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THE ANALYSIS OF WAVE RECORDS USING AN I.B.M. 1800 COMPUTER

BY

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SECTION 1

Introduction

Over the past few years, the Institute of Oceanographic Sciences has been obtaining a collection of wave records from various stations around the British Isles, with a view to assisting civil engineers and others in their quest for suitable sites for oil rigs, harbours, lighthouse stations and the Channel Tunnel etc. The number of requests for such information has increased so rapidly in the last year or so, that at present about 30,000 records must be analysed per year in order to make full use of the 9 ship-borne wave recorders which are at present in use around the coast of Great Britain.

With the installation of an I.B.M. 1800 Computer at Wormley in June 1968 and on the Royal Research Ship "Discovery" in January 1969, the computerisation of this wave analysis was considered a necessity.

The computer at Wormley consisted of a core store of 32K words each of 16 bits, 3 magnetic disk drives, 2 magnetic tape decks, 1 card reader/punch, 1 lineprinter, 1 graph plotter and 1 typewriter/keyboard at the time that the programs described in this report were written.

The I.B.M. 1800 system described above operates under the Multiprogramming Executive Software System (M.P.X.). M.P.X. consists of a Fortran compiler, Assembler, Subroutine Library, Nonprocess monitor and Disk utility program etc. M.P.X. is responsible for the production of object coding from Fortran source statements and for building these object programs into executable coreloads. When these coreloads are executed, M.P.X. controls all input/output including the linkaging of the various sections of programs stored on disk which may be too large to fit into core as a single core load.

SECTION 2

Summary of Wave Analysis System

In order to analyse any wave records using the programs described in this report, several programs and data files have to be set up on disk.

Disk drive Ø is always used as a system drive at Wormley, leaving drive 1 free to contain all the necessary programs and drive 2 for the data files. The disk used on drive 1 is defined as having 150 cylinders of relocatable area, The program SBWRØ must be loaded to the relocatable area; while the programs MALIS, LISTØ, CORR2, CORR3, SETLA, WAST, READW, HSLOT, PERS, HPLOT, TPLOT, SWPLT, SCATP, PERP and DUMP are loaded to the fixed area. The subroutines DCORF and HEAD (used by SBWRØ), INCR and PRINT (used by CORR2 and LISTØ respectively), and TITLE (used by CORR3) are stored in the relocatable area on drive Ø. Several data files are required by this system, and they are set up on a drive 2 disk with 199 cylinders of fixed area as follows: TZ - 4 sectors, HS - 4 sectors, SWPA - 1 sector, HSG - 1Ø sectors, SCAT - 5 sectors, and a series of 4Ø files, each of 1 sector, called PEØ2, PEØ4.......PE8Ø. The remaining fixed area is used to store up to 2 files each of 430_{10} sectors. These files contain the output from SBWRØ and their names usually bear some resemblance to the names of the wave stations which are being analysed. It is assumed that at least one of these files will have been stored on magnetic tape by CORR3 before a third data file is required, in which case the obsolete file will be deleted and a new file initialised.

Once the basic data has been punched, it is run with program SBWRØ, which yields lineprinter and disk output. By executing progaam LISTØ this disk output may be listed as many times as is required. The programs CORR2 and CORR3 are then executed to interpolate and substitute any missing data within the disk file. CORR2 stores the corrected data in the same disk file and may be listed with LISTØ if required, while CORR3 stores its output on magnetic tape. This magnetic tape may be listed by executing MALIS. The final program in this suite collates the data on magnetic tape and stores the resulting data in the disk data files described earlier, prior to plotting it.

SYSTEM FLOWCHART FOR WAVE ANALYSIS PROGRAMS

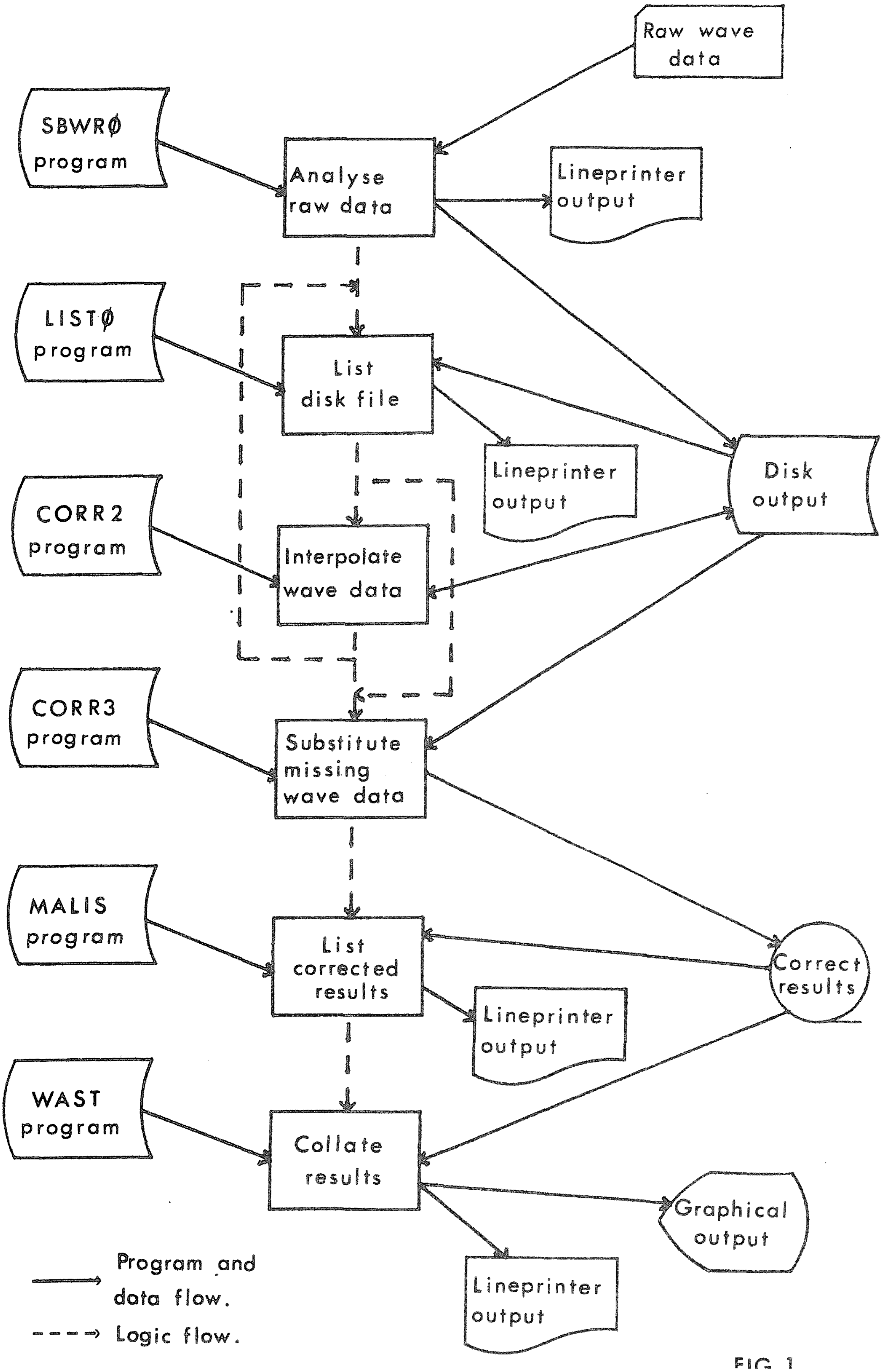


FIG. 1

Tape Security System (T.A.S.S.)

To ensure against accidental over-writing of magnetic tape, a system was devised whereby the next available file and record numbers for every magnetic tape in use is stored on disk. The disk file (MFILE) contains one record for every tape using the system, each record consisting of the tape name, a file and record number. When a tape is first used, the file and record number are both set to 1 using the Subroutine INITM. This Subroutine will also store any other required values in the disk record. After a file has been written to, and assuming that the next file will be required later on, the file number is increased by 1, the record number set to 1, and both these figures are stored in the disk file using the Subroutine STORM. When it is required to position a tape at the next available file and record, the subroutine NEXTM will read these two values from disk and position the tape accordingly.

The three Subroutines described above are used in the wave analysis system as follows:- The program CORR3 commences by calling the Subroutine NEXTM. This positions the tape at record N (usually 1) of file M, where N and M have been read from disk. N is increased after every "write" to magnetic tape, so that the total number of records written to the tape may be printed out prior to resetting N to 1, and storing N and M on disk using STORM. The program MALIS then automatically positions the tape at record N of file M, so that the current file in use may be listed. This position is again stored on disk at the end of MALIS so that the final program will also start reading tape at the beginning of the file. At the end of this program the file number is increased by 1 and the record number set to 1, so that the next station's analysis will be stored in the next file on tape.

It is possible to access a file out of sequence at any time by changing the disk file entry using INITM, as long as the disk file is reset afterwards.

Double Buffering and Spooling Subroutines.

In order to increase the execution time of a program which reads several data cards and prints a large quantity of lineprinter output, two subroutines are incorporated into the program SBWRØ. These are PBUFA and CBUFA. A call to these routines at the start of a program will cause double buffering of the lineprinter and card reader respectively, until such time as calls to PBUFX and CBUFX (entry points in the subroutines PBUFA and CBUFA) are encountered to clear the printer and reader buffers.

The graphical routines used in the program WAST have been written so that the output from the plotting section of the program may be spooled to disk and plotted at a later time while another job is using the C.P.U. This entails the insertion of calls to the I.B.M. written subroutines NPBSY and ENDPL. NPBSY is called immediately before any plotting is carried out in order to initiate the spooling, while ENDPL is called at the end of the plotting routine. This causes the output which has been generated in the program to be plotted and the pen reset for the next job.

These two calls have no adverse affect on the program if they are called when the spooling package is not in operation.

SECTION 3

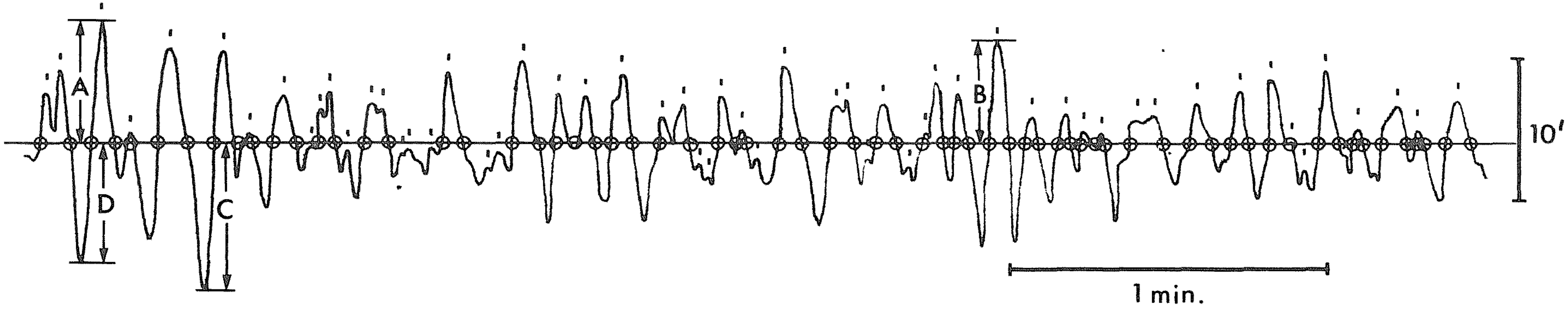
The Analysis of Wave Records

At present, all wave records received at the Institute of Oceanographic Sciences (Wormley) are basically analysed by hand in order to obtain the data needed for the program SBWRØ. Each record is analysed as follows:-

1. Where possible, a 12 minute length of record should be measured off. If this length is not available, a shorter length may be used as long as the difference in duration is noted. The section chosen should be taken from the middle of the recording-this avoids analysing any inconsistencies caused by the switching on and off of the recorder.
2. Check that there is nothing obviously wrong with the record i.e. the sea surface is not flat or has suddenly produced "square" waves! In cases like these, the record is classed as "FAULTY" and should be recorded as such with the appropriate date and time of start of recording. If a record is completely non-existent, it should be classed as "MISSING". If the highest crest plus the lowest trough is less than 1 ft. in height, a record is classed as being "CALM" and no further basic analysis is necessary.
3. If none of the three cases stated above apply then a mean water-level line must be drawn through the section to be analysed. This may or may not be a straight line.
4. Measure the highest and second highest crest (less than or equal to the highest crest) above the mean line, and the lowest and second lowest trough (less than or equal to the lowest trough) below the mean line. All values are positive and correct to one decimal place.
5. Count the number of times that the wave crosses the mean line in an upwards and downwards direction. If a maximum or minimum point occurs on the line, this counts as one crossing.
6. Count the number of crests above and below the mean line. A useful check for the validity of these last two values is (2 times the number of crests is greater than the number of zero crossings.)

All the programs described in this report assume that 8 records were analysed per day.

Figure 2 shows a typical wave record.



A TYPICAL WAVE RECORD

ˈ represent wave crests

o represent zero crossings

A represents the highest crest

B represents the second highest crest

C represents the lowest trough

D represents the second lowest trough

FIG. 2

SECTION 4

Description of Program SBWRØ

When the required number of wave records have been analysed in the manner described in SECTION 3, the data is then punched onto cards in the following format:-

Card 1 F or S in column 1, to denote the type of wave recorder in use - Frequency Modulated (F.M.) or Shipborne.

```
         cc1
Card 2   LINEC - a right justified line number, usually
         set to 1 at the start of a year's analysis.
```

Card 3 A data title, punched anywhere on the card. Each month's data is preceded by 2 cards:-

```
         cc1
Card 1   MO - the month number.

         cc1
Card 2   YEARbbC.OR - the year in which the month  February
```

occurred, followed by a correction factor by which the two highest crests and two lowest troughs must be multiplied if the first data card contains F, otherwise is is set to Ø.

Then follows the wave data, one card for each record analysed, ending with one blank card, thus:-

```
cc1                                          47
 XDATIMESTbDURA.THIGH.FHIGH.SLOWE.SLOWE.TIZEROCR

cc48        61
 NOCRESTDEPT.HY
```

Where X is a terminator < for the last record in the month,
/ for the last record to be analysed, otherwise blank.

DA - the day of the month.

TIMEST - the time, right justified, of the start of recording.

DURAT - the length of the recording interval, in minutes, correct to one decimal place.

HIGHF - the height in feet of the highest crest, correct to one decimal place.

HIGHS - the height in feet of the second highest crest, correct to one decimal place.

LOWES - the height in feet of the lowest trough, correct to one decimal place.

LOWET - the height in feet of the second lowest trough, correct to one decimal place.

IZEROCR - the number of zero crossings in an upwards and downwards direction, right justified.

NOCREST - the number of crests, right justified.

DEPTH - the depth in feet of the pressure unit below sea level, correct to one decimal place.

Y - "M", "F", or "C" to denote a missing, faulty or calm record, otherwise blank. In any of these cases, only the day number, time and one of these letters is punched.

A listing of some sample data cards and the control cards required for this program are showm in Figure 3, and Figure 4 shows some typical output from this program.

