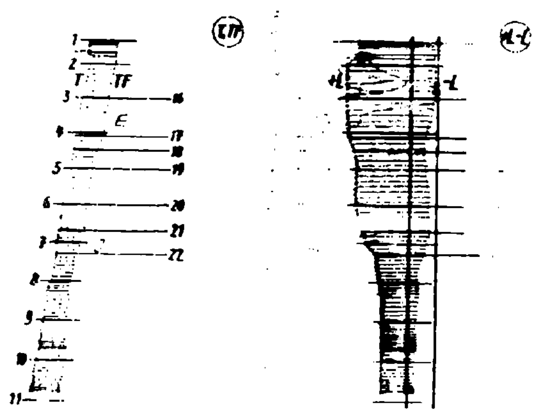


Example
11
26 Sept. 1970

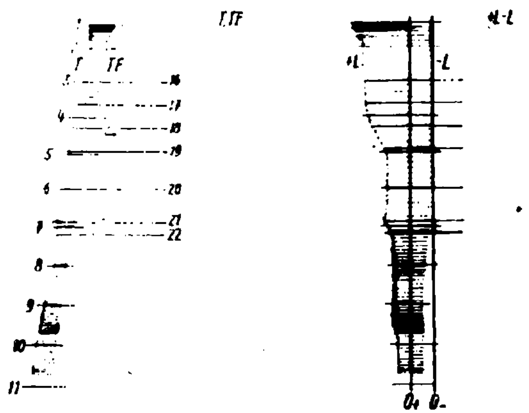
(3)



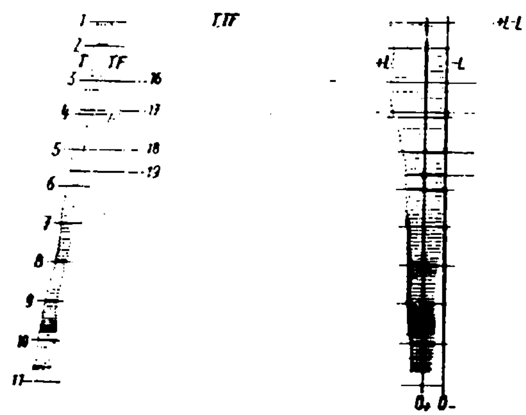

(4)




(5)

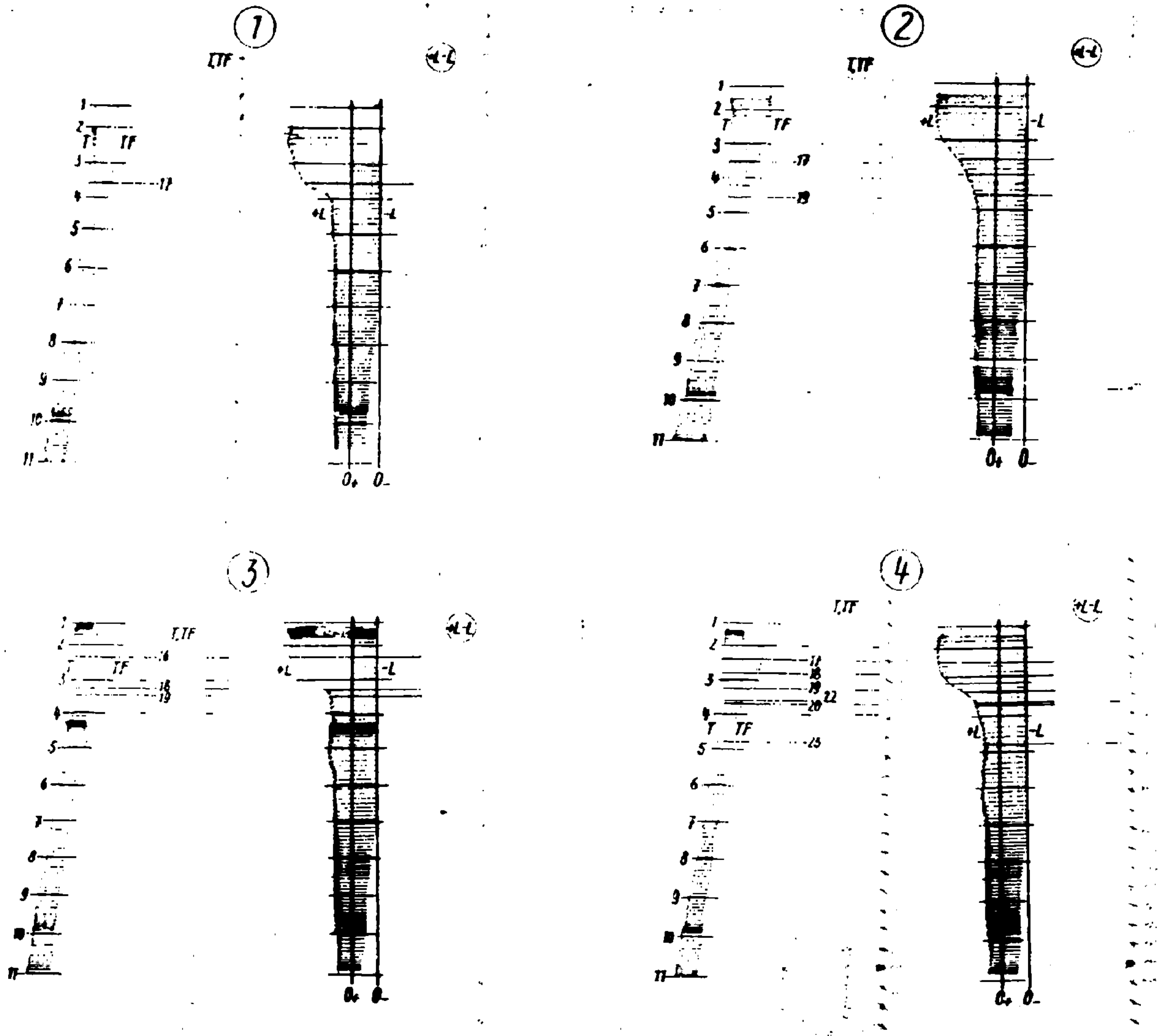



(6)



# Example J

17 Sept. 1970



# Example A 5 Oct. 1970

Z=0733 05.10.1970 11.00 UHR

0

HAUPT-NIVEAUS

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7060 | +08,4 | +00,3 | 3048 | 3170 | 05,07 | 04,47 | [illegible] | 01,7 | //// | [illegible] | [illegible] | |
| 02 | [illegible] | [illegible] | [illegible] | [illegible] | 3032 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | //// | [illegible] | [illegible] | |
| 03 | 2600 | 7377 | +08,4 | [illegible] | 3038 | [illegible] | 04,21 | 04,15 | [illegible] | [illegible] | //// | [illegible] | [illegible] | |
| 04 | 2400 | 7553 | +08,4 | +01,3 | 3016 | 3123 | [illegible] | 03,95 | [illegible] | [illegible] | //// | [illegible] | [illegible] | |
| 05 | 2200 | 7734 | +08,1 | +02,3 | 3005 | 3120 | [illegible] | [illegible] | [illegible] | [illegible] | //// | 1,27 | [illegible] | |
| 06 | 2000 | 7914 | +08,4 | +03,3 | 2993 | 3114 | 05,31 | 04,15 | 57,7 | [illegible] | //// | [illegible] | [illegible] | |
| 07 | 1800 | 8105 | +07,9 | [illegible] | [illegible] | 3111 | 07,15 | 04,74 | [illegible] | [illegible] | //// | 1,27 | [illegible] | |
| 08 | 1600 | [illegible] | +07,9 | +05,2 | [illegible] | 3111 | 07,34 | 05,54 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | |
| 09 | 1400 | [illegible] | +08,1 | +07,0 | [illegible] | [illegible] | 03,40 | [illegible] | [illegible] | 02,0 | 01,1 | [illegible] | [illegible] | |
| 10 | 1200 | [illegible] | +06,3 | +07,4 | [illegible] | 3113 | 03,79 | 07,03 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | |
| 11 | 1000 | [illegible] | +09,0 | [illegible] | [illegible] | [illegible] | 10,54 | 07,40 | [illegible] | 01,5 | [illegible] | [illegible] | [illegible] | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | +035 | , | , | , | , | , | [illegible] | 01,44 | , | | 01 |
| 02 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 02 |
| 03 | +055 | +0,65 | [illegible] | [illegible] | [illegible] | [illegible] | 01,86 | 01,30 | [illegible] | 50744 | 03 |
| 04 | +060 | +0,30 | [illegible] | [illegible] | [illegible] | +0,70 | 01,18 | [illegible] | 7,74 | [illegible] | 04 |
| 05 | [illegible] | +0,35 | [illegible] | +0,80 | [illegible] | [illegible] | [illegible] | [illegible] | 0,51 | [illegible] | 05 |
| 06 | [illegible] | +0,38 | -0,32 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 06 |
| 07 | +087 | +0,85 | -0,18 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 07 |
| 08 | [illegible] | +0,00 | -0,61 | +0,40 | [illegible] | [illegible] | [illegible] | [illegible] | 0,87 | [illegible] | 08 |
| 09 | [illegible] | +0,10 | -1,02 | [illegible] | [illegible] | [illegible] | 00,75 | [illegible] | [illegible] | [illegible] | 09 |
| 10 | [illegible] | +0,10 | [illegible] | [illegible] | +1,15 | [illegible] | 01,05 | [illegible] | [illegible] | [illegible] | 10 |
| 11 | +102 | [illegible] | [illegible] | +0,19 | [illegible] | [illegible] | 01,37 | [illegible] | [illegible] | [illegible] | 11 |

NF-TEMPERATUR

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1805 | [illegible] | +07,9 | [illegible] | [illegible] | 3111 | [illegible] | [illegible] | [illegible] | [illegible] | //// | [illegible] | [illegible] | |
| 17 | 1705 | [illegible] | [illegible] | [illegible] | [illegible] | 3110 | [illegible] | [illegible] | [illegible] | [illegible] | //// | [illegible] | [illegible] | |
| 18 | 1605 | [illegible] | [illegible] | [illegible] | [illegible] | 3111 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | |
| 19 | 1550 | [illegible] | [illegible] | +09,7 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | |
| 20 | 1451 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | |
| 21 | 1405 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | +047 | , | , | , | , | , | [illegible] | [illegible] | , | 16 |
| 17 | 100 | [illegible] | +0,10 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0,14 | [illegible] | 17 |
| 18 | 100 | [illegible] | +0,10 | [illegible] | +0,41 | [illegible] | [illegible] | [illegible] | 0,74 | [illegible] | 18 |
| 19 | 055 | +040 | [illegible] | -1,19 | [illegible] | -1,73 | [illegible] | [illegible] | [illegible] | [illegible] | 19 |
| 20 | [illegible] | +033 | +0,51 | -0,56 | -0,35 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 20 |
| 21 | 040 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0,35 | [illegible] | 21 |

NF-FEUCHTIGKEIT

****

****

1

[illegible]

2

Z=0738 05.10.1970 13.30 UHR

HAUPT-NIVEAUS

[illegible]

4

[illegible]

****

****

# Example B 18 Nov. 1970

```
Z-0851 18.11.1970        12.33 UHR          (1)

HAUPT-NIVEAUS:

MET. WERTE:

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
                +05.0   .  1846  1985 02.9  04.1  33.1    .     .     .  03.3

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
       +035 +0.00 +0.15 +0.09 +1.86 +0.89   .   00.5  C048.

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
05 2800 7691 +04.4 -00.6 2998 3064 03.87 02.65 37.4 08.6 //./ 1.45 04.4
06 2000 7865 +05.5 +00.8 2988 3055 03.43 08.71 37.9 08.5 //./ 1.45 04.4
07 1800 8084 +05.3 +00.6 2959 3039 03.87 08.98 43.3 08.3 //./ 1.45 03.5
08 1600 8289 +05.1 +01.2 2936 3086 04.58 03.40 51.4 08.0 01.8 1.61 03.2
09 1400 8490 +04.9 +01.7 2913 3018 05.11 03.75 56.9 01.8 01.8 1.46 03.1
10 1800 8713 +05.7 +08.3 2901 2999 05.85 03.78 57.3 01.8 01.8 1.89 08.9
11 1000 8933 +04.3 +08.7 2865 2983 06.47 04.58 77.9 01.1 00.8 1.33 01.9

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
05       +040    .     .     .     .     .  01.73 00.88   .               05
06       +059 +0.35 [illegible] +0.03 -0.87 +0.47 01.55 00.87  43.08     00 06
07       +056 +0.10 [illegible] +0.13 +8.70 +1.17 01.39 00.35   6.85   6780 07
08       +056 +0.10 [illegible] +0.81 +4.04 +1.18 01.99 00.55   3.81   3790 08
09       +055 -0.10 [illegible] +0.17 +3.75 +1.15 08.47 00.78  11.55  11104 09
10       +063 +0.40 [illegible] -0.00 +0.68 +0.62 03.04 01.06  15.89  14013 10
11       +050 -0.70 [illegible] +0.38 -0.33 +1.76 03.63 08.64   3.88   3545 11

MP-TEMPERATUR:

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
08 1599 8089 +05.1 +01.8 2936 3086 04.58 03.40 51.4 08.0 01.8 1.61 03.2
17 1495 8394 +05.3 +01.4 2987 3017 04.59 03.41 51.5 01.9 01.8 1.38 03.4
18 1445 8450 +04.9 +01.6 2918 3015 05.01 03.70 57.8 01.9 01.8 1.34 03.3
08 1400 8498 +04.9 +01.7 2913 3018 05.11 03.75 56.9 01.8 01.8 1.46 03.1
80 1306 8598 +05.3 +01.9 2907 3004 05.07 03.64 56.9 01.8 01.8 1.44 03.0
81 1849 8640 +05.7 +08.1 2906 3031 05.04 03.63 55.0 01.7 01.1 1.60 08.6
10 1200 8713 +05.7 +08.3 2901 2999 05.85 03.74 57.3 01.6 01.8 1.89 08.9
83 1096 8886 +05.9 +08.6 2898 2998 05.44 03.84 58.5 01.6 01.1 1.48 08.7
84 1104 8818 +05.3 +08.7 2886 2995 05.90 04.17 66.8 01.4 01.1 1.33 08.5
88 1089 8900 +05.3 +08.8 2879 2988 06.00 04.80 67.3 01.3 00.9 1.40 08.3
11 1000 8933 +04.3 +08.7 2868 2983 06.47 04.58 77.9 01.1 00.8 1.33 01.9

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
08       +056    .     .     .     .     .  01.95 00.56   .               08
17 104  +056 +0.19 -0.07 +0.01 -0.05 +0.84 08.88 00.59 110.84      00 17
18 049  +055 +0.61 +0.85 -0.59 -8.77 +1.69 08.38 00.65   8.88   4575 18
08 049  +055 +0.00 -0.81 -0.11 +8.83 +1.04 03.47 00.78   6.82   2868 08
80 093  +059 +0.43 +0.04 +0.07 +8.16 +0.59 08.75 00.91  11.72  11063 80
81 057  +043 +0.88 +0.09 +0.08 +3.83 +0.31 08.98 01.09   8.76   4468 81
10 048  +063 +0.00 +0.48 -0.86 -4.57 +1.03 03.04 01.06 148.86      00 10
83 103  +065 +0.19 +0.18 +0.08 -1.80 +0.83 03.38 01.37   9.41   6884 83
84 007  +060 +8.89 +8.37 +4.58 +5.78 -7.58 03.33 01.50   0.45    414 84
85 071  +060 +0.30 +0.13 +0.08 +1.88 +1.33 03.57 01.95   6.98   6308 85
11 089  +050 -3.38 +1.80 +1.07 +5.77 +4.58 03.63 08.64   0.67    848 11

MP-FEUCHTIGKEIT:

----
Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
10 1198 8713 +05.7 +08.3 2901 2999 05.85 03.74 57.3 01.4 01.8 1.89 08.9
88 1188 8793 +05.9 +08.5 2889 2994 05.33 03.78 57.4 01.6 01.8 1.40 08.9
89 1070 8863 +05.7 +08.4 2887 2989 05.55 03.91 80.5 01.5 01.3 1.45 08.6
30 1046 8880 +05.5 +08.8 2883 2990 05.48 04.13 65.1 01.4 00.9 1.53 08.4
11 0898 8933 +04.3 +08.7 2885 2983 06.47 04.56 77.9 01.1 00.8 1.33 01.9

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
10       +063    .     .     .     .     .  03.07 01.07   .               10
88 073  +065 +0.87 +0.18 +0.08 +0.18 +0.75 03.87 01.16  89.96  47604 88
89 034  +063 -0.37 -0.39 -0.83 +5.78 +1.41 03.44 01.51   3.83   4984 89
30 084  +068 -0.88 +1.37 +0.98 +8.67 +1.86 03.51 01.78   8.39   8178 30
11 047  +050 -8.98 +1.84 -0.81 +8.85 +1.63 03.66 08.66   1.35   1810 11
```

```
Z-0852 18.11.1970        13.33 UHR          (2)

HAUPT-NIVEAUS:

MET. WERTE:

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
                +04.0   .  2965  3053 04.1  03.2  50.3    .     .     .  03.3

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
       +045 +0.31 +0.14 -0.07 -0.56 +0.55   .   01.9  C044.

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
01 3000 7080 [illegible]
02 2800 7146 +00.5 +02.6 3018 3091 03.86 08.66 51.6 08.0 //./ 1.30 03.6
03 2600 7321 +01.9 +01.3 3006 3085 03.37 08.67 47.2 08.3 //./ 1.30 03.7
04 2400 7515 +03.0 +01.1 2998 3077 03.54 08.93 45.3 08.3 //./ 1.30 04.0
05 2200 7704 +04.6 +00.1 2982 3073 03.44 08.96 41.6 08.4 //./ 1.30 04.6
06 2000 7896 +05.6 +00.5 2982 3060 03.47 08.88 40.3 08.3 //./ 1.30 04.1
07 1800 8093 +05.8 +01.2 2963 3058 04.30 03.31 46.6 08.1 //./ 1.30 03.6
08 [illegible]
09 1400 8508 +05.6 +08.1 2918 3019 05.85 03.85 56.5 01.5 01.1 1.35 08.7
10 1800 8714 +06.3 +08.7 2907 3007 05.34 03.88 55.9 01.3 01.1 1.31 08.5
11 1000 8931 +05.6 +03.1 2877 2991 06.87 04.36 66.9 01.3 01.0 1.34 08.4

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
01       +036    .     .     .     .     .  08.61 08.74   .               01
02       +000 +0.97 +0.06 -0.08 +3.88 +0.08 08.49 01.64   6.66   7356 02
03       +083 +0.70 +0.05 +0.01 +8.04 +0.31 08.31 01.88  48.18  46365 03
04       +034 +0.35 +0.06 -0.03 +0.97 +0.47 01.94 00.98  85.68  81503 04
05       +081 +0.83 +0.06 +0.01 +8.03 +0.80 01.74 00.88  41.93  44871 05
06       +080 +0.80 +0.00 +0.03 +0.48 +0.58 01.55 00.77  406.81     00 06
07       +083 +0.10 +0.38 +0.81 +3.15 +0.94 01.38 00.90  66.10  66689 07
08       +078 +0.45 +0.18 +0.13 +8.64 +0.56 01.68 01.49   7.93   7844 08
09       +080 +0.68 +0.80 +0.40 +8.58 +1.71 08.39 08.67  18.18  11744 09
10       +080 +0.45 +0.05 +0.01 +1.49 +0.55 08.98 03.55  83.46  80749 10
11       +081 -0.45 +0.47 +0.88 +7.00 +1.48 03.48 04.80 881.73     00 11

MP-TEMPERATUR:

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
07 1801 8093 +05.8 +01.3 2963 3058 04.30 03.31 46.6 08.1 //./ 1.30 03.6
17 1805 8800 +05.9 +01.4 2953 3041 04.38 03.88 46.4 08.0 //./ 1.30 03.5
18 1688 8868 +07.8 +01.5 2960 3034 03.89 08.78 38.3 08.1 //./ 1.36 03.7
08 1601 8895 +06.7 +01.3 2958 3033 04.06 03.05 41.3 08.0 01.8 1.67 03.8
80 1569 8338 +06.8 +01.3 2958 3033 04.78 03.38 48.5 01.7 01.8 1.48 03.0
09 1401 8508 +05.6 +08.1 2918 3019 05.85 03.85 56.5 01.5 01.1 1.35 08.7

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
07       +063    .     .     .     .     .  01.39 00.93   .               07
17 106  +064 +0.09 -0.08 +0.03 +0.13 +0.94 01.66 01.07  16.71  16987 17
18 047  +076 +1.93 +0.95 +0.78 +3.18 +1.01 01.83 01.10 184.38     00 18
08 086  +078 +1.86 +1.38 -1.01 -8.89 +3.08 01.88 01.89   0.66    838 08
80 036  +056 +5.86 +8.00 +1.86 +9.40 +6.58 01.98 01.76   3.16   3079 80
09 183  +060 +0.37 +0.84 +0.17 -1.81 +0.65 08.39 08.57  19.47  18678 09

MP-FEUCHTIGKEIT:

----
Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
07 1801 8093 +05.8 +01.3 2963 3058 04.30 03.31 46.6 08.1 //./ 1.30 03.6
83 1685 8810 +05.0 +01.4 2943 3046 04.80 03.65 35.0 08.0 //./ 1.30 03.5
84 1666 8808 +07.8 +01.6 2966 3043 03.81 08.89 37.5 08.1 //./ 1.30 03.7
85 1577 8383 +04.9 +01.3 2931 3033 04.73 03.54 54.5 01.7 01.1 1.50 08.9
86 1519 8318 +04.9 +01.5 2931 3038 04.94 03.70 58.9 01.6 01.8 1.36 08.9
87 1497 8402 +04.9 +01.7 2928 3023 05.13 03.80 59.1 01.6 01.3 1.17 08.9
09 1408 8508 +05.6 +08.1 2918 3019 05.85 03.85 58.5 01.5 01.1 1.35 08.7

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
07       +063    .     .     .     .     .  01.39 00.93   .               07
83 116  +056 -0.89 -0.43 -0.89 -7.84 +1.77 01.48 01.13  14.78  14898 83
84 000  +077 +1.95 -9.83 -6.90 -6.57 +8.67 01.48 01.08   0.01     00 84
85 108  +058 +0.11 -0.88 +0.89 -5.60 +3.86 01.95 01.13   0.38   8870 85
86 001  +058 +0.00 +0.67 +0.06 +3.13 +1.53 01.13 01.88   0.55    638 86
87 081  +055 +0.00 +0.83 +0.13 -8.71 +1.03 08.16 01.95 116.88     00 87
09 095  +060 +0.88 +0.13 +0.05 +0.68 +0.48 08.39 08.57  18.44  11867 09
```

```
Z-0854 18.11.1970        15.44 UHR          (4)

HAUPT-NIVEAUS:

MET. WERTE:

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
                +04.0   .  2457  3057 [illegible] 03.3  54.4    .     .     .  03.1

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
       +048 +0.30 +0.17 +0.09 +0.88 +0.54   .   01.8  1316.

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
01 3000 7010 +01.1 [illegible] 3011 [illegible]      //./ 1.57 [illegible]
02 2800 7138 [illegible]                             //./ 1.57 [illegible]
03 2600 7321 [illegible] 3021 3044 [illegible] 54.1 [illegible] //./ 1.57 03.3
04 2400 7508 [illegible] 3001 3048 [illegible]       //./ 1.57 [illegible]
05 2200 7485 [illegible]                             //./ 1.57 [illegible]
06 2000 7444 [illegible] 3047 [illegible] 41.0 [illegible] //./ 1.57 [illegible]
07 1800 [illegible] 3057 [illegible] 34.5 [illegible] //./ 1.57 [illegible]
08 1600 8485 +07.0 [illegible] 3038 [illegible]      01.1 1.48 [illegible]
09 1400 [illegible]                                       1.54 [illegible]
10 1200 8734 [illegible] 3028 [illegible] 55.4 [illegible] 1.42 [illegible]
11 1000 [illegible]                                       1.45 [illegible]

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
01       +036    .     .     .     .     .  [illegible]     .               01
02       [illegible]                                        21.6   23778 02
03       [illegible]                                        19.15  21058 03
04       [illegible]                                        24.57  [illegible] 04
05       [illegible]                                        12.56  13253 05
06       [illegible]                                        55.37  51378 06
07       [illegible]                                        [illegible]  [illegible] 07
08       [illegible]                                        [illegible]   3373 08
09       [illegible]                                        [illegible]  [illegible] 09
10       [illegible]                                        [illegible]  [illegible] 10
11       [illegible]                                        [illegible]     00 11

MP-TEMPERATUR:

[illegible]
```

```
Z-0856 18.11.1970        16.33 UHR          (6)

HAUPT-NIVEAUS:

MET. WERTE:

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
                +04.5   .  2971  3044 04.4  03.5  53.0    .     .     .  03.6

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
       +051 +0.31 +0.18 +0.05 +0.14 +0.55   .   00.4  C017.

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
01 3000 7010 +03.4 -03.2 3011 3103 03.71 03.81 [illegible] 01.8 //./ 1.83 08.9
02 2800 7140 +00.4 +02.3 3014 3103 03.77 03.89 59.7 08.1 //./ 1.83 03.8
03 2600 7322 +01.8 +01.0 3008 3108 04.07 03.63 60.8 08.3 //./ 1.83 04.8
04 2400 7501 +03.3 +00.3 3001 3095 04.17 03.44 58.1 08.8 //./ 1.83 04.4
05 2200 7486 +04.5 +00.4 2998 3045 04.40 03.40 44.4 08.5 //./ 1.83 04.6
06 2000 7449 +05.6 +01.3 2945 3038 04.34 03.45 47.8 08.5 //./ 1.83 04.5
07 1650 8088 +07.1 +08.1 2974 3047 04.41 03.48 43.9 08.5 //./ 1.83 04.6
08 1600 8847 +08.4 +08.7 2964 3057 04.40 03.31 43.4 08.3 01.4 1.45 03.9
09 1400 8482 +07.4 +08.3 2944 3088 04.14 03.69 38.9 01.9 01.4 1.32 03.3
10 1200 8724 +06.3 +08.4 2909 3012 05.53 03.93 58.4 01.5 01.4 1.04 03.0
11 1000 8881 +05.4 +03.0 2874 2990 06.10 04.31 70.4 01.5 01.4 1.05 08.8

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
01       +033    .     .     .     .     .  08.47 03.49   .               01
02       +069 +0.89 +0.11 +0.06 +8.78 +0.10 08.85 08.80   1.66   1838 08
03       +084 +0.73 +0.85 +0.17 +0.64 +0.31 08.37 08.36   4.38   4953 03
04       +038 +0.73 +0.05 +0.09 +4.05 +0.85 08.18 08.35  15.69  14874 04
05       +050 +0.80 +0.01 +0.03 +1.17 +0.48 01.40 03.85  14.85  19758 05
06       +043 +0.85 +0.09 +0.08 +1.88 +0.38 01.71 03.83  43.18  46117 06
07       +074 +0.65 +0.04 +0.07 +1.64 +0.34 01.55 00.88  14.57  14550 07
08       +047 +0.55 +0.08 +0.05 +1.73 +0.48 01.84 00.33   1.74   1731 08
09       +093 +0.80 +0.18 +0.14 +0.74 +1.85 08.88 00.53   3.47   3373 09
10       +044 -0.75 +0.74 +0.44 +8.47 +1.81 08.58 00.74   9.86   4758 10
11       +081 -0.45 +0.33 +0.18 +5.87 +1.49 08.98 00.33  40.66  37887 11

MP-TEMPERATUR:

Z  H     P     T     TP    PT    EPT   E     S     HP    +L    -L    +I-  L
07 1400 8088 +07.1 +08.1 2974 3047 04.40 03.42 43.9 08.5 //./ 1.83 04.6
17 1481 8888 +04.0 +08.5 2973 3040 04.38 03.87 40.8 08.5 //./ 1.83 04.5
04 1600 8847 +04.2 +08.7 2964 3057 04.40 03.31 40.4 08.3 01.6 1.45 03.9
18 1544 8332 +06.0 +08.7 2941 3050 04.48 03.78 41.8 08.8 01.9 1.64 03.7
80 1444 8380 +04.4 +08.4 2958 3048 04.47 03.38 41.1 08.1 01.5 1.38 03.8
09 1401 8482 +07.4 +08.3 2946 3088 04.18 03.08 38.9 01.9 01.4 1.38 03.3
88 1358 8532 +08.4 +08.4 2930 3088 05.15 03.78 56.4 01.7 01.3 1.83 03.1
81 1307 8585 +05.5 +08.4 2884 3083 05.80 03.71 56.5 01.7 01.3 1.58 03.0
84 1877 8688 +06.3 +08.4 2915 3014 05.47 03.86 57.3 01.7 01.4 1.14 03.0
10 1801 8706 +06.3 +08.4 2908 3018 05.57 03.94 58.8 01.5 01.4 1.04 03.0

Z  DH    TV    G-T   G-E   G-S   G-HP  G-PT   I     N     A          D     Z
07       +074    .     .     .     .     .  01.55 00.80   .               07
17 182  +045 +0.43 +0.04 +0.10 +8.58 +0.34 01.80 00.54   6.03   6214 17
04 057  +047 +0.35 -0.15 +0.07 +0.43 +0.47 01.84 00.33  (5.37)   385 04
18 051  +045 +0.37 +0.14 +0.04 +8.74 +1.45 01.41 00.34   2.04   6317 18
80 083  +047 +0.44 +0.04 +0.07 +1.58 +0.41 08.07 00.43   8.04   3883 80
09 044  +043 +0.41 +0.34 +0.37 +8.84 +1.47 08.44 00.53   8.44   4844 09
88 044  +075 +0.09 -8.31 +1.85 +8.84 +8.31 08.31 00.84   1.57   1837 88
83 048  +178 +0.71 +0.48 +0.08 +1.84 +1.88 08.41 00.88 (80.45) 19380 83
84 031  +041 +1.44 +0.48 +0.78 +1.73 +8.78 08.47 00.73  87.47  25711 84
10 038  +047 +0.71 +0.18 +0.76 +1.84 +1.73 08.58 00.74   35.35  35570 10
```

# Example $C_1$ 14 Oct. 1970

Z-0779 14.10.1970 09.22 Uhr

0

HAUPT-NIVEAUS:

| Z | H | P | T | TF | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7170 | +01,9 | +03,1 | 3085 | 3125 | 04,15 | 03,71 | 58,1 | 01,9 | //,/ | 1,33 | 03,6 |
| 02 | 8800 | 7300 | +08,6 | +00,8 | 3019 | 3127 | 04,36 | 03,69 | 59,3 | 01,9 | //,/ | 1,33 | 03,6 |
| 03 | 8600 | 7468 | +03,6 | +00,9 | 3039 | 3125 | 05,0 | 04,4 | 63,3 | 01,7 | //,/ | 1,33 | 03,9 |
| [illegible] | | | | | | | | | | | | | |
| 05 | 8800 | 7657 | +06,1 | +08,5 | 2998 | 3124 | 05,44 | 04,38 | 57,7 | 08,0 | //,/ | 1,33 | 03,5 |
| 06 | 8000 | 8081 | +07,8 | +03,1 | 8983 | 3096 | 05,45 | 04,84 | 53,6 | 08,0 | //,/ | 1,33 | 03,5 |
| 07 | 1600 | 8848 | +08,3 | +03,7 | 8974 | 3083 | 05,45 | 04,18 | 49,7 | 08,0 | //,/ | 1,33 | 03,5 |
| 08 | 1600 | 8481 | +06,3 | +04,1 | 8955 | 3067 | 05,73 | 04,84 | 51,7 | 01,7 | 01,1 | 1,51 | 03,9 |
| 09 | 1400 | 8650 | +07,6 | +04,3 | 8948 | 3047 | 06,30 | 04,54 | 59,5 | 01,6 | 01,4 | 1,33 | 03,3 |
| 10 | 1400 | 8871 | +07,8 | +05,4 | 8907 | 3046 | 07,16 | 05,32 | 71,4 | 01,4 | 01,1 | 1,84 | 08,5 |
| 11 | 1000 | 9080 | +07,9 | +06,6 | 8898 | 3058 | 09,20 | 06,34 | 86,5 | 00,7 | 00,8 | 1,14 | 01,6 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +025 | , | , | , | , | , | 06,73 | 01,03 | , | | 01 |
| 02 | | +034 | +0,62 | -0,28 | -0,12 | +1,48 | +0,32 | 08,41 | 00,74 | 11,53 | 13740 | 02 |
| 03 | | +045 | +0,50 | -0,26 | -0,17 | +1,03 | +0,56 | 08,18 | 00,87 | 114,75 | 00 | 03 |
| 04 | | +057 | +0,60 | -0,07 | -0,01 | +1,71 | +0,40 | 01,67 | 00,74 | 51,34 | 54574 | 04 |
| 05 | | +066 | +0,55 | -0,11 | -0,02 | +1,10 | +0,45 | 01,65 | 00,53 | 4,69 | 7850 | 05 |
| 06 | | +075 | +0,55 | -0,00 | -0,05 | +0,08 | +0,45 | 01,96 | 00,47 | 57,41 | 56931 | 06 |
| 07 | | +090 | +0,55 | +0,00 | -0,05 | +1,98 | +0,45 | 01,29 | 00,40 | 30,36 | 30351 | 07 |
| 08 | | +098 | +0,11 | -0,14 | -0,05 | +0,98 | +0,78 | 03,47 | 01,58 | 0,74 | 747 | 08 |
| 09 | | +065 | +0,35 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 09 |
| 10 | | +067 | +0,05 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 04,21 | 2,97 | 4348 | 10 |
| 11 | | +087 | +0,05 | -0,13 | -0,51 | +7,54 | +0,99 | 10,18 | 03,14 | 19,51 | 17706 | 11 |

HP-TEMPERATUR:

| Z | H | P | T | TF | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 8345 | 7170 | +02,6 | +01,1 | 3088 | 3125 | 04,01 | 03,47 | 54,9 | 01,8 | //,/ | 1,33 | 03,6 |
| 17 | 8470 | 7437 | +03,0 | +00,8 | 3088 | 3135 | 04,48 | 03,66 | 57,3 | 01,8 | //,/ | 1,33 | 03,8 |
| 18 | 8769 | 7300 | +08,4 | +00,8 | 3019 | 3187 | 04,56 | 03,47 | 59,3 | 01,9 | //,/ | 1,33 | 03,4 |
| 19 | 8636 | 7443 | +03,4 | +00,8 | 3004 | 3187 | 05,19 | 04,35 | 66,3 | 01,6 | //,/ | 1,33 | 03,1 |
| 20 | 8600 | 7469 | +03,8 | +00,9 | 3009 | 3185 | 05,08 | 04,08 | 63,3 | 01,7 | //,/ | 1,33 | 03,0 |
| 21 | 1900 | 8848 | +08,3 | +03,7 | 8974 | 3083 | 05,45 | 04,18 | 49,7 | 08,0 | //,/ | 1,33 | 03,5 |
| 22 | 1750 | 8380 | +06,8 | +03,7 | 8964 | 3075 | 05,57 | 04,17 | 50,6 | 01,9 | //,/ | 1,33 | 03,3 |
| 23 | 1650 | 8481 | +06,5 | +04,1 | 8955 | 3067 | 05,73 | 04,63 | 51,4 | 01,1 | | 1,51 | 03,9 |
| 24 | 1623 | 8658 | +07,6 | +04,3 | 8924 | 3047 | 06,30 | 04,54 | 59,5 | 01,6 | 01,4 | 1,33 | 03,3 |
| 25 | 1361 | 8700 | +07,8 | +04,5 | 8914 | 3046 | 06,57 | 04,88 | 61,6 | 01,4 | 01,4 | 1,33 | 03,3 |
| 26 | 1233 | 8819 | +07,8 | +05,0 | 8913 | 3046 | 07,09 | 05,08 | 66,9 | 01,4 | 01,4 | 1,40 | 04,1 |
| 27 | 1800 | 8871 | +07,8 | +05,4 | 8907 | 3046 | 07,58 | 05,38 | 71,4 | 01,4 | 01,1 | 1,33 | 03,1 |
| 28 | 1144 | 8916 | +07,5 | +05,8 | 8902 | 3057 | 08,54 | 05,27 | 80,5 | 01,5 | 00,9 | 1,15 | 03,0 |
| 29 | 1000 | 9080 | +07,9 | +06,6 | 8898 | 3058 | 09,28 | 06,34 | 86,5 | 00,9 | 00,8 | 1,14 | 01,0 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | +027 | , | , | , | , | , | 08,43 | 01,97 | , | | 16 |
| 17 | 075 | +036 | +1,06 | -0,24 | -0,44 | -3,35 | +0,10 | 03,51 | 03,94 | 64,09 | 00 | 17 |
| 18 | 070 | +034 | -1,98 | -0,18 | -0,25 | -0,47 | +1,38 | 03,33 | 03,77 | 4,46 | 4336 | 18 |
| 19 | 163 | +041 | +0,37 | -0,30 | -0,45 | -4,39 | +0,66 | 03,18 | 03,63 | 199,85 | 00 | 19 |
| 20 | 035 | +045 | +1,11 | -0,30 | -0,33 | +3,49 | +0,15 | 03,18 | 09,47 | 19,47 | 43233 | 20 |
| 21 | 192 | +030 | +0,58 | -0,05 | -0,11 | +1,70 | +0,44 | 03,27 | 00,40 | 83,83 | 26605 | 21 |
| 22 | 103 | +091 | +0,10 | -0,14 | -0,05 | +0,81 | +0,74 | 03,39 | 03,83 | 0,47 | 463 | 22 |
| 23 | 092 | +098 | +0,10 | -0,14 | -0,05 | -3,93 | +0,98 | 03,47 | 01,58 | 1,35 | 1318 | 23 |
| 24 | 020 | +065 | +0,35 | -0,28 | -0,15 | +3,44 | +1,34 | 05,71 | 03,60 | 41,74 | 37456 | 24 |
| 25 | 038 | +048 | +0,00 | -0,57 | -0,36 | -1,41 | +1,01 | 06,11 | 06,06 | 12,74 | 00 | 25 |
| 26 | 105 | +068 | +0,00 | -0,54 | -0,33 | -3,06 | +1,01 | 03,33 | 08,74 | 13,50 | 12962 | 26 |
| 27 | 055 | +067 | +0,00 | -0,86 | -0,36 | -4,08 | +1,01 | 05,68 | 04,21 | 2,34 | 2483 | 27 |
| 28 | 050 | +038 | +0,00 | +1,98 | +1,94 | +3,84 | +1,01 | 06,55 | 04,70 | 3,08 | 8748 | 28 |
| 29 | 149 | +079 | +0,07 | -0,46 | -0,26 | +3,94 | +0,93 | 10,18 | 08,16 | 65,70 | 77562 | 29 |

