KONINKLIJK NEDERLANDS METEOROLOGISCH INSTITUUT

WETENSCHAPPELIJK RAPPORT
SCIENTIFIC REPORT

W.R. 80 - 8

DESCRIPTION OF THE KNMI OPERATIONAL WAVE FORECAST MODEL GONO.

J. Bruinsma[1], P.A.E.M. Janssen[2], G.J. Komen[2], H.H. Peeck[2], M.J.M. Saraber[2] and W.J.P. de Voogt[3].

1) Rijkswaterstaat Den Haag, The Netherlands
2) KNMI, De Bilt, The Netherlands
3) Delft Hydraulics Laboratory, De Voorst Branch, The Netherlands

Publikatienummer: K.N.M.I. W.R. 80 - 8 (OMM)

Koninklijk Nederlands Meteorologisch Instituut,
Oceanografisch en Maritiem Meteorologisch Onderzoek,
Postbus 201,
3730 AE De Bilt,
Nederland.

U.D.C.: 551.466.33:518

Contents

Preface

In Spring 1980 there was a workshop on the KNMI wave prediction model GONO. The workshop was attended by J. Bruinsma (RWS), W.J.P. de Voogt (Delft Hydr. Lab.), G.J. Komen, H.H. Peeck, M.J.M. Saraber and P.A.E.M. Janssen all at KNMI.
The findings of this workshop are embodied in this report.

The authors are pleased to acknowledge useful discussions with J.W. Sanders, who developed GONO. They thank E.H.J. Vermaas for his help in many details of the program.

This work was performed as part of a joint wave modeling program of KNMI, Rijkswaterstaat and Delft Hydraulics Laboratory.

May 2, 1980,
Peter A.E.M. Janssen.

I. Introduction

The purpose of this report is to give a description of the GONO computer-code, which is operational at KNMI for many years now.
The program was developed by J.W. Sanders,[1] and its deep water version is based on a Norwegian wave prediction model, built by C. Haug in the sixties.[2] Shallow water effects are however important in the southern part of the North Sea, giving a limitation of the wave growth and causing important swell dissipation. A discussion of the shallow-water effects, as present in GONO, is given by Sanders in Ref. 3. The computer code GONO is written in ALGOL60 and operational on the Burroughs 6700 of KNMI.

The program GONO calculates wind speed, wind direction and sea energy at every grid point of the GONO grid (c.f. Appendix A) and swell energy at a limited number of points only (we call these points swell points). GONO runs every six hours and it gives a 12 and 24 hours forecast as well as results based on analyzed weather maps.

In the winter of '79-'80 the output of GONO was compared with measurements and the operational wave model of Bracknell (United Kingdom). (The latter GONO version differs a little bit from the version here described). The preliminary results of this comparison are given in Ref. 4. A reasonable agreement of significant wave height and low-frequency energy, as given by GONO, with the observations was found.
The present version of GONO, with small modifications compared to the previous version, is operational since the end of February 1980.

We note that F. Klepper[5] has evaluated the GONO output over the period November-December 1973. Also a brief description of the computer program is given.

Essentially, the GONO model is based on two steps. First, the sea energy at every grid point is determined. To this end advection of energy is treated by means of a finite difference scheme whereas the growth of the wave energy is calculated by means of an empirical growth curve (assuming that the wave spectrum has a fixed form).

The second step is the calculation of the swell.
Of course, in principle swell can be treated likewise, but then one has to store swell energy (and its direction) at every time, at every grid point for every frequency band. Also, this finite difference scheme is rather crude for swell propagation, whereas, because of stability reasons, there is an upper bound for the propagation speed (in the present case the upper bound is given by 13.87 m/s).
If one is only interested in swell information at particular points (swell points), it is tempting to use a ray technique. The advantage of this technique is that it is very accurate. Swell is determined in this fashion in GONO.

We should note that our interest is mainly in the wave part of the program, so that for this reason the plan of this report is as follows. In section II we outline the GONO program. Next, a detailed description is given of the procedures WIND, ZEEGANGSBEREKENING (Sea) and DEINING (Swell) (Section III).
Section IV gives an outline of the program BOLPROLYN, which produces a number of data sets. BOLPROLYN is relevant for hindcasting studies. Where possible a brief account of the physics involved will be given followed by a detailed description of the program itself. Also a flow diagram is presented.
In appendix A the GONO grid is given, appendix B presents a summary on the shallow water effects in GONO, which will be published by J.W. Sanders,[3] and in appendix C a listing of the present version of GONO is given, while appendix D gives a 'recipe' how to run GONO.

List of frequently used symbols

ARRAYS

D : contains swell energy + direction of at most 10 positions

DA : depth

EA : wind sea energy

GSN: average group velocity

WR : wind direction

WRN: new wind direction

WS : wind speed

FILES

ARCHIEFTEL 1
ARCHIEFTEL 2 } : contains pressure information from the telescope model

GNO/ZGHI/DATUM: contains D, EA, GSN and WRN

GONOINPUT: contains pressure information

PROLYNHI: contains a.o. position of the swell points

VTHI: contains fixed tables like DA, TYDA and HS (growth rate curve), CGOND (group velocity on shallow water) and KOM (k(ω): wave number k as a function of angular frequency ω).

II. Global Description of GONO

In this section we briefly describe the main blocks in GONO. They are (line numbers in the GONO code are given in parenthesis):

- GONOSTART (517-856)
- GONO1 (858-1040)
- GONO2 (1043-2536)
- GONO3 (2539-3000).

The program GONO2, which is discussed in more detail in section III, calculates the wind, the sea energy at every grid point and the swell energy at certain swell points. To that end it reads the arrays DA, EA, WR, WS, GSN, D and as a result the file GNO/ZGHI/DATUM is written.

The rest of this section is devoted to the other blocks of GONO.

GONOSTART (Boolean procedure)

GONOSTART takes care of the initialisation; it reads a number of parameters (e.g. several constants) and reads the sea and swell energy at BEGINDTG (DTG = Date Time Group).

First, procedure PRELUDEGONO (DTG, END DTG) (525-689) is declared. In this procedure the files ARCHIEFTEL 1 and ARCHIEFTEL 2, containing pressure information from the Telescope Model, are called and stored in file GONOINPUT.

In PRELUDEGONO the procedures FOUND [(548-560), check of grid code], MATCH [(562-569),] and PROCESSGRID [(571-616), transformation of Telescope Grid to the GONOANAL grid] are declared.

At 692 GONO starts by determining DTG (Date Time Group). Furthermore it is checked whether DTG-12 h matches the ENDDTG of the previous run, otherwise the run terminates. At 720 procedure PRELUDEGONO is called.

Finally, the remaining part of the block GONOSTART (736-844) defines the constants and reads the files PROLYNHI, VTHI and GNO/ZGHI/DATUM.

It should be noted that in the part of the main program, preceeding GONOSTART, a number of procedures are declared. They are amongst others procedure INTER [(118-199), interpolation calculation], SUM (201-218), SURFACEF, SURFPREP, and SURFCALC [(220-443), needed for a continuous pressure field], and UITSPLITS [(445-515), takes care of the distinction between sea and swell energy]. The last procedure is discussed at the end of Section III in more detail.

GONO1 (858-1040)

GONO1 reads the pressure from file GONOINPUT, infers from this a continuous pressure field and transforms the result to the GONO grid. A continuous representation of the pressure field is made because the calculation of the wind (see GONO2) needs second derivatives of the pressure. For fitting, GONO1 uses Legendre-like polynomials, the degree of which depends on the extent of the area and the fine structure.

GONO3 (2539-3000)

GONO3 produces the output of the wave information for oil rigs.

The main program GONO now runs as follows:
If GONOSTART is true then GONO1 runs twice, because GONO2 needs the rate of change of the pressure field in time in order to calculate the wind.
Next, GONO2 is called and calculates the wind and sea energy. Then, GONO1 and GONO2 are called in sequence until the forecast period (FP = 12 or 24 hours) is reached. Then, GONO prints output for the oil rigs, Hook of Holland, Zierikzee etc.

III. GONO2 Description

GONO2 consists of the following procedures:

1051-1180 procedure PF (calculation p_x, p_{xx}, p_y, p_{yy}, p_{xy})
1182-1545 procedure DEINING
1547-1652 procedure WIND
1655-1668 procedure WINDCOEF(A)
1670-1978 procedure UITVOER(D, DK)
VERIFICATIEIN (1678)
VERIFICATIEOUT (1707)
VERIFICATIEFILE (1733)
AFSTAND (1780)
DEININGPUNT (1789)
UITVOER ZIERIKZEE (1951)
UITVOER WEERKAMER (1957)
UITVOER RESEARCH (1963)
1981-2025 procedure GRIDKAART
2027-2043 ARRAY DECLARATION
2044-2071 procedure PRINTSNEDE
2073-2122 procedure ZGUIT
2124-2530 THRU 2 DO ZEEGANGSBEREKENING
2536 END of GONO2

In this section we describe the procedures WIND and DEINING and block ZEEGANGSBEREKENING (2124-2530) in more detail. To this end a brief account of the physics involved in the program is given followed by a detailed description of the program which is listed in appendix C. Whenever necessary a global flow diagram is presented. The section is concluded with some final remarks.

III.1. Procedure WIND (1547-1652)

The wind is calculated from the pressure field in procedure WIND. By means of an iterative solution of the Navier-Stokes equation the following relation between the wind and the pressure field is obtained[6]

$$u = -\frac{a_1}{f}p_y - \frac{a_2}{f}p_x + \frac{a_3}{f^2}(p_{ty} + vp_{yy}) + \frac{a_4}{f^2}(p_{tx} + vp_{xy}) + O(f^{-3}) ,$$

$$v = -\frac{a_2}{f}p_y + \frac{a_1}{f}p_x + \frac{a_4}{f^2}(p_{ty} + up_{xy}) - \frac{a_3}{f^2}(p_{tx} + up_{xx}) + O(f^{-3}) ,$$

where u and v are the x and y components of the velocity, and the coefficients a_1, a_2, a_3 and a_4 depend on the air-sea temperature difference $\Delta T = T_a - T_s$, and friction coefficients.
The derivatives of the pressure p are calculated by means of procedure PF. In the next step the coefficient a_1, a_2, a_3 and a_4 are determined by means of procedure WINDCOEF(A) (1656-1669) for different values of the temperature difference ΔT. Then u and v are determined by means of the parameters B_1, ..., B_6, where F, F_1, ..., F_3 are constants needed for the transformation to grid and time step units.
As a result, at every grid point I, J the windspeed (in array WS[I, J]) and the wind direction (in array WR[I, J]) are now known.

III.2. Calculation of sea (2124-2530)

If refraction may be neglected the energy balance equation is given by

$$\frac{\partial}{\partial t}E + \vec{C}_g.\nabla E = S \equiv S_{IN} + S_{NL} + S_{DISS} ,$$

where S_{IN} is the atmospheric energy input, S_{DISS} represents the dissipation of energy due to bottom friction, wave breaking, etc. and S_{NL} is the non-linear interaction term. The term $\vec{C}_g.\nabla E$ represents advection of energy, $E = E(x, y, t; \omega)$ is the energy density, and $\vec{C}_g$ is the group velocity $\partial\omega/\partial\vec{k}$ (ω and $\vec{k}$ are circular frequency and wave vector respectively).

Advection will be discussed in a while.

The source term S however, is not well-known and for this reason an empirical growth-rate curve is used. This growth-rate curve, for infinite fetch, relates the significant wave height $H_S = 4\sqrt{E_{tot}}$ ($E_{tot} = \int E d\omega$) with time t (cf. Figure 1). For infinite fetch advection vanishes so that the growth curve in Fig. 1 correctly corresponds to the source term S in the energy balance equation.

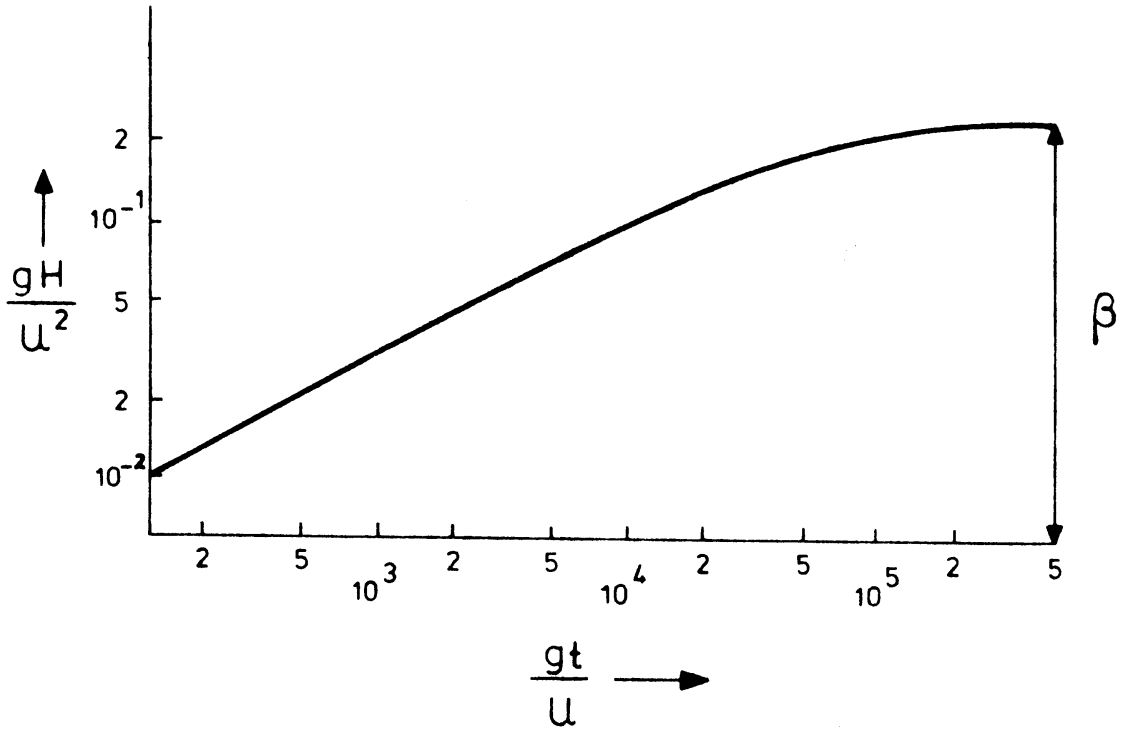


Fig. 1. Significant wave height H_S versus time: Growth rate curve for deep water in case of infinite fetch.

Assuming a fixed form of the frequency spectrum for the sea state, e.g. the spectrum in Fig. 2*, the problem of growing sea can be solved in principle for fixed values of the Phillips constant α. To this end one assumes that in saturation ($gt/U \to \infty$) the peak frequency f_p is related to the windspeed U by $f_p = g/2\pi U$. Then using $\beta = .22$ and $\alpha = 8.2\ 10^{-3}$ the minimum frequency for the Kruseman spectrum f_m is given by

$$f_m = .76\ f_p\ .$$

* Henceforth to be called the Kruseman spectrum[7].

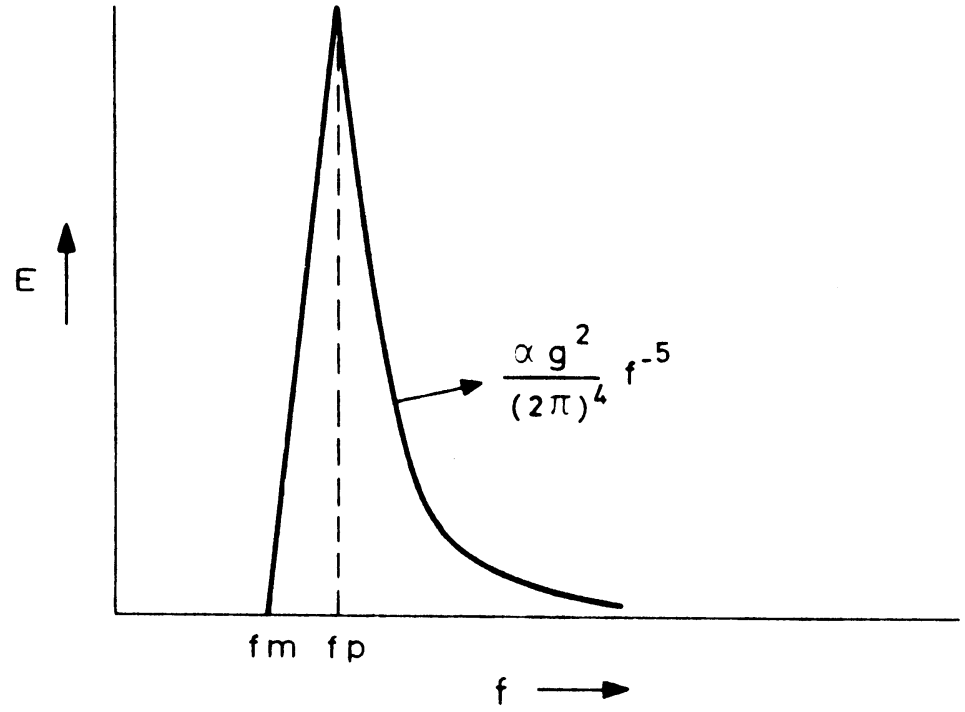


Fig. 2. The Kruseman Spectrum.

For growing sea the time dependence of the peak frequency follows from $\int E d\omega = \frac{1}{16} H_S^2$ (t). From our assumption that the form of the spectrum does not depend on the growth stage (hence the ratio f_m/f_p is fixed as in the fully grown case) we obtain

$$f_p(t) = \frac{g}{2\pi U} \sqrt{\beta} \left(\frac{U^2}{gH_S}\right)^{\frac{1}{2}} .$$

The spectrum for sea is now determined for every t since the significant wave height is known from the growth rate curve.
It is useful to label growing sea with a parameter. Sanders[1] introduced to this end the quantity U_*/U, where U_* is defined according to

$$\frac{gH_S(t)}{U_*^2} = \beta ,$$

thus for growing sea $U_* < U$. The parameter U_* is the wind velocity for which a given spectrum would be fully grown. The peak frequency $f_p(t)$ may then be written as

$$f_p(t) = \frac{g}{2\pi U_*} .$$

In the above treatment we have fixed the value of α. Initial stages of growth show, however, an overshoot effect so that α becomes a function of the growth stage parameter U_*/U. In addition also the ratio $f_m/f_p = \gamma$ becomes a function of the growth stage while

$$f_p = \frac{g}{2\pi U_*} \delta \ .$$

(cf. Ref. 1) Sanders has determined the dependence of α, δ and f_m/f_p on U_*/U. Thus, GONO takes into account overshoot effects as well.

Apart from the invariance of the frequency dependence of the spectrum also the directional distribution of energy is assumed to be fixed. It is given by $\cos^2(\theta-\phi)$, where ϕ is the angle between the wind direction and the y-axis and θ the angle between the y-axis and the direction of interest.

The program ZEEGANGSBEREKENING works as follows:
At every grid point I, J the increase of energy due to advection of sea energy from neighbouring grid points is calculated. This energy flows in a direction, which in general differs an angle $\Delta\alpha$ from the wind direction. Only the part of the propagated energy that falls within the directional spectrum corresponding to the new wind direction is subject to growth by the wind. The remaining part of the propagated energy might be potential swell or just dissipates. Let us denote the retained part of the energy, corresponding to the dashed area of Fig. 3, by E'.

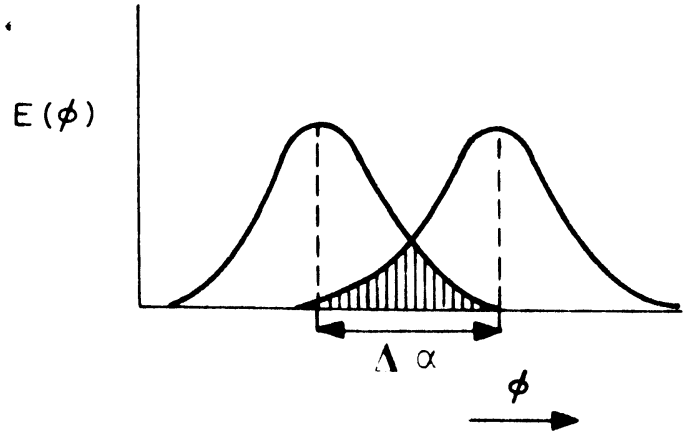


Fig. 3. Dashed area = retained sea energy after propagation during one time-step.

Then, there are two possiblities:

1. $E' < E_o = \frac{1}{16}(\frac{\beta}{g})^2 U^4$. The increase in energy in a time step Δt is determined by means of the growth curve.
2. $E' > E_o = \frac{1}{16}(\frac{\beta}{g})^2 U^4$. Apparently, in addition to sea there is swell present as well. The energy is saturated and the swell part $(E'-E_o)$ is corrected for swell dissipation (cf. III.3. Swell) during the time step Δt.

In both cases the energy E' propagating in the wind direction according to the $\cos^2$-distribution is stored in array EA[I,J].

GONO also takes into account shallow water effects on e.g. the saturation value for the energy; these effects are considered in appendix B.

Description of the program (2124-2530)

In this section we comment on various steps in the program.

2126 The program runs twice with a time step t = 1.5 h.

2138-42 Read depth DA[I, J], sea energy EA[I, J] and the wind direction WR[I, J] = : Fi.

2152-82 Determination of increase in sea energy due to advection. First the wind direction at the gridpoint I, J is checked. From this it is concluded that energy flows to I, J from particular grid points only (in this case from a and b).
The energy is decomposed in the x and y direction according to

2152-53 $E_x = E\sin^2\phi$, $E_y = E\cos^2\phi$.

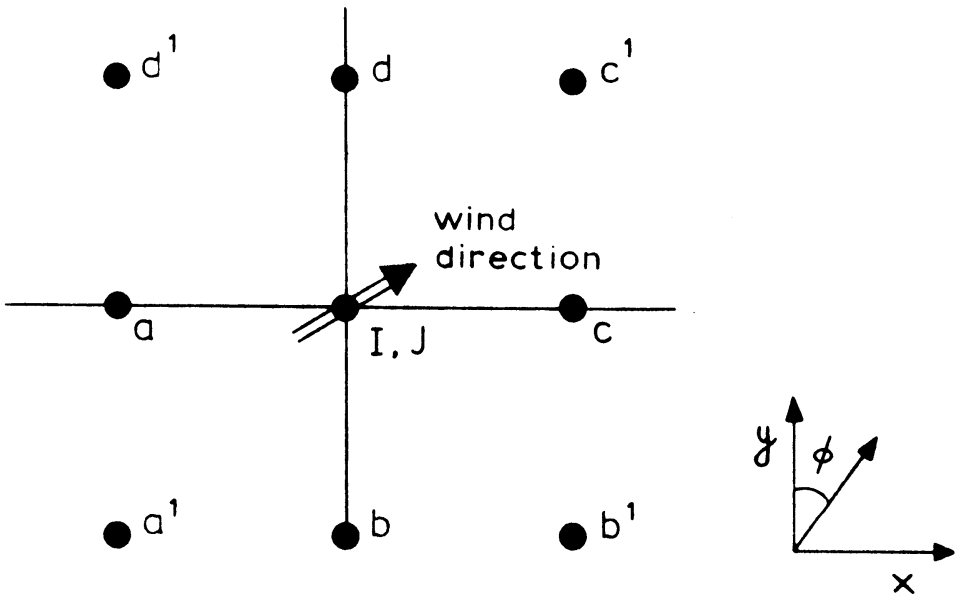


Fig. 4.

Determination of the energy increase from the x direction according to

2174 ENXN1 - ENXN0 = $\delta E_x = \{C_g(x+\Delta x,t)E(x+\Delta x,t)-C_g(x,t)E(x,t)\} \frac{\Delta t}{\Delta x}$

Here C_g is the average group velocity in the x-direction.

2182 Analogous calculation for δE_y = ENYN1 - ENYN0.

2183-2204 The same calculation is done for the energy flow from the corner points (df. Fig. 4 a', b', c', d') by rotating the coordinate system. GONO takes the average of the change in energy of both systems and also the average of the direction of the energy flow.

2205-08 Determination of the propagation direction of the energy coming from the nearest gridpoints (FI1) and the next nearest neighbours (cornerpoints a', b', c', d'; FI2).
The following part of the program treats the energy increase due to the wind.

2229-31 Read the wind speed WS[I,J] and wind direction WRN[I, J] at time t+Δt.

2232 Determination of the average direction of the energy flow = (FI1 + FI2)/2.

2236 α = (FI1 + FI2)/2 - WRN .

2238 Calculation of that part of the energy which interacts with the wind (cf. Ref. 2)

$$E = \left(1 - \frac{|\alpha|}{\pi} - \frac{|\sin \alpha|}{\pi}\right) (|E_x| + |E_y|) ,$$

where $|E_x|$ and $|E_y|$ are the components of the energy at t+Δt propagating in the x and y direction respectivily.

Now by means of EO and EON (saturation energy in deep water and shallow water respectivily) two cases are distinguished.

2259 a) If E > EO(D > 200) or EON(D < 200) then go to VOLGR(OEID) (2290). This energy is labeled with a minus sign.

2261-89 b) Else we have <u>growing sea</u>.

2261 Calculation of $U_* = 2E^{\frac{1}{4}}\sqrt{g/\beta}$. Then the new energy (EA[I, J]) is determined by means of the growth curve.

COMMENT: The growth curve is tabulated (H_S in 100 steps, t in 110 steps) so that an interpolation procedure is applied.

2289 EA[I, J] is the energy at time t + Δt, propagating in the new wind direction. In 2345 a correction on EA[I, J] due to bottom effects (cf. appendix B) is applied.

2290-2337 Treatment of the (over) saturated state. The swell part is corrected for swell dissipation during the time step Δt (cf. appendix B).

2350 Array EA[I, J], provided with a minus sign in case of (over) saturation.

2378 End of sea calculation.

<u>Finally:</u>

1) 2379-2413: WR is replaced by WRN. In addition, the new averaged group velocity is calculated. If $U_*/U < 1$ then (cf. Ref. 1).

2406 $$C_g = \frac{8\,U_*}{\beta^2\delta^5}\left(\frac{6}{5} + \frac{\gamma}{1-\gamma}\ln\gamma\right).$$

COMMENT: γ = GMOD[K], α = AMOD[K] δ = DMOD(K).

If however $U_*/U > 1$ sea as well as swell energy is present. For this case an extrapolated group velocity is used

$$C_g = (0.4\,U_*/U + .12)U_*.$$

This information is stored in GSN[I, J]. Note that the maximum group velocity is due to numerical unstability less than 13.7 m/s.

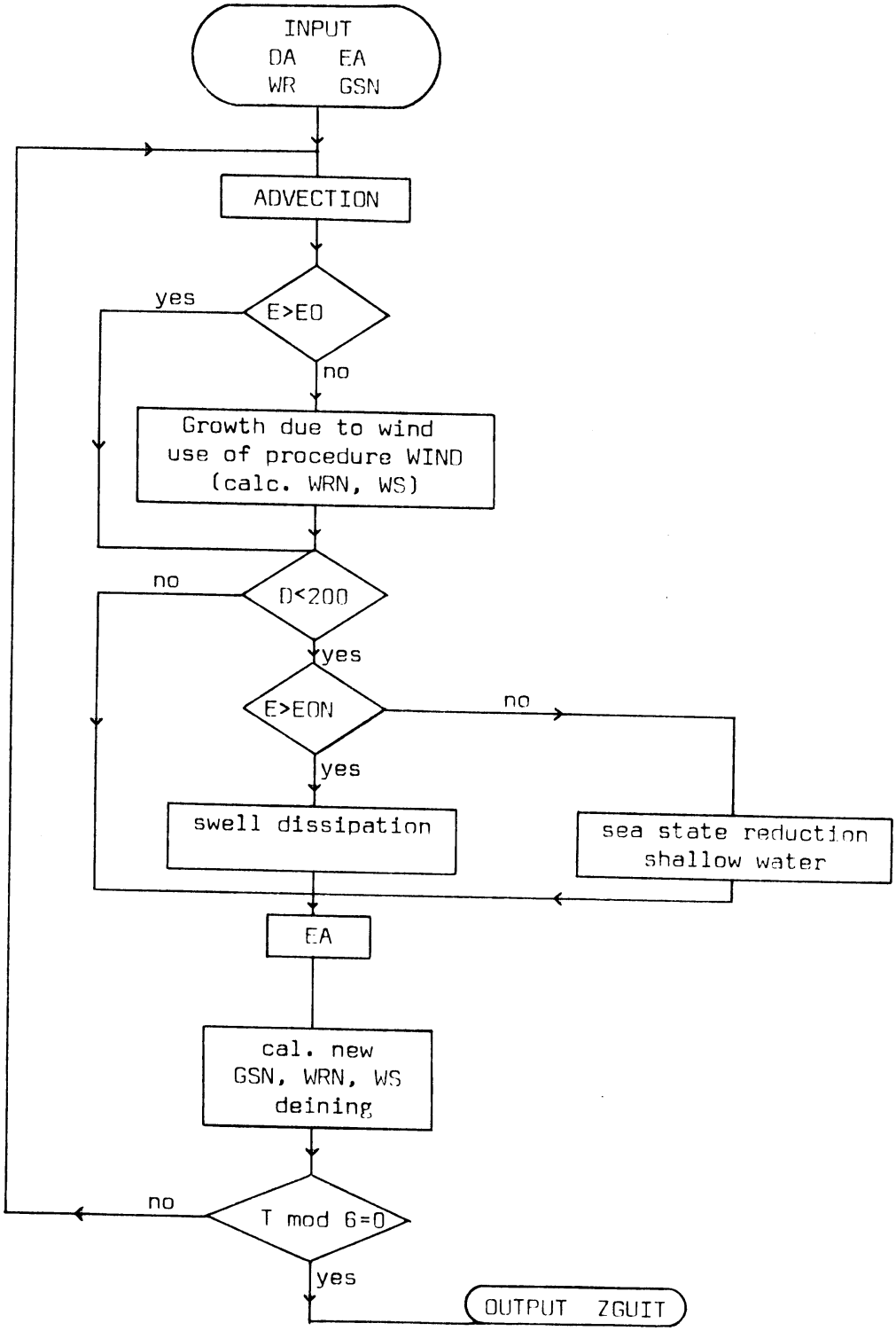
COMMENT: For shallow water under extreme conditions ($HSS > \frac{2}{3}HH$) i.e. if the wave height is > 2/3 of the maximum wave height at a wind speed of 30 m/s (cf. appendix B) the growth stage U_*/U is corrected.

2) 2414-2434: Calculation of the wind speed, wind direction and group velocity at the edge of the GONO grid in behalf of the following time step.

3) 2435-2448: Call for DEINING (swell).

4) 2449-2537: Every 6 hours the results are printed. The arrays D[J,K,I] are shifted 6 hours in time. In addition, if TMOD6 = 0 then go to procedure ZGUIT (2073-2122) where two files, namely GNO/ZGHI/DATUM and GNO/BRON/DATUM, are written. GNO/ZGHI/DATUM contains the arrays WRN, EA, GSN + swell data of at most 10 positions from 0 → 72 hours ahead.

FLOW DIAGRAM (2125-2531)



III.3. Procedure DEINING (1182-1545)

We first describe the principle of the swell calculation. To this end it is assumed that the sea energy (EA) and the wind (WS, WR) are known at every grid point for t = -1.5 h, -3 h, ..., -72 h. [Note: in the actual program the swell is known in only ten selected points]. The program would then read

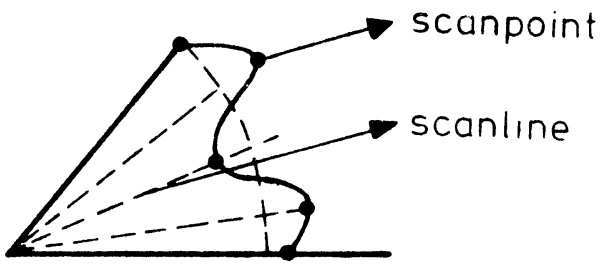
```
for t := -72 step 1.5 until -1.5 do
calculate EA and WR, WS
DEINING (t, DK)
print DK
```

For every time DEINING calculates for every swell point and for every period band (T) the swell which arrives at the swell point after t hours. To that end a circle is constructed with the swell point at its centre. The radius is given by $C_{gdw}(T)*t$ where $C_{gdw}(T)$ is the deep water group velocity corresponding to the period T.

The circle is divided into 6 sectors. For every sector the swell will be calculated. To calculate this swell every sector is divided, giving a number of scan lines and scan points. For every scan line the effect of the bottom on the propagation speed of the swell is accounted for. As a matter of fact a new scan point on the scan line is determined such that

$$\int_0^{r_{scan}} \frac{dr}{C_{gow}(T,\ D(r))} = t \ ,$$

where C_{gow} is the shallow water group velocity and D is the depth.
At every scan point array EA is called.
In case of sea (E > 0) the growth stage model (III.2) is used whereas in case of (over) saturation the wind speed is reduced by 10%, and $U_* = U$.



In both cases the sea spectrum at the grid point can be reconstructed so that the energy for every period band is known (denoted by E(T)). For every scan point the contribution to the swell is then given by

$$SW = \int_{T_1}^{T_2} E(T)dt * \cos^2(\phi-\alpha) ,$$

where $\phi-\alpha$ is the angle between the wind direction and the scan line. While propagating from the scan point to the swell point the swell dissipates according to

$$\frac{d}{dt} SW = -\alpha(T, DA)SW .$$

(cf. appendix B). In addition, an empirical swell decay is accounted for. The latter only depends on the length of the scan line and the period T of the swell.

The contribution to the swell in a sector is then given by

$$\overrightarrow{SW}_{sector} = \Sigma\overrightarrow{SW}_i ,$$

where $\overrightarrow{SW}_i$ denotes the contribution to the swell from a scan point; its direction is determined by the direction of the scan line.
In this fashion swell is calculated for every sector, every period band and every call (t = -72, -70,5 .....).
The swell prediction for t = 0 is then given by

$$\max_{t=-72,-70.5,\ldots} \overrightarrow{SW}_{sector} .$$

Description of the procedure DEINING (1182-1545)

External variables are: TTT = the time the swell needs to arrive at a swell point

D, DK, BR[*, *, *]: arrays in which the swell data are stored.

Procedure DISS (1193-1222)

DISS calculates the swell dissipation along a scan line due to bottom effects.

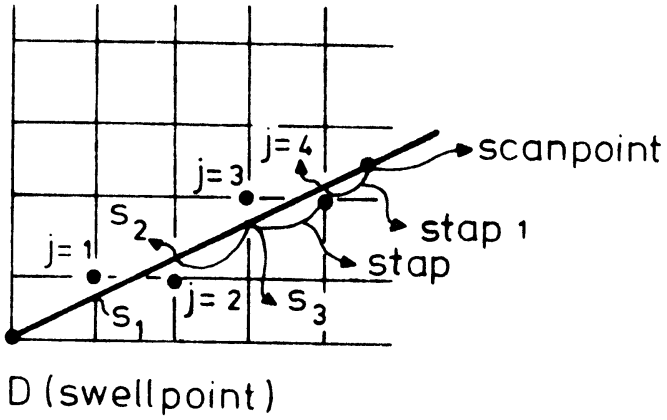


Fig. 5

If DISS is called the following quantities are known:

- DEIN = swell energy at the scan point (1483),
- STAP, STAP1, see the figure,
- K_1, average period of a period band,
- DB, depth along a scan line [DB(NLYN+1)] is taken from the grid point nearest to the scan point.