The program takes about 30 minutes to analyse 1 year's data. The output is headed with the title, and each page is in turn headed with the month and year, and the appropriate headings for each column of results, while the month and year only are written to disk. For each record the following values are computed and stored on the disk file of 430_{10} sectors, and printed on the 1443 printer:-

a) The day of the month

b) The time at which the record started

c) The wave period in seconds, to 2 decimal places, calculated by:

T_Z= 12∅ DURAT/ IZEROCR

d) The height in feet, to 1 decimal place, of the highest crest plus the lowest trough i.e.

$$H_1 = \text{HIGHF+LOWES}$$

where HIGHF and LOWES have each been previously multiplied by COR if F.M. data is being analysed.

e) The height in feet, to 1 decimal place of the second highest crest plus the second lowest trough i.e.

$$H_2 = \text{HIGHS + LOWET}$$

where HIGHS and LOWET have each been previously multiplied be COR if F.M. data is being analysed.

f) The spectral width parameter to three decimal places is given by

$$E = \sqrt{1 - \frac{(T_C)^2}{(T_Z)^2}}$$

where T_c = 6Ø DURAT/NOCREST

g) and h) For the shipborne wave recorder H_1 and H_2 are corrected for instrumental response as follows

$$H_1{}' = K\,H_1 \quad \text{and} \quad H_2{}' = K\,H_2$$

where

$$K=\emptyset.83(1+(8.8\mu)^{-2})\tfrac{3}{2}\ \exp\ (2.5\ D\mu^2/G)$$

where

$$\mu = \frac{2\pi}{T_Z}\ ,\ D = \text{DEPTH} \quad \text{and}\quad G = 32.174\ \text{ft.sec}^{-2}$$

For the F.M. recorder, T_Z and DEPTH are input to the subroutine DCORF to give RATIO, which is then used in the equations

$$H_1' = \text{RATIO}\ (H_1) \quad \text{and}\quad H_2' = \text{RATIO}\ (H_2)$$

i) and j) The mean height of the highest one-third of the waves is calculated from $H_1{}'$ and $H_2{}'$ by

$$H_S{}' = \frac{2H_1{}'}{(2\theta)^{\frac{1}{2}}(1+\emptyset.289\theta^{-1}-\emptyset.247\theta^{-2})}$$

and

$$H_S{}^2 = \frac{2H_2{}'}{(2\theta)^{\frac{1}{2}}(1-\emptyset.211\theta^{-1}-\emptyset.1\emptyset30\theta^{-2})}$$

where

$$\theta = \log_e \frac{(\text{IZEROCR})}{2}$$

k) The significant wave height, HS, is calculated by taking the average of H_S' and H_S'.

l) The most probable height of the highest wave which would occur in a three-hour period, correct to 1 decimal place is given by

$$\mathrm{HMAX(3HRS)} = \frac{\sqrt{2}}{2}(\emptyset.\emptyset\emptyset6361\,Y^4 - \emptyset.\emptyset73968Y^3 + \emptyset.33\emptyset573Y^2 + \emptyset.316548Y + \emptyset.5664\emptyset5)\mathrm{HS}$$

where

$$Y = \sqrt{\log_e \frac{(9\emptyset\mathrm{IZEROCR})}{\mathrm{DURAT}}}$$

m) The duration of the record in minutes.

n) If no measurements were available, the words

RECORD MISSING or RECORD FAULTY

will be printed at the right-hand side of the page against the appropriate date and time. If the record was too small to measure (i.e. H_1 less than or equal to 1 ft.) the word CALM will be printed in the wave period column. In the above cases the letter M, F, or C is stored in word 1 of the disk record, otherwise it is set to space.

o) The depth of the pressure units in feet correct to 1 decimal place. This is given as zero if the record is Calm, Missing or Faulty.

p) The line number which increases by 1 throughout the year's results after each record or newline between days is printed at the right hand side of the page.

Five days' results are printed on each page, with a blank line between each day. Each month's output starts on a new page. The output terminates with the words "END OF DATA".

```
// JOB            X     X
// XEQ SBWRO
*FILES(1,TEST,2)
*CCEND
S
    1
     TEST DATA FOR SBWRO
 1
1972
  1  0000    12.0    1.0    0.8    1.4    1.1     312     176    4.8
  1  0300    12.0    0.9    0.8    1.5    1.3     293     159    4.8
  1  0600                                                          M
  1  0900                                                          M
  1  1200    12.0    0.8    0.6    0.9    0.9     302     173    4.8
  1  1500    12.0    0.9    0.8    0.8    0.8     317     179    4.8
  1  1800    12.0    0.6    0.6    0.6    0.6     334     187    4.8
  1  2100    12.0    0.7    0.6    0.7    0.6     312     186    4.8
  2  0001    12.0    0.8    0.6    0.8    0.6     382     196    4.8
  2  0300    12.0    1.1    1.1    1.1    1.0     386     226    4.8
  2  0600                                                          C
  2  0900    12.0    1.5    1.3    1.7    1.6     329     202    4.8
  2  1200    12.0    1.7    1.7    2.0    1.8     279     167    4.8
  2  1500    12.0    1.4    1.0    1.6    1.5     306     181    4.8
  2  1800    12.0    1.8    1.6    1.8    1.4     322     199    4.8
  2  2100    12.0    2.3    2.2    2.3    2.2     318     170    4.8
  3  0001    12.0    2.5    2.0    2.1    2.0     299     172    4.8
  3  0300    12.0    2.3    2.0    2.0    2.0     313     176    4.8
  3  0600    12.0    2.5    2.5    2.5    3.2     301     170    4.8
  3  0900    12.0    2.8    2.5    2.5    2.5     242     165    4.8
  3  1200                                                          M
  3  1500    12.0    3.0    3.0    3.5    3.1     278     153    4.8
  3  1800    12.0    3.5    3.5    3.5    3.0     272     148    4.8
  3  2100    12.0    4.0    3.5    4.0    3.5     252     147    4.8
  4  0000    12.0    4.0    3.5    4.0    3.      2 2     147    4.8
  4  0300                                                          F
  4  0600                                                          F
  4  0900                                                          F
  4  1200                                                          F
  4  1500                                                          F
  4  1800                                                          M
  4  2100                                                          M
  5  0000                                                          M
  5  0300                                                          M
  5  0600    12.0    5.0    4.1    4.7    4.5     193     123    4.8
  5  0900    12.0    5.2    4.5    5.0    4.3     213     130    4.8
  5  1200    12.0    6.8    5.4    5.0    4.9     218     120    4.8
  5  1500    12.0    5.9    5.9    5.7    5.6     196     122    4.8
  5  1800    12.0    4.7    4.0    4.7    3.7     177     103    4.8
/ 5  2100    12.0    4.0    4.0    3.8    3.5     199     120    4.8
ONE BLANK CARD
```

FIG.3

```
JANUARY  1972

DATE  TIME     TZ     H1     H2      E      H1'    H2'    HS1    HS2    HS     HMAX(3HRS) DURATION            DEPTH

 1    0.00   4.62   2.4    1.9   0.463    4.0    3.2    2.4    2.1    2.3       4.5      12.00                  4.8    1
 1    3.00   4.91   2.4    2.1   0.389    3.7    3.2    2.2    2.2    2.2       4.3      12.00                  4.8    2
 1    6.00                                                                                   RECORD MISSING 0.0    3
 1    9.00                                                                                   RECORD MISSING 0.0    4
 1   12.00   4.77   1.7    1.5   0.488    2.7    2.4    1.6    1.6    1.6       3.2      12.00                  4.8    5
 1   15.00   4.54   1.7    1.6   0.465    2.9    2.7    1.7    1.8    1.8       3.5      12.00                  4.8    6
 1   18.00   4.31   1.2    1.2   0.450    2.2    2.2    1.3    1.5    1.4       2.8      12.00                  4.8    7
 1   21.00   4.62   1.4    1.2   0.545    2.3    2.0    1.4    1.3    1.4       2.7      12.00                  4.8    8

 2    0.00   3.77   1.6    1.2   0.224    3.8    2.8    2.2    1.8    2.0       4.1      12.00                  4.8   10
 2    3.00   3.73   2.2    2.1   0.520    5.3    5.1    3.1    3.3    3.2       6.4      12.00                  4.8   11
 2    6.00   CALM                                                                                              0.0   12
 2    9.00   4.38   3.2    2.9   0.580    5.8    5.2    3.5    3.4    3.4       6.8      12.00                  4.8   13
 2   12.00   5.16   3.7    3.5   0.550    5.4    5.1    3.3    3.4    3.3       6.6      12.00                  4.8   14
 2   15.00   4.71   3.0    2.5   0.534    4.9    4.1    2.9    2.7    2.8       5.6      12.00                  4.8   15
 2   18.00   4.47   3.6    3.0   0.588    6.3    5.3    3.8    3.5    3.6       7.2      12.00                  4.8   16
 2   21.00   4.53   4.6    4.4   0.354    7.9    7.6    4.7    5.0    4.9       9.6      12.00                  4.8   17

 3    0.00   4.82   4.6    4.0   0.494    7.3    6.3    4.4    4.2    4.3       8.5      12.00                  4.8   19
 3    3.00   4.60   4.3    4.0   0.458    7.2    6.7    4.3    4.4    4.4       8.7      12.00                  4.8   20
 3    6.00   4.78   5.0    5.7   0.465    8.0    9.1    4.8    6.0    5.4      10.7      12.00                  4.8   21
 3    9.00   5.95   5.3    5.0   0.680    6.8    6.4    4.2    4.3    4.3       8.3      12.00                  4.8   22
 3   12.00                                                                                   RECORD MISSING 0.0   23
 3   15.00   5.18   6.5    6.1   0.418    9.5    8.9    5.7    5.9    5.8      11.5      12.00                  4.8   24
 3   18.00   5.29   7.0    6.5   0.394   10.0    9.2    6.1    6.2    6.1      12.0      12.00                  4.8   25
 3   21.00   5.71   8.0    7.0   0.515   10.6    9.3    6.5    6.3    6.4      12.4      12.00                  4.8   26

 4    0.00   7.13   8.0    6.5   0.727    9.1    7.4    5.7    5.1    5.4      10.4      12.00                  4.8   28
 4    3.00                                                                                   RECORD FAULTY  0.0   29
 4    6.00                                                                                   RECORD FAULTY  0.0   30
 4    9.00                                                                                   RECORD FAULTY  0.0   31
 4   12.00                                                                                   RECORD FAULTY  0.0   32
 4   15.00                                                                                   RECORD FAULTY  0.0   33
 4   18.00                                                                                   RECORD MISSING 0.0   34
 4   21.00                                                                                   RECORD MISSING 0.0   35

 5    0.00                                                                                   RECORD MISSING 0.0   37
 5    3.00                                                                                   RECORD MISSING 0.0   38
 5    6.00   7.46   9.7    8.6   0.620   10.8    9.6    6.8    6.7    6.7      12.9      12.00                  4.8   39
 5    9.00   6.76  10.2    8.8   0.573   11.9   10.3    7.4    7.1    7.3      14.0      12.00                  4.8   40
 5   12.00   6.61  11.8   10.3   0.418   14.0   12.2    8.7    8.4    8.6      16.5      12.00                  4.8   41
 5   15.00   7.35  11.6   11.5   0.596   13.0   12.9    8.2    9.0    8.6      16.4      12.00                  4.8   42
 5   18.00   8.14   9.4    7.7   0.512   10.1    8.2    6.4    5.8    6.1      11.6      12.00                  4.8   43
 5   21.00   7.24   7.8    7.5   0.559    8.8    8.5    5.5    5.9    5.7      10.9      12.00                  4.8   44
```

FIG.4

```
END OF DATA
```

SECTION 5

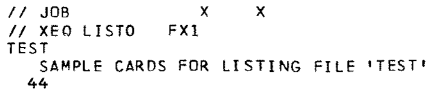
Description of Program LISTØ

Further copies of the results from SBWRØ may be obtained by listing the disk file of 430_{10} sectors with the aid of the control cards shown in Figure 5. This program may be compiled with a working storage *FILES card, but by using the N.I.O. Subprogram DFT, any fixed area data file may be accessed. The subroutine alters the 6 word define file table at compilation time by inserting the drive code and address of the file name set up in the array NAMFL (in Figure 5 the name FILENb is read into NAMFL) in word 5, the number of records in the file is inserted in word 2, the record length in words in word 3, and the number of records per sector in word 6.

The first data card contains the name of the disk file to be listed, left justified in the first 6 columns. A data title is read in and printed, and the number of records to be listed is read in, right justified in the first 4 columns of the third card . This is calculated by the formula (number of records analysed + number of interday gaps).

The program outputs the month and year and headings as given by SBWRØ, followed by a months' results. As each disk record is read, word 1 is tested. If it is "C" the record is calm, if it is "M" the record is missing, if it is "F" the record is faulty. If word 1 contains "." the record is left blank except for the date and time which is printed on every line regardless of the value of word 1. This condition will occur only if 2NOCREST<IZEROCR during the analysis of any record in SBWRØ. The origin of "N" and "I" in word 1 will be described later, but in these cases the record has been interpolated. A space in word 1 denotes a correct record, which is printed in the same format as the output from SBWRØ, as are all the other types of record. Throughout the program, tests are made for the end of a month, end of page (5 day's results are printed on 1 page) and end of day. In each of these cases appropriate action is taken to ensure that the output is identical to that of SBWRØ.