HP-FEUCHTIGKEIT:

****
****

Z-0780 14.10.1970 10.25 UHR

1

HAUPT-NIVEAUS:

| Z | H | P | T | TF | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7150 | +08,5 | -00,3 | 3034 | 3146 | 04,63 | 04,04 | 61,8 | 01,5 | //,/ | 1,43 | 08,5 |
| 02 | 8800 | 7881 | +08,8 | +00,8 | 3081 | 3138 | 04,95 | 04,84 | 66,1 | 01,8 | //,/ | 1,43 | 03,1 |
| 03 | 8600 | 7466 | +03,8 | +00,8 | 3011 | 3185 | 04,99 | 04,17 | 68,8 | 01,9 | //,/ | 1,43 | 03,3 |
| 04 | 8400 | 7655 | +04,9 | +01,5 | 3001 | 3114 | 05,09 | 04,14 | 58,6 | 08,0 | //,/ | 1,43 | 03,4 |
| 05 | 8800 | 7840 | +06,1 | +08,1 | 8993 | 3101 | 05,03 | 04,00 | 55,4 | 08,0 | //,/ | 1,43 | 03,4 |
| 06 | [illegible] | [illegible] | [illegible] | [illegible] | 8970 | 3090 | 05,[illegible] | 04,18 | 54,9 | 01,8 | //,/ | 1,43 | 03,0 |
| 07 | 1800 | 8847 | +07,6 | +03,3 | 8967 | 3075 | 05,39 | 04,08 | 51,6 | 01,7 | //,/ | 1,43 | 03,0 |
| 08 | 1600 | 8482 | +06,9 | +05,9 | 8938 | 3108 | 08,73 | 06,45 | 67,7 | 01,0 | 00,5 | 1,80 | 01,5 |
| 09 | 1400 | 8644 | +06,7 | +05,7 | 8916 | 3078 | 08,59 | 06,19 | 87,4 | 00,8 | 00,5 | 1,47 | 01,3 |
| 10 | 1800 | 8881 | +07,0 | +06,8 | 8907 | 3074 | 09,84 | 06,50 | 86,6 | 00,6 | 00,5 | 1,84 | 01,8 |
| 11 | 1000 | 9108 | +09,8 | +07,9 | 8900 | 3075 | 09,87 | 06,76 | 84,8 | 00,8 | 00,6 | 1,80 | 01,8 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +031 | , | , | , | , | , | 08,73 | 01,74 | , | | 01 |
| 02 | | +038 | +0,81 | -0,88 | -0,13 | -3,00 | +0,86 | 08,98 | 01,10 | 8,90 | 6194 | 02 |
| 03 | | +045 | +0,50 | -0,08 | +0,03 | +1,98 | +0,54 | 08,48 | 00,93 | 60,41 | 68708 | 03 |
| 04 | | +038 | +0,55 | -0,05 | +0,01 | +1,77 | +0,48 | 08,48 | 00,86 | 810,38 | 00 | 04 |
| 05 | | +067 | +0,60 | +0,03 | +0,07 | +8,65 | +0,48 | 08,38 | 00,86 | 1880,30 | 00 | 05 |
| 06 | | +074 | +0,30 | -0,18 | -0,00 | -0,78 | +0,74 | 08,31 | 01,06 | 39,50 | 40315 | 06 |
| 07 | | +083 | +0,48 | +0,00 | +0,08 | +1,68 | +0,57 | 08,38 | 01,10 | 1487,03 | 00 | 07 |
| 08 | | +080 | -0,38 | +1,67 | -1,19 | -8,08 | +1,41 | 04,08 | 06,08 | 1,53 | 1404 | 08 |
| 09 | | +077 | -0,10 | +0,07 | +0,13 | +0,18 | +1,14 | 05,78 | 10,10 | 84,15 | 51280 | 09 |
| 10 | | +090 | +0,60 | -0,33 | +0,15 | +0,40 | +0,41 | 07,50 | 16,81 | 110,85 | 00 | 10 |
| 11 | | +103 | +0,65 | -0,38 | +0,14 | +0,98 | +0,35 | 09,88 | 13,87 | 788,78 | 00 | 11 |

HP-TEMPERATUR:

| Z | H | P | T | TF | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 8199 | 7840 | +06,1 | +08,1 | 8993 | 3101 | 06,03 | 04,00 | 83,4 | 08,0 | //,/ | 1,43 | 03,4 |
| 17 | 8148 | 7900 | +06,0 | +08,4 | 8906 | 3100 | 05,38 | 04,88 | 81,5 | 01,8 | //,/ | 1,43 | 03,1 |
| 18 | 1999 | 8048 | +06,7 | +08,8 | 8978 | 3090 | 05,38 | 04,18 | 84,9 | 01,8 | //,/ | 1,43 | 03,0 |
| 19 | 1799 | 8847 | +07,6 | +03,3 | 8961 | 3078 | 05,39 | 04,08 | 81,6 | 01,7 | //,/ | 1,43 | 03,0 |
| 20 | 1899 | 8390 | +07,9 | +03,7 | 8980 | 3071 | 05,64 | 04,81 | 84,9 | 01,6 | //,/ | 1,43 | 08,7 |
| 21 | 1681 | 8309 | +07,9 | +03,8 | 8984 | 3089 | 06,08 | 04,35 | 84,9 | 01,8 | //,/ | 1,43 | 08,8 |
| 22 | 1636 | 8415 | +07,8 | +04,8 | 8988 | 3074 | 06,84 | 04,63 | 88,9 | 00,9 | //,/ | 1,43 | 01,6 |
| 23 | 1611 | 8441 | +07,1 | +04,7 | 8948 | 3068 | 07,80 | 06,38 | 71,3 | 00,9 | //,/ | 1,43 | 01,6 |
| 24 | 1593 | 8453 | +06,9 | +08,9 | 8938 | 3108 | 08,73 | 06,48 | 87,7 | 01,0 | 00,8 | 1,80 | 01,8 |
| 25 | 1530 | 8516 | +06,6 | +08,8 | 8987 | 3084 | 08,17 | 05,99 | 84,9 | 00,9 | 00,8 | 1,80 | 01,8 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | +087 | , | , | , | , | , | 08,38 | 00,86 | , | | 16 |
| 17 | 083 | +087 | -0,18 | -0,66 | -0,47 | -7,73 | +1,86 | 08,38 | 01,04 | 3,14 | 3831 | 17 |
| 18 | 146 | +074 | +0,48 | -0,01 | +3,04 | +1,74 | +0,88 | 08,37 | 01,06 | 8349,88 | 00 | 18 |
| 19 | 800 | +083 | +0,48 | +0,00 | +0,08 | +1,65 | +0,87 | 08,48 | 01,13 | 409,48 | 00 | 19 |
| 20 | 100 | +086 | +0,30 | -0,88 | -0,13 | -1,87 | +0,73 | 03,38 | 01,88 | 8,61 | 8780 | 20 |
| 21 | 047 | +086 | +0,00 | -0,44 | -0,88 | -4,17 | +1,04 | 03,61 | 08,99 | 1,08 | 1080 | 21 |
| 22 | 018 | +088 | -0,65 | -0,84 | -1,63 | -6,40 | +1,78 | 03,08 | 08,44 | 0,18 | 118 | 22 |
| 23 | 084 | +080 | +8,81 | -3,84 | -8,79 | -9,70 | +3,99 | 03,99 | 05,88 | 818,30 | 00 | 23 |
| 24 | 011 | +080 | +1,74 | -3,31 | -9,80 | -8,33 | +8,87 | 04,16 | 08,18 | 8,64 | 1878 | 24 |
| 25 | 061 | +074 | +0,81 | +0,90 | +0,76 | +4,48 | +1,89 | 04,67 | 07,86 | 41,36 | 39880 | 25 |

HP-FEUCHTIGKEIT:

****
****

Z-0781 14.10.1970 11.30 Uhr

2

HAUPT-NIVEAUS:

| Z | H | P | T | TF | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7150 | +08,4 | +00,3 | 3033 | 3162 | 04,48 | 04,38 | 62,9 | 01,9 | //,/ | 1,45 | 03,4 |
| 02 | 8500 | 7881 | +08,8 | +00,3 | 3081 | 3140 | 05,04 | 04,32 | 67,4 | 02,0 | //,/ | 1,45 | 03,7 |
| 03 | 8600 | 7468 | +03,7 | +00,7 | 3010 | 3183 | 04,94 | 04,13 | 68,5 | 08,0 | //,/ | 1,45 | 03,6 |
| 04 | 8400 | 7654 | +04,7 | +01,3 | 8999 | 3113 | 04,99 | 04,06 | 58,3 | 01,8 | //,/ | 1,45 | 03,4 |
| 05 | 8800 | 7847 | +07,6 | +08,8 | 8995 | 3123 | 05,39 | 04,89 | 58,8 | 01,8 | //,/ | 1,45 | 03,3 |
| 06 | 8000 | 8044 | +06,8 | +08,7 | 8977 | 3098 | 05,34 | 04,14 | 54,7 | 01,9 | //,/ | 1,45 | 03,2 |
| 07 | 1800 | 8848 | +07,8 | +03,4 | 8968 | 3094 | 05,78 | 04,33 | 56,3 | 01,3 | //,/ | 1,45 | 03,4 |
| 08 | 1600 | 8458 | +05,8 | +05,4 | 8937 | 3097 | 04,75 | 07,46 | 94,8 | 01,8 | 01,8 | 1,18 | 00,4 |
| 09 | 1400 | 8665 | +06,7 | +06,1 | 8916 | 3047 | 07,07 | 07,54 | 98,4 | 00,5 | 00,4 | 1,47 | 00,9 |
| 10 | 1800 | 8881 | +07,9 | +06,9 | 8907 | 3074 | 07,38 | 06,59 | 87,5 | 00,6 | 00,5 | 1,16 | 01,1 |
| 11 | 1000 | 9103 | +09,3 | +07,8 | 8901 | 3073 | 09,71 | 07,54 | 86,6 | 00,6 | 00,5 | 1,34 | 01,1 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +030 | , | , | , | , | , | 05,77 | 01,07 | , | | 01 |
| 02 | | +035 | +0,88 | -0,85 | -0,14 | -3,07 | +0,74 | 03,69 | 00,94 | 44,55 | 53688 | 02 |
| 03 | | +044 | +0,45 | -0,75 | +0,07 | +0,67 | +0,59 | 03,05 | 01,04 | 198,06 | 00 | 03 |
| 04 | | +053 | +0,50 | -0,08 | +0,03 | +1,85 | +0,53 | 03,44 | 01,24 | 41,47 | 65484 | 04 |
| 05 | | +060 | +0,45 | -0,60 | +0,11 | +0,48 | +0,58 | 03,48 | 01,39 | 141,31 | 00 | 05 |
| 06 | | +073 | +0,50 | +0,03 | +0,07 | +8,84 | +0,56 | 03,71 | 01,57 | 171,77 | 00 | 06 |
| 07 | | +079 | +0,30 | -0,19 | -0,09 | -3,76 | +0,73 | 03,97 | 08,10 | 12,70 | 12865 | 07 |
| 08 | | +069 | -0,70 | +1,58 | -1,07 | -9,38 | +1,76 | 04,63 | 03,37 | 1,96 | 1964 | 08 |
| 09 | | +078 | +0,45 | -0,16 | -0,04 | +1,19 | +0,59 | 05,69 | 10,46 | 58,84 | 48477 | 09 |
| 10 | | +090 | +0,40 | -0,15 | +0,04 | +4,49 | +0,40 | 05,95 | 14,51 | 877,15 | 00 | 10 |
| 11 | | +104 | +0,70 | -0,16 | -0,03 | +8,61 | +0,30 | 06,66 | 15,47 | 3786,40 | 00 | 11 |

HP-TEMPERATUR:

| Z | H | P | T | TF | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1999 | 8044 | +06,6 | +08,7 | 8977 | 3018 | 05,34 | 04,14 | 54,7 | 01,8 | //,/ | 1,45 | 03,4 |
| 17 | 1869 | 8175 | +07,0 | +03,8 | 8968 | 3082 | 05,63 | 04,39 | 96,1 | 01,8 | //,/ | 1,45 | 03,4 |
| 18 | 1799 | 8846 | +07,6 | +03,4 | 8962 | 3078 | 05,78 | 04,33 | 56,3 | 01,3 | //,/ | 1,45 | 03,4 |
| 19 | 1747 | 8899 | +07,1 | +03,6 | 8956 | 3078 | 05,44 | 04,50 | 59,3 | 00,8 | //,/ | 1,25 | 01,7 |
| 20 | 1705 | 8348 | +06,8 | +04,8 | 8946 | 3083 | 06,81 | 05,13 | 76,4 | 00,4 | //,/ | 1,35 | 00,8 |
| 21 | 1670 | 8378 | +06,4 | +04,9 | 8741 | 3095 | 07,63 | 05,34 | 81,4 | 00,1 | //,/ | 1,45 | 00,8 |
| 22 | 1603 | 8446 | +05,6 | +05,3 | 8967 | 3096 | 06,43 | 06,36 | 93,5 | 00,4 | //,/ | 1,45 | 00,4 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | +073 | , | , | , | , | , | 06,73 | 01,56 | , | | 16 |
| 17 | 135 | +077 | +0,31 | -0,44 | +0,18 | -1,07 | +0,73 | 03,61 | 01,02 | 34,41 | 34456 | 17 |
| 18 | 067 | +079 | +0,64 | -0,13 | -0,05 | -0,60 | +0,74 | 04,93 | 02,18 | 4,16 | 4180 | 18 |
| 19 | 051 | +078 | +0,17 | -0,51 | -0,33 | -5,76 | +1,65 | 04,18 | 05,50 | 6,76 | 986 | 19 |
| 20 | 041 | +076 | +0,78 | -1,98 | -1,43 | -3,01 | +1,80 | 04,31 | 14,53 | 6,50 | 665 | 20 |
| 21 | 038 | +074 | +1,85 | -8,23 | -3,13 | -5,99 | +1,89 | 04,43 | 45,74 | 6,55 | 574 | 21 |
| 22 | 067 | +086 | +0,89 | -1,19 | +0,41 | -6,03 | +1,94 | 04,63 | 69,87 | 22,63 | 11764 | 22 |

HP-FEUCHTIGKEIT:

****

| Z | H | P | T | TF | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | 1799 | 8846 | +07,8 | +03,4 | 8962 | 3078 | 05,72 | 04,33 | 56,3 | 01,3 | //,/ | 1,45 | 02,4 |
| 24 | 1738 | 8904 | +07,4 | +03,7 | 8956 | 3076 | 06,04 | 04,53 | 59,4 | 00,5 | //,/ | 1,45 | 01,5 |
| 25 | 1673 | 8375 | +06,5 | +04,8 | 8747 | 3093 | 07,44 | 05,71 | 77,1 | 00,4 | //,/ | 1,45 | 00,3 |
| 26 | 1597 | 8454 | +05,8 | +05,4 | 8967 | 3097 | 08,75 | 06,46 | 94,4 | 00,8 | 00,8 | 1,16 | 00,4 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | | +074 | , | , | , | , | , | 04,[illegible] | [illegible] | , | | 23 |
| 24 | 040 | +073 | +0,00 | -0,58 | -0,34 | -5,14 | +1,94 | [illegible] | [illegible] | [illegible] | [illegible] | 24 |
| 25 | 044 | +074 | +1,[illegible] | -2,50 | -1,41 | -8,31 | +2,16 | 04,40 | [illegible] | [illegible] | [illegible] | 25 |
| 26 | 073 | +086 | +0,95 | +1,47 | +1,02 | +1,27 | +2,04 | 05,46 | 43,67 | 13,46 | [illegible] | 26 |

Z-0782 14.10.1970 12.10 Uhr

3

HAUPT-NIVEAUS:

| Z | H | P | T | TF | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7165 | [illegible] | +00,3 | 3032 | 3144 | 04,82 | [illegible] | [illegible] | 01,[illegible] | //,/ | 1,30 | 03,5 |
| 02 | 8800 | 7878 | [illegible] | +00,1 | 3014 | 3137 | 05,15 | 04,31 | [illegible] | [illegible] | //,/ | 1,30 | 03,9 |
| 03 | [illegible] | 7456 | [illegible] | [illegible] | 3007 | 3127 | 05,14 | 04,36 | [illegible] | [illegible] | //,/ | 1,30 | 03,7 |
| 04 | 8400 | 7747 | +04,7 | +01,3 | [illegible] | 3111 | [illegible] | 04,11 | 57,4 | [illegible] | //,/ | 1,30 | 03,2 |
| 05 | 8251 | 7851 | +05,3 | +02,5 | 2945 | 3101 | 05,36 | [illegible] | [illegible] | [illegible] | //,/ | 1,30 | [illegible] |
| 06 | 2000 | 8080 | +07,1 | +02,7 | [illegible] | 3097 | 05,61 | [illegible] | [illegible] | [illegible] | //,/ | 1,1[illegible] | [illegible] |
| 07 | 1400 | 8248 | +07,3 | +03,6 | 8240 | 3095 | [illegible] | 04,45 | [illegible] | [illegible] | //,/ | 1,3[illegible] | 03,1 |
| 08 | 1700 | 8452 | +05,7 | +05,3 | [illegible] | 3095 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0,44 | 00,0 |
| 09 | 1600 | 8686 | +06,3 | +06,3 | [illegible] | 3121 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1,11 | 01,0 |
| 10 | 1400 | 8882 | +07,8 | +07,4 | [illegible] | 3374 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1,11 | 01,4 |
| 11 | 1000 | 9106 | +09,8 | +07,7 | [illegible] | 3271 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1,14 | 01,0 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +027 | , | , | , | , | , | [illegible] | [illegible] | , | | 01 |
| 02 | | +031 | +0,84 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 02 |
| 03 | | +041 | +0,50 | [illegible] | [illegible] | [illegible] | +0,54 | [illegible] | [illegible] | [illegible] | 00 | 03 |
| 04 | | +053 | [illegible] | [illegible] | [illegible] | [illegible] | +0,40 | [illegible] | [illegible] | [illegible] | [illegible] | 04 |
| 05 | | +067 | +0,35 | +0,15 | +0,07 | [illegible] | [illegible] | [illegible] | [illegible] | 11,74 | [illegible] | 05 |
| 06 | | +074 | +0,43 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 06 |
| 07 | | +076 | +0,40 | -0,14 | -0,05 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 32745 | 07 |
| 08 | | +077 | [illegible] | +1,47 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1,49 | 1731 | 08 |
| 09 | | +[illegible]10 | [illegible] | [illegible] | [illegible] | +1,17 | [illegible] | [illegible] | 12,47 | [illegible] | [illegible] | 09 |
| 10 | | +073 | [illegible] | [illegible] | [illegible] | [illegible] | +0,51 | [illegible] | 10,41 | [illegible] | 00 | 10 |
| 11 | | +103 | +0,45 | +0,19 | [illegible] | [illegible] | +0,35 | 05,47 | 16,56 | [illegible] | 00 | 11 |

HP-TEMPERATUR:

| Z | H | P | T | TF | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | [illegible] | [illegible] | +06,1 | [illegible] | [illegible] | 3012 | [illegible] | [illegible] | [illegible] | [illegible] | //,/ | 1,1[illegible] | [illegible] |
| 17 | 1971 | 8175 | [illegible] | +03,0 | 8265 | 3078 | [illegible] | [illegible] | [illegible] | [illegible] | //,/ | 1,1[illegible] | [illegible] |
| 18 | 1653 | [illegible] | [illegible] | [illegible] | [illegible] | 3079 | [illegible] | [illegible] | [illegible] | [illegible] | //,/ | 1,1[illegible] | [illegible] |
| 19 | 1756 | [illegible] | [illegible] | [illegible] | 2751 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | //,/ | 1,1[illegible] | [illegible] |
| 20 | 1717 | 8323 | +05,6 | [illegible] | [illegible] | 3101 | [illegible] | [illegible] | [illegible] | [illegible] | //,/ | 1,1[illegible] | [illegible] |
| 21 | 1677 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | //,/ | 1,1[illegible] | 00,[illegible] |
| 22 | 1703 | [illegible] | [illegible] | +05,2 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0,44 | [illegible] |
| 23 | 1575 | [illegible] | [illegible] | [illegible] | [illegible] | 3077 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 24 | 1495 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1,1[illegible] | 01,0 |

[illegible]

HP-FEUCHTIGKEIT:

****

[illegible]

# Example $C_2$ 14 Oct. 1970

[illegible] 14.10.1970 13.00 UHR

4

HAUPT-NIVEAUS

[illegible]

MAX-TEMPERATUR

[illegible]

MAX-FEUCHTIGKEIT

----

Z-0745 14.10.1970 15.00 UHR

6

HAUPT-NIVEAUS

[illegible]

MAX-TEMPERATUR

[illegible]

MAX-FEUCHTIGKEIT

----

Z-0754 14.10.1970 14.00 UHR

5

HAUPT-NIVEAUS

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +I+ | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7140 | +04,8 | +02,8 | 3032 | 3136 | 04,30 | 03,75 | 58,8 | 01,9 | //// | 1,89 | 03,5 |
| 02 | 2800 | 7272 | +03,8 | +00,0 | 3023 | 3135 | 04,16 | 04,08 | 60,7 | 02,1 | //// | 1,89 | 03,8 |
| 03 | 2600 | 7457 | +03,8 | +00,7 | 3018 | 3124 | 04,30 | 04,09 | 61,0 | 08,1 | //// | 1,89 | 03,8 |
| 04 | 2400 | 7648 | +04,9 | +01,7 | 3008 | 3119 | 04,89 | 04,31 | 61,0 | 08,1 | //// | 1,89 | 03,8 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 04,81 | 57,3 | 08,1 | //// | 1,89 | 03,7 |
| 06 | 2000 | 8036 | +06,6 | +03,8 | 2960 | 3100 | 05,97 | 04,48 | 58,3 | 01,7 | //// | 1,89 | 03,1 |
| 07 | 1800 | 8237 | +07,4 | +03,9 | 2965 | 3090 | 06,17 | 04,67 | 59,8 | 01,5 | //// | 1,89 | 03,6 |
| 08 | 1600 | 8446 | +08,6 | +05,9 | 2938 | 3109 | 08,30 | 06,58 | 91,2 | 00,5 | 00,3 | 1,53 | 00,8 |
| 09 | 1400 | 8657 | +07,8 | +06,7 | 2988 | 3101 | 09,19 | 06,63 | 87,7 | 00,7 | 00,6 | 1,26 | 01,3 |
| 10 | 1200 | 8874 | +09,9 | +07,5 | 2918 | 3093 | 09,55 | 06,78 | 83,7 | 00,7 | 00,6 | 1,81 | 01,4 |
| 11 | 1000 | 9094 | +10,1 | +08,1 | 2910 | 3081 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

[illegible]

MAX-TEMPERATUR

[illegible]

MAX-FEUCHTIGKEIT

----

Z-0757 14.10.1970 16.30 UHR

8

HAUPT-NIVEAUS

[illegible]

MAX-TEMPERATUR

[illegible]

MAX-FEUCHTIGKEIT

----

[illegible]

# Example $E_1$ 17 Oct. 1970

Z-0804 17.10.1970   08.30 UHR   1

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | EPT | E | S | HP | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7180 | +08,? | +0.,. | 3034 | 3129 | 06,77 | 05,94 | 94,5 | 08,4 | //// | 8,00 | 03,6 |
| 02 | 2800 | 7850 | +03,4 | +0.,6 | 3038 | 3028 | 07,19 | 06,19 | 98,1 | 08,6 | //// | 8,00 | 04,0 |
| 03 | 2600 | 7434 | +03,9 | +0.,2 | 3016 | 3104 | 07,24 | 06,17 | 90,9 | 08,5 | //// | 8,00 | 03,9 |
| 04 | 2400 | 7681 | +04,8 | +03,4 | 3004 | 3148 | 07,09 | 05,81 | 89,4 | 08,4 | //// | 8,00 | 03,8 |
| 05 | 2200 | 7813 | +05,8 | +0.,8 | 2987 | 3144 | 07,30 | 05,83 | 89,4 | 08,4 | //// | 8,00 | 03,6 |
| 06 | 2000 | 8009 | +08,3 | +03,6 | 2967 | 3116 | 07,83 | 05,63 | 81,0 | 08,3 | //// | 8,00 | 03,8 |
| 07 | 1800 | 8810 | +08,4 | +03,8 | 2947 | 3098 | 07,15 | 05,44 | 77,7 | 08,3 | //// | 8,00 | 03,8 |
| 08 | 1600 | 8417 | +04,9 | +03,1 | 2921 | 3081 | 06,63 | 04,91 | 76,5 | 08,0 | 00,6 | 8,46 | 08,8 |
| 09 | ~~1400~~ | ~~8620~~ | +03,2 | +08,7 | 2884 | 3018 | 07,08 | 06,18 | 91,4 | 01,7 | 01,8 | 1,43 | 08,9 |
| 10 | 1800 | 8847 | +08,6 | +08,0 | 2852 | 2979 | 06,38 | 04,65 | 88,1 | 01,4 | 00,6 | 8,37 | 08,0 |
| 11 | 1000 | 9018 | +01,8 | +01,8 | 2881 | 2940 | 06,66 | 04,58 | 10,0 | 01,8 | 00,6 | 8,07 | 01,9 |

| Z | DH | TV | G-T | G-E | G-S | G-HP | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +028 | , | , | , | , | , | 00,85 | 00,80 | , | | 01 |
| 02 | | +044 | +0,84 | -0,89 | +0,17 | +1,67 | +0,17-08,84 | | 00,15 | 1,46 | 1645 | 02 |
| 03 | | +048 | +0,86 | -0,08 | +0,01 | +0,61 | +0,81-01,97 | | 00,14 | 174,00 | 00 | 03 |
| 04 | | +087 | +0,85 | +0,13 | +0,16 | +4,86 | +0,86-01,74 | | 00,14 | 490,81 | 00 | 04 |
| 05 | | +061 | +0,80 | +0,10 | +0,01 | +0,03 | +0,85-01,83 | | 00,18 | 11,13 | 11480 | 05 |
| 06 | | +068 | +0,08 | +0,08 | +0,10 | +0,49 | +1,00-01,36 | | 00,11 | 15,88 | 15601 | 06 |
| 07 | | +083 | +0,08 | +0,08 | +0,10 | +0,70 | +1,00-01,81 | | 00,10 | 84,58 | 86419 | 07 |
| 08 | | +087 | -0,89 | +0,86 | +0,86 | +1,99 | +1,30 | 03,30 | 00,42 | 0,17 | 164 | 08 |
| 09 | | +041 | -0,80 | -0,88 | +0,10 | +7,44 | +1,87 | 06,41 | 00,48 | 8,00 | 4718 | 09 |
| 10 | | +038 | -0,88 | -0,84 | +0,84 | +1,68 | +1,89 | 07,38 | 01,89 | 8,04 | 1871 | 10 |
| 11 | | +019 | -0,80 | -0,04 | +0,03 | +8,98 | +1,85-09,70 | | 08,69 | 36,38 | 38238 | 11 |

NP-TEMPERATUR:

----
----
----

Z-0806 17.10.1970   10.48 UHR   3

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | EPT | E | S | HP | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7100 | +08,7 | +0.,8 | 3048 | 3048 | 00,83 | 00,80 | 03,0 | 08,4 | //// | 1,48 | 04,1 |
| 02 | 2800 | 7831 | +03,8 | +04,7 | 3035 | 3040 | 00,19 | 00,16 | 08,3 | 08,6 | //// | 1,48 | 04,5 |
| 03 | 2600 | 7418 | +03,9 | +04,1 | 3018 | 3087 | 00,41 | 00,34 | 04,8 | 08,4 | //// | 1,48 | 04,1 |
| 04 | 2400 | 7604 | +04,7 | +03,8 | 3005 | 3008 | 00,17 | 00,14 | 01,8 | 08,3 | //// | 1,48 | 04,0 |
| 05 | 2200 | 7797 | +04,9 | +03,1 | 2985 | 2918 | 00,59 | 00,47 | 06,8 | 08,4 | //// | 1,48 | 03,9 |
| 06 | 2000 | 7994 | +08,3 | +08,7 | 2969 | 2969 | 00,64 | 00,80 | 06,8 | 08,4 | //// | 1,48 | 04,1 |
| 07 | 1800 | 8197 | +08,4 | +01,8 | 2948 | 2976 | 01,35 | 01,03 | 14,3 | 08,3 | //// | 1,48 | 03,9 |
| 08 | 1600 | 8405 | +04,8 | +01,7 | 2921 | 2934 | 01,69 | 01,86 | 18,7 | 08,0 | 01,8 | 1,35 | 03,5 |
| 09 | 1400 | 8618 | +04,8 | +00,8 | 2893 | 2938 | 06,88 | 08,11 | 34,8 | 01,4 | 01,1 | 1,88 | 08,5 |
| 10 | 1800 | 8836 | +08,9 | +00,1 | 2860 | 2943 | 04,59 | 03,16 | 84,9 | 01,4 | 00,6 | 8,10 | 08,1 |
| 11 | 1000 | 9064 | +00,1 | +00,7 | 2810 | 2905 | 05,89 | 03,64 | 85,8 | 00,8 | 00,9 | 0,96 | 00,5 |

| Z | DH | TV | G-T | G-E | G-S | G-HP | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +087 | , | , | , | , | , | 08,53 | 00,83 | , | | 01 |
| 02 | | +038 | +0,85 | +0,03 | +0,03 | +0,47 | +0,49-08,86 | | 03,64 | 9,87 | 10367 | 02 |
| 03 | | +039 | +0,80 | -0,11 | -0,09 | -1,84 | +0,69-08,08 | | 00,68 | 388,0x | 00 | 03 |
| 04 | | +047 | +0,40 | +0,18 | +0,10 | +1,49 | +0,65-01,88 | | 00,88 | 401,98 | 00 | 04 |
| 05 | | +049 | +0,10 | -0,81 | +0,17 | -8,30 | +0,97-01,85 | | 00,81 | 348,48 | 00 | 05 |
| 06 | | +053 | +0,80 | -0,03 | +0,08 | -0,81 | +0,89-01,91 | | 00,81 | 31,80 | 38606 | 06 |
| 07 | | +055 | +0,05 | +0,35 | -0,86 | -3,78 | +1,01-01,39 | | 00,50 | 925,79 | 00 | 07 |
| 08 | | +080 | -0,30 | -0,17 | +0,11 | -8,81 | +1,37-03,08 | | 01,35 | 1,51 | 1467 | 08 |
| 09 | | +044 | -0,35 | -0,80 | +0,43 | -7,81 | +1,41-04,76 | | 03,76 | 4,00 | 3788 | 09 |
| 10 | | +034 | +0,60 | -0,80 | +0,84 | -8,88 | +1,66-06,80 | | 06,84 | 87,77 | 88336 | 10 |
| 11 | | +037 | -1,41 | -0,39 | -0,83 | -8,98 | +9,48-08,85 | | 84,48 | 6,73 | 8881 | 11 |

NP-TEMPERATUR:

| Z | H | P | T | TP | PT | EPT | E | S | HP | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1800 | 8197 | +0.,4 | +01,8 | 2948 | 2976 | 01,35 | 01,03 | 14,3 | 08,3 | //// | 1,48 | 04,0 |
| 17 | 1660 | 8348 | +05,4 | +01,7 | 2934 | 2961 | 01,38 | 01,03 | 14,4 | 08,3 | //// | 1,48 | 03,9 |
| 18 | ~~1600~~ | 8405 | +04,6 | +01,7 | 2921 | 2934 | 01,69 | 01,85 | 18,7 | 08,0 | 01,5 | 1,35 | 03,5 |
| 19 | ~~1454~~ | 8560 | +04,5 | +00,8 | 2903 | 2983 | 08,41 | 01,90 | 89,4 | 01,5 | 01,0 | 1,51 | 08,6 |
| 20 | 1401 | 8618 | +04,1 | +00,8 | 2893 | 2948 | 08,98 | 08,11 | 34,8 | 01,4 | 01,1 | 1,88 | 08,5 |
| 21 | 1386 | 8699 | +03,4 | +03,1 | 2878 | 2934 | 04,04 | 08,90 | 85,1 | 01,7 | 01,1 | 1,48 | 08,0 |
| 22 | 1801 | 6838 | +08,9 | +00,1 | 2860 | 2943 | 04,58 | 03,18 | 89,9 | 01,4 | 00,6 | 8,10 | 08,1 |
| 23 | 1145 | 8901 | +08,7 | +03,1 | 2658 | 2936 | 04,68 | 03,64 | 68,8 | 01,0 | 00,6 | 1,65 | 01,7 |
| 24 | 1101 | 8950 | +06,1 | +00,8 | 2841 | 2985 | 04,65 | 03,64 | 64,C | 00,8 | 00,8 | 1,88 | 03,4 |
| 25 | 1088 | 8999 | +00,4 | +00,8 | 2819 | 2913 | 05,28 | 03,61 | 88,6 | 00,8 | 00,8 | 0,98 | 03,4 |
| 26 | 1008 | 9064 | +00,1 | -30,7 | 2810 | 2905 | 05,89 | 03,64 | 85,6 | 00,8 | 00,8 | 0,96 | 00,5 |

| Z | DH | TV | G-T | G-E | G-S | G-HP | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | +055 | , | , | , | , | , | 01,39 | 03,50 | , | | 16 |
| 17 | 140 | +055 | +0,10 | -0,08 | -0,00 | -0,83 | +1,08 | 08,57 | 00,96 | 1,47 | 1436 | 17 |
| 18 | 060 | +050 | +1,00 | -0,51 | -0,36 | +6,68 | +5,10 | 03,08 | 01,35 | 1,61 | 1353 | 18 |
| 19 | 145 | +048 | -0,81 | -0,83 | -0,45 | +7,51 | +1,88 | 04,35 | 03,34 | 8,98 | 8447 | 19 |
| 20 | 083 | +044 | -0,14 | -0,38 | -0,80 | +8,60 | +1,88-04,75 | | 03,16 | 35,47 | 33838 | 20 |
| 21 | 074 | +038 | -0,64 | -1,81 | -1,06 | +1,39 | +8,08-03,47 | | 03,46 | 140,8C | 00 | 21 |
| 22 | 189 | +034 | -0,40 | -0,38 | -0,83 | +7,81 | +1,49-06,50 | | 06,84 | 8,13 | 7438 | 22 |
| 23 | 096 | +038 | -0,36 | -0,19 | -0,09 | -4,08 | +1,40-07,03 | | 10,84 | 4,13 | 7338 | 23 |
| 24 | 043 | +086 | -1,38 | -0,06 | +0,01 | -4,05 | +8,46 | 07,37 | 98,39 | 0,83 | 476 | 24 |
| 25 | 048 | +010 | -3,96 | -1,33 | -0,88 | -3,84 | +5,11-07,81 | | 36,32 | 102,66 | 81057 | 25 |
| 26 | 056 | +007 | -0,83 | -0,18 | -0,04 | -8,61 | +1,57-08,88 | | 84,45 | 76,61 | 67874 | 26 |

NP-FEUCHTIGKEIT:

----

| Z | H | P | T | TP | PT | EPT | E | S | HP | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | 1404 | 8618 | +04,1 | -00,8 | 2893 | 2948 | 08,98 | 08,11 | 34,8 | 01,4 | 01,1 | 1,88 | 08,5 |
| 28 | 1373 | 8651 | +03,7 | -30,5 | 2886 | 2891 | 03,46 | 08,49 | 41,8 | 01,7 | 01,1 | 1,48 | 08,9 |
| 29 | 1804 | 8834 | +08,9 | +00,1 | 2860 | 2943 | 04,58 | 03,18 | 89,9 | 01,4 | 00,6 | 8,10 | 08,1 |

| Z | DH | TV | G-T | G-E | G-S | G-HP | G-PT | I | V | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | | +044 | , | , | , | , | , | 04,78 | 03,76 | , | | 27 |
| 28 | 030 | +041 | +1,32 | +1,76 | -1,84 | +4,69 | +2,61 | 05,24 | 03,64 | 3,33 | 3101 | 28 |
| 29 | 169 | +034 | +0,47 | +0,48 | -0,41 | +0,46 | +1,63 | 06,50 | 06,84 | 9,71 | 8904 | 29 |