1214 OMEG = angular frequency.

1215 (7, 9, 11, 13, 15, 17, 19) → (1, 2, 3, 4, 5, 6, 7) [renumbering of period bands].

1218-20 If at the scan point the depth is smaller than 200 m then swell dissipation is calculated while propagating one step (e.g. from j = 4 to j = 3) by means of procedure EN (1199-1213) [see Fig. 5].

1221-28 If at S_i the depth is smaller than 200 m swell dissipation is determined while propagating from S_i to S_{i-1}.

In DEIN the procedure DISS stores the swell energy corrected for swell decay along the scan line.

Procedure EN(STAP) (1199-1213)

Swell dissipation over a distance STAP is calculated for constant depth D by means of (cf. appendix B)

$$\frac{d}{dt} SW = -16\alpha U_T^2 SW ,$$

where $\alpha = 1.75.10^{-5}$, $U_T = \omega/\sinh kD$, ω = angular frequency and k is the wave number. The time step δt = STAP/CGOND, where CGOND = the shallow water group velocity.

1236-1543: loop with variable K, scanning the swell points.

1247-1541: loop with variable K_1, scanning the frequency bands.

1254-1539: loop with variable KH, scanning the sectors.

Thus for every swell point (K), for every frequency (K_1) and for every sector (KH) swell is calculated.

1238-39: variable K: 1, 2, -NDEINING. Read coordinates I_o, J_o from DP[1:10, 1:2] (array of selected swell points).

Let us follow the swell calculation for a particular swell point, frequency band and sector. We only consider swell which arrives at the swell point after a time TTT.

1) First a circle with its centre at the swell point and with radius LM is constructed. Here LM is the distance which the swell, corresponding to a certain frequency band, covers in a time TTT on deep water.
Hence LM = C_{gD} * TTT where $C_{gD} = \frac{g}{4\pi} K_1$ (K_1 is the period of the band) so that C_{gD} is the average group velocity corresponding to

the frequency band. Length scales are in units R (grid distance = 75 km) and the time scale is one hour.

1249 $LM = \frac{3600 * 908}{4\pi * 75000} * K_1 * TTT = FACD * TTT * K_1$.

2) The circumference is divided in NM segments, where NM = 8LM.
COMMENT: NM = 8LM is suitable because this gives a segment which is a bit smaller than the grid distance.

3) Consider the sector KH. Since the y axis of the GONO grid is not directed towards the North pole, a correction is needed by means of the angle CORFI.

1240 $CORFI = \arctan(\frac{I_o + 1.45}{56.6 - J_o})$.

Here -1.45, 56.6 are the coordinates of the North pole.

1251 HOEKCOR := - CORFI * NM/2 .
The sectors are numbered along the circle from 0 to 8LM-1.

1261 The variable K_2 scans these points where HEEL1 and HEEL2 denote the beginning and the end of the sector.

4) Every K_2 now determines the scan line to the swell point.

1264-65 Testing whether a scan line is 'meaningful', i.e. whether the scan line meets land or ends on it. If the scan is not significant the boolean ALYN is true and the program goes to the label VOLG so that this particular scan is not performed.

5) If the scan is significant the grid point on a distance LM from the swell point has to be found, taking into account the effect of the bottom on the propagation speed of the swell.

1266 ALFA = 2 * K_2/MN is the angle between the scan line and the y axis. Let us start in the swell point I_o, J_o. Let T denote the time needed to propagate over a distance LL.

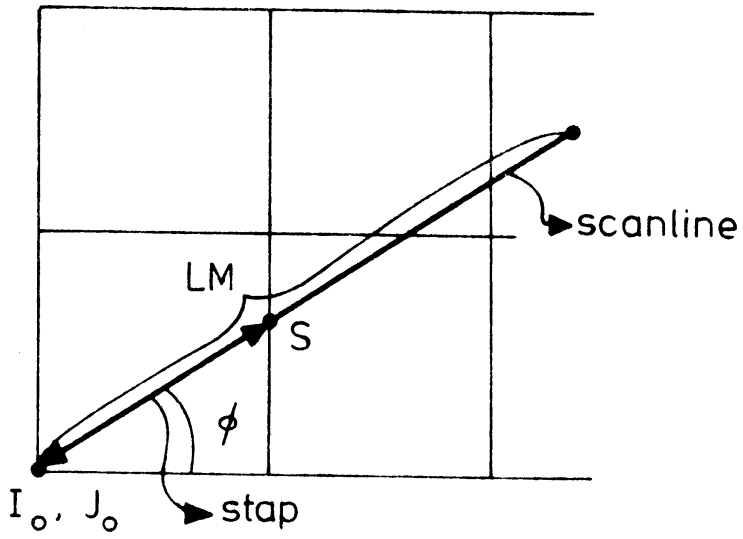


Fig. 6

1286 6) If (tan ϕ/<1 (Fig. 6) then after every step the x coordinate of the crossing S (see figure) is determined. Next, the grid point nearest to the crossing is searched for. If $|\tan\phi|>1$ the y coordinate is determined first.

1292 $$STAP := \begin{cases} \frac{1}{\cos\phi}, & \phi < 45^o \\ \frac{1}{\sin\phi}, & \phi > 45^o \end{cases}$$

The propagation time T depends on the depth through

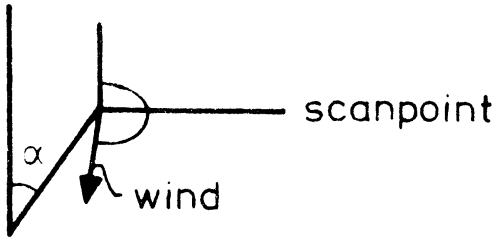
$$T := 10^6 \; STAP/CGOND\,[PER, DO] * 3600 + T ,$$

where the array CGOND gives the group velocity as a function of depth and period.

1327-37 If T > TTT the last step is corrected such that T = TTT. Else the program proceeds until the condition T > TTT is satisfied. At every step the coordinates of the nearest grid point are determined and the corresponding depths are stored in DB[NLYN+1].
After that the program goes to the label RESULT where the sea energy in the end point of the scan line is read and swell along the scan line is determined.

1410-81 The spectrum of the sea is reconstructed in the scan point so that the amount of energy in a frequency band is known. The amount of energy propagating in the direction of the scan line is stored

in UEIN.



1412 $\beta = [\alpha - \phi]$ where ϕ is the wind direction.

If there is no energy in the scan direction proceed to the next scan point (label VOLG (1494)) else

1416 Read the wave energy at the scan point; COSI := $\cos^2\beta$;

1420-21 Read the wind speed and the depth.

1422-33 If E < 0 the wind speed is reduced 10% and $U_* := U$.
For shallow water the correction on the saturation value of the energy due to bottom effects is applied. For all E U_* is calculated by

$$U_* = 2E^{\frac{1}{4}}\sqrt{g/\beta}.$$

1435 $Kr = \text{Max}\ (\frac{1}{2}, \frac{U_*}{U})$ where Kr labels the growth stage.

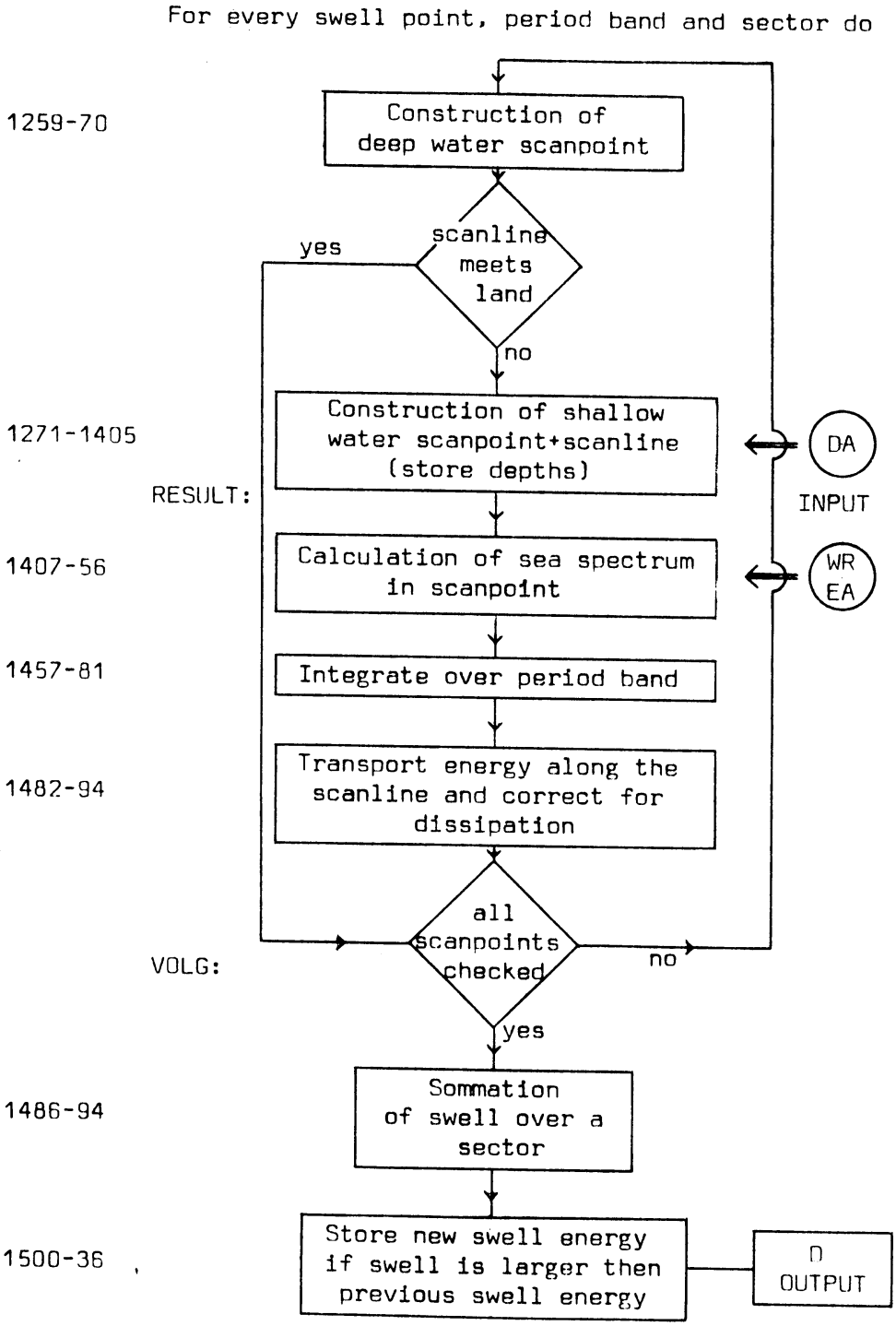
1436-44 For shallow water under extreme conditions U_*/U is corrected (cf. appendix B).

1447-1537 Construction of the Kruseman spectrum; integration over a frequency band; conservation of the energy in the scan direction; calculation of dissipation due to bottom friction plus an additional empirical decay; and finally

$$\vec{D}_{\text{sector}} = \Sigma_{\text{sector}}\ \vec{D}_i,\ \text{scanpoint}\ .$$

If $|\vec{D}_{\text{sector}}| > D_{\text{sector}}$ (previous time step) then D(KH, K, KG) := $|\vec{D}_{\text{sector}}|$.

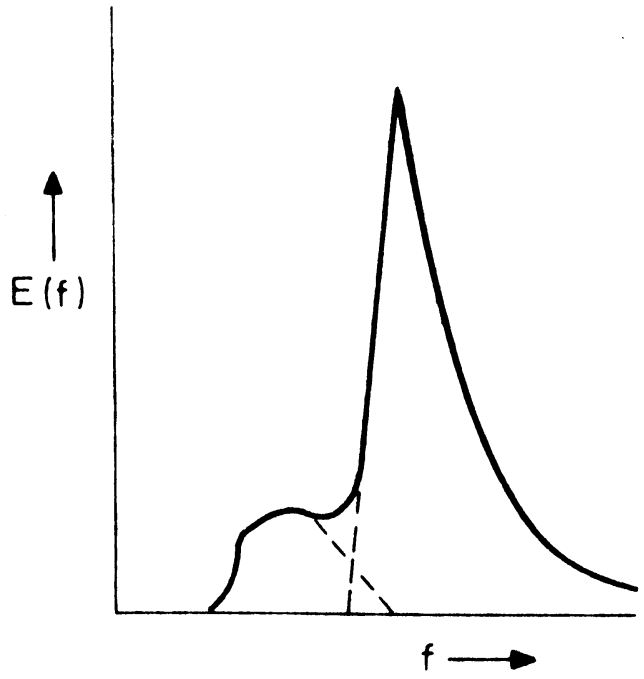
FLOW DIAGRAM (1182-1545)



III.4. Final Remarks

We have given a description of the determination of the wind and sea energy at every grid point, and swell energy at the chosen swell points. Usually one can easily distinguish sea from swell, except when the swell propagates in approximately the same direction as the sea (the criteria in GONO is 30^{o}).

GONO this case treats in procedure UITSPLITS (445-515). We recall that for the swell calculation the circle around the swell point is divided in 6 sectors. Procedure UITSPLITS first selects the sector from which the wind is blowing. In this sector the direction of swell is compared with the propagation direction of sea. Also in the neighbouring sector this comparison is made. If the angle between swell and sea direction is smaller than 30^{o} then for every frequency band the maximum of sea energy and the total swell energy of the corresponding sectors is taken. In both cases it is called sea (?ZEEGANG?)*. By means of this procedure a reconstruction of the wave energy spectrum at the swell points is now possible. In addition we note that GONO now allows for double-humped spectra (see Fig. 7).



* Perhaps, if in a frequency band the swell energy is larger than the sea energy a more appropriate name would be swell (see figure).

IV. BOLPROLYN

BOLPROLYN changes a number of data sets:

1. PROLYNHI
2. ZG/DTG
3. VTHI

DTG is a formal parameter.
BOLPROLYN reads the file KAART. This file contains information on changes in the ice boundary and in swell points.

COMMENT 1: For hindcasting studies the correct ice boundary and swell points may be read beforehand. However, an empty file ZG/DTG must present then.

COMMENT 2: During a hindcast the ice boundary and swell points may be changed by running BOLPROLYN weekly e.g. Then every week the GONO run is terminated by a BOLPROLYN run with DTG = date_00, and GONO starts again with this same DTG.

File KAART contains:

$$\begin{cases} n \leq 10 \\ x_1 y_1, \ \ldots\ldots \ x_n y_n \end{cases}$$

$$\begin{cases} m \\ x_1 y_1 D_1 \\ \cdot \\ \cdot \\ \cdot \\ x_m y_m D_m \end{cases}$$

where n is the number of swell points; x_i, y_i are their coordinates [GONO grid]; m is the number of changes in the ice boundary, x_i, y_i are the coordinates; D_i = 0 then sea becomes ice, D_i = 200 then ice becomes sea (deep water).

PROLYN contains ALYN[0 : 9999]. ALYN contains n (swell points), $x_i y_1$, ..., $x_{10} y_{10}$ (coordinates), and Booleans. The Booleans store information on the swell scanning (whether a scan line meets land or falls out of the grid).

ZG/DTG contains the arrays WR (wind direction), EA (energy in the wind direction, GSN (the group velocity), D66 ..... D6 (swell energy, corrected for dissipation), and DK66, ... DK6 (swell energy).

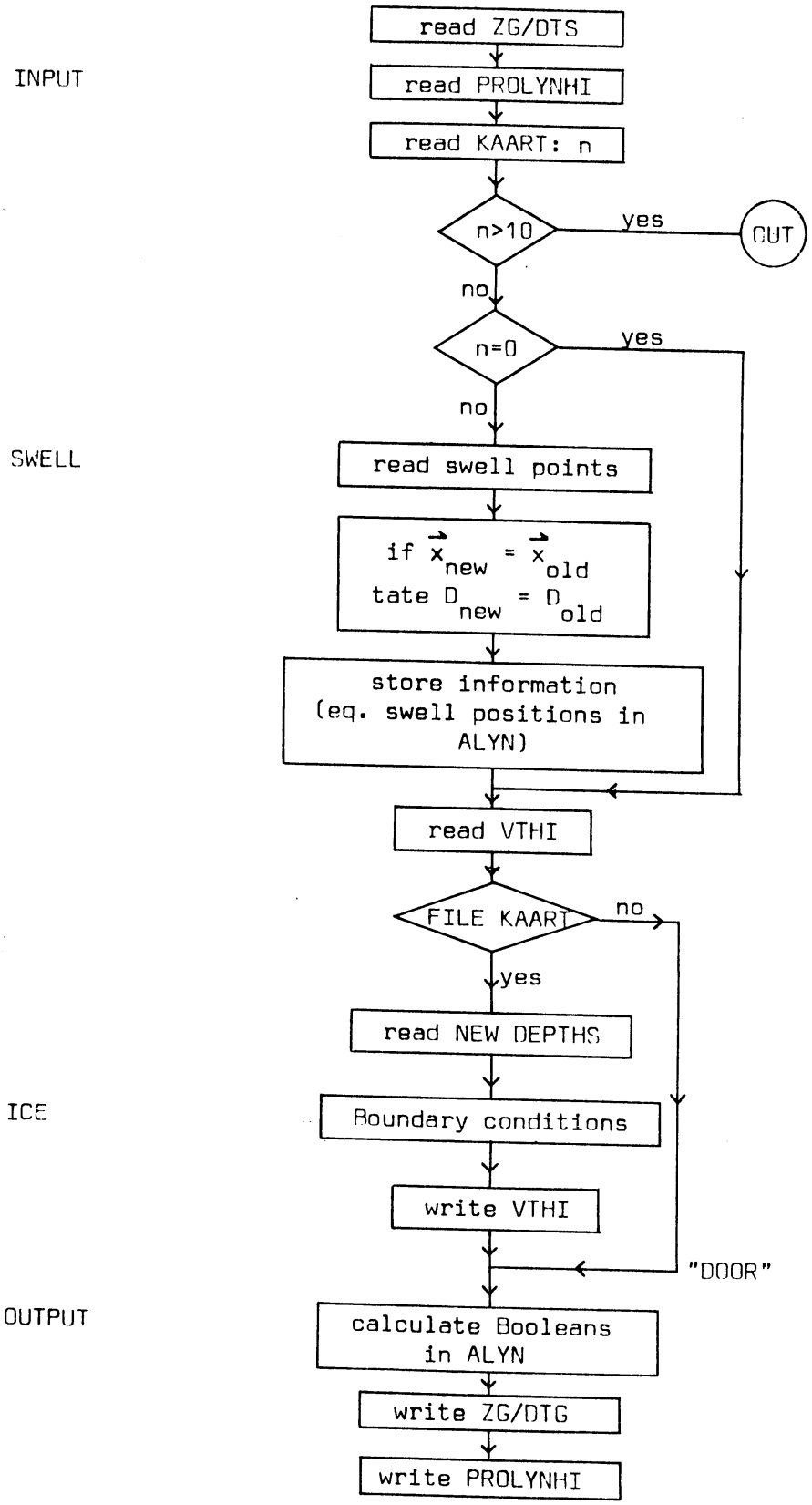
VTHI contains the fixed tables ORA, COEFW, DA (depth), TYDA and HS (growth rate curve), CGOND (group velocity on shallow water) and KOM [k(ω), wave number k as a function of angular frequency ω].

COMMENT 1: ALYN takes care of changes in the swell points. For new swell points D equals zero.

COMMENT 2: If the ice boundary is changed, DA is changed. In new ice points wind, sea and swell are equal to zero.

Due to changes in the ice boundary scan lines may end on ice. This is tested in the main program GONO only (and not in ALYN).

FLOW DIAGRAM BOLPROLYN



The swell call in BOLPROLYN

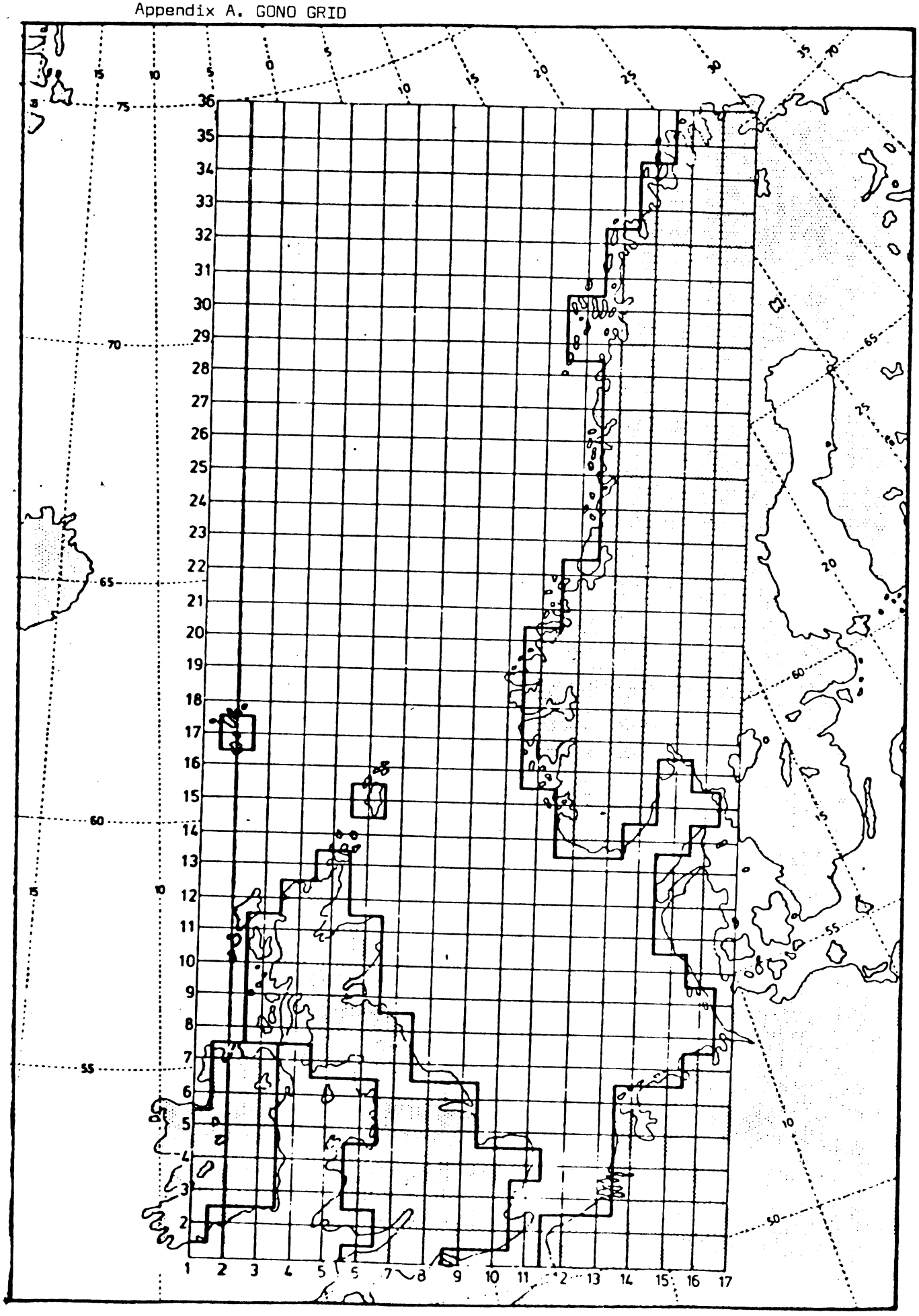
Procedure DEINING in BOLPROLYN differs partly from the procedure DEINING in GONO2.
DEINING is called for

TTT = 70.5, 64.5, ..., 10.5, 4.5
69, 63, ..., 9
67,5, 61.5, ..., 7.5
66, 60, ..., 6

The other formal parameter are not relevant.
For every swell point and period band DEINING constructs, just like DEINING in GONO2, the transformed circles. Next, DEINING checks whether a scan line meets land or ends on it. Then FLOPA is true. The FLOPA values are stored in ALYN.

COMMENT: For economical reasons FLOPA is packed in a word bit by bit. By means of ALYN [TELINDIV48]. [TELINMOD48] the value of FLOPA is calculated.

Appendix A. GONO GRID



Appendix B. Some shallow water effects

In this appendix some shallow water effects are briefly discussed.

I. Limitation of wave energy

The growth of waves on shallow water (GONO: D < 200 m) is limited by interaction of the waves with the bottom. However, only waves with a wave length λ such that

$$\lambda > 2bD = \lambda_B \quad (1)$$

where D is the depth and b is a tuning parameter, are affected. By means of the deep water dispersion relation $\omega^2 = 2\pi g/\lambda$ the corresponding frequency is given by

$$f_B = \sqrt{\frac{g}{4\pi bD}} \quad (2)$$

or in terms of the variables used in the GONO program

$$f_B = \sqrt{\frac{1}{\text{LABDAFAC} * D}} = \frac{1}{\text{PERTOL}} \qquad (2244).$$

Assuming that the decrease of energy is proportional to the energy itself and since only waves with a frequency f smaller than f_B dissipate, the rate of change of the energy due to bottom dissipation is given by

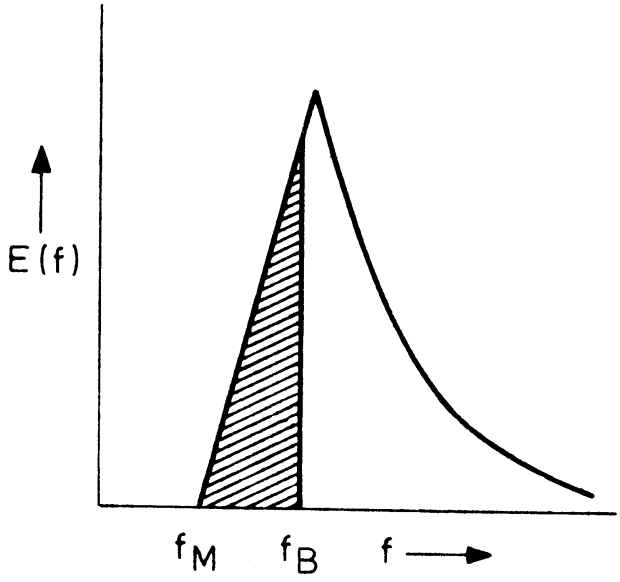
$$\frac{d}{dt}E = -C \int_0^{f_B} E(f)df \quad (3)$$

where C is an unknown constant, E(f) is the energy density and E is the total energy. In GONO the Kruseman spectrum is used and the transition of $f_m > f_B$ to $f_m < f_B$ is rather sudden because at $f_m = f_B$ the dissipation is switched on. To obtain a more smooth behaviour, a Pierson - Moskovitch like spectrum is used in evaluating the integral in Equation (3). The final result reads after integration of Eq. (3) with respect to time

$$EON = EO\left[1 - \exp - 4\alpha\left(\frac{bD}{\pi H_s}\right)^2\right], \quad (4)$$

where EO and EON denote the saturation energy on deep and shallow water respectively.

Eq. (4) corresponds to the ones found in the lines 2259 and 2345-46 of the GONO program.



II. Deviations from the α - U_*/U relation

In a 1½ hour time step the rate of change of the energy is determined by the competition of the increase in energy due to the wind and a decrease in energy due to bottom dissipation. At a certain depth and wind speed a stationary state is achieved when dissipation balances growth by the wind. A maximum in wave energy is then obtained.

Under extreme conditions, however, the usual α - U_*/U relation is not valid anymore (cf. Ref. 1): α is under these conditions smaller than expected from the growth stage (U_*/U). In that case one simply takes a somewhat higher value for U_*/U.

An extreme condition is present, according to the GONO program, if the wave height is larger than 2/3 HM:

(5) $\quad HSS > \frac{2}{3} HM \quad$ (line 2397) ,

where HM is the maximal observed wave height in extreme situations in shallow water. The observed dependence of the depth of HM is given by $HM = \{(4 - \sqrt{D})0.02 + 0.27\}D$.

Then the growth stage U_*/U is increased according to

(6) $$\frac{U_*}{U} = \{(10\frac{U_*}{U} - 21)\frac{U_*}{U} + 21\}\ (\frac{1}{10}\frac{U_*}{U})\ (\frac{1}{3} + \frac{H_{SS}}{HM})$$ (line 2398) .

III. Dissipation of swell

The energy loss of a swell component with period T per unit of time is given by

(7) $$\frac{d}{dt} SW(T) = -\langle \vec{U}_T \cdot \vec{\tau} \rangle ,$$

where $\vec{U}_T$ is the velocity of the swell component and $\vec{\tau}$ is the stear stress

(8) $$\vec{\tau} = \rho C_F |\vec{U}| \vec{U} .$$

Here C_F is the friction coefficient and $\vec{U}$ is the total velocity including tidal and rest currents, and swell.
For simplicity we take

(9) $$\vec{U} = (a + U_T, 0, 0), \vec{U}_T = (U_T, 0, 0) ,$$

where a is a constant. From (7) we then obtain

(10) $$\frac{d}{dt} SW(T) = -\rho C_F [a^2 \langle U_T \rangle + 2a \langle U_T^2 \rangle + \langle U_T^3 \rangle] .$$

Now $\langle U_T \rangle = 0$. In addition, neglecting $\langle U_T^3 \rangle$, we finally arrive at

(11) $$\frac{d}{dt} SW(T) = -16ABD2(\frac{\omega}{\sinh kD})^2 SW(T) ,$$

where ADB2 = $\frac{1}{4} \rho C_F a$.

This expression can easily be integrated and the result is applied
1) in case of swell dissipation [procedure EN(STAP)(1199-1213)],
2) and if there is (over)saturation: The swell part is then corrected for swell dissipation too (cf. 2290-2337 in the program).

In addition it must be noted that the swell part in case of (over) saturation (E < 0) is propagated with the group velocity corresponding

to the mean period of energy surplus $E - E_o$, where E_o is the saturation energy. Thus,

$$\overline{T} = \frac{\int_o^\infty T[E(f) - E_o(f)]df}{\int_o^\infty [E(f) - E_o(f)]df} .$$

Using the Kruseman spectrum the result is

$$(12)\quad \overline{T} = .586211 * 2\sqrt{\frac{g}{\beta}}\,(E^{5/4} - E_o^{5/4}) ,$$

which corresponds to the formula of line 2303 in the program.
Now if

$$\overline{T} > \frac{1}{0.9}\ \frac{3}{4}\ f_B^{-1} * \quad \text{(line 2304 and 2305)} ,$$

the energy surplus $E - E_o$ is corrected for swell dissipation, i.e. (line 2337)

$$(E - E_o)_{new} = (E - E_o)_{old}\ \exp\{-ABD2\ (\frac{\omega}{\sin k\,kD})^2 \cdot 16 \cdot \frac{\Delta x}{C_{gow}}\} ,$$

where Δx = grid distance = 75.000 m.

*) Here the factor $\frac{1}{0.9} \cdot \frac{3}{4}$ has been chosen so that there is good agreement between model and observations.

Appendix C Listing of present GONO version

Appendix D. How to run GONO on the B6700?

GONO can be run as

RUN GONO T ; where the task T is defined by T (VALUE = DTG), and where DTG is an 8 digit integer, representing date and time.

The following files must be present:

GNO/VTHI : permanent file, contains tables

GNO/PROLYNHI : contains data on coastal geometry and swell scanning, created by BOLPROLYNHI

GNO/ZGHI/(DTG-12)
GNO/ZGHI/(DTG- 6) : contains information on sea state at DTG-12 and DTG-6, and swell information up to 72 hours ahead, usually created during previous GONO-run. ZGHI/(DTG-6) is updated

ARCHIEFTEL1/DTG1,
DTG1=DTG-12,DTG-9..DTG: contain pressure fields as produced by BK4

DIFAIRSEA/YY010100 : contains air sea temperature differences

The following files have a special status:

GONOINPUT : pressure field on GONO grid of relevance for actual run created (or updated) and read in a single run

GONOOWN : stores consecutive GONOINPUTS (up to 40 3-hourly pressure fields on GONO grid)
created by GONO, if not present, otherwise updated.

RECOVERY/GONO : created and updated by GONO, used on recovery after failure.

The following disk files are written only:

GNO/ZGHI/DTG : store wave data, as input for next run

GNO/VERIFIKATIE/YYMM : contains updated wave results for DTG-6 created if not present.

The following printfiles are produced:

filename	normal destination
TX	Zestienhoven
NTX	"Noordzee meteoroloog"
RTX	"routering"
LPEHZI	Zierikzee
LPMAPCWD	CWD
LPRPS	ME
LPEMDB	CWD

For a hindcasting study, GONO has to be run as follows

```
   DTG: = BEGINDTG;
L: T (VALUE = DTG);
   RUN GONO [T];
   IF DTG ≤ ENDDTG GO L;
   END;
```

This could be worked out as in the following job:

```
BEGIN

   REAL ENDDTG,DTG,BEGINDTG;
   LONG EBCDIC ARRAY JOB[0:2999];
   ARRAY A[0:29];
   FILE STATUS(KIND=DISK,TITLE="RECOVERY/NWPSTATUS ON GONO.",
   MAXRECSIZE=30,AREASIZE=1,AREAS=1);

   DTG:=MYSELF.TASKVALUE; ENDDTG:=80020500;
   IF STATUS.RESIDENT THEN  READ(STATUS,30,A);
   BEGINDTG:=IF DTG=0 THEN A[0] ELSE DTG;
   REPLACE JOB BY
  "?BEGIN JOB GONO",BEGINDTG FOR 8 DIGITS,";PRIORITY=90;CHARGE=AQOEXP;",
   "FAMILY DISK=GONO OTHERWISE DISK;",
   "SUBROUTINE SUBREM;",
   "BEGIN ",
   "MYSELF(FAMILY DISK=DISK ONLY);",
   "REMOVE   GONOOUTPUT/= ;",
   "MYSELF(FAMILY DISK=GONO OTHERWISE  DISK);",
   "END;",
   "TASK TT,T;STRING S;REAL DTG,BEGINDTG,ENDDTG,SHIFT,BACKRAND;",
   "ON TASKFAULT,BEGIN SUBREM;GO EINO;END;",
   "ON RESTART,BEGIN ENDDTG:=",ENDDTG FOR 8 DIGITS,";GO L;END;",
   "DTG:=",DTG FOR 8 DIGITS,";",
   "BEGINDTG:=",BEGINDTG FOR 8 DIGITS,";",
   "ENDDTG:=",ENDDTG FOR 8 DIGITS,";",
   "T(VALUE=DTG);",
   "L:IF DTG= 0 THEN RUN CHECKDATE(1)[T];",
   "IF DTG> ENDDTG THEN GO EINO ;",
   "LL: DTG:=T(VALUE);",
   "DISPLAY(""RUNDATE=""&STRING(DTG,8));",
   "TT(VALUE=DTG);",
   "T(VALUE=DTG,OPTION=(BDBASE,NOSUMMARY,*),",
   "BDNAME=&(""GONOOUTPUT/""&STRING(DTG,8)));",
   "IF (79121400 LEQ DTG AND DTG LEQ 79121900) ",
   "OR (80011212 LEQ DTG AND DTG LEQ 80011800) ",
   "THEN RUN GONO[TT] ELSE RUN GONO[T];",
   "SUBREM;",
   "RUN CHANGEDATE(1,DTG)[T];",
   "DTG:=T(VALUE);",
    "RUN CHANGEDATE(1,DTG)[T];",
   "IF DTG< ENDDTG THEN GO LL;",
   "EINO:",
   "END JOB"&"00";
   ZIP WITH JOB;
END.
```

References

1. J.W. Sanders, A growth-stage scaling model for the wind-driven sea. D. Hydr. Zts., 29, 136-161 (1976).

2. O. Haug, A numerical model for prediction of sea and swell. Meteorologiske Annaler, 5, 139-161 (1968).

3. J.W. Sanders, to be published; see also a forthcoming M.L.T.P. publication.

4. E. Bouws, B.W. Golding, G.J. Komen, H.H. Peeck and M.J.M. Saraber, Preliminary results on the comparison of shallow water wave predictions. KNMI W.R. 80-5 (1980).