When the requisite number of records have been listed the program exits.



```
// JOB            X    X
// XEQ LISTO   FX1
TEST
   SAMPLE CARDS FOR LISTING FILE 'TEST'
  44
```

FIG.5

JANUARY 1972

DATE	TIME	TZ	H1	H2	E	H1'	H2'	HS1	HS2	HS	HMAX(3HRS)	DURATION		DEPTH	
1	0.00	4.62	2.4	1.9	0.463	4.0	3.2	2.4	2.1	2.3	4.5	12.00		4.8	1
1	3.00	4.91	2.4	2.1	0.389	3.7	3.2	2.2	2.2	2.2	4.3	12.00		4.8	2
1	6.00	4.87	2.2	1.9	0.422	3.4	3.0	2.0	2.0	2.0	4.0		INTERPOLATED		3
1	9.00	4.82	1.9	1.7	0.455	3.1	2.7	1.8	1.8	1.8	3.6		INTERPOLATED		4
1	12.00	4.77	1.7	1.5	0.488	2.7	2.4	1.6	1.6	1.6	3.2	12.00		4.8	5
1	15.00	4.54	1.7	1.6	0.465	2.9	2.7	1.7	1.8	1.8	3.5	12.00		4.8	6
1	18.00	4.31	1.2	1.2	0.450	2.2	2.2	1.3	1.5	1.4	2.8	12.00		4.8	7
1	21.00	4.62	1.4	1.2	0.545	2.3	2.0	1.4	1.3	1.4	2.7	12.00		4.8	8
2	0.00	3.77	1.6	1.2	0.224	3.8	2.8	2.2	1.8	2.0	4.1	12.00		4.8	10
2	3.00	3.73	2.2	2.1	0.520	5.3	5.1	3.1	3.3	3.2	6.4	12.00		4.8	11
2	6.00	CALM												0.0	12
2	9.00	4.38	3.2	2.9	0.580	5.8	5.2	3.5	3.4	3.4	6.8	12.00		4.8	13
2	12.00	5.16	3.7	3.5	0.550	5.4	5.1	3.3	3.4	3.3	6.6	12.00		4.8	14
2	15.00	4.71	3.0	2.5	0.534	4.9	4.1	2.9	2.7	2.8	5.6	12.00		4.8	15
2	18.00	4.47	3.6	3.0	0.588	6.3	5.3	3.8	3.5	3.6	7.2	12.00		4.8	16
2	21.00	4.53	4.6	4.4	0.354	7.9	7.6	4.7	5.0	4.9	9.6	12.00		4.8	17
3	0.00	4.82	4.6	4.0	0.494	7.3	6.3	4.4	4.2	4.3	8.5	12.00		4.8	19
3	3.00	4.60	4.3	4.0	0.458	7.2	6.7	4.3	4.4	4.4	8.7	12.00		4.8	20
3	6.00	4.78	5.0	5.7	0.465	8.0	9.1	4.8	6.0	5.4	10.7	12.00		4.8	21
3	9.00	5.95	5.3	5.0	0.680	6.8	6.4	4.2	4.3	4.3	8.3	12.00		4.8	22
3	12.00	5.57	5.9	5.5	0.549	8.1	7.6	5.0	5.1	5.0	9.9		INTERPOLATED		23
3	15.00	5.18	6.5	6.1	0.418	9.5	8.9	5.7	5.9	5.8	11.5	12.00		4.8	24
3	18.00	5.29	7.0	6.5	0.394	10.0	9.2	6.1	6.2	6.1	12.0	12.00		4.8	25
3	21.00	5.71	8.0	7.0	0.515	10.6	9.3	6.5	6.3	6.4	12.4	12.00		4.8	26
4	0.00	7.13	8.0	6.5	0.727	9.1	7.4	5.7	5.1	5.4	10.4	12.00		4.8	28
4	3.00												RECORD FAULTY	0.0	29
4	6.00												RECORD FAULTY	0.0	30
4	9.00												RECORD FAULTY	0.0	31
4	12.00												RECORD FAULTY	0.0	32
4	15.00												RECORD FAULTY	0.0	33
4	18.00												RECORD MISSING	0.0	34
4	21.00												RECORD MISSING	0.0	35
5	0.00												RECORD MISSING	0.0	37
5	3.00												RECORD MISSING	0.0	38
5	6.00	7.46	9.7	8.6	0.620	10.8	9.6	6.8	6.7	6.7	12.9	12.00		4.8	39
5	9.00	6.76	10.2	8.8	0.573	11.9	10.3	7.4	7.1	7.3	14.0	12.00		4.8	40
5	12.00	6.61	11.8	10.3	0.418	14.0	12.2	8.7	8.4	8.6	16.5	12.00		4.8	41
5	15.00	7.35	11.6	11.5	0.596	13.0	12.9	8.2	9.0	8.6	16.4	12.00		4.8	42
5	18.00	8.14	9.4	7.7	0.512	10.1	8.2	6.4	5.8	6.1	11.6	12.00		4.8	43
5	21.00	7.24	7.8	7.5	0.559	8.8	8.5	5.5	5.9	5.7	10.9	12.00		4.8	44

FIG.6

SECTION 6

Description of Program CORR2

Two programs were written to correct the "MISSING" and "FAULTY" records which occurred during the execution of SBWRØ. The first of these programs, CORR2, linearly interpolates all the gaps of four or less records and returns the corrected output to the same disk file from which it was read. Figures 6 and 7 show the input and output for this program.

Two data cards are needed:-

```
         cc1    5       13       20    24
CARD 1     PAbbNAMEFLbbMAXLCbbMAXRN
```

where

PA - if set to 1 the program LISTØ is executed after CORR2, in which case the data cards for LISTØ (shown in Figure 5) must be added to this deck.

If PA is greater than 1, the program CORR3 is executed after CORR2 in which case the data cards for CORR3 must be added.

NAMEFL - a three element array containing the name of the disk file to be accessed, left justified.

MAXLC - the maximum line count, right justified, obtained from the last record output by SBWRØ.

MAXRN - the maximum record number to be read from disk, calculated by (Number of records analysed + number of month header records).

CARD 2 A data title punched anywhere in the first 72 columns of the card.

The program commences by reading the two parameter cards and accessing the correct disk file by using the subroutine DFT as described in SECTION 5. After various counts have been set up, the disk data is read.

If a gap occurs at the beginning or end of the data file, the number of missing records is stored in KNO and LNO respectively. This gap is interpolated at the end of the program.

When a missing or faulty record is read during the year's data, the previous record (i.e. the last correct record) is read into the first record of a working array. A count (NO) is kept of how many more missing records are read, and providing NO is less than 5 the next correct record is stored in the (NO+2)th record of the working array. If NO is greater than, or equal to 5 a flag is set (INO) and the gap and its adjacent correct records are ignored.

After each record has been read the subroutine INCR is executed to test for the end of data or end of a month. At the end of a month, the program reads the month header record from disk before resetting counts and reading more data. At the end of the year the value of NO is printed out, and the value of LNO and KNO are tested to see if there is a gap at either end of the data. If this gap is less than 5 records long, its adjacent correct records are stored in the working array, otherwise the program terminates.

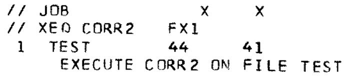
Once the limits of a gap have been found, the I.B.M. Subroutine JULAN is used to insert the correct day number in the first word of each record of the working array. This subroutine will convert the month and day number to a day number within the year or vice versa. The time of the start of recording, which is increased by 3 hrs. for each record, is inserted in element 2 of each record. Checks are made and appropriate action is taken at the start of a month or day to ensure that the first 2 words of the working array are correct. The duration and depth in each interpolated record are left blank while the remaining elements are calculated by obtaining the incremental step between the two limits and adding this to the last record so formed. The line count is then calculated and stored in the last element of each record.

Before the new array is written to disk the variable TEST is set to "N" if the record is calm and has been interpolated (in this case the record has been set to Ø except for the date, time and line count), otherwise it is set to "I" to denote an interpolated record. This value of TEST is used in LISTØ and MALIS. Each completed record contains TEST, date, time, 10 interpolated values, spaces for duration and depth and the line count, and the new array is then written to the correct position on disk.

The disk record number is then altered so that reading commences immediately after the gap that has just been interpolated.

When the gap at the end of the data is being interpolated KNO records are inserted at the beginning of the date and LNO records are inserted at the end of the data.

Any length data file may be corrected with this program, it terminates only when the line count on disk equals P.



```
// JOB            X     X
// XEQ CORR2   FX1
 1  TEST       44     41
     EXECUTE CORR2 ON FILE TEST
```

FIG. 7

```
                         CORR2 EXECUTED                EXECUTE CORR2 ON FILE TEST
```

FIG. 8

SECTION 7

Description of Program CORR3

The second program written to correct the "MISSING" and "FAULTY" records in the SBWRØ output (called CORR3) substitutes records from either side of a gap of 5 or more records and stores the corrected outputon magnetic tape. The input and output for this program are shown in Figures 8 and 9 respectively.

The program commences by positioning the tape at the required file by using the subroutine NEXTM as described in SECTION 2.

The data cards are read in the following format:-

CARD 1
```
1                      24
NAMEDISKFILEbbMAXLCMAXDR
```

where NAMEDISKFILE is a 6 element array, the first three containing the name of the 430_{10} sector disk file to be corrected, the last three containing the name of the disk file which contains the magnetic tape file numbers (called MFILE in SECTION 2). Both these names are left justified within their fields.

MAXLC is the maximum line count, obtained from the SBWRØ output.

MAXDR - is the maximum number of disk records to be read - calculated by (number of records analysed + number of month header records).

CARD 2 A data title punch in the first 72 columns of the card.

The title is written to magnetic tape and printer, before the month is read from disk, and the number of records in the month is calculated.

The data is then read from disk. A count of the missing records is kept in NO, and when the start of a gap is encountered the record number is stored in IFST. After each disk is read a check is made for the end of a month or end of the data, and in both these cases appropriate action is taken. If a gap occurs at either end of the data, the disk record number is altered accordingly so that reading may continue at the opposite end of the data. When the limits of a gap have been found, the number of records to be substituted is stored in NOREC. If NOREC is odd, (NOREC+1)/2 records are folded into the start of the gap and (NOREC-1)/2 records are folded into the end of the gap, otherwise NOREC/2 records are folded into each end of the gap.

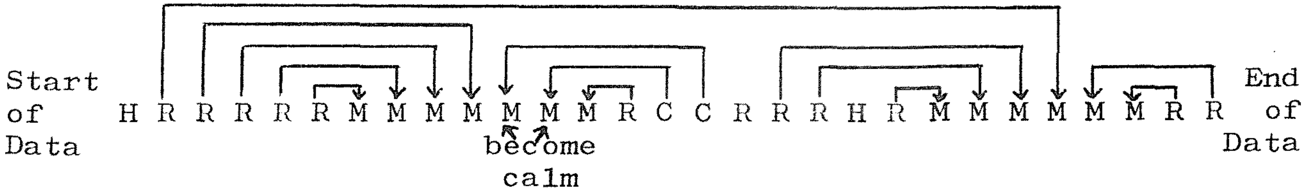
IN is set to the number of records to be filled into each half of the data, and the following procedure is carried out for each half of the data:-

Starting at the last correct record and working through the correct data adjacent to the gap, NREC is to set the number of the record to be inserted. If this is less than or equal to ∅ it is added to MAXDR, or if it is greater than MAXDR, MAXDR is subtracted from NREC. The record is then read; if the second variable in the record (this can be either the day number in a wave record or the year in a header record) is greater than 31, the record is a header record and the next record is read.

NREC is recalculated as before to find the incorrect record into which the correct record is to be inserted. The date, time and line count of the incorrect record is kept constant the duration and depth are set to spaces, while the other values read from the correct record are inserted. The variable TEST at the start of each substituted record is set to "Y" if the record which was inserted was "CALM", otherwise it is set to "S".

Any "interpolated" records created in CORR2 which are within the data to be substituted become "substituted" records.

The Substitution of Disk Data



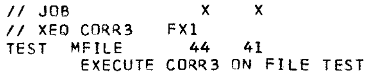
H = header record

R = correct record

M = "MISSING" or "FAULTY" record

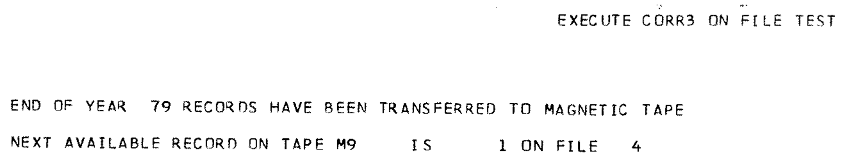
C = "CALM" record

When all the gaps have been filled, the complete disk file is written to magnetic tape adding the appropriate "page" headings. The tape file is then in an identical format to the output produced on the lineprinter by SBWRØ. At the end of the data, a message is printed to the lineprinter saying how many records have been written to the tape. The file number and record number 1 are then stored on the disk using the Subroutine STORM, the tape is rewound, and the program MALIS is called.



```
// JOB            X    X
// XEQ CORR3   FX1
TEST  MFILE      44   41
       EXECUTE CORR3 ON FILE TEST
```

FIG. 9



```
                                                  EXECUTE CORR3 ON FILE TEST


END OF YEAR  79 RECORDS HAVE BEEN TRANSFERRED TO MAGNETIC TAPE
NEXT AVAILABLE RECORD ON TAPE M9      IS       1 ON FILE   4
```

FIG.10

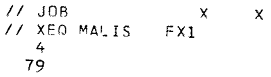
SECTION 8

Description of Program MALIS

When the program CORR3 has been successfully run, a call to MALIS is executed, and in this case the two data cards needed for the program must be added to the control cards for CORR3. If MALIS is to be executed as a stand-alone program, the control cards shown in Figure 10 are required.

This program lists any one magnetic tape file, the number of which is specified, right justified, in the first 4 columns of the first data card. To access the correct file, the Subroutine FINDM is used - this Subroutine positions the tape at any record of any file. In this case the record number is always 1, while the file number is input at run time. The second data card specifies, right justified in the first 4 columns, the number of lines to be listed on the 1443 printer. As program CORR3 writes headings to magnetic tape as well as the corrected output, the tape file is already in an identical format to that of SBWRØ output. Because of this, no extra headings are required, and MALIS simply dumps the required number of records to printer with no additions or deletions.

When the requested number of records have been listed, the file number and the record number 1 are stored on disk using STORM so that the tape may be positioned at the beginning of the same file at the start of the next program.



```
// JOB              X     X
// XEQ MALIS    FX1
   4
  79
```