Z-0805 17.10.1970   09.37 UHR   2

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | EPT | E | S | HP | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7100 | +08,8 | ////,/ | 3037 | 3190 | 06,84 | 05,53 | 87,8 | 08,4 | //// | 1,50 | 04,0 |
| 02 | 2800 | 7831 | +02,9 | ////,/ | 3089 | 3170 | 05,95 | 05,13 | 79,0 | 08,7 | //// | 1,50 | 04,4 |
| 03 | 2600 | 7416 | +03,9 | ////,/ | 3018 | 3143 | 05,44 | 04,57 | 67,8 | 08,6 | //// | 1,50 | 04,3 |
| 04 | 2400 | 7605 | +04,4 | ////,/ | 3001 | 3116 | 05,15 | 04,88 | 61,5 | 08,4 | //// | 1,50 | 04,0 |
| 05 | 2200 | 7798 | +04,9 | -03,0 | 2985 | 3000 | 00,46 | 00,54 | 07,4 | 08,3 | //// | 1,50 | 03,9 |
| 06 | 2000 | 7996 | +05,3 | -08,8 | 2964 | 2998 | 01,12 | 00,87 | 11,9 | 08,4 | //// | 1,50 | 04,0 |
| 07 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | //// | [illegible] | [illegible] |
| 08 | 1600 | 8406 | +05,5 | -01,8 | 2960 | 2964 | 01,80 | 01,33 | 18,9 | 08,3 | 01,5 | 1,48 | 03,9 |
| 09 | 1400 | 8619 | +04,8 | -00,3 | 2894 | 2958 | 03,39 | 08,45 | 39,4 | 01,8 | 01,8 | 1,47 | 03,1 |
| 10 | 1800 | 8838 | +03,3 | +00,4 | 2864 | 2948 | 04,54 | 03,84 | 59,3 | 01,5 | 01,0 | 1,50 | 08,6 |
| 11 | 1000 | 9044 | +08,8 | +00,1 | 2838 | 2919 | 04,89 | 03,37 | 68,3 | 01,3 | 00,8 | 1,54 | 08,8 |

| Z | DH | TV | G-T | G-E | G-S | G-HP | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +031 | , | , | , | , | , | 02,45 | 00,48 | , | | 01 |
| 02 | | +037 | +0,46 | +0,84 | -0,87 | +0,11 | +0,56-02,44 | | 00,30 | 8,98 | 3354 | 02 |
| 03 | | +048 | +0,50 | +0,85 | +0,84 | +5,85 | +0,54-01,97 | | 00,88 | 132,82 | 00 | 03 |
| 04 | | +081 | +0,85 | +0,14 | +0,17 | +8,86 | +0,85-01,74 | | 00,89 | 4713,84 | 00 | 04 |
| 05 | | +049 | +0,85 | +8,84 | +1,84 | +7,09 | +0,80-01,53 | | 00,86 | 46,36 | 48508 | 05 |
| 06 | | +054 | +0,80 | -0,68 | -0,16 | -8,88 | +0,85-01,38 | | 00,88 | 16,16 | 12450 | 06 |
| 07 | | +056 | +0,05 | -0,48 | -0,31 | -4,37 | +1,06-01,81 | | 00,80 | 60,35 | 60818 | 07 |
| 08 | | +057 | +0,05 | +0,07 | +0,07 | +0,85 | +1,00 | 03,30 | 00,57 | 0,55 | 535 | 08 |
| 09 | | +046 | -0,65 | -0,80 | -0,56 | -0,31 | +1,70-05,41 | | 01,45 | 8,00 | 1893 | 09 |
| 10 | | +036 | -0,45 | -0,60 | -0,40 | -9,95 | +1,81-07,55 | | 02,60 | 10,03 | 9888 | 10 |
| 11 | | +087 | -0,55 | -0,15 | -0,06 | -4,58 | +1,80-09,70 | | 08,51 | 86,16 | 83395 | 11 |

NP-TEMPERATUR:

| Z | H | P | T | TP | PT | EPT | E | S | HP | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1800 | 8198 | +08,4 | -01,8 | 2940 | 2988 | 01,95 | 01,48 | 80,6 | 08,4 | //// | 1,50 | 04,0 |
| 17 | 1600 | 8408 | +08,5 | -01,8 | 2988 | 2964 | 01,40 | 01,33 | 18,9 | 08,3 | 01,5 | 1,48 | 03,9 |
| 18 | 1513 | 8498 | +04,6 | -00,6 | 2910 | 2968 | 02,64 | 01,96 | 30,8 | 08,0 | 01,4 | 1,39 | 03,4 |
| 19 | 1401 | 8619 | +04,8 | -00,3 | 2894 | 2958 | 03,34 | 08,45 | 39,4 | 01,8 | 01,8 | 1,47 | 03,1 |
| 20 | ~~1385~~ | 8701 | +03,4 | +00,4 | 2878 | 2948 | 03,72 | 08,66 | 46,1 | 01,7 | 01,0 | 1,63 | 08,7 |
| 21 | ~~1808~~ | 8838 | +03,3 | +00,4 | 2864 | 2948 | 04,59 | 03,84 | 59,3 | 01,5 | 01,0 | 1,50 | 08,6 |
| 22 | 1093 | 8940 | +03,5 | +00,3 | 2852 | 2933 | 04,35 | 03,08 | 55,3 | 01,4 | 00,9 | 1,48 | 08,3 |
| 23 | 0999 | 9067 | +08,6 | +00,8 | 2836 | 2981 | 04,76 | 03,87 | 64,5 | 01,3 | 00,9 | 1,50 | 08,8 |

| Z | DH | TV | G-T | G-E | G-S | G-HP | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | +056 | , | , | , | , | , | 01,81 | 00,80 | , | | 16 |
| 17 | 200 | +057 | +0,05 | +0,07 | +0,07 | +0,85 | +1,00-03,30 | | 00,57 | 0,55 | 535 | 17 |
| 18 | 096 | +049 | -1,04 | -1,01 | -0,79 | -3,01 | +8,13 | 04,85 | 00,95 | 1,03 | 986 | 18 |
| 19 | 112 | +046 | -0,36 | -0,63 | -0,43 | -8,84 | +1,41-05,41 | | 01,45 | 4,07 | 3888 | 19 |
| 20 | 078 | +038 | -1,04 | -0,48 | -0,86 | -6,98 | +8,19-06,26 | | 08,60 | 3,66 | 3394 | 20 |
| 21 | 183 | +038 | -0,08 | -0,70 | -0,46 | -3,99 | +1,18-07,55 | | 08,49 | 87,35 | 85060 | 21 |
| 22 | 108 | +040 | +0,18 | +0,83 | +0,80 | +3,66 | +0,84-08,73 | | 03,64 | 15,00 | 13519 | 22 |
| 23 | 094 | +031 | -0,96 | -0,48 | +0,86 | -9,84 | +8,01-09,81 | | 04,61 | 78,08 | 64086 | 23 |

NP-FEUCHTIGKEIT:

----

| Z | H | P | T | TP | PT | EPT | E | S | HP | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 1600 | 8406 | +05,5 | -01,8 | 2960 | 2964 | 01,40 | 01,33 | 18,9 | 08,3 | 01,5 | 1,48 | 03,9 |
| 25 | 1535 | 8475 | +04,8 | -00,9 | 2914 | 2962 | 08,47 | 01,82 | 27,4 | 08,0 | 01,4 | 1,41 | 03,4 |
| 26 | 1401 | 8619 | +04,8 | -00,3 | 2894 | 2958 | 03,39 | 08,45 | 39,4 | 01,8 | 01,8 | 1,47 | 03,1 |

| Z | DH | TV | G-T | G-E | G-S | G-HP | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | | +057 | , | , | , | , | , | 03,30 | 00,57 | , | | 24 |
| 25 | 065 | +051 | -1,07 | -1,03 | -0,74 | -3,06 | +8,17 | 04,34 | 00,89 | 0,76 | 723 | 25 |
| 26 | 134 | +046 | -0,45 | -0,69 | -0,47 | -8,98 | +1,51-05,41 | | 01,45 | 4,10 | 3661 | 26 |

Z-0807 17.10.1970   11.17 UHR   4

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | EPT | E | S | HP | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7100 | +08,3 | -08,1 | 3040 | 3053 | 00,41 | 00,36 | 05,4 | 08,1 | //// | 1,38 | 03,6 |
| 02 | 2800 | 7833 | +03,3 | -04,7 | 3033 | 3040 | 00,29 | 00,25 | 03,6 | 08,4 | //// | 1,38 | 04,8 |
| 03 | 2600 | 7418 | +03,7 | -04,3 | 3016 | 3083 | 00,33 | 00,29 | 04,0 | 08,5 | //// | 1,38 | 04,3 |
| 04 | 2400 | 7608 | +04,1 | -03,8 | 2999 | 3009 | 00,47 | 00,36 | 05,5 | 08,4 | //// | 1,38 | 04,1 |
| 05 | 2200 | 7795 | +04,8 | -03,1 | 2985 | 2998 | 00,64 | 00,51 | 07,0 | 08,4 | //// | 1,38 | 04,8 |
| 06 | 2000 | 7991 | +08,3 | -08,1 | 2969 | 2994 | 01,88 | 00,95 | 18,4 | 08,5 | //// | 1,38 | 04,3 |
| 07 | 1800 | 8193 | +08,7 | -01,9 | 2958 | 2974 | 01,09 | 00,83 | 11,3 | 08,3 | //// | 1,38 | 03,9 |
| 08 | 1600 | 8399 | +05,7 | -00,9 | 2931 | 2970 | 08,00 | 01,48 | 83,4 | 08,3 | 01,8 | 1,45 | 04,0 |
| 09 | 1400 | 8611 | +04,8 | -00,7 | 2901 | 2981 | 08,63 | 01,90 | 89,1 | 01,7 | 01,3 | 1,34 | 03,0 |
| 10 | ~~1800~~ | 8886 | +08,9 | +00,8 | 2861 | 2946 | 04,48 | 03,86 | 61,3 | 00,7 | 00,6 | 1,39 | 01,6 |
| 11 | ~~1300~~ | 9083 | +00,9 | +00,1 | 2880 | 2981 | 08,67 | 03,91 | 67,0 | 00,4 | 00,4 | 1,09 | 00,9 |

| Z | DH | TV | G-T | G-E | G-S | G-HP | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +085 | , | , | , | , | , | 08,51 | 00,90 | , | | 01 |
| 02 | | +033 | +0,55 | +0,06 | +0,07 | +1,44 | +0,42-08,87 | | 00,82 | 4,93 | 5061 | 02 |
| 03 | | +037 | +0,80 | -0,08 | -0,08 | -0,88 | +0,84-08,07 | | 00,55 | 48,33 | 48317 | 03 |
| 04 | | +041 | +0,83 | -0,07 | -0,05 | -0,73 | +0,86-01,91 | | 00,54 | 447,7A | 00 | 04 |
| 05 | | +048 | +0,35 | -0,08 | -0,06 | -0,79 | +0,69-01,77 | | 00,50 | 130,08 | 00 | 05 |
| 06 | | +054 | +0,85 | -0,89 | -0,08 | -8,94 | +0,74-01,67 | | 00,43 | 41,05 | 41976 | 06 |
| 07 | | +058 | +0,60 | +0,06 | +0,06 | +0,88 | +0,84-01,89 | | 00,50 | 39,03 | 38993 | 07 |
| 08 | | +039 | +0,00 | -0,45 | -0,33 | -4,69 | +1,05 | 08,86 | 00,86 | 3,88 | 3877 | 08 |
| 09 | | +031 | -0,45 | -0,31 | +0,81 | -4,86 | +1,51 | 04,16 | 08,04 | 3,34 | 3174 | 09 |
| 10 | | +034 | -0,96 | -1,02 | -0,68 | -6,81 | +8,03-05,47 | | 08,19 | 2,91 | 3401 | 10 |
| 11 | | +015 | -1,00 | -0,83 | -0,38 | -8,84 | +8,06-08,80 | | 35,75 | 81,80 | 19836 | 11 |

NP-TEMPERATUR:

| Z | H | P | T | TP | PT | EPT | E | S | HP | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1793 | 8193 | +05,7 | -01,9 | 2958 | 2974 | 01,09 | 00,83 | 11,3 | 08,3 | //// | 1,38 | 03,9 |
| 17 | 1647 | 8349 | +05,8 | -01,3 | 2937 | 2968 | 01,56 | 01,16 | 15,9 | 08,4 | //// | 1,38 | 04,8 |
| 18 | 1599 | 8399 | +05,7 | -00,9 | 2931 | 2970 | 08,00 | 01,48 | 80,8 | 08,3 | 01,6 | 1,45 | 04,0 |
| 19 | 1508 | 8493 | +05,8 | -01,8 | 2916 | 2953 | 01,93 | 01,41 | 80,7 | 08,8 | 01,4 | 1,53 | 03,6 |
| 20 | 1399 | 8611 | +04,8 | -00,7 | 2901 | 2951 | 08,43 | 01,92 | 89,1 | 01,7 | 01,3 | 1,34 | 03,0 |
| 21 | 1385 | 8698 | +03,6 | +00,4 | 2881 | 2964 | 04,45 | 03,19 | 56,3 | 01,5 | 01,0 | 1,46 | 08,6 |
| 22 | 1068 | 8760 | +03,5 | +00,7 | 2873 | 2963 | 04,80 | 03,42 | 61,1 | 01,1 | 00,8 | 1,31 | 01,9 |
| 23 | 1887 | 8799 | +03,1 | +00,5 | 2865 | 2955 | 04,88 | 03,41 | 63,1 | 01,0 | 00,7 | 1,38 | 01,7 |
| 24 | 1801 | 8888 | +03,9 | +00,8 | 2861 | 2946 | 04,02 | 03,26 | 61,3 | 00,9 | 00,6 | 1,39 | 01,6 |
| 25 | 1137 | 8899 | +01,5 | +00,1 | 2862 | 2937 | 05,33 | 03,73 | 78,8 | 00,5 | 00,4 | 1,31 | 03,9 |
| 26 | 1098 | 8950 | +01,0 | +00,0 | 2830 | 2930 | 05,52 | 03,84 | 83,9 | 00,4 | 00,3 | 1,86 | 03,8 |

| Z | DH | TV | G-T | G-E | G-S | G-HP | G-PT | I | V | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | +058 | , | , | , | , | , | 01,64 | 00,58 | , | | 16 |
| 17 | 151 | +060 | +0,07 | -0,31 | -0,88 | -3,08 | +0,99 | 08,41 | 00,78 | 5,96 | 5825 | 17 |
| 18 | 048 | +059 | +0,81 | -0,98 | -0,67 | -9,74 | +1,80 | 08,93 | 00,84 | 8,06 | 1966 | 18 |
| 19 | 094 | +054 | +0,53 | +0,07 | +0,07 | -0,08 | +1,60-03,51 | | 01,84 | 3,40 | 3440 | 19 |
| 20 | 105 | +051 | -0,38 | -0,66 | -0,46 | -7,97 | +1,43-04,88 | | 08,07 | 3,58 | 3384 | 20 |
| 21 | 074 | +041 | -1,60 | -8,43 | -1,78 | -6,14 | +8,70-04,68 | | 08,98 | 5,05 | 4893 | 21 |
| 22 | 068 | +040 | +0,16 | -0,57 | -0,57 | -7,93 | +1,40 | 05,07 | 05,41 | 8,05 | 1988 | 22 |
| 23 | 038 | +036 | -1,13 | -0,05 | +0,01 | -5,59 | +8,25-05,36 | | 08,76 | 8,86 | 7581 | 23 |
| 24 | 086 | +034 | +0,76 | +0,76 | +0,58 | +4,70 | +1,48-05,47 | | 04,19 | 6,85 | 6830 | 24 |
| 25 | 043 | +081 | +8,80 | -1,11 | -0,74 | -4,55 | +3,31 | 05,94 | 81,89 | 8,87 | 8546 | 25 |
| 26 | 045 | +016 | +1,11 | -0,48 | +0,24 | -8,77 | +2,17 | 06,20 | 86,14 | 31,54 | 88164 | 26 |

NP-FEUCHTIGKEIT:

----
----

# Example $E_2$ 17 Oct. 1970

Z-0830 17.10.1970 13.00 UHR

5

HAUPT-NIVEAUS

| Z | H | P | T | TT | PT | EPT | E | S | RF | +L | +L | +I+ | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7100 | +03,7 | +04,6 | 3053 | 3087 | 00,54 | 00,51 | 07,6 | 02,4 | ////, | 1,37 | 04,1 |
| 02 | 2800 | 7233 | +04,1 | +03,4 | 3042 | 3058 | 00,66 | 00,57 | 07,7 | 02,4 | ////, | 1,37 | 04,8 |
| 03 | 2600 | 7414 | +04,7 | +03,3 | 3027 | 3045 | 00,40 | 00,41 | 08,9 | 02,4 | ////, | 1,37 | 04,4 |
| 04 | 2400 | 7602 | +05,1 | +02,4 | 3004 | 3027 | 00,77 | 00,43 | 02,3 | 02,4 | ////, | 1,37 | 04,8 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | ////, | [illegible] | [illegible] |
| 06 | 2000 | 7991 | +05,8 | +01,8 | 2974 | 3000 | 01,84 | 00,97 | 18,7 | 02,3 | ////, | 1,37 | 04,1 |
| 07 | 1800 | 8193 | +06,4 | +00,9 | 2957 | 2994 | 01,84 | 01,38 | 14,0 | 08,8 | ////, | 1,37 | 03,9 |
| 08 | 1600 | 8399 | +05,9 | +00,1 | 2933 | 2961 | 08,93 | 08,37 | 31,5 | 03,1 | 01,5 | 1,36 | 03,4 |
| 09 | 1400 | 8611 | +05,3 | +01,4 | 2906 | 2932 | 04,54 | 03,64 | 50,9 | 01,4 | 01,0 | 1,36 | 08,4 |
| 10 | 1200 | 8829 | +03,9 | +04,0 | 2871 | 2941 | 05,95 | 04,40 | 73,6 | 00,7 | 00,5 | 1,31 | 01,3 |
| 11 | 1000 | 9053 | +03,7 | +08,1 | 2846 | 2946 | 06,15 | 04,84 | 77,9 | 00,9 | 00,5 | 1,30 | 01,9 |

| Z | DH | TV | G+T | G-E | G+S | G+HP | G+PT | I | V | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +037 | , | , | , | , | , | 08,44 | 08,84 | , | | 01 |
| 02 | | +042 | +0,28 | +0,36 | +0,04 | -0,50 | +0,74 | -02,24 | 01,44 | 136,58 | 00 | 02 |
| 03 | | +044 | +0,33 | +0,07 | +0,05 | -0,57 | +0,74 | -08,06 | 01,42 | 409,01 | 00 | 03 |
| 04 | | +052 | +0,70 | +0,01 | +0,04 | +0,33 | +0,86 | 01,90 | 01,73 | 1045,74 | 00 | 04 |
| 05 | | +056 | +0,33 | [illegible] | +0,04 | +0,33 | +0,86 | 01,77 | 01,41 | 516,15 | 00 | 05 |
| 06 | | +090 | +0,15 | [illegible] | +0,15 | -1,98 | +0,93 | -01,67 | 01,70 | (0,00) | 00 | 06 |
| 07 | | +064 | +0,20 | [illegible] | +0,41 | +8,00 | +0,44 | -01,50 | 01,70 | 912,52 | 00 | 07 |
| 08 | | +062 | +0,13 | [illegible] | +0,43 | +4,75 | +1,21 | -08,49 | 04,90 | 14,18 | 3773 | 08 |
| 09 | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 4,50 | 6077 | 09 |
| 10 | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 16,80 | 15584 | 10 |
| 11 | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 00 | 11 |

NF-TEMPERATUR

[illegible]

Z-0610 17.10.1970 14.37 UHR

7

HAUPT-NIVEAUS

[illegible]

NF-TEMPERATUR

[illegible]

NF-FEUCHTIGKEIT

[illegible]

Z-0807 17.10.1970 14.25 UHR

6

HAUPT-NIVEAUS

[illegible]

NF-TEMPERATUR

[illegible]

NF-FEUCHTIGKEIT

[illegible]

Z-0811 17.10.1970 15.28 UHR

8

HAUPT-NIVEAUS

[illegible]

NF-TEMPERATUR

[illegible]

NF-FEUCHTIGKEIT

[illegible]

# Example F 30 Sept. 1970

Z-0784 30.09.1970    13.03 Uhr

4

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | HPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7130 | +05,8 | +01,8 | 3073 | 3184 | 04,49 | 03,93 | 63,6 | 01,5 | //// | 1,30 | 02,8 |
| 02 | 2800 | 7280 | +07,3 | +08,0 | 3074 | 3141 | 04,51 | 03,88 | 88,1 | 01,8 | //// | 1,40 | [illegible] |
| 03 | 2600 | 7484 | +08,3 | +02,7 | 3065 | 3172 | 04,67 | 03,98 | 42,6 | 01,6 | //// | 1,80 | 02,5 |
| 04 | 2400 | 7601 | +07,4 | +03,3 | 3056 | 3160 | 04,77 | 03,83 | 42,6 | 01,6 | //// | 1,50 | 02,7 |
| 05 | 2200 | 7762 | +10,6 | +04,1 | 3046 | 3153 | 04,64 | 03,65 | 37,5 | 01,7 | //// | 1,80 | 01,7 |
| 06 | 2000 | 7967 | +11,7 | +05,3 | 3040 | 3156 | 05,55 | 04,33 | 40,2 | 01,6 | //// | 1,40 | 01,5 |
| 07 | 1800 | 8155 | +16,7 | +06,0 | 3030 | 3147 | 05,73 | 04,39 | 39,6 | 01,7 | //// | 1,80 | 02,8 |
| 08 | 1600 | 8347 | +13,9 | +06,6 | 3083 | 3136 | 05,71 | 04,27 | 38,9 | 01,7 | 00,4 | 2,16 | 02,2 |
| 09 | 1400 | 8544 | +13,8 | +06,8 | 3008 | 3168 | 06,50 | 06,81 | 83,0 | 01,0 | 00,5 | 1,44 | 01,5 |
| 10 | 1200 | 8744 | +15,2 | +09,7 | 2996 | 3161 | 06,65 | 06,36 | 81,8 | 00,8 | 00,4 | 1,78 | 01,6 |
| 11 | 1000 | 8950 | +16,0 | +11,4 | 2985 | 3169 | 10,17 | 07,10 | 55,9 | 00,1 | 00,5 | 1,06 | 01,3 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +064 | , | , | , | , | , | 02,81 | 08,73 | , | | 01 |
| 02 | | +079 | +1,05 | -0,01 | +0,03 | +3,81 | -0,11 | 08,49 | 08,81 | 37,30 | 48067 | 02 |
| 03 | | +089 | +0,80 | -0,04 | +0,08 | +0,76 | +0,44 | 08,81 | 01,99 | 244,63 | 00 | 03 |
| 04 | | +100 | +0,55 | -0,00 | +0,04 | +1,51 | +0,42 | 01,96 | 01,71 | 115,35 | 00 | 04 |
| 05 | | +112 | +0,60 | -0,08 | -0,08 | +0,46 | +0,30 | 01,74 | 01,42 | 71,40 | 76341 | 05 |
| 06 | | +124 | +0,55 | -0,34 | -0,18 | -1,17 | +0,43 | 01,68 | 01,48 | 4816,74 | 00 | 06 |
| 07 | | +134 | +0,50 | -0,15 | +0,03 | +0,86 | +0,46 | 01,39 | 01,80 | 36,16 | 57671 | 07 |
| 08 | | +148 | +0,60 | +0,01 | +0,08 | +1,83 | +0,37 | 01,68 | 01,48 | 78,31 | 78648 | 08 |
| 09 | | +148 | +0,08 | +1,38 | -0,97 | -8,69 | +1,65 | 01,66 | 04,37 | 44,86 | 3815 | 09 |
| 10 | | +182 | +0,70 | +0,18 | -0,04 | +1,31 | +0,66 | 08,13 | 07,36 | 35,73 | 34496 | 10 |
| 11 | | +178 | +0,40 | +0,68 | -0,38 | -9,31 | +0,82 | 08,48 | 07,81 | 3301,57 | 00 | 11 |

MP-TEMPERATUR:

| Z | H | P | T | TP | PT | HPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1601 | 8347 | +13,9 | +06,6 | 3083 | 3136 | 05,71 | 04,27 | 38,9 | 01,7 | 00,8 | 2,16 | 02,7 |
| 17 | 1496 | 8450 | +14,8 | +08,3 | 3018 | 3164 | 07,65 | 06,85 | 47,8 | 01,3 | 00,4 | 1,47 | 01,4 |
| 18 | 1446 | 8499 | +13,8 | +04,7 | 3006 | 3168 | 06,38 | 06,16 | 83,1 | 01,0 | 00,8 | 1,66 | 01,5 |
| 19 | 1400 | 8544 | +13,8 | +05,8 | 3008 | 3165 | 06,80 | 06,81 | 83,8 | 01,0 | 00,8 | 1,44 | 01,5 |

| Z | DH | TV | G-T | G-F | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | +146 | , | , | , | , | , | 01,62 | 01,48 | , | | 16 |
| 17 | 105 | +151 | +0,89 | -1,83 | -1,35 | +0,63 | +0,73 | 01,78 | 08,14 | 4,07 | 4686 | 17 |
| 18 | 049 | +148 | -0,80 | -1,47 | -1,08 | +1,78 | +1,84 | 01,81 | 05,84 | 0,67 | 654 | 18 |
| 19 | 045 | +148 | +0,00 | -0,26 | -0,18 | +1,64 | +0,99 | 01,84 | 04,37 | 348,90 | 00 | 19 |

MP-FEUCHTIGKEIT:

----

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1601 | 8347 | +13,9 | +06,6 | 3083 | 3136 | 05,71 | 04,07 | 38,9 | 01,7 | 00,8 | 2,18 | 08,6 |
| 21 | 1565 | 8308 | +14,1 | +06,6 | 3081 | 3136 | 05,83 | 04,34 | 36,8 | 01,7 | 07,6 | 1,93 | 02,5 |
| 22 | 1470 | 8475 | +14,2 | +07,7 | 3013 | 3166 | 06,68 | 05,08 | 48,3 | 01,1 | 00,6 | 1,77 | 01,7 |
| 23 | 1400 | 8544 | +13,8 | +08,8 | 3008 | 3165 | 06,50 | 06,81 | 83,8 | 01,0 | 00,5 | 1,84 | 01,5 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | | +146 | , | , | , | , | , | 01,68 | 01,48 | , | | 20 |
| 21 | 036 | +148 | +0,55 | -0,33 | -0,19 | -0,75 | +0,42 | 01,66 | 01,50 | 89,63 | 83678 | 21 |
| 22 | 095 | +150 | +0,10 | -1,08 | -2,75 | -6,44 | +0,83 | 01,77 | 03,83 | 1,39 | 1373 | 22 |
| 23 | 070 | +146 | -0,87 | -8,34 | -1,68 | -6,39 | +1,88 | 01,88 | 04,37 | 8,40 | 4312 | 23 |

Z-0785 30.09.1970    14.10 Uhr

5

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | HPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7097 | +06,3 | +00,9 | 3093 | 3180 | 03,99 | 03,50 | 61,7 | 01,7 | //// | 1,75 | 08,5 |
| 02 | 2800 | 7210 | +06,7 | +01,4 | 3073 | 3173 | 04,48 | 03,07 | 43,0 | 01,6 | //// | 1,43 | 06,7 |
| 03 | 2600 | 7358 | +03,0 | +02,4 | 3076 | 3171 | 04,50 | 03,37 | 48,1 | 01,7 | //// | 1,94 | 02,8 |
| 04 | 2400 | 7550 | +09,6 | +03,5 | 3063 | 3171 | 04,80 | 03,77 | 40,1 | 01,6 | //// | 1,93 | 08,4 |
| 05 | 2200 | 7730 | +10,4 | +04,7 | 3051 | 3174 | 05,72 | 04,53 | 44,5 | 01,4 | //// | 1,98 | 06,1 |
| 06 | 2000 | 7982 | +11,5 | +05,5 | 3043 | 3167 | 05,84 | 04,44 | 40,3 | 01,3 | //// | 1,46 | 09,0 |
| 07 | 1800 | 8107 | +16,7 | +05,7 | 3035 | 3158 | 05,64 | 04,34 | 35,3 | 01,4 | //// | 1,40 | 02,8 |
| 08 | 1600 | 8299 | +13,6 | +07,0 | 3087 | 3158 | 06,40 | 04,76 | 39,4 | 01,4 | 00,5 | 2,83 | 01,9 |
| 09 | 1402 | 8493 | +14,4 | +09,5 | 3017 | 3177 | 07,50 | 08,54 | 58,3 | 00,9 | 00,5 | 1,88 | 01,5 |
| 10 | 1200 | 8693 | +15,6 | +10,1 | 3005 | 3174 | 09,20 | 06,61 | 51,4 | 00,8 | 00,4 | 1,41 | 01,1 |
| 11 | 1000 | 8898 | +16,7 | +11,5 | 2997 | 3169 | 10,61 | 07,36 | 55,8 | 00,7 | 00,5 | 1,51 | 01,8 |

| Z | DH | TV | G-T | G-F | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +069 | , | , | , | , | , | 03,01 | 04,01 | , | | 01 |
| 02 | | +073 | +0,86 | -0,11 | +0,23 | +2,35 | +0,73 | 02,76 | 03,48 | 51,92 | 74455 | 02 |
| 03 | | +086 | +0,65 | -0,08 | +0,03 | +1,45 | +0,32 | 06,54 | 03,40 | 37,6,65 | 00 | 03 |
| 04 | | +102 | +0,80 | -0,14 | +0,07 | +1,08 | +0,18 | 02,38 | 03,55 | 6856,30 | 00 | 04 |
| 05 | | +111 | +0,40 | -0,41 | -0,29 | -2,31 | +0,60 | 03,81 | 04,88 | 16,64 | 00 | 05 |
| 06 | | +123 | +0,55 | -0,13 | -0,05 | +0,60 | +0,40 | 02,09 | 04,66 | 970,97 | 00 | 06 |
| 07 | | +134 | +0,70 | +0,18 | +0,15 | +4,49 | +0,37 | 01,99 | 03,69 | 183,84 | 00 | 07 |
| 08 | | +148 | +0,54 | -0,32 | -0,19 | +0,71 | +0,83 | 09,14 | 05,83 | 65,11 | 75491 | 08 |
| 09 | | +152 | +0,50 | -1,31 | -0,71 | +7,51 | +0,47 | 08,31 | 08,99 | 30,40 | 34408 | 09 |
| 10 | | +167 | +0,40 | -0,15 | +0,03 | +0,47 | +0,58 | 08,81 | 13,48 | 117,60 | 00 | 10 |
| 11 | | +180 | +0,35 | +0,65 | -0,39 | -1,69 | +0,46 | 09,78 | 13,83 | 5034,03 | 00 | 11 |

MP-TEMPERATUR:

----

| Z | H | P | T | TP | PT | HPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 2400 | 7598 | +09,6 | +03,5 | 3063 | 3171 | 04,80 | 03,76 | 40,1 | 01,6 | //// | 1,99 | 08,4 |
| 17 | 2074 | 7698 | +10,3 | +04,8 | 3055 | 3164 | 05,14 | 04,16 | 41,6 | 01,5 | //// | 1,99 | 08,3 |
| 18 | 2138 | 7793 | +10,7 | +05,5 | 3044 | 3165 | 06,35 | 05,04 | 40,3 | 01,8 | //// | 1,98 | 01,9 |
| 19 | 2000 | 7982 | +11,5 | +05,5 | 3043 | 3167 | 05,84 | 04,44 | 43,3 | 01,3 | //// | 1,98 | 08,0 |
| 20 | 1800 | 8107 | +15,7 | +05,9 | 3038 | 3151 | 05,64 | 04,34 | 38,3 | 01,4 | //// | 1,98 | 08,8 |
| 21 | 1870 | 8233 | +13,5 | +06,7 | 3031 | 3154 | 06,11 | 04,83 | 39,4 | 01,4 | //// | 1,98 | 08,1 |
| 22 | 1587 | 8309 | +13,9 | +07,1 | 3027 | 3153 | 06,35 | 04,77 | 39,3 | 01,3 | 00,5 | 2,50 | 01,9 |
| 23 | 1518 | 8379 | +14,4 | +06,7 | 3023 | 3164 | 08,20 | 06,11 | 50,6 | 01,1 | 00,5 | 2,06 | 01,6 |
| 24 | 1390 | 8493 | +14,4 | +09,5 | 3017 | 3169 | 08,90 | 06,54 | 52,8 | 00,9 | 00,5 | 1,60 | 01,5 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | +132 | , | , | , | , | , | 00,36 | 03,55 | , | | 16 |
| 17 | 136 | +110 | +0,45 | -0,24 | +7,13 | -0,56 | +0,54 | 08,84 | 03,64 | 467,72 | 00 | 17 |
| 18 | 111 | +115 | +0,38 | -1,30 | -0,38 | -7,40 | +0,63 | 04,17 | 05,19 | 16,60 | 17697 | 18 |
| 19 | 131 | +123 | +0,61 | +0,35 | +0,24 | +4,51 | +0,37 | 04,04 | 04,66 | 4655,35 | 00 | 19 |
| 20 | 200 | +134 | +0,40 | -0,12 | +0,15 | +2,79 | +0,33 | 01,33 | 03,69 | 10,37 | 00 | 20 |
| 21 | 183 | +173 | +0,74 | -0,32 | -0,23 | -0,64 | +0,35 | 04,04 | 04,17 | 147,79 | 00 | 21 |
| 22 | 082 | +177 | +0,75 | -0,27 | -0,16 | -5,53 | +0,69 | 08,18 | 05,30 | 84,47 | 25611 | 22 |
| 23 | 072 | +152 | +0,41 | -0,55 | -1,05 | +4,79 | +0,56 | 07,22 | 07,89 | 13,45 | 13633 | 23 |
| 24 | 115 | +159 | +0,51 | +0,77 | -0,37 | +1,40 | +0,66 | 08,32 | 06,02 | 78,38 | 93317 | 24 |

MP-FEUCHTIGKEIT:

----

Z-0786 30.09.1970    15.30 Uhr

6

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | HPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3000 | 7075 | +08,9 | +01,7 | 3061 | 3160 | 04,94 | 04,35 | 53,1 | 01,4 | //// | 1,78 | 08,8 |
| 02 | 2800 | 7195 | +09,5 | +05,5 | 3073 | 3134 | 05,34 | 04,65 | 54,9 | 01,3 | //// | 1,88 | [illegible] |
| 03 | 2600 | 7365 | +07,4 | +03,4 | 3084 | 3158 | 05,75 | [illegible] | [illegible] | [illegible] | //// | 1,58 | [illegible] |
| 04 | 2400 | 7540 | +08,4 | +04,1 | 3094 | 3158 | 05,88 | [illegible] | [illegible] | [illegible] | //// | 1,58 | [illegible] |
| 05 | 2200 | 7719 | +09,7 | +05,4 | 3080 | 3199 | 07,03 | [illegible] | [illegible] | [illegible] | //// | 1,58 | [illegible] |
| 06 | 2000 | 7908 | +10,7 | +06,3 | 3038 | 3190 | 07,85 | [illegible] | [illegible] | [illegible] | //// | 1,68 | [illegible] |
| 07 | 1800 | 8086 | +11,9 | +07,3 | 3048 | 3189 | 07,80 | [illegible] | [illegible] | [illegible] | //// | 1,68 | [illegible] |
| 08 | 1600 | 8279 | +12,5 | +09,4 | 3013 | 3817 | 10,30 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 09 | 1400 | 8471 | +13,7 | +10,8 | 3008 | 3880 | 10,93 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 10 | 1200 | 8671 | +14,6 | +11,5 | 2993 | 3880 | 11,68 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 11 | 1000 | 8876 | +15,6 | +11,0 | 2986 | 3206 | 11,91 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | +068 | , | , | , | , | , | 03,85 | 01,95 | , | | 01 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

MP-TEMPERATUR:

| Z | H | P | T | TP | PT | HPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

MP-FEUCHTIGKEIT:

----
----

Z-0787 30.09.1970    17.00 Uhr

7

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | HPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

MP-TEMPERATUR:

----
----
----

# Example $G_1$ 28 Sept. 1970

2

[illegible]

3

[illegible]

4

[illegible]

6

[illegible]

# Example $G_2$ 28 Sept. 1970

7

8

9

10

# Example H 26 Sept. 1970

③

HAUPT-NIVEAUS

| E | H | P | T | TP | PT | SPT | E | S | RF | +L | -L | +I- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| E | DH | TV | 0-T | 0-E | 0-S | 0-RF | 0-PT | I | N | A | D | E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

NP-TEMPERATUR:

....

④

HAUPT-NIVEAUS

NP-TEMPERATUR:

....

NP-LEITFAEHIGKEIT:

....

⑤

HAUPT-NIVEAUS:

NP-TEMPERATUR:

....

NP-LEITFAEHIGKEIT:

....

⑥

....

....

# Example J 17 Sept. 1970

## ①

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +\|- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3000 | 7150 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 8 | 2800 | 7878 | +08,4 | -04,7 | 893,6 | 303,6 | 01,44 | 01,48 | 86,3 | 08,4 | 00,0 | 7,09 | 00,5 |
| 3 | 2600 | 7440 | +08,9 | -04,8 | 894,5 | 301,8 | 01,61 | 01,39 | 84,4 | 08,8 | 00,0 | 8,11 | 08,3 |
| 4 | 2400 | 7480 | +08,8 | -08,8 | 893,3 | 300,7 | 03,38 | 08,71 | 53,5 | 00,8 | 00,0 | 9,18 | 00,9 |
| 5 | 2200 | 7815 | +08,1 | -01,9 | 893,8 | 308,8 | 03,87 | 03,09 | 90,8 | 00,1 | 00,0 | 1,88 | 00,7 |
| 6 | 2000 | 8008 | +01,9 | -00,5 | 893,1 | 308,7 | 04,90 | 03,97 | 64,3 | 00,3 | 00,0 | 7,32 | 00,7 |
| 7 | 1800 | 8190 | +03,3 | +00,3 | 898,8 | 308,0 | 04,68 | 03,51 | 90,6 | 00,6 | 00,0 | 7,63 | 00,7 |
| 8 | 1600 | 8298 | +04,7 | +01,3 | 898,1 | 301,6 | 04,88 | 03,98 | 94,4 | 00,6 | 00,1 | 4,01 | 00,7 |
| 9 | 1400 | 8398 | +06,8 | +08,5 | 891,9 | 301,6 | 05,88 | 03,88 | 98,9 | 00,6 | 00,4 | 1,50 | 01,0 |
| 1 | 1800 | 8605 | +07,7 | +03,9 | 890,8 | 308,1 | 06,10 | 04,38 | 90,5 | 00,8 | 00,8 | 1,14 | 01,0 |
| 8 | 1000 | 9018 | +08,8 | [illegible] | 889,8 | 301,4 | 06,45 | 04,47 | 90,3 | 00,5 | 00,4 | 0,88 | 01,1 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | +00,8 | , | , | , | , | , | 08,51 | 01,04 | , | | 1 |
| 8 | | +00,6 | +0,30 | -0,05 | +0,06 | +1,67 | +0,78 | 08,18 | 00,01 | 11,11 | 10881 | 8 |
| 3 | | +01,1 | +0,86 | +0,03 | +0,04 | +0,87 | +0,79 | -01,76 | 00,78 | 890,08 | 00 | 3 |
| 4 | | +00,6 | -0,37 | -0,91 | -0,78 | -8,38 | +1,47 | 01,44 | 04,16 | 0,98 | 471 | 4 |
| 5 | | +01,6 | +0,86 | -0,88 | -0,80 | -2,33 | +0,78 | -01,19 | 04,94 | 880,88 | 00 | 5 |
| 6 | | +08,5 | +0,63 | -0,38 | -0,88 | -8,38 | +0,38 | 00,69 | 04,88 | 1193,79 | 00 | 6 |
| 7 | | +03,8 | +0,74 | -0,01 | +0,03 | +0,48 | +0,87 | -00,65 | 03,88 | 90,38 | 98808 | 7 |
| 8 | | +08,3 | +0,73 | -0,11 | -0,04 | +1,66 | +0,87 | -00,98 | 04,38 | 40,84 | 48180 | 8 |
| 9 | | +07,0 | +0,89 | -0,14 | -0,06 | +1,80 | +0,11 | 01,38 | 03,88 | 67,78 | 64441 | 9 |
| 1 | | +08,0 | +0,47 | -0,98 | -0,38 | -3,43 | +0,84 | -01,89 | 03,34 | 4437,77 | 00 | 1 |
| 8 | | +08,9 | +0,47 | -0,19 | -0,08 | +0,13 | +0,84 | -08,08 | 03,67 | 1388,80 | 00 | 8 |

HP-TEMPERATUR:

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +\|- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8AG0 | 7440 | +00,9 | -04,4 | 896,1 | 301,8 | 01,61 | 01,38 | 84,4 | 08,8 | 00,0 | 8,11 | 08,3 |
| 8 | 6598 | 7360 | +01,0 | -03,8 | 897,0 | 301,8 | 08,04 | 01,48 | 30,8 | 01,7 | 00,0 | 0,07 | 01,8 |
| 3 | 8480 | 7489 | +00,8 | -08,8 | 893,3 | 308,7 | 03,38 | 08,71 | 53,1 | 00,8 | 00,0 | 9,18 | 00,9 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | +01,1 | , | , | , | , | , | 01,76 | 00,78 | , | | 1 |
| 8 | 0117 | +01,8 | +0,09 | +0,37 | -0,89 | -8,39 | +0,90 | 01,88 | 01,07 | 3,89 | 9606 | 8 |
| 3 | 0071 | +00,6 | +1,11 | +1,78 | -1,43 | -1,86 | +0,67 | 01,47 | 04,84 | 0,84 | 831 | 3 |

HP-FEUCHTIGKEIT:

....
....