5. F. Klepper, KNMI Memo (1975), (unpublished).

6. H.C. Bijvoet, A new overlay for the determination of the surface wind over sea from surface weather charts. Mededelingen en Verhandelingen KNMI no. 71 (1957).

7. Handbook on Wave Analysis and Forecasting, World Meteorological Organization Report No. 446 (1976).

```
1000   $LEVEL 2
2000   $SET INSTALLATION                                                                    @ 226001
3000   $SET LINEINFO                                                                        @ 226001
4000   PROCEDURE GONO;                                                                      @ 226001
5000   BEGIN                                                                                @ 226001
6000      %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%  @ 226001
7000      %                                                                                %  @ 226001
8000      %         K N M I                                                                %  @ 226001
9000      %                                                                                %  @ 226001
10000     %         G O N O : A N A L + P R E B                                            %  @ 226001
11000     %                                                                                %  @ 226001
12000     %                                                                                %  @ 226001
13000     %                                                                                %  @ 226001
14000     %        LAATSTE KORREKTIE:       19 JUNI  1980   (3)                           %  @ 226001
15000     %        PROGRAMMAVERSIE: 03,   FEBRUARI 1980                                    %
16000     %        DATUM OPERATIONEEL:    27 FEBR. 1980                                    %  @ 226001
17000     %                                                                                %  @ 226001
18000     %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%  @ 226001
19000  $RESET SEGS                                                                         @ 226001
20000  $ INCLUDE "GRIDPAK/EEN ON TEST."                                                    @ 226001
21000  $POP SEGS                                                                           @ 226001
22000                                                                                      @ 226001
23000     INTEGER DTG,BEGINDTG,ENDDTG,                                                     @ 226001
24000     I,J,K,ADRES,ADRES1,TELP,AANTALP,KX,KY,M,N,MB,NB,M2,N2,M2B,                       @ 226001
25000     N2B,ISTOP,NM,L,KXO,KYO,A,DATUM,IO,I1,JO,J1,KG,M1,N1,M1MIN,N1MIN,                @ 226001
26000     NDEINING,A2X,A2Y,TEKI,TEKJ,K1,K2,EMAX,A1X,A1Y,LUS,FP,                           @ 226001
27000     TELSTOP,NMIN,MMIN,D,MMINB,NMINB,M1B,N1B,TELIN,TELDEIN;                           @ 226001
28000     REAL                                                                             @ 226001
29000     LABDAFAC,HULP,EPS,TIJD,S,EPSO,PI,PI2,PIG2,PI3G2,PIG4,FAC1,FAC2,FACC,            @ 226001
30000     COEFFE,TYD,G1,G2,KR,ALFA,BETA,T,W2,EX,EY,TERM1,TERM2,SCH,LABNUL,EFFW,            @ 226001
31000     EON,U,UKM,FI,FI1,FI2,PO,PX,PY,PXX,PYY,PXY,PXT,PYT,CG,PERMAX,PERTOL,E,           @ 226001
32000     E1,E2,LM,XX,YY,XO,YO,ENXO,ENYO,ENXN1,ENXN2,ENYN1,ENYN2,TT,ABO1,AED2,            @ 226001
33000     ABO3,TEMPV,FC1,FC2,DEIN,DEINS,DEINX,EXO,EYO,EXG,EYG,ENXOG,ENYOG,                 @ 226001
34000     DEINY,COSI,COSS,SINN,FACU,FACCG,FACE,FACLIJN,FACT4,DEINSK,DEINXK,                @ 226001
35000     DEINYK,DEINK,EO,TO,T1,TMAX,U4,USTER,XOO,YOO,DSIN,DCOS,FIO,DIEP,                  @ 226001
36000     FSS,HM,ESOM;                                                                     @ 226001
37000     BOOLEAN BOL,BOLZ,FLOPA,BANO,BOLSTART,BOLUIT,BOLPROG,BOLDOOR,                     @ 226001
38000     SCHRIJFZG,TESTING,TELEXTRUE;                                                     @ 226001
39000     ARRAY GAMMA1,GAMMA2,GAMMAS,GAMMA1B,GAMMA2B,GAMMASB                              @ 226001
40000     [0:12,0:12],AX,BX,AY,BYA,AYB,BYB[0:12],AMOD,GMOD,DMOD[0:50],X[1:13],             @ 226001
41000     Y[1:14],DX,DY,DYB[-1:12],PHI[0:12,1:13],PSI,PSIB[0:12,1:14],                     @ 226001
42000     ALYN[0:9999],GSN,EA,HR[0:18,0:37],NOP[1:10,1:2],ORA,LANDWIND[1:32],              @ 226001
43000     DEINPUNT[0:20],OP[1:10,1:2],DA,HS,WRN,APXT,APYT[1:17,                            @ 226001
44000     1:36],COEFW[1:4,-3:2],TYDA[0:110],HS[0:100],CGOND,KOM[1:7,1:19],                 @ 226001
45000     ADM[1:7],ZEEGAN[0:9,1:10],TEMP,TEMP1,TEMP2[1:4],CT[0:4,0:4],                     @ 226001
46000     C72,C66,D6C,D54,D48,C42,D36,D30,D24,D18,D12,D6,DO,BR0,BR6,BR12,BR18,             @ 226001
47000     BR24,BR30,BR36,BR42,BR48,BR54,BR60,BR66,BR72[0:5,1:10,1:7],                      @ 226001
48000     DK72,DK66,DK60,DK54,DK48,DK42,DK36,DK30,DK24,DK18,DK12,DK6,                      @ 226001
49000     DK0[0:5,1:2,1:7],ARRUN[0:299],TEMPAR[0:7],V[0:299],                              @ 226001
50000     HWS00,HWR0C,HWS10,HWR10,HWS01,HWR01[1:17,1:36];                                  @ 226001
51000                                                                                      @ 226001
52000     EBCDIC ARRAY TITLE[0:255],TXLINE[0:255],BESTEMMING[0:30];                        @ 226001
53000     DIRECT ARRAY RECOVERY[0:29];                                                     @ 226001
54000                                                                                      @ 226001
55000     LABEL EXIT;                                                                      @ 226001
56000     DIRECT FILE RECOVER(                                                             @ 226001
57000     KIND=DISK                                                                        @ 226001
58000     ,AREASIZE=1                                                                      @ 226001
59000     ,AREAS=1                                                                         @ 226001
60000     ,TITLE="RECOVERY/GONO1."                                                         @ 226001
61000     ,PROTECTION=PROTECTED                                                            @ 226001
62000     ,SECURITYTYPE=PRIVATE                                                            @ 226001
63000     ,EXCLUSIVE=TRUE                                                                  @ 226001
64000     )                                                                                @ 226001
65000     ;                                                                                @ 226001
66000     FILE ZG(KIND=DISK,                                                               @ 226001
67000     SECURITYTYPE=CLASSA,                                                             @ 226001
68000     MAXRECSIZE=7710,                                                                 @ 226001
69000     BLOCKSIZE=7710,                                                                  @ 226001
70000     AREAS=1,                                                                         @ 226001
71000     AREASIZE=1,                                                                      @ 226001
72000     BUFFERS=1);                                                                      @ 226001
73000     FILE BRON(KIND=DISK,                                                             @ 226001
74000     SECURITYTYPE=CLASSA,                                                             @ 226001
75000     MAXRECSIZE=4620,                                                                 @ 226001
76000     BLOCKSIZE=4620,                                                                  @ 226001
77000     AREASIZE=1,                                                                      @ 226001
78000     AREAS=1,                                                                         @ 226001
79000     BUFFERS=1);                                                                      @ 226001
80000     FILE GONOINPUT(KIND=DISK,FILETYPE=7,TITLE="GONOINPUT.");                         @ 226001
```

```
 81000      FILE TX(KIND=PRINTER,UNITS=CHARACTERS,TITLE="CWDP.");                    @ 226001
 82000      FILE NTX(KIND=PRINTER,UNITS=CHARACTERS,TITLE="CWDP.");                   @ 226001
 83000      FILE RTX(KIND=PRINTER,UNITS=CHARACTERS,TITLE="CWDP.");                   @ 226001
 84000      FILE LPEHZI(KIND=PRINTER,UNITS=CHARACTERS);                              @ 226001
 85000      FILE LPRESEARCH(KIND=PRINTER,UNITS=CHARACTERS);                          @ 226001
 86000      FILE LPEHDB(KIND=PRINTER,UNITS=CHARACTERS);                              @ 226001
 87000      POINTER PTR;                                                             @ 226001
 88000      DEFINE DEF(A)=FOR K:=0 STEP 1 UNTIL 5 DO                                 @ 226001
 89000      FOR I:=1,I+1 WHILE I LEQ 10 DO                                           @ 226001
 90000      FOR J:=1,J+1 WHILE J LEQ 7 DO A(K,I,J)#;                                 @ 226001
 91000      DEFINE DEFM(A)=FOR K:=0 STEP 1 UNTIL 5 DO                                @ 226001
 92000      FOR I:=1,2 DO                                                            @ 226001
 93000      FOR J:=1,J+1 WHILE J LEQ 7 DO A(K,I,J)#;                                 @ 226001
112000      REAL PROCEDURE SUM(I,H,K,TI);                                            @ 226001
113000      VALUE K;                                                                 @ 226001
114000      INTEGER I,H,K;                                                           @ 226001
115000      REAL TI;                                                                 @ 226001
116000      FORWARD;                                                                 @ 226001
117000                                                                               @ 226001
118000      PROCEDURE INTER(KX,KY,DX,DY,GAMMA,BOL,S,EPS);                            @ 226001
119000      INTEGER KX,KY;                                                           @ 226001
120000      ARRAY DX,DY[*],GAMMA[*,*];                                               @ 226001
121000      BOOLEAN BOL;                                                             @ 226001
122000      REAL S,EPS;                                                              @ 226001
123000      BEGIN                                                                    @ 226001
124000         LABEL GOON,OUT;                                                       @ 226001
125000         OWN INTEGER TX,TY,VX,VY;                                              @ 226001
126000         OWN REAL SX,SY,SX2,SY2,STOT,SQUARES;                                  @ 226001
127000         INTEGER I,J,K;                                                        @ 226001
128000         IF S>0 THEN                                                           @ 226001
129000         BEGIN                                                                 @ 226001
130000            IF KX=0 THEN  GO TO GOON;                                          @ 226001
131000            TX:=KX+1;                                                          @ 226001
132000            TY:=KY+1;                                                          @ 226001
133000            SQUARES:=1;                                                        @ 226001
134000            GAMMA[0,0]:=STOT:=SX:=SY:=SX2:=SY2:=0;                             @ 226001
135000            GO TO OUT                                                          @ 226001
136000         END;                                                                  @ 226001
137000   GOON:                                                                       @ 226001
138000         IF KY=0 THEN                                                          @ 226001
139000         BEGIN                                                                 @ 226001
140000            IF KX=0 THEN SQUARES:=S;                                           @ 226001
141000            S:=0;                                                              @ 226001
142000            BOL:= FALSE ;                                                      @ 226001
143000            GO TO OUT                                                          @ 226001
144000         END;                                                                  @ 226001
145000         IF KY=1 THEN                                                          @ 226001
146000         BEGIN                                                                 @ 226001
147000            BOL:=KX=1;                                                         @ 226001
148000            IF BOL THEN STOT:=GAMMA[0,0]**2*DX[0]*DY[0];                       @ 226001
149000            GO TO OUT                                                          @ 226001
150000         END;                                                                  @ 226001
151000         IF KY=2 THEN                                                          @ 226001
152000         BEGIN                                                                 @ 226001
153000            BOL:=KX=2;                                                         @ 226001
154000            IF BOL THEN SY:=GAMMA[0,1]**2*DX[0]*DY[1];                         @ 226001
155000            GO TO OUT                                                          @ 226001
156000         END;                                                                  @ 226001
157000         STOT:=(IF KX NEQ VX THEN SX2 ELSE SY2)+STOT;                          @ 226001
158000         IF KX=TX AND KY=TY THEN                                               @ 226001
159000         BEGIN                                                                 @ 226001
160000            DX[-1]:=KX-3;                                                      @ 226001
161000            DY[-1]:=KY-3;                                                      @ 226001
162000            BOL:= FALSE ;                                                      @ 226001
163000            EPS:=(SQUARES-STOT)/SQUARES;                                       @ 226001
164000            GO TO OUT                                                          @ 226001
165000         END;                                                                  @ 226001
166000         I:=KX-1;                                                              @ 226001
167000         J:=KY-1;                                                              @ 226001
168000         IF KY NEQ VY THEN                                                     @ 226001
169000         BEGIN                                                                 @ 226001
170000            SY2:=SY;                                                           @ 226001
171000            SY:=SUM(K,0,I-2,GAMMA[K,J]**2*DX[K])*DY[J];                        @ 226001
172000            J:=J-2;                                                            @ 226001
173000            SX:=GAMMA[I,J]**2*DX[I]*DY[J]+SX;                                  @ 226001
174000            SX2:=GAMMA[I-1,J]**2*DX[I-1]*DY[J]+SX2                             @ 226001
175000         END                                                                   @ 226001
176000         ELSE                                                                  @ 226001
177000         BEGIN                                                                 @ 226001
178000            SX2:=SX;                                                           @ 226001
```

```
179000            SX:=SUM(K,0,J-2,GAMMA[I,K]**2*DY[K])*DX[I];                    @ 226001
180000            I:=I-2;                                                        @ 226001
181000            SY:=GAMMA[I,J]**2*DX[I]*DY[J]+SY;                              @ 226001
182000            SY2:=GAMMA[I,J-1]**2*DX[I]*DY[J-1]+SY2                         @ 226001
183000         END;                                                              @ 226001
184000         BOL:=SX+SX2>SY+SY2;                                               @ 226001
185000 OUT:                                                                      @ 226001
186000         VX:=KX;                                                           @ 226001
187000         VY:=KY;                                                           @ 226001
188000         IF SQUARES-STOT LEQ EPS*SQUARES THEN                              @ 226001
189000         BEGIN                                                             @ 226001
190000            DX[-1]:=KX-3;                                                  @ 226001
191000            DY[-1]:=KY-3;                                                  @ 226001
192000            IF 3>KX THEN DX[-1]:=0;                                        @ 226001
193000            IF 3>KY THEN DY[-1]:=0;                                        @ 226001
194000            EPS:=(SQUARES-STOT)/SQUARES;                                   @ 226001
195000            KX:=TX;                                                        @ 226001
196000            KY:=TY                                                         @ 226001
197000         END                                                               @ 226001
198000      END                                                                  @ 226001
199000      OF INTER;                                                            @ 226001
200000                                                                           @ 226001
201000      REAL PROCEDURE SUM(I,H,K,TI);                                        @ 226001
202000      VALUE K;                                                             @ 226001
203000      INTEGER I,H,K;                                                       @ 226001
204000      REAL TI;                                                             @ 226001
205000      BEGIN                                                                @ 226001
206000         LABEL NEXT,TESTA;                                                 @ 226001
207000         REAL S;                                                           @ 226001
208000         S:=0;                                                             @ 226001
209000         I:=H;                                                             @ 226001
210000         GO TO TESTA;                                                      @ 226001
211000 NEXT:                                                                     @ 226001
212000         S:=S+TI;                                                          @ 226001
213000         I:=I+1;                                                           @ 226001
214000 TESTA:                                                                    @ 226001
215000         IF I LEQ K THEN  GO TO NEXT;                                      @ 226001
216000         SUM:=S                                                            @ 226001
217000      END                                                                  @ 226001
218000      OF SUM;                                                              @ 226001
219000                                                                           @ 226001
220000      PROCEDURE SURFACEF(M,N,KX,KY,Z,AX,AY,BX,BYA,DX,DY,PSI,GAMMA,INTER,   @ 226001
221000      EOL,S,EPS);                                                          @ 226001
222000      COMMENT  DEZE PROCEDURE IS AFKOMSTIG VAN IR. H.J. DE VRIES,          @ 226001
223000      MEDEWERKER VAN HET ERCU;                                             @ 226001
224000      VALUE M,N;                                                           @ 226001
225000      INTEGER M,N,KX,KY;                                                   @ 226001
226000      REAL S,EPS;                                                          @ 226001
227000      BOOLEAN BOL;                                                         @ 226001
228000      PROCEDURE INTER;                                                     @ 226001
229000      ARRAY AX,AY,BX,BYA,DX,DY[*],PSI,GAMMA[*,*];                          @ 226001
230000      INTEGER ARRAY Z[*,*];                                                @ 226001
231000      BEGIN                                                                @ 226001
232000         LABEL L1,L2,OUT;                                                  @ 226001
233000         INTEGER I,J,DEGX,DEGY;                                            @ 226001
234000         REAL S1,S2,P0,P1,P2,R,T;                                          @ 226001
235000         ARRAY LX[1:M],LY[1:N];                                            @ 226001
236000         INTER(KX,KY,DX,DY,GAMMA,BOL,S,EPS);                               @ 226001
237000         DEGX:=KX+1;                                                       @ 226001
238000         DEGY:=KY+1;                                                       @ 226001
239000         KX:=KY:=0;                                                        @ 226001
240000         S:=0;                                                             @ 226001
241000         FOR J:=1,J+1 WHILE J LEQ N DO FOR I:=1,I+1 WHILE I LEQ M DO       @ 226001
242000         BEGIN                                                             @ 226001
243000            HULP:=Z[I,J]/10;                                               @ 226001
244000            S:=HULP*HULP+S                                                 @ 226001
245000         END;                                                              @ 226001
246000         INTER(KX,KY,DX,DY,GAMMA,BOL,S,EPS);                               @ 226001
247000 L1:                                                                       @ 226001
248000         IF KX=DEGX THEN  GO TO L2;                                        @ 226001
249000         S1:=DX[KX];                                                       @ 226001
250000         FOR I:=1,I+1 WHILE I LEQ M DO LX[I]:=PHI[KX,I];                   @ 226001
251000         FOR J:=1,J+1 WHILE J LEQ N DO                                     @ 226001
252000         BEGIN                                                             @ 226001
253000            HULP:=0;                                                       @ 226001
254000            K:=0;                                                          @ 226001
255000            FOR K:=K+1 WHILE K LEQ M DO HULP:=Z[K,J]*LX[K]+HULP;           @ 226001
256000            LY[J]:=HULP/(S1*10)                                            @ 226001
257000         END;                                                              @ 226001
258000         I:=-1;                                                            @ 226001
```

```
259000        FOR I:=I+1 WHILE KY>I DO                                                    @ 226001
260000        BEGIN                                                                       @ 226001
261000           T:=DY[I];                                                                @ 226001
262000           HULP:=0;                                                                 @ 226001
263000           K:=0;                                                                    @ 226001
264000           FOR K:=K+1 WHILE K LEQ N DO HULP:=PSI[I,K]*LY[K]+HULP;                   @ 226001
265000           R:=GAMMA[KX,I]:=HULP/T;                                                  @ 226001
266000           S:=-R**2*S1+T+S                                                          @ 226001
267000        END;                                                                        @ 226001
268000        KX:=KX+1;                                                                   @ 226001
269000        INTER(KX,KY,DX,DY,GAMMA,BOL,S,EPS);                                         @ 226001
270000        IF BOL THEN  GO TO L1;                                                      @ 226001
271000  L2:                                                                               @ 226001
272000        IF KY=DEGY THEN                                                             @ 226001
273000        BEGIN                                                                       @ 226001
274000           IF KX=DEGX THEN  GO TO OUT;                                              @ 226001
275000           GO TO L1                                                                 @ 226001
276000        END;                                                                        @ 226001
277000        S1:=DY[KY];                                                                 @ 226001
278000        FOR I:=1,I+1 WHILE I LEQ N DO LY[I]:=PSI[KY,I];                             @ 226001
279000        FOR J:=1,J+1 WHILE J LEQ M DO                                               @ 226001
280000        BEGIN                                                                       @ 226001
281000           HULP:=0;                                                                 @ 226001
282000           K:=0;                                                                    @ 226001
283000           FOR K:=K+1 WHILE K LEQ N DO HULP:=Z[J,K]*LY[K]+HULP;                     @ 226001
284000           LX[J]:=HULP/(S1*10)                                                      @ 226001
285000        END;                                                                        @ 226001
286000        I:=-1;                                                                      @ 226001
287000        FOR I:=I+1 WHILE KX>I DO                                                    @ 226001
288000        BEGIN                                                                       @ 226001
289000           T:=DX[I];                                                                @ 226001
290000           HULP:=0;                                                                 @ 226001
291000           K:=0;                                                                    @ 226001
292000           FOR K:=K+1 WHILE K LEQ M DO HULP:=PHI[I,K]*LX[K]+HULP;                   @ 226001
293000           R:=GAMMA[I,KY]:=HULP/T;                                                  @ 226001
294000           S:=-R**2*S1+T+S                                                          @ 226001
295000        END;                                                                        @ 226001
296000        KY:=KY+1;                                                                   @ 226001
297000        INTER(KX,KY,DX,DY,GAMMA,BOL,S,EPS);                                         @ 226001
298000        IF BOL THEN  GO TO L1;                                                      @ 226001
299000        GO TO L2;                                                                   @ 226001
300000  OUT:                                                                              @ 226001
301000     END                                                                            @ 226001
302000     OF SURFACEFIT;                                                                 @ 226001
303000                                                                                    @ 226001
304000     PROCEDURE SURFPREP(M,KX,X,AX,BX,DX,PHI);                                       @ 226001
305000     COMMENT  DEZE PROCEDURE IS AFKOMSTIG VAN IR. H.J. DE VRIES, MEDEWE            @ 226001
306000     RKER VAN HET ERCU;                                                             @ 226001
307000     VALUE M,KX;                                                                    @ 226001
308000     INTEGER M,KX;                                                                  @ 226001
309000     ARRAY X,AX,BX,DX[*],PHI[*,*];                                                  @ 226001
310000     BEGIN                                                                          @ 226001
311000        INTEGER I,J,K,L;                                                            @ 226001
312000        REAL S1,S2,P0,P1,P2,R,T;                                                    @ 226001
313000        S2:=0;                                                                      @ 226001
314000        FOR I:=1,I+1 WHILE I LEQ M DO                                               @ 226001
315000        BEGIN                                                                       @ 226001
316000           PHI[0,I]:=1;                                                             @ 226001
317000           S2:=X[I]+S2                                                              @ 226001
318000        END;                                                                        @ 226001
319000        DX[0]:=M;                                                                   @ 226001
320000        P1:=AX[0]:=S2/M;                                                            @ 226001
321000        BX[0]:=0;                                                                   @ 226001
322000        S1:=S2:=0;                                                                  @ 226001
323000        FOR I:=1,I+1 WHILE I LEQ M DO                                               @ 226001
324000        BEGIN                                                                       @ 226001
325000           T:=X[I];                                                                 @ 226001
326000           PHI[1,I]:=R:=T-P1;                                                       @ 226001
327000           R:=R**2;                                                                 @ 226001
328000           S1:=R+S1;                                                                @ 226001
329000           S2:=R*T+S2                                                               @ 226001
330000        END;                                                                        @ 226001
331000        DX[1]:=S1;                                                                  @ 226001
332000        AX[1]:=S2/S1;                                                               @ 226001
333000        BX[1]:=S1/M;                                                                @ 226001
334000        J:=1;                                                                       @ 226001
335000        FOR J:=J+1 WHILE J LEQ KX DO                                                @ 226001
336000        BEGIN                                                                       @ 226001
337000           K:=J-1;                                                                  @ 226001
338000           L:=K-1;                                                                  @ 226001
```

```
339000            S1:=S2:=0;                                                    @ 226001
340000            P1:=AX[K];                                                    @ 226001
341000            P2:=BX[K];                                                    @ 226001
342000            FOR I:=1,I+1 WHILE I LEQ M DO                                 @ 226001
343000            BEGIN                                                         @ 226001
344000               T:=X[I];                                                   @ 226001
345000               PHI[J,I]:=R:=(T-P1)*PHI[K,I]-PHI[L,I]*P2;                  @ 226001
346000               R:=R**2;                                                   @ 226001
347000               S1:=R+S1;                                                  @ 226001
348000               S2:=R*T+S2                                                 @ 226001
349000            END;                                                          @ 226001
350000            DX[J]:=S1;                                                    @ 226001
351000            AX[J]:=S2/S1;                                                 @ 226001
352000            BX[J]:=S1/DX[K]                                               @ 226001
353000         END;                                                             @ 226001
354000      END                                                                 @ 226001
355000      OF SURFPREP;                                                        @ 226001
356000                                                                          @ 226001
357000      REAL PROCEDURE SURFCALC(Q,AY,BYA);                                  @ 226001
358000      ARRAY Q[*,*],AY,BYA[*];                                             @ 226001
359000      COMMENT  DEZE PROCEDURE IS AFKOMSTIG VAN IR. H. J. DE VRIES,        @ 226001
360000      MEDEWERKER VAN HET E.R.C.;                                          @ 226001
361000      BEGIN                                                               @ 226001
362000         LABEL REP7,REP8;                                                 @ 226001
363000         INTEGER I,J,K,L;                                                 @ 226001
364000         REAL A0,A1,A2,B0,B1,B2,AX0,AX1,AX2,AY0,AY1,AY2,S,T,S1,T1,R0,R1,  @ 226001
365000         R2;                                                              @ 226001
366000         BOOLEAN BOLX,BOLY;                                               @ 226001
367000         BOLX:=BOLY:= FALSE ;                                             @ 226001
368000         I:=M1MIN;                                                        @ 226001
369000   REP7:                                                                  @ 226001
370000         BOLY:= FALSE ;                                                   @ 226001
371000         J:=N1MIN;                                                        @ 226001
372000   REP8:                                                                  @ 226001
373000         IF BOLY THEN                                                     @ 226001
374000         BEGIN                                                            @ 226001
375000            B0:=S*B1-T*B2+Q[I,J];                                         @ 226001
376000            B2:=B1;                                                       @ 226001
377000            B1:=B0;                                                       @ 226001
378000            IF 1 LEQ J THEN                                               @ 226001
379000            BEGIN                                                         @ 226001
380000               S:=Y0-AY[J-1];                                             @ 226001
381000               T:=BYA[J];                                                 @ 226001
382000               AY0:=S*AY1-T*AY2+B1;                                       @ 226001
383000               AY2:=AY1;                                                  @ 226001
384000               AY1:=AY0                                                   @ 226001
385000            END;                                                          @ 226001
386000         END                                                              @ 226001
387000         ELSE IF J=N1MIN THEN B1:=B2:=AY1:=AY2:=Q[I,N1MIN] ELSE           @ 226001
388000         BEGIN                                                            @ 226001
389000            B1:=(Y0-AY[J])*B1+Q[I,J];                                     @ 226001
390000            BOLY:= TRUE ;                                                 @ 226001
391000            IF 1 LEQ J THEN                                               @ 226001
392000            BEGIN                                                         @ 226001
393000               S:=Y0-AY[J-1];                                             @ 226001
394000               T:=BYA[J];                                                 @ 226001
395000               AY1:=AY0:=S*AY1+B1                                         @ 226001
396000            END;                                                          @ 226001
397000         END;                                                             @ 226001
398000         J:=J-1;                                                          @ 226001
399000         IF 0 LEQ J THEN  GO TO REP8;                                     @ 226001
400000         IF BOLX THEN                                                     @ 226001
401000         BEGIN                                                            @ 226001
402000            A0:=S1*A1-T1*A2+B1;                                           @ 226001
403000            R0:=S1*R1-T1*R2+AY1;                                          @ 226001
404000            A2:=A1;                                                       @ 226001
405000            A1:=A0;                                                       @ 226001
406000            R2:=R1;                                                       @ 226001
407000            R1:=R0;                                                       @ 226001
408000            IF 1 LEQ I THEN                                               @ 226001
409000            BEGIN                                                         @ 226001
410000               S1:=X0-AX[I-1];                                            @ 226001
411000               T1:=BX[I];                                                 @ 226001
412000               AX0:=S1*AX1-T1*AX2+A1;                                     @ 226001
413000               AX2:=AX1;                                                  @ 226001
414000               AX1:=AX0                                                   @ 226001
415000            END;                                                          @ 226001
416000         END                                                              @ 226001
417000         ELSE IF I=M1MIN THEN                                             @ 226001
418000         BEGIN                                                            @ 226001
```

```
419000          A1:=A2:=AX1:=AX2:=B1;                                          @ 226001
420000          R1:=R2:=AY1                                                    @ 226001
421000       END                                                               @ 226001
422000       ELSE                                                              @ 226001
423000       BEGIN                                                             @ 226001
424000          S1:=X0-AX[I];                                                  @ 226001
425000          A1:=S1*A1+B1;                                                  @ 226001
426000          R1:=S1*R1+AY1;                                                 @ 226001
427000          BOLX:= TRUE ;                                                  @ 226001
428000          IF 1 LEQ I THEN                                                @ 226001
429000          BEGIN                                                          @ 226001
430000             S1:=X0-AX[I-1];                                             @ 226001
431000             T1:=BX[I];                                                  @ 226001
432000             AX1:=AX0:=S1*AX1+A1                                         @ 226001
433000          END;                                                           @ 226001
434000       END;                                                              @ 226001
435000       I:=I-1;                                                           @ 226001
436000       IF 0 LEQ I THEN  GO TO REP7;                                      @ 226001
437000       SURFCALC:=A1;                                                     @ 226001
438000       PXT:=AX1;                                                         @ 226001
439000       PYT:=R1;                                                          @ 226001
440000       IF M1MIN=0 THEN PXT:=0;                                           @ 226001
441000       IF N1MIN=0 THEN PYT:=0                                            @ 226001
442000    END                                                                  @ 226001
443000    OF SURFCALC;                                                         @ 226001
444000                                                                         @ 226001
445000    PROCEDURE UITSPLITS(EZ,FIZ,K,KG,EN,RI,D);                            @ 226001
446000    REAL EZ,FIZ; INTEGER K,KG; ARRAY EN,RI[*],D[*,*,*];                  @ 226001
447000    BEGIN                                                                @ 226001
448000       INTEGER KH,KL,KR,I;                                               @ 226001
449000       REAL FI,FIO,FIL,FIR,EO,EL,ER,EHULP,ADO,ADL,ADR;                   @ 226001
450000       FOR I:=0 STEP 1 UNTIL 5 DO EN[I]:=-10; ESOM:=0;                   @ 226001
451000       KH:=(FIZ/60) DIV 1;                                               @ 226001
452000       KL:=ABS((KH-1) MOD 6);                                            @ 226001
453000       KR:=(KH+1) MOD 6;                                                 @ 226001
454000       ADO:=D[KH,K,KG]; FIO:=ADO DIV 1; EO:=(ADO-FIO)*1000000;           @ 226001
455000       ADL:=D[KL,K,KG]; FIL:=ADL DIV 1; EL:=(ADL-FIL)*1000000;           @ 226001
456000       ADR:=D[KR,K,KG]; FIR:=ADR DIV 1; ER:=(ADR-FIR)*1000000;           @ 226001
457000       EHULP:=0;                                                         @ 226001
458000       IF EO>1 THEN                                                      @ 226001
459000       BEGIN                                                             @ 226001
460000          FI:=FIZ-FIO;                                                   @ 226001
461000          IF ABS(FI)<30 THEN FI:=ABS(FI);                                @ 226001
462000          IF FI<0 THEN FI:=FI+360;                                       @ 226001
463000          IF FI<30 THEN                                                  @ 226001
464000          BEGIN                                                          @ 226001
465000             EN[KH]:=RI[KH]:=0; EHULP:=EO                                @ 226001
466000          END                                                            @ 226001
467000          ELSE                                                           @ 226001
468000          BEGIN                                                          @ 226001
469000             EN[KH]:=EO; RI[KH]:=FIO                                     @ 226001
470000          END;                                                           @ 226001
471000       END                                                               @ 226001
472000       ELSE EN[KH]:=RI[KH]:=0;                                           @ 226001
473000       IF ER>1 THEN                                                      @ 226001
474000       BEGIN                                                             @ 226001
475000          FI:=FIR-FIZ;                                                   @ 226001
476000          IF ABS(FI)<30 THEN FI:=ABS(FI);                                @ 226001
477000          IF FI<0 THEN FI:=360-FIZ+FIR;                                  @ 226001
478000          IF FI<30 THEN                                                  @ 226001
479000          BEGIN                                                          @ 226001
480000             EN[KR]:=RI[KR]:=0; EHLLP:=EHULP+ER                          @ 226001
481000          END                                                            @ 226001
482000          ELSE                                                           @ 226001
483000          BEGIN                                                          @ 226001
484000             EN[KR]:=ER; RI[KR]:=FIR                                     @ 226001
485000          END;                                                           @ 226001
486000       END                                                               @ 226001
487000       ELSE EN[KR]:=RI[KR]:=0;                                           @ 226001
488000       IF EL>1 THEN                                                      @ 226001
489000       BEGIN                                                             @ 226001
490000          FI:=FIZ-FIL;                                                   @ 226001
491000          IF ABS(FI)<30 THEN FI:=ABS(FI);                                @ 226001
492000          IF FI<0 THEN FI:=360-FIL+FIZ;                                  @ 226001
493000          IF FI<30 THEN                                                  @ 226001
494000          BEGIN                                                          @ 226001
495000             EN[KL]:=RI[KL]:=0; EHULP:=EHULP+EL                          @ 226001
496000          END                                                            @ 226001
497000          ELSE                                                           @ 226001
498000          BEGIN                                                          @ 226001
```

```
499000              EN[KL]:=EL; RI[KL]:=FIL                                                  @ 226001
500000           END;                                                                        @ 226001
501000        END                                                                            @ 226001
502000        ELSE EN[KL]:=RI[KL]:=0;                                                        @ 226001
503000        IF EHULP>EZ THEN EZ:=EHULP;                                                    @ 226001
504000        FOR I:=0 STEP 1 UNTIL 5 DO                                                     @ 226001
505000        BEGIN                                                                          @ 226001
506000           IF EN[I]<-1 THEN                                                            @ 226001
507000           BEGIN                                                                       @ 226001
508000              ADO:=DC[I,K,KG]; RI[I]:=ADO DIV 1;                                       @ 226001