FIG.11

JANUARY 1972

DATE	TIME	TZ	H1	H2	E	H1'	H2'	HS1	HS2	HS	HMAX(3HRS)	DURATION		DEPTH	
1	0.00	4.62	2.4	1.9	0.463	4.0	3.2	2.4	2.1	2.3	4.5	12.00		4.8	1
1	3.00	4.91	2.4	2.1	0.389	3.7	3.2	2.2	2.2	2.2	4.3	12.00		4.8	2
1	6.00	4.87	2.2	1.9	0.422	3.4	3.0	2.0	2.0	2.0	4.0		INTERPOLATED		3
1	9.00	4.82	1.9	1.7	0.455	3.1	2.7	1.8	1.8	1.8	3.6		INTERPOLATED		4
1	12.00	4.77	1.7	1.5	0.488	2.7	2.4	1.6	1.6	1.6	3.2	12.00		4.8	5
1	15.00	4.54	1.7	1.6	0.465	2.9	2.7	1.7	1.8	1.8	3.5	12.00		4.8	6
1	18.00	4.31	1.2	1.2	0.450	2.2	2.2	1.3	1.5	1.4	2.8	12.00		4.8	7
1	21.00	4.62	1.4	1.2	0.545	2.3	2.0	1.4	1.3	1.4	2.7	12.00		4.8	8
2	0.00	3.77	1.6	1.2	0.224	3.8	2.8	2.2	1.8	2.0	4.1	12.00		4.8	10
2	3.00	3.73	2.2	2.1	0.520	5.3	5.1	3.1	3.3	3.2	6.4	12.00		4.8	11
2	6.00	CALM												0.0	12
2	9.00	4.38	3.2	2.9	0.580	5.8	5.2	3.5	3.4	3.4	6.8	12.00		4.8	13
2	12.00	5.16	3.7	3.5	0.550	5.4	5.1	3.3	3.4	3.3	6.6	12.00		4.8	14
2	15.00	4.71	3.0	2.5	0.534	4.9	4.1	2.9	2.7	2.8	5.6	12.00		4.8	15
2	18.00	4.47	3.6	3.0	0.588	6.3	5.3	3.8	3.5	3.6	7.2	12.00		4.8	16
2	21.00	4.53	4.6	4.4	0.354	7.9	7.6	4.7	5.0	4.9	9.6	12.00		4.8	17
3	0.00	4.82	4.6	4.0	0.494	7.3	6.3	4.4	4.2	4.3	8.5	12.00		4.8	19
3	3.00	4.60	4.3	4.0	0.458	7.2	6.7	4.3	4.4	4.4	8.7	12.00		4.8	20
3	6.00	4.78	5.0	5.7	0.465	8.0	9.1	4.8	6.0	5.4	10.7	12.00		4.8	21
3	9.00	5.95	5.3	5.0	0.680	6.8	6.4	4.2	4.3	4.3	8.3	12.00		4.8	22
3	12.00	5.57	5.9	5.5	0.549	8.1	7.6	5.0	5.1	5.0	9.9		INTERPOLATED		23
3	15.00	5.18	6.5	6.1	0.418	9.5	8.9	5.7	5.9	5.8	11.5	12.00		4.8	24
3	18.00	5.29	7.0	6.5	0.394	10.0	9.2	6.1	6.2	6.1	12.0	12.00		4.8	25
3	21.00	5.71	8.0	7.0	0.515	10.6	9.3	6.5	6.3	6.4	12.4	12.00		4.8	26
4	0.00	7.13	8.0	6.5	0.727	9.1	7.4	5.7	5.1	5.4	10.4	12.00		4.8	28
4	3.00	7.13	8.0	6.5	0.727	9.1	7.4	5.7	5.1	5.4	10.4		SUBSTITUTED		29
4	6.00	5.71	8.0	7.0	0.515	10.6	9.3	6.5	6.3	6.4	12.4		SUBSTITUTED		30
4	9.00	5.29	7.0	6.5	0.394	10.0	9.2	6.1	6.2	6.1	12.0		SUBSTITUTED		31
4	12.00	5.18	6.5	6.1	0.418	9.5	8.9	5.7	5.9	5.8	11.5		SUBSTITUTED		32
4	15.00	5.57	5.9	5.5	0.549	8.1	7.6	5.0	5.1	5.0	9.9		SUBSTITUTED		33
4	18.00	7.35	11.6	11.5	0.596	13.0	12.9	8.2	9.0	8.6	16.4		SUBSTITUTED		34
4	21.00	6.61	11.8	10.3	0.418	14.0	12.2	8.7	8.4	8.6	16.5		SUBSTITUTED		35
5	0.00	6.76	10.2	8.8	0.573	11.9	10.3	7.4	7.1	7.3	14.0		SUBSTITUTED		37
5	3.00	7.46	9.7	8.6	0.620	10.8	9.6	6.8	6.7	6.7	12.9		SUBSTITUTED		38
5	6.00	7.46	9.7	8.6	0.620	10.8	9.6	6.8	6.7	6.7	12.9	12.00		4.8	39
5	9.00	6.76	10.2	8.8	0.573	11.9	10.3	7.4	7.1	7.3	14.0	12.00		4.8	40
5	12.00	6.61	11.8	10.3	0.418	14.0	12.2	8.7	8.4	8.6	16.5	12.00		4.8	41
5	15.00	7.35	11.6	11.5	0.596	13.0	12.9	8.2	9.0	8.6	16.4	12.00		4.8	42
5	18.00	8.14	9.4	7.7	0.512	10.1	8.2	6.4	5.8	6.1	11.6	12.00		4.8	43
5	21.00	7.24	7.8	7.5	0.559	8.8	8.5	5.5	5.9	5.7	10.9	12.00		4.8	44

FIG.12

SECTION 9

Description of Program WAST

The final program in this suite is in fact 11 linked coreloads which are executed to produce graphs on the 1627 plotter of the percentage exceedance of the significant and maximum wave height, the percentage occurrence of the wave period, the percentage occurrence of the spectral width parameter, a scatter diagram relating wave height and period, and a persistence diagram. The control cards for this program are shown in Figure 11 while the output is shown in Figure 12.

As certain variables are used throughout the coreloads in this program, a common area in core is set up. This area of 1862 words consists of the following integer variables, in identical order in each link:-

SWPA - a one dimensional array of 42 elements containing the spectral width parameter values.

SCAT - a two dimensional array of 40 x 37 elements containing the wave height and period distribution.

HS - a one dimensional array of 102 elements containing the significant wave height values.

HMAX - a one dimensional array of 102 elements containing the maximum wave height values.

TZ - a two dimensional array of 2 x 22 elements containing the wave period.

IREC - disk file record number.

JREC - disk file record number.

LAB - set to indicate the returning point in link 2.

MAXH - indicates the maximum Y value in various graphs.

N - magnetic tape file number.

MM - magnetic tape record number.

II - number of records analysed in the year.

TITLE - a one dimensional array of 36 elements containing a data title.

S - season number (January - March = 1 etc.).

NAMT - a one dimensional array of 3 elements containing the name of the magnetic tape in use.

M - the month number.

YEAR - the year in which February occurred during the recording interval.

DATES - a one dimensional array of 30 elements containing the dates of recording.

P - the number of records in the season.

KREC - disk file record number.

LREC - disk file record number.

NREC - disk file record number.

MREC - disk file record number.

R - number of records in month.

K - number or records analysed on page.

L - number of records analysed in day.

PI - number of records analysed in season.

KNT - number of seasons analysed.

IHMAX - maximum value of the significant wave height.

RI - number of record analysed in month.

Each link will be described in the order in which it is executed.

SETLA This link sets all the disk file record numbers and the variable LAB to 1, and stores Ø in each element of the arrays SWPA, SCAT, HS, HMAX and TZ.

WAST This link requires the disk data file called MFILE, as described in SECTION 2.

The magnetic tape is positioned at the first record of the file which is to be collated by using the Subroutine NEXTM, and then reads the title and month from the magnetic tape. Two data cards are read in in the following format:-

1. cc1
NAMET where NAMET is the left justified name of the magnetic tape.

2. cc2 75
DATES OF RECORDINGbbYEARbbMAbbIHM

where DATES OF RECORDING are the two dates between which the data was recorded - punched anywhere in the first 60 columns.

YEAR - the year in which February occurred during the recording interval.

MA - set to 2Ø if the highest value of HS (obtainable from SBWRØ output) is less than or equal to 2Ø ft., to 4Ø if it is less than or equal to 4Ø ft. or 8Ø if the highest value is less than or equal to 8Ø ft. This variable is read in as MAXH and is stored in the common area.

IHM - the highest integer value of HS (obtainable from

SBWRØ output). This is read in as IHMAX and stored in the common area. If the month is not January, April, July or October i.e.the beginning of the season, the tape is rewound and the job aborted. At the start of each season the season number (S) is set (January - March = 1 etc.) and M, P, R, RI, PI, K and L are set to Ø. A call to READW is executed to collate a season's data.

At the end of a season control is returned to this link to increase the season number and to set new values to the variables as described above, before returning to READW.

At the end of a year's analysis WAST rewinds the magnetic tape and stores the next available file number on the disk file MFILE using the Subroutine STORM. The returning point in this link is set in the variable LAB.

READW This link reads one season's data from magnetic tape. As each record is read the wave period is tested to see if it is "CALM". If it is, 1 is added to the first element of the arrays SWPA, SCAT, TZ, HS and HMAX and a significant wave height of Ø is written to the next record in the disk file which has 3ØØØ one word records, and is called HSG. After each record has been read, the counts II, PI, RI, L and K are increased by 1 and tests are carried out for the end of a season, end of a month, end of a page and end of a day. At the end of a season the next coreload is executed, while at the end of a month the counts R, RI, K and L are reset before reading more data. The data is stored on magnetic tape in 5 day "pages" with headings to speed the execution of MALIS, and these headings must be by-passed during this link. For this reason the variable K is used to count how many records in a "page" have been analysed; when K reached 4Ø the headings are read and K is reset to Ø before more data is read. At the end of an 8-record day, one extra line of magnetic tape is read, and L is reset to Ø before more data is read.

If the record is not "CALM", the wave period is converted from 2(2A1) format to F5.2 format using the 1130 Commercial Subroutine GET. One is then added to the arrays HS, HMAX, TZ, SWPA and SCAT as follows:-

Let the wave period = A = 4.59

Spectral width parameter

= EPSI = Ø.371 (read in as 371)

Significant wave height

= BHS = 10.6

Maximum wave height

= JHMAX = 14. (read in as 14)

Then:-

IHS = BHS

HS(IHS+2) and HMAX(JHMAX+2) are increased by 1 and IHS is written to the disk file HSG.

The wave period is then converted to an integral part (TZAC) and a fractional part (TZAB). if TZAB is greater than or equal to Ø.5, 1 is added to TZ(2,TZAC+2), otherwise 1 is added to TZ(1,TZAC+2).

The value of EPSI is tested in intervals of 25. If Ø≤ EPSI≤24, SWPA (2) is increased by 1, if 25≤EPSI≤49, SWPA(3) is increased by 1, etc.

The wave period is tested in intervals of Ø.5. If Ø≤A≤Ø.49 then IK=1, if Ø.5≤A≤Ø.99 then IK=2 etc. The same process is repeated for BHS in intervals of 0.5 if MAXH=2Ø, in intervals of 1.Ø if MAXH=4Ø or 2.Ø if MAXH=8Ø, the result being stored in IL. When IK and IL have been calculated for each record then SCAT(IL,IK) is increased by 1.

Using the above data and formulae, the following results are obtained:-

HS(12), HMAX(16), TZ(2,6), SWPA(17), SCAT(22,1Ø) if MAXH=2Ø, SCAT(11,1Ø) if MAXH=4Ø or SCAT(6,1Ø) if MAXH=8Ø are all increased by 1.

The link then increases counts and continues as described above.

<u>HSLOT</u> This link requires five disk files:-

1) File HS containing 4 records each of 3Ø6 words.

2) File HMAX containing 4 records each of 3Ø6 words.

3) File TZ containing 4 records each of 132 words.

4) File SWPA containing 1 record of 126 words.

5) File SCAT containing 4Ø records each of 37 words.

The link commences by calculating which disk record is to be written to in the first three files, according to which season has been analysed. The cumulative percentages of the HS and HMAX arrays which are in core are obtained by expressing each element as a percentage of the number of records in the season and adding the previous total to it

i.e.   AHS(3) = (HS(3)/PI*1ØØ.)+AHS(2)

and   AHS(3) = (HMAX(3)/PI*1ØØ.)+AHS(2)

The two new arrays are written to disk files 1 and 2 respectively.

The percentage occurrence of the TZ array is calculated by the general formula

ATZ(J) = TZ(K,L)*1ØØ./PI

The new array is written to the appropriate record in disk file 3.

If the end of the year has not been reached, the arrays HS, HMAX, AHS, TZ and ATZ are set to zero, LAB is set to 2 and control is returned to WAST. At the end of a year the program calculates the percentage occurrence of the spectral width parameter by using the general formula:-

ASWP(J) = SWPA(J)*1ØØ./II

The array ASWP is then written to disk file 4.

Each element of the SCAT array is tested; if it equals Ø it is set to "space", if it equals 1 it is set to "*", if it equals 2 it is set to "+", otherwise the formula

SCAT(I,J) = SCAT(I,J)*1ØØØ./II

is applied to convert to parts per thousand. The resulting array is written to disk file 5 in 4Ø records.

<u>PERS</u> This link requires the disk file described for READW, together with 4Ø files each consisting of 32Ø 1 word records. These files are called PEØ2, PEØ4......PE8Ø, but the program only references PEØ2 when it is compiled. The Subroutine DFT (as described in SECTION 5) is used in this program to access the correct "PE" file. The program commences by storing Ø in all the "PE" files which are to be used, this value being IHMAX/2. For each even wave height up to IHMAX, each value of IHS is read from the disk file HSG and tested against the current value of IHMAX. If it is equal to or greater than IHMAX, IVAL is increased by 1 and the loop continues unless the end of the year has been reached. At the end of the year, or if IVAL is less than IHMAX, IVAL is tested. If it is positive the IVALth record of the file PE(IHMAX/2) is increased by 1. At the end of this loop

each disk file contains the number of occurrences for which each wave height exceeds a given duration. The cumulative occurrence of each disk file are then calculated and the results are stored on disk.

HPLOT This link plots, for each season, a graph of the percentage exceedance of the significant wave heights, the data for which has been stored in disk files 1 and 2 described in HSLOT. After printing the name of the recording station and the dates between recording the program then plots four axes in a square. The Y-axes represent the percentage exceedance from Ø-1ØØ%, while the X-axes represent the wave height in feet in two logarithmic cycles from 1-1ØØ ft. After printing headings and labelling the left-hand Y-axis and the lower X-axis, the data contained in the two disk files is plotted taking X values of 1, 2, 3, ...1Ø, 12, 14,......2Ø, 25, 3Ø, 4Ø.....1ØØ. The HS curve is plotted by means of a series of "+" while HMAX is plotted as "X". The two curves are then labelled. These, and all the other graphs described in this program are no larger than 11" x 12½", so that they may be stored with lineprinter outputs from each recording station. All the graphic output from this program is produced with the aid of the I.B.M. 1800 Plotter Subroutines.

TPLOT This link plots, for each season, a curve representing the percentage occurrence of the wave period. Each curve is enclosed within four axes, the X-axes representing the wave period from Ø-2Ø seconds while the Y-axes represent the percentage occurrence from Ø-3Ø%. The graphs are labelled as are the left hand Y-axes and the lower X-axis. The data plotted is that stored in disk file 3 in HSLOT. The first value in the disk file is the percentage of calm readings in the season which is printed below the X-axis, while the remainder of the data is plotted in half second intervals as a solid line.

SWPLT This link plots the annual values of the spectral width parameter which have been stored in disk file 4 described in HSLOT. Both axes are linear, the lower X_axis being labelled and representing the spectral width parameter in tenths from Ø-1, while the Y-axes represent the percentage occurrence from Ø-15. The first number stored in the disk file is the percentage of calms in the year, and this value is printed below the lower X axis. The remaining values are then plotted as a solid curve.

SCATP The X-axes plotted in this link represent the wave period from Ø-18 seconds, while the Y-axes represent significant wave height in feet. The range is calculated by the value of MAXH if it equals 2Ø the range is Ø-2Ø ft., if it is 4Ø the range is Ø-4Ø ft. and it it is 8Ø the range is Ø-8Ø ft. The axes are then labelled, the Y-axis labels varying according to the value of MAXH.

Each record in the disk file 5 (described in HSLOT) is accessed and rearranged into A1 format using the Subroutine INECB. Each word is stored, right justified into six consecutive elements of an output array which has previously been loaded with spaces. If the disk word already contains an asterisk or a plus, one of these symbols is stored in the right hand element of the six which are being accessed. Otherwise the number contained in the disk word is converted to A1 format. Before each array is printed on the plotter a check is made to see whether every element is a space. If it is the array is ignored and the next disk record is read. The number of calm records in the year is printed as parts per thousand in the bottom left hand corner of the graph, while all other values are printed in their correct positions on the graph, the symbol * representing one occurrence and + representing two occurrences.

PERPL This link commences by reading the first number stored in the disk files PEØ2 and PEØ4. The larger of these two numbers is used to determine the range of the Y-axes, and the positions of the labels relative to the axes. If this number is less than or equal to 8Ø the Y-axes range from Ø-1ØØ, if it is less than or equal to 18Ø the axes range from Ø-2ØØ, otherwise they range from Ø-3ØØ. The X-axes are logarithmic, ranging from 1-2ØØ and representing duration in hours. The Y-axis represents the number of occurrences of wave conditions exceeding a given duration.

By using the Subroutine DFT described earlier, the program plots the data stored in each "PE" disk file until IHMAX/2 files have been plotted. Each curve is then labelled with the appropriate wave height.