## ②

E-0440 17.09.1970 13.00 UHR

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +\|- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3000 | 7150 | +00,0 | -05,8 | 303,7 | 304,1 | 00,1 | [illegible] | 08,0 | 08,8 | 00,0 | 4,85 | 08,8 |
| 8 | 2800 | 7873 | +08,6 | -05,8 | 318,0 | 308,5 | 00,1 | [illegible] | 01,5 | 08,3 | 00,0 | 5,87 | 08,4 |
| 3 | 2600 | 1440 | +08,9 | -04,8 | 300,3 | 308,1 | 00,80 | [illegible] | 10,8 | 08,0 | 00,0 | 3,88 | 08,1 |
| 4 | 2400 | 7480 | +03,0 | -01,3 | 898,4 | 305,7 | 03,3 | 08,71 | 48,4 | 01,0 | 00,0 | 8,13 | 01,1 |
| 5 | 2200 | 7815 | +03,7 | +00,9 | 897,1 | 300,0 | 05,01 | 04,05 | 63,8 | 00,8 | 00,0 | 7,83 | 00,7 |
| 6 | 2000 | 8004 | +04,8 | +01,8 | 896,0 | 307,4 | 05,41 | 04,86 | 64,5 | 00,6 | 00,0 | 7,63 | 00,7 |
| 7 | 1800 | 8197 | +04,1 | +08,7 | 895,6 | 306,9 | 95,97 | 04,84 | 90,1 | 00,7 | 00,0 | 6,01 | 00,8 |
| 8 | 1600 | 8398 | +07,8 | +03,5 | 895,4 | 306,1 | 05,48 | 04,04 | 51,8 | 00,8 | 00,3 | 6,03 | 01,0 |
| 9 | 1400 | 8808 | +08,4 | +04,8 | 895,0 | 306,9 | 05,97 | 04,34 | 50,7 | 00,8 | 00,4 | 1,51 | 01,1 |
| 1 | 1800 | 8800 | +10,8 | +05,4 | 894,5 | 305,3 | 05,88 | 04,13 | 44,9 | 00,6 | 00,4 | 1,88 | 01,1 |
| 8 | 1000 | 9010 | +18,6 | +06,6 | 894,6 | 305,5 | 06,17 | 04,87 | 47,8 | 00,5 | 00,5 | 0,98 | 01,1 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | +08,8 | , | , | , | , | , | 08,48 | 00,89 | , | | 1 |
| 8 | | +04,6 | +0,16 | +0,08 | -0,08 | +0,31 | +1,19 | 08,08 | 00,68 | 8,38 | 9835 | 8 |
| 3 | | +03,0 | +0,15 | +0,30 | -0,88 | -3,90 | +0,87 | -01,71 | 00,89 | 1897,88 | 00 | 3 |
| 4 | | +03,4 | +0,05 | +1,87 | -1,03 | -6,18 | +0,97 | 01,38 | 01,88 | 1,67 | 1778 | 4 |
| 5 | | +04,3 | +0,38 | +0,67 | -0,87 | -0,88 | +0,84 | 01,07 | 03,83 | 16,83 | 10788 | 5 |
| 6 | | +08,3 | +0,48 | +0,80 | +0,11 | -0,41 | +0,83 | -00,80 | 08,78 | 89,05 | [illegible] | 6 |
| 7 | | +08,8 | +0,75 | +0,05 | +0,01 | +8,68 | +0,81 | -00,85 | 01,89 | 84,83 | [illegible] | 7 |
| 8 | | +08,5 | +0,84 | +0,04 | +0,09 | +3,78 | +0,11 | -00,48 | 01,07 | 7,44 | 7485 | 8 |
| 9 | | +10,1 | +0,80 | -0,84 | -0,14 | +0,43 | +0,15 | -00,44 | 00,78 | 16,84 | 15648 | 9 |
| 1 | | +11,8 | +0,89 | +0,08 | +0,11 | +8,87 | +0,86 | -00,48 | 00,78 | 163,44 | 00 | 1 |
| 8 | | +13,3 | +0,89 | +0,17 | +0,07 | +1,38 | +0,06 | -00,41 | 00,68 | 608,91 | 00 | 8 |

HP-TEMPERATUR:

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +\|- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8800 | 7440 | +08,9 | -04,8 | 300,3 | 308,1 | 00,80 | 00,66 | 10,8 | 08,0 | 00,0 | 3,88 | 08,1 |
| 8 | 8408 | 7541 | +08,8 | -08,4 | 899,1 | 304,6 | 08,41 | 01,99 | 31,3 | 01,3 | 00,0 | 8,41 | 01,4 |
| 3 | 8401 | 7489 | +03,0 | -01,3 | 898,4 | 305,7 | 03,31 | 08,71 | 48,4 | 01,0 | 00,0 | 8,13 | 01,1 |
| 4 | 8098 | 7723 | +03,9 | -00,1 | 897,3 | 307,1 | 04,47 | 03,61 | 57,3 | 00,7 | 00,0 | 8,88 | 00,8 |
| 5 | 8800 | 7812 | +03,7 | +00,9 | 897,1 | 308,0 | 05,07 | 04,05 | 83,6 | 00,6 | 00,0 | 7,83 | 00,7 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | +03,0 | , | , | , | , | , | 01,71 | 00,69 | , | | 1 |
| 8 | 0108 | +03,1 | +0,10 | -1,58 | -1,89 | +0,61 | +1,13 | 01,58 | 01,38 | 0,88 | 937 | 8 |
| 3 | 0098 | +03,4 | +0,81 | -0,84 | -0,74 | -1,49 | +0,87 | 01,38 | 01,88 | 4,85 | 4909 | 3 |
| 4 | 0108 | +03,6 | +0,90 | -1,14 | -0,89 | -4,57 | +1,08 | 01,81 | 03,18 | 3,83 | 3893 | 4 |
| 5 | 0098 | +04,3 | +0,71 | -0,61 | -0,44 | -4,41 | +0,88 | 01,07 | 03,53 | 44,81 | 88947 | 5 |

HP-FEUCHTIGKEIT:

....
....

## ③

E-0441 17.09.1970 18.15 UHR

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +\|- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3000 | 7180 | +08,9 | -04,8 | 304,8 | 308,3 | 00,45 | 00,40 | 08,8 | 08,4 | 00,0 | 7,40 | 08,8 |
| 8 | 2800 | 7841 | +03,0 | -04,8 | 300,8 | 303,7 | 00,34 | 00,89 | 04,4 | 08,5 | 00,0 | 8,84 | 08,6 |
| 3 | 2600 | 7416 | +03,1 | -01,9 | 300,9 | 307,3 | 08,76 | 08,38 | 35,1 | 01,8 | 00,0 | 0,53 | 01,9 |
| 4 | 2400 | 7895 | +03,3 | +00,8 | 890,1 | 310,7 | 05,88 | 04,88 | 67,3 | 00,8 | 00,0 | 9,08 | 00,9 |
| 5 | 2200 | 7778 | +04,8 | +00,9 | 898,6 | 308,4 | 04,51 | 03,68 | 88,4 | 00,9 | 00,0 | 0,15 | 01,0 |
| 6 | 2000 | 7964 | +05,8 | +08,9 | 897,7 | 310,3 | 05,00 | 04,70 | 65,0 | 00,7 | 00,0 | 7,78 | 00,7 |
| 7 | 1800 | 8194 | +06,9 | +03,6 | 896,9 | 309,4 | 06,13 | 04,89 | 61,5 | 00,6 | 00,0 | 7,85 | 00,7 |
| 8 | 1600 | 8348 | +07,7 | +04,6 | 898,7 | 308,1 | 06,77 | 08,06 | 64,4 | 00,6 | 00,8 | 8,91 | 00,8 |
| 9 | 1400 | 8548 | +09,3 | +05,4 | 893,4 | 308,4 | 06,76 | 04,94 | 57,7 | 00,6 | 00,4 | 1,88 | 01,0 |
| 1 | 1800 | 8751 | +10,8 | +06,3 | 894,4 | 308,0 | 07,89 | 05,80 | 58,5 | 00,5 | 00,4 | 1,88 | 00,9 |
| 8 | 1000 | 8960 | +10,9 | +04,9 | 293,1 | 304,8 | 07,98 | 05,88 | 58,1 | 00,5 | 00,6 | 0,78 | 01,1 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | +08,9 | , | , | , | , | , | 08,45 | 00,77 | , | | 1 |
| 8 | | +02,0 | +0,07 | +0,08 | +0,07 | +1,03 | +0,96 | 08,08 | 00,61 | 9,48 | 10506 | 8 |
| 3 | | +03,4 | +0,05 | -1,81 | -1,01 | -5,36 | +0,98 | 01,70 | 00,98 | 6,64 | 7855 | 3 |
| 4 | | +04,C | +0,10 | -1,83 | -0,98 | -4,13 | +0,9 | 01,38 | 03,38 | 1,51 | 1615 | 4 |
| 5 | | +05,4 | +0,78 | +0,35 | +0,33 | +7,46 | +0,91 | 01,09 | 08,37 | 96,93 | 88178 | 5 |
| 6 | | [illegible] | [illegible] | +0,14 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 57,91 | [illegible] | |
| 7 | | +07,7 | +0,85 | +0,07 | +0,01 | [illegible] | +0,42 | [illegible] | 08,34 | [illegible] | 96138 | 7 |
| 8 | | +08,5 | +0,40 | +0,38 | +0,19 | +1,48 | [illegible] | [illegible] | [illegible] | 84,84 | 84496 | 8 |
| 9 | | +10,1 | +0,79 | +0,00 | +0,06 | +3,30 | +0,16 | -00,48 | 01,09 | 18,88 | 15399 | 9 |
| 1 | | +11,1 | +0,45 | -0,86 | +0,13 | -0,48 | +0,51 | 00,43 | 01,08 | 0,01 | 00 | 1 |
| 8 | | +11,8 | +0,34 | -0,14 | +0,04 | +0,88 | +0,68 | 00,48 | 00,69 | 7,78 | 7110 | 8 |

HP-TEMPERATUR:

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +\|- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8738 | 7300 | + 0,9 | -04,8 | 308,0 | 304,1 | 00,87 | 00,74 | 11,1 | 09,1 | 00,0 | 3,66 | 08,8 |
| 8 | 8599 | 7416 | + ,1 | -01,9 | 300,9 | 307,3 | 08,76 | 08,38 | 35,1 | 01,8 | 00,0 | 0,53 | 01,9 |
| 3 | 2548 | 7468 | +0 9 | -00,8 | 300,1 | 310,4 | 08,48 | 03,74 | 57,8 | 00,7 | 00,0 | 8,39 | 00,8 |
| 4 | 8506 | 7499 | +0 | +00,1 | 899,7 | 310,5 | 04,76 | 03,94 | 63,8 | 00,8 | 00,0 | 9,38 | 00,9 |
| 5 | 8430 | 7595 | +03, | +00,8 | 899,1 | 310,7 | 05,88 | 04,88 | 67,3 | 00,8 | 00,0 | 9,08 | 00,9 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | +03,0 | , | , | , | , | , | 01,93 | 00,74 | , | | 1 |
| 8 | 0138 | +03,4 | +0,15 | -1,44 | -1,80 | -8,13 | +0,86 | 01,68 | 00,91 | 30,74 | 33468 | 8 |
| 3 | 0051 | +03,5 | -0,39 | -3,31 | -8,74 | -3,88 | +1,44 | 01,40 | 04,40 | 0,08 | 88 | 3 |
| 4 | 0041 | +03,5 | +0,00 | -0,69 | -0,53 | -3,18 | +1,02 | 01,53 | 03,49 | 4,75 | 3084 | 4 |
| 5 | 0198 | +04,0 | +0,38 | -0,43 | -0,30 | -3,83 | +0,61 | 01,38 | 03,38 | 1580,88 | 00 | 5 |

HP-FEUCHTIGKEIT:

....
....

## ④

E-0448 17.09.1970 16.85 UHR

HAUPT-NIVEAUS:

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +\|- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3000 | 7108 | +08,9 | -08,4 | 304,4 | 303,9 | 00,19 | 00,16 | 08,4 | 08,8 | 00,0 | 4,80 | 08,3 |
| 8 | 2800 | 7888 | +03,4 | -04,8 | 303,4 | 303,8 | 00,14 | 00,14 | 01,9 | 08,3 | 00,0 | 4,33 | 08,4 |
| 3 | 2600 | 7404 | +03,8 | -03,3 | 301,8 | 304,5 | 01,16 | 00,97 | 13,9 | 01,8 | 00,0 | 1,06 | 01,9 |
| 4 | 2400 | 7484 | +03,4 | +00,8 | 899,8 | 310,8 | 04,78 | 03,93 | 60,4 | 00,8 | 00,0 | 8,93 | 00,8 |
| 5 | 2200 | 7789 | +04,8 | +08,4 | 898,4 | 311,8 | 04,18 | 04,96 | 73,3 | 00,5 | 00,0 | 4,18 | 00,6 |
| 6 | 2000 | 7957 | +05,8 | +08,7 | 897,8 | 310,0 | 05,79 | 04,54 | 68,9 | 00,6 | 00,0 | 7,55 | 00,7 |
| 7 | 1800 | 8149 | +06,8 | +04,0 | 896,8 | 310,3 | 06,68 | 05,07 | 67,0 | 00,5 | 00,0 | 6,03 | 00,6 |
| 8 | 1600 | 8346 | +07,7 | +04,9 | 895,7 | 309,8 | 07,18 | 05,38 | 67,6 | 00,5 | 00,1 | 3,88 | 00,7 |
| 9 | 1400 | 8546 | +09,0 | +05,9 | 895,1 | 309,8 | 07,53 | 05,80 | 65,6 | 00,5 | 00,3 | 1,44 | 00,8 |
| 1 | 1800 | 8751 | +10,8 | +06,6 | 894,4 | 308,6 | 07,84 | 05,46 | 61,5 | 00,4 | 00,3 | 1,84 | 00,8 |
| 8 | 1000 | 8960 | +11,3 | +07,3 | 893,5 | 307,7 | 07,86 | 05,47 | 58,6 | 00,5 | 00,4 | 1,08 | 01,0 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | +02,8 | , | , | , | , | , | 08,45 | 00,61 | , | | 1 |
| 8 | | +03,4 | +0,35 | -0,88 | +0,81 | -3,08 | +0,66 | 08,07 | 00,46 | 5,08 | 5618 | 2 |
| 3 | | +03,9 | +0,80 | -0,50 | -0,48 | +5,98 | +0,88 | 01,78 | 00,48 | 14,64 | 16069 | 3 |
| 4 | | +04,8 | -0,10 | -1,81 | +1,48 | -3,30 | +1,14 | 01,41 | 08,33 | 0,90 | 963 | 4 |
| 5 | | +05,3 | +0,45 | -0,70 | -0,58 | -6,46 | +0,94 | 01,13 | 03,49 | 81,75 | 88786 | 5 |
| 6 | | +06,5 | +0,65 | +0,80 | +0,81 | +5,33 | +0,38 | -00,88 | 08,10 | 14,07 | 14471 | 6 |
| 7 | | +07,6 | +0,50 | -0,48 | -0,87 | +8,14 | +0,48 | 00,65 | 00,58 | 135,18 | 00 | 7 |
| 8 | | +08,6 | +0,45 | -0,85 | -0,18 | +0,34 | +0,54 | -00,57 | 01,78 | 31,46 | 31033 | 8 |
| 9 | | +09,9 | +0,65 | -0,81 | -0,09 | +1,08 | +0,38 | -00,80 | 01,04 | 7,05 | 7771 | 9 |
| 1 | | +11,1 | +0,60 | -0,06 | +0,08 | +8,08 | +0,37 | 00,46 | 01,11 | 449,04 | 00 | 1 |
| 8 | | +18,8 | +0,85 | -0,10 | -0,00 | +1,65 | +0,48 | 00,44 | 00,66 | 5,60 | 5805 | 8 |

HP-TEMPERATUR:

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +\|- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8800 | [illegible] | +03,4 | +04,8 | 303,4 | 303,8 | 00,16 | 00, | | | 00,0 | 8,33 | 08,4 |
| 8 | 8717 | 7300 | +03,8 | -04,8 | 303,0 | 304,0 | 00,43 | 00,37 | 05,1 | 08,3 | 00,0 | 6,18 | 08,4 |
| 3 | 8646 | 7363 | +03,8 | -03,8 | 308,3 | 304,0 | 00,74 | 00,63 | 08,9 | 08,1 | 00,0 | 4,87 | 08,8 |
| 4 | 8548 | 7450 | +03,7 | -01,8 | 301,8 | 307,0 | 08,55 | 08,13 | 30,8 | 01,4 | 00,0 | 5,64 | 01,4 |
| 5 | 8485 | 7585 | +03,8 | +00,1 | 899,7 | 310,8 | 04,41 | 03,88 | 59,9 | 00,8 | 00,0 | 9,98 | 00,9 |
| 6 | 8400 | 7584 | +03,6 | +00,5 | 899,5 | 310,8 | 04,78 | 03,93 | 60,4 | 00,8 | 00,0 | 8,93 | 00,8 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | +03,4 | , | , | , | , | , | 08,07 | 00,46 | , | | 1 |
| 8 | 0088 | +03,8 | +0,49 | -0,33 | -0,88 | -3,69 | +0,51 | 01,90 | 00,43 | 88,43 | 84798 | 8 |
| 3 | 0071 | +03,9 | +0,00 | -0,43 | -0,36 | -5,88 | +1,04 | 01,79 | 00,46 | 15,03 | 16469 | 3 |
| 4 | 0097 | +04,0 | +0,10 | -1,65 | -1,54 | -8,51 | +1,15 | 01,66 | 00,96 | 0,46 | 500 | 4 |
| 5 | 0083 | +03,8 | +0,60 | -1,48 | -8,03 | -4,96 | +1,49 | 01,50 | 08,03 | 0,65 | 698 | 5 |
| 6 | 0084 | +04,8 | +0,68 | -0,86 | -0,17 | -0,78 | +0,36 | 01,41 | 08,33 | 19,75 | 80977 | 6 |

HP-FEUCHTIGKEIT:

....

| Z | H | P | T | TP | PT | EPT | E | S | RF | +L | -L | +\|- | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8488 | 7510 | +03,1 | +00,1 | 899,8 | 310,4 | 04,66 | 03,87 | 61,0 | 00,9 | 00,0 | 0,30 | 01,0 |
| 8 | 8845 | 7787 | +04,3 | +08,8 | 898,7 | 318,0 | 06,09 | 04,91 | 73,8 | 00,5 | 00,0 | 6,33 | 00,6 |

| Z | DH | TV | G-T | G-E | G-S | G-RF | G-PT | I | N | A | D | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | +03,7 | , | , | , | , | , | 01,53 | 01,93 | , | | 1 |
| 8 | 0936 | +05,1 | +0,51 | -0,60 | +0,44 | -5,18 | +0,48 | 01,18 | 03,67 | 14,15 | 14918 | 2 |

## 4. Tables I - XII

## TABLE I

**RaB in air; units: $10^{-12} \mu c/cm^3$**

**Station designations:** Z Zugspitze 2964 m a.s.l.
W Wank 1780 m a.s.l.
G Garmisch-Partenkirchen 730 m a.s.l.

**Measurement periods :** a = 2150 - 0920, b = 0950 - 1220,
c = 1250 - 1620. (Central European Time)

Month: <u>July 1970</u> ("No measurement" is denoted by: - )

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | 8,5 | 7 | 130 | 14,2 | 16 | 82 | 7,9 | 61 | 85 |
| 2. | - | 57 | 233 | 12,2 | 24 | 64 | 14,8 | - | 58 |
| 3. | 8,1 | 28 | 108 | 8,8 | 16 | 43 | 7,1 | 10 | 37 |
| 4. | 3,3 | 18 | 130 | 1,9 | 11 | 46 | 3,9 | 17 | 57 |
| 5. | - | - | 171 | - | - | 54 | - | - | - |
| 6. | 4,2 | - | 263 | 4,9 | 57 | 145 | 17,5 | 64 | 92 |
| 7. | 4,1 | 49 | 299 | 20,4 | 109 | 160 | 60,6 | 108 | 150 |
| 8. | 5,8 | 116 | 256 | 71,7 | 145 | 237 | 90,3 | 154 | 229 |
| 9. | - | 75 | 194 | 55,9 | 76 | 128 | 31,8 | 11 | 57 |
| 10. | 32,7 | 90 | 304 | 58,7 | 81 | 116 | 62,9 | 81 | 86 |
| 11. | 100,3 | 135 | 333 | 86,5 | 146 | 151 | 92,8 | 90 | 129 |
| 12. | - | - | 268 | - | - | 115 | - | - | - |
| 13. | 49,7 | 150 | - | 80,9 | 171 | 228 | 96,2 | 141 | 189 |
| 14. | 65,5 | 87 | 313 | 68,2 | 113 | 180 | 66,9 | 103 | 131 |
| 15. | 3,7 | 4 | 35 | 2,5 | 7 | 39 | 1,5 | 10 | 53 |
| 16. | 3,2 | 7 | 80 | 1,3 | 4 | 58 | 0,8 | - | 38 |
| 17. | 1,7 | 2 | 54 | 0,5 | 4 | 50 | 0,6 | - | 46 |
| 18. | 2,6 | 15 | 180 | 7,7 | 35 | 93 | 5,4 | 21 | 53 |
| 19. | - | - | 172 | - | - | 88 | - | - | - |
| 20. | 75,1 | - | 306 | 99,9 | 157 | 208 | 93,2 | 168 | 153 |
| 21. | 63,7 | 63 | 148 | 79,3 | 77 | 135 | 55,9 | 86 | 89 |
| 22. | 69,7 | 156 | 336 | 64,0 | 150 | 200 | 85,1 | 113 | 138 |
| 23. | 68,3 | 107 | 320 | 78,3 | 157 | 291 | 114,2 | 105 | 147 |
| 24. | 75,8 | 75 | 200 | 84,4 | 126 | - | 88,2 | 104 | 183 |
| 25. | 1,6 | 14 | - | 1,6 | 9 | - | 1,2 | 14 | 38 |
| 26. | - | - | - | - | - | 38 | - | - | - |
| 27. | 1,4 | 15 | 173 | 2,1 | 15 | 128 | 3,4 | 23 | 113 |
| 28. | 5,2 | 74 | 316 | 13,3 | 46 | 190 | 69,3 | 108 | 186 |
| 29. | 77,4 | 68 | 307 | 111,4 | 110 | 131 | 17,6 | 32 | 96 |
| 30. | 49,3 | 97 | 304 | 58,1 | 150 | 213 | 73,1 | 118 | 152 |
| 31. | 44,2 | 89 | 240 | 55,2 | 126 | 184 | 65,4 | 46 | - |

## TABLE II

**RaB in air; units: $10^{-12}\mu c/cm^3$**

**Station Designations:** **Z** **Zugspitze** **2964 m a.s.l.**
**W** **Wank** **1780 m a.s.l.**
G Garmisch-Partenkirchen 730 m a.s.l.

Measurement periods : a = 2150 - 0920, b = 0950 - 1220,
c = 1250 - 1620. (Central European Time)

Month: <u>August 1970</u> ("No measurement" is denoted by: - )

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | 22,1 | 49 | 297 | 40,5 | 112 | 246 | 51,2 | 44 | 65 |
| 2. | - | - | - | - | - | 174 | - | - | - |
| 3. | 31,8 | 101 | - | 63,2 | 111 | - | 67,2 | 77 | - |
| 4. | 38,8 | 69 | 286 | 41,0 | 36 | 148 | 70,4 | 108 | 145 |
| 5. | 110,3 | 147 | 359 | 99,8 | 125 | 143 | 89,7 | 82 | - |
| 6. | 71,3 | 160 | 333 | 76,2 | 166 | 268 | 97,0 | 137 | 191 |
| 7. | 142,6 | 107 | 349 | 87,5 | 95 | 188 | 73,0 | 94 | - |
| 8. | 50,4 | 49 | 242 | 45,6 | 87 | 120 | 25,2 | 48 | 96 |
| 9. | - | - | 161 | - | - | 130 | - | - | - |
| 10. | 1,5 | - | 569 | 1,6 | 4 | 338 | - | 7 | 431 |
| 11. | 0,3 | 32 | 466 | - | 58 | 174 | - | 26 | 112 |
| 12. | 2.7 | 18 | 165 | 10,7 | 50 | 107 | 46,6 | 56 | - |
| 13. | 28,4 | 98 | - | 39,8 | 105 | - | 78,5 | 122 | 132 |
| 14. | 83,7 | 107 | 388 | 73,5 | 136 | 200 | 53,4 | 77 | 100 |
| 15. | - | - | - | - | - | - | - | - | - |
| 16. | - | - | - | - | - | - | - | - | - |
| 17. | 28,3 | 98 | 268 | 0,8 | 17 | 153 | 3,6 | 18 | 109 |
| 18. | 15,6 | 67 | 215 | 13,3 | 103 | 169 | 40,0 | 99 | 133 |
| 19. | 70,5 | 172 | 426 | 85,6 | 232 | 295 | 105,0 | 154 | 134 |
| 20. | 77,8 | 110 | 449 | 101,7 | 132 | 150 | 53,7 | 23 | 110 |
| 21. | 3,8 | 10 | 90 | 4,4 | 9 | 66 | - | 9 | 61 |
| 22. | 5,1 | 25 | 151 | 7,8 | 35 | 93 | 28,6 | 41 | 68 |
| 23. | - | - | 258 | - | - | 109 | - | - | - |
| 24. | - | - | 194 | 1,7 | 20 | 243 | 1,2 | 19 | 102 |
| 25. | 21,9 | 62 | 304 | 19,9 | 91 | 158 | 35,3 | 76 | 93 |
| 26. | 15,5 | 101 | 306 | 24,1 | 128 | 207 | 82,2 | 86 | 117 |
| 27. | 72,0 | 100 | 382 | 78,3 | 104 | 203 | 86,3 | 125 | 189 |
| 28. | 28,3 | 48 | 217 | 50,7 | 58 | 130 | 82,6 | 70 | 153 |
| 29. | 75,2 | 115 | 318 | 94,5 | 140 | 240 | 87,4 | 156 | 210 |
| 30. | - | - | 503 | - | - | 174 | - | - | - |
| 31. | 33,1 | - | 306 | 36,0 | 121 | 198 | 39,5 | 101 | 133 |

## TABLE III

**RaB in air; units:** $10^{-12}\mu c/cm^3$

**Station Designations:**
- Z Zugspitze 2964 m a.s.l.
- W Wank 1780 m a.s.l.
- G Garmisch-Partenkirchen 730 m a.s.l.

**Measurement periods :** a = 2150 - 0920, b = 0950 - 1220, c = 1250 - 1620. (Central European Time)

Month: <u>September 1970</u> ("No measurement" is denoted by: - )

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | 8,3 | 56 | 535 | 3,7 | 33 | 117 | 4,8 | 85 | 198 |
| 2. | 38,4 | 80 | 167 | 45,5 | 114 | 154 | 88,5 | 129 | 12[illegible] |
| 3. | 76,4 | 124 | 448 | 104,4 | 127 | 250 | 60,8 | 123 | 247 |
| 4. | 2,4 | 41 | 279 | 3,7 | 22 | 67 | 13,2 | 30 | 59 |
| 5. | 2,7 | 22 | 342 | - | 4 | 114 | 1,4 | 16 | 61 |
| 6. | - | - | 92 | - | - | 57 | - | - | - |
| 7. | 3,1 | 40 | 136 | 10,4 | 54 | 115 | 26,4 | 82 | 81 |
| 8. | 65,6 | 120 | 276 | 44,5 | 131 | 230 | 84,7 | 153 | 160 |
| 9. | 67,9 | 136 | 279 | 69,7 | 181 | 255 | 121,5 | 163 | 158 |
| 10. | 54,0 | 112 | 301 | 59,7 | 101 | 157 | 50,9 | 91 | 181 |
| 11. | 63,2 | 91 | 326 | 62,8 | 65 | 105 | 15,4 | 12 | 75 |
| 12. | 37,8 | 20 | 88 | 51,8 | 35 | 104 | 65,3 | 47 | 99 |
| 13. | - | - | 107 | - | - | 44 | - | - | - |
| 14. | 29,4 | 58 | 258 | 26,3 | 153 | 160 | 63,4 | 101 | 103 |
| 15. | 83,7 | - | 394 | 124,8 | 131 | 208 | 138,7 | 156 | 159 |
| 16. | 4,3 | 16 | 74 | 2,3 | 11 | 84 | 1,8 | 12 | 37 |
| 17. | 6,3 | 38 | 235 | 3,5 | 28 | 53 | 1,7 | 33 | 59 |
| 18. | 5,5 | 26 | 275 | 11,1 | 53 | 184 | 24,0 | 83 | 124 |
| 19. | 27,3 | 108 | 380 | 26,9 | 177 | 376 | 43,9 | 193 | 318 |
| 20. | - | - | 504 | - | - | 237 | - | - | - |
| 21. | 8,0 | 46 | 527 | 1,6 | 92 | 150 | - | 91 | 134 |
| 22. | 1,6 | 48 | 697 | 12,4 | 143 | 201 | 36.8 | 94 | 119 |
| 23. | 4,8 | 89 | 273 | 5,9 | 117 | 153 | 56,3 | 84 | 122 |
| 24. | 8,4 | 84 | 410 | 0,9 | 109 | 201 | 24,3 | 132 | 167 |
| 25. | 2,6 | 10 | 331 | 5,6 | 70 | 175 | 14,3 | 61 | 133 |
| 26. | 5,4 | 41 | 401 | 3,2 | 138 | 230 | 31,2 | 170 | 164 |
| 27. | - | - | 419 | - | - | 257 | - | - | - |
| 28. | 5,8 | 19 | 311 | 6,6 | 74 | 265 | 22,3 | 144 | 211 |
| 29. | 13,6 | 64 | 384 | 36,2 | 109 | 315 | 64,3 | 200 | 333 |
| 30. | 5,9 | 44 | 329 | 12,8 | 50 | 200 | 41,6 | 146 | 226 |

## TABLE IV

**RaB in air; units $10^{-12} \mu c/cm^3$**

**Station Designations:** **Z Zugspitze** **2964 m a.s.l.**
**W Wank** **1780 m a.s.l.**
**G Garmisch-Partenkirchen** **730 m a.s.l.**

Measurement periods : **a** = 2150 - 0920, **b** = 0950 - 1220,
**c** = 1250 - 1620. **(Central European Time)**

Month: <u>October 1970</u> **("No measurement" is denoted by: - )**

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | - | 4 | 130 | - | 6 | 47 | - | 2 | 53 |
| 2. | 1,7 | 16 | 99 | 0,2 | 9 | 96 | 0,1 | 8 | 34 |
| 3. | 2,7 | 3 | 45 | 0,9 | - | 35 | 2,4 | 2 | 15 |
| 4. | - | - | 59 | - | - | 56 | - | - | - |
| 5. | 1,1 | 11 | 175 | 0,6 | 11 | 145 | 0,9 | 27 | 126 |
| 6. | 15,5 | 22 | 190 | 20,6 | 74 | 143 | 50,3 | 103 | 174 |
| 7. | 24,8 | 86 | 210 | 29,3 | 77 | 107 | 65,6 | 80 | 109 |
| 8. | 40,3 | 43 | 251 | 26,3 | 61 | 245 | 34,8 | 50 | 294 |
| 9. | 40,7 | 49 | 631 | 40,5 | 40 | 410 | 45,9 | 74 | 401 |
| 10. | 27,7 | 71 | 276 | 28,6 | 74 | 123 | 52,8 | 103 | 392 |
| 11. | - | - | 359 | - | - | 653 | - | - | - |
| 12. | 12,4 | 51 | 238 | 9,9 | 124 | 431 | 14,0 | 155 | 399 |
| 13. | 8,8 | 84 | 407 | 7,0 | 112 | 382 | 15,9 | 168 | 270 |
| 14. | 16,4 | 65 | 727 | 20,2 | 232 | 373 | 46,4 | 192 | 392 |
| 15. | 4,7 | 78 | 268 | 5,4 | 150 | 200 | 5,7 | 34 | 141 |
| 16. | 7,4 | 61 | 412 | 9,9 | 82 | 322 | 16,7 | 78 | 141 |
| 17. | 6,8 | 61 | 700 | 4,4 | 79 | 361 | 16,6 | 145 | 354 |
| 18. | - | - | 395 | - | - | 464 | - | - | - |
| 19. | 11,8 | 18 | 297 | 13,6 | 31 | 282 | 19,6 | 69 | 203 |
| 20. | 13,1 | 11 | 71 | 6,0 | 4 | 136 | 8,7 | 3 | 171 |
| 21. | 18,9 | 25 | 159 | 5,2 | 21 | 74 | 4,1 | 20 | 74 |
| 22. | 11,1 | 32 | 226 | 14,7 | 19 | 63 | 13,4 | 40 | 96 |
| 23. | - | 7 | 129 | 3,5 | 3 | 57 | 3,2 | 4 | 18 |
| 24. | 14,2 | 23 | 175 | 9,6 | 61 | 112 | 12,9 | 69 | 102 |
| 25. | - | - | 221 | - | - | 117 | - | - | - |
| 26. | - | 9 | - | 2,3 | 10 | 345 | 6,6 | 36 | 200 |
| 27. | 13,3 | 44 | 493 | 13,4 | 33 | 345 | 16,4 | 105 | 193 |
| 28. | 7,2 | 38 | 487 | 6,0 | 66 | 264 | 16,1 | 60 | 169 |
| 29. | 3,4 | 17 | 302 | 0,8 | 9 | 138 | 2,0 | 7 | 149 |
| 30. | 6,5 | 15 | 286 | 2,5 | 35 | 208 | 8,4 | 25 | 205 |
| 31. | 7,6 | 13 | 208 | 7,3 | 18 | 305 | 14,6 | 21 | 252 |

# TABLE V

Station Designations: Z Zugspitze 2964 m a.s.l.
W Wank 1780 m a.s.l.
G Garmisch-Partenkirchen 730 m a.s.l.

Measurement periods : a = 2150 - 0920, b = 0950 - 1220, c = 1250 - 1620. (Central European Time)

Month: November 1970 ("No measurement" is denoted by: - )

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | - | - | 221 | - | - | 145 | - | - | - |
| 2. | 4,8 | 10 | 271 | 9,8 | 7 | 82 | 12,0 | 10 | 56 |
| 3. | 14,4 | 22 | 276 | 11,6 | 9 | 35 | 12,2 | 11 | 34 |
| 4. | 26,9 | 51 | 319 | 19,4 | 65 | 129 | 24,8 | 77 | 134 |
| 5. | 7,0 | 15 | 416 | 8,3 | 10 | 196 | 4,2 | 5 | 36 |
| 6. | 14,2 | 9 | 54 | 4,5 | 8 | 41 | 9,3 | 16 | 58 |
| 7. | 20,1 | 65 | 384 | 19,7 | 125 | 320 | 49,5 | 193 | 289 |
| 8. | - | - | 446 | - | - | 383 | - | - | - |
| 9. | 35,2 | 48 | 484 | 15,2 | 47 | 373 | 13,5 | 29 | 91 |
| 10. | 10,8 | 17 | 64 | 8,6 | 14 | 45 | 7,8 | 13 | 46 |
| 11. | 4,7 | 28 | 334 | 2,6 | 25 | 196 | 2,3 | 6 | 270 |
| 12. | 11,0 | 30 | 366 | 11,4 | 41 | 222 | 17,7 | 83 | 177 |
| 13. | 82,9 | 83 | 415 | 80,1 | 136 | 241 | 86,8 | 116 | 183 |
| 14. | 65,3 | 88 | 521 | 61,1 | 136 | 310 | 67,8 | 26 | 263 |
| 15. | - | - | 211 | - | - | 91 | - | - | - |
| 16. | 7,9 | 5 | 109 | 10,3 | 4 | 78 | 17,0 | 7 | 79 |
| 17. | 3,3 | 21 | 315 | 1,3 | 10 | 228 | 0,7 | 2 | 227 |
| 18. | 16,6 | 36 | 327 | 18,5 | 70 | 291 | 28,1 | 78 | 245 |
| 19. | 32,2 | 32 | 302 | 39,4 | 29 | 209 | 48,1 | 70 | 146 |
| 20. | 11,7 | 10 | 193 | 10,6 | 7 | 189 | 9,3 | 28 | 99 |
| 21. | 45,8 | - | 384 | 57,9 | - | 174 | 44,3 | - | 61 |
| 22. | - | - | 194 | - | - | 86 | - | - | - |
| 23. | 3,4 | 19 | 306 | 2,9 | 14 | 145 | - | 23 | 146 |
| 24. | 2,8 | 7 | 236 | 1,9 | 5 | 188 | 1,3 | 5 | 209 |
| 25. | 4,7 | 22 | 245 | 3,6 | 16 | 189 | 1,3 | 83 | 294 |
| 26. | 5,9 | 11 | 285 | 0,3 | 25 | 271 | - | 47 | 247 |
| 27. | 3,4 | 24 | 551 | 0,7 | 40 | 308 | 0,4 | 61 | 403 |
| 28. | 2,9 | - | 202 | 2,1 | - | 187 | 23,5 | - | 158 |
| 29. | - | - | 197 | - | - | 340 | - | - | - |
| 30. | 57,7 | 33 | 546 | 7,6 | 5 | 620 | 7,2 | 14 | 261 |

# TABLE VI

Station Designation: Z Zugspitze 2964 m a.s.l.
W Wank 1780 m a.s.l.
G Garmisch-Partenkirchen 730 m a.s.l.