509000              EN[I]:=(ADO-RI[I])*1000000                                               @ 226001
510000           END;                                                                        @ 226001
511000        END;                                                                           @ 226001
512000        FOR I:=0 STEP 1 UNTIL 5 DO ESOM:=*+EN[I];                                      @ 226001
513000        ESOM:=*+EZ;                                                                    @ 226001
514000     END                                                                               @ 226001
515000     OF UITSPLITS;                                                                     @ 226001
516000                                                                                       @ 226001
517000     BOOLEAN PROCEDURE GONOSTART;                                                      @ 226001
518000     BEGIN                                                                             @ 226001
519000        LABEL NORUN;                                                                   @ 226001
520000        FILE VTHI(KIND=DISK,FILETYPE=7);                                               @ 226001
521000        FILE PRCLYNHI(KIND=DISK,FILETYPE=7);                                           @ 226001
522000        REAL PROTG;                                                                    @ 226001
523000                                                                                       @ 226001
524000  $BEGINSEGMENT                                                                        @ 226001
525000        PROCEDURE PRELUDEGONO(DTG,ENDDTG);                                             @ 226001
526000        VALUE DTG; REAL DTG,ENDDTG;                                                    @ 226001
527000        BEGIN                                                                          @ 226001
528000           FILE OLDF(KIND=DISK,FILETYPE=7,TITLE="GONOOWN.",EXCLUSIVE);                 @ 226001
529000           FILE NEWF(KIND=DISK,MAXRECSIZE=330,BLOCKSIZE=990,AREASIZE=30,               @ 226001
530000           MYUSE=OUT,TITLE="GONOOWN.",
531000           SECURITYTYPE=CLASSA,SECURITYUSE=IN);
532000           FILE GONO(KIND=DISK,MAXRECSIZE=330,BLOCKSIZE=990,AREASIZE=9,                @ 226001
533000           MYUSE=OUT,TITLE="GONOINPUT.");                                              @ 226001
534000           FILE LP(KIND=PRINTER);
535000           FILE GRF(KIND=DISK,FILETYPE=7);                                             @ 226001
536000           DEFINE                                                                      @ 226001
537000           ANALNAME = "(VCOW)ARCHIEFTEL1/" #                                           @ 226001
538000           ,PROGNAME = "(VOOW)ARCHIEFTEL2/" #
539000           ;
540000           VALUE ARRAY SNEDE(2,-7905.8,-4313.4,8120,-4690,4690,8120,32+7);             @ 226001
541000           INTEGER I,J,K,N,O,FP,KLL,OLDDTG,RECL,GN,MT;                                 @ 226001
542000           REAL CS; BOOLEAN TESTING,OLDFOK;                                            @ 226001
543000           EBCDIC ARRAY TE[0:100]; POINTER P;                                          @ 226001
544000           ARRAY GONOGR[0:5000],GNGR[0:500];                                           @ 226001
545000           LONG ARRAY GR[0:2500];                                                      @ 226001
546000           LABEL EOF1,ALTERNATIVE,GONOWR,EOF2;                                         @ 226001
547000                                                                                       @ 226001
548000           BOOLEAN PROCEDURE FOUND;                                                    @ 226001
549000           BEGIN                                                                       @ 226001
550000              LABEL EXIT;                                                              @ 226001
551000              FOR GN:=1 STEP 1 UNTIL GR[NGRF] DO                                       @ 226001
552000              IF FOUND:=                                                               @ 226001
553000              GR[DTCRF(GN)]=D AND                                                      @ 226001
554000              GR[FPF(GN)]=FP AND                                                       @ 226001
555000              (MT=0 OR GR[MTF(GN)] DIV 1000 = MT) AND                                  @ 226001
556000              ((GR[MPF(GN)]=1 AND GR[MPV1F(GN)]=1000) OR GR[MPF(GN)]=8)                @ 226001
557000              THEN GO TO EXIT;                                                         @ 226001
558000  EXIT:                                                                                @ 226001
559000           END                                                                         @ 226001
560000           FOUND;                                                                      @ 226001
561000                                                                                       @ 226001
562000           BOOLEAN PROCEDURE MATCH(A,C); ARRAY A[0],C[0];                              @ 226001
563000           BEGIN                                                                       @ 226001
564000              INTEGER I; LABEL EXIT;                                                   @ 226001
565000              FOR I:=0 STEP 1 UNTIL 6 DO                                               @ 226001
566000              IF NOT (MATCH:=A[POF+I] EQL C[I]) THEN GO TO EXIT;                       @ 226001
567000  EXIT:                                                                                @ 226001
568000           END                                                                         @ 226001
569000           MATCH;                                                                      @ 226001
570000                                                                                       @ 226001
571000           PROCEDURE PROCESSGRID;                                                      @ 226001
572000           BEGIN                                                                       @ 226001
573000              IF TESTING THEN                                                          @ 226001
574000              BEGIN                                                                    @ 226001
575000                 WRITE(LP[SKIP 1]);                                                    @ 226001
576000                 COINCIDENCEPOINT(90,0); REFERENCEPOINT(40,-30,"I");                   @ 226001
577000                 PRINTGRID(LP,GR,1,SNEDE);                                             @ 226001
578000              END;                                                                     @ 226001
```

```
579000              IF MATCH(GR,TELESCOOPCOORDINATES) THEN                                  @ 226001
580000              BEGIN                                                                   @ 226001
581000                 INITGRIDCODE(GNGR,500);                                              @ 226001
582000                 NORMALGRID(GNGR,0,17,-2,-24);                                        @ 226001
583000                 FILLGRIDCOOR(GNGR,TELESCOOPCOORDINATES);                             @ 226001
584000                 MOVEGRID(GR,GN,GNGR,1);                                              @ 226001
585000                 SETINTERPOLATIONMETHOD(1);                                           @ 226001
586000                 SETUPINTERPOLATION(GNGR,1);                                          @ 226001
587000              END                                                                     @ 226001
588000              ELSE                                                                    @ 226001
589000              BEGIN                                                                   @ 226001
590000                 SETINTERPOLATIONMETHOD(1);                                           @ 226001
591000                 SETUPINTERPOLATION(GF,GN);                                           @ 226001
592000              END;                                                                    @ 226001
593000              FILL GONOGR[*] WITH 100,0,12,22,0,1,330,0,                              @ 226001
594000              2,-1024.1,-4350.7,146.7,-31.2,31.2,146.7,                               @ 226001
595000              0,0,0,25,0,5(NOTDEFINED);                                               @ 226001
596000              GENERATEGRID(GONOGR,1);                                                 @ 226001
597000              IF TESTING THEN                                                         @ 226001
598000              BEGIN                                                                   @ 226001
599000                 WRITE(LP[SKIP 1]);                                                   @ 226001
600000                 WRITE(LP,<2I10>,D,FP);                                               @ 226001
601000                 WRITE(LP,<23(/,13F6.1)>,                                             @ 226001
602000                 FOR I:=0,I+1 WHILE I<299 DO GONOGR[25+I]);                           @ 226001
603000                 WRITE(LP[SPACE 5]);                                                  @ 226001
604000                 SETINTERPOLATIONMETHOD(0);                                           @ 226001
605000                 COINCIDENCEPOINT(90,0); REFERENCEPOINT(40,-30,"I");                  @ 226001
606000                 PRINTGRID(LP,GONOGR,1,SNEDE);                                        @ 226001
607000              END;                                                                    @ 226001
608000              IF GONOGR[MFF(1)] NEQ 8 THEN                                            @ 226001
609000              BEGIN                                                                   @ 226001
610000                 FOR I:=25 STEP 1 UNTIL 323 DO GONOGR[I]:=GONOGR[I]/8                 @ 226001
611000                 *100;                                                                @ 226001
612000                 GONOGR[MFF(1)]:=8;                                                   @ 226001
613000                 GONOGR[MFV1F(1)]:=0;                                                 @ 528800
614000              END;                                                                    @ 528800
615000           END                                                                        @ 226001
616000           PROCESSGRID;                                                               @ 226001
617000                                                                                      @ 226001
618000           IF TESTING:=DTG<0 THEN DTG:=-DTG;                                          @ 226001
619000           OLDDTG:=BACKUPDATE(DTG,-168);                                              @ 226001
620000           OLDFOK:=OLDF.RESIDENT;                                                     @ 226001
621000           IF OLDFOK THEN                                                             @ 226001
622000           WHILE NOT READ(OLDF,330,GONOGR) DO                                         @ 226001
623000           IF GONOGR[328]>OLDDTG THEN                                                 @ 226001
624000           WRITE(NEWF,330,GONOGR);                                                    @ 226001
625000                                                                                      @ 226001
626000           FP:=0;                                                                     @ 226001
627000           ENDDTG:=0:=BACKUPDATE(DTG,-12);                                            @ 226001
628000           WHILE D LEQ DTG DO                                                         @ 226001
629000           BEGIN                                                                      @ 226001
630000              REPLACE T BY ANALNAME,D FOR 8 DIGITS,".";                               @ 226001
631000              REPLACE GRF.TITLE BY T;                                                 @ 226001
632000              IF NOT  GRF.RESIDENT THEN GO EOF1;                                      @ 226001
633000              MT:=13;                                                                 @ 226001
634000              DO READ(GRF,*,GR[*])[ALTERNATIVE] UNTIL FOUND;                          @ 226001
635000              IF FALSE THEN                                                           @ 226001
636000              BEGIN                                                                   @ 226001
637000 ALTERNATIVE:                                                                         @ 226001
638000                 REWIND(GRF);                                                         @ 226001
639000                 MT:=0;                                                               @ 226001
640000                 DO READ(GRF,*,GR[*])[EOF1] UNTIL FOUND;                              @ 226001
641000              END;                                                                    @ 226001
642000              CS:=CHECKSUM(GR,0,GR[LF]-1);                                            @ 226001
643000              IF OLDFOK THEN                                                          @ 226001
644000              BEGIN                                                                   @ 226001
645000                 REWIND(OLDF);                                                        @ 226001
646000                 WHILE NOT READ(OLDF,330,GONOGR) DO                                   @ 226001
647000                 IF GONOGR[328]=D AND GONOGR[329]=CS THEN GO TO GONOWR;               @ 226001
648000              END;                                                                    @ 226001
649000              PROCESSGRID;                                                            @ 226001
650000              GONOGR[329]:=CS;                                                        @ 226001
651000              WRITE(NEWF,330,GONOGR);                                                 @ 226001
652000 GONOWR:                                                                             @ 226001
653000              WRITE(GONO,330,GONOGR);                                                 @ 226001
654000              CLOSE(GRF);                                                             @ 226001
655000              GRF.FILETYPE:=7;                                                        @ 226001
656000              ENDDTG:=0;                                                              @ 226001
657000              D:=BACKUPDATE(D,+3);                                                    @ 226001
658000           END;                                                                       @ 226001
```

```
659000  ECF1:
660000            CLOSE(OLDF);                                                  @ 226001
661000            LOCK(NEWF,CRUNCH);                                            @ 226001
662000     $ SET OMIT = OLDPRELUDE                                              @ 226001
663000            D:=DTG; MT:=0;                                                @ 226001
664000            REPLACE T BY PROGNAME,DTG FOR 8 DIGITS,".";                   @ 226001
665000            REPLACE GRF.TITLE BY T; GRF.FILETYPE:=7;                      @ 226001
666000            IF NOT GRF.RESIDENT OR ENDDTG LSS DTG  THEN GO TO EOF2;       @ 226001
667000            FOR FP:=3 STEP 3 UNTIL 24 DO                                  @ 226001
668000            BEGIN                                                         @ 226001
669000               DO READ(GRF,*,GR(*))[EOF2] UNTIL FOUND;                    @ 226001
670000               PROCESSGRID;                                               @ 226001
671000               WRITE(GONO,330,GONOGR);                                    @ 226001
672000               ENDDTG:=BACKUPDATE(ENDDTG,+3);                             @ 226001
673000            END;                                                          @ 226001
674000     $ POP OMIT                                                           @ 226001
675000  EOF2:                                                                   @ 226001
676000                                                                          @ 226001
677000            LOCK(GONO);                                                   @ 226001
678000            IF FALSE THEN                                                 @ 226001
679000            BEGIN                                                         @ 226001
680000               SCAN P:T WHILE NEQ ".";                                    @ 226001
681000               REPLACE P BY ":  ",D FOR 8 DIGITS,"+",FP FOR 2 DIGITS,     @ 226001
682000               " NIET AANWEZIG"48"00";                                    @ 226001
683000               ACCEPT(T);                                                 @ 226001
684000               MYSELF.STATUS:=-1;                                         @ 226001
685000            END;                                                          @ 226001
686000                                                                          @ 226001
687000         END                                                              @ 226001
688000         PRELUDEGONO;                                                     @ 226001
689000                                                                          @ 226001
690000     $ENDSEGMENT                                                          @ 226001
691000                                                                          @ 226001
692000         DTG:=MYSELF.TASKVALUE;                                           @ 226001
693000         IF DTG=0 THEN                                                    @ 226001
694000         BEGIN                                                            @ 226001
695000            FILE CRD(KIND=READER);                                        @ 226001
696000            READ(CRD,/,DTG,ENDDTG,BEGINDTG);                              @ 226001
697000            TESTING:=TRUE;                                                @ 226001
698000         END                                                              @ 226001
699000         ELSE                                                             @ 226001
700000         BEGIN                                                            @ 226001
701000            IF DTG<0 THEN                                                 @ 226001
702000            BEGIN                                                         @ 226001
703000               DTG:=ABS(DTG);                                             @ 226001
704000               TX.KIND:=VALUE(REMOTE);                                    @ 226001
705000               RTX.KIND:=VALUE(REMOTE);                                   @ 226001
706000               NTX.KIND:=VALUE(REMOTE);                                   @ 226001
707000            END                                                           @ 226001
708000            ELSE                                                          @ 226001
709000            IF RECOVER.RESIDENT THEN                                      @ 226001
710000            READ(RECOVER,30,RECOVERY);                                    @ 226001
711000            WAIT(RECOVERY);                                               @ 226001
712000            IF RECOVERY[0]=DTG THEN BEGINDTG:=RECOVERY[1] ELSE            @ 226001
713000            BEGINDTG:=BACKUPDATE(DTG,-12);                                @ 226001
714000         END;                                                             @ 226001
715000         BEGINDTG:=(BEGINDTG DIV 100)*100+(BEGINDTG MOD 100 DIV 6)*6;     @ 226001
716000         RECOVERY[0]:=ABS(DTG);                                           @ 226001
717000         RECOVERY[1]:=BEGINDTG;                                           @ 226001
718000         WRITE(RECOVER[0],30,RECOVERY);                                   @ 226001
719000         WAIT(RECOVERY);                                                  @ 226001
720000         PRELUDEGONO(DTG,PRDTG);                                          @ 226001
721000         DTG:=ABS(DTG);                                                   @ 226001
722000         IF TESTING THEN IF ENDDTG>PRDTG THEN ENDDTG:=PRDTG ELSE          @ 226001
723000         ELSE ENDDTG:=PRDTG;                                              @ 226001
724000         IF BEGINDTG=ENDDTG THEN GO NORUN;                                @ 226001
725000         REPLACE TITLE BY " " FOR 256;                                    @ 226001
726000         REPLACE TITLE BY "CWD",DTG MOD 10000 FOR 4 DIGITS,".";           @ 226001
727000         REPLACE LPEHDB.TITLE BY TITLE;                                   @ 226001
728000         REPLACE TITLE BY "BME",DTG MOD 10000 FOR 4 DIGITS,".";           @ 226001
729000         REPLACE LPRESEARCH.TITLE BY TITLE;                               @ 226001
730000         REPLACE TITLE BY "EHZI",DTG MOD 10000 FOR 4 DIGITS,".";          @ 226001
731000         REPLACE LPEHZI.TITLE BY TITLE;                                   @ 226001
732000  %      NAME(LPRESEARCH,"   BUREAU M.E.  ");                             @ 226001
733000  %      NAME(LPRESEARCH," GONO  ANAL+PREB");
734000         WRITE(LPRESEARCH(SPACE 11),<"DATUMTIJD: ",I8>,DTG);              @ 226001
735000                                                                          @ 226001
736000         DATUM:=BEGINDTG;                                                 @ 226001
737000         W2:=SQRT(2); PI:=3.14159265358979793; PI2:=PI*2;                 @ 226001
738000         PIG2:=PI/2; PIG4:=PI/4; PI3G2:=PI*3/2; FAC1:=5400/75000;         @ 226001
```

```
739000        FAC2:=FAC1/W2;                                                                  @ 226001
740000        FACD:=3600*9.8/(4*PI*75000); FACE:=(0.22/9.8)**2/16;                            @ 226001
741000        FACU:=SQRT(9.8/0.22)*2; FACCG:=0.457080148491 5;                                @ 226001
742000        EMAX:=30**4*FACE*1000000;                                                       @ 226001
743000        COEFFE:=4*0.63363E36*9.8*9.8/0.767772-2;                                        @ 226001
744000        FOR K:=0,K+1 WHILE K LEQ 50 DO                                                  @ 226001
745000        BEGIN                                                                           @ 226001
746000            HULP:=0.5*K/100;                                                            @ 226001
747000            AMOD[K]:=0.00493*HULP**(-1.944);                                            @ 226001
748000            GMOD[K]:=1.5-(0.00439*HULP**(-1.504))/AMOD[K];                              @ 226001
749000            OMOD[K]:=((3-2*GMOD[K])*AMOD[K]/0.0121)**0.25                               @ 226001
750000        END;                                                                            @ 226001
751000        ABD1:=ABD3:=0; ABD2:=0.0000175;                                                 @ 226001
752000        EPS:=EPS0:=5@-5; KX0:=11; KY0:=12;                                              @ 226001
753000        LABDAFAC:=4.25;                                                                 @ 226001
754000        LABNUL:=LABDAFAC;                                                               @ 226001
755000        LABDAFAC:=4*PI*LABDAFAC/9.8;                                                    @ 226001
756000        REPLACE TITLE BY "VT1.";
757000        REPLACE VTHI.TITLE BY TITLE;
758000        READ(VTHI,*,ORA,                                                                @ 226001
759000        FOR I:=1,1+I WHILE I LEQ 4 DO FOR J:=-3,J+1 WHILE J                             @ 226001
760000        LEQ 2 DO COEFW[I,J],                                                            @ 226001
761000        FOR I:=1,I+1 WHILE I LEQ 17 DO FOR J:=1,J+1 WHILE J                             @ 226001
762000        LEQ 36 DO DA[I,J],                                                              @ 226001
763000        TYDA,                                                                           @ 226001
764000        HS,                                                                             @ 226001
765000        FOR I:=1,I+1 WHILE I LEQ 7 DO FOR J:=1,J+1 WHILE J                              @ 226001
766000        LEQ 19 DO CGOND[I,J],                                                           @ 226001
767000        FOR I:=1,I+1 WHILE I LEQ 7 DO FOR J:=1,J+1 WHILE J                              @ 226001
768000        LEQ 19 DO KOM[I,J]);                                                            @ 226001
769000        CLOSE(VTHI);                                                                    @ 226001
770000        REPLACE TITLE BY "PROLYN1.";
771000        REPLACE PROLYNHI.TITLE BY TITLE;
772000        I:=-1; THRU 100 DO READ(PROLYNHI,100,ALYN[(I:=*+1)*100]);                       @ 226001
773000        CLOSE(PROLYNHI);                                                                @ 226001
774000        NDEINING:=ALYN[0];                                                              @ 226001
775000        I:=0; FOR I:=I+1 WHILE I LEQ NDEINING DO                                        @ 226001
776000        BEGIN                                                                           @ 226001
777000            OP[I,1]:=ABS(ALYN[I*2-1]); NOP[I,1]:=ALYN[I*2-1];                           @ 226001
778000            OP[I,2]:=ABS(ALYN[I*2]); NOP[I,1]:=ALYN[I*2];                               @ 226001
779000        END;                                                                            @ 226001
780000        FOR I:=1,2,3,4,5 DO NOP[I,1]:=-OP[I,1];                                         @ 226001
781000        TELDEIN:=NDEINING*2;                                                            @ 528800
782000        IF NDEINING>0 THEN                                                              @ 226001
783000        BEGIN                                                                           @ 226001
784000            FOR J:=0 STEP 1 UNTIL 5 DO                                                  @ 226001
785000            FOR K:=1,K+1 WHILE K LEQ NDEINING DO                                        @ 226001
786000            FOR I:=1,I+1 WHILE I LEQ 7 DO                                               @ 226001
787000            DO[J,K,I]:=D72[J,K,I]:=0;                                                   @ 226001
788000            FOR J:=0 STEP 1 UNTIL 5 DO                                                  @ 226001
789000            FOR K:=1,2 DO                                                               @ 226001
790000            FOR I:=1 STEP 1 UNTIL 7 DO                                                  @ 226001
791000            OK0[J,K,I]:=OK72[J,K,I]:=0;                                                 @ 226001
792000        END;                                                                            @ 226001
793000        FOR I:=1,I+1 WHILE I LEQ 13 DO X[I]:=I*2-5;                                     @ 226001
794000        FOR I:=1,I+1 WHILE I LEQ 14 DO Y[I]:=I*2+13;                                    @ 226001
795000        KX:=KX0; KY:=KY0; MB:=13; NB:=14; EPS:=EPS0; N:=14;                             @ 226001
796000        SURFPREP(MB,KX,X,AX,BX,DX,PHI);                                                 @ 226001
797000        SURFPREP(NB,KY,Y,AYB,BYB,DYB,PSIB);                                             @ 226001
798000        FOR I:=1,I+1 WHILE I LEQ 14 DO Y[I]:=I*2-5;                                     @ 226001
799000        SURFPREP(N,KY,Y,AY,BYA,DY,PSI);                                                 @ 226001
800000        REPLACE TITLE BY "ZG/",DATUM FOR 8 DIGITS,".";
801000        REPLACE ZG.TITLE BY TITLE;
802000        READ(ZG,*,FOR J:=0,J+1 WHILE J LEQ 37 DO                                        @ 226001
803000        FOR I:=0,I+1 WHILE I LEQ 18 DO WR[I,J],                                         @ 226001
804000        FOR J:=0,J+1 WHILE J LEQ 37 DO                                                  @ 226001
805000        FOR I:=0,I+1 WHILE I LEQ 18 DO EA[I,J],                                         @ 226001
806000        FOR J:=0,J+1 WHILE J LEQ 37 DO                                                  @ 226001
807000        FOR I:=0,I+1 WHILE I LEQ 18 DO GSN[I,J],                                        @ 226001
808000        DEF(D66),                                                                       @ 226001
809000        DEF(D60),                                                                       @ 226001
810000        DEF(D54),                                                                       @ 226001
811000        DEF(D48),                                                                       @ 226001
812000        DEF(D42),                                                                       @ 226001
813000        DEF(D36),                                                                       @ 226001
814000        DEF(D30),                                                                       @ 226001
815000        DEF(D24),                                                                       @ 226001
816000        DEF(D18),                                                                       @ 226001
817000        DEF(D12),                                                                       @ 226001
818000        DEF(D6),                                                                        @ 226001
```

```
819000        DEFK(OK66),                                                    @ 226001
820000        DEFK(OK60),                                                    @ 226001
821000        DEFK(OK54),                                                    @ 226001
822000        DEFK(OK48),                                                    @ 226001
823000        DEFK(OK42),                                                    @ 226001
824000        DEFK(OK36),                                                    @ 226001
825000        DEFK(OK30),                                                    @ 226001
826000        DEFK(OK24),                                                    @ 226001
827000        DEFK(OK18),                                                    @ 226001
828000        DEFK(OK12),                                                    @ 226001
829000        DEFK(OK6)); CLOSE(ZG);                                         @ 226001
830000        REPLACE TITLE BY "GNO/BRON/",DTG FOR 8 DIGITS,".";             @ 226001
831000        REPLACE BRON.TITLE BY TITLE;                                   @ 226001
832000    $SET OMIT                                                          @ 226001
833000        READ(BRON,*,                                                   @ 226001
834000        DEF(BR66),                                                     @ 226001
835000        DEF(BR60),                                                     @ 226001
836000        DEF(BR54),                                                     @ 226001
837000        DEF(BR48),                                                     @ 226001
838000        DEF(BR42),                                                     @ 226001
839000        DEF(BR36),                                                     @ 226001
840000        DEF(BR30),                                                     @ 226001
841000        DEF(BR24),                                                     @ 226001
842000        DEF(BR18),                                                     @ 226001
843000        DEF(BR12),                                                     @ 226001
844000        DEF(BR6)); CLOSE(BRON);                                        @ 226001
845000    $POP OMIT                                                          @ 226001
846000        FOR J:=0,J+1 WHILE J LEQ 12 DO FOR I:=0,I+1 WHILE I LEQ 12 DO  @ 226001
847000        GAMMA2B[I,J]:=GAMMA2[I,J]:=0;                                  @ 226001
848000        M2B:=N2B:=M2:=N2:=0;                                           @ 226001
849000        FOR I:=1,2,3,4 DO TEMP2[I]:=0;                                 @ 226001
850000        TELIN:=1008;                                                   @ 226001
851000        T:=0;                                                          @ 226001
852000        SCHRIJFZG:=GONOSTART:=TRUE;                                    @ 226001
853000        BCLPROG:=BOLSTART:=FALSE;                                      @ 226001
854000    NORLN:                                                             @ 226001
855000      END                                                              @ 226001
856000      GONOSTART;                                                       @ 226001
857000                                                                       @ 226001
858000      PROCEDURE GONO1;                                                 @ 226001
859000      BEGIN                                                            @ 226001
860000        INTEGER ARRAY P[1:13,1:14];                                    @ 226001
861000        PROCEDURE LEESINPUT(DTGR,FP);                                  @ 226001
862000        VALUE DTGR,FP; INTEGER DTGR,FP;                                @ 226001
863000        BEGIN                                                          @ 226001
864000          BOOLEAN PR;                                                  @ 226001
865000          INTEGER X,WDTGR,WFP,I;                                       @ 226001
866000          ARRAY GRBUF[0:329];                                          @ 226001
867000          PR:=FALSE;                                                   @ 226001
868000          WHILE NOT READ(GONOINPUT,*,GRBUF[*]) DO                      @ 226001
869000          BEGIN                                                        @ 226001
870000            GETGRIDINFO(GRBUF,1,X,WDTGR,WFP,X,X,X);                    @ 226001
871000            IF WDTGR=DTGR AND WFP=FP THEN                              @ 226001
872000            BEGIN                                                      @ 226001
873000              GETGRIDDIRECT(GRBUF,1,V,0);                              @ 226001
874000              FOR I:=0 STEP 1 UNTIL 298 DO V[I]:=(V[I]-1000)*10;       @ 226001
875000              PR:=TRUE;                                                @ 226001
876000            END;                                                       @ 226001
877000          END;                                                         @ 226001
878000          REWIND(GONOINPUT);                                           @ 226001
879000          IF NOT PR THEN                                               @ 226001
880000          BEGIN                                                        @ 226001
881000            WRITE(LPRESEARCH,<"FILE NIET AANWEZIG,DATUM:",I8," FP:",   @ 226001
882000            I2>,DTGR,FP);                                              @ 226001
883000            GO TO EXIT;                                                @ 226001
884000          END;                                                         @ 226001
885000        END                                                            @ 226001
886000        OF LEESINPUT;                                                  @ 226001
887000                                                                       @ 226001
888000        PROCEDURE GETADETCEDATA(DTG,TEMPERATUREN);                     @ 226001
889000        VALUE DTG;                                                     @ 226001
890000        REAL DTG;                                                      @ 226001
891000        ARRAY TEMPERATUREN[0];  %  HET GEMIDDELDE VAN                  @ 226001
892000        %  DE WOORDEN 2 T/M 7   %                                      @ 226001
893000        %  KOMT IN WOORD 1  .   %                                      @ 226001
894000        BEGIN                                                          @ 226001
895000          REAL JR,MND,WOORD,WOORDNR,SCHRIKKELJAAR,I;                   @ 226001
896000          FILE VERZAMEL(KIND=DISK,FILETYPE=7);                         @ 226001
897000          FILE LP(KIND=PRINTER,UNITS=CHARACTERS);                      @ 226001
898000          ARRAY VERZAMELA[0:3120];                                     @ 226001
```

```
899000          EBCDIC ARRAY TITLE[0:60];                                                    @ 226001
900000          VALUE ARRAY                                                                  @ 226001
901000          DAGEN[0,0,31,59,90,120,151,181,212,243,273,304,334);                         @ 226001
902000          IF DTG MOD 100 MOD 6 NEQ 0 THEN DTG:=BACKUPDATE(DTG,-3);                     @ 226001
903000          MND:=DTG DIV 10000 MOD 100;                                                  @ 226001
904000          JR:=DTG DIV 1000000;                                                         @ 226001
905000          REPLACE TITLE BY "(VCOW)DIFAIRSEA/",
906000          JR FOR 2 DIGITS,                                                             @ 226001
907000          "010100 ON TEST.";
908000          REPLACE VERZAMEL.TITLE BY TITLE;
909000          IF NOT VERZAMEL.RESIDENT THEN                                                @ 226001
910000          BEGIN                                                                        @ 226001
911000             WRITE(LP,<A33," NOT RESIDENT">,TITLE);                                    @ 226001
912000             REPLACE TEMPERATUREN BY REAL(NOT FALSE) FOR 8 WORDS;                      @ 226001
913000          END                                                                          @ 226001
914000          ELSE                                                                         @ 226001
915000          BEGIN                                                                        @ 226001
916000             SCHRIKKELJAAR:=REAL(JR MOD 4 EQL 0 AND MND GTR 2)*8;                      @ 226001
917000             READ(VERZAMEL,3120,VERZAMELA);                                            @ 226001
918000             WCORDNR:=(DAGEN[MND]+(DTG MOD 10000 DIV 100)-1)*8+                        @ 226001
919000             DTG MOD 100 DIV 3 + SCHRIKKELJAAR;                                        @ 226001
920000             WCORD:=VERZAMELA[WOORDNR];                                                @ 226001
921000             FOR I:=0 STEP 1 UNTIL 7 DO                                                @ 226001
922000             TEMPERATUREN[I]:=WOORD.[(I+1)*6-1:6]-32;
923000          END;
924000          TEMP1[1]:=TEMP2[1]:=TEMPAR[0]*10;                                            @ 226001
925000          TEMP1[2]:=TEMP2[2]:=TEMPAR[2]*10;                                            @ 226001
926000          TEMP1[3]:=TEMP2[3]:=TEMPAR[5]*10;                                            @ 226001
927000          TEMP1[4]:=TEMP2[4]:=TEMPAR[6]*10;                                            @ 226001
928000          FOR I:=1 STEP 1 UNTIL 4 DO                                                   @ 226001
929000          IF TEMP2[I] <-40 THEN TEMP2[I]:=-40 ELSE                                     @ 226001
930000          IF TEMP2[I] >100 THEN TEMP2[I]:=100;                                         @ 226001
931000       END;                                                                            @ 226001
932000                                                                                       @ 226001
933000       FP:=DTGDISTANCE(DTG,DATUM);                                                     @ 226001
934000       LEESINPUT(MIN(DATUM,DTG),MAX(FP,0));                                            @ 226001
935000       IF BOLSTART  THEN GETADETOEDATA(DATUM,TEMPAR);
936000       FOR J:=0,J+1 WHILE J LEQ 12 DO FOR I:=0,I+1 WHILE I LEQ 12 DO                   @ 226001
937000       BEGIN                                                                           @ 226001
938000          GAMMA1B[I,J]:=GAMMA2B[I,J];                                                  @ 226001
939000          GAMMA1[I,J]:=GAMMA2[I,J]                                                     @ 226001
940000       END;                                                                            @ 226001
941000       M1B:=M2B; N1B:=N2B; M1:=M2; N1:=N2;                                             @ 226001
942000       FOR J:=14,J-1 WHILE J GEQ 1 DO                                                  @ 226001
943000       FOR I:=1,I+1 WHILE I LEQ 13 DO P[I,J]:=V[(14-J)*13+I-1];                        @ 226001
944000       S:=1; KX:=KX0; KY:=KY0; EPS:=EPS0; MB:=13; NB:=14;                              @ 226001
945000       SURFACEF(MB,NB,KX,KY,P,AX,AYB,BX,BYB,DX,DYB,PSIE,GAMMA2B,INTER,                 @ 226001
946000       BOL,S,EPS);                                                                     @ 226001
947000       M2B:=DX[-1];                                                                    @ 226001
948000       N2B:=DYB[-1];                                                                   @ 226001
949000       %WRITE(LPRESEARCH,<"GRAAD-X,GRAAD-Y,NAUWKEURIGHEID    ",2I3,X2,F8.6          @ 226001
950000       %              M2B,N2B,EPS);                                                    @ 226001
951000       S:=1; KX:=KX0; KY:=KY0; M:=13; N:=14; EPS:=EPS0;                                @ 226001
952000       FOR J:=14,J-1 WHILE J GEQ 1 DO                                                  @ 226001
953000       FOR I:=1,I+1 WHILE I LEQ 13 DO P[I,J]:=V[(23-J)*13+I-1];                        @ 226001
954000       SURFACEF(M,N,KX,KY,P,AX,AY,BX,BYA,DX,DY,PSI,GAMMA2,INTER,                       @ 226001
955000       BOL,S,EPS);                                                                     @ 226001
956000       M2:=DX[-1];                                                                     @ 226001
957000       N2:=DY[-1];                                                                     @ 226001
958000       %WRITE(LPRESEARCH,<"GRAAD-X,GRAAD-Y,NAUWKEURIGHEID    ",2I3,X2,F8.6          @ 226001
959000       %              M2,N2,EPS);                                                      @ 226001
960000       J:=-1;                                                                          @ 226001
961000       FOR J:=J+1 WHILE J LEQ N2B DO                                                   @ 226001
962000       BEGIN                                                                           @ 226001
963000          I:=M2B;                                                                      @ 226001
964000          FOR I:=I+1 WHILE I LEQ 12 DO GAMMA2B[I,J]:=0                                 @ 226001
965000       END;                                                                            @ 226001
966000       J:=-1;                                                                          @ 226001
967000       FOR J:=J+1 WHILE J LEQ N2 DO                                                    @ 226001
968000       BEGIN                                                                           @ 226001
969000          I:=M2;                                                                       @ 226001
970000          FOR I:=I+1 WHILE I LEQ 12 DO GAMMA2[I,J]:=0                                  @ 226001
971000       END;                                                                            @ 226001
972000       J:=N2B;                                                                         @ 226001
973000       FOR J:=J+1 WHILE J LEQ 12 DO                                                    @ 226001
974000       FOR I:=0,I+1 WHILE I LEQ 12 DO GAMMA2B[I,J]:=0;                                 @ 226001
975000       J:=N2;                                                                          @ 226001
976000       FOR J:=J+1 WHILE J LEQ 12 DO                                                    @ 226001
977000       FOR I:=0,I+1 WHILE I LEQ 12 DO GAMMA2[I,J]:=0;                                  @ 226001
978000       IF M1B>M2B THEN MB:=M1B ELSE MB:=M2B;                                           @ 226001
```

```
979000        IF N1B>N2B THEN NB:=N1B ELSE NB:=N2B;                                  @ 2260001
980000        MMINB:=MB; NMINB:=NB;                                                  @ 2260001
981000        IF M1>M2 THEN M:=M1 ELSE M:=M2;                                        @ 2260001
982000        IF N1>N2 THEN N:=N1 ELSE N:=N2;                                        @ 2260001
983000        MMIN:=M; NMIN:=N;                                                      @ 2260001
984000        IF BOLSTART THEN                                                       @ 2260001
985000        BEGIN                                                                  @ 2260001
986000           FOR J:=0,J+1 WHILE J LEQ NB DO FOR I:=0,I+1 WHILE I LEQ MB DO       @ 2260001
987000           GAMMASB[I,J]:=(GAMMA2B[I,J]-GAMMA1B[I,J])/3;                        @ 2260001
988000           FOR J:=0,J+1 WHILE J LEQ N DO FOR I:=0,I+1 WHILE I LEQ M DO         @ 2260001
989000           GAMMAS[I,J]:=(GAMMA2[I,J]-GAMMA1[I,J])/3;                           @ 2260001
990000           FOR J:=1,J+1 WHILE J LEQ 36 DO FOR I:=1,I+1 WHILE I LEQ 17 DO       @ 2260001
991000           BEGIN                                                               @ 2260001
992000              IF DA[I,J] NEQ 0 THEN                                            @ 2260001
993000              BEGIN                                                            @ 2260001