DUMP This link lists on the 1443 printer all the data which has been plotted except for the wave height/period graph. This is done to enable the user to verify the value of any doubtful point on any graph.

Control is then returned to WAST in order to terminate the program.

Acknowledgements

I should like to thank all the members of I.O.S.(Wormley) who helped with the preparation of these programs, and in particular Mr. B.J. Hinde and Mr. L. Draper for their invaluable assistance.

```
// JOB                X     X
// XEQ SETLA    FX1
M9
      1ST - 5TH JANUARY 1972                             1972  20     8
```

FIG.13

PERCENTAGE EXCEEDANCE OF HS AND HMAX

WINTER - JANUARY TO MARCH

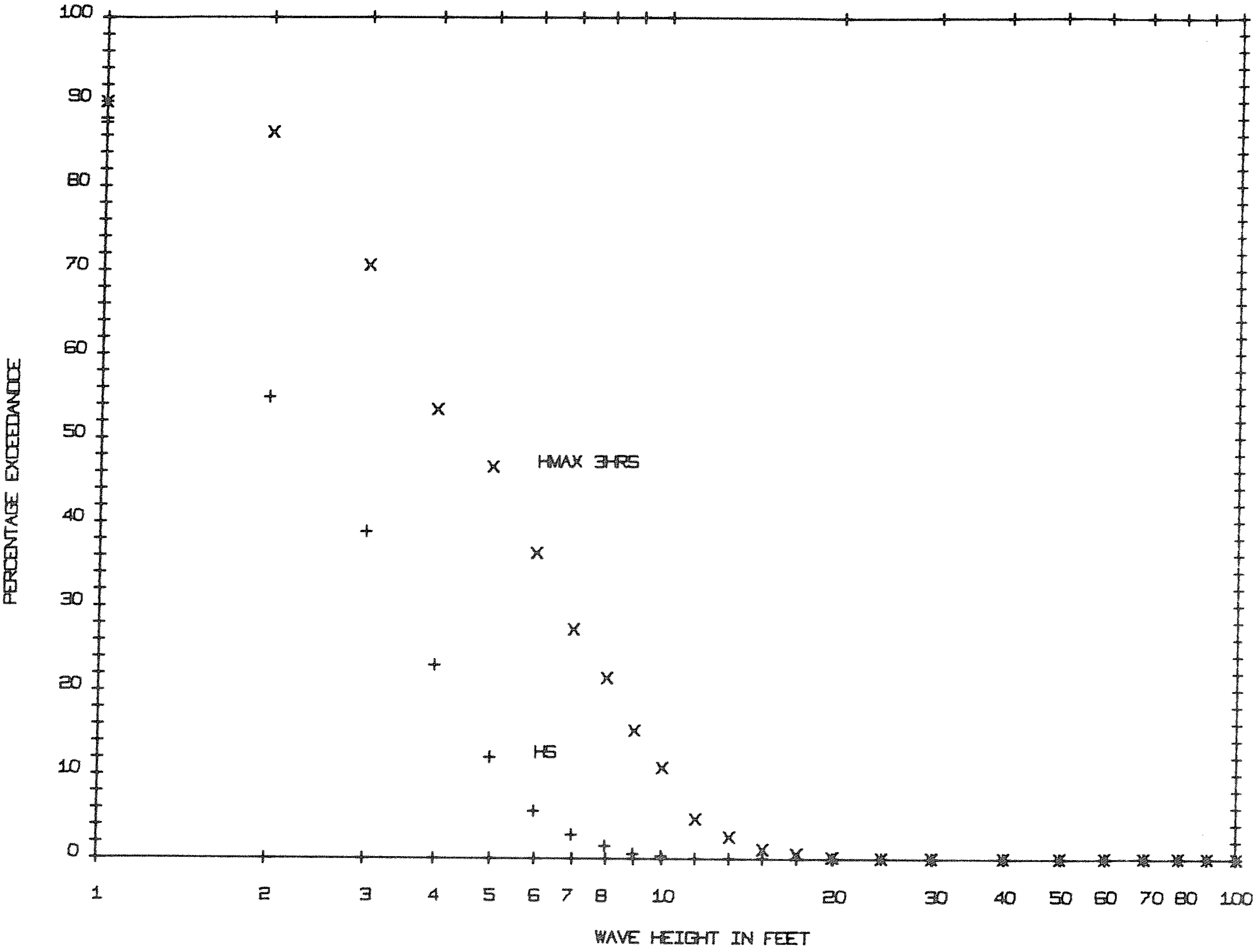


FIG.14-1

PERCENTAGE EXCEEDANCE OF HS AND HMAX

SPRING - APRIL TO JUNE

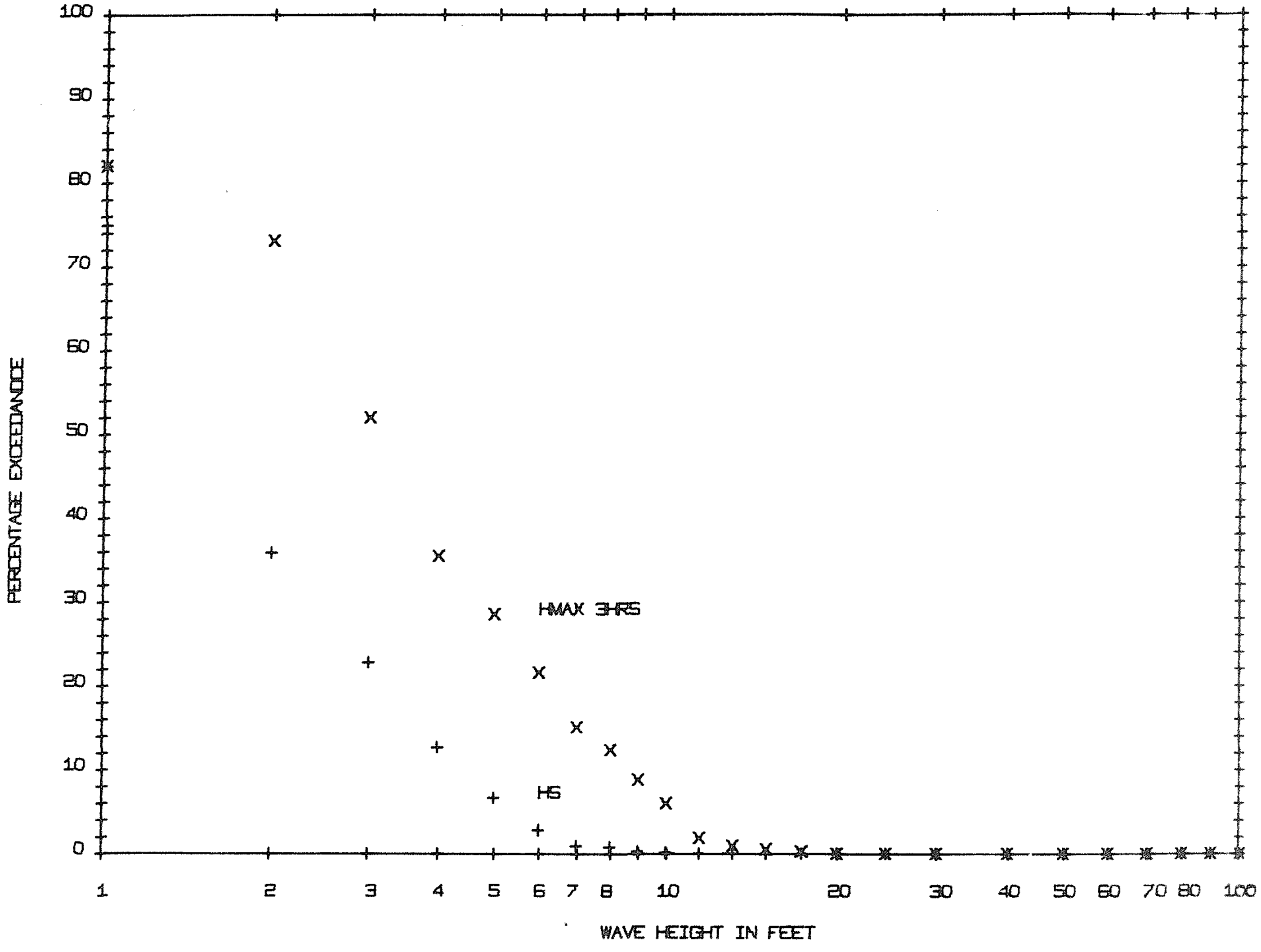


FIG.14-2

PERCENTAGE EXCEEDANCE OF HS AND HMAX

SUMMER - JULY TO SEPTEMBER

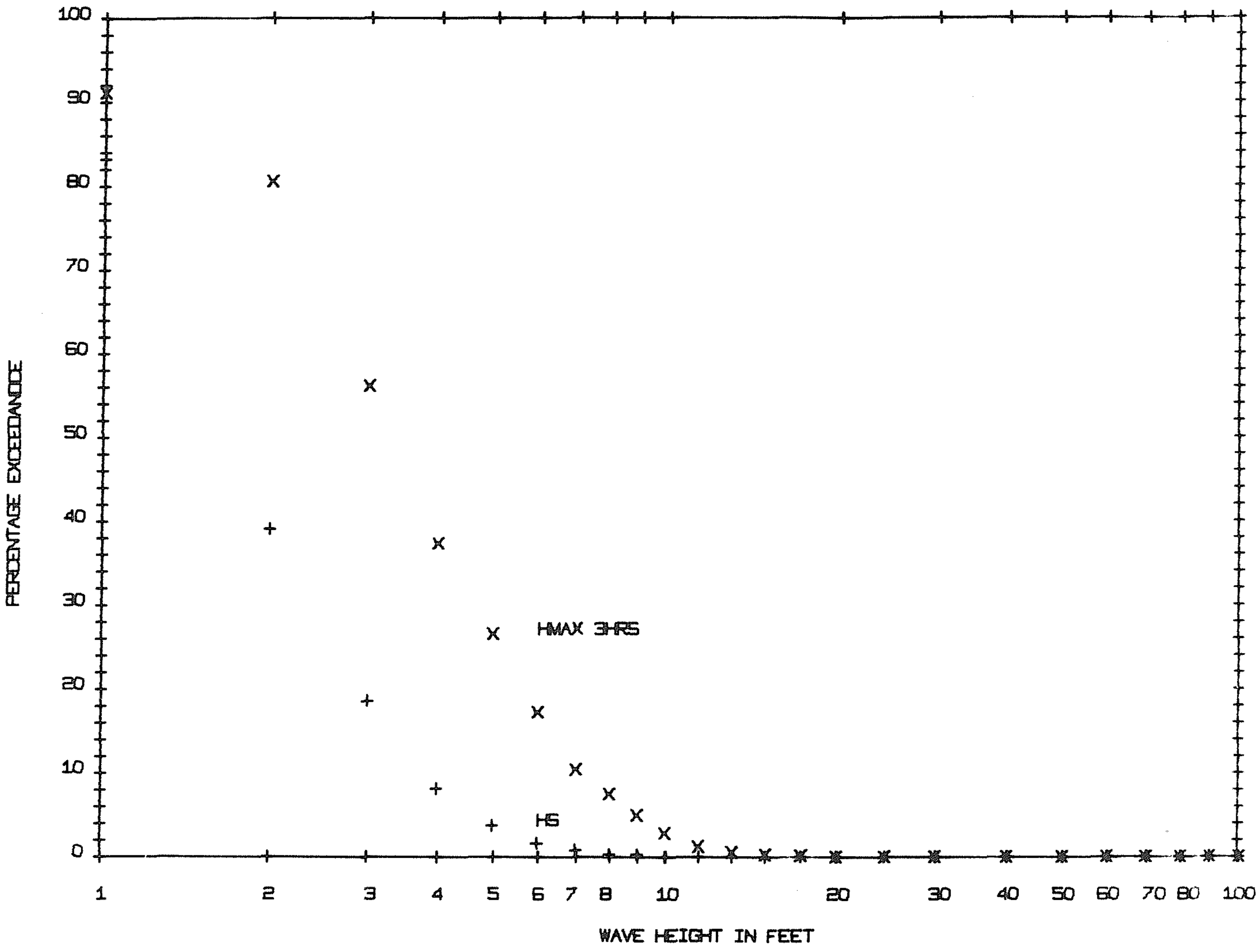


FIG.14-3

PERCENTAGE EXCEEDANCE OF HS AND HMAX

AUTUMN - OCTOBER TO DECEMBER

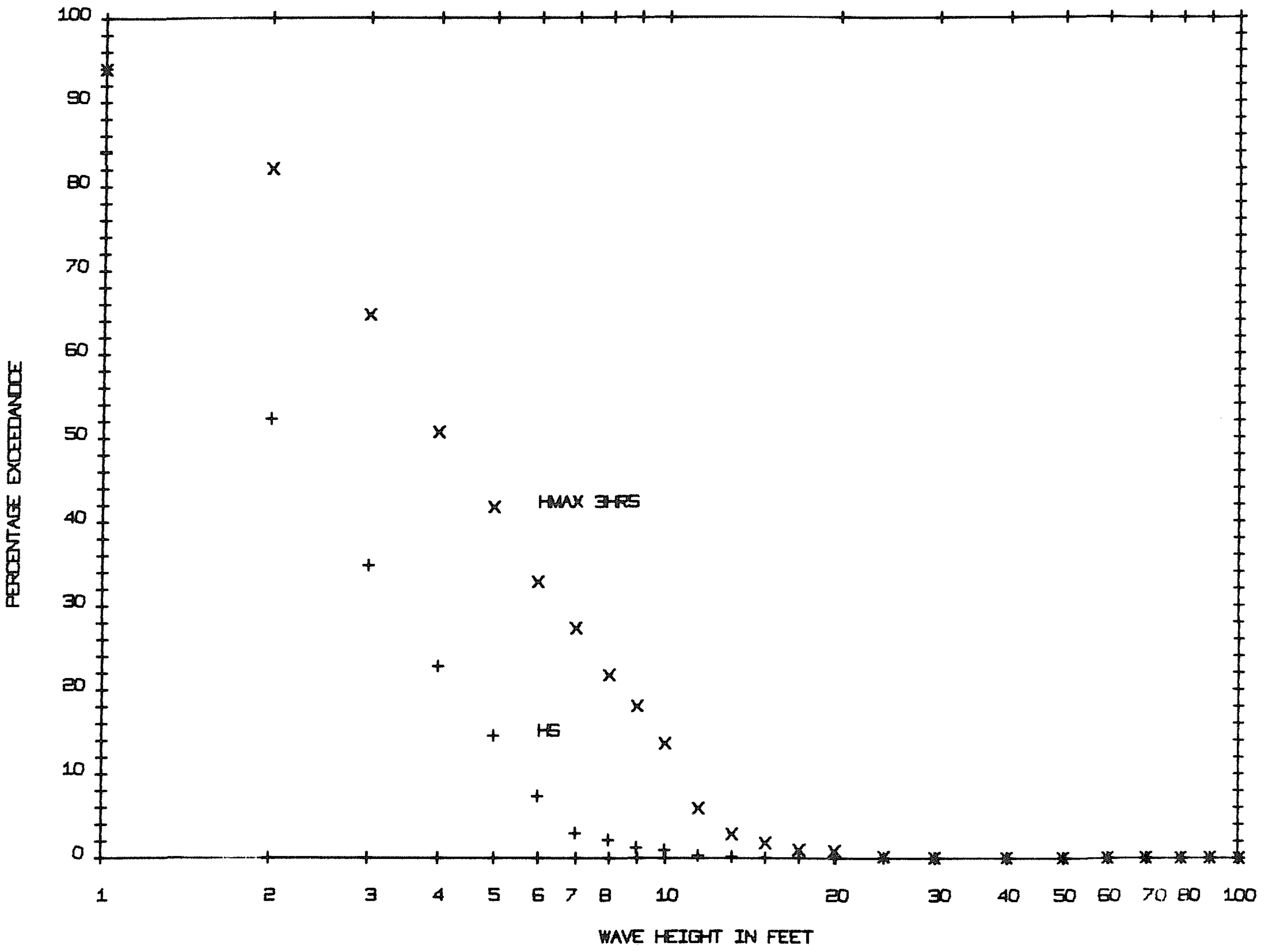
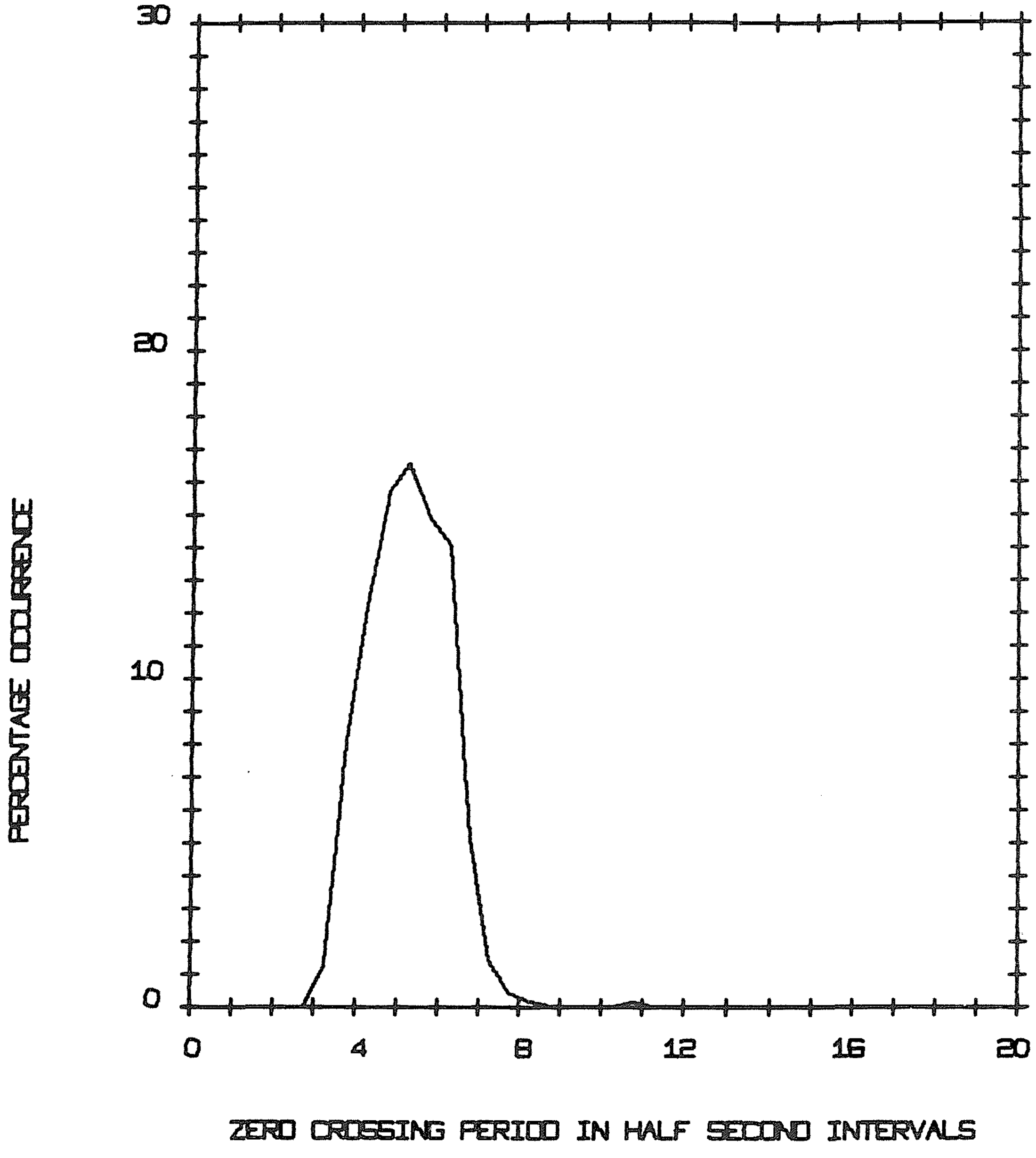