Measurement periods: a = 2150 - 0920, b = 0950 - 1220.
b = 1250 - 1620. (Central European Time)

Month: December 1970 ("No measurement" is denoted by: - )

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | 22,9 | 70 | 350 | 24,9 | 85 | 292 | 55,4 | 92 | 315 |
| 2. | 6,7 | 9 | 285 | 7,5 | 18 | 175 | 7,5 | 22 | 146 |
| 3. | 10,9 | 27 | 279 | - | 21 | 224 | - | 4 | 135 |
| 4. | - | 11 | 233 | 4,1 | 15 | 250 | - | - | 181 |
| 5. | 15,0 | - | 317 | 4,7 | - | 371 | 2,1 | - | 59 |
| 6. | - | - | 343 | - | - | 183 | - | - | - |
| 7. | 57,0 | - | 505 | 73,9 | 85 | 648 | 74,6 | 226 | 333 |
| 8. | 42,0 | 23 | 187 | 38,7 | 23 | 205 | 9,4 | 72 | 233 |
| 9. | 3,2 | 17 | 513 | 1,3 | 10 | 397 | 1,5 | 10 | 401 |
| 10. | 2,9 | 6 | 746 | 0,2 | 12 | 672 | - | 38 | 551 |
| 11. | 3,1 | 16 | 1045 | 1,6 | 13 | 557 | 1,4 | 36 | 509 |
| 12. | 6,8 | 49 | 239 | 6,1 | 23 | 228 | 9,7 | 33 | 344 |
| 13. | - | - | 317 | - | - | 570 | - | - | - |
| 14. | 17,6 | 142 | 824 | 14,2 | 148 | 825 | 30,7 | 140 | 750 |
| 15. | 32,3 | 10 | 173 | 5,4 | 12 | 108 | 16,3 | 15 | 102 |
| 16. | - | 11 | 257 | 2,1 | 16 | 332 | 3,2 | 27 | 234 |
| 17. | 2,4 | 7 | 804 | 0,9 | 9 | 830 | - | 50 | 630 |
| 18. | 7,8 | 16 | 686 | 5,6 | 17 | 670 | 7,4 | 33 | 430 |
| 19. | 5,8 | 54 | 429 | 5,3 | 74 | 378 | 3,6 | 105 | 280 |
| 20. | - | - | 554 | - | - | 715 | - | - | - |
| 21. | 2,7 | 15 | 555 | 1,4 | 26 | 685 | 6,5 | 16 | 485 |
| 22. | 11,3 | 6 | 88 | 8,9 | 14 | 84 | 18,7 | 16 | 102 |
| 23. | 20,4 | 44 | 436 | 21,7 | 21 | 260 | 15,9 | 28 | 152 |
| 24. | 11,2 | 28 | - | 13,8 | 43 | 598 | - | - | 272 |
| 25. | - | - | 490 | - | - | 495 | - | - | - |
| 26. | - | - | - | - | - | 750 | - | - | - |
| 27. | - | - | 328 | - | - | 850 | - | - | - |
| 28. | 52,0 | 52 | 559 | 47,4 | 57 | 510 | 62,2 | 79 | 546 |
| 29. | 34,8 | 88 | 504 | 31,9 | 93 | 466 | 25,3 | 38 | 434 |
| 30. | 39,3 | 113 | 430 | 63,9 | 168 | 488 | 71,1 | 68 | 494 |
| 31. | 78,5 | 61 | 713 | 54,2 | 103 | 292 | - | - | 278 |

## TABLE VII

RaB in air; units $10^{-12} \mu c/cm^3$

Station Designations: Z Zugspitze 2964 m a.s.l.
W Wank 1780 m a.s.l.
G Garmisch-Partenkirchen 730 m a.s.l.

Measurement periods : a = 2150 - 0920, b = 0950 - 1220,
c = 1250 - 1620, (Central European Time)

Month: January 1971 ("No measurement" is denoted by: - )

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | - | - | 182 | - | - | 120 | - | - | - |
| 2. | 3,2 | 12 | 444 | 2,3 | 8 | 415 | 3,1 | 10 | 459 |
| 3. | - | - | 1150 | - | - | 721 | - | - | - |
| 4. | 17,6 | 6 | 514 | 31,5 | 54 | 368 | 34,6 | 133 | 330 |
| 5. | 25,1 | 74 | 650 | 12,5 | 79 | 1006 | 17,0 | 120 | 844 |
| 6. | - | - | 402 | - | - | 481 | - | - | - |
| 7. | 8,6 | 51 | 347 | 6,7 | 19 | 319 | 7,4 | 45 | 331 |
| 8. | 4,4 | 8 | 247 | 3,0 | 13 | 291 | 0,7 | 13 | 399 |
| 9. | 1,9 | 5 | 256 | 0,1 | 4 | 350 | 5,2 | 22 | 345 |
| 10. | - | - | 279 | - | - | 413 | - | - | - |
| 11. | 30,8 | 30 | 290 | 32,5 | 30 | 292 | 25,5 | 30 | 287 |
| 12. | 34,1 | 85 | 508 | 25,6 | 111 | 445 | 31,4 | 186 | 344 |
| 13. | 21,4 | 124 | 661 | 14,3 | 145 | 880 | 17,1 | 160 | 509 |
| 14. | 26,4 | 36 | 334 | 30,6 | 26 | 371 | 32,5 | 30 | 558 |
| 15. | 84,1 | 198 | 516 | 63,4 | 195 | 536 | 109,2 | 128 | 150 |
| 16. | 30,2 | 127 | 588 | 25,3 | 151 | 599 | 25,5 | 147 | 304 |
| 17. | - | - | 560 | - | - | 420 | - | - | - |
| 18. | 12,8 | 107 | 434 | 10,2 | 79 | 445 | 25,9 | 217 | 443 |
| 19. | 57,5 | 81 | 441 | 52,6 | 73 | 497 | 48,3 | 95 | 327 |
| 20. | 52,9 | 91 | 480 | 35,1 | 77 | 511 | 34,9 | 107 | 431 |
| 21. | 31,2 | 53 | 388 | 27,2 | 25 | 498 | 36,4 | 22 | 369 |
| 22. | 11,7 | 31 | - | 11,7 | 19 | 403 | 19,4 | 24 | 416 |
| 23. | 30,9 | 91 | 400 | 23,8 | 119 | 342 | 21,1 | 124 | 213 |
| 24. | - | - | 314 | - | - | 139 | - | - | - |
| 25. | 17,3 | - | 321 | 32,9 | 62 | 348 | 36,3 | 37 | 198 |
| 26. | 11,3 | 27 | 350 | 9,9 | 12 | 338 | 9,0 | 22 | 291 |
| 27. | 32,7 | 59 | 330 | 27,5 | 77 | 297 | 35,1 | 71 | 160 |
| 28. | 11,7 | 11 | 176 | 11,7 | 12 | 207 | 12,3 | 17 | 109 |
| 29. | 10,3 | 119 | 467 | 7,4 | 122 | 278 | 12,6 | 145 | 184 |
| 30. | 26,5 | 99 | 336 | 29,4 | 86 | 294 | 24,2 | 61 | 198 |
| 31. | - | - | 144 | - | - | 78 | - | - | - |

## TABLE VIII

**RaB in air; units $10^{-12} \mu c/cm^3$**

**Station Designations:**
Z Zugspitze 2964 m a.s.l.
W Wank 1780 m a.s.l.
G Garmisch-Partenkirchen 730 m a.s.l.

**Measurement periods :** a = 2150 - 0920, b = 0950 - 1220, c = 1250 - 1620. (Central European Time)

Month: February 1971 ("No measurement" is denoted by: - )

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | 20,5 | 26 | 498 | 41,8 | 102 | 390 | 45,5 | 72 | 235 |
| 2. | 4,1 | 27 | 57 | 2,0 | 26 | 60 | 5,7 | 86 | 74 |
| 3. | 3,0 | 7 | 430 | 2,1 | 10 | 333 | 0,2 | 12 | 352 |
| 4. | 11,9 | 3 | 65 | 16,1 | 4 | 64 | 11,1 | 15 | 85 |
| 5. | 5,2 | 5 | 388 | 1,0 | 10 | 308 | - | 26 | 305 |
| 6. | 8,6 | 2 | 224 | .. | 6 | 445 | 0,8 | 26 | 392 |
| 7. | - | - | 772 | - | - | 283 | - | - | - |
| 8. | 2,8 | 5 | 414 | 0,3 | 22 | 212 | 1,0 | 34 | 134 |
| 9. | 3,1 | 31 | 457 | 0,5 | 66 | 415 | - | 121 | 298 |
| 10. | 2,0 | 91 | 635 | - | 117 | 644 | - | 192 | 478 |
| 11. | 2,4 | 156 | 677 | 0,8 | 158 | 910 | 0,1 | 170 | 592 |
| 12. | 5,1 | 76 | 487 | - | 31 | 364 | 24,3 | 26 | 135 |
| 13. | 8,1 | 64 | 388 | 9,1 | 67 | 425 | 33,6 | 153 | 184 |
| 14. | - | - | 615 | - | - | 277 | - | - | - |
| 15. | 103,7 | 85 | 362 | 75,4 | 149 | - | 104,3 | 185 | 362 |
| 16. | 54,7 | 56 | 281 | 35,2 | 34 | 184 | 53,5 | 16 | 33 |
| 17. | 7,1 | 20 | 264 | 5,3 | 12 | - | 6,6 | 22 | - |
| 18. | 7,3 | 17 | - | 4,1 | 8 | 280 | 9,9 | 21 | 275 |
| 19. | 12,3 | 20 | 339 | 11,6 | 21 | 367 | 24,5 | 22 | 141 |
| 20. | 12,1 | 7 | 47 | 12,9 | 20 | 79 | 12,1 | 16 | 66 |
| 21. | - | - | 348 | - | - | 210 | - | - | - |
| 22. | 8,6 | 23 | 388 | 3,0 | 15 | 96 | 6,0 | 7 | 38 |
| 23. | 5,1 | 7 | 47 | 4,6 | 7 | 25 | 5,5 | 5 | 36 |
| 24. | 5,7 | 15 | 236 | 1,5 | 29 | 117 | 1,1 | 78 | 93 |
| 25. | 1,8 | 19 | 367 | 6,1 | 14 | 203 | 6,2 | 7 | 63 |
| 26. | - | - | 46 | 8,6 | 7 | 34 | 12,0 | 6 | 40 |
| 27. | - | 14 | 33 | - | 17 | 48 | 22,5 | 21 | 63 |
| 28. | - | - | 338 | - | - | 109 | - | - | - |

## TABLE IX

RaB in air; units $10^{-12} \mu c/cm^3$

Station Designations: Z Zugspitze 2964 m a.s.l.
W Wank 1780 m a.s.l.
G Garmisch-Partenkirchen 730 m a.s.l.

Measurement periods : a = 2150 - 0920, b = 0950 - 1220,
c = 1250 - 1620. (Central European Time)

Month: March 1971 ("No measurement" is denoted by: - )

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | 58,9 | 72 | 85 | 57,4 | 73 | 117 | 65,2 | 70 | 128 |
| 2. | 14,6 | 90 | 482 | 22,9 | 128 | 255 | 6,0 | 133 | 210 |
| 3. | 41,1 | 71 | 470 | - | 113 | 349 | 98,4 | 112 | 215 |
| 4. | 62,9 | 133 | 147 | 45,6 | 117 | 170 | 13,9 | 107 | 130 |
| 5. | 49,2 | 75 | 553 | 51,2 | 109 | 209 | 69,6 | - | 129 |
| 6. | 45,4 | 95 | 461 | 52,9 | 169 | 420 | 55,8 | 176 | 230 |
| 7. | - | - | 613 | - | - | 198 | - | - | - |
| 8. | 28,9 | 136 | 470 | 16,7 | 136 | 312 | 16,4 | 182 | 320 |
| 9. | 11,3 | 130 | 756 | 19,9 | 192 | 544 | 14,7 | 101 | 266 |
| 10. | 5,8 | 27 | 272 | 34,3 | 13 | 137 | 18,7 | 18 | 54 |
| 11. | - | 18 | 101 | 9,2 | 15 | 87 | - | 13 | 64 |
| 12. | 5,5 | 19 | 124 | 1,5 | 12 | 79 | 7,1 | 16 | 101 |
| 13. | 4,4 | 16 | 266 | 1,7 | 35 | 207 | 5,0 | 65 | 189 |
| 14. | - | - | 336 | - | - | 242 | - | - | - |
| 15. | 23,1 | 180 | 407 | 17,1 | 169 | 334 | 62,9 | 157 | 196 |
| 16. | 64,2 | 12 | 128 | 23,0 | 6 | 69 | 24,1 | 8 | 58 |
| 17, | 10,2 | 18 | 232 | 0,8 | 38 | 125 | 22,4 | 24 | 138 |
| 18. | 27,1 | 90 | 270 | 29,8 | 79 | 221 | 100,3 | 69 | 162 |
| 19. | 24,6 | 30 | 292 | 22,2 | 37 | 176 | 41,2 | 47 | 158 |
| 20. | 32,8 | 37 | 201 | 42,7 | 35 | 105 | 31,3 | 23 | 63 |
| 21. | - | - | 93 | - | - | 41 | - | - | - |
| 22. | 16,4 | 28 | 195 | 13,4 | 39 | 165 | 85,8 | 75 | 162 |
| 23. | 24,9 | 8 | 60 | 26,3 | 21 | 61 | - | 5 | 80 |
| 24. | 8,7 | 92 | 274 | 0,6 | 91 | 212 | 2,9 | 63 | 124 |
| 25. | 5,7 | 42 | 381 | 16,4 | 80 | 201 | 29,4 | 51 | 78 |
| 26. | 10,5 | 18 | 91 | 15,8 | 19 | 57 | 18,3 | 13 | 42 |
| 27. | 16,8 | 3 | 57 | 17,2 | 12 | 38 | 13,1 | 13 | 35 |
| 28. | - | - | 138 | - | - | 61 | - | - | - |
| 29. | 6,2 | - | 259 | 1,4 | 58 | 108 | 37,1 | 36 | 71 |
| 30. | 4,4 | 86 | 350 | 10,7 | 122 | 201 | 1,2 | 122 | 108 |
| 31. | 87,8 | - | 317 | 94,7 | 116 | 352 | 147,6 | 106 | 266 |

## TABLE X

**RaB in air; units $10^{-12} \mu C/cm^3$**

Station Designations: Z Zugspitze 2964 m a.s.l.
W Wank 1780 m a.s.l.
G Garmisch-Partenkirchen 730 m a.s.l.

Measurement periods : a = 2150 - 0920, b = 0950 - 1220,
c = 1250 - 1620. (Central European Time)

Month: April 1971 ("No measurement" is denoted by: - )

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | 13,4 | 75 | 324 | 3,2 | 87 | 210 | 64,6 | 85 | 189 |
| 2. | 39,0 | 132 | 388 | 44,2 | 134 | 259 | 73,5 | 152 | 242 |
| 3. | 82,1 | 122 | 382 | 108,0 | 141 | 229 | 115,3 | 98 | 179 |
| 4. | - | - | - | - | - | 61 | - | - | - |
| 5. | 35,5 | 74 | 316 | 38,7 | 98 | 139 | 73,0 | 67 | 104 |
| 6. | 26,2 | 67 | 330 | 29,5 | 68 | 103 | 51,3 | 47 | 92 |
| 7. | 56,2 | 109 | 276 | 75,1 | 99 | 147 | 105,4 | 111 | 157 |
| 8. | 37,3 | 109 | 265 | 15,4 | 42 | 149 | 62,2 | 95 | 129 |
| 9. | - | - | 311 | - | - | 156 | - | - | - |
| 10. | 61,4 | 97 | 507 | 35,7 | 153 | 263 | 70,6 | 174 | 255 |
| 11. | - | - | 203 | - | - | 132 | - | - | - |
| 12. | - | - | 228 | - | - | 90 | - | - | - |
| 13. | 8,5 | 44 | 261 | 1,6 | 47 | 94 | 30,3 | 56 | 75 |
| 14. | 5,8 | 56 | 304 | 1,0 | 63 | 130 | 23,5 | 22 | 53 |
| 15. | 8,5 | 63 | 242 | 1,8 | 76 | 162 | 34,7 | 105 | 130 |
| 16. | 53,9 | 76 | 332 | 54,6 | 81 | 101 | 47,6 | 76 | 102 |
| 17. | - | 145 | 381 | 52,6 | 24 | 88 | 16,0 | 19 | 91 |
| 18. | - | - | 178 | - | - | 102 | - | - | - |
| 19. | 8,1 | 122 | 256 | 32,4 | 145 | 203 | 92,2 | 139 | 166 |
| 20. | 77,1 | 129 | 372 | 109,3 | 140 | 145 | 75,0 | 85 | 101 |
| 21. | - | 122 | 289 | 48,4 | 117 | 187 | 61,9 | 110 | 138 |
| 22. | 67,2 | 142 | 286 | 70,1 | 118 | 152 | 77,0 | 123 | 113 |
| 23. | 54,4 | 92 | 254 | 62,2 | 72 | 104 | 45,4 | 63 | 90 |
| 24. | - | - | 176 | 22,8 | - | 60 | 11,5 | - | 80 |
| 25. | - | - | 49 | - | - | 58 | - | - | - |
| 26. | 32,1 | - | 102 | 16,7 | 15 | 51 | 18,5 | 19 | 42 |
| 27. | 52 5 | 87 | 295 | 50,4 | 79 | 169 | 39,8 | 54 | 73 |
| 28. | 32,8 | 18 | 52 | 35,0 | 13 | 56 | 28,1 | 16 | 89 |
| 29. | 28,8 | 71 | 245 | 41,0 | 76 | 185 | 49,7 | 88 | 114 |
| 30. | 31,9 | 124 | 402 | 24,6 | 109 | 250 | 18,5 | 120 | 138 |

## TABLE XI

RaB in air; units $10^{-12}\mu C/cm^3$

Station Designations: Z Zugspitze 2964 m a.s.l.
~~W Wank 1780 m a.s.l.~~
G Garmisch-Partenkirchen 730 m a.s.l.

Measurement periods : a = 2150 - 0920, b = 0950 - 1220,
c = 1250 - 1620. (Central European Time)

Month: May 1971 ("No measurement" is denoted by: -)

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | - | - | 282 | - | - | 193 | - | - | - |
| 2. | - | - | 203 | - | - | 190 | - | - | - |
| 3. | 51,5 | - | 220 | 49,6 | 118 | 207 | 53,9 | 100 | 155 |
| 4. | 67,6 | 91 | 220 | 70,0 | 98 | 195 | 92,6 | 95 | 194 |
| 5. | 75,8 | 90 | 329 | 64,8 | 68 | 207 | 45,7 | 76 | 198 |
| 6. | 39,3 | 64 | 299 | 53,1 | 49 | 140 | 61,4 | 79 | 110 |
| 7. | 36,6 | 52 | 306 | 31,8 | 68 | 126 | 62,3 | 65 | 100 |
| 8. | 30,3 | - | 429 | 37,3 | - | 317 | 26,4 | - | 223 |
| 9. | - | - | 336 | - | - | 100 | - | - | - |
| 10. | 49,2 | - | 395 | 65,6 | 130 | 247 | 32,7 | 47 | 144 |
| 11. | 39,4 | 77 | 204 | 41,1 | 81 | 179 | 47,4 | 49 | 95 |
| 12. | 28,5 | 56 | 185 | 49,0 | 53 | 68 | 53,0 | 80 | 103 |
| 13. | 131,3 | 134 | 340 | 90,4 | 125 | 128 | 42,7 | 66 | 91 |
| 14. | 35,9 | 29 | 260 | 13,6 | 8 | 128 | 28,0 | 61 | 139 |
| 15. | 33,9 | 43 | 398 | 39,7 | 87 | 154 | 52,3 | 73 | 81 |
| 16. | - | - | 228 | - | - | 75 | - | - | - |
| 17. | 19,5 | 111 | 172 | 34,9 | 45 | 113 | 52,3 | 86 | 117 |
| 18. | 29,0 | 129 | 277 | 40,2 | 39 | 103 | 45,4 | 45 | 111 |
| 19. | 23,0 | 50 | 150 | 44,8 | 52 | 79 | 67,5 | 54 | 97 |
| 20. | - | - | 251 | - | - | 158 | - | - | - |
| 21. | 58,0 | 128 | 203 | 62,8 | 94 | 94 | 44,1 | 27 | 73 |
| 22. | 19,5 | 33 | 174 | 35,5 | 46 | 69 | 45,8 | 39 | 78 |
| 23. | - | - | 213 | - | - | 159 | - | - | - |
| 24. | 85,2 | 110 | 289 | 84,7 | 97 | 118 | 72,2 | 53 | 114 |
| 25. | 71,5 | 70 | 168 | 57,6 | 74 | 116 | 45,9 | 69 | 112 |
| 26. | 31,1 | 42 | 128 | 48,8 | 41 | 102 | 35,8 | 25 | 58 |
| 27. | 25,7 | 29 | 190 | 40,5 | 15 | 153 | 55,2 | 39 | 144 |
| 28. | 24,6 | 44 | 147 | 25,0 | 56 | 89 | 14,3 | 21 | 69 |
| 29. | 19,7 | 24 | 111 | 33,2 | 23 | 78 | 30,7 | 35 | 80 |
| 30. | - | - | 148 | - | - | 121 | - | - | - |
| 31. | - | - | 308 | - | - | 145 | - | - | - |

## TABLE XII

RaB in air; units $10^{-12}$ µC/cm$^3$

Station Designations: Z Zugspitze 2964 m a.s.l.
W Wank 1780 m a.s.l.
G Garmisch-Partenkirchen 730 m a.s.l.

Measurement periods : a = 2150 - 0920, b = 0950 - 1220,
c = 1250 - 1620. (Central European Time)

Month: June 1971 ("No measurement" is denoted by: -)

| | a | | | b | | | c | | |
|---|---|---|---|---|---|---|---|---|---|
| | Z | W | G | Z | W | G | Z | W | G |
| 1. | 25,7 | 101 | 450 | 25,7 | 89 | 165 | 21,0 | 75 | 104 |
| 2. | 31,6 | 54 | 223 | 64,7 | 130 | 198 | 93,3 | 65 | 123 |
| 3. | 54,8 | 102 | 368 | 87,3 | 98 | 158 | 97,6 | 78 | 142 |
| 4. | 72,8 | 107 | 274 | 90,4 | 146 | 203 | 94,8 | 115 | 159 |
| 5. | 42,4 | 83 | 201 | 47,4 | 68 | 96 | 72,2 | 49 | 97 |
| 6. | - | - | 346 | - | - | 147 | - | - | - |
| 7. | 26,9 | 62 | 251 | 22,7 | 40 | 150 | 21,6 | 70 | 113 |
| 8. | 16,5 | 17 | 300 | 20,1 | 21 | 228 | 20,9 | 39 | 102 |
| 9. | 30,1 | 47 | 299 | 32,4 | 47 | 193 | 47,6 | 65 | 96 |
| 10. | - | - | 209 | - | - | 37 | - | - | - |
| 11. | 34,4 | 32 | 121 | 10,0 | 12 | 54 | 30,2 | 10 | 55 |
| 12. | 8,3 | 13 | 73 | 17,3 | 17 | 53 | 21,5 | 21 | 37 |
| 13. | - | - | 169 | - | - | 39 | - | - | - |
| 14. | 28,7 | 69 | 171 | 44,0 | 46 | 110 | 75,8 | 68 | 128 |
| 15. | 60,6 | 80 | 99 | 12,4 | 4 | 29 | 2,0 | 5 | 27 |
| 16. | 7,3 | 17 | 73 | 6,6 | 21 | 34 | 19,6 | 16 | 30 |
| 17. | - | - | 150 | - | - | 67 | - | - | - |
| 18. | 12,7 | 71 | 329 | 11,6 | 12 | 74 | 9,1 | 8 | 39 |
| 19. | - | 26 | 206 | 5,9 | 7 | 91 | 1,3 | 13 | 89 |
| 20. | - | - | 51 | - | - | 73 | - | - | - |
| 21. | - | 39 | 110 | - | 14 | 43 | - | 12 | 48 |
| 22. | 28,9 | 59 | 218 | 55,6 | 101 | 116 | 26,1 | 17 | 53 |
| 23. | 44,4 | 58 | 111 | 42,5 | 37 | 81 | 43,5 | 32 | 76 |
| 24. | 71,5 | 96 | 379 | 87,3 | 112 | 261 | 84,0 | 53 | 252 |
| 25. | 40,3 | 40 | 391 | 48,1 | 93 | 187 | 71,8 | 71 | 96 |
| 26. | 63,5 | 87 | 297 | 84,7 | 81 | 135 | 107,1 | 81 | 101 |
| 27. | - | - | 61 | - | - | 55 | - | - | - |
| 28. | 52,9 | 53 | 134 | 53,6 | 61 | 116 | 54,2 | 44 | 74 |
| 29. | 5,1 | 9 | 26 | 7,2 | 11 | 25 | 6,9 | 8 | 33 |
| 30. | 6,3 | 14 | 101 | 8,0 | 16 | 77 | 4,3 | 11 | 57 |

## 5. The Computer Program

PAGE 001

```
                    *
                    * WANK + ZUGSPITZE - TEMPS PROGRAMM *
                    *
0000                AW      ORG     X'0'
                    *
0000 00                     HLT
0001 44C186                 JMP/    BEG
     8000           SPE     SET     X'8000'
     8200           TAD     SET     X'8200'
     1801           MOF     SET     X'1801'
     1863           MGF     SET     X'1863'
     18D9           CAF     SET     X'18D9'
     18F1           CPE     SET     X'18F1'
     1678           ADF     SET     X'1678'
     1681           SBF     SET     X'1681'
     1733           MLF     SET     X'1733'
     17D1           DVF     SET     X'17D1'
     18C9           CDF     SET     X'18C9'
     197A           EDF     SET     X'197A'
                    *  SET - 80
                    *
                    *
     1BA1           CPL     SET     X'1BA1'
     1BB6           COS     SET     X'1BB6'
     1AB4           POL     SET     X'1ABA'
     1A86           EXN     SET     X'1A86'
     1A8C           EXB     SET     X'1A8C'
     1ABA           EXB     SET     X'1ABA'
     1807           LGN     SET     X'1807'
     181E           LGB     SET     X'181E'
     183D           LGB     SET     X'183D'
                    *
                    * SPEICHERPLATZ ; NR.= 39 *
                    *
0004 0004           TF      DS      4
0008 0004           E       DS      4
000C 0004           RF      DS      4
0010 0004           S       DS      4
0014 0004           TV      DS      4
0018 0004           EPT     DS      4
001C 0004           GRE     DS      4
0020 0004           GRF     DS      4
0024 0004           GRS     DS      4
0028 0004           GRT     DS      4
002C 0004           GPT     DS      4
0030 0004           T       DS      4
0034 0004           P       DS      4
0038 0004           ET      DS      4
003C 0004           ETF     DS      4
0040 0004           PT      DS      4
0044 0004           PL      DS      4
0048 0004           NL      DS      4
004C 0004           VPN     DS      4
0050 0004           L       DS      4
0054 0004           PLO     DS      4
0058 0004           NLO     DS      4
005C 0004           IT      DS      4
0060 0004           INS     DS      4
0064 0004           INR     DS      4
```

PAGE 002

```
0068 0004           HSI     DS      4
006C 0004           GRA     DS      4
0070 0004           TB      DS      4
0074 0004           TI      DS      4
0078 0004           ZI      DS      4
007C 0008           ZTA     DS      8
007E 0008           ZEI     DS      8
0080 0008           PRE     DS      8
0088 0004           ZB      DS      4
0086 0004           AUS     DS      4
008A 0004           P1      DS      4
008E 0004           P0      DS      4
0092 0004           H1      DS      4
0096 0004           H0      DS      4
009A 0004           DIF     DS      4
009E 0004           DH      DS      4
00A2 0008           ZEH     DS      8
00A4 0008           TX      DS      8
00A6 0008           FX      DS      8
00A8 0008           HST     DC      X'0008'
00AA 0008           RX      DS      8
00AC 0008           KX      DS      8
00AE 0008           TTX     DS      8
00B0 0008           TPX     DS      8
00B8 0008           TLX     DS      8
00B4 0004           ESP     DS      4
00B8 0006           WO1     DS      6
00BE 000D           WO2     DS      13
00CB 0009           WO3     DS      9
00D4 0004           ZWT     DS      4
00D8 0004           ZW1     DS      4
00DC 0004           ZW2     DS      4
00E0 0004           ZW3     DS      4
00E4 0004           ZW4     DS      4
00E8 0008           ZWT     DS      8
00EA 0004           M       DS      4
00EE 0004           KL      DS      4
00F2 0004           HOE     DS      4
00F6 0004           LW      DS      4
00FA 0002           ASP     DS      2
00FC 0004           F       DS      4
                    *
                    *
                    *
0100 0000           SRK     DC      **                  ZEICHEN IN R,K
0102 878D9E                 LDX=    A'SRK'
0105 4E                     TXA
0106 B78000                 SBA=    X'8000'
0109 F0FA                   STA     ASP
010B E7FFDE                 LDA=    X'FFDE'
010E 6E0DC5                 RTJ/    HI8
0111 88AA                   STX     RX
0113 878D9E                 LDX=    A'SRK'
0116 4E                     TXA
0117 B78000                 SBA=    X'8000'
011A F0FA                   STA     ASP
011C E7FFCB                 LDA=    X'FFCB'
011F 6E0DC5                 RTJ/    HI8
0122 88AC                   STX     KX
```

PAGE 003

```
0124 63DA                   JMP*    SRK
                    *
                    *
                    *
                    *  EINLESEN VON R + K *
                    *
0126 00             BEG     HLT
0127 08                     RO1
0128 E70000                 LDA=    0
012B F0FA                   STA     ASP
012D EF91                   LDV=    X'91'
012F 3800                   OSS     0,0
0131 3000           INO     INS     0,0
0133 D7007F                 ANA=    X'7F'
0136 A70080                 ADA=    X'80'
0139 80FA                   LDX     ASP
013B FEA89E                 STV/    SRK,X
013E 87008A                 LDX=    X'8A'
0141 17E2                   JAX     INO
0143 87008D                 LDX=    X'8D'
0146 17E9                   JAX     INO
0148 8700FF                 LDX=    X'FF'
014B 17EA                   JAX     INO
014D 8700A0                 LDX=    X'A0'
0150 17DF                   JAX     INO
0152 8700D3                 LDX=    X'D3'
0155 17D4                   JAX     ZEO
0157 70FA                   IMN     ASP
0159 61D6                   JMP     INO
015B EF93           ZEO     LDV=    X'93'
015D 3800                   OSS     0,0
015F 6E0100                 RTJ/    SRK
                    *
                    *
                    * ANFANG , EINLESEN PER PART. *
                    *
0162 E700C1                 LDA=    X'C1'
0165 F68DAE                 STA/    CAS
0168 6E11B8                 RTJ/    CIT
016B 660330                 JMP/    SBX
016E E700D4         BG1     LDA=    X'D4'
0171 F68DAE                 STA/    CAS
0174 6E11B8                 RTJ/    CIT
0177 6E1868                 RTJ/    BLX
017A 6E1878                 RTJ/    BGX
017D 6601BC                 JMP/    TAB
0180 E700C6         BG2     LDA=    X'C6'
0183 F68DAE                 STA/    CAS
0186 6E11B8                 RTJ/    CIT
0189 6E188E                 RTJ/    BLT
018C 1003                   JOV     BG3-3
018E 66083D                 JMP/    TA3
0191 66038C                 JMP/    PA9-3
0194 E700CC         BG3     LDA=    X'CC'
0197 F68DAE                 STA/    CAS
019A 6E11B8                 RTJ/    CIT
019D 6E188E                 RTJ/    BLT
01A0 1003                   JOV     BG4-3
01A2 66083D                 JMP/    TA3
```

PAGE 004

```
01A5 66036A                 JMP/    PAA-3
01A8 E70080         BG4     LDA=    X'80'
01AB F68DAE                 STA/    CAS
01AE 6E11B8                 RTJ/    CIT
01B1 6E188E                 RTJ/    BLT
01B4 1003                   JOV     *+5
01B6 66083D                 JMP/    TA3
01B9 660186                 JMP/    BEG
                    *
                    *
                    * TRANSF. V. T,TF,H,P, IN TAB ;  NR = 48  *
                    *
01BC 870000         TAB     LDX=    0
01BF 887C                   STX     ZTA
01C1 08                     RO1
01C2 870008                 LDX=    8
01C5 88B4                   STX     ESP
01C7 80B4           SB0     LDX     ESP
01C9 09                     RO2
01CA EEA000                 LDV/    SPE,X
01CD 6E0685                 RTJ/    HI3
01D0 FEA801                 STV/    TAB+1,X
01D3 6E09ED                 RTJ/    HI4
01D6 0B                     RO4
01D7 EEA008                 LDV/    SPE+8,X                 P
01DA 6E05F5                 RTJ/    HIP
01DD EEA006                 LDV/    SPE+6,X                 T
01E0 6E0608                 RTJ/    HIT
01E3 EEA00A                 LDV/    SPE+10,X
01E6 6E060F                 RTJ/    HTF                     TF
01E9 0A                     RO3
01EA EEA00E                 LDV/    SPE+14,X
01ED 6E061C                 RTJ/    HLP                     LP
01F0 EEA011                 LDV/    SPE+17,X                LN
01F3 6E0689                 RTJ/    HLN
01F6 08                     RO1
01F7 EEA014                 LDV/    SPE+20,X
01FA 88B4                   STX     ESP
01FC 6E8BD4                 RTJ/    CSA
01FF 171E                   JAX     SB1
0201 80B4                   LDX     ESP
0203 E69FFE                 LDA/    SPE-8,X
0206 807C                   LDX     ZTA
0208 6E8765                 RTJ/    ZHR
020B 6E0BCE                 RTJ/    RET
020E 6E8F50                 RTJ/    RAS
0211 61B4                   JMP     SB0
0213 6E8F73         SB1     RTJ/    HLE
0216 570000                 LDX=    0
0219 887C                   STX     ZTA
021B 6E0BCE                 RTJ/    RET
021E 6E07AF                 RTJ/    PRL
0221 FEAE                   STV     TTX
0223 6E07CA                 RTJ/    TPL
0226 FE8D8E                 STV/    TIY
0229 807C                   LDX     ZTA
022B EEA801                 LDV/    TAB+1,X
022E FEDA                   STV     WO1+8
0230 E7A8B0                 LDA=    X'A8B0'
```

PAGE 005

```
0833 FC88                 STA   W01
0835 6E0693               RTJ/  UP3
0838 F8A8                 STV   TX
083A 66087C               JMP/  SB7
083D 08          TA3      R01
083E 870000               LDX=  0
0841 887C                 STX   ZTA
0843 870008               LDX=  8
0846 8884                 STX   ZSP
0848 8084        SB8      LDX   ZSP
084D 6E08B6               RTJ/  CSA
0850 1709                 JAX   SB3
0852 6E0648               RTJ/  MIT
0855 61F1                 JMP   SB8
0857 6E0F73      SB3      RTJ/  MLS
                          LDX=  0
085D 887C                 STX   ZTA
085F 807C        DP1      LDX   ZTA
0861 6E0D31               RTJ/  PN0
0864 6E0CEC               RTJ/  PN1
0867 807C                 LDX   ZTA
0869 FEA831               STV/  TAB+49,X
086C 48                   TXA
086D A7C063               ADA=  X'63'
0870 4C                   TAX
0871 E4A800               LDA/  TAB,X
0874 87A0A0               LDX=  X'A0A0'
0877 1FE6                 MAX   DP1
0879 6613A7               JMP/  VYS
                 *
                 * HP - NR -43 *
                 *
087C 6E0C8B      SB7      RTJ/  PG1                ZUERST ML+LAB
087F 6E8E97               RTJ/  PGX
0882 6E08AA               RTJ/  PG0
0885 870000      SB6      LDX=  0
0888 887C                 STX   ZTA                1. REIHE V. TAB IN FL
088A 807C        SP1      LDX   ZTA
088C 6E07C4               RTJ/  TFL
088F 6E07AF               RTJ/  PFL
0892 6E07FC               RTJ/  LPF
0895 6E0811               RTJ/  LMF
0898 6E096A               RTJ/  OBF
089B 171B                 JAN   SC3
089D 6E07E0               RTJ/  TFF
08A0 E830                 LDV   T
08A2 F8DE                 STV   ZV1
08A4 6E0830               RTJ/  PC8
08A7 F838                 STV   ST                       ST
08A9 E804                 LDV   TF
08AB F8DE                 STV   ZW1
08AD 6E0830               RTJ/  PC8
08B0 F83C                 STV   ZTF                      ETF
08B2 6E088E               RTJ/  PC4                   E,S,TV,RF
08B5 66098A               JMP/  PD8                EPT
08B8 6E09DF      SC3      RTJ/  PC5                 //// IN Z,S ....
08BB 6E093C               RTJ/  PE3                PT
08BE 6E8EA1               RTJ/  PEX
```