994000                 X0:=I; Y0:=J;                                                 @ 2260001
995000                 IF J LEQ 19 THEN                                              @ 2260001
996000                 BEGIN                                                         @ 2260001
997000                    M1MIN:=MMIN; N1MIN:=NMIN;                                  @ 2260001
998000                    SURFCALC(GAMMAS,AY,BYA)                                    @ 2260001
999000                 END                                                           @ 2260001
1000000                ELSE                                                          @ 2260001
1001000                BEGIN                                                         @ 2260001
1002000                   M1MIN:=MMINB; N1MIN:=NMINB;                                @ 2260001
1003000                   SURFCALC(GAMMASB,AYB,BYB)                                  @ 2260001
1004000                END;                                                          @ 2260001
1005000                APXT[I,J]:=PXT*1000000;                                       @ 2260001
1006000                APYT[I,J]:=PYT*1000000                                        @ 2260001
1007000             END                                                              @ 2260001
1008000          END                                                                 @ 2260001
1009000       END;                                                                   @ 2260001
1010000                                                                              @ 2260001
1011000       BEGIN                                                                  @ 2260001
1012000          %       FOR J:=0,J+1 WHILE J LEQ 22 DO                              @ 2260001
1013000          %WRITE(LPRESEARCH,<13F6.1,/>,                                       @ 2260001
1014000          %FOR I:=1,I+1 WHILE I LEQ 13 DO V[J*13+I-1]);                       @ 2260001
1015000          %       WRITE(LPRESEARCH[SPACE 4]);                                 @ 2260001
1016000          FOR J:=23,J-1 WHILE J GEQ 13 DO                                     @ 2260001
1017000          BEGIN                                                               @ 2260001
1018000             FOR I:=1,I+1 WHILE I LEQ 13 DO                                   @ 2260001
1019000             BEGIN                                                            @ 2260001
1020000                X0:=I*2-5; Y0:=J*2-5;                                         @ 2260001
1021000                M1MIN:=MMINB; N1MIN:=NMINB;                                   @ 2260001
1022000                P[I,1]:=SURFCALC(GAMMA2B,AYB,BYB)*10-V[(23-J)*13+I-1]         @ 2260001
1023000             END;                                                             @ 2260001
1024000             %WRITE(LPRESEARCH,<13I6,/>,FOR I:=1,I+1 WHILE I LEQ 13 DO P[     @ 2260001
1025000          END;                                                                @ 2260001
1026000          FOR J:=12,J-1 WHILE J GEQ 1 DO                                      @ 2260001
1027000          BEGIN                                                               @ 2260001
1028000             FOR I:=1,I+1 WHILE I LEQ 13 DO                                   @ 2260001
1029000             BEGIN                                                            @ 2260001
1030000                X0:=I*2-5; Y0:=J*2-5;                                         @ 2260001
1031000                M1MIN:=MMIN; N1MIN:=NMIN;                                     @ 2260001
1032000                P[I,1]:=SURFCALC(GAMMA2,AY,BYA)*10-V[(23-J)*13+I-1]           @ 2260001
1033000             END;                                                             @ 2260001
1034000             %WRITE(LPRESEARCH,<13I6,/>,FOR I:=1,I+1 WHILE I LEQ 13 DO P[     @ 2260001
1035000          END;                                                                @ 2260001
1036000          %       WRITE(LPRESEARCH[SKIP 1])                                   @ 2260001
1037000       END;                                                                   @ 2260001
1038000       BOLSTART:=TRUE;                                                        @ 2260001
1039000    END                                                                       @ 2260001
1040000    GONO1;                                                                    @ 2260001
1041000                                                                              @ 2260001
1042000                                                                              @ 2260001
1043000    PROCEDURE GONO2;                                                          @ 2260001
1044000    BEGIN                                                                     @ 2260001
1045000       LABEL STAPA,STAPT,VOLGR,NIETS,NIET,AL,KLAAR,ONDER;                     @ 2260001
1046000                                                                              @ 2260001
1047000       PROCEDURE WINDCOEF(A);                                                 @ 2260001
1048000       ARRAY A[0];                                                            @ 2260001
1049000       FORWARD;                                                               @ 2260001
1050000       REAL PROCEDURE PF(Q,AY,BYA);                                           @ 2260001
1051000       ARRAY Q[*,*],AY,BYA[*];                                                @ 2260001
1052000       BEGIN                                                                  @ 2260001
1053000          LABEL REP1,REP2;                                                    @ 2260001
1054000          INTEGER I,J;                                                        @ 2260001
1055000          REAL A0,A1,A2,B0,B1,B2,AX0,AX1,AX2,AXX0,AXX1,AXX2,AY0,AY1,AY2,      @ 2260001
1056000          AYY0,AYY1,AYY2,AXY0,AXY1,AXY2,S,                                    @ 2260001
1057000          T,S1,T1,R0,R1,R2,RR0,RR1,RR2,SS,TT,SS1,TT1;                         @ 2260001
1058000          BOOLEAN BOLX,BOLY;                                                  @ 2260001
```

```
1059000            BOLX:=BOLY:= FALSE ;                                                  a 226001
1060000            I:=M1MIN;                                                             a 226001
1061000  REP1:                                                                          a 226001
1062000            BOLY:= FALSE ;                                                        a 226001
1063000            J:=N1MIN;                                                             a 226001
1064000  REP2:                                                                          a 226001
1065000            IF BOLY THEN                                                          a 226001
1066000            BEGIN                                                                 a 226001
1067000               BO:=S*B1-T*B2+Q[I,J];                                              a 226001
1068000               B2:=B1;                                                            a 226001
1069000               B1:=BO;                                                            a 226001
1070000               IF 1 LEQ J THEN                                                    a 226001
1071000               BEGIN                                                              a 226001
1072000                  S:=YO-AY[J-1];                                                  a 226001
1073000                  T:=BYA[J];                                                      a 226001
1074000                  AYO:=S*AY1-T*AY2+B1;                                            a 226001
1075000                  AY2:=AY1;                                                       a 226001
1076000                  AY1:=AYO;                                                       a 226001
1077000                  IF 2 LEQ J THEN                                                 a 226001
1078000                  BEGIN                                                           a 226001
1079000                     SS:=YO-AY[J-2];                                              a 226001
1080000                     TT:=BYA[J-1];                                                a 226001
1081000                     AYYO:=SS*AYY1-TT*AYY2+AY1;                                   a 226001
1082000                     AYY2:=AYY1;                                                  a 226001
1083000                     AYY1:=AYYO;                                                  a 226001
1084000                  END                                                             a 226001
1085000               END                                                                a 226001
1086000            END                                                                   a 226001
1087000            ELSE IF J=N1MIN THEN B1:=B2:=AY1:=AY2:=AYY1:=AYY2:=Q[I,J]             a 226001
1088000            ELSE                                                                  a 226001
1089000            BEGIN                                                                 a 226001
1090000               B1:=(YO-AY[J])*B1+Q[I,J];                                          a 226001
1091000               BOLY:= TRUE ;                                                      a 226001
1092000               IF 1 LEQ J THEN                                                    a 226001
1093000               BEGIN                                                              a 226001
1094000                  S:=YO-AY[J-1];                                                  a 226001
1095000                  T:=BYA[J];                                                      a 226001
1096000                  AY1:=AYO:=S*AY1+B1;                                             a 226001
1097000                  IF 2 LEQ J THEN                                                 a 226001
1098000                  BEGIN                                                           a 226001
1099000                     SS:=YO-AY[J-2];                                              a 226001
1100000                     TT:=BYA[J-1];                                                a 226001
1101000                     AYY1:=AYYO:=SS*AYY1+AY1                                      a 226001
1102000                  END;                                                            a 226001
1103000               END;                                                               a 226001
1104000            END;                                                                  a 226001
1105000            J:=J-1;                                                               a 226001
1106000            IF 0 LEQ J THEN  GO TO REP2;                                          a 226001
1107000            IF BOLX THEN                                                          a 226001
1108000            BEGIN                                                                 a 226001
1109000               AO:=S1*A1-T1*A2+B1;                                                a 226001
1110000               RO:=S1*R1-T1*R2+AY1;                                               a 226001
1111000               RRO:=S1*RR1-T1*RR2+AYY1;                                           a 226001
1112000               A2:=A1;                                                            a 226001
1113000               A1:=AO;                                                            a 226001
1114000               R2:=R1;                                                            a 226001
1115000               R1:=RO;                                                            a 226001
1116000               RR2:=RR1;                                                          a 226001
1117000               RR1:=RRO;                                                          a 226001
1118000               IF 1 LEQ I THEN                                                    a 226001
1119000               BEGIN                                                              a 226001
1120000                  S1:=XO-AX[I-1];                                                 a 226001
1121000                  T1:=BX[I];                                                      a 226001
1122000                  AXO:=S1*AX1-T1*AX2+A1;                                          a 226001
1123000                  AX2:=AX1;                                                       a 226001
1124000                  AX1:=AXO;                                                       a 226001
1125000                  AXYO:=S1*AXY1-T1*AXY2+R1;                                       a 226001
1126000                  AXY2:=AXY1;                                                     a 226001
1127000                  AXY1:=AXYO;                                                     a 226001
1128000                  IF 2 LEQ I THEN                                                 a 226001
1129000                  BEGIN                                                           a 226001
1130000                     SS1:=XO-AX[I-2];                                             a 226001
1131000                     TT1:=BX[I-1];                                                a 226001
1132000                     AXXO:=SS1*AXX1-TT1*AXX2+AX1;                                 a 226001
1133000                     AXX2:=AXX1;                                                  a 226001
1134000                     AXX1:=AXXO                                                   a 226001
1135000                  END                                                             a 226001
1136000               END                                                                a 226001
1137000            END                                                                   a 226001
1138000            ELSE IF I=M1MIN THEN                                                  a 226001
```

```
1139000            BEGIN                                                                    @ 226001
1140000               A1:=A2:=AX1:=AX2:=AXX1:=AXX2:=B1;                                     @ 226001
1141000               R1:=R2:=AXY1:=AXY2:=AY1;                                              @ 226001
1142000               RR1:=RR2:=AYY1                                                        @ 226001
1143000            END                                                                      @ 226001
1144000            ELSE                                                                     @ 226001
1145000            BEGIN                                                                    @ 226001
1146000               S1:=XO-AX[I];                                                         @ 226001
1147000               A1:=S1*A1+B1;                                                         @ 226001
1148000               R1:=S1*R1+AY1;                                                        @ 226001
1149000               RR1:=S1*RR1+AYY1;                                                     @ 226001
1150000               BOLX:= TRUE ;                                                         @ 226001
1151000               IF 1 LEQ I THEN                                                       @ 226001
1152000               BEGIN                                                                 @ 226001
1153000                  S1:=XO-AX[I-1];                                                    @ 226001
1154000                  T1:=BX[I];                                                         @ 226001
1155000                  AX1:=AXO:=S1*AX1+A1;                                               @ 226001
1156000                  AXY1:=AXYO:=S1*AXY1+R1;                                            @ 226001
1157000                  IF 2 LEQ I THEN                                                    @ 226001
1158000                  BEGIN                                                              @ 226001
1159000                     SS1:=XO-AX[I-2];                                                @ 226001
1160000                     TT1:=BX[I-1];                                                   @ 226001
1161000                     AXX1:=AXXO:=SS1*AXX1+AX1                                        @ 226001
1162000                  END                                                                @ 226001
1163000               END                                                                   @ 226001
1164000            END                                                                      @ 226001
1165000            ;                                                                        @ 226001
1166000            I:=I-1;                                                                  @ 226001
1167000            IF 0 LEQ I THEN  GO TO REP1;                                             @ 226001
1168000            PF:=A1;                                                                  @ 226001
1169000            PX:=AX1;                                                                 @ 226001
1170000            PXX:=AXX1;                                                               @ 226001
1171000            PY:=R1;                                                                  @ 226001
1172000            PYY:=RR1;                                                                @ 226001
1173000            PXY:=AXY1;                                                               @ 226001
1174000            IF M1MIN=0 THEN PX:=PXX:=PXY:=0;                                         @ 226001
1175000            IF N1MIN=0 THEN PY:=PYY:=PXY:=0;                                         @ 226001
1176000            IF M1MIN=1 THEN PXX:=0;                                                  @ 226001
1177000            IF N1MIN=1 THEN PYY:=0                                                   @ 226001
1178000         END                                                                         @ 226001
1179000         PF;                                                                         @ 226001
1180000                                                                                     @ 226001
1181000                                                                                     @ 226001
1182000         PROCEDURE DEINING(TTT,D,DK,BR);                                             @ 226001
1183000         VALUE TTT;                                                                  @ 226001
1184000         REAL TTT;                                                                   @ 226001
1185000         ARRAY D,DK,BR[*,*,*];                                                       @ 226001
1186000         BEGIN                                                                       @ 226001
1187000            LABEL VOLG;                                                              @ 226001
1188000            INTEGER NLYN,HEEL1,HEEL2,KH,IZONDER;                                     @ 226001
1189000            REAL FRAC,STAP,T1,T2,CORFI,HOEKCOR,DIEP,KR,DI,GDI;                       @ 226001
1190000            BOOLEAN ZONDER;                                                          @ 226001
1191000            INTEGER ARRAY CB[1:36];                                                  @ 226001
1192000                                                                                     @ 226001
1193000            PROCEDURE DISS;                                                          @ 226001
1194000            BEGIN                                                                    @ 226001
1195000               LABEL DIEP2,DIEP3,DIEP1;                                              @ 226001
1196000               INTEGER J,D,DD,PER;                                                   @ 226001
1197000               REAL E,E1,OMEG,STAP1,V,VT,K;                                          @ 226001
1198000               PROCEDURE EN(STAP);                                                   @ 226001
1199000               REAL STAP;                                                            @ 226001
1200000               BEGIN                                                                 @ 226001
1201000                  DD:=D;                                                             @ 226001
1202000                  IF DD GEQ 60 THEN                                                  @ 226001
1203000                  BEGIN                                                              @ 226001
1204000                     IF DD GEQ 100 THEN DD:=(DD+180)/20 ELSE DD:=(DD+40)/10          @ 226001
1205000                  END                                                                @ 226001
1206000                  ELSE DD:=(DD-10)/5;                                                @ 226001
1207000                  K:=KOM[PER,DD]/10000000;                                           @ 226001
1208000                  V:=1000000/CGOND[PER,DD];                                          @ 226001
1209000                  E1:=EXP(K*0);                                                      @ 226001
1210000                  VT:=OMEG*2/(-1/E1+E1);                                             @ 226001
1211000                  E:=EXP(-ABD2*VT*VT*16*STAP*V)*E                                    @ 226001
1212000               END;                                                                  @ 226001
1213000               E:=DEIN;                                                              @ 226001
1214000               OMEG:=PI2/K1;                                                         @ 226001
1215000               PER:=(K1-7)/2+1;                                                      @ 226001
1216000               STAP1:=FRAC*STAP;                                                     @ 226001
1217000               D:=DB[NLYN+1];                                                        @ 226001
1218000               IF D=200 THEN  GO TO DIEP2;                                           @ 226001
```

```
1219000                EN(STAP1);                                                  a 226001
1220000  DIEP2:                                                                   a 226001
1221000                J:=NLYN+1;                                                  a 226001
1222000                FOR J:=J-1 WHILE J>0 DO                                     a 226001
1223000                BEGIN                                                       a 226001
1224000                   D:=DB(J);                                                a 226001
1225000                   IF D=200 THEN  GO TO DIEP3;                              a 226001
1226000                   EN(STAP);                                                a 226001
1227000  DIEP3:                                                                   a 226001
1228000                END;                                                        a 226001
1229000  DIEF1:                                                                   a 226001
1230000                   DEIN:=E                                                  a 226001
1231000             END                                                           a 226001
1232000             DISS;                                                         a 226001
1233000                                                                           a 226001
1234000             HULP:=FACO*TTT;                                               a 226001
1235000             K:=0; IZONDER:=0;                                             a 226001
1236000             FOR K:=K+1 WHILE K LEQ NOEINING DO                            a 226001
1237000             BEGIN                                                         a 226001
1238000                IC:=DP(K,1);                                               a 226001
1239000                JC:=DP(K,2);                                               a 226001
1240000                CORFI:=ARCTAN((IO+1.45)/(56.6-JO));                        a 226001
1241000                IF IO=13 AND (JO=4 OR JO=5) THEN                           a 226001
1242000                BEGIN                                                      a 226001
1243000                   ZONDER:=TRUE; IZONDER:=*+1                              a 226001
1244000                END                                                        a 226001
1245000                ELSE ZONDER:=FALSE;                                        a 226001
1246000                KG:=0;                                                     a 226001
1247000                FOR K1:=7,9,11,13,15,17,19 DO                              a 226001
1248000                BEGIN                                                      a 226001
1249000                   LM:=HULP*K1;                                            a 226001
1250000                   NM:=8*LM;                                               a 226001
1251000                   HOEKCOR:=-CORFI*NM/PI2;                                 a 226001
1252000                   HEEL2:=HOEKCOR;                                         a 226001
1253000                   KG:=*+1;                                                a 226001
1254000                   FOR KH:=0 STEP 1 UNTIL 5 DO                             a 226001
1255000                   BEGIN                                                   a 226001
1256000                      GOI:=0;                                              a 226001
1257000                      HEEL1:=HEEL2;                                        a 226001
1258000                      HEEL2:=(KH+1)*NM/6+HOEKCOR;                          a 226001
1259000                      K2:=HEEL1-1;                                         a 226001
1260000                      DEINX:=DEINY:=DEINS:=DEINXK:=DEINYK:=DEINSK:=0;      a 226001
1261000                      FOR K2:=K2+1 WHILE K2 LSS HEEL2 DO                   a 226001
1262000                      BEGIN                                                a 226001
1263000                         TELIN:=TELIN+1;                                   a 226001
1264000                         IF BOOLEAN(ALYN[TELIN DIV 48].[TELIN MOD 48:1])   a 226001
1265000                         THEN GO TO VOLG;                                  a 226001
1266000                         ALFA:=PI2*K2/NM;                                  a 226001
1267000                         SINN:=SIN(ALFA);                                  a 226001
1268000                         COSS:=COS(ALFA);                                  a 226001
1269000                         XX:=SINN*LM+IO;                                   a 226001
1270000                         YY:=COSS*LM+JO;                                   a 226001
1271000                         BEGIN                                             a 226001
1272000                            LABEL II,JJ,ZOEK,RESULT,LXX,LYY;               a 226001
1273000                            INTEGER I,J,KG,PER,CC,DD;                      a 226001
1274000                            REAL ALF,T,TV,LL;                              a 226001
1275000                            FLOPA:= FALSE ;                                a 226001
1276000                            I:=IO;                                         a 226001
1277000                            J:=JO;                                         a 226001
1278000                            KR:=0.5;                                       a 226001
1279000                            LL:=T:=0;                                      a 226001
1280000                            PER:=(K1-7)/2+1;                               a 226001
1281000                            NLYN:=0;                                       a 226001
1282000                            IF XX NEQ IO THEN                              a 226001
1283000                            BEGIN                                          a 226001
1284000                               IF YY NEQ JO THEN                           a 226001
1285000                               BEGIN                                       a 226001
1286000                                  ALF:=ABS((YY-JO)/(XX-IO));               a 226001
1287000                                  IF XX>IO THEN TEKI:=1 ELSE TEKI:=-1;     a 226001
1288000                                  IF YY>JO THEN TEKJ:=1 ELSE TEKJ:=-1;     a 226001
1289000                                  IF ALF>1 THEN                            a 226001
1290000                                  BEGIN                                    a 226001
1291000                                     BOLZ:= FALSE ;                        a 226001
1292000                                     STAP:=SQRT(1/(ALF*ALF)+1)*75000;      a 226001
1293000                                     GO TO JJ                              a 226001
1294000                                  END                                      a 226001
1295000                                  ELSE                                     a 226001
1296000                                  BEGIN                                    a 226001
1297000                                     BOLZ:= TRUE ;                         a 226001
1298000                                     STAP:=SQRT(ALF*ALF+1 )*75000          a 226001
```

```
                         END;
                         ;
 II:
                         I:=I+TEKI;
                         IF (I-I0)*ALF*TEKI>KR THEN
                         BEGIN
                            J:=J+TEKJ;
                            KR:=KR+1
                         END;
                         GO TO ZOEK;
 JJ:
                         J:=J+TEKJ;
                         IF (J-J0)*TEKJ/ALF>KR THEN
                         BEGIN
                            I:=I+TEKI;
                            KR:=KR+1
                         END;
 ZOEK:
                         DO:=DA[I,J];
                         DD:=DC;
                         IF DD GEQ 60 THEN
                         BEGIN
                            IF DD GEQ 100 THEN DD:=(DD+180)/20
                            ELSE DD:=(DD+40)/10;
                         END
                         ELSE DD:=(DD-10)/5;
                         TV:=T;
                         T:=1000000*STAP/(CGOND[PER,DD]*3600)+T;
                         IF T GEQ TTT THEN
                         BEGIN
                            FRAC:=(TTT-TV)/(T-TV);
                            LL:=(FRAC*STAP+LL)/75000;
                            XX:=SIN(ALFA)*LL+I0;
                            YY:=COS(ALFA)*LL+J0;
                            I1:=XX;
                            J1:=YY;
                            DB[NLYN+1]:=DA[I1,J1];
                            GO TO RESULT
                         END;
                         LL:=LL+STAP;
                         NLYN:=NLYN+1;
                         DB[NLYN]:=DO;
                         IF BOLZ THEN  GO TO II ELSE  GO TO JJ
                      END
                      ELSE
                      BEGIN
                         IF XX>I0 THEN TEKI:=1 ELSE TEKI:=-1;
                         STAP:=75000;
 LXX:
                         I:=*+TEKI;
                         DO:=DA[I,J];
                         DD:=DO;
                         IF DD GEQ 60 THEN
                         BEGIN
                            IF DD GEQ 100 THEN DD:=(DD+180)/20
                            ELSE DD:=(DC+40)/10;
                         END
                         ELSE DD:=(DD-10)/5;
                         TV:=T;
                         T:=1000000*STAP/(CGOND[PER,DD]*3600)+T;
                         IF T GEQ TTT THEN
                         BEGIN
                            FRAC:=(TTT-TV)/(T-TV);
                            LL:=(FRAC*STAP+LL)/75000;
                            XX:=LL*TEKI+I0;
                            I1:=XX;
                            J1:=J0;
                            DB[NLYN+1]:=DA[I1,J1];
                            GO TO RESULT
                         END;
                         LL:=LL+STAP;
                         NLYN:=NLYN+1;
                         DB[NLYN]:=DO;
                         GO TO LXX;
                      END
                   END
                   ELSE
                   BEGIN
                      IF YY>J0 THEN TEKJ:=1 ELSE TEKJ:=-1;
                      STAP:=75000;
```

```
1379000 LYY:                                                                    @ 226001
1380000                     J:=*+TEKJ;                                          @ 226001
1381000                     DO:=DA[I,J];                                        @ 226001
1382000                     DD:=DO;                                             @ 226001
1383000                     IF DD GEQ 60 THEN                                   @ 226001
1384000                     BEGIN                                               @ 226001
1385000                        IF DD GEQ 100 THEN DD:=(DD+180)/20 ELSE          @ 226001
1386000                        DD:=(DD+40)/10;                                  @ 226001
1387000                     END                                                 @ 226001
1388000                     ELSE DD:=(DD-10)/5;                                 @ 226001
1389000                     TV:=T;                                              @ 226001
1390000                     T:=1000000*STAP/(CGONDCPER,DD]*3600)+T;             @ 226001
1391000                     IF T GEQ TTT THEN                                   @ 226001
1392000                     BEGIN                                               @ 226001
1393000                        FRAC:=(TTT-TV)/(T-TV);                           @ 226001
1394000                        LL:=(FRAC*STAP+LL)/75000;                        @ 226001
1395000                        YY:=LL*TEKJ+JO;                                  @ 226001
1396000                        I1:=IO;                                          @ 226001
1397000                        J1:=YY;                                          @ 226001
1398000                        DB[NLYN+1]:=DA[I1,J1];                           @ 226001
1399000                        GO TO RESULT                                     @ 226001
1400000                     END;                                                @ 226001
1401000                     LL:=LL+STAP;                                        @ 226001
1402000                     NLYN:=NLYN+1;                                       @ 226001
1403000                     DB[NLYN]:=DO;                                       @ 226001
1404000                     GO TO LYY;                                          @ 226001
1405000                  END;                                                   @ 226001
1406000 RESULT:                                                                 @ 226001
1407000                  DI:=LL;                                                @ 226001
1408000               END                                                       @ 226001
1409000               LYN;                                                      @ 226001
1410000               ALFA:=ALFA+PI;                                            @ 226001
1411000               IF ALFA GEQ PI2 THEN ALFA:=ALFA-PI2;                      @ 226001
1412000               FI:=WR[I1,J1]/10000;                                      @ 226001
1413000               BETA:=ABS(FI-ALFA);                                       @ 226001
1414000               IF BETA>PIG2 AND BETA<PI3G2 THEN  GO TO VOLG;             @ 226001
1415000               IF BETA>PI THEN BETA:=PI2-BETA;                           @ 226001
1416000               E:=EA[I1,J1]/1000000;                                     @ 226001
1417000               DEIN:=DEINK:=0;                                           @ 226001
1418000               COSI:=COS(BETA);                                          @ 226001
1419000               COSI:=COSI*COSI;                                          @ 226001
1420000               U:=WS[I1,J1]/10000;                                       @ 226001
1421000               DIEP:=DA[I1,J1];                                          @ 226001
1422000               IF E<0 THEN                                               @ 226001
1423000               BEGIN                                                     @ 226001
1424000                  U:=U*0.9;USTER:=U;
1425000                  IF DIEP<200 THEN                                       @ 226001
1426000                  BEGIN                                                  @ 226001
1427000                     U4:=U**4;                                           @ 226001
1428000                     E:=(1-EXP(-(9.8*SQRT(DA[I1,J1]*LABDAFAC)/PI2)       @ 226001
1429000                     **4/U4*0.63363636))*U4/COEFFE;                      @ 226001
1430000                     USTER:=E**0.25*FACU;                                @ 226001
1431000                  END                                                    @ 226001
1432000               END                                                       @ 226001
1433000               ELSE USTER:=E**0.25*FACU;                                 @ 226001
1434000               KR:=USTER/U; BOL:=FALSE;                                  @ 226001
1435000               IF KR<0.5 THEN KR:=0.5;                                   @ 226001
1436000               IF DIEP LEQ 100 THEN                                      @ 226001
1437000               BEGIN                                                     @ 226001
1438000                  HSS:=USTER*USTER*0.22/9.8;                             @ 226001
1439000                  HM:=(-(SQRT(DIEP)-4)*0.02+0.27)*DIEP;                  @ 226001
1440000                  HM:=**(LABNUL+1)/5;                                    @ 226001
1441000                  IF HSS>HM*0.66667 THEN                                 @ 226001
1442000                  BEGIN                                                  @ 226001
1443000                     BOL:=TRUE;                                          @ 226001
1444000                     KR:=((KR*10-21)*KR+21)/10*(HSS/HM+0.33333)*KR;      @ 226001
1445000                  END;                                                   @ 226001
1446000               END;                                                      @ 226001
1447000               I:=KR*100-50;                                             @ 226001
1448000               IF I GEQ 50 THEN                                          @ 226001
1449000               BEGIN                                                     @ 226001
1450000                  IF BOL THEN I:=50 ELSE I:=35                           @ 226001
1451000               END;                                                      @ 226001
1452000               TO:=0.6411413578753*USTER/DMOD[I];                        @ 226001
1453000               KR:=GMOD[I];                                              @ 226001
1454000               TMAX:=TO/KR;                                              @ 226001
1455000               FACLIJN:=0.061621558*AMOD[I]*KR*KR/ (1-KR);               @ 226001
1456000               FACT4:=0.015405390 *AMOD[I];                              @ 226001
1457000               T1:=K1-1;                                                 @ 226001
1458000               T2:=K1+1;                                                 @ 226001
```

```
1459000                    IF K1=19 THEN T2:=TMAX+1;                                    @ 226001
1460000                    IF T2>TO THEN                                                @ 226001
1461000                    BEGIN                                                        @ 226001
1462000                       IF T2>TMAX THEN                                           @ 226001
1463000                       BEGIN                                                     @ 226001
1464000                          IF T1>TMAX THEN  GO TO VOLG ELSE T2:=TMAX              @ 226001
1465000                       END;                                                      @ 226001
1466000                       IF T1>TO THEN                                             @ 226001
1467000                       BEGIN                                                     @ 226001
1468000                          T1:=TMAX/T1;                                           @ 226001
1469000                          T2:=TMAX/T2;                                           @ 226001
1470000                          DEIN:=TO**4*(T1-T2)*((T1+T2)/2-1)*FACLIJN              @ 226001
1471000                       END                                                       @ 226001
1472000                       ELSE                                                      @ 226001
1473000                       BEGIN                                                     @ 226001
1474000                          E:=TO**4;                                              @ 226001
1475000                          DEIN:=(-T1**4+E)*FACT4;                                @ 226001
1476000                          T1:=TMAX/TO;                                           @ 226001
1477000                          T2:=TMAX/T2;                                           @ 226001
1478000                          DEIN:=(T1-T2)*((T1+T2)/2-1)*E*FACLIJN+DEIN             @ 226001
1479000                       END                                                       @ 226001
1480000                    END                                                          @ 226001
1481000                    ELSE DEIN:=(T2**4-T1**4)*FACT4;                              @ 226001
1482000                    DEIN:=DEIN*COSI*4/NM;                                        @ 226001
1483000                    IF DEIN<2-5 THEN  GO TO VOLG;                                @ 226001
1484000                    DEINK:=DEIN;                                                 @ 226001
1485000                    DISS;                                                        @ 226001
1486000                    DEIN:=**EXP(-0.66*DI/(K1-5)**2);                             @ 226001
1487000                    GOI:=OI*DEIN+GOI;                                            @ 226001
1488000                    DEINS:=DEIN+DEINS;                                           @ 226001
1489000                    DEINX:=-DEIN*SINN+DEINX;                                     @ 226001
1490000                    DEINY:=-DEIN*COSS+DEINY;                                     @ 226001
1491000                    DEINSK:=DEINK+DEINSK;                                        @ 226001
1492000                    DEINXK:=-DEINK*SINN+DEINXK;                                  @ 226001
1493000                    DEINYK:=-DEINK*COSS+DEINYK;                                  @ 226001
1494000 VOLG:                                                                           @ 226001
1495000                 END                                                             @ 226001
1496000                 %VAN K2 LOOP                                                    @ 226001
1497000                 ;                                                               @ 226001
1498000                 DEINS:=DEINS/100;                                               @ 226001
1499000                 IF DEINS>(DE(KH,K,KG) MOD 1) THEN                               @ 226001
1500000                 BEGIN                                                           @ 226001
1501000                    BR(KH,K,KG):=GOI/(DEINS*100);                                @ 226001
1502000                    IF DEINY=0 THEN FI:=PI/2 ELSE                                @ 226001
1503000                    FI:=ARCTAN(ABS(DEINX/DEINY));                                @ 226001
1504000                    IF DEINX<0 THEN                                              @ 226001
1505000                    BEGIN                                                        @ 226001
1506000                       IF DEINY GEQ 0 THEN FI:=PI2-FI ELSE FI:=FI+PI             @ 226001
1507000                    END                                                          @ 226001
1508000                    ELSE                                                         @ 226001
1509000                    BEGIN                                                        @ 226001
1510000                       IF DEINY<0 THEN FI:=PI-FI                                 @ 226001
1511000                    END                                                          @ 226001
1512000                    ;                                                            @ 226001
1513000                    FI:=((FI+CORFI+PI)*360/PI2) MOD 360;                         @ 226001
1514000                    DE(KH,K,KG):=(FI DIV 1)+DEINS                                @ 226001
1515000                 END                                                             @ 226001
1516000                 ;                                                               @ 226001
1517000                 IF ZONDER THEN                                                  @ 226001
1518000                 BEGIN                                                           @ 226001
1519000                    DEINSK:=DEINSK/100;                                          @ 226001
1520000                    IF DEINSK>(DK(KH,IZONDER,KG) MOD 1) THEN                     @ 226001
1521000                    BEGIN                                                        @ 226001
1522000                       IF DEINYK=0 THEN FI:=PI/2 ELSE                            @ 226001
1523000                       FI:=ARCTAN(ABS(DEINXK/DEINYK));                           @ 226001
1524000                       IF DEINXK<0 THEN                                          @ 226001
1525000                       BEGIN                                                     @ 226001