FIG.14-4

GRAPH OF PERCENTAGE OCCURRENCE OF TZ

WITHIN HALF-SECOND INTERVALS

WINTER - JANUARY TO MARCH



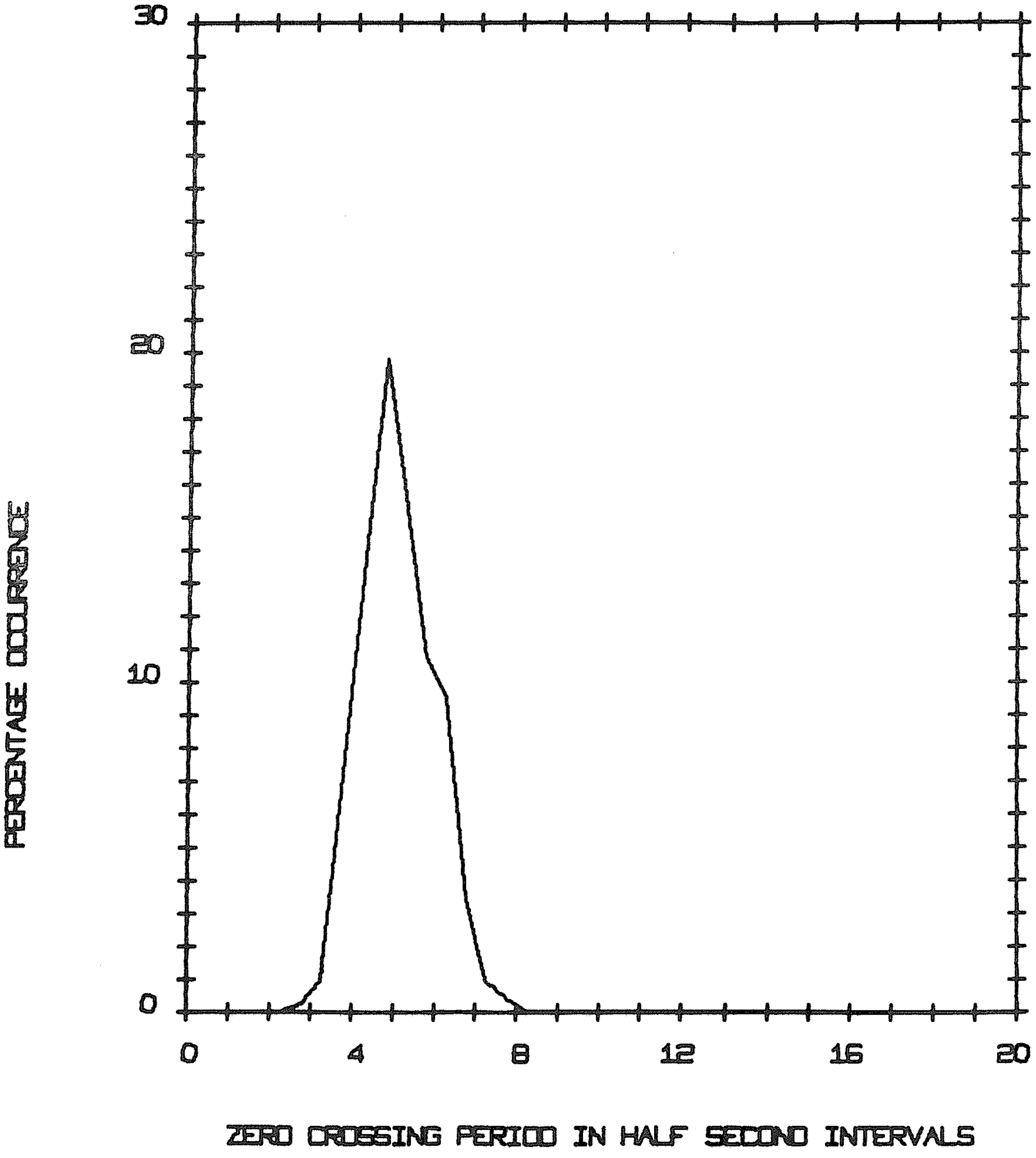
CALM = 10·13 PER CENT

FIG.14-5

GRAPH OF PERCENTAGE OCCURRENCE OF TZ

WITHIN HALF-SECOND INTERVALS

SPRING - APRIL TO JUNE



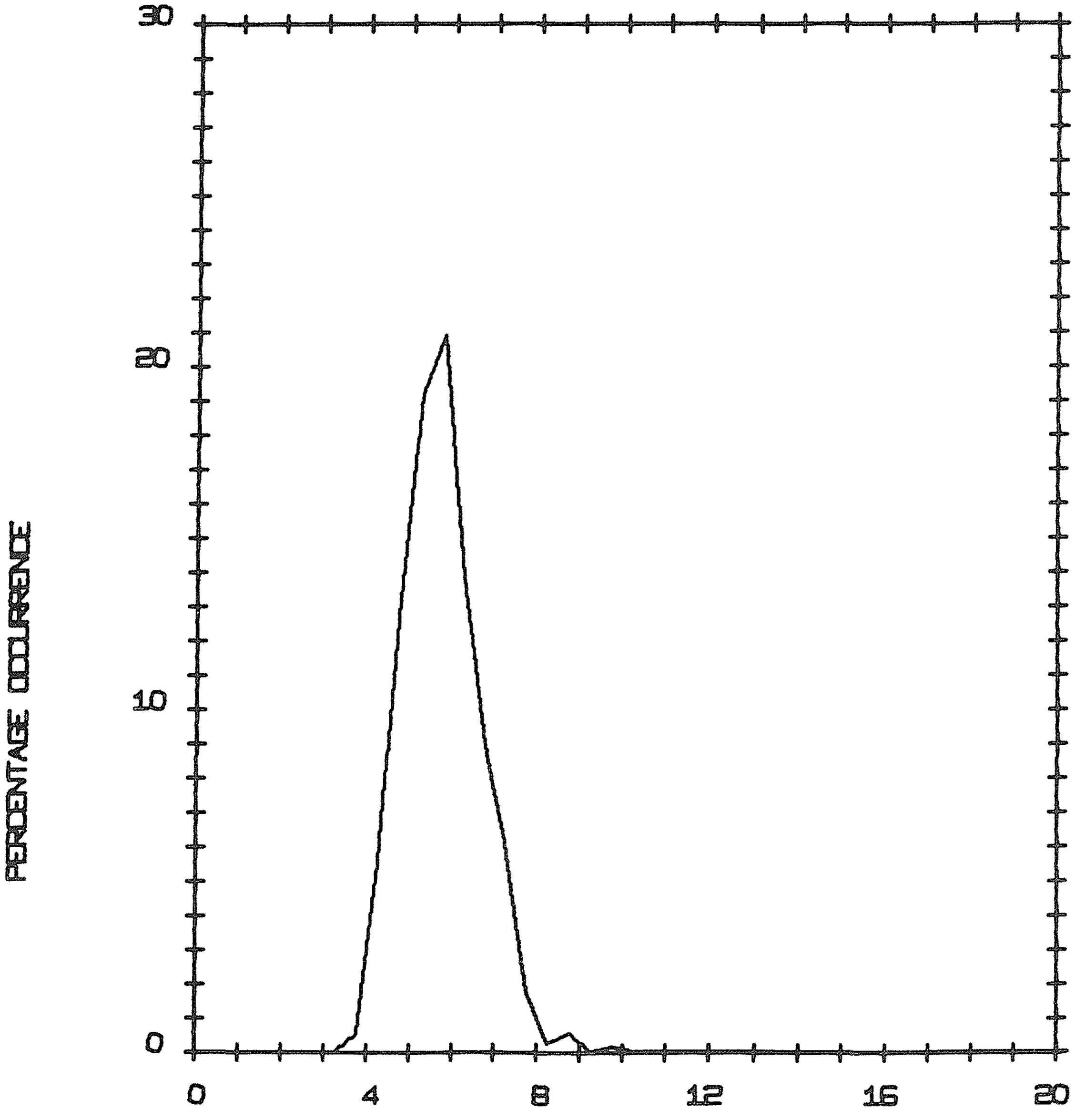
CALM = 17.99 PER CENT

FIG. 14-6

GRAPH OF PERCENTAGE OCCURRENCE OF TZ

WITHIN HALF-SECOND INTERVALS

SUMMER - JULY TO SEPTEMBER



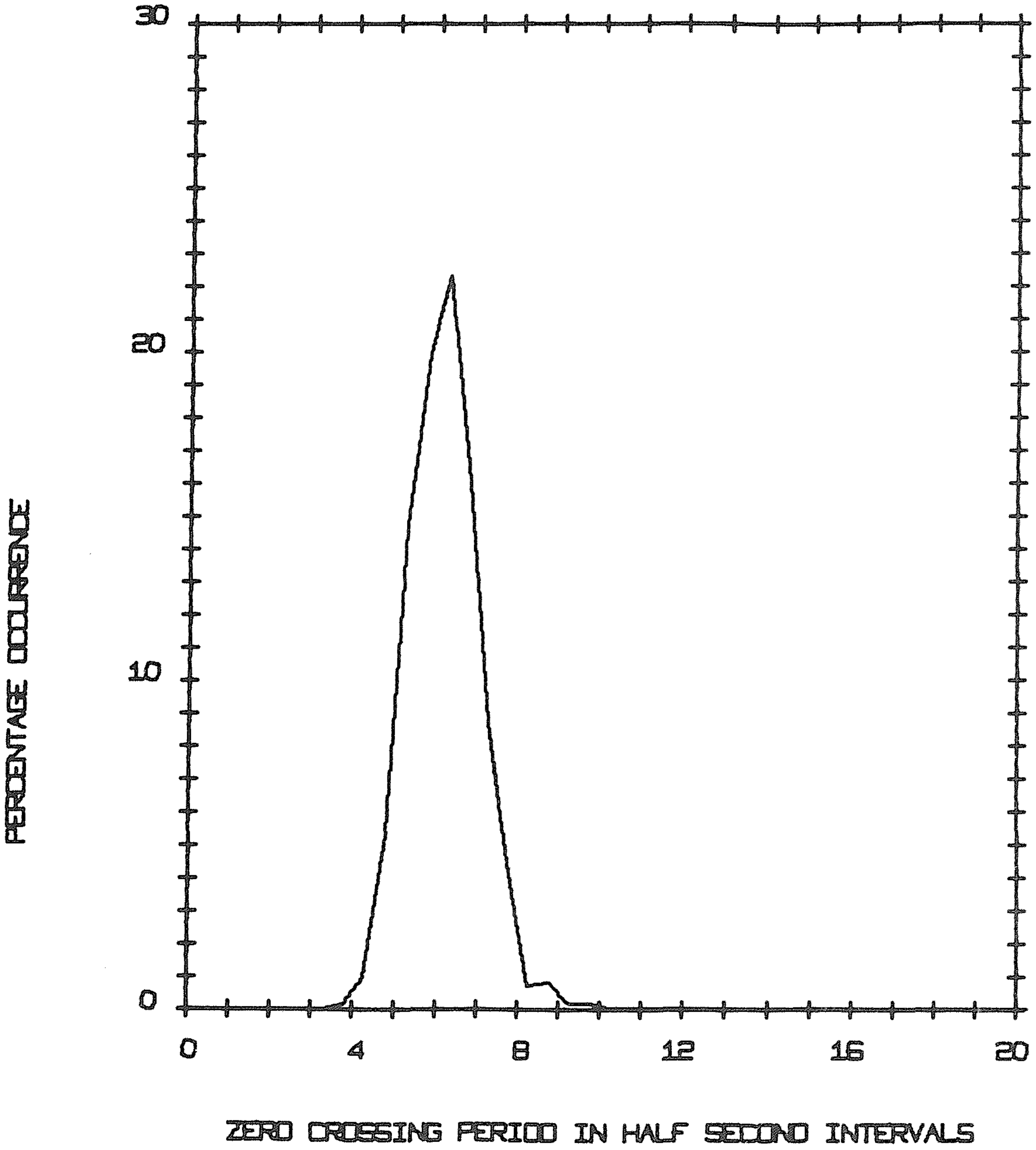
CALM = 8·96 PER CENT

FIG.14-7

GRAPH OF PERCENTAGE OCCURRENCE OF TZ

WITHIN HALF-SECOND INTERVALS

AUTUMN - OCTOBER TO DECEMBER



CALM = 6·11 PER CENT

FIG.14-8

GRAPH OF SPECTRAL WIDTH PARAMETER

FOR A WHOLE YEAR

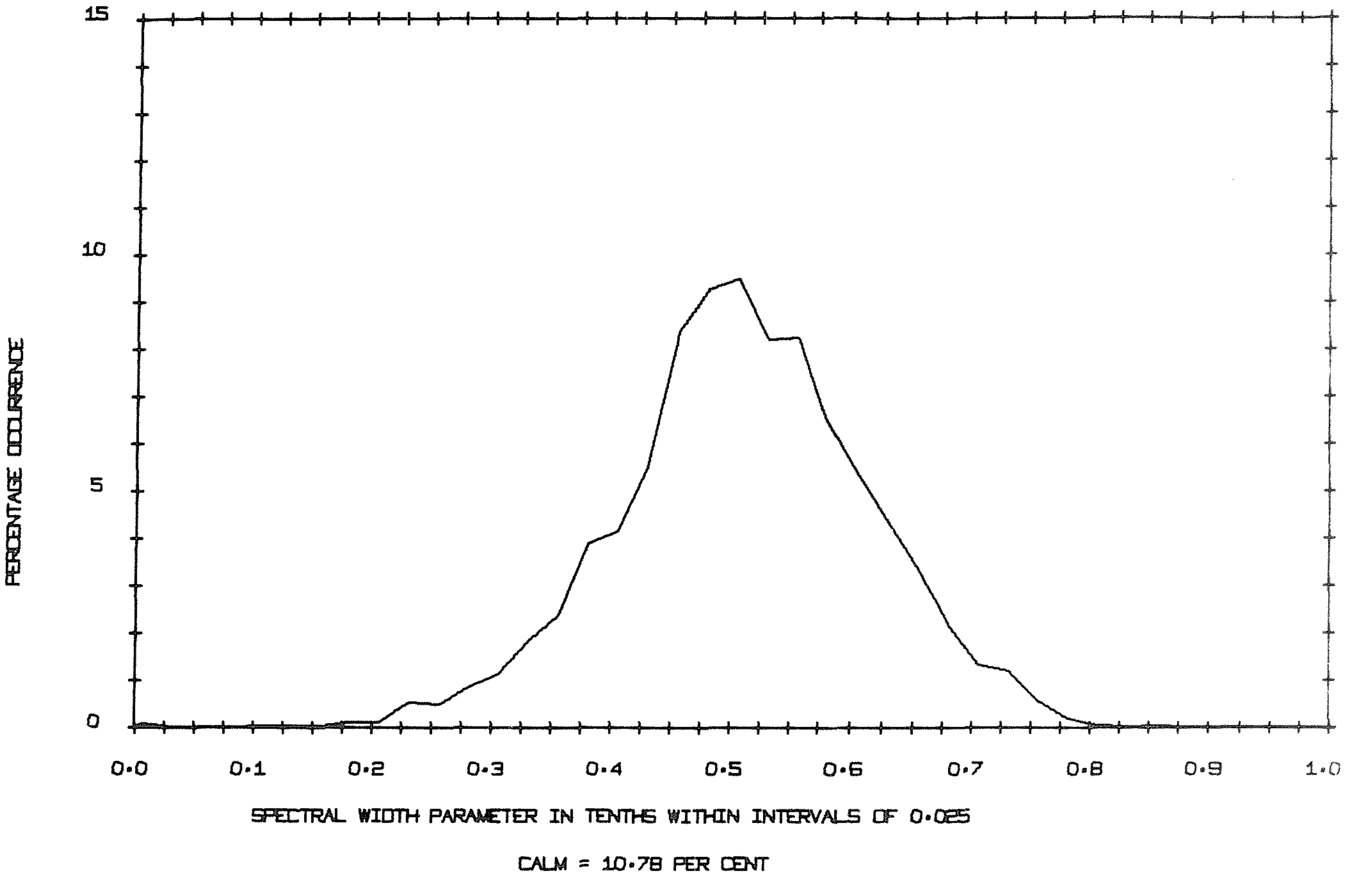


FIG.14-9

SCATTER DIAGRAM FOR THE WHOLE YEAR

IN PARTS PER THOUSAND * = 1 OCCURRENCE, + = 2 OCCURRENCES

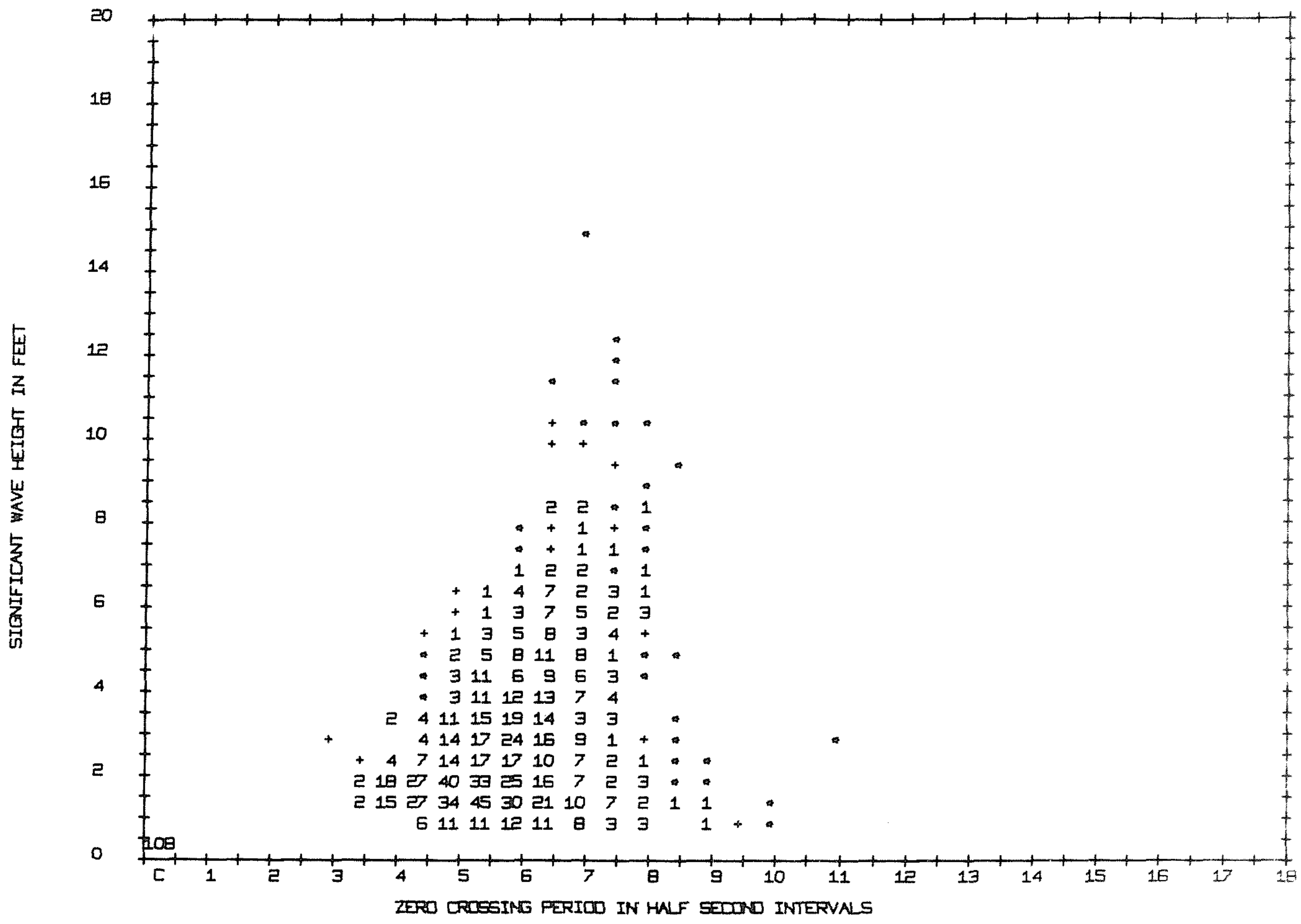


FIG.14-10

PERSISTENCE DIAGRAM FOR THE WHOLE YEAR

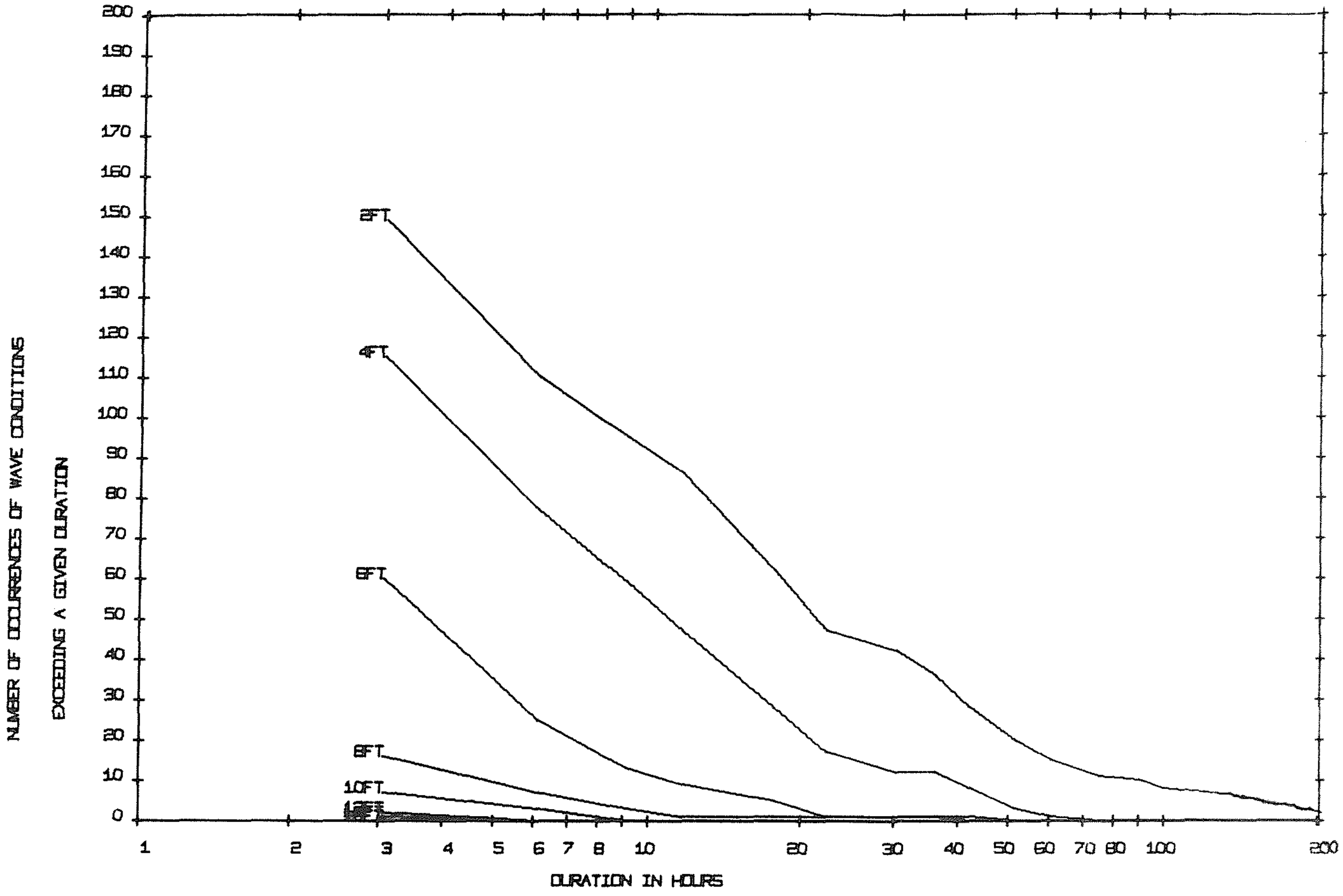


FIG. 14-11

```
// JOB    08 AUG 73  16.714 HRS                                            CBUF0000
// *NIO MPX MASTER LIBRARY PROGRAM
// ASM CBUFA                 VERSION 20 MODIFICATION 0  -174               CBUF0010
*LIST ALL
0000      030A4181        1             ENT      CBUFA  START BUFFERING CARD READER   CBUF0030
0031      030A41A7        2             ENT      CBUFX  STOP BUFFERING CARD READER    CBUF0040
FF68                      3      CARD   EQU      -/98  CALL CARDN IN FIO TABLE,REL TV  CBUF0050
                          4      *NOTE.CONTENTS OF THE LAST CARD READ BEFORE CALLING CBUF0060
                          5      *EXIT OR CBUFX ARE LOST.PURPOSE OF CBUFX IS TO MAKE CBUF0070
                          6      *SURE THIS CARD GOES THROUGH CARD READER PROPERLY,ASCBUF0080
                          7      *AN UNCHECKED I/O ERROR COULD CAUSE THIS LAST CARD  CBUF0090
                          8      *TO BE READ BY THE NEXT PROGRAM.                    CBUF0100
                          9      *CBUFX ALSO &UTS BACK ADDRESS OF CARDN IN FIO TABLE.CBUF0110
                         10      *SO THAT HTE SAME PROGRAM CAN THEN WRITE TO THE     CBUF0120
                         11      *CARD READER IF REQUIRED.                           CBUF0130
0000 0  0000             12      CBUFA DC       *-*                                  CBUF0140
0001 0  C84E             13            LDD      CALL       FIX FIO TABLE             CBUF0150
0002 00 DF00FF68         14            STD  L3 CARD                                  CBUF0160
0004 30 03059115         15            CALL     CARDN      START CARD READER         CBUF0170
0006 1  0045             16            DC       LIST                                 CBUF0180
0007 01 4C800000         17            BSC  I   CBUFA                                CBUF0190
0009 0  0000             18      SUB   DC       *-*  PSEUDO CARDN                    CBUF0200
000A 0  6A21             19            STX   2 X2+1                                  CBUF0210
000B 0  C0FD             20            LD       SUB                                  CBUF0220
000C 0  D001             21            STO      *+1                                  CBUF0230
000D 00 66800000         22            LDX  I2 *-*                                   CBUF0240
000F 0  C042             23            LD       D1        SUCCESS                    CBUF0250
0010 0  D206             24            STO   2 6         FIO LIST ERROR PARAMETER    CBUF0260
0011 0  C033             25      TESTA LD       LIST  TEST OUR LIST OFF QUEUE        CBUF0270
0012 01 4C200011       * 26            BSC  L   TESTA,Z                              CBUF0280
0014 0  C036             27            LD       LIST+6      ERROR PARAMETER          CBUF0290
0015 0  903C             28            S        D1                                   CBUF0300
0016 01 4C08001F         29            BSC  L   KA,+                                 CBUF0310
0018 0  9035             30            S        D7                                   CBUF0320
0019 01 4C18001F         31            BSC  L   KA,+-                                CBUF0330
001B 30 03059115         32            CALL     CARDN     RETRY                      CBUF0340
001D 1  0045             33            DC       LIST                                 CBUF0350
001E 0  70F2             34            MDX      TESTA                                CBUF0360
001F 0  C208             35      KA    LD    2 8  FIO AREA ADDRESS                   CBUF0370
0020 0  D004             36            STO      A+1           INTO LOOP              CBUF0380
0021 0  6250             37            LDX   2 80       MOVE 80 JOL CHARACTERS       CBUF0390
0022 01 C6000053         38      B     LD   L2 AREA  FROM OUR BUFFER                 CBUF0400
0024 00 D6000000         39      A     STO  L2 *-*        INTO FIO BUFFER            CBUF0410
0026 0  72FF             40            MDX   2 -1                                    CBUF0420
0027 0  70FA             41            MDX      B                                    CBUF0430
0028 30 03059115         42            CALL     CARDN  START READING NEXT            CBUF0440
002A 1  0045             43            DC       LIST CARD INTO BUFFER                CBUF0450
002B 00 66000000         44      X2    LDX  L2 *-*                                   CBUF0460
002D 01 74010009         45            MDX  L   SUB,1                                CBUF0470
002F 01 4C800009         46            BSC  I   SUB                                  CBUF0480
0031 0  0000             47      CBUFX DC       *-*                                  CBUF0490
0032 0  C012             48      TESTB LD       LIST                                 CBUF0500
0033 01 4C200032         49            BSC  L   TESTB,Z                              CBUF0510
0035 0  C015             50            LD       LIST+6                               CBUF0520
0036 0  901B             51            S        D1                                   CBUF0530
0037 01 4C080040         52            BSC  L   KB,+                                 CBUF0540
0039 0  9014             53            S        D7                                   CBUF0550
```

```
003A 01 4C180040     54            BSC  L  KB,+-                                CBUF0560
003C 30 03059115     55      R     CALL    CARDN  RETRY TO MAKE SURE RIGHT NUMBERCBUF0570
003E 1  0045         56            DC      LIST  OF CARDS HAVE PASSED CARD READERCBUF0580