PAGE 006

```
08C1 6E0ADA               RTJ/  PPT                IT
08C4 6E0B0B               RTJ/  PC4                IN PG4 WIRD N GER.
08C7 E07C                 LDX   ZTA               ALLE ERG. IN FL+LA. IN D
08C9 6E0C6C               RTJ/  ZTA
08CC 6E09CE               RTJ/  MZT
08CF 6E0CC8               RTJ/  TAE                OP ENDE V. TAB
08D2 61B6                 JMP   SP1
                 *
                 *
                 * HP : NR - 44  *
                 *
08D4 6E0D31      SP8      RTJ/  PN0                AUS + DIF
08D7 6E0CE0               RTJ/  PN1
08DA 6E0DA1               RTJ/  PN8
08DD 6E0D86               RTJ/  PH1
08E0 F830                 STV   T
08E2 6E0DAE               RTJ/  PN3
08E5 6E0D86               RTJ/  PH1
08E8 F808        PR8      STV   E
08EA 6E0DC0               RTJ/  PN4
08ED 6E0D86               RTJ/  PH1
08F0 F810                 STV   S
08F2 6E0DDD               RTJ/  PN5
08F5 6E0D86               RTJ/  PH1
08F8 F80C                 STV   RF
08FA 6E0DEF               RTJ/  PN6
08FD 6E0D86               RTJ/  PH1
0300 F840                 STV   PT
0302 6E0E01               RTJ/  PN7
0305 6E0E15               RTJ/  PI1
0308 807C                 LDX   ZTA
030A E89E                 LDV   DN
030C FEA831               STV/  TAB+49,X
030F E830                 LDV   T
0311 FEA839               STV/  TAB+57,X
0314 E808                 LDV   E
0316 FEA83D               STV/  TAB+61,X
0319 E810                 LDV   S
031B FEA841               STV/  TAB+65,X
031E E20C                 LDV   RF
0320 FEA845               STV/  TAB+69,X
0323 E840                 LDV   PT
0325 FEA849               STV/  TAB+73,X
0328 E886                 LDV   AUS
032A FEA857               STV/  TAB+87,X
032D E89A                 LDV   DIF
032F FEA85D               STV/  TAB+93,X
0332 6E0D73               RTJ/  TAF
0335 6608D4               JMP/  SP8
0338 870000      SBR      LDX=  0
033B 887C                 STX   ZTA
033D 0A                   R03
033E EEA00F               LDV/  SPE+15,X
0341 6E067F               RTJ/  UP1
0344 08                   R01
0345 EEA00E               LDV/  SPE+14,X
0348 6E068C               RTJ/  UP2
034B 6E0693               RTJ/  UP3
034E 6E0886               RTJ/  DZE
```

PAGE 007

```
0351 F8FC                 STV   F
0353 6604BC               JMP/  SR7
0356 E0E8AE      SP5      LDA/  OAS
0359 870004               LDX=  X'0004'
035C 1F03                 MAX   *+3
035E 6E18F0               RTJ/  PRI
                 *
                 * HP : NR - 45 *
                 *
0361 6E8EA7               RTJ/  PMX
0364 887C                 STX   ZTA
0366 6E0ED8      SPX      RTJ/  PM2                ANFANG FL IN DER TAB
0369 1008                 JOV   SP6
036B 61F9                 JMP   SPX
036D 870004      SP6      LDX=  4
0370 887C                 STX   ZTA
0372 6E0ED8               RTJ/  PM2
0375 1008                 JOV   SP7
0377 61F9                 JMP   SP6+5
0379 870000      SP7      LDX=  0
037C 887C                 STX   ZTA
037E 6E0EF0               RTJ/  PM4
0381 1008                 JOV   SP8
0383 61F9                 JMP   SP7+5
0385 870004      SP8      LDX=  4
0388 887C                 STX   ZTA
038A 6E0EF0               RTJ/  PM4
038D 1008                 JOV   SP9
038F 61F9                 JMP   SP8+5
0391 870034      SP9      LDX=  38
0394 887C                 STX   ZTA
0396 6E0EF0               RTJ/  PM4
0399 1008                       SPA
039B 61F9                       SP9+5
039D 870038      SPA            56
03A0 887C                       ZTA
03A2 6E0EF0                     PM4
03A5 1008                       SPB
03A7 61F9                 JMP   SPA+5
03A9 870008      SPB      LDX=  8
03AC 887C                 STX   ZTA
03AE 6E0EF0               RTJ/  PM4
03B1 1008                 JOV   SPC
03B3 61F9                 JMP   SPB+5
03B5 870063      SPC      LDX=  99
03B8 887C                 STX   ZTA
03BA 6E0F0F               RTJ/  PM0
03BD 1008                 JOV   SPD
03BF 61F9                 JMP   SPC+5
03C1 870000      SPD      LDX=  0
03C4 887C                 STX   ZTA
03C6 6E0E7D               RTJ/  MIP
03C9 1008                 JOV   SPY
03CB 61F9                 JMP   SPD+5
03CD 870067      SPY      LDX=  103      G+T
03D0 887C                 STX   ZTA
03D2 6E0F85               RTJ/  PIN
03D5 1008                 JOV   SPF
03D7 61F9                 JMP   SPY+5
```

PAGE 008

```
03D9 87006B      SPF      LDX=  107      GRE
03DC 887C                 STX   ZTA
03DE 6E0F85               RTJ/  PIN
03E1 1008                 JOV   SR1
03E3 61F9                 JMP   SPF+5
03E5 87006F      SR1      LDX=  111       GRS
03E8 887C                 STX   ZTA
03EA 6E0F85               RTJ/  PIN
03ED 1008                 JOV   SRE
03EF 61F9                 JMP   SR1+5
03F1 870073      SR8      LDX=  115       GRF
03F4 887C                 STX   ZTA
03F6 6E0F85               RTJ/  PIN
03F9 1008                 JOV   SR3
03FB 61F9                 JMP   SR8+5
03FD 870077      SR3      LDX=  119      GPT
0400 887C                 STX   ZTA
0402 6E0F85               RTJ/  PIN
0405 1008                 JOV   SR4
0407 61F9                 JMP   SR3+5
0409 870063      SR4      LDX=  99
040C 887C                 STX   ZTA
040E 6E0FAA               RTJ/  PTN
0411 1008                 JOV   SR5
0413 61F9                 JMP   SR4+5
0415 870063      SR5      LDX=  99
0418 887C                 STX   ZTA
041A 6E0F6E               RTJ/  PGM
041D 1008                 JOV   SR6
041F 61F9                 JMP   SR5+5
0421 870063      SR6      LDX=  99
0424 887C                 STX   ZTA
0426 6E0F89               RTJ/  PGM
0429 6E1817               RTJ/  RUP
                 *
                 * HP : NR - 46 *
                 *
042C 08          SR7      R01                  ANFANG + PRINT
042D 870000               LDX=  0
0430 6E1170               RTJ/  VRZ
0433 6E1195               RTJ/  PRS
0436 EFAD                 LDV=  X'AD'          '-'
0438 6E8BF8               RTJ/  OUT
043B 6E1195               RTJ/  PRS
043E 6E1195               RTJ/  PRS
0441 6E1195               RTJ/  PRS
0444 6E1195               RTJ/  PRS
0447 870006               LDX=  6
044A 6E117E               RTJ/  ZWR
044D 870005               LDX=  5
0450 6E1195               RTJ/  PRS
0453 6E1195               RTJ/  PRS
0456 EFAE                 LDV=  X'AE'         '.'
0458 6E8BF8               RTJ/  OUT
045B 6E1195               RTJ/  PRS
045E 6E1195               RTJ/  PRS
0461 EFAE                 LDV=  X'AE'
0463 6E8BF8               RTJ/  OUT
0466 EFB1                 LDV=  X'B1'
```

PAGE 009

```
0468 6E8BF8            RTJ/  OUT
046B EF20              LDV*  X'B0'
046D 6E8BF8            RTJ/  OUT
0470 EFB7              LDV*  X'B7'
0472 6E8BF8            RTJ/  OUT
0475 6E1198            RTJ/  PRS
0478 870007            LDX*  7
047B 6E117E            RTJ/  ZVR
....                   ....  ..
0481 6E1198            RTJ/  PRS
0484 6E1198            RTJ/  PRS
0487 EFAE              LDV*  X'AE'
0489 6E8BF8            RTJ/  OUT
048C 6E1198            RTJ/  PRS
048F 6E1198            RTJ/  PRS
0492 870001            LDX*  1
0495 6E117E            RTJ/  ZVR
0498 EFD5              LDV*  X'D5'         'U'
049A 6E8BF8            RTJ/  OUT
049D EFC8              LDV*  X'C8'         H
049F 6E8BF8            RTJ/  OUT
04A2 EFD8              LDV*  X'D8'         R
04A4 6E8BF2            RTJ/  OUT
04A7 6E1170            RTJ/  VRE
04AA 6E1170            RTJ/  VRE
04AD 6E1170            RTJ/  VRE
04B0 87000D            LDX*  13
04B3 EEA446      PA1   LDV/  AN1,X
04B6 6E8BF8            RTJ/  OUT
04B9 45                DCX
04BA 1DF7              NXN   PA1
04BC 6E1170            RTJ/  VRE
04BF 661844            JMP/  VRA
04C2 6E1019      R1U   RTJ/  K01
04C5 6E10CB      SK1   RTJ/  PT1           PRT 1.TEIL TAB IN HN
04C8 6E05CE            RTJ/  NET
04CB EEA800            LDV/  TAB,X
04CE 87FFA0            LDX*  X'FFA0'
04D1 1708              JAX   SK8
04D3 6170              JMP   SK1
04D5 6E1170      SK8   RTJ/  VRE
04D8 6E1049            RTJ/  K03           KOPF 2
04DB 6E1108            RTJ/  PT2           PRINT 2. TEIL TAB IN HN
04DE 6E05CE            RTJ/  NET
04E1 EEA800            LDV/  TAB,X
04E4 87FFA0            LDX*  X'FFA0'
04E7 1708              JAX   SK3
04E9 6170              JMP   SK8+6
04EB 6E1170      SK3   RTJ/  VRE
04EE 87000D            LDX*  13
04F1 EEAA61      PA8   LDV/  AN8,X            HP-T
04F4 6E8BF8            RTJ/  OUT
04F7 45                DCX
04F8 1DF7              NXN   PA8
04FA 6E1170            RTJ/  VRE
04FC 66184A            JMP/  VRB
0500 6E1019      R8U   RTJ/  K01
0503 6E10CB      SK6   RTJ/  PT1
0506 6E05CE            RTJ/  NET
```

PAGE 010

```
0509 EEA800            LDV/  TAB,X
050C 87FFA0            LDX*  X'FFA0'
050F 1708              JAX   SK5
0511 6170              JMP   SK6
                 *
                 *
                 * HP : PRINT FORTSETZUNG 3 NR. 47 *
                 *
0513 6E1170      SK5   RTJ/  VRE
0516 6E1049            RTJ/  K03
0519 6E1108            RTJ/  PT3
051C 6E05CE            RTJ/  NET
051F EEA800            LDV/  TAB,X
0522 87FFA0            LDX*  X'FFA0'
0525 1708              JAX   *+4
0527 6170              JMP   SK5+6
0529 6E1170            RTJ/  VRE
052C 87000F            LDX*  15
052F EEAA5F      PA9   LDV/  AN9,X
0532 6E8BF8            RTJ/  OUT
0535 45                DCX
0536 1DF7              NXN   PA9
0538 6E1170            RTJ/  VRE
053B 661850            JMP/  VRC
053E 6E1019      R3U   RTJ/  K01
0541 6E10CB      SK9   RTJ/  PT1
0544 6E05CE            RTJ/  NET
0547 EEA800            LDV/  TAB,X
054A 87FFA0            LDX*  X'FFA0'
054D 1708              JAX   SK8
054F 6170              JMP   SK9
0551 6E1170      SK8   RTJ/  VRE
0554 6E1049            RTJ/  K03
0557 6E1108      SKA   RTJ/  PT3
055A 6E05CE            RTJ/  NET
055D EEA800            LDV/  TAB,X
0560 87FFA0            LDX*  X'FFA0'
0563 1708              JAX   *+4
0565 6170              JMP   SKA
0567 6E1170            RTJ/  VRE
056A 870011            LDX*  17
056D EEAA7F      PAA   LDV/  ANA,X
0570 6E8BF8            RTJ/  OUT
0573 45                DCX
0574 1DF7              NXN   PAA
0576 6E1170            RTJ/  VRE
0579 661856            JMP/  VRD
057C 6E1019      R4U   RTJ/  K01
057F 6E10CB      SKD   RTJ/  PT1
0582 6E05CE            RTJ/  NET
0585 EEA800            LDV/  TAB,X
0588 87FFA0            LDX*  X'FFA0'
058B 1708              JAX   SKC
058D 6170              JMP   SKD
058F 6E1170      SKC   RTJ/  VRE
0592 6E1049            RTJ/  K03
0595 6E1188      SKE   RTJ/  PT3
0598 6E05CA            RTJ/  NET
059B EEA800            LDV/  TAB,X
```

PAGE 011

```
059E 87FFA0            LDX*  X'FFA0'
05A1 1708              JAX   SKB
05A3 4170              JMP   SKE
05A5 66185C      SKB   JMP/  VRE
                 *
                 *
                 * UP-10
                 *
05A8 0000        SUE   DC    **
05AA 08                R01
05AB F01E              STA   ZS1
05AD 80FA        SUN   LDX   ASP
05AF EEA000            LDV/  SPE,X
05B2 A01E              LDX   ZS1
05B4 1704              JAX   SU1
05B6 70FA              IWN   ASP
05B8 61F3              JMP   SUN
05BA 63EC        SU1   JMP*  SUE
                 *
05BC 0000        HI1   DC    **
05BE 870000            LDX*  0
05C1 88FA              STX   ASP
05C3 63F7              JMP*  HI1
                 *
05C5 0000        HI8   DC    **
05C7 6E05A8            RTJ/  SUE
05CA 80FA              LDX   ASP
05CC 63F7              JMP*  HI8
                 *
                 *
                 * UP-8 : NAECHSTE ZEILE IN TAB + SPE *
                 *
05CE 0000        NET   DC    **
05D0 B07C              LDA   ZTA
05D2 A70063            ADA*  F'99'
05D5 F07C              STA   ZTA
05D7 AC                TAX
05D8 63F4              JMP*  NET
                 *
05DA 0000        NES   DC    **
05DC E0B4              LDA   ZSP
05DE A70014            ADA*  F'20'
05E1 F0B4              STA   ZSP
05E3 63F5              JMP*  NES
                 *
05E5 0000        HI3   DC    **
05E7 88B4              STX   ZSP
05E9 807C              LDX   ZTA
05EB 63F8              JMP*  HI3
                 *
05ED 0000        HI4   DC    **
05EF A87C              STX   ZTA
05F1 80B4              LDX   ZSP
05F3 63F6              JMP*  HI4
                 *
                 *
                 * UP - 3 : HILFSPRO. *
                 *
05F5 0000        HIP   DC    **
```

PAGE 012

```
05F7 6E05E5            RTJ/  HI3
05FA FEA805            STV/  TAB+5,X
05FD 6E05ED            RTJ/  HI4
0600 63F3              JMP*  HIP
                 *
0602 0000        HIT   DC    **
0604 6E05E5            RTJ/  HI3
0607 FEA809            STV/  TAB+9,X
060A 6E05ED            RTJ/  HI4
060D 63F3              JMP*  HIT
                 *
060F 0000        HTP   DC    **
0611 6E05E5            RTJ/  HI3
0614 FEA80D            STV/  TAB+13,X
0617 6E05ED            RTJ/  HI4
061A 63F3              JMP*  HTP
                 *
061C 0000        HLP   DC    **
061E 6E05E5            RTJ/  HI3
0621 FEA825            STV/  TAB+37,X
0624 6E05ED            RTJ/  HI4
0627 63F3              JMP*  HLP
                 *
0629 0000        HLN   DC    **
062B 6E05E5            RTJ/  HI3
062E FEA828            STV/  TAB+40,X
0631 6E05ED            RTJ/  HI4
0634 63F3              JMP*  HLN
                 *
                 *
                 * UP-4 : HILFSPRO. *
                 *
                 *
0636 0000        HI6   DC    **
0638 08                R04
0639 EEA000            LDV/  SPE,X            P
063C 6E05F5            RTJ/  HIP
063F EEA004            LDV/  SPE+4,X
0642 6E0602            RTJ/  HIT                 T'1
0645 EEA008            LDV/  SPE+8,X            TP
0648 6E060F            RTJ/  HTP
064B 0A                R03
064C EEA00C            LDV/  SPE+12,X
064F 6E061C            RTJ/  HLP                 LP11
0652 EEA00F            LDV/  SPE+15,X            LN
0655 6E0629            RTJ/  HLN
0658 E09FF8            LDA/  SPE-8,X
065B 807C              LDX   ZTA
065D 6EBF9B            RTJ/  SHR
0660 08                R01
0661 80B4              LDX   ZSP
0663 EEA018            LDV/  SPE+18,X
0666 63CE              JMP*  HI6
                 *
0668 0000        HI7   DC    **
066A 6E05DA            RTJ/  NES
066D 6E05CE            RTJ/  NET
0670 63F6              JMP*  HI7
                 *
```

```
PAGE 013

                    *
                    *
                    * UP-6: VO1 VOLL MIT 4.2:ODER VORZEI. *
                    *
0673 0000           UP0    DC     **
0674 0B                    RO4
0675 F8BA                  STV    VO1+8
0677 09                    RO8
0678 E7AB80                LDA=   X'AB80'
067B F8B6                  STV    VO1
067D 6373                  JMP=   UP0
                    *
067F 0000           UP1    DC     **
0681 0A                    RO3
0682 F8B8                  STV    VO1+3
0684 EFAB8080              LDV=   X'AB808C'
0688 F8B6                  STV    VO1
068A 63F4                  JMP=   UP1
                    *
068C 0000           UP8    DC     **
068E 08                    RO1
068F F8B6                  STV    VO1
0691 63F9                  JMP=   UP8
                    *
                    * UP3 : IN PL *
                    *
0693 0000           UP3    DC     **
0695 09                    RO8
0696 8700B6                LDX=   A'VO1'
0699 6E18B6                RTJ/   CDB
069C 6E18D4                RTJ/   CEF
069F 0B                    RO4
06A0 63F1                  JMP=   UP3
                    *
                    * UP4 : TRANSF. IN DEZ *
                    *
06A2 0000           UP4    DC     **
06A4 87AFAF                LDX=   X'AFAF'
06A7 1F08                  NAX    *+10
06A9 0A                    RO3
06AA EFAFAFAF              LDV=   X'AFAFAF'
06AE 66374F                JMP/   AC4
06B1 0B                    RO4
06B2 8700BE                LDX=   A'VO8'
06B5 6E197A                RTJ/   EDF
06B8 6385                  JMP=   UP4
                    *
                    *
                    * DEZ : CONV. V. EDP IN DEZ-FORM *
                    *
06BA 0000           DEZ    DC     **
06BC 6E06A2                RTJ/   UP4
06BF 08                    RO1
06C0 E8C8                  LDV    VO8+10
06C2 F8C9                  STV    VO8+11
06C4 09                    RO8
06C5 E8C9                  LDV    VO8+11
06C7 87ABB6                LDX=   X'ABB6'
06CA 1F0F                  NAX    DX8

PAGE 014

06CC 6E07A6                RTJ/   DE1
06CF 0B                    RO4
06D0 E8C0                  LDV    VO8+8
06D2 F8CC                  STV    VO3+1
06D4 E8C4                  LDV    VO8+6
06D6 F8D0                  STV    VO3+5
06D8 660791                JMP/   DX7
06DB 87ABB5         DX8    LDX=   X'ABB5'
06DE 1731                  JAX    DX0
06E0 87ABB4                LDX=   X'ABB4'
06E3 173F                  JAX    DX1
06E5 87ABB3                LDX=   X'ABB3'
06E8 174F                  JAX    DX8
06EA 87ABB8                LDX=   X'ABB8'
06ED 175F                  JAX    DX3
06EF 87ABB1                LDX=   X'ABB1'
06F2 176F                  JAX    DX4
06F4 87AB80                LDX=   X'AB80'
06F7 177A                  JAX    DX5
06F9 87AD81                LDX=   X'AD81'
06FC 1710                  JAX    D6X
06FE 6E07A6                RTJ/   DE1
0701 E8C0                  LDV    VO8+8
0703 F8D3                  STV    VO3+8
0705 870007                LDX=   7
0708 6E0797                RTJ/   UDE
070B 660791                JMP/   DX7
070E 660783         D6X    JMP/   DX6
0711 6E07A6         DX0    RTJ/   DE1
0714 EF80                  LDV=   X'D0'
0716 F8D3                  STV    VO3+8
0718 0B                    RO4
0719 E8C0                  LDV    VO8+8
071B F0CC                  STV    VO3+1
071D 0A                    RO3
071E E8C4                  LDV    VO8+5
0720 F8D0                  STV    VO3+5
0722 618D                  JMP    DX7
0724 6E07A6         DX1    RTJ/   DE1
0727 870001                LDX=   1
072A 6E0797                RTJ/   UDE
072D 0B                    RO4
072E E8C0                  LDV    VO8+8
0730 F8CD                  STV    VO3+8
0732 0A                    RO3
0733 E8C4                  LDV    VO8+6
0735 F8D1                  STV    VO3+6
0737 6158                  JMP    DX7
0739 6E07A6         DX8    RTJ/   DE1
073C 870008                LDX=   8
073F 6E0797                RTJ/   UDE
0742 0B                    RO4
0743 E8C0                  LDV    VO8+8
0745 F8CE                  STV    VO3+3
0747 09                    RO8
0748 E8C4                  LDV    VO8+6
074A F8DE                  STV    VO3+7
074C 6143                  JMP    DX7
074E 6E07A6         DX3    RTJ/   DE1

PAGE 015

0751 870003                LDX=   3
0754 6E0797                RTJ/   UDE
0757 0B                    RO4
0758 E8C0                  LDV    VO8+8
075A F8C7                  STV    VO3+4
075C 08                    RO1
075D E8C4                  LDV    VO8+6
075F F8D3                  STV    VO3+6
0761 618E                  JMP    DX7
0763 6E07A6         DX4    RTJ/   DE1
0766 870004                LDX=   4
0769 6E0797                RTJ/   UDE
076C 0B                    RO4
076D E8C0                  LDV    VO8+8
076F F8D0                  STV    VO3+5
0771 611E                  JMP    DX7
0773 6E07A6         DX5    RTJ/   DE1
0776 870005                LDX=   5
0779 6E0797                RTJ/   UDE
077C 0A                    RO3
077D E8C0                  LDV    VO8+8
077F F8D1                  STV    VO3+6
0781 610E                  JMP    DX7
0783 6E07A6         DX6    RTJ/   DE1
0786 870006                LDX=   6
0789 6E0797                RTJ/   UDE
078C 09                    RO8
078D E8C0                  LDV    VO8+8
078F F8DE                  STV    VO3+7
0791 6E18A6         DX7    RTJ/   ARD
0794 6706BA                JMP=   DEZ
                    * UP-8 : HILFSPRO. *
                    *
0797 0000           UDE    DC     **
0799 08             DEB    RO1
079A EF80                  LDV=   X'80'
079C F88DCB                STV/   VO3,X
079F 45                    DCX
07A0 1308                  JXE    DE0
07A2 6173                  JMP    DEB
07A4 63F1           DE0    JMP=   UDE
                    *
07A6 0000           DE1    DC     **
07A8 08                    RO1
07A9 E8BE                  LDV    VO8
07AB F8C3                  STV    VO3
07AD 63F7                  JMP=   DE1
                    *
                    * UP-9 : DATEN IN PL *
                    *
07AF 0000           PPL    DC     **
07B1 0B                    RO4
07B2 807C                  LDX    ETA
07B4 EEAE05                LDV/   TAB+5,X
07B7 6E0678                RTJ/   UP0
07BA 6E0693                RTJ/   UP3
07BD 6E08B6                RTJ/   DEZ

PAGE 016

07C0 F834                  STV    P
07C2 63ED                  JMP=   PPL
                    *
07C4 0000           TPL    DC     **
07C6 0A                    RO3
07C7 807C                  LDX    ETA
07C9 EEAE0A                LDV/   TAB+10,X
07CC 6E067F                RTJ/   UP1
07CF 08                    RO1
07D0 EEAE09                LDV/   TAB+9,X
07D3 6E068C                RTJ/   UP8
07D6 6E0693                RTJ/   UP3
07D9 6E08B6                RTJ/   DZE
07DC F830                  STV    T
07DE 63E4                  JMP=   TPL
                    *
07E0 0000           TFF    DC     **
07E2 0A                    RO3
07E3 807C                  LDX    ETA
07E5 EEAE0E                LDV/   TAB+14,X
07E8 6E067F                RTJ/   UP1
07EB 08                    RO1
07EC EEAE0D                LDV/   TAB+13,X
07EF 6E068C                RTJ/   UP8
07F2 6E0693                RTJ/   UP3
07F5 6E08B6                RTJ/   DZE
07F8 F8D4                  STV    TF
07FA 63E4                  JMP=   TFF
                    *
07FC 0000           LPF    DC     **
07FE 0A                    RO3
07FF 807C                  LDX    ETA
0801 EEAE85                LDV/   TAB+37,X
0804 6E067F                RTJ/   UP1
0807 6E0693                RTJ/   UP3
080A 6E08B6                RTJ/   DZE
080D F844                  STV    PL
080F 63ED                  JMP=   LPF
                    *
0811 0000           LNF    DC     **
0813 0A                    RO3
0814 807C                  LDX    ETA
0816 FEAE88                LDV/   TAB+40,X
0819 6E067F                RTJ/   UP1
081C 6E0693                RTJ/   UP3
081F 6E08B6                RTJ/   DZE
0822 F848                  STV    NL
0824 63ED                  JMP=   LNF
                    *
0826 0000           DZE    DC     **
0828 87EA95                LDX=   A'NB'
082B 6E17D1                RTJ/   DVF
082E 63F6                  JMP=   DZE
                    *
                    *
                    * FORMEL ET , NR.10 *
                    *
0830 0000           FCE    DC     **
0832 807C                  LDX    ETA
```

PAGE 017

```
0834 08                 RO1
0835 EEA80D             LDV/  TAB+13,X
0838 87FFAD             LDX=  X'FFAD'
083B 1781               JMX   SC1
083D 0B                 RO4
083E E8D8               LDV   ZV1
0840 878A95             LDX=  A'K8'
0843 6E1733             RTJ/  MLF
0846 878AA1             LDX=  A'K8'         8373
0849 6E17D1             RTJ/  DVF
084C F8D4               STV   ZVT
084E E8D8               LDV   ZV1
0850 878A9D             LDX=  A'KA'         75
0853 6E1733             RTJ/  MLF
0856 8700D4             LDX=  A'ZVT'
0859 6E17D1             RTJ/  DVF
085C 6117               JMP   SC8
085E 0B        SC1      RO4
085F E8D8               LDV   ZV1
0861 878A95             LDX=  A'K8'
0864 6E1733             RTJ/  MLF
0867 878AA9             LDX=  A'K7'         6655
086A 6E1678             RTJ/  ADF
086D F8D4               STV   ZVT
086F E8D8               LDV   ZV1
0871 878AA5             LDX=  A'K6'         95
0874 6E1733             RTJ/  MLF
0877 8700D4             LDX=  A'ZVT'
087A 6E17D1             RTJ/  DVF
087D 6E1A9C    SC8      RTJ/  ZXD
0880 878AC1             LDX=  A'KD'
0883 6E1733             RTJ/  MLF
0886 878AF1             LDX=  A'K9'         1001  KD=611
0889 6E17D1             RTJ/  DVF
088C 63A8               JMP=  PC8
               *
               *
               * FORMEL F. E,S,RF,TV , KR = 11 *
               *
088E 0000      PC4      DC    **
0890 0B                 RO4
0891 E830               LDV   T
0893 870004             LDX=  A'TF'
0896 6E1681             RTJ/  SBF
0899 878A91             LDX=  A'K1'         K
089C 6E1733             RTJ/  MLF
089F 870034             LDX=  A'P'
08A2 6E1733             RTJ/  MLF
08A5 878A99             LDX=  A'K3'
08A8 6E17D1             RTJ/  DVF           K3=10064
08AB F8D8               STV   ZV1
08AD E83C               LDV   ETF
08AF 8700D8             LDX=  A'ZV1'
08B2 6E1681             RTJ/  SBF
08B5 F808               STV   E
08B7 870038             LDX=  A'ET'         RF
08BA 6E17D1             RTJ/  DVF
08BD 878A81             LDX=  A'K9'         100
08C0 6E1733             RTJ/  MLF
```

PAGE 018

```
08C3 F80C               STV   RF
08C5 E808               LDV   E             5
08C7 878A85             LDX=  A'KA'         378
08CA 6E1733             RTJ/  MLF
08CD 878A89             LDX=  A'KB'         1000
08D0 6E17D1             RTJ/  DVF
08D3 F8D8               STV   ZV1
08D5 E834               LDW   M
08D7 8700D8             LDX=  A'ZV1'
08DA 6E1681             RTJ/  SBF
08DD F8D8               STV   ZV1
08DF E808               LDV   E
08E1 878AAD             LDX=  A'K6'         688
08E4 6E1733             RTJ/  MLF
08E7 8700D8             LDX=  A'ZV1'
08EA 6E17D1             RTJ/  DVF
08ED F810               STV   S
08EF 87148A             LDX=  A'K8K'
08F2 6E1733             RTJ/  MLF
08F5 878A89             LDX=  A'KB'         1000
08F8 6E17D1             RTJ/  DVF
08FB 878A8D             LDX=  A'KC'         1
08FE 6E1678             RTJ/  ADF
0901 6E8BC3             RTJ/  MUS
0904 67088E             JMP=  PC4
               *
               *
               * PD1 : PT-FORMEL,NR 18 *
               *
               *
0907 0000      PD1      DC    **
0909 EE8A89             LDV/  KB            1000
090C 870034             LDX=  A'P'
090F 6E17D1             RTJ/  DVF
0912 6E1B07             RTJ/  LGN
0915 878A85             LDX=  A'K8'         6
0918 6E1733             RTJ/  MLF
091B 878AE9             LDX=  A'KF'         7
091E 6E17D1             RTJ/  DVF
0921 6E1A86             RTJ/  EXN
0924 F8D8               STV   ZV1           1000/P , E-18/7
0926 8700D8             LDX=  A'E'
0929 6E1733             RTJ/  MLF
092C 878ACD             LDX=  A'KK1'        1570
092F 6E1733             RTJ/  MLF
0932 870034             LDX=  A'P'
0935 6E17D1             RTJ/  DVF
0938 F8D4               STV   ZVT           DT
093A 63C8               JMP=  PD1
               *
               * PT *
               *
093C 0000      PE3      DC    **
093E 6E0907             RTJ/  PD1
0941 EE8AE1             LDV/  KK8           8738
0944 878A95             LDX=  A'K8'         10
0947 6E17D1             RTJ/  DVF
094A 870030             LDX=  A'T'
094D 6E1678             RTJ/  ADF
```

PAGE 019

```
0950 8700D8             LDX=  A'ZV1'
0953 6E1733             RTJ/  MLF
0956 F840               STV   PT
0958 6328               JMP=  PE3
               *
               * EPT - FORMEL *
               *
095A 6E093C    PE8      RTJ/  PE3
095D E840               LDV   PT
095F 8700D4             LDX=  A'ZVT'
0962 6E1678             RTJ/  ADF
0965 F81C               STV   EPT
0967 6406E8             JMP/  SC3+3
               *
               * OB FEUCHTIGKEIT VORHANDEN *
               *
096A 0000      OBF      DC    **
096C 807C               LDX   ETA
096E EEA80D             LDA/  TAB+13,X
0971 87AFAF             LDX=  X'AFAF'
0974 63F4               JMP=  OBF
               *
               * L- EICHWERTE IN PL *
               *
0976 0000      EL1      DC    **
0978 0A                 RO3
0979 E854               LDV   PLO
097B 6E067F             RTJ/  UP1
097E 6E0693             RTJ/  UP3
0981 6E06B6             RTJ/  DZE
0984 F8D8               STV   ZV1
0986 0A                 RO3
0987 E858               LDV   NLO
0989 6E067F             RTJ/  UP1
098C 6E0693             RTJ/  UP3
098F 6E06B6             RTJ/  DZE
0992 F8D4               STV   ZVT
0994 63E0               JMP=  EL1
               *
               * PE1 : FORMEL  +L+-L+ +/+ , L  ) NR. 14 *
               *
0996 0000      PE1      DC    **
0998 6E0976             RTJ/  EL1
099B E844               LDV   PL
099D 6E09CF             RTJ/  MID
09A0 8700D8             LDX=  A'ZV1'
09A3 6E17D1             RTJ/  DVF
09A6 F844               STV   PL
09A8 E848               LDV   NL
09AA 6E09CF             RTJ/  MID
09AD 8700D4             LDX=  A'ZVT'
09B0 6E17D1             RTJ/  DVF
09B3 F848               STV   NL
09B5 870044             LDX=  A'PL'
09B8 6E1678             RTJ/  ADF
09BB F850               STV   L
09BD E844               LDV   PL
```

PAGE 020

```
09BF 870048             LDX=  A'NL'
09C2 6E17D1             RTJ/  DVF
09C5 878A95             LDX=  A'K8'
09C8 6E1733             RTJ/  MLF
09CB F840               STV   VPN
09CD 63C7               JMP=  PE1
               *
09CF 0000      MID      DC    **
09D1 878AD5             LDX=  A'KK3'        443
09D4 6E1733             RTJ/  MLF
09D7 878A81             LDX=  A'K9'         100
09DA 6E17D1             RTJ/  DVF
09DD 63F0               JMP=  MID
               *
               *
               * PC8 : IN E,S,RF,TV,EPT,CR-E,S,-RF  '//// ' TRANSF.
               *
09DF 0000      PC8      DC    **
09E1 87001J             LDX=  19
09E4 08                 RO1
09E5 E7AF      SC4      LDV=  X'AF'
09E7 FE8008             STV/  E,X
09EA 45                 DCX
09EB 1DFA               NXN   SC4
09ED 0B                 RO4
09EE 63EF               JMP=  PC8
               *
               * PF1 : FORMEL INS ) NR. ....... 15 *
               *
09F0 0000      PF1      DC    **
09F2 0B                 RO4
09F3 E8D4               LDV   ZVT           ...Z IN KM
09F5 878ADD             LDX=  A'KK5'        408
09F8 6E1733             RTJ/  MLF
09FB 878A89             LDX=  A'KB'         1000
09FE 6E17D1             RTJ/  DVF
0A01 6E1A86             RTJ/  EXN
0A04 878AD9             LDX=  A'KK4'        1849
0A07 6E1733             RTJ/  MLF
0A0A 878A89             LDX=  A'KB'
0A0D 6E17D1             RTJ/  DVF
0A10 F860               STV   INS
0A12 63DC               JMP=  PF1
               *
               *
               * PF8 : FORMEL INR  ) NR.16 *
               *
0A14 0000      PF8      DC    **
0A16 0B                 RO4
0A17 E8E4               LDV   ZV4           ... Z8
0A19 8700E0             LDX=  A'ZV3'        ... Z1
0A1C 6E1681             RTJ/  SBF
0A1F F8E4               STV   ZV4
0A21 E8DC               LDV   ZV8
0A23 8700D8             LDX=  A'ZV1'
0A26 6E1681             RTJ/  SBF
0A29 878AE1             LDX=  A'KK6'        ...80
0A2C 6E17D1             RTJ/  DVF
0A2F 8700E4             LDX=  A'ZV4'
```