1526000                          IF DEINYK GEQ 0 THEN FI:=PI2-FI ELSE                   @ 226001
1527000                          FI:=FI+PI                                              @ 226001
1528000                       END                                                       @ 226001
1529000                       ELSE                                                      @ 226001
1530000                       BEGIN                                                     @ 226001
1531000                          IF DEINYK<0 THEN FI:=PI-FI                             @ 226001
1532000                       END                                                       @ 226001
1533000                       ;                                                         @ 226001
1534000                       FI:=((FI+CORFI+PI)*360/PI2) MOD 360;                      @ 226001
1535000                       DK(KH,IZONDER,KG):=(FI DIV 1)+DEINSK                      @ 226001
1536000                    END                                                          @ 226001
1537000                 END                                                             @ 226001
1538000              END                                                                @ 226001
```

```
1539000                 %VAN KH LOOP                                                    @ 226001
1540000               END                                                               @ 226001
1541000               %VAN K1 LOOP                                                      @ 226001
1542000            END                                                                  @ 226001
1543000            %VAN K LOOP                                                          @ 226001
1544000         END                                                                     @ 226001
1545000         DEINING;                                                                @ 226001
1546000                                                                                 @ 226001
1547000         PROCEDURE WIND;                                                         @ 226001
1548000         BEGIN                                                                   @ 226001
1549000            INTEGER K;                                                           @ 226001
1550000            ARRAY CC[0:4];                                                       @ 226001
1551000            REAL                                                                 @ 226001
1552000            VX,VY,B1,B2,B3,B4,B5,B6,F,F1,F2,F3,A1,A2,A3,A4,HULP,UU,FFI,          @ 226001
1553000            G,GX,GY;                                                             @ 226001
1554000            LABEL TERUG;                                                         @ 226001
1555000            B1:=I+1.45;                                                          @ 226001
1556000            B2:=56.6-J;                                                          @ 226001
1557000            F:=B1*B1+B2*B2;                                                      @ 226001
1558000            B1:=26862.65/(F+25063.19);                                           @ 226001
1559000            B2:=B1*1.866025-1;                                                   @ 226001
1560000            F:=0.00014584*F2*B1;                                                 @ 226001
1561000            F1:=F*3600/B1;                                                       @ 226001
1562000            F2:=-80/(F+75000);                                                   @ 226001
1563000            F3:=-80/(F*F+75000*F+75000);                                         @ 226001
1572000               XC:=I;                                                            @ 226001
1573000               YC:=J;                                                            @ 226001
1574000               IF J LEQ 19 THEN                                                  @ 226001
1575000               BEGIN                                                             @ 226001
1576000                  M1MIN:=MMIN;                                                   @ 226001
1577000                  N1MIN:=NMIN;                                                   @ 226001
1578000                  PO:=PF(GAMMA1,AY,BYA);                                         @ 226001
1579000               END                                                               @ 226001
1580000               ELSE                                                              @ 226001
1581000               BEGIN                                                             @ 226001
1582000                  M1MIN:=MMINB;                                                  @ 226001
1583000                  N1MIN:=NMINB;                                                  @ 226001
1584000                  PO:=PF(GAMMA1B,AYB,BYB);                                       @ 226001
1585000               END;                                                              @ 528800
1587000            HULP:=(J-I-22)*W2/2;                                                 @ 226001
1588000            IF HULP GEQ 0 THEN                                                   @ 226001
1589000            BEGIN                                                                @ 226001
1590000               TEMPV:=TEMP[1]/10;                                                @ 226001
1591000               IF TEMPV<0 THEN                                                   @ 226001
1592000               BEGIN                                                             @ 226001
1593000                  HULP:=(13-HULP)/13;                                            @ 226001
1594000                  HULP:=**HULP*HULP;                                             @ 226001
1595000                  TEMPV:=**HULP/2;                                               @ 226001
1596000                  WINDCOEF(CC);                                                  @ 226001
1597000                  A1:=CC[1]; A2:=CC[2]; A3:=CC[3]; A4:=CC[4];                    @ 226001
1598000               END                                                               @ 226001
1599000               ELSE                                                              @ 226001
1600000               BEGIN                                                             @ 226001
1601000                  A1:=CT[1,1]; A2:=CT[1,2]; A3:=CT[1,3]; A4:=CT[1,4]             @ 226001
1602000               END                                                               @ 226001
1603000            END                                                                  @ 226001
1604000            ELSE                                                                 @ 226001
1605000            BEGIN                                                                @ 226001
1606000               IF J>19 THEN K:=1 ELSE                                            @ 226001
1607000               BEGIN                                                             @ 226001
1608000                  IF J>13 THEN K:=2 ELSE                                         @ 226001
1609000                  BEGIN                                                          @ 226001
1610000                     IF J>7 THEN K:=3 ELSE K:=4                                  @ 226001
1611000                  END                                                            @ 226001
1612000               END;                                                              @ 226001
1613000               A1:=CT[K,1]; A2:=CT[K,2]; A3:=CT[K,3]; A4:=CT[K,4];               @ 226001
1614000            END;                                                                 @ 226001
1615000            PXT:=APXT[I,J]/1000000;                                              @ 226001
1616000            PYT:=APYT[I,J]/1000000;                                              @ 226001
1617000            B1:=(A1*PY+A2*PX-(A3*PYT+A4*PXT)/F1)*F2;                             @ 226001
1618000            B2:=(A2*PY-A1*PX-(A4*PYT-A3*PXT)/F1)*F2;                             @ 226001
1619000 TERUG:                                                                          @ 226001
1620000            B3:=(A3*PXY+A4*PXX)*F3+1;                                            @ 226001
1621000            B4:=(A4*PYY-A3*PXY)*F3+1;                                            @ 226001
1622000            B5:=(A3*PYY+A4*PXY)*F3;                                              @ 226001
1623000            B6:=(A4*PXY-A3*PXX)*F3;                                              @ 226001
1624000            F:=B3*B4-B5*B6;                                                      @ 226001
1625000            IF F<0.6 THEN                                                        @ 226001
1626000            BEGIN                                                                @ 226001
1627000               PXX:=0.9*PXX;                                                     @ 226001
```

```
1628000              PYY:=0.9*PYY;                                                    @ 226001
1629000              PXY:=0.9*PXY;                                                    @ 226001
1630000              GO TO TERUG                                                      @ 226001
1631000           END;                                                                @ 226001
1632000           VX:=(B1*B4-B2*B5)/F;                                                @ 226001
1633000           VY:=(B2*B3-B1*B6)/F;                                                @ 226001
1634000           U:=SQRT(VX*VX+VY*VY);                                               @ 226001
1635000           GX:=(A1*PY+A2*PX)*F2;                                               @ 226001
1636000           GY:=(A2*PY-A1*PX)*F2;                                               @ 226001
1637000           G:=SQRT(GX*GX+GY*GY);                                               @ 226001
1638000           IF G<U THEN U:=G;                                                   @ 226001
1639000           IF U>28 THEN U:=(U-28)*0.4+28;                                      @ 226001
1640000           IF U<0.001 THEN U:=0.001;                                           @ 226001
1641000           IF VY=0 THEN FI:=PI/2 ELSE                                          @ 226001
1642000           FI:=ARCTAN(ABS(VX/VY));                                             @ 226001
1643000           IF VX<0 THEN                                                        @ 226001
1644000           BEGIN                                                               @ 226001
1645000              IF VY GEQ 0 THEN FI:=PI2-FI ELSE FI:=PI+FI                       @ 226001
1646000           END                                                                 @ 226001
1647000           ELSE                                                                @ 226001
1648000           BEGIN                                                               @ 226001
1649000              IF VY<0 THEN FI:=PI-FI                                           @ 226001
1650000           END;                                                                @ 226001
1651000        END                                                                    @ 226001
1652000        WIND;                                                                  @ 226001
1653000                                                                               @ 226001
1654000                                                                               @ 226001
1655000        PROCEDURE WINDCOEF(A);                                                 @ 226001
1656000        ARRAY A[0];                                                            @ 226001
1657000        BEGIN                                                                  @ 226001
1658000           INTEGER I;                                                          @ 226001
1659000           TEMPV:=TEMPV/2;                                                     @ 226001
1660000           KG:=TEMPV;                                                          @ 226001
1661000           IF KG>TEMPV THEN KG:=KG-1;                                          @ 226001
1662000           IF KG GEQ 1 THEN KG:=1;                                             @ 226001
1663000           IF KG LEQ -3 THEN KG:=-3;                                           @ 226001
1664000           FOR I:=1,2,3,4 DO                                                   @ 226001
1665000           A[I]:=((COEFW[I,KG+1]-COEFW[I,KG])*(TEMPV-KG)+                      @ 226001
1666000           COEFW[I,KG])/10000;                                                 @ 226001
1667000        END                                                                    @ 226001
1668000        OF WINDCOEF;                                                           @ 226001
1669000                                                                               @ 226001
1670000        PROCEDURE UITVOER(D,DK);                                               @ 226001
1671000        INTEGER ARRAY D,DK[*,*,*];                                             @ 226001
1672000        BEGIN                                                                  @ 226001
1673000           INTEGER I1,J1,I,K,KG,J,K1,IZONDER;                                  @ 226001
1674000           REAL ETOT,E10,FIO,ADO,TO,T1,T2,TMAX,DEIN,E,FIZ,EZ,HULP;             @ 226001
1675000           BOOLEAN ZONDER,E10TEST,PRINT;                                       @ 226001
1676000           ARRAY ENZ[0:7],EN,RI[0:5],VERIF[0:4,0:7];                           @ 226001
1677000                                                                               @ 226001
1678000           PROCEDURE VERIFIKATIEIN;                                            @ 226001
1679000           BEGIN                                                               @ 226001
1680000              INTEGER P,T,TIJD;                                                @ 226001
1681000              REAL DD,UU;                                                      @ 226001
1682000              IF K=1 THEN P:=0 ELSE                                            @ 226001
1683000              IF K=2 THEN P:=1 ELSE                                            @ 226001
1684000              IF K=4 THEN P:=2 ELSE                                            @ 226001
1685000              IF K=5 THEN P:=3 ELSE                                            @ 226001
1686000              IF K=10 THEN P:=4 ELSE P:=-1;                                    @ 226001
1687000              IF P NEQ -1 THEN                                                 @ 226001
1688000              BEGIN                                                            @ 226001
1689000                 VERIF[P,0]:=DATUM;                                            @ 226001
1690000                 VERIF[P,1]:=P;                                                @ 226001
1691000                 IF FP=-6 THEN VERIF[P,2]:=+1 ELSE                             @ 226001
1692000                 IF FP=0 THEN VERIF[P,2]:=-1 ELSE                              @ 226001
1693000                 IF FP=+12  THEN VERIF[P,2]:=2  ELSE                           @ 226001
1694000                 IF FP=+24  THEN VERIF[P,2]:=3  ELSE                           @ 226001
1695000                 VERIF[P,2]:=0;                                                @ 226001
1696000                 DD:=WR[I1,J1]/10000+ARCTAN((I1+1.45)/(56.6-J1))+PI;           @ 226001
1697000                 IF DD GEQ PI2 THEN DD:=DD-PI2;                                @ 226001
1698000                 VERIF[P,3]:=DD*360/PI2;                                       @ 226001
1699000                 VERIF[P,4]:=WS[I1,J1]/1000;                                   @ 226001
1700000                 VERIF[P,5]:=4*SQRT(HULP);                                     @ 226001
1701000                 VERIF[P,6]:=E10;                                              @ 226001
1702000                 VERIF[P,7]:=SQRT(ABS(EA[I1,J1]))*0.4;                         @ 226001
1703000              END;                                                             @ 226001
1704000           END                                                                 @ 226001
1705000           OF VERIFIKATIEIN;                                                   @ 226001
1706000                                                                               @ 226001
1707000           PROCEDURE VERIFIKATIEUIT(LP);                                       @ 226001
```

```
1708000          FILE LP;                                                                  a 226001
1709000          BEGIN                                                                     a 226001
1710000             INTEGER P,KK;                                                          a 226001
1711000             EBCDIC ARRAY NAAM[0:16];                                               a 226001
1712000             IF FF=-6 THEN WRITE(LP[SKIP 1]);                                       a 226001
1713000             WRITE(LP[SPACE 4]);                                                    a 226001
1714000             WRITE(LP,<"VERIFIKATIE-TABEL, DATUM: "                                 a 226001
1715000             ,I8," + ",I2>,DTG,FP);                                                 a 226001
1716000             WRITE(LP[SPACE 2]);                                                    a 226001
1717000             WRITE(LP,<"     LOKATIE         DATUM   P   T   OD   ",               a 226001
1718000             "FF    HS     E10    HZEE">);                                         a 226001
1719000             WRITE(LP[SPACE 1]);                                                    a 226001
1720000             FOR P:=0 STEP 1 UNTIL 4 DO                                             a 226001
1721000             BEGIN                                                                  a 226001
1722000                IF P=0 THEN WRITE(NAAM[0],<A17>,"EURO-5    13, 4  ");           a 226001
1723000                IF P=1 THEN WRITE(NAAM[0],<A17>,"IJMUIDEN  13, 5  ");           a 226001
1724000                IF P=2 THEN WRITE(NAAM[0],<A17>,"PENNZOIL  12, 6  ");           a 226001
1725000                IF P=3 THEN WRITE(NAAM[0],<A17>,"EKOFISK   10,10  ");           a 226001
1726000                IF P=4 THEN WRITE(NAAM[0],<A17>,"STATION-M  7,24  ");           a 226001
1727000                WRITE(LP,<A17,I8,X2,I2,X2,I2,X2,I3,X2,I3,X2,I4,X2,I6,           a 226001
1728000                X3,I4>,NAAM,FOR KK:=0 STEP 1 UNTIL 7 DO VERIF[P,KK]);           a 226001
1729000             END;                                                                   a 226001
1730000          END                                                                       a 226001
1731000          OF VERIFIKATIELIT;                                                        a 226001
1732000                                                                                    a 226001
1733000          PROCEDURE VERIFIKATIEFILE(DATUM); VALUE DATUM; INTEGER                    a 226001
1734000          DATUM;                                                                    a 226001
1735000          BEGIN                                                                     a 226001
1736000             INTEGER T,P,DAG,UUR,N,RECNR,OD,FF,HS,HZ,E10;                           a 226001
1737000             INTEGER ARRAY AA[0:75];                                                a 226001
1738000             EBCDIC ARRAY TITLE[0:100];                                             a 226001
1739000             FILE VERIFGONO(KIND=DISK,MAXRECSIZE=76,AREASIZE=124,                   a 226001
1740000             SECURITYTYPE=CLASSA);                                                  a 226001
1741000             REPLACE TITLE BY "VERIFIKATIE/",DATUM DIV 10000 FOR 4
1742000             DIGITS,".";                                                            a 226001
1743000             REPLACE VERIFGONO.TITLE BY TITLE;                                      a 226001
1744000             IF NOT VERIFGONO.RESIDENT THEN                                         a 226001
1745000             BEGIN                                                                  a 226001
1746000                FOR DAG:= 1 STEP 1 UNTIL 31 DO                                      a 226001
1747000                FOR UUR:=0 STEP 1 UNTIL 3 DO                                        a 226001
1748000                BEGIN                                                               a 226001
1749000                   AA[0]:=(DATUM DIV 10000)*10000+DAG*100+UUR*6;                    a 226001
1750000                   FOR N:=1 STEP 1 UNTIL 75 DO                                      a 226001
1751000                   AA[N]:=987654321;                                                a 226001
1752000                   WRITE(VERIFGONO,*,AA[*]);                                        a 226001
1753000                END;                                                                a 226001
1754000                LOCK(VERIFGONO,CRUNCH);                                             a 226001
1755000             END;                                                                   a 226001
1756000             DAG:=DATUM DIV 100 MOD 100;                                            a 226001
1757000             UUR:=(DATUM MOD 100)/6;                                                a 226001
1758000             RECNR:=(DAG-1)*4+UUR;                                                  a 226001
1759000             READ(VERIFGONO[RECNR],*,AA[*]);                                        a 226001
1760000             IF AA[0]=DATUM THEN                                                    a 226001
1761000             BEGIN                                                                  a 226001
1762000                FOR P:=0 STEP  1 UNTIL 4 DO                                         a 226001
1763000                BEGIN                                                               a 226001
1764000                   T:=VERIF[P,2];                                                   a 226001
1765000                   OD:=VERIF[P,3];                                                  a 226001
1766000                   FF:=VERIF[P,4];                                                  a 226001
1767000                   HS:=VERIF[P,5];                                                  a 226001
1768000                   HZ:=VERIF[P,7];                                                  a 226001
1769000                   E10:=VERIF[P,6];                                                 a 226001
1770000                   N:=1+(T+1)*15+P*3;                                               a 226001
1771000                   AA[N]:=OD*1000+FF;                                               a 226001
1772000                   AA[N+1]:=HS*10000+HZ;                                            a 226001
1773000                   AA[N+2]:=E10;                                                    a 226001
1774000                END;                                                                a 226001
1775000                WRITE(VERIFGONO[RECNR],*,AA[*]);                                    a 226001
1776000             END;                                                                   a 226001
1777000          END                                                                       a 226001
1778000          OF VERIFIKATIEFILE;                                                       a 226001
1779000                                                                                    a 226001
1780000          PROCEDURE AFSTAND(LP); FILE LP;                                           a 226001
1781000          BEGIN                                                                     a 226001
1782000             INTEGER I,J;                                                           a 226001
1783000             WRITE(LP[SPACE 2]);                                                    a 226001
1784000             FOR I:=1 STEP 1 UNTIL 7 DO                                             a 226001
1785000             WRITE(LP,</,I7,6F11.1>,I*2+5,FOR J:=0 STEP 1 UNTIL 5 DO                a 226001
1786000             BR6[J,K,I]);                                                           a 226001
1787000          END;                                                                      a 226001
```

```
1788000
1789000 PROCEDURE DEININGPUNT(LP,K,E10TEST,PRINT);                          a 226001
1790000 FILE LP; INTEGER K; BOOLEAN E10TEST,PRINT;                          a 226001
1791000 BEGIN                                                               a 226001
1792000    LABEL VOLG; EBCDIC ARRAY NAAM[0:14];                             a 226001
1793000    FOR I:=0 STEP 1 UNTIL 7 DO ENZ[I]:=0;                            a 226001
1794000    I1:=DP[K,1];                                                     a 226001
1795000    J1:=DP[K,2];                                                     a 226001
1796000    WRITE(NAAM[0],<A15>,"                ");                        a 226001
1797000    IF I1=13 AND J1=4  THEN WRITE(NAAM[0],<A15>,                     a 226001
1798000    "  EUROPOORT    ");                                              a 226001
1799000    IF I1=13 AND J1=5  THEN WRITE(NAAM[0],<A15>,                     a 226001
1800000    "  YMUIDEN      ");                                              a 226001
1801000    IF I1=12 AND J1=6  THEN WRITE(NAAM[0],<A15>,                     a 226001
1802000    "  PENNZOIL     ");                                              a 226001
1803000    IF I1=10 AND J1=10 THEN WRITE(NAAM[0],<A15>,                     a 226001
1804000    "  AUK/EKOFISK  ");                                              a 226001
1805000    IF I1= 8 AND J1=17 THEN WRITE(NAAM[0],<A15>,                     a 226001
1806000    "  DUNLIN/BRENT ");                                              a 226001
1807000    IF I1= 7 AND J1=24 THEN WRITE(NAAM[0],<A15>,                     a 226001
1808000    "  WEERSCHIP M  ");                                              a 226001
1809000    IF PRINT THEN                                                    a 226001
1810000    BEGIN                                                            a 226001
1811000       IF FP<0 THEN WRITE(LP,<//"DEININGANALYSE OP POSITIE",         a 226001
1812000       I4,I3,A15," ANALYSE: ",I8>,                                   a 226001
1813000       I1,J1,NAAM,DATUM)                                             a 226001
1814000       ELSE WRITE(LP,<//"DEININGPROGNOSE OP POSITIE",                a 226001
1815000       I4,I3,A15," PROG: ",I8,"+",I2>,                               a 226001
1816000       I1,J1,NAAM,DTG,ABS(FP));                                      a 226001
1817000    END;                                                             a 226001
1818000    IF I1=13 AND (J1=4 OR J1=5) THEN                                 a 226001
1819000    BEGIN                                                            a 226001
1820000       IZONDER:=++1; ZONDER:=FALSE                                   a 226001
1821000    END                                                              a 226001
1822000    ELSE ZONDER:=FALSE;                                              a 226001
1823000    IF J1=56.6 THEN FI:=PI/2 ELSE                                    a 226001
1824000    FI:=ARCTAN((I1+1.45)/(56.6-J1))*360/PI2;                         a 226001
1825000    E:=EA[I1,J1]/1000000;                                            a 226001
1826000    U:=WS[I1,J1]/10000;                                              a 226001
1827000    DIEP:=DA[I1,J1];                                                 a 226001
1828000    IF E<0 THEN                                                      a 226001
1829000    BEGIN                                                            a 226001
1830000       U:=U*0.9;USTER:=U;                                            a 226001
1831000       IF DIEP<200 THEN                                              a 226001
1832000       BEGIN                                                         a 226001
1833000          U4:=U**4;                                                  a 226001
1834000          E:=(1-EXP(-(9.8*SQRT(DA[I1,J1]*LABDAFAC)/PI2)**4           a 226001
1835000          /U4*0.63363636))*U4/COEFFE;                                a 226001
1836000          USTER:=E**0.25*FACU;                                       a 226001
1837000       END                                                           a 226001
1838000    END                                                              a 226001
1839000    ELSE USTER:=E**0.25*FACU;                                        a 226001
1840000    KR:=USTER/U; BOL:=FALSE;                                         a 226001
1841000    IF KR<0.5 THEN KR:=0.5;                                          a 226001
1842000    IF DIEP LEQ 100 THEN                                             a 226001
1843000    BEGIN                                                            a 226001
1844000       HSS:=USTER*USTER*0.22/9.8;                                    a 226001
1845000       HM:=(-(SQRT(DIEP)-4)*0.02+0.27)*DIEP;                         a 226001
1846000       HM:=**(LABNUL+1)/5;                                           a 226001
1847000       IF HSS>HM*0.66667 THEN                                        a 226001
1848000       BEGIN                                                         a 226001
1849000          BOL:=TRUE;                                                 a 226001
1850000          KR:=((KR*10-21)*KR+21)/10*(HSS/HM+0.33333)*KR;             a 226001
1851000       END;                                                          a 226001
1852000    END;                                                             a 226001
1853000    I:=KR*100-50;                                                    a 226001
1854000    IF I GEQ 50 THEN                                                 a 226001
1855000    BEGIN                                                            a 226001
1856000       IF BOL THEN I:=50 ELSE I:=35                                  a 226001
1857000    END;                                                             a 226001
1858000    TO:=0.641141357853*USTER/DMOD[I];                                a 226001
1859000    KR:=GMOD[I];                                                     a 226001
1860000    TMAX:=TO/KR;                                                     a 226001
1861000    ZEEGAN[8,K]:=TO;                                                 a 226001
1862000    ZEEGAN[9,K]:=TMAX;                                               a 226001
1863000    IF PRINT THEN                                                    a 226001
1864000    WRITE(LP,<"ZEEGANGS-SPECTRUM: U+/U, ALPHA, F-PIEK,  ",           a 226001
1865000    "F-MIN",4F9.4,/>,USTER/U,AMOD[I],1/TO,1/TMAX);                   a 226001
1866000    FACLIJN:=0.061621558*AMOD[I]*KR*KR/(1-KR);                       a 226001
1867000    FACT4:=0.015405390*AMOD[I];                                      a 226001
```

```
1868000              FOR K1:=0,7,9,11,13,15,17,19 DO                                    @ 226001
1869000              BEGIN                                                              @ 226001
1870000                 DEIN:=0;                                                        @ 226001
1871000                 T1:=K1-1;                                                       @ 226001
1872000                 T2:=K1+1;                                                       @ 226001
1873000                 IF K1=0 THEN                                                    @ 226001
1874000                 BEGIN                                                           @ 226001
1875000                    T1:=0; T2:=6                                                 @ 226001
1876000                 END;                                                            @ 226001
1877000                 IF K1=19 THEN T2:=TMAX+1;                                       @ 226001
1878000                 IF T2>TO THEN                                                   @ 226001
1879000                 BEGIN                                                           @ 226001
1880000                    IF T2>TMAX THEN                                              @ 226001
1881000                    BEGIN                                                        @ 226001
1882000                       IF T1>TMAX THEN  GO TO VOLG ELSE T2:=TMAX                 @ 226001
1883000                    END                                                          @ 226001
1884000                    ;                                                            @ 226001
1885000                    IF T1>TO THEN                                                @ 226001
1886000                    BEGIN                                                        @ 226001
1887000                       T1:=TMAX/T1;                                              @ 226001
1888000                       T2:=TMAX/T2;                                              @ 226001
1889000                       DEIN:=TO**4*(T1-T2)*((T1+T2)/2-1)*FACLIJN                 @ 226001
1890000                    END                                                          @ 226001
1891000                    ELSE                                                         @ 226001
1892000                    BEGIN                                                        @ 226001
1893000                       E:=TO**4;                                                 @ 226001
1894000                       DEIN:=(-T1**4+E)*FACT4;                                   @ 226001
1895000                       T1:=TMAX/TO;                                              @ 226001
1896000                       T2:=TMAX/T2;                                              @ 226001
1897000                       DEIN:=(T1-T2)*((T1+T2)/2-1)*E*FACLIJN+DEIN                @ 226001
1898000                    END                                                          @ 226001
1899000                 END                                                             @ 226001
1900000                 ELSE DEIN:=(T2**4-T1**4)*FACT4;                                 @ 226001
1901000  VOLG:                                                                          @ 226001
1902000                 IF K1=0 THEN ENZ[0]:=DEIN*10000 ELSE                            @ 226001
1903000                 ENZ[(K1-5)/2]:=DEIN*10000                                       @ 226001
1904000              END;                                                               @ 226001
1905000              FOR I:=0 STEP 1 UNTIL 7 DO ZEEGAN[I,K]:=ENZ[I];                    @ 226001
1906000              FIZ:=WR[I1,J1]/10000*360/PI2; ETOT:=0; E10:=0;                     @ 226001
1907000              FIZ:=FIO:=(FIZ+FI+180) MOD 360;                                    @ 226001
1908000              IF PRINT THEN                                                      @ 226001
1909000              WRITE(LP,</,"PERIODE        0-60      60-120     120-180",       @ 226001
1910000              "     180-240     240-300     300-360    ?ZEEGANG?",             @ 226001
1911000              "   TOTAAL">,);                                                    @ 226001
1912000              FOR I:=1 STEP 1 UNTIL 7 DO                                         @ 226001
1913000              BEGIN                                                              @ 226001
1914000                 IF ENZ[I]>1 THEN                                                @ 226001
1915000                 BEGIN                                                           @ 226001
1916000                    EZ:=ENZ[I]; UITSPLITS(EZ,FIZ,K,I,EN,RI,0)                    @ 226001
1917000                 END                                                             @ 226001
1918000                 ELSE                                                            @ 226001
1919000                 BEGIN                                                           @ 226001
1920000                    ESOM:=EZ:=0;                                                 @ 226001
1921000                    FOR J:=0 STEP 1 UNTIL 5 DO                                   @ 226001
1922000                    BEGIN                                                        @ 226001
1923000                       ADO:=D[J,K,I]; RI[J]:=ADO DIV 1;                          @ 226001
1924000                       EN[J]:=(ADO-RI[J])*1000000; ESOM:=ESOM+EN[J]              @ 226001
1925000                    END                                                          @ 226001
1926000                 END;                                                            @ 226001
1927000                 ETOT:=ETOT+ESOM; IF I>2 THEN E10:=E10+ESOM;                     @ 226001
1928000                 IF EZ>0 THEN FIO:=FIZ ELSE FIO:=0;                              @ 226001
1929000                 IF PRINT THEN IF I<6 THEN                                       @ 226001
1930000                 WRITE(LP,<I7,7(I7,"*",I3),I8>,5+I*2,                            @ 226001
1931000                 FOR J:=0 STEP 1 UNTIL 5 DO [EN[J],RI[J]],                       @ 226001
1932000                 EZ,FIO,ESOM);                                                   @ 226001
1933000              END;                                                               @ 226001
1934000              HULP:=ETOT+ENZ[0];                                                 @ 226001
1935000              IF HULP<ABS(EA[I1,J1])/100 THEN                                    @ 226001
1936000              HULP:=ABS(EA[I1,J1])/100;                                          @ 226001
1937000              IF PRINT THEN                                                      @ 226001
1938000              WRITE(LP,<"GEMIDDELDE GOLFHOOGTE:",F7.1,                           @ 226001
1939000              "     ENERGIE BOVEN 10 SEC:",I8>,                                @ 226001
1940000              SQRT(HULP)/25,E10);                                                @ 226001
1941000              VERIFIKATIEIN;                                                     @ 226001
1942000              %AFSTAND(LPRESEARCH);                                              @ 226001
1943000              IF I1=13 AND J1=4 THEN IF E10TEST THEN IF E10>10 THEN              @ 226001
1944000              BEGIN                                                              @ 226001
1945000                 IF E10>150 THEN WRITE(LP,<X84,"*** WAARSCHUWING ***">)          @ 226001
1946000                 ELSE WRITE(LP,<X84,"*** ATTENTIE ***">);                        @ 226001
1947000              END;                                                               @ 226001
```

```
1948000          END
1949000          OF DEININGPUNT;                                                    a 226001
1950000                                                                             a 226001
1951000          % UITVOER ZIERIKZEE %                                              a 226001
1952000          IF FP GEQ -6 AND FP MOD 6 = 0 THEN                                 a 226001
1953000          BEGIN                                                              a 226001
1954000             E10TEST:=FALSE; PRINT:=TRUE; IZONDER:=0;                        a 226001
1955000             FOR K:=1,4,5,9 DO DEININGPUNT(LPERZI,K,E10TEST,PRINT);          a 226001
1956000          END;                                                               a 226001
1957000          % UITVOER WEERKAMER %                                              a 226001
1958000          IF FP=+12 OR FP=+24 THEN                                           a 226001
1959000          BEGIN                                                              a 226001
1960000             E10TEST:=TRUE; PRINT:=TRUE; IZONDER:=0;                         a 226001
1961000             FOR K:=1,4,5 DO DEININGPUNT(LPEHOB,K,E10TEST,PRINT);            a 226001
1962000          END;                                                               a 226001
1963000          % UITVOER RESEARCH %                                               a 226001
1964000          IF FP=-6 OR FP=0 OR FP=+12 OR FP=+24 THEN                          a 226001
1965000          BEGIN                                                              a 226001
1966000             E10TEST:=FALSE; PRINT:=FALSE; IZONDER:=0;                       a 226001
1967000             FOR K:=1, K+1 WHILE K LEQ NDEINING DO                           a 226001
1968000             BEGIN                                                           a 226001
1969000                IF K=1 OR K=2 OR K=4 OR K=5 THEN                             a 226001
1970000                PRINT:=TRUE ELSE PRINT:=FALSE;                               a 226001
1971000                IF FP  NEQ -6 THEN PRINT:=FALSE;                             a 226001
1972000                DEININGPUNT(LPRESEARCH,K,E10TEST,PRINT);                     a 226001
1973000             END;                                                            a 226001
1974000             VERIFIKATIEFILE(DATUM);                                         a 226001
1975000             VERIFIKATIELIT(LPRESEARCH);                                     a 226001
1976000          END;                                                               a 226001
1977000       END                                                                   a 226001
1978000       OF UITVOER;                                                           a 226001
1979000                                                                             a 226001
1980000                                                                             a 226001
1981000       PROCEDURE GRIDKAART(LP);                                              a 226001
1982000       FILE LP;                                                              a 226001
1983000       BEGIN                                                                 a 226001
1984000          REAL T;                                                            a 226001
1985000          EBCDIC ARRAY UIT[0:131];                                           a 226001
1986000          WRITE(LP,<"DATUM : ",I8>,DATUM);                                   a 226001
1987000          WRITE(LP,<"SIGNIFICANTE GOLFHOOGTE IN  M.">);                      a 226001
1988000          WRITE(LP,<"WINDRICHTING T.O.V. HET WARE NOORDEN IN GRADEN"         a 226001
1989000          >);                                                                a 226001
1990000          WRITE(LP,<"TL-TZ : ",2F5.1>,TEMP2[1]/10,TEMP2[2]/10);              a 226001
1991000          FOR J:=36,J-1 WHILE J GEQ 1 DO                                     a 226001
1992000          BEGIN                                                              a 226001
1993000             WRITE(UIT[0],<A7>,"        ");                                  a 226001
1994000             WRITE(UIT[126],<A6>,"       ");                                 a 226001
1995000             WRITE(LP[SPACE 1]);                                             a 226001
1996000             FOR I:=1,I+1 WHILE I LEQ 17 DO                                  a 226001
1997000             BEGIN                                                           a 226001
1998000                IF DA[I,J]>0 THEN                                            a 226001
1999000                BEGIN                                                        a 226001
2000000                   T:=SQRT(ABS(EA[I,J]))*0.004;                              a 226001
2001000                   WRITE(UIT[I*7],<F7.1>,SIGN(EA[I,J])*T);                   a 226001
2002000                END                                                          a 226001
2003000                ELSE WRITE(UIT[I*7],<A7>,"        ");                       a 226001
2004000             END;                                                            a 226001
2005000             WRITE(LP,<A132>,UIT);                                           a 226001
2006000             FOR I:=1,I+1 WHILE I LEQ 17 DO                                  a 226001
2007000             BEGIN                                                           a 226001
2008000                IF DA[I,J]>0 THEN                                            a 226001
2009000                BEGIN                                                        a 226001
2010000                   FI:=WR[I,J]/10000+ARCTAN((I+1.45)/(56.6-J))+PI;           a 226001
2011000                   IF FI GEQ PI2 THEN FI:=FI-PI2;                            a 226001
2012000                   WRITE(UIT[I*7],<I7>,FI*360/PI2);                          a 226001
2013000                END                                                          a 226001
2014000                ELSE WRITE(UIT[I*7],<A7>,"        ");                       a 226001
2015000             END;                                                            a 226001
2016000             WRITE(LP,<A132>,UIT);                                           a 226001
2017000             FOR I:=1,I+1 WHILE I LEQ 17 DO                                  a 226001
2018000             BEGIN                                                           a 226001
2019000                IF DA[I,J]>0 THEN WRITE(UIT[I*7],<F7.1>,WS[I,J]/10000)       a 226001
2020000                ELSE WRITE(UIT[I*7],<A7>,"        ");                       a 226001
2021000             END;                                                            a 226001
2022000             WRITE(LP,<A132>,UIT);                                           a 226001