003F 0  70F2         57            MDX     TESTB                                CBUF0590
0040 0  C0FC         58      KB    LD      R+1  PUT BACK CALL CARDN IN FIO TABLE CBUF0600
0041 00 0700FF69     59            STO  L3 CARD+1                               CBUF0610
0043 01 4C800031     60            BSC  I  CBUFX                                CBUF0620
0045    0007         61      LIST  BSS     7                                    CBUF0630
004C 0  1000         62            DC      /1000                                CBUF0640
004D 1  0053         63            DC      AREA                                 CBUF0650
004E 0  0007         64      D7    DC      7                                    CBUF0660
0050    0000         65      CALL  BSS  E  0                                    CBUF0670
0050 01 44000009     66            BSI  L  SUB                                  CBUF0680
0052 0  0001         67      D1    DC      1                                    CBUF0690
0053 0  0050         68      AREA  DC      80                                   CBUF0700
0054    0050         69            BSS     80                                   CBUF0710
00A4                 70            END     CBUFA                                CBUF0720

000 ERROR(S) AND 000 WARNING(S) IN ABOVE ASSEMBLY.




CBUFA CBUFX
DMP FUNCTION COMPLETED
*DELETE             CBUFA                                              CBUF0730
DMP FUNCTION COMPLETED
*STORE              CBUFA                                              CBUF0740
CBUFA CBUFX
DMP FUNCTION COMPLETED
```

```
// JOB   08 AUG 73 16.753 HRS                                                PBUF0000
// *MIO MPX MASTER LIBRARY PROGRAM
// ASM PBUFA             VERSION 20 MODIFICATION 0  -173                     PBUF0010
*LIST ALL
0000     170A4181     1          ENT     PBUFA     TO BUFFER FIO PRINTING       PBUF0030
002D     170A41A7     2          ENT     PBUFX       TO EMPTY BUFFER            PBUF0040
FF6C                  3    PRINT EQU     -/94                                   PBUF0050
0000 0   0000         4    PBUFA DC      *-*                                    PBUF0060
0001 0   C840         5          LDD     CALL      FIX CALL PRNTN IN FIO TABLE PBUF0070
0002 00 DF00FF6C      6          STD  L3 PRINT                                  PBUF0080
0004 01 4C800000      7          BSC  I  PBUFA                                  PBUF0090
0006 0   0000         8    SUB   DC      *-*                                    PBUF0100
0007 0   6A22         9          STX   2 X2+1                                   PBUF0110
0008 0   C0FD        10          LD      SUB                                    PBUF0120
0009 0   D001        11          STO     *+1                                    PBUF0130
000A 00 66800000     12          LDX  I2 *-*                                    PBUF0140
000C 0   C037        13          LD      D1            SUCCESS                  PBUF0150
000D 0   D206        14          STO   2 6       ERROR PARAMETER IN LIST        PBUF0160
000E 0   C02A        15    TESTA LD      LIST                                   PBUF0170
000F 01 4C20000E     16          BSC  L  TESTA,Z                                PBUF0180
0011 0   C02D        17          LD      LIST+6   SEE IF LAST CALL TO PRNTN WASPBUF0190
0012 0   9031        18          S       D1   SUCCESSFUL                        PBUF0200
0013 01 4C080019     19          BSC  L  K,+                                    PBUF0210
0015 30 176558D5     20          CALL    PRNTN      OTHERWISE RETRY             PBUF0220
0017 1   0039        21          DC      LIST                                   PBUF0230
0018 0   70F5        22          MDX     TESTA                                  PBUF0240
0019 0   C208        23    K     LD    2 8  AREA ADDRESS(FIO BUFFER)            PBUF0250
001A 0   D004        24          STO     B+1  AND INTO LOOP                     PBUF0260
001B 0   C207        25          LD    2 7   CONTROL PARAMETER                  PBUF0270
001C 0   D023        26          STO     LIST+7   INTO OUR LIST                 PBUF0280
                     27    *SHIFT 120 CHARACTERS                                PBUF0290
001D 0   623C        28          LDX   2 60                                     PBUF0300
001E 00 C6000000     29    B     LD   L2 *-*                                    PBUF0310
0020 01 D6000045     30          STO  L2 BUFF                                   PBUF0320
0022 0   72FF        31          MDX   2 -1                                     PBUF0330
0023 0   70FA        32          MDX     B                                      PBUF0340
0024 30 176558D5     33    C     CALL    PRNTN                                  PBUF0350
0026 1   0039        34          DC      LIST                                   PBUF0360
0027 01 74010006     35          MDX  L  SUB,1                                  PBUF0370
0029 00 66000000     36    X2    LDX  L2 *-*                                    PBUF0380
002B 01 4C800006     37          BSC  I  SUB                                    PBUF0390
002D 0   0000        38    PBUFX DC      *-*                                    PBUF0400
002E 0   C00A        39    TESTB LD      LIST     LOOP TILL LIST OFF QUEUE      PBUF0410
002F 01 4C20002E     40          BSC  L  TESTB,Z                                PBUF0420
0031 0   C00D        41          LD      LIST+6  WAS LAST CALL PRNTN SUCCESSFULPBUF0430
0032 0   9011        42          S       D1                                     PBUF0440
0033 01 4C88002D     43          BSC  I  PBUFX,+                                PBUF0450
0035 30 176558D5     44          CALL    PRNTN  OTHERWISE RETRY OPERATION       PBUF0460
0037 1   0039        45          DC      LIST                                   PBUF0470
0038 0   70F5        46          MDX     TESTB                                  PBUF0480
0039     0008        47    LIST  BSS     8                                      PBUF0490
0041 1   0045        48          DC      BUFF                                   PBUF0500
0042     0000        49    CALL  BSS  E  0                                      PBUF0510
0042 01 44000006     50          BSI  L  SUB                                    PBUF0520
0044 0   0001        51    D1    DC      1                                      PBUF0530
0045 0   003C        52    BUFF  DC      60                                     PBUF0540
0046     003C        53          BSS     60                                     PBUF0550
```

```