6

```
PAGE 081

0A32 6E17D1           RTJ/  DVF
0A35 F8DC             STV   ZV8            ... KSI
0A37 870OD4           LDX*  A'ZVT'
0A3A 6E1733           RTJ/  MLF
0A3D F8D4             STV   ZVT
0A3F E8D8             LDV   ZVI
0A41 87EAE1           LDX*  A'KK6'
0A44 6E17D1           RTJ/  DVF
.... F8D8             STV      ZVI          ..D
0A49 E8DC             LDV   ZV8
0A4B 8700E0           LDX*  A'ZV3'       Z1
0A4E 6E1733           RTJ/  MLF
0A51 F8E0             STV   ZV3          C
0A53 E8D4             LDV   ZVT
0A55 8700D8           LDX*  A'ZVI'        D
0A58 6E1678           RTJ/  ADF
0A5B 8700E0           LDX*  A'ZV3'          C
0A5E 6E1681           RTJ/  SBF
0A61 870040           LDX*  A'INS'
0A64 6E1678           RTJ/  ADF
0A67 F85C             STV   IT
0A69 EE8809           LDV/  K7K          39
0A6C 87EA98           LDX*  A'K8'
0A6F 6E17D1           RTJ/  DVF
0A72 F8D8             STV   ZVI
0A74 E85C             LDV   IT
0A76 8700D8           LDX*  A'ZVI'
0A79 6E1681           RTJ/  SBF
0A7C F85C             STV   IT
0A7E 6394             JMP*  PF2
                 *
                 *
                 * PF3 : VELCHE Z1,Z8 VERDEN BENUTZT ;  NR. 17 *
                 *
0A80 0000        PF3  DC    **
0A82 80AA             LDX   RX
0A84 44               INX
0A85 88E8             STX   ZVK
0A87 80E8        SF2  LDX   ZVK
0A89 09               R08
0A8A EEA000           LDV/  SPE,X
0A8D 807C             LDX   ZTA
0A8F CEA801           CPV/  TAB+1,X
0A92 1009             JOV   SF1
0A94 E0E8             LDA   ZVK
0A96 A70007           ADA*  7
0A99 F0E8             STA   ZVK
0A9B 61EA             JMP   SF2
0A9D E0E8        FF1  LDA   ZVK            Z8-ZEILE
0A9F B70007           SBA*  7
0AA2 F0FA             STA   ASP
0AA4 63DA             JMP*  PF3            Z1-ZEILE IN ASP
                 *
                 *
                 * DATEN Z1,Z2,RAD-1,RAD-8,Z IN FL ; NR. 18 *
                 *
0AA6 0000        PF4  DC    **
0AA8 80FA             LDX   ASP
0AAA 6E0AEA           RTJ/  HIE

PAGE 082

0AAD F8E0             STV   ZV3            IN ZV3 IST Z1 IN KM
0AAF 80FA             LDX   ASP
0AB1 6E0AFE           RTJ/  HIF
0AB4 F8D8             STV   ZVI              RAD-1
0AB6 80E8             LDX   ZVK
0AB8 6E0AEA           RTJ/  HIE
0ABB F8E4             STV   ZV4            Z8 IN KM
0ABD 80E8             LDX   ZVK
....                  ....  ...
0AC2 F8DC             STV   ZV8            RAD-8
0AC4 CA               R03
0AC5 807C             LDX   ZTA
0AC7 EEA801           LDV/  TAB+1,X
0ACA 6E087F           RTJ/  UP1
0ACD 6E0893           RTJ/  UP3
0AD0 87EA81           LDX*  A'K8'           100
0AD3 6E17D1           RTJ/   DVF
0AD6 F8D4             STV   ZVT
0AD8 63CC             JMP*   PF4           IN ZVT  IST Z IN KM
                 *
0ADA 0000        PFT  DC    **
0ADC 6E0A80           RTJ/  PF3
0ADF 6E0AA6           RTJ/ . PF4
0AE2 6E09F0           RTJ/  PF1
0AE5 6E0A14           RTJ/  PF2
0AE8 63F0             JMP*  PFT
                 *
0AEA 0000        HIE  DC    **
0AEC 0A               R03
0AED EEA000           LDV/  SPE,X
0AF0 6E087F           RTJ/  UP1
0AF3 6E0893           RTJ/  UP3
0AF6 87EA81           LDX*  A'K8'
0AF9 6E17D1           RTJ/  DVF
0AFC 63EC             JMP*  HIE
                 *
0AFE 0000        HIF  DC    **
0B00 EEA003           LDV/  SPE+3,X
0B03 6E0878           RTJ/  UP0
0B06 6E0893           RTJ/  UP3
0B09 63F3             JMP*  HIF
                 *
                 *
                 * PG4 : FORMEL FUER N ; NR. 19 *
                 *
0B0B 0000        PG4  DC    **
0B0D 0B               R04
0B0E E85C             LDV   IT
0B10 87EAE1           LDX*  A'KK6'           5C
0B13 6E1733           RTJ/  MLF
0B16 6E181E           RTJ/  LOD
0B19 F8D8             STV   ZVI
0B1B 87EAE5           LDX*  A'KK7'       455
0B1E 6E1733           RTJ/  MLF
0B21 87EAB9           LDX*  A'KB'
0B24 6E17D1           RTJ/   DVF
0B27 F8D4             STV   ZVT             A
0B29 EEEAE9           LDV/  KK8         15458

PAGE 083

0B2C 87EAB9           LDX*  A'KB'
0B2F 6E17D1           RTJ/  DVF
0B32 F8DC             STV   ZV8          D
0B34 E8D8             LDV   ZVI
0B36 87EAED           LDX*  A'KK9'         39
0B39 6E1733           RTJ/  MLF
0B3C 87EAB1           LDX*  A'K8'
0B3F 6E17D1           RTJ/  DVF
0B42 F8D8             STV   ZVI
0B44 EEEAF1           LDV/  KIK          8686) IN ZVI IST Z
0B47 87EAB9           LDX*  A'KB'
0B4A 6E17D1           RTJ/  DVF
0B4D F8E4             STV   ZV4          D
0B4F E8D8             LDV   ZVI
0B51 8700E4           LDX*  A'ZV4'
0B54 6E1681           RTJ/  SBF
0B57 F8D8             STV   ZVI          Z-D
0B59 E850             LDV   L
0B5B 8700EE           LDX*  A'XL'
0B5E 6E1733           RTJ/  MLF
0B61 878803           LDX*  A'K8K'          37184
0B64 6E1733           RTJ/  MLF
0B67 87EAB1           LDX*  A'K9'
0B6A 6E17D1           RTJ/  DVF
0B6D 6E1807           RTJ/  LGN
0B70 8700D8           LDX*  A'ZVI'
0B73 6E1733           RTJ/  MLF
0B76 8700DC           LDX*  A'ZV8'
0B79 6E1678           RTJ/  ADF
0B7C 8700D4           LDX*  A'ZVT'
0B7F 6E1681           RTJ/  SBF
0B82 6E1A66           RTJ/  ZXN
0B85 F8EA             STV   N
0B87 670B0B           JMP*  PG4
                 *
                 *
                 * FORMEL LAE ...NL ; NR. 80 *
                 *
0B8A 0000        PG8  DC    **
0B8C 0B               R04
0B8D EEEAF1           LDV/  KIK            8686
0B90 87EAB9           LDX*  A'KB'
0B93 6E17D1           RTJ/  DVF
0B96 F8DC             STV   ZV8
0B98 E8E4             LDV   ZV4
0B9A 6E181E           RTJ/  LOD
0B9D F8E4             STV   ZV4          LOG RAD
0B9F 87EAED           LDX*  A'KK9'          39
0BA2 6E1733           RTJ/  MLF
0BA5 87EAB1           LDX*  A'K9'
0BA8 6E17D1           RTJ/  DVF
0BAB 8700DC           LDX*  A'ZV8'
0BAE 6E1681           RTJ/  SBF
0BB1 F8DC             STV   ZV8
0BB3 EEEAE9           LDV/  KK6         15458
0BB6 87EAB9           LDX*  A'KB'
0BB9 6E17D1           RTJ/  DVF
0BBC F8E0             STV   ZV3
0BBE E8E4             LDV   ZV4

PAGE 084

0BC0 87EAE5           LDX*  A'KK7'        455
0BC3 6E1733           RTJ/  MLF
0BC6 87EAB9           LDX*  A'KB'
0BC9 6E17D1           RTJ/  DVF
0BCC 8705F8           LDX*  A'KOK'
0BCF 6E1678           RTJ/  ADF
0BD2 8700E0           LDX*  A'ZV3'
0BD5 6E1681           RTJ/  SBF
0BD8 8700DC           LDX*  A'ZV8'
0BDB 6E17D1           RTJ/  DVF
0BDE F8D8             STV   ZVI
0BE0 EE8801           LDV/  K8K         5918
0BE3 87EAB9           LDX*  A'KB'
0BE6 6E17D1           RTJ/  DVF
0BE9 F8DC             STV   ZV8              B) IN ZVI IST A
0BEB E8D8             LDV   ZVI
0BED 8700DC           LDX*  A'ZV8'
0BF0 6E1681           RTJ/  SBF
0BF3 6E1A66           RTJ/  ZXN
0BF6 8700F6           LDX*  A'LV'
0BF9 6E17D1           RTJ/  DVF
0BFC F8EE             STV   XL
0BFE 670B8A           JMP*  PG8
                 *
                 *
                 * LV -ZUERST RECHNEN ; NR 81 *
                 *
0C01 0000        PG3  DC    **
0C03 E7B1D8           LDA*  X'B1D8'
0C06 F0DC             STA   ZV8
0C08 F70000           LDX*  0
0C0B 887C             STX   ZTA
0C0D 807C        S06  LDX   ZTA
0C0F 09               R08
0C10 EEA801           LDV/  TAB+1,X
0C13 80DC             LDX   ZV8
0C15 1708             JAX   SC8
0C17 6E05CE           RTJ/  NFT
0C1A 61F1             JMP   S06
0C1C 6E07FC      S05  RTJ/  LFI
0C1F 6E0811           RTJ/  LNF
0C22 6E0E41           RTJ/  PEX
0C25 E850             LDV   L
0C27 F0F6             STV   LV
0C29 63D6             JMP*  PG3
                 *
                 *
                 * PG1 : RAD -V SUCHEN + IN FL ; NR. 82 *
                 *
0C2B 0000        PG1  DC    **
0C2D 80AA             LDX   RX
0C2F 44               INX
0C30 88FA             STX   ASP
0C32 80FA        S08  LDX   ASP
0C34 09               R08
0C35 E6A000           LDA/  SPE,X
0C38 87B1B8           LDX*  X'B1B8'
0C3B 1709             JAX   S01
0C3D E0FA             LDA   ASP
```

```
PAGE 085

0C3F A70007            ADA*   ?
0C42 F0FA              STA    ASP
0C44 612C              JMP    SG2
0C46 0B         SG1    RO4
0C47 80FA              LDX    ASP
0C49 EEA003            LDV/   SPE+3,X
0C4C 6E047B            RTJ/   UP0
0C4F 6E0693            RTJ/   UP3
0C52 F8E4              STV    ZW4          PAB-V
0C54 E8AC              LDV    VW
0C56 EEA101            LDV/   SPE+1,X
0C59 6E067C            RTJ/   UP0
0C5C 6E0693            RTJ/   UP3
0C5F 872AB1            LDX*   A'K9'
0C62 6E17D1            RTJ/   DVF
0C65 6E1807            RTJ/   LTF
0C68 F8F2              STV    HOK
0C6A 63BF              JMP*   PO1
                *
                *
                * LTA : ERGEBNISSE (IN FL) IN TAB ; NR.= 83 *
                *
0C6C 0000       LTA    DC     **
0C6E 0B                RO4
0C6F E840              LDV    PT
0C71 FEA811            STV/   TAB+17,X
0C74 E818              LDV    EPT
0C76 FEA815            STV/   TAB+21,X
0C79 E806              LDV    K
0C7B FEA819            STV/   TAB+25,X
0C7E E810              LDV    S
0C80 FEA81D            STV/   TAB+29,X
0C83 E8DC              LDV    HF
0C85 FEA821            STV/   TAB+33,X
0C88 E8C4              LDV    TV
0C8A FEA835            STV/   TAB+53,X
0C8D E8BC              LDV    IT
0C8F FEA84D            STV/   TAB+77,X
0C92 E8EA              LDV    N
0C94 FEA851            STV/   TAB+81,X
0C97 E34A              LDV    PL
0C99 6E0CBC            RTJ/   PO1
0C9C FEA825            STV/   TAB+37,X
0C9F 0B                RO4
0CA0 E848              LDV    NL
0CA2 6E0CBC            RTJ/   PO1
0CA5 FEA828            STV/   TAB+40,X
0CA8 0B                RO4
0CA9 E84C              LDV    VPN
0CAB 6E0CBC            RTJ/   PO1
0CAE FEA82B            STV/   TAB+43,X
0CB1 0B                RO4
0CB2 E850              LDV    L
0CB4 6E0CBC            RTJ/   PO1
0CB7 FEA82E            STV/   TAB+46,X
0CBA 63B0              JMP*   LTA
                *
0CBC 0000       PO1    DC     **
0CBE 6E08BA            RTJ/   DEE
```

```
PAGE 086

0CC1 807C              LDX    ZTA
0CC3 0A                RO3
0CC4 E8CF              LDV    W03+4
0CC3 63FA              JMP*   PO1
                *
                *
                * TAE : ENDE V. TAB ? ; NR = 84 *
                *
0CCE 0000       TAE    DC     **
0CD0 0B                RO4
0CCB 807C              LDX    ZTA
0CCD EEA000            LDV/   TAB,X
0CD0 87FFA0            LDX*   X'FFA0'       BLANK
0CD3 1703              JAX    SA8           NAECHSTER TEIL
0CD5 0B                RO4
0CD6 63F0              JMP*   TAE
0CD8 870000     SA8    LDX*   0
0CDB 887C              STX    ZTA
0CDD 660884            JMP/   SPE
                *
                * PK1 : FORMEL DH ;  NR. = 85 *
                *
0CE0 0000       PK1    DC     **
0CE2 0B                RO4
0CE3 E8D4              LDV    ZW1
0CE5 87008E            LDX*   A'PE'
0CE8 6E17D1            RTJ/   DVF
0CEB 6E1807            RTJ/   LGN
0CEE F8D8              STV    ZW1          LN PIK/PE
0CF0 EEBAD1            LDV/   KRE           8738
0CF3 872A95            LDX*   A'KE'         10
0CF6 6E17D1            RTJ/   DVF
0CF9 F8DC              STV    ZW2
0CFB E874              LDV    T1
0CFD 87008C            LDX*   A'ZW2'
0D00 6E1678            RTJ/   ADF
0D03 F874              STV    T1           IN K.
0D05 E870              LDV    T8
0D07 87008C            LDX*   A'ZW2'
0D0A 6E1678            RTJ/   ADF
0D0D F870              STV    T8
0D0F 870074            LDX*   A'T1'
0D12 6E1678            RTJ/   ADF
0D15 872A95            LDX*   A'KE'         8
0D18 6E17D1            RTJ/   DVF
0D1B 8700D8            LDX*   A'ZW1'
0D1E 6E1733            RTJ/   MLF
0D21 872AFD            LDX*   A'MAR'        89886
0D24 6E1733            RTJ/   MLF
0D27 872AB9            LDX*   A'KB'
0D2A 6E17D1            RTJ/   DVF
0D2D F89E              STV    DH
0D2F 63AF              JMP*   PK1
                *
                *
                * PK8 : DATEN IN FL ; NR = 86 *
                *
0D31 0000       PK8    DC     **
0D33 6E07AF            RTJ/   PFL
```

```
PAGE 087

0D36 E834              LDV    P
0D38 F88E              STV    P8
0D3A 6E07C4            RTJ/   TFL
0D3D E830              LDV    T
0D3F F870              STV    T8
0D41 6E0BCE            RTJ/   NET
0D44 6E0D73            RTJ/   TAF
0D47 6E07AF            RTJ/   PFL
0D4A E834              LDV    P
0D4C F88A              STV    P1
0D4E 6E07CA            RTJ/   TFL
0D51 E830              LDV    T
0D53 F874              STV    T1
0D55 E88A              LDV    P1
0D57 87008E            LDX*   A'P8'
0D5A 6E1881            RTJ/   SBF
0D5D 8700FC            LDX*   A'F'
0D60 6E1733            RTJ/   MLF
0D63 872AB1            LDX*   A'K9'
0D66 6E17D1            RTJ/   DVF
0D69 87008A            LDX*   A'P1'
0D6C 6E1678            RTJ/   ADF
0D6F F8D4              STV    ZWT
0D71 63BE              JMP*   PK8
                *
                *
                * TAF : ENDE DER TAB ( WIE TAE ) ; NR = 87 *
                *
0D73 0000       TAF    DC     **
0D75 0B                RO1
0D76 807C              LDX    ZTA
0D78 EEA200            LDV/   TAB,X
0D7B 87FFA0            LDX*   X'FFA0'
0D7E 1703              JAX    SA4
0D80 0B                RO4
0D81 63F0              JMP*   TAF
0D83 660354     SA4    JMP/   SP5
                *
                *
                * FH1 : FORMEL CPA ; *HILFSPHC. ; NR = 88 *
                *
0D86 0000       PH1    DC     **
0D88 0B                RO4
0D89 E8D8              LDV    ZW1
0D8B 3700DC            LDX*   A'ZW2'
0D8E 6E1881            RTJ/   SBF
0D91 87009E            LDX*   A'DH'
0D94 6E17D1            RTJ/   DVF
0D97 872AB1            LDX*   A'K9'
0D9A 6E1733            RTJ/   MLF
0D9D F84C              STV    CPA
0D9F 63E5              JMP*   PH1
                *
0DA1 0000       PH2    DC     **
0DA3 0B                RO4
0DA4 E874              LDV    T1
0DA6 F8D8              STV    ZW1
0DA8 E870              LDV    T8
0DAA F8DC              STV    ZW2
```

```
PAGE 088

0DAC 63F3              JMP*   PH2
                *
0DAE 0000       PH3    DC     **
0DB0 6E8C09            RTJ/   P2H
0DB3 EEA819            LDV/   TAB+25,X
0DB6 6E0DD8            RTJ/   PO2
0DB9 EEA819            LDV/   TAB+25,X
0DBC F8D8              STV    ZW1
0DBE 63E5              JMP*   PH3                 E1,E2
                *
0DC0 0000       PH4    DC     **          S1,S8
0DC2 6E8C8F            RTJ/   PAH
0DC5 EEA81D            LDV/   TAB+29,X
0DC8 6E0DD8            RTJ/   PO2
0DCB EEA81D            LDV/   TAB+29,X
0DCE F8D8              STV    ZW1
0DD0 63EE              JMP*   PH4
                *
0DD2 0000       PO2    DC     **
0DD4 F8DC              STV    ZW8
0DD6 4E                TXA
0DD7 B70083            SBA*   F'99'
0DDA 4C                TAX
0DDB 63F5              JMP*   PO2
                *
0DDD 0000       PH5    DC     **
0DDF 6E8C55            RTJ/   PSH
0DE2 EEA821            LDV/   TAB+33,X
0DE5 6E0DD8            RTJ/   PO2
0DE8 EEA821            LDV/   TAB+33,X
0DEB F8D8              STV    ZW1
0DED 63EE              JMP*   PH5
                *
0DEF 0000       PH6    DC     **
0DF1 0B                RO4
0DF2 807C              LDX    ZTA
0DF4 EEA811            LDV/   TAB+17,X
0DF7 6E0DD8            RTJ/   PO2
0DFA EEA811            LDV/   TAB+17,X
0DFD F8D8              STV    ZW1
0DFF 63EE              JMP*   PH6                 PT1,PT8   UND IN PH5 RF
                *
0E01 0000       PH7    DC     **
0E03 0B                RO4
0E04 807C              LDX    ZTA
0E06 EEA851            LDV/   TAB+81,X
0E09 F896              STV    NP
0E0B 6E0DD8            RTJ/   PO2
0E0E EEA851            LDV/   TAB+81,X
0E11 F892              STV    N1
0E13 63EC              JMP*   PH7                 N1,N8
                *
                *
                * AUSTAUSCH *
                *
0E15 0000       PI1    DC     **
0E17 0B                RO4
0E18 4E8B1E            RTJ/   GE1
0E1B E88A              LDV    P1
```

PAGE 029

```
0E1D 870074            LDX=  A'T1'
0E20 6E17D1            RTJ/  DVF
0E23 F8D8              STV   ZV1
0E25 E88E              LDV   P8
0E27 870070            LDX=  A'T8'
0E2A 6E17D1            RTJ/  DVF
0E2D 87008E            LDX=  A'ZW1'
0E30 6E107B            RTJ/  ABF
0E33 F8D8              STV   ZV1
0E35 E898              LDV   M1
0E37 6EE800            RTJ/  RC8
0E3A F898              STV   M1
0E3C E8E8E8            LDV/  P8
0E3F 870098            LDX=  A'M1'
0E42 6E17D1            RTJ/  DVF
0E45 F892              STV   M1
0E47 E896              LDV   M8
0E49 6EE800            RTJ/  RC8
0E4C F896              STV   M8
0E4E EEEA88            LDV/  M8
0E51 870096            LDX=  A'M8'
0E54 6E17D1            RTJ/  DVF
0E57 F896              STV   M8
0E59 E898              LDV   M1
0E5B 870096            LDX=  A'M8'
0E5E 6E1481            RTJ/  SBF
0E61 F892              STV   M1
0E63 870098            LDX=  A'M1'
0E66 6E1733            RTJ/  MLF
0E69 F89E              STV   M1
0E6B E86A              LDV   P1
0E6D 87008E            LDX=  A'P8'
0E70 6E1681            RTJ/  SBF
0E73 F8DC              STV   EV8
0E75 8700DC            LDX=  A'ZV8'
0E78 6E1733            RTJ/  MLF
0E7B F8DC              STV   ZV8
0E7D 878AF8            LDX=  A'KEK'      643
0E80 6E1733            RTJ/  MLF
0E83 878AB1            LDX=  A'K9'       100
0E86 6E17D1            RTJ/  DVF
0E89 878AB9            LDX=  A'K3'       1000
0E8C 6E17D1            RTJ/  DVF
0E8F 878AB9            LDX=  A'K8'
0E92 6E17D1            RTJ/  DVF
0E95 8700D8            LDX=  A'ZV1'
0E98 6E17D1            RTJ/  DVF
0E9B 870098            LDX=  A'M1'
0E9E 6E17D1            RTJ/  DVF
0EA1 F886              STV   AUS
0EA3 E8DC              LDV   EV8
0EA5 878AF9            LDX=  A'K3N'      373
0EA8 6E1733            RTJ/  MLF
0EAB 878AB1            LDX=  A'K9'
0EAE 6E17D1            RTJ/  DVF
0EB1 8700D8            LDX=  A'ZV1'
0EB4 6E17D1            RTJ/  DVF
0EB7 8700D8            LDX=  A'EV1'
0EBA 6E17D1            RTJ/  DVF
```

PAGE 030

```
0EBD 870098                 LDX=  A'M1'
0EC0 6E1701                 RTJ/  DVF
0EC3 F89A                   STV   DIF
0EC5 670E15                 JMP=  P11
                    *
                    *
                    *
0EC8 0000           PH1     DC    **
0ECA E0D8                   LDA   ZV1
0ECC 807C                   SBA   ZTA
0ECE 1408                   JAN   FR1
                            RTJ/  ...
0ED3 6373                   JMP=  PH1
0ED5 0C             FR1     R01
0ED6 6370                   JMP=  PH1
                    *
                    *
0ED8 0000           PH2     DC    **              PT
0EDA 0B                     R04
0EDB 807C                   LDX   ZTA
0EDD EEA811                 LDV/  TAB+17,X
0EE0 6E06BA                 RTJ/  DEZ
0EE3 0B                     R04
0EE4 E8CE                   LDV   W03+3
0EE6 807C                   LDX   ZTA
0EE8 FEA811                 STV/  TAB+17,X
0EEB 6E0EC8                 RTJ/  PH1
0EEE 63E8                   JMP=  PH2
                    *
                    *
0EF0 0000           PH4     DC    **                   E
0EF2 0B                     R04
0EF3 807C                   LDX   ZTA
0EF5 EEA819                 LDV/  TAB+25,X
0EF8 6E0F03                 RTJ/  P03
0EFB FEA819                 STV/  TAB+25,X
0EFE 6E0EC8                 RTJ/  PH1
0F01 63ED                   JMP=  PH4
                    *
0F03 0000           P03     DC    **
0F05 6E06BA                 RTJ/  DEZ
0F08 0B                     R04
0F09 E8CF                   LDV   W03+4
0F0B 807C                   LDX   ZTA
0F0D 63F4                   JMP=  P03
                    *
                    *
0F0F 0000           PK9     DC    **                   DH
0F11 0B                     R04
0F12 807C                   LDX   ZTA
0F14 EEA831                 LDV/  TAB+49,X
0F17 6E0F03                 RTJ/  P03
0F1A 0B                     R04
0F1B E8CD                   LDV   W03+2
0F1D FEA831                 STV/  TAB+49,X
0F20 6E0EC8                 RTJ/  PH1
0F23 63EA                   JMP=  PK9
                    *
```

PAGE 031

```
                    *
                    * FORTSETZUNG V. NR. 30 ;   NR = 31  *
                    *
0F25 0000           PIN     DC    **
0F27 0B                     R04
0F28 807C                   LDX   ZTA
0F2A EEA835                 LDV/  TAB+53,X
0F2D 6E06BA                 RTJ/  DEZ
0F30 6E0F41                 RTJ/  P04
0F33 FEA835                 STV/  TAB+53,X
0F36 0A                     R03
0F37 E8D0                   LDV   W03+5
0F39 FEA836                 STV/  TAB+54,X
0F3C 6E0EC8                 RTJ/  PH1
0F3F 63E4                   JMP=  PIN
                    *
0F41 0000           P04     DC    **
0F43 08                     R01
0F44 E8C9                   LDV   W03
0F46 807C                   LDX   ZTA
0F48 63F7                   JMP=  P04
                    *
0F4A 000C           PTM     DC    **
0F4C 0B                     R04                        A
0F4D 807C                   LDX   ZTA
0F4F EEA857                 LDV/  TAB+87,X
0F52 6E06BA                 RTJ/  DEZ
0F55 6E0F65                 RTJ/  P05
0F58 FEA845                 STV/  TAB+69,X
0F5B E8D0                   LDV   W03+5
0F5D FEA858                 STV/  TAB+88,X
0F60 6E0EC8                 RTJ/  PH1
0F63 63E5                   JMP=  PTM
                    *
0F65 0000           P05     DC    **
0F67 0A                     R03
0F68 E8CD                   LDV   W03+2
0F6A 807C                   LDX   ZTA
0F6C 63F7                   JMP=  P05
                    *
                    *
0F6E 0000           PSM     DC    **
0F70 0B                     R04
0F71 807C                   LDX   ZTA
0F73 EEA85D                 LDV/  TAB+93,X
0F76 6E06BA                 RTJ/  DEZ
0F79 6E8836                 RTJ/  CEB
0F7C FEA85B                 STV/  TAB+91,X
0F7F E8CF                   LDV   W03+4
0F81 FEA85E                 STV/  TAB+94,X
0F84 6E0EC8                 RTJ/  PH1
0F87 63E5                   JMP=  PSM
                    *
                    *
                    * PSM ; IN AUS +DIF VORNE STATT RO AO BRINGEN *
                    *
0F89 0000           POM     DC    **
0F8B 08                     R01
0F8C 807C                   LDX   ZTA
```

PAGE 032

```
0F8E EEA855                 LDV/  TAB+85,X
0F91 6E0FCB                 RTJ/  P06
0F94 FEA855                 STV/  TAB+85,X
0F97 EEA856                 LDV/  TAB+86,X
0F9A 6E0FCB                 RTJ/  P06
0F9D FEA856                 STV/  TAB+86,X
0FA0 EEA857                 LDV/  TAB+87,X
0FA3 6E0FCB                 RTJ/  P06
0FA6 FEA857                 STV/  TAB+87,X
0FA9 807C           SM1     LDX   ZTA
0FAB EEA85B                 LDV/  TAB+91,X
0FAE 6E0FD8                 RTJ/  P07
0FB1 FEA85B                 STV/  TAB+91,X
0FB4 EEA85C                 LDV/  TAB+92,X
0FB7 6E0FD8                 RTJ/  P07
0FBA FEA85C                 STV/  TAB+92,X
0FBD EEA85D                 LDV/  TAB+93,X
0FC0 3E0FD8                 RTJ/  P07
0FC3 FEA85D                 STV/  TAB+93,X
0FC6 6E0EC8         SM2     RTJ/  PH1
0FC9 63BE                   JMP=  POM
                    *
0FCB 0000           P06     DC    **
0FCD 87FFF0                 LDX=  X'FFF0'
0FD0 1FC7                   MAX   SM1
0FD2 EFA0                   LDV=  X'A0'
0FD4 807C                   LDX   ZTA
0FD6 63F3                   JMP=  P06
                    *
0FD8 0000           P07     DC    **
0FDA 87FFB0                 LDX=  X'FFB0'
0FDD 1FE7                   MAX   SM2
0FDF EFA0                   LDV=  X'A0'
0FE1 807C                   LDX   ZTA
0FE3 63F3                   JMP=  P07
                    *
                    *
                    * UP F. PRINT  ; NR. = 33 *
                    *
0FE5 0000           PR2     DC    **
0FE7 6E118A                 RTJ/  PPT
0FEA 6E118A                 RTJ/  PRT
0FED 63F6                   JMP=  PR2
                    *
0FEF 0000           PP3     DC    **
0FF1 6E118A                 RTJ/  PRT
0FF4 6E0FE5                 RTJ/  PR2
0FF7 63F6                   JMP=  PR3
                    *
0FF9 0000           PP4     DC    **
0FFB 6E0FEF                 RTJ/  PR3
0FFE 6E118A                 RTJ/  PRT
1001 63F6                   JMP=  PR4
                    *
1003 0000           CO1     DC    **
1005 EFAC                   LDV=  C',
1007 6E2BF2                 RTJ/  OUT
100A 6E118A                 RTJ/  PRT
100D 63F4                   JMP=  CO1
```

PAGE 033

```
                    *
100F 0000           CO8     DC      **
1011 6E1003                 RTJ/    CO1
1014 6E110A                 RTJ/    PRT
1017 63F6                   JMP*    CO8
                    *
                    *
                    * KOPF 1 + 2 ; NR - 34 *
                    *
1019 0000           KO1     DC      **
101B 870017                 LDX*    23
101E EEA001         PA0     LDV/    AN0,X
1021 6E80F8                 RTJ/    OUT
1024 43                     DEX
1025 1DF7                   BXN     PA0
1027 870017                 LDX*    23
102A EEA0E0         PA3     LDV/    AN3,X
102D 6E80F8                 RTJ/    OUT
1030 43                     DEX
1031 1DF7                   BXN     PA3
1033 870017                 LDX*    23
1036 EEA001         PA4     LDV/    AN4,X
1039 6E80F8                 RTJ/    OUT
103C 43                     DEX
103D 1DF7                   BXN     PA4
103F 6E1170                 RTJ/    VRZ
1042 870000                 LDX*    0
1045 807C                   STX     STA
1047 6300                   JMP*    KO1
                    *
1049 0000           KO8     DC      **
104B 870016                 LDX*    24
104E EEA019         PA5     LDV/    AN5,X
1051 6E80F8                 RTJ/    OUT
1054 43                     DEX
1055 1DF7                   BXN     PA5
1057 870017                 LDX*    23
105A EEA036         PA6     LDV/    AN6,X
105D 6E80F8                 RTJ/    OUT
1060 43                     DEX
1061 1DF7                   BXN     PA6
1063 870016                 LDX*    22
1066 EEA04A         PA7     LDV/    AN7,X
1069 6E80F8                 RTJ/    OUT
106C 43                     DEX
106D 1DF7                   BXN     PA7
106F 6E1170                 RTJ/    VRZ
1072 870000                 LDX*    0
1075 807C                   STX     STA
1077 6300                   JMP*    KO8
                    *
                    * UP F. PRINT + ZVI ; NR.- 35 *
                    *
1079 0000           P40     DC      **
107B 6E0FF9                 RTJ/    PR4
107E 6E11A9                 RTJ/    ZVI
1081 63F6                   JMP*    P40
                    *
1083 0000           P31     DC      **
```

PAGE 034

```
1085 6E0FE7                 RTJ/    PR3
1088 6E1003                 RTJ/    CO1
108B 6E11A9                 RTJ/    ZVI
108E 63F3                   JMP*    P31
                    *
1090 0000           P88     DC      **
1092 6E0FE6                 RTJ/    PR8
1095 6E100F                 RTJ/    CO8
1098 6E11A9                 RTJ/    ZVI
109B 63F3                   JMP*    P88
                    *
109D 0000           P48     DC      **
109F 6E0FF9                 RTJ/    PR4
10A2 6E100F                 RTJ/    CO8
10A5 6E11A9                 RTJ/    ZVI
10A8 63F3                   JMP*    P48
                    *
10AA 0000           P11     DC      **
10AC 6E0F63                 RTJ/    PRX
10AF 6E0F0F                 RTJ/    IZI
10B2 63F6                   JMP*    P11
                    *
10B4 0000           P81     DC      **
10B6 6E0FE8                 RTJ/    PR8
10B9 6E1003                 RTJ/    CO1
10BC 6E11A9                 RTJ/    ZVI
10BF 63F3                   JMP*    P81
                    *
10C1 0000           P4K     DC      **
10C3 6E0FF9                 RTJ/    PR4
10C6 6E100F                 RTJ/    CO8
10C9 63F6                   JMP*    P4K
                    *
                    *
                    * PT1 - PRINT 1.TEIL V. TAB ; NR. - 36 *
                    *
10CB 0000           PT1     DC      **
10CD 807C                   LDX     STA
10CF 6E10AA                 RTJ/    P11             Z
10D2 6E1079                 RTJ/    P40             K
10D5 6E1079                 RTJ/    P40             P
10D8 6E1083                 RTJ/    P81             T
10DB 6E1083                 RTJ/    P31             TF
10DE 6E1079                 RTJ/    P40
10E1 6E1079                 RTJ/    P40     EPT.    PT'
10E4 6E1090                 RTJ/    P88             B
10E7 6E1090                 RTJ/    P88             S
10EA 6E10B4                 RTJ/    P81
10ED 4A                     INX
10EE 6E10B4                 RTJ/    P81             +L
10F1 6E10B4                 RTJ/    P81             -L
10F4 6E118A                 RTJ/    PRT             +/-
10F7 6E100F                 RTJ/    CO8
10FA 6E11A9                 RTJ/    ZVI
10FD 6E0FE8                 RTJ/    PR8             L
1100 6E1003                 RTJ/    CO1
1103 6E1170                 RTJ/    VRZ
1106 63C3                   JMP*    PT1
                    *
```

PAGE 035

```
1108 0000           PT8     DC      **
110A 807C                   LDX     STA
110C 6E10AA                 RTJ/    P11     Z
110F 4E                     TXA
1110 A700B0                 ADA*    F'B0'
1113 F0FA                   STA     ASP
1115 870004                 LDX*    4
1118 6E117E                 RTJ/    ZVR
111B 80FA                   LDX     ASP
111D 6E1131                 RTJ/    PT4
1120 63E6                   JMP*    PT8
                    *
1122 0000           PT3     DC      **
1124 807C                   LDX     STA
1126 6E0FA1                 RTJ/    IX8
1129 6E0B4F                 RTJ/    GE4
112C 6E1131                 RTJ/    PT4
112F 63F1                   JMP*    PT3
                    *
1131 0000           PT4     DC      **
1133 6E1079                 RTJ/    P40
1136 6E1090                 RTJ/    P88             GT
1139 6E1090                 RTJ/    P88             GE
113C 6E1090                 RTJ/    P88             GS
113F 6E1090                 RTJ/    P88             GRP
1142 6E1090                 RTJ/    P88             CPT
1145 6E1090                 RTJ/    P88             I
1148 6E1090                 RTJ/    P88             N
114B 6E10C1                 RTJ/    P4K
114E 6E11A9                 RTJ/    ZVI
1151 6E0B3F                 RTJ/    GE3
1154 807C                   LDX     STA
1156 6E0F63                 RTJ/    PRX
1159 6E1170                 RTJ/    VRZ
115C 63D3                   JMP*    PT4
                    *
                    *
                    *
                    * ENT ; TEIL T.F/L ENTFAELLT *
                    *
115E 0000           ENT     DC      **
1160 870003                 LDX*    3
1163 EFAD           EN1     LDV*    X'AD'
1165 6E80F8                 RTJ/    OUT
1168 43                     DEX
1169 1DF8                   BXN     EN1
116B 6E0BR0                 RTJ/    RU6
116E 63EE                   JMP*    ENT
                    *
                    *
                    * UP ( VRZ, PRT PRS,ZVI,ZVR ...  ; NR.- 38 *
                    *
1170 0000           VRZ     DC      **
1172 EF8D                   LDV*    X'8D'
1174 6E80F8                 RTJ/    OUT
1177 EF8A                   LDV*    X'8A'
1179 6E80F8                 RTJ/    OUT
117C 63F2                   JMP*    VRZ
                    *
```

PAGE 036

```
117E 0000           ZVR     DC      **
1180 EFA0                   LDV*    X'A0'
1182 6E80F8                 RTJ/    OUT
1185 43                     DEX
1186 1DFB                   BXZ     ZVR+8
1188 63F4                   JMP*    ZVR
                    *
118A 0000           PRT     DC      **
118C EEAE00                 LDV/    TAB,X
118F 6E80F8                 RTJ/    OUT
1192 4A                     INX
1193 63F5                   JMP*    PRT
                    *
1195 0000           PRS     DC      **
1197 EEA000                 LDV/    SPE,X
119A 6E80F8                 RTJ/    OUT
119D 4A                     INX
119E 63F8                   JMP*    PRS
                    *
11A0 0000           COM     DC      **
11A2 EFAC                   LDV*    C','
11A4 6E80F8                 RTJ/    OUT
11A7 63F7                   JMP*    COM
                    *
11A9 0000           ZVI     DC      **
11AB EFA0                   LDV*    X'A0'
11AD 6E80F8                 RTJ/    OUT
11B0 63F7                   JMP*    ZVI
                    *
                    *
                    * UP - EINLESEN MIT SLE *
11B2 0000           CIT     DC      **
11B4 58                     ROI
11B5 870000                 LDA*    0
11B8 F600FA                 STA/    ASP
11BB 39C8                   ORA     6,8
11BD 6E11EE         INP     RTJ/    SLE
11C0 D7007F                 ANA*    X'7F'
11C3 A70080                 ADA*    X'80'
11C6 8600FA                 LDX/    ASP
11C9 FEA000                 STV/    SPE,X
11CC 8700FF                 LDX*    X'FF'
11CF 17EC                   JAN     INP
11D1 87008A                 LDX*    X'8A'
11D4 17E7                   JAN     INP
11D6 87008D                 LDX*    X'8D'
11D9 17E2                   JAN     INP
11DB 8700A0                 LDX*    X'A0'
11DE 17DD                   JAN     INP
11E0 860BAE                 LDX/    CAS
11E3 1705                   JAN     EEI
11E5 7600FA                 INV/    ASP
11E8 41D3                   JMP     INP
11EA 3958           EEI     ORA     4,8
11EC 41B7                   JMP     CIX
11EE 0000           SLE     DC      **
11F0 6E11FE                 RTJ/    RTA
11F3 63F9                   JMP*    SLE
11F5 1003                   JOV     ERR
```