2023000          END                                                                a 226001
2024000       END                                                                   a 226001
2025000       OF GRIDKAART;                                                         a 226001
2026000                                                                             a 226001
2027000       ARRAY WAVEHGT[0:636];                                                 a 226001
```

```
2028000        % GRIDCODEINFORMATIE %                                                    @ 226001
2029000        VALUE ARRAY                                                              @ 226001
2030000        GONOGRID(2,-757.25,-4177.45,73.35,-15.6,15.6,73.35);                     @ 226001
2031000        VALUE ARRAY GRIDINFO(100,1,17,36,1,1,637,0,2,-757.25,-4177.45,           @ 226001
2032000        73.35,-15.6,15.6,73.35,0,0,0,25,0,0,0,0,0);                              @ 226001
2033000        VALUE ARRAY                                                              @ 226001
2034000        S1(2,-668.30,-4119.7,1173.6,-249.6,546.0,2567.25,536);                   @ 226001
2035000        VALUE ARRAY                                                              @ 226001
2036000        S2(2,-668.30,-4119.7,1173.6,-249.6,343.2,1613.70,536);                   @ 226001
2037000        VALUE ARRAY S3(2,505.3,-4369.3,343.2,1613.7,-1173.6,249.6,536);          @ 226001
2038000        VALUE ARRAY                                                              @ 226001
2039000        S4(2,505.3,-4369.3,343.2,1613.7,-1100.25,234.0,536);                     @ 226001
2040000        % S1 : GEHELE GONOGRID WORDT GEPRINT                                     @ 226001
2041000        % S2 : SNEDE V.H. GONOGRID BEGRENSD DOOR (1,1),(17,1),(1,23)            @ 226001
2042000        % S3 : ZELFDE SNEDE ALS IN S2, MAAR GEDRAAID OVER 90 GRADEN             @ 226001
2043000                                                                                 @ 226001
2044000        PROCEDURE PRINTSNEDE(LP,SNEDE);                                          @ 226001
2045000        FILE LP; ARRAY SNEDE[0];                                                 @ 226001
2046000        BEGIN                                                                    @ 226001
2047000           INTEGER I,J,ELEMENTIJ;                                                @ 226001
2048000           % INVULLEN VAN ZEEGANGSGRID                                          @ 226001
2049000           FILL WAVEHGT[*] WITH                                                  @ 226001
2050000           100,1,17,36,1,1,637,0,2,-757.25,-4177.45,                             @ 226001
2051000           73.35,-15.6,15.6,73.35,0,0,0,25,0,0,0,0,0;                            @ 226001
2052000           WAVEHGT[20]:=DATUM; WAVEHGT[21]:=0; WAVEHGT[22]:=385;                 @ 226001
2053000           FOR J:=36,J-1 WHILE J GEQ 1 DO                                        @ 226001
2054000           FOR I:=1,I+1 WHILE I LEQ 17 DO                                        @ 226001
2055000           BEGIN                                                                 @ 226001
2056000              ELEMENTIJ:=(36-J)*17+I+24;                                         @ 226001
2057000              IF DA[I,J]=0 THEN WAVEHGT[ELEMENTIJ]:=987654321 ELSE               @ 226001
2058000              WAVEHGT[ELEMENTIJ]:=SQRT(ABS(EA[I,J]))*0.004;                      @ 226001
2059000           END;                                                                  @ 226001
2060000           % PRINTEN VAN ZEEGANGSGRID                                           @ 226001
2061000           IF FP<0 THEN                                                          @ 226001
2062000           WRITE(LP,<"GOLFKAART NOORDZEE. DATUM: ",I8,                           @ 226001
2063000           "   GOLFHOOGTE IN METERS">,DATUM)                                     @ 226001
2064000           ELSE WRITE(LP,<"GOLFKAART NOORDZEE. DATUM: ",I8,"+",I2,               @ 226001
2065000           "   GOLFHOOGTE IN METERS">,DTG,ABS(FP));                              @ 226001
2066000           COINCIDENCEPOINT(60,0);                                               @ 226001
2067000           REFERENCEPOINT(51,0,"+");                                             @ 226001
2068000           ISOVALUES(0,0.5);                                                     @ 226001
2069000           PRINTGRID(LP,WAVEHGT,1,SNEDE);                                        @ 226001
2070000        END                                                                      @ 226001
2071000        OF PRINTSNEDE;                                                           @ 226001
2072000                                                                                 @ 226001
2073000        PROCEDURE ZGUIT;                                                         @ 226001
2074000        BEGIN                                                                    @ 226001
2075000           REPLACE TITLE BY "ZG/",DATUM FOR 8 DIGITS,".";
2076000           REPLACE ZG.TITLE BY TITLE;                                            @ 226001
2077000           WRITE(ZG,*,FOR J:=0,J+1 WHILE J LEQ 37 DO                             @ 226001
2078000           FOR I:=0,I+1 WHILE I LEQ 18 DO WR[I,J],                               @ 226001
2079000           FOR J:=0,J+1 WHILE J LEQ 37 DO                                        @ 226001
2080000           FOR I:=0,I+1 WHILE I LEQ 18 DO EA[I,J],                               @ 226001
2081000           FOR J:=0,J+1 WHILE J LEQ 37 DO                                        @ 226001
2082000           FOR I:=0,I+1 WHILE I LEQ 18 DO GSN[I,J],                              @ 226001
2083000           DEF(C66),                                                             @ 226001
2084000           DEF(C60),                                                             @ 226001
2085000           DEF(C54),                                                             @ 226001
2086000           DEF(C48),                                                             @ 226001
2087000           DEF(C42),                                                             @ 226001
2088000           DEF(C36),                                                             @ 226001
2089000           DEF(C30),                                                             @ 226001
2090000           DEF(C24),                                                             @ 226001
2091000           DEF(C18),                                                             @ 226001
2092000           DEF(C12),                                                             @ 226001
2093000           DEF(C6),                                                              @ 226001
2094000           DEFK(DK66),                                                           @ 226001
2095000           DEFK(DK60),                                                           @ 226001
2096000           DEFK(DK54),                                                           @ 226001
2097000           DEFK(DK48),                                                           @ 226001
2098000           DEFK(DK42),                                                           @ 226001
2099000           DEFK(DK36),                                                           @ 226001
2100000           DEFK(DK30),                                                           @ 226001
2101000           DEFK(DK24),                                                           @ 226001
2102000           DEFK(DK18),                                                           @ 226001
2103000           DEFK(DK12),                                                           @ 226001
2104000           DEFK(DK6));                                                           @ 226001
2105000           LOCK(ZG,CRUNCH);                                                      @ 226001
2106000           REPLACE TITLE BY "BRON/",DATUM FOR 8 DIGITS,".";
2107000           REPLACE BRON.TITLE BY TITLE;                                          @ 226001
```

```
2108000          WRITE(BRON,*,
2109000          DEF(BR66),                                                    @ 226001
2110000          DEF(BR60),                                                    @ 226001
2111000          DEF(BR54),                                                    @ 226001
2112000          DEF(BR48),                                                    @ 226001
2113000          DEF(BR42),                                                    @ 226001
2114000          DEF(BR36),                                                    @ 226001
2115000          DEF(BR30),                                                    @ 226001
2116000          DEF(BR24),                                                    @ 226001
2117000          DEF(BR18),                                                    @ 226001
2118000          DEF(BR12),                                                    @ 226001
2119000          DEF(BR6));                                                    @ 226001
2120000          %LOCK(BRON,CRUNCH);                                           @ 226001
2121000       END                                                              @ 226001
2122000       OF ZGUIT;                                                        @ 226001
2123000                                                                        @ 226001
2124000       THRU 2 DO                                                        @ 226001
2125000       BEGIN                                                            @ 226001
2126000          T:=*+1.5;                                                     @ 226001
2127000          FOR K:=1,2,3,4 DO                                             @ 226001
2128000          BEGIN                                                         @ 226001
2129000             TEMPV:=TEMP2(K)/10; WINDCDEF(CT(K,*))                      @ 226001
2130000          END;                                                          @ 226001
2131000          FOR J:=0,J+1 WHILE J LEQ NB DO FOR I:=0,I+1 WHILE I LEQ MB DO @ 226001
2132000          GAMMA1B(I,J):=1.5*GAMMASB(I,J)+GAMMA1B(I,J);                  @ 226001
2133000          FOR J:=0,J+1 WHILE J LEQ N DO FOR I:=0,I+1 WHILE I LEQ M DO   @ 226001
2134000          GAMMA1(I,J):=1.5*GAMMAS(I,J)+GAMMA1(I,J);                     @ 226001
2135000          FOR J:=1,J+1 WHILE J LEQ 36 DO                                @ 226001
2136000          FOR I:=1,I+1 WHILE I LEQ 17 DO                                @ 226001
2137000          BEGIN                                                         @ 226001
2138000             D:=DA(I,J);                                                @ 226001
2139000             IF D>C THEN                                                @ 226001
2140000             BEGIN                                                      @ 226001
2141000                E:=ABS(EA(I,J)/1000000);                                @ 226001
2142000                FI:=WR(I,J)/10000;                                      @ 226001
2143000                COSI:=COS(FI);                                          @ 226001
2144000                COSI:=COSI*COSI;                                        @ 226001
2145000                K:=FI/PIC4-0.499999;                                    @ 226001
2146000                IF K=8 THEN K:=0;                                       @ 226001
2147000                K:=4*K;                                                 @ 226001
2148000                A1X:=ORA(K+1);                                          @ 226001
2149000                A1Y:=ORA(K+2);                                          @ 226001
2150000                A2X:=ORA(K+3);                                          @ 226001
2151000                A2Y:=ORA(K+4);                                          @ 226001
2152000                ENXO:=(1-COSI)*E*A1X;                                   @ 226001
2153000                ENYO:=COSI*E*A1Y;                                       @ 226001
2154000                HULP:=GSN(I,J);                                         @ 226001
2155000                EX:=ENXO*HULP;                                          @ 226001
2156000                EY:=ENYO*HULP;                                          @ 226001
2157000                FI:=*+PIC4; IF FI GEQ PI2 THEN FI:=*-PI2;               @ 226001
2158000                COSI:=COS(FI); SINN:=SIN(FI);                           @ 226001
2159000                ENXOG:=E*ABS(SINN)*SINN;                                @ 226001
2160000                ENYOG:=E*ABS(COSI)*COSI;                                @ 226001
2161000                EXG:=ENXOG*HULP;                                        @ 226001
2162000                EYG:=ENYOG*HULP;                                        @ 226001
2163000                G1:=I+1.45;                                             @ 226001
2164000                G2:=56.6-J;                                             @ 226001
2165000                SCH:=G1*G1+G2*G2;                                       @ 226001
2166000                SCH:=26862.65/(SCH+25063.19);                           @ 226001
2167000                HULP:=GSN(I-A1X,J);                                     @ 226001
2168000                IF HULP<C.000001 THEN EXO:=0 ELSE                       @ 226001
2169000                BEGIN                                                   @ 226001
2170000                   FI:=WR(I-A1X,J)/10000;                               @ 226001
2171000                   SINN:=SIN(FI);                                       @ 226001
2172000                   EXO:=ABS(EA(I-A1X,J)*SINN/1000000)*SINN*HULP;        @ 226001
2173000                END;                                                    @ 226001
2174000                ENXN1:=ENXO-(EX-EXO)*FAC1/SCH;                          @ 226001
2175000                HULP:=GSN(I,J-A1Y);                                     @ 226001
2176000                IF HULP<C.000001 THEN EYO:=0 ELSE                       @ 226001
2177000                BEGIN                                                   @ 226001
2178000                   FI:=WR(I,J-A1Y)/10000;                               @ 226001
2179000                   COSI:=COS(FI);                                       @ 226001
2180000                   EYO:=ABS(EA(I,J-A1Y)*COSI/100000)*COSI*HULP;         @ 226001
2181000                END;                                                    @ 226001
2182000                ENYN1:=ENYO-(EY-EYO)*FAC1/SCH;                          @ 226001
2183000                I1:=I-A2X;                                              @ 226001
2184000                J1:=J-A2X;                                              @ 226001
2185000                HULP:=GSN(I1,J1);                                       @ 226001
2186000                IF HULP<C.000001 THEN EXO:=0 ELSE                       @ 226001
2187000                BEGIN                                                   @ 226001
```

```
2186000                  FI:=WR[I1,J1]/10000;                                    a 226001
2189000                  FI:=*+PIG4; IF FI GEQ PI2 THEN FI:=*-PI2;               a 226001
2190000                  SINN:=SIN(FI);                                          a 226001
2191000                  EXO:=ABS(EA[I1,J1]*SINN/1000000)*SINN*HULP;             a 226001
2192000               END;                                                       a 226001
2193000               ENXN2:=ENXOG-(EXG-EXO)*FAC2/SCH;                           a 226001
2194000               I1:=I+A2Y;                                                 a 226001
2195000               J1:=J-A2Y;                                                 a 226001
2196000               HULP:=GSN[I1,J1];                                          a 226001
2197000               IF HULP<0.000001 THEN EYO:=0 ELSE                          a 226001
2198000               BEGIN                                                      a 226001
2199000                  FI:=WR[I1,J1]/10000;                                    a 226001
2200000                  FI:=*+PIG4; IF FI GEQ PI2 THEN FI:=*-PI2;               a 226001
2201000                  COSI:=COS(FI);                                          a 226001
2202000                  EYO:=ABS(EA[I1,J1]*COSI/1000000)*COSI*HULP;             a 226001
2203000               END;                                                       a 226001
2204000               ENYN2:=ENYOG-(EYG-EYO)*FAC2/SCH;                           a 226001
2205000               IF ENYN1=0 THEN FI1:=PI/2 ELSE                             a 226001
2206000               FI1:=ARCTAN(SQRT(ABS(ENXN1/ENYN1)));                       a 226001
2207000               IF ENYN2=0 THEN FI2:=PI/2 ELSE                             a 226001
2208000               FI2:=ARCTAN(SQRT(ABS(ENXN2/ENYN2)));                       a 226001
2209000               IF ENXN1 GEQ 0 THEN                                        a 226001
2210000               BEGIN                                                      a 226001
2211000                  IF ENYN1<0 THEN FI1:=PI-FI1                             a 226001
2212000               END                                                        a 226001
2213000               ELSE                                                       a 226001
2214000               BEGIN                                                      a 226001
2215000                  IF ENYN1>0 THEN FI1:=PI2-FI1 ELSE FI1:=PI+FI1           a 226001
2216000               END                                                        a 226001
2217000               ;                                                          a 226001
2218000               IF ENXN2 GEQ 0 THEN                                        a 226001
2219000               BEGIN                                                      a 226001
2220000                  IF ENYN2<0 THEN FI2:=PI-FI2                             a 226001
2221000               END                                                        a 226001
2222000               ELSE                                                       a 226001
2223000               BEGIN                                                      a 226001
2224000                  IF ENYN2>0 THEN FI2:=PI2-FI2 ELSE FI2:=PI+FI2           a 226001
2225000               END                                                        a 226001
2226000               ;                                                          a 226001
2227000               FI2:=FI2-PIG4;                                             a 226001
2228000               IF FI2<0 THEN FI2:=FI2+PI2;                                a 226001
2229000               WIND;                                                      a 226001
2230000               WRN[I,J]:=FI*10000;                                        a 226001
2231000               WS[I,J]:=U*10000;                                          a 226001
2232000               UKW:=U*U;                                                  a 226001
2233000               HULP:=(FI2+FI1)/2;                                         a 226001
2234000               IF ABS(HULP-FI1) GEQ PIG2 THEN HULP:=HULP+PI;              a 226001
2235000               IF HULP GEQ PI2 THEN HULP:=HULP-PI2;                       a 226001
2236000               ALFA:=ABS(HULP-FI);                                        a 226001
2237000               IF ALFA GEQ PI THEN ALFA:=PI2-ALFA;                        a 226001
2238000               E:=(1-(ALFA+SIN(ALFA))/PI)*(ABS(ENXN1)+ABS(ENYN1)          a 226001
2239000               +ABS(ENXN2)+ABS(ENYN2))/2;                                 a 226001
2240000               U4:=UKW*UKW;                                               a 226001
2241000               EO:=FACE*U4;                                               a 226001
2242000               IF D<200 THEN                                              a 226001
2243000               BEGIN                                                      a 226001
2244000                  PERTOL:=SQRT(D*LABDAFAC);                               a 226001
2245000                  EON:=(1-EXP(-(9.8*PERTOL/PI2)**4/U4+0.63363636))*U4/    a 226001
2246000                  COEFFE;                                                 a 226001
2247000                  IF E>EON THEN                                           a 226001
2248000                  BEGIN                                                   a 226001
2249000                     E:=E*1000000;                                        a 226001
2250000                     EA[I,J]:=-E;                                         a 226001
2251000                     GO TO VOLGR                                          a 226001
2252000                  END                                                     a 226001
2253000               END                                                        a 226001
2254000               ;                                                          a 226001
2255000               IF E>EO THEN                                               a 226001
2256000               BEGIN                                                      a 226001
2257000                  EA[I,J]:=-E*1000000;                                    a 226001
2258000                  GO TO VOLGR                                             a 226001
2259000               END                                                        a 226001
2260000               ;                                                          a 226001
2261000               USTER:=E**0.25*FACU;                                       a 226001
2262000               KR:=SQRT(E)*19600/UKW;                                     a 226001
2263000               IF KR GEQ 110 THEN                                         a 226001
2264000               BEGIN                                                      a 226001
2265000                  KR:=110;                                                a 226001
2266000                  KG:=109                                                 a 226001
2267000               END                                                        a 226001
```

```
2268000                 ELSE
2269000                 BEGIN                                                    @ 226001
2270000                    KG:=KR;                                               @ 226001
2271000                    IF KG>KR THEN KG:=KG-1                                @ 226001
2272000                 END                                                      @ 226001
2273000                 ;                                                        @ 226001
2274000                 TT:=(TYDA[KG+1]-TYDA[KG])*(KR-KG)+TYDA[KG];              @ 226001
2275000                 KR:=(52920/U+TT)/2000;                                   @ 226001
2276000                 IF KR GEQ 100 THEN                                       @ 226001
2277000                 BEGIN                                                    @ 226001
2278000                    KR:=100;                                              @ 226001
2279000                    KG:=99                                                @ 226001
2280000                 END                                                      @ 226001
2281000                 ELSE                                                     @ 226001
2282000                 BEGIN                                                    @ 226001
2283000                    KG:=KR;                                               @ 226001
2284000                    IF KG>KR THEN KG:=KG-1                                @ 226001
2285000                 END                                                      @ 226001
2286000                 ;                                                        @ 226001
2287000                HULP:=(((HS[KG+1]-HS[KG])*(KR-KG)+HS[KG])*UKW/1000000/9.8) @ 226001
2288000                 **2/16;                                                  @ 226001
2289000                 EA[I,J]:=HULP*1000000;                                   @ 226001
2290000  VOLGR:                                                                  @ 226001
2291000                 E:=EA[I,J];                                              @ 226001
2292000                 IF ABS(E)>EMAX THEN EA[I,J]:=SIGN(EA[I,J])*EMAX;         @ 226001
2293000                 IF D<200 THEN                                            @ 226001
2294000                 BEGIN                                                    @ 226001
2295000                    E:=E/1000000;                                         @ 226001
2296000                    IF ABS(E)<0.14 THEN  GO TO NIETS;                     @ 226001
2297000                    BOL:= FALSE ;                                         @ 226001
2298000                    IF E<0 THEN                                           @ 226001
2299000                    BEGIN                                                 @ 226001
2300000                       BOL:= TRUE ;                                       @ 226001
2301000                       E:=ABS(E);                                         @ 226001
2302000                       E0:=E0N;                                           @ 226001
2303000                       HULP:=(E**1.25-E0**1.25)*FACU*0.586211/(E-E0);     @ 226001
2304000                       HULP:=**0.9;                                       @ 226001
2305000                       IF HULP<0.75*PERTOL THEN                           @ 226001
2306000                       BEGIN                                              @ 226001
2307000                          E:=**1000000;                                   @ 226001
2308000                          GO TO KLAAR                                     @ 226001
2309000                       END                                                @ 226001
2310000                       ;                                                  @ 226001
2311000                       KR:=(HULP-7)/2+1;                                  @ 226001
2312000                       KG:=ENTIER(KR);                                    @ 226001
2313000                       IF KR<1 THEN                                       @ 226001
2314000                       BEGIN                                              @ 226001
2315000                          E:=**1000000;                                   @ 226001
2316000                          GO TO KLAAR                                     @ 226001
2317000                       END                                                @ 226001
2318000                       ;                                                  @ 226001
2319000                       IF KR GEQ 7 THEN                                   @ 226001
2320000                       BEGIN                                              @ 226001
2321000                          KG:=6;                                          @ 226001
2322000                          KR:=7                                           @ 226001
2323000                       END                                                @ 226001
2324000                       ;                                                  @ 226001
2325000                       K:=IF D GEQ 60 THEN                                @ 226001
2326000                       (IF D GEQ 100 THEN (D+180)/20 ELSE (D+40)/10) ELSE @ 226001
2327000                       (D-10)/5;                                          @ 226001
2328000                       E2:=1000000/(((CGOND[KG+1,K]-CGOND[KG,K])*(KR-KG)+ @ 226001
2329000                       CGOND[KG,K]);                                      @ 226001
2330000                       E1:=((KOM[KG+1,K]-KOM[KG,K])*(KR-KG)+KOM[KG,K])/   @ 226001
2331000                       10000000;                                          @ 226001
2332000                       E1:=EXP(E1*D);                                     @ 226001
2333000                       E1:=4*PI/((-1/E1+E1)*HULP);                        @ 226001
2334000                       KR:=E0;                                            @ 226001
2335000                       E0:=EXP(-ABD2*E1*E1*16*75000*E2)*(E-E0);           @ 226001
2336000                       E:=(E0+KR)*1000000;                                @ 226001
2337000                       GO TO KLAAR;                                       @ 226001
2338000  NIET:                                                                   @ 226001
2339000                    END                                                   @ 226001
2340000                    ELSE                                                  @ 226001
2341000                    BEGIN                                                 @ 226001
2342000                       U:=E**0.25*FACU+0.000001;                          @ 226001
2343000                       U4:=U*U;                                           @ 226001
2344000                       U4:=U4*U4;                                         @ 226001
2345000                       E:=(1-EXP(-(9.8*PERTOL/PI2)**4/U4*0.63363636))     @ 226001
2346000                       *U4/COEFFE;                                        @ 226001
2347000                       E:=E*1000000;                                      @ 226001
```

```
2348000                    END;                                                  @ 226001
2349000  KLAAR:                                                                 @ 226001
2350000                    EA[I,J]:=IF BOL THEN -E ELSE E;                       @ 226001
2351000  NIETS:                                                                 @ 226001
2352000                 END                                                     @ 226001
2353000              END                                                        @ 226001
2354000              ;                                                          @ 226001
2355000              IF D<0 THEN                                                @ 226001
2356000              BEGIN                                                      @ 226001
2357000                 WIND;                                                   @ 226001
2358000                 D:=-D;                                                  @ 226001
2359000                 KR:=5292C/(U*2CCO);                                     @ 226001
2360000                 WR[I,J]:=FI*10CC0;                                      @ 226001
2361000                 WS[I,J]:=U*10000;                                       @ 226001
2362000                 IF KR GEC 100 THEN                                      @ 226001
2363000                 BEGIN                                                   @ 226001
2364000                    KR:=1CC;                                             @ 226001
2365000                    KG:=99                                               @ 226001
2366000                 END                                                     @ 226001
2367000                 ELSE                                                    @ 226001
2368000                 BEGIN                                                   @ 226001
2369000                    KG:=KR;                                              @ 226001
2370000                    IF KG>KR THEN KG:=KG-1                               @ 226001
2371000                 END                                                     @ 226001
2372000                 ;                                                       @ 226001
2373000              E:=(((HS[KG+1]-HS[KG])*(KR-KG)+HS[KG])*U*U/9.8)**2/16OOCOCO; @ 226001
2374000                 IF D>1000 THEN D:=1000-D;                               @ 226001
2375000                 EA[I,J]:=D*E/100                                        @ 226001
2376000              END                                                        @ 226001
2377000           END                                                           @ 226001
2378000           ;                                                             @ 226001
2379000           FOR J:=1,J+1 WHILE J LEQ 36 DO FOR I:=1,I+1 WHILE I LEQ 17 DC @ 226001
2380000           BEGIN                                                         @ 226001
2381000              D:=DA[I,J];                                                @ 226001
2382000              IF D NEQ 0 THEN                                            @ 226001
2383000              BEGIN                                                      @ 226001
2384000                 WR[I,J]:=WRN[I,J];                                      @ 226001
2385000                 E:=EA[I,J]/100C000;                                     @ 226001
2386000                 U:=WS[I,J]/10000;                                       @ 226001
2387000                 UKW:=U*U;                                               @ 226001
2388000                 E:=ABS(E);                                              @ 226001
2389000                 USTER:=E**0.25*FACU;                                    @ 226001
2390000                 KR:=USTER/U;                                            @ 226001
2391000                 IF KR<0.5 THEN KR:=0.5;                                 @ 226001
2392000                 IF D LEQ 100 THEN                                       @ 226001
2393000                 BEGIN                                                   @ 226001
2394000                    HM:=(-(SQRT(D)-4)*0.02+0.27)*C;                      @ 226001
2395000                    HM:=**(LABNUL+1)/5;                                  @ 226001
2396000                    HSS:=USTER*USTER*0.22/9.8;                           @ 226001
2397000                    IF HSS>HM*0.66667 THEN                               @ 226001
2398000                    KR:=((KR*10-21)*KR+21)/10+(HSS/HM+0.33333)*KR;       @ 226001
2399000                 END;                                                    @ 226001
2400000                 IF KR>1.3 THEN KR:=1.3;                                 @ 226001
2401000                 K:=KR*10C-50;                                           @ 226001
2402000                 IF K GTR 50 THEN CG:=(KR*0.4+0.12)*USTER ELSE           @ 226001
2403000                 BEGIN                                                   @ 226001
2404000                    HULP:=GMOD[K];                                       @ 226001
2405000                    HULP:=LN(HULP)*HULP/(1-HULP)+1.2;                    @ 226001
2406000                    CG:=AMOD[K]*USTER*HULP*2/(DMOD[K]**5*0.0121);        @ 226001
2407000                 END;                                                    @ 226001
2408000                 IF CG>13.7 THEN CG:=13.7;                               @ 226001
2409000                 GSN[I,J]:=CG;                                           @ 226001
2410000              END                                                        @ 226001
2411000              ELSE GSN[I,J]:=0;                                          @ 226001
2412000           END                                                           @ 226001
2413000           ;                                                             @ 226001
2414000           FOR I:=1,I+1 WHILE I LEQ 17 DO                                @ 226001
2415000           BEGIN                                                         @ 226001
2416000              IF I=1 OR I=17 THEN S:=0.9 ELSE S:=1;                      @ 226001
2417000              EA[I,0]:=IF EA[I,1]<0 THEN 0.67*EA[I,1] ELSE S*EA[I,1];    @ 226001
2418000              GSN[I,0]:=GSN[I,1]; WR[I,0]:=WRN[I,1];                     @ 226001
2419000              EA[I,37]:=IF EA[I,36]<0 THEN 0.67*EA[I,36] ELSE S*EA[I,36]; @ 226001
2420000              GSN[I,37]:=GSN[I,36]; WR[I,37]:=WRN[I,36];                 @ 226001
2421000           END                                                           @ 226001
2422000           ;                                                             @ 226001
2423000           FOR J:=1,J+1 WHILE J LEQ 36 DO                                @ 226001
2424000           BEGIN                                                         @ 226001
2425000              IF J=1 OR J=36 THEN S:=0.9 ELSE S:=1;                      @ 226001
2426000              EA[0,J]:=IF EA[1,J]<0 THEN 0.67*EA[1,J] ELSE S*EA[1,J];    @ 226001
2427000              GSN[0,J]:=GSN[1,J]; WR[0,J]:=WRN[1,J];                     @ 226001
```

```
2428000              EA[18,J]:=IF EA[17,J]<0 THEN 0.67*EA[17,J] ELSE S*EA[17,J];   @ 226001
2429000              GSN[18,J]:=GSN[17,J]; WR[18,J]:=WRN[17,J];                    @ 226001
2430000            END                                                             @ 226001
2431000            ;                                                               @ 226001
2432000            EA[0,37]:=EA[0,36]; EA[0,0]:=EA[0,1];                           @ 226001
2433000            GSN[0,37]:=GSN[0,36]; GSN[0,0]:=GSN[0,1];                       @ 226001
2434000            WR[0,37]:=WR[0,36]; WR[0,0]:=WR[0,1];                           @ 226001
2435000            DEINING(72-T,D72,DK72,BR72);                                    @ 226001
2436000            DEINING(66-T,D66,DK66,BR66);                                    @ 226001
2437000            DEINING(60-T,D60,DK60,BR60);                                    @ 226001
2438000            DEINING(54-T,D54,DK54,BR54);                                    @ 226001
2439000            DEINING(48-T,D48,DK48,BR48);                                    @ 226001
2440000            DEINING(42-T,D42,DK42,BR42);                                    @ 226001
2441000            DEINING(36-T,D36,DK36,BR36);                                    @ 226001
2442000            DEINING(30-T,D30,DK30,BR30);                                    @ 226001
2443000            DEINING(24-T,D24,DK24,BR24);                                    @ 226001
2444000            DEINING(18-T,D18,DK18,BR18);                                    @ 226001
2445000            DEINING(12-T,D12,DK12,BR12);                                    @ 226001
2446000            IF 6-T<4 THEN  GO TO ONDER;                                     @ 226001
2447000            DEINING(6-T,D6,DK6,BR6);                                        @ 226001
2448000  ONDER:                                                                    @ 226001
2449000            IF T MOD 6=0 THEN                                               @ 226001
2450000            BEGIN                                                           @ 226001
2451000               % UITVOER ZIERIKZEE                                          @ 226001
2452000               IF FP GEQ -6 AND FP MOD 6 =0 THEN                            @ 226001
2453000               BEGIN                                                        @ 226001
2454000                  WRITE(LPEHZI[SKIP 1]);                                    @ 226001
2455000                  PRINTSNEDE(LPEHZI,S4);                                    @ 226001
2456000                  WRITE(LPEHZI[SKIP 1]);                                    @ 226001
2457000               END;                                                         @ 226001
2458000               % UITVOER WEERKAMER %                                        @ 226001
2459000               IF FP=+12 OR FP=+24 THEN                                     @ 226001
2460000               BEGIN                                                        @ 226001
2461000                  WRITE (LPEHDB[SKIP 1]);                                   @ 226001
2462000                  PRINTSNEDE(LPMAPSCWD,S4);                                 @ 226001
2463000                  IF FP=+12 THEN WRITE(LPMAPSCWD[SKIP 1]);                  @ 528800
2464000               END;                                                         @ 226001
2465000               % UITVOER CWD RESEARCH                                       @ 226001
2466000               IF FP=-6 THEN                                                @ 226001
2467000               BEGIN                                                        @ 226001
2468000                  WRITE(LPRESEARCH[SKIP 1]);                                @ 226001
2469000                  PRINTSNEDE(LPRESEARCH,S1);                                @ 226001
2470000                  WRITE(LPRESEARCH[SPACE 5]);                               @ 226001
2471000               END;                                                         @ 226001
2472000               IF FP MOD 6 =0 THEN UITVOER(D6,DK6);                         @ 226001
2473000               % UITVOER CWD RESEARCH                                       @ 226001
2474000               BEGIN                                                        @ 226001
2475000                  % WRITE(LPRESEARCH[SKIP 1]);                             @ 226001
2476000                  % GRIDKAART(LPRESEARCH);                                 @ 226001
2477000               END;                                                         @ 226001
2478000               IF NDEINING>0 THEN                                           @ 226001
2479000               BEGIN                                                        @ 226001
2480000                  FOR J:=0 STEP 1 UNTIL 5 DO                                @ 226001
2481000                  FOR K:=1 STEP 1 UNTIL NDEINING DO                         @ 226001
2482000                  FOR I:=1 STEP 1 UNTIL 7 DO                                @ 226001
2483000                  BEGIN                                                     @ 226001
2484000                     DC[J,K,I]:=D6[J,K,I];                                  @ 226001
2485000                     D6[J,K,I]:=D12[J,K,I];                                 @ 226001
2486000                     D12[J,K,I]:=D18[J,K,I];                                @ 226001
2487000                     D18[J,K,I]:=D24[J,K,I];                                @ 226001
2488000                     D24[J,K,I]:=D30[J,K,I];                                @ 226001
2489000                     D30[J,K,I]:=D36[J,K,I];                                @ 226001
2490000                     D36[J,K,I]:=D42[J,K,I];                                @ 226001
2491000                     D42[J,K,I]:=D48[J,K,I];                                @ 226001
2492000                     D48[J,K,I]:=D54[J,K,I];                                @ 226001
2493000                     D54[J,K,I]:=D60[J,K,I];                                @ 226001
2494000                     D60[J,K,I]:=D66[J,K,I];                                @ 226001
2495000                     D66[J,K,I]:=D72[J,K,I];                                @ 226001
2496000                     D72[J,K,I]:=0;                                         @ 226001
2497000                     BR0[J,K,I]:=BR6[J,K,I];                                @ 226001
2498000                     BR6[J,K,I]:=BR12[J,K,I];                               @ 226001
2499000                     BR12[J,K,I]:=BR18[J,K,I];                              @ 226001
2500000                     BR18[J,K,I]:=BR24[J,K,I];                              @ 226001
2501000                     BR24[J,K,I]:=BR30[J,K,I];                              @ 226001
2502000                     BR30[J,K,I]:=BR36[J,K,I];                              @ 226001
2503000                     BR36[J,K,I]:=BR42[J,K,I];                              @ 226001
2504000                     BR42[J,K,I]:=BR48[J,K,I];                              @ 226001
2505000                     BR48[J,K,I]:=BR54[J,K,I];                              @ 226001
2506000                     BR54[J,K,I]:=BR60[J,K,I];                              @ 226001
2507000                     BR60[J,K,I]:=BR66[J,K,I];                              @ 226001
```

```
2508000                    BR66[J,K,I]:=BR72[J,K,I];                                  a 226001
2509000                    BR72[J,K,I]:=0;                                            a 226001
2510000                 END;                                                          a 226001
2511000                 FOR J:=0 STEP 1 UNTIL 5 DO                                    a 226001
2512000                 FOR K:=1,2 DO                                                 a 226001
2513000                 FOR I:=1 STEP 1 UNTIL 7 DO                                    a 226001
2514000                 BEGIN                                                         a 226001
2515000                    DK0[J,K,I]:=DK6[J,K,I];                                    a 226001
2516000                    DK6[J,K,I]:=DK12[J,K,I];                                   a 226001
2517000                    DK12[J,K,I]:=DK18[J,K,I];                                  a 226001
2518000                    DK18[J,K,I]:=DK24[J,K,I];                                  a 226001
2519000                    DK24[J,K,I]:=DK30[J,K,I];                                  a 226001
2520000                    DK30[J,K,I]:=DK36[J,K,I];                                  a 226001
2521000                    DK36[J,K,I]:=DK42[J,K,I];                                  a 226001
2522000                    DK42[J,K,I]:=DK48[J,K,I];                                  a 226001
2523000                    DK48[J,K,I]:=DK54[J,K,I];                                  a 226001
2524000                    DK54[J,K,I]:=DK60[J,K,I];                                  a 226001
2525000                    DK60[J,K,I]:=DK66[J,K,I];                                  a 226001
2526000                    DK66[J,K,I]:=DK72[J,K,I];                                  a 226001
2527000                    DK72[J,K,I]:=0                                             a 226001
2528000                 END                                                           a 226001
2529000              END                                                              a 226001
2530000           END;                                                                a 226001
2531000           IF T=6 THEN TELIN:=1008;                                            a 226001
2532000           IF T MOD 6 = 0 THEN ZGUIT;                                          a 226001
2533000           IF T=6 THEN T:=0;                                                   a 226001
2534000        END;                                                                   a 226001
2535000     END                                                                       a 226001
2536000     %GONO2                                                                    a 226001
2537000     ;                                                                         a 226001
2538000                                                                               a 226001
2539000     PROCEDURE GONO3;                                                          a 226001
2540000     BEGIN                                                                     a 226001
2541000        INTEGER K,KO,K1,I,J,I1,J1,KG,KEER,INO,IX,JY,NOEIN,PER1,PER2;           a 226001
2542000        BOOLEAN ZEE,SPLITS,OSPLITS,OEIN48;                                     a 226001
2543000        REAL ETOT,E10,FIO,ADO,TO,T1,T2,TMAX,OEIN,E,FIZ,EZ,ZPLUSO,              a 226001
2544000        DTOT,ZTOT,MZTOT,GEMPER,NORM,PERMAX,DIR1,DIR2;                          a 226001
2545000        ARRAY ENZ[0:7],EN,RI[0:5],M[0:6,0:14];                                 a 226001
2546000        EBCDIC VALUE ARRAY CYF("0123456789");                                  a 226001
2547000        EBCDIC ARRAY                                                           a 226001
2548000        R,RR,R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11[0:68],TR[0:2];                 a 226001
2549000        LABEL SCHRIJF;                                                         a 226001
2550000                                                                               a 226001
2551000        PROCEDURE H2(A); VALUE A; REAL A;                                      a 226001
2552000        BEGIN                                                                  a 226001
2553000           INTEGER N,M;                                                        a 226001
2554000           M:=A; N:=M DIV 10;                                                  a 226001
2555000           IF N=0 THEN REPLACE TR[0] BY " " FOR 1                              a 226001
2556000           ELSE REPLACE TR[0] BY CYF[N] FOR 1;                                 a 226001
2557000           N:=-10*N+M;                                                         a 226001
2558000           REPLACE TR[1] BY CYF[N] FOR 1;                                      a 226001
2559000        END                                                                    a 226001
2560000        H2;                                                                    a 226001
2561000                                                                               a 226001
2562000        PROCEDURE H3(A); VALUE A; REAL A;                                      a 226001
2563000        BEGIN                                                                  a 226001
2564000           INTEGER N,K,L,M;                                                    a 226001
2565000           M:=A; N:=M DIV 100;                                                 a 226001
2566000           IF N=0 THEN REPLACE TR[0] BY " " FOR 1                              a 226001
2567000           ELSE REPLACE TR[0] BY CYF[N] FOR 1;                                 a 226001
2568000           L:=(-100*N+M); K:=L DIV 10;                                         a 226001
2569000           IF N=0 AND K=0 THEN REPLACE TR[1] BY " " FOR 1                      a 226001
2570000           ELSE REPLACE TR[1] BY CYF[K] FOR 1;                                 a 226001
2571000           N:=-10*K+L;                                                         a 226001
2572000           REPLACE TR[2] BY CYF[N] FOR 1;                                      a 226001
2573000        END                                                                    a 226001
2574000        H3;                                                                    a 226001
2575000                                                                               a 226001
2576000        PROCEDURE EN1C(OE,T);                                                  a 226001
2577000        INTEGER T; INTEGER ARRAY OE[*,*,*];                                    a 226001
2578000        BEGIN                                                                  a 226001
2579000           INTEGER I,J; REAL ADO,HULP;                                         a 226001
2580000           HULP:=0;                                                            a 226001
2581000           FOR J:=0 STEP 1 UNTIL 5 DO                                          a 226001
2582000           FOR I:=3 STEP 1 UNTIL 7 DO                                          a 226001
2583000           BEGIN                                                               a 226001
2584000              ADO:=OE[J,KO,I]; HULP:=(ADO-(ADO DIV 1))*1000000+HULP;           a 226001
2585000           END;                                                                a 226001
2586000           IF HULP>50 THEN                                                     a 226001
2587000           WRITE(TX,</,"VERWACHTING E10 OVER",I4," UUR MINSTENS"               a 226001
```

```
2588000          ,I7>,T+24,HULP)                                                    @ 226001
2589000       END                                                                   @ 226001
2590000       E10;                                                                  @ 226001
2591000                                                                             @ 226001
2592000       PROCEDURE TABEL(K,T); INTEGER K,T;                                    @ 226001
2593000       BEGIN                                                                 @ 226001
2594000          INTEGER I,J; REAL HULP;                                            @ 226001
2595000          FOR I:=0 STEP 1 UNTIL 7 DO ENZ[I]:=ZEEGAN[I,K];                    @ 226001
2596000          I1:=OP[K,1];                                                       @ 226001
2597000          J1:=OP[K,2];                                                       @ 226001
2598000          FI:=ARCTAN((I1+1.45)/(56.6-J1))*360/PI2;                           @ 226001
2599000          WRITE(TX,</,/,"DEINING VERWACHTING OP POSITIE",I4,I3>,             @ 226001
2600000          I1,J1);                                                            @ 226001
2601000          IF I1=13 AND J1=4  THEN WRITE(TX,<"  EUROPOORT">);                 @ 226001
2602000          IF I1=12 AND J1=6 THEN WRITE(TX,<"   PENNZOIL ">);                 @ 226001
2603000          WRITE(TX,</,"DATUM",I10," +",I3,/>,DTG,T);                         @ 226001
2604000          FIZ:=WR[I1,J1]/10000*360/PI2; ETOT:=0; E10:=0;                     @ 226001
2605000          FIZ:=FI0:=(FIZ+FI+180) MOD 360;                                    @ 226001
2606000          WRITE(TX,<"PER  EN-DDD  EN-DDD  EN-DDD",                           @ 226001
2607000          "  EN-DDD  EN-DDD  EN-DDD  ZEEGANG",                               @ 226001
2608000          " TOTAAL">,);                                                      @ 226001
2609000          FOR I:=1 STEP 1 UNTIL 7 DO                                         @ 226001
2610000          BEGIN                                                              @ 226001
2611000             ESOM:=EZ:=0;                                                    @ 226001
2612000             IF ENZ[I]>1 THEN                                                @ 226001
2613000             BEGIN                                                           @ 226001
2614000                EZ:=ENZ[I]; UITSPLITS(EZ,FIZ,K,I,EN,RI,DO)                   @ 226001
2615000             END                                                             @ 226001
2616000             ELSE                                                            @ 226001
2617000             BEGIN                                                           @ 226001
2618000                FOR J:=0 STEP 1 UNTIL 5 DO                                   @ 226001
2619000                BEGIN                                                        @ 226001
2620000                   ADO:=CO[J,K,I]; RI[J]:=ADC CIV 1;                         @ 226001
2621000                   EN[J]:=(ADO-RI[J])*1000000; ESOM:=+ESOM+EN[J]             @ 226001
2622000                END                                                          @ 226001
2623000             END;                                                            @ 226001
2624000             ETOT:=+ESOM; IF I>2 THEN E10:=+ESOM;                            @ 226001
2625000             IF EZ < 0.5 THEN FI0:=0;                                        @ 226001
2626000             FOR J:=0 STEP 1 UNTIL 5 DO                                      @ 226001
2627000             IF EN[J] GEQ 999.5 THEN EN[J]:=999;                             @ 226001
2628000             IF I<6 THEN                                                     @ 226001
2629000             BEGIN                                                           @ 226001
2630000                IF ESOM LSS 0.55 THEN WRITE(TX,<I3>,5+I*2) ELSE              @ 226001
2631000                WRITE(TX,<I3,6(I4,":",I3),I5,":",I3,I7>,5+I*2,               @ 226001
2632000                FOR J:=0 STEP 1 UNTIL 5 DO [EN[J],RI[J]],                    @ 226001
2633000                EZ,FI0,ESOM);                                                @ 226001
2634000             END;                                                            @ 226001
2635000          END;                                                               @ 226001
2636000          HULP:=ETOT+ENZ[0];                                                 @ 226001
2637000          IF HULP<ABS(EA[I1,J1])/100 THEN                                    @ 226001
2638000          HULP:=ABS(EA[I1,J1])/100;                                          @ 226001
2639000          WRITE(TX,<"SIGNIFICANTE GOLFHOOGTE:",F7.1>,                        @ 226001
2640000          SQRT(HULP)/25);                                                    @ 226001
2641000          WRITE(TX,<"ENERGIE BOVEN 10 SEC:",I8>,E10);                        @ 226001
2642000          IF I1=13 AND J1=4 THEN                                             @ 226001
2643000          BEGIN                                                              @ 226001
2644000             IF E10>10 THEN                                                  @ 226001
2645000             BEGIN                                                           @ 226001
2646000                IF E10>150 THEN                                              @ 226001
2647000                WRITE(TX,<X25,"+++++++      WAARSCHUWING      ",           @ 226001
2648000                "+++++++">,)                                                 @ 226001
2649000                ELSE                                                         @ 226001
2650000                WRITE(TX,<X25,"+++++++      ATTENTIE      +++++++">,)       @ 226001
2651000             END                                                             @ 226001
2652000          END;                                                               @ 226001
2653000       END                                                                   @ 226001
2654000       TABEL;                                                                @ 226001
2655000                                                                             @ 226001
2656000                                                                             @ 226001
2657000       PROCEDURE MTABEL(I1,J1,K); VALUE I1,J1; INTEGER I1,J1,K;              @ 226001
2658000       BEGIN                                                                 @ 226001
2659000          INTEGER I,J; REAL HULP;                                            @ 226001
2660000          FOR I:=0 STEP 1 UNTIL 7 DO ENZ[I]:=ZEEGAN[I,K];                    @ 226001
2661000          FI:=ARCTAN((I1+1.45)/(56.6-J1))*360/PI2;                           @ 226001
2662000          FIZ:=WR[I1,J1]/10000*360/PI2; ETOT:=0; E10:=0;                     @ 226001
2663000          FIZ:=FI0:=(FIZ+FI+180) MOD 360;                                    @ 226001
2664000          FOR I:=1 STEP 1 UNTIL 7 DO                                         @ 226001
2665000          BEGIN                                                              @ 226001
2666000             ESOM:=EZ:=0;                                                    @ 226001
2667000             IF ENZ[I]>1 THEN                                                @ 226001
```

```
2668000            BEGIN                                                                  a 226001
2669000               EZ:=ENZ[I]; UITSPLITS(EZ,FIZ,K,I,EN,RI,DO)                          a 226001
2670000            END                                                                    a 226001
2671000            ELSE                                                                   a 226001
2672000            BEGIN                                                                  a 226001
2673000               FOR J:=0 STEP 1 UNTIL 5 DO                                          a 226001
2674000               BEGIN                                                               a 226001
2675000                  ADO:=CO[J,K,I]; RI[J]:=ADO DIV 1;                                a 226001
2676000                  EN[J]:=(ADO-RI[J])*1000000; ESOM:=+EN[J]                         a 226001
2677000               END                                                                 a 226001
2678000            END;                                                                   a 226001
2679000            ETOT:=+ESOM; IF I>2 THEN E10:=+ESOM;                                   a 226001
2680000            M[I-1,14]:=ESOM;                                                       a 226001
2681000            IF EZ < 0.5 THEN                                                       a 226001
2682000            BEGIN                                                                  a 226001
2683000               M[I-1,12]:=0; M[I-1,13]:=0                                          a 226001
2684000            END                                                                    a 226001
2685000            ELSE                                                                   a 226001
2686000            BEGIN                                                                  a 226001
2687000               M[I-1,12]:=EZ; M[I-1,13]:=FIO                                       a 226001
2688000            END;                                                                   a 226001
2689000            FOR J:=0 STEP 1 UNTIL 5 DO                                             a 226001
2690000            BEGIN                                                                  a 226001
2691000               M[I-1,2*J]:=EN[J]; M[I-1,2*J+1]:=RI[J]                              a 226001
2692000            END;                                                                   a 226001
2693000         END;                                                                      a 226001
2694000         HULP:=ETOT+ENZ[0];                                                        a 226001
2695000         IF HULP<ABS(EA[I1,J1])/100 THEN                                           a 226001
2696000         HULP:=ABS(EA[I1,J1])/100;                                                 a 226001
2697000         ZPLUSO:=SQRT(HULP)/25;                                                    a 226001
2698000      END                                                                          a 226001
2699000      MTABEL;                                                                      a 226001
2700000                                                                                   a 226001
2701000      PROCEDURE TELEXHEADING(TX,BESTEMMING);                                       a 226001
2702000      VALUE BESTEMMING;REAL BESTEMMING;FILE TX;                                    a 528800
2703000      BEGIN                                                                        a 226001
2704000         IF DEIN48 AND TELEXTRUE THEN ELSE
2705000         WRITE(TX,<"ZCZC 00000"/A18/>,TXLINE);
2706000         IF BESTEMMING=ROUTERING THEN
2707000         WRITE(TX,<//"FORECAST NORTHSEAPLATFORMS"/
2708000         "POSITION 13, 4=EUROPOORT  =LOCATION P-17    "/
2709000         "POSITION 13, 5=IJMUIDEN   =LOCATION P-9,0-7 "/
2710000         "POSITION 13, 6=TEXEL      =LOCATION L-13    "/
2711000         "POSITION 12, 6=PENNZOIL   =LOCATION K-13    "/
2712000         "POSITION 14, 7=AMELAND    =LOCATION M-8     "/
2713000         "POSITION 10,10=AUK/EKOFISK                  "/>
2714000          BESTEMMING);
2715000         IF DEIN48 THEN                                                            a 226001
2716000         BEGIN                                                                     a 226001
2717000            WRITE(TX[SPACE 2]);                                                    a 226001
2718000            WRITE(TX,<"RESULTING SWELL ABOVE 6 SEC FOR",                           a 226001
2719000            I10,"+48"/" AS COMPUTED FROM WAVECHART",                               a 226001
2720000            I10,"+24">,DTG,DTG);                                                   a 226001
2721000         END;                                                                      a 226001
2722000      END                                                                          a 226001
2723000      OF TELEXHEADING;                                                             a 226001
2724000                                                                                   a 226001
2725000      THRU (FP DIV 12) DO                                                          a 226001
2726000      BEGIN                                                                        a 226001
2727000         BEGIN
2728000            REPLACE TXLINE BY " " FOR 256;                                         a 226001
2729000            REPLACE TXLINE BY "FXNL46 EHDB",                                       a 226001
2730000            (DTG MOD 10000)*100 FOR 6 DIGITS;                                      a 226001
2731000
2732000
2733000            TELEXHEADING(NTX,NOORDZEEMET) ;
2734000            TELEXTRUE:=TRUE;
2735000            IF DEIN48 THEN
2736000            BEGIN
2737000               TELEXTRUE:=FALSE;
2738000               REPLACE BESTEMMING BY " " FOR 31;
2739000               REPLACE BESTEMMING BY "NAAR ROUTERING";
2740000               TELEXHEADING(RTX,ROUTERING);
2741000               TELEXTRUE:=TRUE;
2742000            END
2743000            ELSE
2744000            BEGIN
2745000               TELEXTXOPEN;
2746000               WRITE(TX,<"BESTEMD VOOR : ZESTIENHOVEN"/
2747000               X14,"RIJKSWATERSTAAT CC TELEX 33028"/
```

```
2748000              "VERWACHTING ZEEGANG EN DEINING"//>);                                  @ 226001
2749000           END;                                                                      @ 226001
2750000        END;                                                                         @ 226001
2751000     KEER:=0; IND:=11; SPLITS:=FALSE;                                                @ 226001
2752000     REPLACE R1 BY "POSITION              " FOR 20;                                  @ 226001
2753000     IF NOT DEIN48 THEN                                                              @ 226001
2754000     BEGIN                                                                           @ 226001
2755000        K:=K0:=K1:=0;                                                                @ 226001
2756000        FOR K:=K+1 WHILE K LEQ NDEINING DO                                           @ 226001
2757000        BEGIN                                                                        @ 226001
2758000           IF DP[K,1]=13 AND DP[K,2]=4 THEN K0:=K;                                   @ 226001
2759000           IF DP[K,1]=12 AND DP[K,2]=6 THEN K1:=K                                    @ 226001
2760000        END;                                                                         @ 226001
2761000        BEGIN                                                                        @ 226001
2762000           FOR I:=K0,K1 DO IF I>0 THEN TABEL[I,FP);                                  @ 226001
2763000        END;                                                                         @ 226001
2764000        WRITE(NTX[SPACE 1]);                                                         @ 226001
2765000        WRITE(NTX,<"FORECAST",I10," + ",I2," GMT">,DTG,FP);                          @ 226001
2766000        WRITE(NTX[SPACE 1]);                                                         @ 226001
2767000        REPLACE R2 BY "E  WIND AT 10 M(KTS)" FOR 20;                                 @ 226001
2768000        REPLACE R3 BY "F       AT 30 M     " FOR 20;                                 @ 226001
2769000        REPLACE R4 BY "        AT 40 M     " FOR 20;                                 @ 226001
2770000        REPLACE R5 BY "        AT 50/60 M  " FOR 20;                                 @ 226001
2771000        REPLACE R6 BY "G  SIGN WAVE HT(M)  " FOR 20;                                 @ 226001
2772000        REPLACE R7 BY "H  SIGN WAVE PER(S) " FOR 20;                                 @ 226001
2773000        REPLACE R8 BY "I  MAX  WAVE HT(M)  " FOR 20;                                 @ 226001
2774000        REPLACE R9 BY "J  EXTR WAVE HT(M)  " FOR 20;                                 @ 226001
2775000     END;                                                                            @ 226001
2776000     REPLACE R10 BY "K  SWELL DIR AND HT " FOR 20;                                   @ 226001
2777000     REPLACE R11 BY "L  SWELL MAX PER    " FOR 20;                                   @ 226001
2778000     REPLACE R BY "2ND COMP SWELL       " FOR 20;                                    @ 226001
2779000     REPLACE RR BY "2ND COMP SWELL      " FOR 20;                                    @ 226001
2780000     FOR NDEIN:=1 STEP 1 UNTIL 10 DO                                                 @ 226001
2781000     IF NDP[NDEIN,1]<0 OR NDEIN=10 THEN                                              @ 226001
2782000     BEGIN                                                                           @ 226001
2783000        IF NDP[NDEIN,1]>0 THEN GO TO SCHRIJF;                                        @ 226001
2784000        KEER:=KEER+1; IND:=KEER+9; DSPLITS:=FALSE;                                   @ 226001
2785000        IX:=DP[NDEIN,1]; JY:=DP[NDEIN,2];                                            @ 226001
2786000        IF DEIN48 THEN                                                               @ 226001
2787000        BEGIN                                                                        @ 226001
2788000           FOR I:=0 STEP 1 UNTIL 5 DO                                                @ 226001
2789000           FOR J:=1 STEP 1 UNTIL 7 DO                                                @ 226001
2790000           DO[I,NDEIN,J]:=D24[I,NDEIN,J];                                            @ 226001
2791000           FOR I:=0 STEP 1 UNTIL 9 DO ZEEGAN[I,NDEIN]:=0;                            @ 226001
2792000        END;                                                                         @ 226001
2793000        MTABEL(IX,JY,NDEIN);                                                         @ 226001
2794000        U:=WS[IX,JY]/5000;                                                           @ 226001
2795000        H2(IX); REPLACE R1[IND] BY "   ",TR FOR 2,"  ";                            @ 226001
2796000        KG:=IND+7;                                                                   @ 226001
2797000        H2(JY); REPLACE R1[KG] BY TR FOR 2;                                          @ 226001
2798000        IF NOT DEIN48 THEN                                                           @ 226001
2799000        BEGIN                                                                        @ 226001
2800000           H3(F10); IF TR[0]=" " THEN                                                @ 226001
2801000           BEGIN                                                                     @ 226001
2802000              REPLACE TR[0] BY "0" FOR 1;                                            @ 226001
2803000              IF TR[1]=" " THEN REPLACE TR[1] BY "0" FOR 1;                          @ 226001
2804000           END;                                                                      @ 226001
2805000           REPLACE R2[IND] BY "   ",TR FOR 3,"/"; KG:=IND+7;                         @ 226001
2806000           H2(U); REPLACE R2[KG] BY TR FOR 2;                                        @ 226001
2807000           H2(1.15*U); REPLACE R3[IND] BY "       ",TR FOR 2;                        @ 226001
2808000           H2(1.20*U); REPLACE R4[IND] BY "       ",TR FOR 2;                        @ 226001
2809000           H2(1.25*U); REPLACE R5[IND] BY "       ",TR FOR 2;                        @ 226001
2810000           H3(10*ZPLUSD); REPLACE R6[INC] BY "     ",TR FOR 2,".",                  @ 226001
2811000           TR[2] FOR 1;                                                              @ 226001
2812000        END;                                                                         @ 226001
2813000        NORM:=ZEEGAN[0,NDEIN];                                                       @ 226001
2814000        TMAX:=ZEEGAN[9,NDEIN];                                                       @ 226001
2815000        IF TMAX<6 THEN GEMPER:=ZEEGAN[8,NDEIN]*NORM                                  @ 226001
2816000        ELSE GEMPER:=5*NORM;                                                         @ 226001
2817000        J:=(TMAX/2 DIV 1)-3; IF J<0 THEN J:=-1;                                      @ 226001
2818000        ZTOT:=DTOT:=MZTOT:=0;                                                        @ 226001
2819000        FOR I:=0 STEP 1 UNTIL 6 DO                                                   @ 226001
2820000        BEGIN                                                                        @ 226001
2821000           HULP:=M[I,14]; NORM:=ZTOT+HULP; GEMPER:=ZTOT+(I*2+7)*HULP;                @ 226001
2822000           HULP:=M[I,12];                                                            @ 226001
2823000           ZTOT:=ZTOT+HULP;                                                          @ 226001
2824000           IF I>J THEN MZTOT:=ZTOT-HULP*M[I,14]                                      @ 226001
2825000           ELSE                                                                      @ 226001
2826000           BEGIN                                                                     @ 226001
2827000              DTOT:=ZTOT-HULP; HULP:=M[I,14];                                        @ 226001
```

```
2828000                 IF HULP>10 THEN PERMAX:=I*2+7;                                  @ 226001
2829000                 DTOT:=*+HULP;                                                   @ 226001
2830000              END                                                                @ 226001
2831000           END;                                                                  @ 226001
2832000           IF NOT OEIN48 THEN                                                    @ 226001
2833000           BEGIN                                                                 @ 226001
2834000              GEMPER:=*/NORM;                                                    @ 226001
2835000              H3(10*GEMPER); REPLACE R7[IND] BY "      ",TR FOR 2,".",        @ 226001
2836000              TR[2] FOR 1;                                                       @ 226001
2837000              H3(17*ZPLUSD); REPLACE R8[IND] BY "      ",TR FOR 2,".",        @ 226001
2838000              TR[2] FOR 1;                                                       @ 226001
2839000              IF U>47 THEN                                                       @ 226001
2840000              BEGIN                                                              @ 226001
2841000                 H3(20*ZPLUSD); REPLACE R9[IND] BY "      ",TR FOR 2,"."      @ 226001
2842000                 ,TR[2] FOR 1;                                                  @ 226001
2843000              END                                                                @ 226001
2844000              ELSE REPLACE R9[IND] BY " " FOR 9;                                 @ 226001
2845000           END;                                                                  @ 226001
2846000           DIR1:=DIR2:=-10;                                                      @ 226001
2847000           IF J>1 THEN I:=J-1 ELSE I:=0;                                         @ 226001
2848000           IF J GEQ 0 THEN                                                       @ 226001
2849000           BEGIN                                                                 @ 226001
2850000              HULP:=5; IF J GEQ 0 THEN PER1:=2*J+8;                              @ 226001
2851000              FOR K:=0 STEP 2 UNTIL 10 DO                                        @ 226001
2852000              IF M[I,K]>HULP THEN                                                @ 226001
2853000              BEGIN                                                              @ 226001
2854000                 HULP:=M[I,K]; DIR1:=M[I,K+1];                                   @ 226001
2855000              END;                                                               @ 226001
2856000           END;                                                                  @ 226001
2857000           HULP:=5;                                                              @ 226001
2858000           I:=J; FOR I:=*+1 WHILE I LEQ 6 DO                                     @ 226001
2859000           FOR K:=0 STEP 2 UNTIL 10 DO                                           @ 226001
2860000           BEGIN                                                                 @ 226001
2861000              NORM:=M[I,K];                                                      @ 226001
2862000              IF NORM>5 THEN PER2:=2*I+8;                                        @ 226001
2863000              IF NORM>HULP THEN                                                  @ 226001
2864000              BEGIN                                                              @ 226001
2865000                 HULP:=NORM; DIR2:=M[I,K+1];                                     @ 226001
2866000              END;                                                               @ 226001
2867000           END;                                                                  @ 226001
2868000           IF 4*DTOT>ZTOT THEN                                                   @ 226001
2869000           BEGIN                                                                 @ 226001
2870000              IF DTOT<100 THEN DIR1:=-10                                         @ 226001
2871000           END;                                                                  @ 226001
2872000           IF MZTOT<100 THEN DIR2:=-10;                                          @ 226001
2873000           IF DIR1<0 THEN                                                        @ 226001
2874000           BEGIN                                                                 @ 226001
2875000              IF DIR2>0 THEN                                                     @ 226001
2876000              BEGIN                                                              @ 226001
2877000                 PER1:=PER2; DIR1:=DIR2                                          @ 226001
2878000              END                                                                @ 226001
2879000           END                                                                   @ 226001
2880000           ELSE                                                                  @ 226001
2881000           BEGIN                                                                 @ 226001
2882000              IF DIR2>0 THEN                                                     @ 226001
2883000              BEGIN                                                              @ 226001
2884000                 IF MZTOT>DTOT/2 OR MZTOT>600 THEN                               @ 226001
2885000                 BEGIN                                                           @ 226001
2886000                    PER1:=PER2; DIR1:=DIR2                                       @ 226001
2887000                 END                                                             @ 226001
2888000                 ELSE                                                            @ 226001
2889000                 BEGIN                                                           @ 226001
2890000                    HULP:=ABS(DIR1-DIR2);                                        @ 226001
2891000                    IF HULP>45 AND HULP<315 THEN                                 @ 226001
2892000                    BEGIN                                                        @ 226001
2893000                       DSPLITS:=TRUE; SPLITS:=TRUE;                              @ 226001
2894000                    END                                                          @ 226001
2895000                 END                                                             @ 226001
2896000              END                                                                @ 226001
2897000           END;                                                                  @ 226001
2898000           IF DSPLITS THEN                                                       @ 226001
2899000           BEGIN                                                                 @ 226001
2900000              H3(DIR1); IF TR[0]=" " THEN                                        @ 226001
2901000              BEGIN                                                              @ 226001
2902000                 REPLACE TR[0] BY "0" FOR 1;                                     @ 226001
2903000                 IF TR[1]=" " THEN REPLACE TR[1] BY "0" FOR 1;                   @ 226001
2904000              END;                                                               @ 226001
2905000              REPLACE R10[IND] BY " ",TR FOR 3,"/"; KG:=IND+5;                   @ 226001
2906000              H3(SQRT(DTOT)*40/100); REPLACE R10[KG] BY TR FOR 2,"."             @ 226001
2907000              ,TR[2] FOR 1;                                                      @ 226001
```

```
2908000                 H3(DIR2); IF TR[0]=" " THEN                                          @ 226001
2909000                 BEGIN                                                                @ 226001
2910000                    REPLACE TR[0] BY "0" FOR 1;                                       @ 226001
2911000                    IF TR[1]=" " THEN REPLACE TR[1] BY "0" FOR 1;                     @ 226001
2912000                 END;                                                                 @ 226001
2913000                 REPLACE R[IND] BY " ",TR FOR 3,"/"; KG :=IND+5;                      @ 226001
2914000                 H3(SQRT(MZTOT)*40/100); REPLACE R[KG] BY TR FOR 2,".",               @ 226001
2915000                 TR[2] FOR 1;                                                         @ 226001
2916000                 H2(PER1); REPLACE R11[IND] BY "       ",TR FOR 2;                    @ 226001
2917000                 H2(PER2); REPLACE RR[IND] BY "       ",TR FOR 2;                     @ 226001
2918000              END                                                                     @ 226001
2919000              ELSE                                                                    @ 226001
2920000              BEGIN                                                                   @ 226001
2921000                 REPLACE R[IND] BY " " FOR 9;                                         @ 226001
2922000                 REPLACE RR[IND] BY " " FOR 9;                                        @ 226001
2923000                 IF DIR1>0 THEN                                                       @ 226001
2924000                 BEGIN                                                                @ 226001
2925000                    H3(DIR1); IF TR[0]=" " THEN                                       @ 226001
2926000                    BEGIN                                                             @ 226001
2927000                       REPLACE TR[0] BY "0" FOR 1;                                    @ 226001
2928000                       IF TR[1]=" " THEN REPLACE TR[1] BY "0" FOR 1;                  @ 226001
2929000                    END;                                                              @ 226001
2930000                    REPLACE R10[IND] BY " ",TR FOR 3,"/"; KG:=IND+5;                  @ 226001
2931000                    H3(SQRT(DTOT+MZTOT)*40/100); REPLACE R10[KG] BY TR                @ 226001
2932000                    FOR 2,".",TR[2] FOR 1;                                            @ 226001
2933000                    H2(PER1); REPLACE R11[IND] BY "       ",TR FOR 2;                 @ 226001
2934000                 END                                                                  @ 226001
2935000                 ELSE                                                                 @ 226001
2936000                 BEGIN                                                                @ 226001
2937000                    REPLACE R10[IND] BY " " FOR 9;                                    @ 226001
2938000                    REPLACE R11[IND] BY " " FOR 9;                                    @ 226001
2939000                 END                                                                  @ 226001
2940000              END;                                                                    @ 226001
2941000 SCHRIJF:                                                                            @ 226001
2942000              IF KEER>0 AND (KEER=5 OR NDEIN=10) THEN                                 @ 226001
2943000              BEGIN                                                                   @ 226001
2944000                 I:=9*KEER+20;                                                        @ 226001
2945000        WRITE(NTX,I,R1);                                                             @ 226001
2946000                 IF DEIN48 THEN                                                       @ 226001
2947000                 BEGIN                                                                @ 226001
2948000                    WRITE(RTX,I,R1);                                                  @ 226001
2949000                    WRITE(RTX,I,R10);                                                 @ 226001
2950000                    IF SPLITS THEN WRITE(RTX,I,R);                                    @ 226001
2951000                    WRITE(RTX,I,R11);                                                 @ 226001
2952000                    IF SPLITS THEN WRITE(RTX,I,RR);                                   @ 226001
2953000                    WRITE(RTX[SPACE 1]);                                              @ 226001
2954000                 END                                                                  @ 226001
2955000                 ELSE                                                                 @ 226001
2956000                 BEGIN                                                                @ 226001
2957000                    WRITE(NTX,I,R2); REPLACE R2[20] BY " " FOR 49;                    @ 226001
2958000                    WRITE(NTX,I,R3); REPLACE R3[20] BY " " FOR 49;                    @ 226001
2959000                    WRITE(NTX,I,R4); REPLACE R4[20] BY " " FOR 49;                    @ 226001
2960000                    WRITE(NTX,I,R5); REPLACE R5[20] BY " " FOR 49;                    @ 226001
2961000                    WRITE(NTX,I,R6); REPLACE R6[20] BY " " FOR 49;                    @ 226001
2962000                    WRITE(NTX,I,R7); REPLACE R7[20] BY " " FOR 49;                    @ 226001
2963000                    WRITE(NTX,I,R8); REPLACE R8[20] BY " " FOR 49;                    @ 226001
2964000                    WRITE(NTX,I,R9); REPLACE R9[20] BY " " FOR 49;                    @ 226001
2965000                 END;                                                                 @ 226001
2966000        REPLACE R1[20] BY " " FOR 49;                                                 @ 226001
2967000                 WRITE(NTX,I,R10); REPLACE R10[20] BY " " FOR 49;                     @ 226001
2968000                 IF SPLITS THEN WRITE(NTX,I,R); REPLACE R[20] BY " "                  @ 226001
2969000                 FOR 49;                                                              @ 226001
2970000                 WRITE(NTX,I,R11); REPLACE R11[20] BY " " FOR 49;                     @ 226001
2971000                 IF SPLITS THEN WRITE(NTX,I,RR); REPLACE RR[20] BY " "                @ 226001
2972000                 FOR 49;                                                              @ 226001
2973000                 WRITE(NTX[SPACE 1]); IND:=11; KEER:=0; SPLITS:=FALSE;                @ 226001
2974000              END;                                                                    @ 226001
2975000           END;                                                                       @ 226001
2976000           IF FP=24 AND NOT DEIN48 THEN                                               @ 226001
2977000           BEGIN                                                                      @ 226001
2978000              IF KO NEQ 0 THEN                                                        @ 226001
2979000              BEGIN                                                                   @ 226001
2980000                 EN10(D6,6);                                                          @ 226001
2981000                 EN10(D12,12);                                                        @ 226001
2982000                 EN10(D18,18);                                                        @ 226001
2983000                 EN10(D24,24);                                                        @ 226001
2984000                 EN10(D30,30);                                                        @ 226001
2985000                 EN10(D36,36);                                                        @ 226001
2986000                 EN10(D42,42);                                                        @ 226001
2987000                 EN10(D48,48);                                                        @ 226001
```

```
2988000                EN10(054,54);
2989000                EN10(060,60);
2990000                EN10(066,66);
2991000                DEIN48:=TRUE;
2992000             END;
2993000          END;                                                          @ 226001
2994000          K:=DATUM MOD 10;                                              @ 226001
2995000       END;                                                             @ 226001
2996000       WRITE(TX,<///"EINDE EN GEGROET",///"NNNN">);                     @ 226001
2997000       IF BACKUPDATE(DTG,FP)=ENDDTG THEN WRITE(NTX,<///"NNNN">);        @ 528800
2998000       IF FP=24 THEN WRITE(RTX,</////"NNNN">);                          @ 528800
2999000    END                                                                 @ 226001
3000000    GONO3;                                                              @ 226001
3001000                                                                        @ 226001
3002000    %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%  @ 226001
3003000    %%%%%          M A I N     P R O G R A M                  %%%%%   @ 226001
3004000    %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%  @ 226001
3005000                                                                        @ 226001
3006000    IF GONOSTART THEN                                                   @ 226001
3007000    FOR DATUM:=BEGINDTG,BACKUPDATE(DATUM,3) WHILE DATUM LEQ ENDDTG DO   @ 226001
3008000    BEGIN                                                               @ 226001
3009000       GONO1;                                                           @ 226001
3010000       IF DATUM NEQ BEGINDTG THEN GONO2;                                @ 226001
3011000       IF FP=+12 OR FP=+24 THEN GONO3;                                  @ 226001
3012000       IF DATUM MOD 100 MOD 6=0 THEN                                    @ 226001
3013000       RECOVERY[1]:=DATUM;                                              @ 226001
3014000       WRITE(RECOVER[0],30,RECOVERY);                                   @ 226001
3015000       WAIT(RECOVERY);                                                  @ 226001
3016000    END;                                                                @ 226001
3017000 EXIT:                                                                  @ 226001
3018000 END.                                                                   @ 226001
3019000                                                                        @ 226001
3020000                                                                        @ 226001
```