PAGE 037

```
11F7 0C                  RO1
11F8 63FA                JMP*  $-4
11FA 3968         SRR    JBA   4,8
11FC 0C                  SLT
11FD 0001                DC    1
11FE 0000         RTA    DC    **
1200 38021IFD            IBM   1,8,RTA-1
1204 E708                LDV*  X'8'
1206 0000                AMV   RTA-1
1208 11F0                JAE   *+8
120A EF08                LDV*  X'8'
120C D0EF                AMV   RTA-1
120E 1101                JAE   *+3
1210 0C                  SO1
1211 8100                TBA   *+8
1213 63E9                JMP*  RTA
1215 639B         GIX    JMP*  GIT
                  *
                  **
                  *
                  * ENTSCH. WELCHE STELL IN PRINT  AUSTEU. *
                  *
1217 0000         RUD    DC    **
1219 1003                JOV   SRX
121B 660486              JMP/  SR6+5
121E E6808E       SRX    LDA/  OA6
1221 870004              LDX*  X'0004'
1224 1909                JAE   RU1
1226 8700C6              LDX*  X'0006'
1229 170F                JAE   RU8
122B 870000              LDX*  X'0000'
122E 170F                JAE   RU3
1230 66097C              JMP/  RAU
1233 63E0                JMP*  RUD
1235 668468       RU1    JMP/  R1U
1238 43ED                JMP*  RUD
123A 660500       RU8    JMP/  R8U
123D 63E6                JMP*  RUD
123F 66053E       RU3    JMP/  R3U
1242 63D3                JMP*  RUD
                  *
1244 6E1170       VRA    RTJ/  VRE
1247 66016E              JMP/  BG1
                  *
124A 6E1170       VRB    RTJ/  VRE
124D 660180              JMP/  B68
                  *
1250 6E1170       VRC    RTJ/  VRE
1253 660194              JMP/  B03
                  *
1256 6E1170       VRD    RTJ/  VRE
1259 660148              JMP/  B04
                  *
125C 6E1170       VRE    RTJ/  VRE
125F 660126              JMP/  BE6
                  *
1262 0000         BLX    DC    **
1264 8707D0              LDX*  8000
1267 0E           BLA    RO1
```

PAGE 038

```
1268 E7A0                LDV*  X'A0'
126A FEA800              STV/  TAB,X
126D 48                  DCX
126E 1DF7                NAM   BLA
1270 63F0                JMP*  FLX
                  *
1272 0000         BOX    DC    **
1274 870000              LDX*  0
1277 807C                STX   ZTA
1279 807C         TRS    LDX   ZTA
127B E7B0B0              LDA*  X'B0B0'
127E F6A803              STA/  TAB+3,X
1281 6E096E              RTJ/  NET
1284 4E                  TXA
1285 870900              ADA*  A'00'
1288 1008                NAM   TR1
128A 61ED                JMP   TRS
128C 63E4         TR1    JMP*  BOX
                  *
128E 0000         BLY    DC    **
1290 870000              LDX*  0
1293 E8A000              LDA/  SPE,X
1296 87ADAD              LDX*  X'ADAD'
1299 1708                JAE   BY1
129B 6E1D62              RTJ/  BLX
129E 63EE                JMP*  BLY
12A0 6E1186       BY1    RTJ/  ENT
12A3 0C                  SO1
12A4 63E0                JMP*  BLY
                  *
                  * AUFRUNDEN AN  'KST' LDX*  .. KOMMASTELLEN*
                  *
12A6 0000         ARD    DC    **
12A8 0E                  RO1
12A9 80A8                LDX   KST             KOMMASTELLEN
12AB E8A801              LDV/  V03+4,X
12AE 87FFB5              ADA*  X'FFB5'
12B1 1C08                NAM   PRI
12B3 63F1                JMP*  ARD
12B5 7680CF       PRI    IVM/  V03+4,X
12B8 E880D0              LDV/  V03+5,X
12BB 87FFBA              LDX*  X'FFBA'
12BE 1F08                NAX   HAI
12C0 E7B0                LDV*  X'B0'
12C2 80A8                LDX   KST
12C4 FE80D0              STV/  V03+5,X
12C7 7680CE              IVM/  V03+3,X
12CA E780CF              LDV/  V03+4,X
12CD 87FFBA              LDX*  X'FFBA'
12D0 1F1C                NAX   HAI
12D2 E7B0                LDV*  X'B0'
12D4 80A8                LDX   KST
12D6 FE80CF              STV/  V03+4,X
12D9 7680CD              IVM/  V03+2,X
12DC EE80CE              LDV/  V03+3,X
12DF 87FFBA              LDX*  X'FFBA'
12E2 1F0A                NAX   HAI
12E4 E7B0                LDV*  X'B0'
12E6 80A8                LDX   KST
```

PAGE 039

```
12E8 FE80CE              STV/  V03+3,X
12EB 7680CC              IVM/  V03+1,X
12EE 63B6         HAI    JMP*  ARD
                  *
                  *  DURCHSCHNITT *
                  *
12F0 0000         PRI    DC    **
12F2 870000              LDX*  0
12F5 6E8E8D              RTJ/  POT
12F8 F830                STV   T
12FA 870011              LDX*  17
12FD 6E136D              RTJ/  PIX
1300 F840                STV   PT
1302 870051              LDX*  81
1305 6E136D              RTJ/  PIX
1308 F818                STV   EPT
130A 870019              LDX*  25
130D 6E136D              RTJ/  PIX
1310 F808                STV   E
1312 870059              LDX*  89
1315 6E136D              RTJ/  PIX
1318 F810                STV   S
131A 870021              LDX*  33
131D 6E136D              RTJ/  PIX
1320 F80C                STV   AF
1322 870000              LDX*  0
1325 6E8E3A              RTJ/  POV
1328 F850                STV   L
132A 870035              LDX*  53
132D 6E136D              RTJ/  PIX
1330 F814                STV   TV
1332 87009C              LDX*  156
1335 6E136D              RTJ/  PIX
1338 F828                STV   GRT
133A 8700A0              LDX*  160
133D 6E136D              RTJ/  PIX
1340 F81C                STV   GRE
1342 8700A4              LDX*  164
1345 6E136D              RTJ/  PIX
1348 F884                STV   GRS
134A 8700A8              LDX*  168
134D 6E136D              RTJ/  PIX
1350 F8FC                STV   GRF
1352 8700AC              LDX*  172
1355 6E136D              RTJ/  PIX
1358 F88C                STV   EPT
135A 870051              LDX*  81
135D 6E136D              RTJ/  PIX
1360 F8EA                STV   N
1362 87008A              LDX*  136
1365 6E136D              RTJ/  PIX
1368 F85A                STV   AUS
136A 668C8F              JMP   EPR-4
                  *
136D 0000         PIX    DC    **
136F 0D                  RO5
1370 807C                STX   ZTA
1372 87000C              LDA*  0
1375 70DA                SIA   ZW1+8
```

PAGE 040

```
1377 6E8F83              RTJ/  PX8
137A 807C         PRE    LDX   ZTA
137C 4E8C7B              RTJ/  PR1
137F 8700D8              LDX*  A'EV1'
1382 6E0F8D              RTJ/  PR3
1385 F8D8                STV   ZV1
1387 6E08CE       PR3    RTJ/  NET
138A 70E8                IVM   ZVX
138C E70008              LDA*  X'8'
138F 80E8                LDX   ZVX
1391 1FE7                NAX   PRE
1393 E8D8                LDV   ZW1
1395 09                  RO8
1396 E8E0                LDV   ZW3
1398 6E15D4              RTJ/  CEF
139B F8EA                STV   ZWA
139D E8D8                LDV   ZW1
139F 8700EA              LDX*  A'ZWA'
13A2 6E17D1              RTJ/  DVF
13A5 63C6                JMP*  PIX
                  *
                  *
                  * HOEHE IN MP *
                  *
13A7 0B           VYS    ROA
13A8 E8AE                LDV   TTX             UP F. HOEHE IN MP
13AA F88E                STV   PB
13AC E8B88F              LDV/  T17
13AF F870                STV   T8
13B1 870000              LDX*  0
13B4 807C                STX   ZTA
13B6 6E07AF              RTJ/  PPL
13B9 E834                LDV   P
13BB F88A                STV   P1
13BD 6E07CA              RTJ/  TPL
13C0 E830                LDV   T
13C2 F874                STV   T1
13C4 E88A                LDV   P1
13C6 87008E              LDX*  A'PR'
13C9 6E1681              RTJ/  SBF
13CC 8700FC              LDX*  A'F'
13CF 6E1733              RTJ/  MLF
13D2 87EAB1              LDX*  A'K9'
13D5 6E17D1              RTJ/  DVF
13D8 87008A              LDX*  A'P1'
13DB 6E1678              RTJ/  ADF
13DE F8D4                STV   ZVT
13E0 6E0CE0              RTJ/  PH1
13E3 E8A4                LDV   TX              HOEHE 1700
13E5 87009E              LDX*  A'DM'
13E8 6E1681              RTJ/  SBF
13EB 870000              LDX*  0
13EE 807C                STX   ZTA
                  *
                  * HOEHE F. MP *
                  *
13F0 807C         VY3    LDX   ZTA
13F2 FEA801              STV/  TAB+1,X
13F5 F8D8                STV   ZV1
```

ii

PAGE 041

```
13F7 6E05CE          RTJ/  NET      NOEMS V. I. NF *
13FA 6E141B          RTJ/  TAK      OB ENDS
13FD EEA831          LDV/  TAB+49,X
1400 F8DC            STV   ZV8
1402 E8D8            LDV   ZV1
1404 870ODC          LDX=  A'ZV8'
1407 6E1681          RTJ/  SBF
140A 6124            JMP   VY3
140C 870000    VY4   LDX=  0
140F 887C            STX   ETA
1411 6E1A00          RTJ/  BNV
1414 1008            JOV   VY5
1416 61F9            JMP   VY4+5
1418 660883    VY5   JMP/  SB8
               *
141B 0000      TAK   DC    **
141D 08              RO1
141E EEA800          LDV/  TAB,X
1421 877FA0          LDX=  X'FFA0'
1424 1705            JAX   VY8
1426 807C            LDX   ETA
1428 08              RO4
1429 6370            JMP*  TAK
142B 661ADC    VY8   JMP/  VYA
               *
142E 0000      PHV   DC    **
1430 0B              RC4
1431 807C            LDX   ETA
1433 EEA801          LDV/  TAB+1,X
1436 6E06BA          RTJ/  DEZ
1439 0B              RO4
143A E8CD            LDV   WO3+2
143C 807C            LDX   ETA
143E FEA801          STV/  TAB+1,X
1441 6E8E66          RTJ/  PHF
1444 63E8            JMP*  PHV
               *
               *
               * KONSTANTEN ( NR - 48 *
               *
1446 BAD3D5C1  AN1   DC    C':SUAEVIN-TPUAN'
144A C3D6C9CE
144E ADD4D0D5
1452 C1C8
1454 48353E00  X6X   DC    X'48J53E00'
89D1                 ORG   X'89D1'
               *
               *
89D1 A0A0C6D4  AN2   DC    C'  FT      T      P      N  E'
89D5 A0A0A0A0
89D9 A0D4A0A0
89DD A0A0D0A0
89E1 A0A0A0A0
89E5 C8A0A0DA
89E9 A0A0A0D3  AN3   DC    C'   S      E     TPE    TP  '
89ED A0A0A0A0
89F1 A0C5A0A0
89F5 A0A0D4D0
89F9 C5A0A0A0
```

PAGE 042

```
89FD DACOAOAO
8A01 A0A0CCA0  AN4   DC    C'  L  -I.  L.   L.   FR '
8A05 A0A0BAAB
8A09 A0A0A0CC
8A0D A0A0A0A0
8A11 CCA0A0A0
8A15 A0C6D0A0
8A19 A0A0C5AD  AN5   DC    C'  E-6  T-8  VT    ND  E'
8A1D C7A0A0A0
8A21 DAA0C7A0
8A25 A0A0A0A0
8A29 A0A0A0A0
8A2D C6CAA0A0
8A31 DA
8A32 A0A0A0C9  AN6   DC    C'  I     TP-6  FR-6  E-6 '
8A36 A0A0A0A0
8A3A A0A0A0D9
8A3E A0A0C6D8
8A42 A0C7A0A0
8A46 D3A0C7A0
8A4A DAA0A0A0  AN7   DC    C'E    D         A         N  '
8A4E A0C4A0A0
8A52 A0A0A0A0
8A56 A0C1A0A0
8A5A A0A0A0A0
8A5E C8A0A0
8A61 BAD5D3D4  AN8   DC    C':RUTAALPHET-PH'
8A65 C1D0C8D0
8A69 CDC5D4AD
8A6D D0C8
8A6F BAD4C9C5  AN9   DC    C':TIEKUITHEVEJ-PH'
8A73 CBC7C9D4
8A77 C8C3D8C5
8A7B C8ADD0C8
8A7F BAD4C9C5  ANA   DC    C':TIEKEINKAFTIEL-PH'
8A83 CBC7C9C8
8A87 CBC1C6D4
8A8B C9C5CCAD
8A8F D0C8
8A91 50000003  K1    DC    X'50000003'
8A95 50000004  K2    DC    X'50000004'
8A99 75F0000D  K3    DC    X'75F0000D'
8A9D 4B000007  K4    DC    X'4B000007'
8AA1 4A70000C  K5    DC    X'4A80000C'
8AA5 5F000007  K6    DC    X'5F000007'
8AA9 5BF8000C  K7    DC    X'5BF8000C'
8AAD 4DC0000A  K8    DC    X'4DC0000A'
8AB1 64000007  K9    DC    X'64000007'
8AB5 58000009  KA    DC    X'58000009'
8AB9 7D00000A  KB    DC    X'7D00000A'
8ABD 40000001  KC    DC    X'40000001'
8AC1 4C60000A  KD    DC    X'4C60000A'
8AC5 40000008  KE    DC    X'40000008'
8AC9 70000003  KF    DC    X'70000003'
8ACD 6B80000B  KK1   DC    X'6B80000B'
8AD1 5340000C  KK2   DC    X'5340000C'
8AD5 6EC00009  KK3   DC    X'6EC00009'
8AD9 7610000B  KK4   DC    X'7610000B'
8ADD 64800009  KK5   DC    X'64800009'
```

PAGE 043

```
8AE1 64000006  KK6   DC    X'64000006'
8AE5 71C00009  KK7   DC    X'71C00009'
8AE9 78E8000E  KK8   DC    X'78E8000E'
8AED 46000006  KK9   DC    X'46000006'
8AF1 5810000C  K1K   DC    X'5810000C'
8AF5 5060000A  K2K   DC    X'5060000A'
8AF9 775C8008  K3K   DC    X'775C8008'
8AFD 7E48000F  K4K   DC    X'7E48000F'
8B01 5C78000D  K5K   DC    X'5C78000D'
8B05 48980010  K6K   DC    X'48980010'
8B09 4E000006  K7K   DC    X'4E000006'
               *
8B0D 0000      RCE   DC    **
8B0F 0B              RO4
8B10 6E1807          RTJ/  LON
8B13 878AC5          LDX=  A'KE'
8B16 6E17D1          RTJ/  DVF
8B19 6E1A86          RTJ/  EXN
8B1C 63EF            JMP*  RCE
               *
               *
8B1E 0000      GE1   DC    **
8B20 E898            LDV   N1
8B22 878AB9          LDX=  A'KB'
8B25 6E1733          RTJ/  MLF
8B28 F292            STV   N1
8B2A E896            LDV   N2
8B2C 878AB9          LDX=  A'KB'
8B2F 6E1733          RTJ/  MLF
8B32 F096            STV   N2
8B34 63E8            JMP*  GE1
               *
               *
8B36 0000      GE2   DC    **
8B38 0A              RO3
8B39 E8CC            LDV   WO3+1
8B3B 807C            LDX   ETA
8B3D 63F7            JMP*  GE2
               *
               *
8B3F 0000      GE3   DC    **
8B41 6E11A9          RTJ/  ZV1
8B44 6E11A9          RTJ/  ZV1
8B47 6ECFF9          RTJ/  PRA
8B4A 6E0F97          RTJ/  PIK
8B4D 63F0            JMP*  GE3
               *
               *
8B4F 0000      GE4   DC    **
8B51 4E              TXA
8B52 A70031          ADA=  F'49'
8B55 4C              TAX
8B56 6E11A9          RTJ/  ZVI
8B59 6E0FA9          RTJ/  P30
8B5C 63F1            JMP*  GE4
               *
8B5E 0050      SPK   DS    80
8BAE 0004      CAS   DS    4
8BB2 0004      T17   DS    4
```

PAGE 044

```
8BB6 0000      CSA   DC    **
8BB8 4C              TAX
8BB9 EE8BAF          LDV/  CAS+1
8BBC F0D6            STA   VO1
8BBE 4E              TXA
8BBF 80D6            LDX   VO1
8BC1 63F3            JMP*  CSA
8BC3 0000      NU5   DC    **
8BC5 F0D8            STV   ZV1
8BC7 EE8AD1          LDV/  KK2
8BCA 878AD5          LDX=  A'KK3'
8BCD 6E17D1          RTJ/  DVF
8BD0 F0DC            STV   ZV8
8BD2 870030          LDX=  A'T'
8BD5 6E1678          RTJ/  ADF
8BD8 870CD8          LDX=  A'ZV1'
8BDB 6E1733          RTJ/  MLF
8BDE 8700DC          LDX=  A'ZV8'
8BE1 6E1681          RTJ/  SBF
8BE4 F014            STV   TV
8BE6 63D8            JMP*  NU5
8BE8 0000      NU6   DC    **
8BEA 6E1170          RTJ/  VRZ
8BED 6E05CE          RTJ/  NET
8BF0 63F6            JMP*  NU6
               *
8BF3 0000      OUT   DC    **
8BF4 06              RU1
8BF5 3800            OBE   0,0
8BF7 63F9            JMP*  OUT
8BF9 06              RO1
8BFA F90C            STV   BUF
8BFC 3183            IBA   1,3
8BFE DF0A            ANV=  X'A'
8C00 11FA            JAZ   *-4
8C02 E904            LDV   BUF
8C04 3903            OBA   0,3
8C06 63EA            JMP*  OUT
8C08 0001      BUF   DS    1
               *
               *
8C09 0000      P3H   DC    **
8C0B 0B              RO4
8C0C 807C            LDX   ETA
8C0E E6A819          LDA/  TAB+25,X
8C11 87AFAF          LDX=  X'AFAF'
8C14 1711            JAX   S31
8C16 807C            LDX   ETA
8C18 6E0DD2          RTJ/  POB
8C1B E6A819          LDA/  TAB+25,X
8C1E 87AFAF          LDX=  X'AFAF'
8C21 1704            JAX   S31
8C23 807C            LDX   ETA
8C25 63E2            JMP*  P3H
8C27 E7AFAFAFAF  S31 LDV=  X'AFAFAFAF'
8C2C 5602E8          JMP/  FR8
               *
               *
8C2F 0000      P4H   DC    **
```

PAGE 045

```
8C31 0B                 RO4
8C32 807C               LDX   ETA
8C34 E4A81D             LDA/  TAB+29,X
8C37 87AFAF             LDX=  X'AFAF'
8C3A 1711               JAX   S41
8C3C 807C               LDX   ETA
[illegible]             RTJ/  POB
[illegible]             LDA/  [illegible]
[illegible]             LDX=  [illegible]
[illegible] 1700        JAX   S01
[illegible]             LDX   ETA
[illegible] 6300        JMP*  PAH
[illegible]       S41   LDV=  X'AFAFAFAF'
[illegible]             JMP/  [illegible]
                  *
                  *
8C56 0000         PGH   DC    **
8C57 0B                 RO4
8C58 807C               LDX   ETA
8C5A E4A821             LDA/  TAB+33,X
8C5D 87AFAF             LDX=  X'AFAF'
8C60 1711               JAX   S51
8C62 807C               LDX   ETA
8C64 6E00DE             RTJ/  POE
8C67 E4A821             LDA/  TAB+33,X
8C6A 87AFAF             LDX=  X'AFAF'
8C6D 1704               JAX   S01
8C6F 807C               LDX   ETA
8C71 6300               JMP*  PGH
8C73 E7AFAFAFAF   S51   LDV=  X'AFAFAFAF'
8C78 6400F8             JMP/  PRE+16
                  *
                  *
8C7B 0000         PX1   DC    **
8C7D E4A800             LDA/  TAB,X
8C80 87AFAF             LDX=  X'AFAF'
8C83 1707               JAX   SX1
8C85 807C               LDX   ETA
8C87 E8A800             LDV/  TAB,X
8C8A 6387               JMP*  PX1
8C8C 661307       SX1   JMP/  PR3
                  *
                  *
                  *
                  *
8C8F 08                 RO1
8C90 87000A             LDX=  10
8C93 E8ADAD       SPR   LDV/  AMB,X
8C96 6E88F8             RTJ/  OUT
8C99 48                 DCX
8C9A 1DF9               MXN   SPR
8C9C 6E1170             RTJ/  VRE
8C9F 6E1170             RTJ/  VRE
8CA2 870000             LDX=  0
8CA5 6E8DC1             RTJ/  POE
8CA8 870030             LDX=  X'30'
8CAB 6E8D87             RTJ/  POA
8CAE FEA809             STV/  TAB+9,X
8CB1 870040             LDX=  X'40'
```

PAGE 046

```
8CB4 6E8D61             RTJ/  POB
8CB7 FEA811             STV/  TAB+17,X
8CBA 870010             LDX=  X'10'
8CBD 6E8D61             RTJ/  POB
8CC0 FEA815             STV/  TAB+21,X
8CC3 870018             LDX=  X'18'
8CC6 6E8D87             RTJ/  POA
[illegible]             STV/  TAB+[illegible],X
8CCC 870008             LDX=  X'8'
8CCF 6E8D6B             RTJ/  POC
8CD2 FEA819             STV/  TAB+25,X
8CD5 870010             LDX=  X'10'
8CD8 6E8D6B             RTJ/  POC
[illegible]             STV/  TAB+[illegible],X
8CDE 87000C             LDX=  X'C'
8CE1 6E8D6B             RTJ/  POC
8CE4 FEA821             STV/  TAB+33,X
8CE7 870050             LDX=  X'50'
8CEA 6E8D6B             RTJ/  POC
8CED FEA82E             STV/  TAB+46,X
8CF0 870088             LDX=  X'88'
8CF3 6E8D75             RTJ/  POD
8CF6 FEA839             STV/  TAB+57,X
8CF9 87001C             LDX=  X'1C'
8CFC 6E8D75             RTJ/  POD
8CFF FEA83D             STV/  TAB+61,X
8D02 870084             LDX=  X'84'
8D05 6E8D75             RTJ/  POD
8D08 FEA841             STV/  TAB+65,X
8D0B 870080             LDX=  X'80'
8D0E 6E8D75             RTJ/  POD
8D11 FEA8AD             STV/  TAB+49,X
8D14 87008C             LDX=  X'8C'
8D17 6E8D75             RTJ/  POD
8D1A FEA849             STV/  TAB+73,X
8D1D 87008A             LDX=  X'8A'
8D20 6E8D6B             RTJ/  POC
8D23 FEA851             STV/  TAB+81,X
8D26 0B                 RO4
8D27 E8E6               LDV   AUB
8D29 6E06BA             RTJ/  DEZ
8D2C 0B                 RO4
8D2D E8CD               LDV   WO3+8
8D2F 807C               LDX   ETA
8D31 FEA855             STV/  TAB+85,X
8D34 88E0               STX   EVX
8D36 08                 RO1
8D37 6E1019             RTJ/  RO1
8D3A 80E8               LDX   EVX
8D3C 887C               STX   ETA
8D3E 6E10CB             RTJ/  PT1
8D41 6E1170             RTJ/  VRE
8D44 6E1049             RTJ/  HOP
8D47 80E8               LDX   EVX
8D49 887C               STX   ETA
8D4B 6E1108             RTJ/  PTR
8D4E 6E1170             RTJ/  VRE
8D51 6E1170             RTJ/  VRE
8D54 671870             JMP*  PR1
```

PAGE 047

```
                  *
8D57 0000         POA   DC    **
8D59 6E8DB6             RTJ/  PAB
8D5C 6E8D8D             RTJ/  T81
8D5F 6376               JMP*  POA
                  *
8D61 0000         POB   DC    **
8D63 6E8DB6             RTJ/  PAB
8D66 6E8D9B             RTJ/  K31
8D69 6376               JMP*  POB
                  *
8D6B 0000         POC   DC    **
8D6D 6E8DB6             RTJ/  PAB
8D70 6E8DA4             RTJ/  K81
8D73 6376               JMP*  POC
                  *
8D75 0000         POD   DC    **
8D77 6E8DB6             RTJ/  PAB
8D7A 6E8D7F             RTJ/  T18
8D7D 6376               JMP*  POD
                  *
8D7F 0000         T18   DC    **
8D81 0A                 RO3
8D82 E8D0               LDV   WO3+8
8D84 F8CC               STV   WO3+1
8D86 0B                 RO4
8D87 E8CB               LDV   WO3
8D89 807C               LDX   ETA
8D8B 6378               JMP*  T18
                  *
8D8D 0000         T81   DC    **
8D8F 0A                 RO3
8D90 E8CF               LDV   WO3+4
8D92 F8CC               STV   WO3+1
8D94 0B                 RO4
8D95 E8CB               LDV   WO3
8D97 807C               LDX   ETA
8D99 6378               JMP*  T81
                  *
8D9B 0000         K31   DC    **
8D9D 0B                 RO4
8D9E E8CE               LDV   WO3+3
8DA0 607C               LDX   ETA
8DA2 6377               JMP*  K31
                  *
8DA4 0000         K81   DC    **
8DA6 0A                 RO3
8DA7 E8CF               LDV   WO3+4
8DA9 807C               LDX   ETA
8DAB 6377               JMP*  K81
                  *
8DAD BAC8DAD8     AMB   DC    C'*ETREW *TIM'
8DB1 C3D7ADAE
8DB5 D4C9CD
                  *
                  *
                  *
8DB8 0000         PAB   DC    **
8DBA 0B                 RO4
```

PAGE 048

```
8DBB EC                 LDV*
8DBC 6E06BA             RTJ/  DEZ
8DBF 6377               JMP*  PAB
                  *
8DC1 0000         POE   DC    **
8DC3 887C               STX   ETA
8DC5 87000D             LDX=  X'D'
8DC8 88E8               STX   EWX
8DCA 6E05CE             RTJ/  NZT
8DCD 90E8               MUL   EWX
8DCF 4D                 TBX
8DD0 887C               STX   ETA
8DD2 63ED               JMP*  POE
                  *
8DD4 0000         POF   DC    **
8DD6 88D8               STX   ZW1
8DD8 88DA               STX   ZW1+8
8DDA 88E8               STX   EWX
8DDC 887C               STX   ETA
8DDE 6374               JMP*  POF
                  *
8DE0 0000         POG   DC    **
8DE2 807C         PRY   LDX   ETA
8DE4 6E07C4             RTJ/  TPL
8DE7 6E8E03             RTJ/  PO1
8DEA 1FF6               NAX   PRY
8DEC 6378               JMP*  POG
                  *
8DEE 0000         POH   DC    **
8DF0 09                 RO2
8DF1 E8E8               LDV   EWX
8DF3 6E18D4             RTJ/  CEF
8DF6 0B                 RO4
8DF7 F8E4               STV   EW4
8DF9 E8D8               LDV   ZW1
8DFB 8700E4             LDX=  A'7W4'
8DFE 6E1731             RTJ/  DVF
8E01 63E8               JMP*  POH
                  *
8E03 0000         PO1   DC    **
8E05 8700D8             LDX=  A'EW1'
8E08 6E1678             RTJ/  ADF
8E0B F8D8               STV   ZW1
8E0D 6E05CE             RTJ/  NZT
8E10 70E8               IWM   EWX
8E12 E4A800             LDA/  TAB,X
8E15 87A0A0             LDX=  X'A0A0'
8E18 63E9               JMP*  PO1
                  *
8E1A 0000         POK   DC    **
8E1C 870006             LDX=  6
8E1F 887C               STX   ETA
8E21 807C         PRE   LDX   ETA
8E23 6E0811             RTJ/  LNF
8E26 6E8E03             RTJ/  PO1
8E29 1FF6               NAX   PRE
8E2B 63ED               JMP*  POK
                  *
8E2D 0000         POT   DC    **
```

PAGE 049

```
8E2F 6E2DD4          RTJ/   POF
8E32 6E2DB0          RTJ/   POG
8E35 6E2DEE          RTJ/   POH
8E38 63F3            JMP*   POT
               *
8E3A 0000      POV   DC     **
8E3C 6E2DD4          RTJ/   POF
8E3F 6E2E1A          RTJ/   POK
                     RTJ/
8E45 63F3            JMP*   POV
               *
8E47 0000      PNX   DC     **
8E49 870000          LDX*   0
8E4C 8E7C            STX    ZTA
                     LDE
8E50 E6AB00          LDA/   TAB,X
8E53 87A0A0          LDX*   X'A0A0'
8E56 1705            JAX    RN1
8E58 6E0DCE          RTJ/   NET
8E5B 61F1            JMP    RN2
8E5D 607C      RN1   LDE    ZTA
8E5F 8ED8            STX    ZVI
8E61 870000          LDX*   0
8E64 63E1            JMP*   PNX
               *
               *
8E66 0000      PNP   DC     **
8E68 0E              RO1
8E69 607C            LDE    ZTA
8E6B EEAB00          LDV/   TAB,X
8E6E 87FFA0          LDX*   X'FFA0'
8E71 1705            JAX    SN1
8E73 6E0DCE          RTJ/   NET
8E76 63EE            JMP*   PNP
8E78 0E        SN1   RO1
8E79 63ED            JMP*   PNP
               *
               *
8E7B 0000      NIP   DC     **
8E7D 0D              RO4
8E7E 607C            LDE    ZTA
8E80 EEAB35          LDV/   TAB+53,X
8E83 6E06BA          RTJ/   DEZ
8E86 6E0F41          RTJ/   PO4
8E89 FEAB35          STV/   TAB+53,X
8E8C 0A              RO3
8E8D E8CF            LDV    VO3+6
8E8F FEAB36          STV/   TAB+54,X
8E92 6E0EC0          RTJ/   PN1
8E95 63EA            JMP*   NIP
               *
               *
8E97 0003      PGX   DC     **
8E99 6E8EE8          RTJ/   LNV
8E9C 6E0C01          RTJ/   PO3
8E9F 63F6            JMP*   PGX
               *
               *
8EA1 0000      PEX   DC     **
```

PAGE 050

```
8EA3 807C            LDE    ZTA
8EA5 E6AB28          LDA/   TAB+40,X
8EA8 87AFAF          LDX*   X'AFAF'
8EAB 1F20            SAX    SP4
8EAD 6E0976          RTJ/   ELI
                     LDV    PL
                     RTJ/
                     LDX*   A'EVI'
                     RTJ/   BVF
                     STV    PL
                     LDX*   A'VLE'
8EC0 6E17D1          RTJ/   BVF
                     LDX*
8EC6 6E1678          RTJ/   ADF
8EC9 FE80            STV    L
8ECB EE8FED          LDV/   VLZ
8ECE 87AAF0          LDX*   A'KE'
8ED1 6E1733          RTJ/   HLF
8ED4 F648            STV    VPN
8ED6 E7AFAF          LDA*   X'AFAF'
8ED9 F048            STA    ML
8EDB 63C4            JMP*   PEX
8EDD 6ED996    SP4   RTJ/   PEI
8EE0 63BF            JMP*   PEX
               *
               *
8EE2 0000      LNV   DC     **
8EE4 870000          LDX*   0
8EE7 8E7C            STX    ZTA
8EE9 807C      RN3   LDE    ZTA
8EEB E6AB28          LDA/   TAB+40,X
8EEE 87AFAF          LDX*   X'AFAF'
8EF1 1F06            MAX    RN4
8EF3 6E0DCE          RTJ/   NET
8EF6 61F1            JMP    RN3
8EF8 870000    RN4   LDX*   0
8EFB 8ED8            STX    ZVI
8EFD 8EDA            STX    ZVI+2
8EFF 8EDC            STX    ZVE
8F01 8EDE            STX    ZVE+2
8F03 6E07FC    SP3   RTJ/   LPF
8F06 6E0E11          RTJ/   LNF
8F09 E84A            LDV    PL
8F0B 8700D8          LDX*   A'ZVI'
8F0E 6E8F31          RTJ/   ACI
8F11 E848            LDV    ML
8F13 6E8F3A          RTJ/   AC2
8F16 6E0DCE          RTJ/   NET
8F19 0E              RO1
8F1A E6AB00          LDV/   TAB,X
8F1D 87FFA0          LDX*   X'FFA0'
8F20 1721            MAX    SP3
8F22 0D              RO4
8F23 6E8F46          RTJ/   AC3
8F26 6E17D1          RTJ/   LVF
8F29 F808            STV    VLZ
8F2B 63B6            JMP*   LNV
8F2D 0004      VLZ   DS     4
               *
```

PAGE 051

```
               *
8F31 0000      ACI   DC     **
8F33 6E1678          RTJ/   ADF
8F36 FED8            STV    ZVI
8F38 63F7            JMP*   ACI
               *
               *
8F3A 0000      AC2   DC     **
8F3C 87008C          LDX*   A'ZW2'
8F3F 6E1678          RTJ/   ADF
8F42 FEDC            STV    ZV2
8F44 63F4            JMP*   AC2
               *
               *
8F46 0000      AC3   DC     **
8F48 EED8            LDV    ZVI
8F4A 87008C          LDX*   A'ZW2'
8F4D 63F7            JMP*   AC3
               *
               *
8F4F F8C8      AC4   STV    VO3
8F51 F8C8            STV    VO3+3
8F53 F8D1            STV    VO3+6
8F55 6706BA          JMP*   DEZ
               *
               *
8F58 0000      MAS   DC     **
8F5A E0D4            LDA    ZSP
8F5C A70016          ADA*   F'22'
8F5F F0D4            STA    ZSP
8F61 63F5            JMP*   MAS
               *
8F63 0000      PRX   DC     **
8F65 EEAB61          LDV/   TAB+97,X
8F68 6E8DF8          RTJ/   OUT
8F6B EEAB62          LDV/   TAB+98,X
8F6E 6E8DF8          RTJ/   OUT
8F71 63F0            JMP*   PRX
               *
               *
8F73 0000      NLZ   DC     **
8F75 8CD4            LDX    ZSP
8F77 E69FF8          LDA/   SPZ+8,X
8F7A 607C            LDE    ZTA
8F7C F6AB61          STA/   TAB+97,X
8F7F 08              RO1
8F80 FEAB00          STV/   TAB,X
8F83 63EE            JMP*   NLZ
               *
8F85 0000      ZNR   DC     **        ZEILE NR IN TAB
8F87 F6AB61          STA/   TAB+97,X
8F8A FEAB00          STV/   TAB,X
8F8D 63F6            JMP*   ZNR
               *
8F8F 0000      IXI   DC     **
8F91 6E11A9          RTJ/   ZVI
8F94 44              INX
8F95 63F8            JMP*   IXI
               *
```

PAGE 052

```
8F97 0000      PIX   DC     **
8F99 6E119A          RTJ/   PRT
8F9C 6E11A9          RTJ/   ZVI
8F9F 63F6            JMP*   PIX
               *
8FA1 0000      IX2   DC     **
8FA3 6E8F63          RTJ/   PRX
8FA6 44              INX
8FA7 63F8            JMP*   IX2
               *
8FA9 0000      P30   DC     **
8FAB 6E0FEF          RTJ/   PR3
8FAE 6E11A9          RTJ/   ZVI
8FB1 63F6            JMP*   P30
               *
8FB3 0000      PX2   DC     **
8FB5 F0D8            STA    ZVI
8FB7 F0E0            STA    ZVX
8FB9 F0E0            STA    ZV3
8FBB 63F6            JMP*   PX2
               *
8FBD 0000      PX3   DC     **
8FBF 6E1678          RTJ/   ADF
8FC2 70E0            IVM    ZV3
8FC4 63F7            JMP*   PX3
               *
8FC6 0000            END    AN
```

PASS 2

UNCLASSIFIED
Security Classification

## DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

| | |
|---|---|
| 1. ORIGINATING ACTIVITY (Corporate author)<br>Physikalisch-Bioklimatische Forschungsstelle der Fraunhofer-Gesekkschaft, 81 Garmisch-Partenkirchen, Germany, Skistadion | 2a. REPORT SECURITY CLASSIFICATION<br>Unclassified<br>2b. GROUP<br>N/A |

3. REPORT TITLE
A Study of the Effects of Atmospheric Fine Structure Characteristics on the Vertical Distribution of Aerosols.

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)
Final Technical Report, July 1971

5. AUTHOR(S) (First name, middle initial, last name)
Reinhold Reiter; Rudolf Sladkowic; and Walter Carnuth

| 6. REPORT DATE | 7a. TOTAL NO. OF PAGES | 7b. NO. OF REFS |
|---|---|---|
| July 1971 | 110 | 3 |

| | |
|---|---|
| 8a. CONTRACT OR GRANT NO.<br>DAJA-37-70C-2647<br>b. PROJECT NO.<br>IT061102B53A<br>c.<br>d. | 9a. ORIGINATOR'S REPORT NUMBER(S)<br><br>9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) |

10. DISTRIBUTION STATEMENT
**This document has been approved for public release and sale; its distribution is unlimited.**

| 11. SUPPLEMENTARY NOTES | 12. SPONSORING MILITARY ACTIVITY |
|---|---|
| | US Army Research & Development Gp (EUR)<br>Box 15, FPO New York 09510 |

13. ABSTRACT


The investigations continued during the reporting period essentially as described in preceding reports. The objectives were:
a. To shield the cable car telemetry systems against all effects of the weather and to obtain by them homogeneous series of recordings;
b. to develop and apply the physical and mathematical bases for the complete numeric evaluation of the recording runs, up to and including computation of the incremental exchange coefficients;
c. to continually record at the three stations the Aitken nuclei concentrations, natural radioactivity (RaB, RaC), and polar conductivities, and to utilize them in the evaluations; and
d. to derive initial deductions from the results.
The entire evaluation technique was completely changed. A new computer (Intertechnique Multi 8) with 12 k words ( 1 word = 9 bit) affords us the possibility to perform the entirety of all computation processes in one single operation, and to print them out in tables.



Key words:
Aerosol; gradient; troposphere; boundary layer; exchange coefficient.


DD FORM 1 NOV 65 1473 REPLACES DD FORM 1473, 1 JAN 64, WHICH IS OBSOLETE FOR ARMY USE.

UNCLASSIFIED