0082                 54            END                                            PBUF0560

000 ERROR(S) AND 000 WARNING(S) IN ABOVE ASSEMBLY.




PBUFA PBUFX
DMP FUNCTION COMPLETED
*DELETE              PBUFA                                              PBUF0570
DMP FUNCTION COMPLETED
*STORE               PBUFA                                              PBUF0580
PBUFA PBUFX
DMP FUNCTION COMPLETED
```

```
// JOB         X      X      X    02 AUG 73 17.146 HRS                           HEAD0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                                       HEAD0010
// FOR HEAD                  VERSION20 MODIFICATION 1 89                         HEAD0020
*EXTENDED PRECISION                                                              HEAD0030
*LIST ALL
      SUBROUTINE HEAD (MONTH,IYEAR)                                              HEAD0040
C                                                                                HEAD0050
C     SUBROUTINE TO PRINT MONTH, YEAR, AND HEADINGS ON EACH PAGE                 HEAD0060
C                                                                                HEAD0070
      GO TO (1,2,3,4,5,6,7,8,9,10,11,12),MONTH                                   HEAD0080
1     WRITE (3,27) IYEAR                                                         HEAD0090
      GO TO 20                                                                   HEAD0100
2     WRITE (3,28) IYEAR                                                         HEAD0110
      GO TO 20                                                                   HEAD0120
3     WRITE (3,29) IYEAR                                                         HEAD0130
      GO TO 20                                                                   HEAD0140
4     WRITE (3,30) IYEAR                                                         HEAD0150
      GO TO 20                                                                   HEAD0160
5     WRITE (3,31) IYEAR                                                         HEAD0170
      GO TO 20                                                                   HEAD0180
6     WRITE (3,32) IYEAR                                                         HEAD0190
      GO TO 20                                                                   HEAD0200
7     WRITE (3,34) IYEAR                                                         HEAD0210
      GO TO 20                                                                   HEAD0220
8     WRITE (3,35) IYEAR                                                         HEAD0230
      GO TO 20                                                                   HEAD0240
9     WRITE (3,36) IYEAR                                                         HEAD0250
      GO TO 20                                                                   HEAD0260
10    WRITE (3,37) IYEAR                                                         HEAD0270
      GO TO 20                                                                   HEAD0280
11    WRITE (3,38) IYEAR                                                         HEAD0290
      GO TO 20                                                                   HEAD0300
12    WRITE (3,39) IYEAR                                                         HEAD0310
20    WRITE (3,40)                                                               HEAD0320
27    FORMAT (1H1,5(/),'+JANUARY',2X,I4,/)                                       HEAD0330
28    FORMAT (1H1,5(/),'+FEBRUARY',2X,I4,/)                                      HEAD0340
29    FORMAT (1H1,5(/),'+MARCH',2X,I4,/)                                         HEAD0350
30    FORMAT (1H1,5(/),'+APRIL',2X,I4,/)                                         HEAD0360
31    FORMAT (1H1,5(/),'+MAY',2X,I4,/)                                           HEAD0370
32    FORMAT (1H1,5(/),'+JUNE',2X,I4,/)                                          HEAD0380
34    FORMAT (1H1,5(/),'+JULY',2X,I4,/)                                          HEAD0390
35    FORMAT (1H1,5(/),'+AUGUST',2X,I4,/)                                        HEAD0400
36    FORMAT (1H1,5(/),'+SEPTEMBER',2X,I4,/)                                     HEAD0410
37    FORMAT (1H1,5(/),'+OCTOBER',2X,I4,/)                                       HEAD0420
38    FORMAT (1H1,5(/),'+NOVEMBER',2X,I4,/)                                      HEAD0430
39    FORMAT (1H1,5(/),'+DECEMBER',2X,I4,/)                                      HEAD0440
40    FORMAT (115H DATE  TIME      TZ       H1       H2        E        H1'    H2HEAD0450
     1'    HS1     HS2     HS    HMAX(3HRS) DURATION                DEPTH,/) HEAD0460
      RETURN                                                                     HEAD0470
      END                                                                        HEAD0480

STATEMENT ALLOCATIONS
 27    =0001  28    =000F  29    =001E  30    =002B  31    =0038  32    =0044  34    =0051  35    =005E  36    =006C  37    =007B
 38    =0089  39    =0098  40    =00A7  1     =0106  2     =010E  3     =0116  4     =011E  5     =0126  6     =012E  7     =0136
 8     =013E  9     =0146  10    =014E  11    =0156  12    =015E  20    =0164
```

```
FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION

CALLED SUBPROGRAMS
 COMGO    MWRT     MCOMP    MIOI     SUBIN

INTEGER CONSTANTS
     3=0000

CORE REQUIREMENTS FOR HEAD
 COMMON        0  INSKEL COMMON       0
  VARIABLES        0  PROGRAM     362



END OF COMPILATION






HEAD
DMP FUNCTION COMPLETED
// DMP                                                              HEAD0490
*DELETE              HEAD                                           HEAD0500
DMP FUNCTION COMPLETED
*STORE               HEAD                                           HEAD0510
HEAD
DMP FUNCTION COMPLETED
```

```
// JOB   02 AUG 73 17.166 HRS                                           DCRF0000
// *NIO MPX MASTER LIBRARY PROGRAM
// FOR                         VERSION 20 MODIFICATION 0  -170          DCRF0010
*LIST ALL                                                               DCRF0020
*EXTENDED PRECISION                                                     DCRF0030
*NONPROCESS PROGRAM                                                     DCRF0040
*ONE WORD INTEGERS                                                      DCRF0050
      SUBROUTINE DCORF(RATIO,D,TZ)                                      DCRF0060
C     SUBROUTINE TO CALCULATE THE DEPTH CORRECTION FACTOR FOR THE       DCRF0070
C     F.M.PRESSURE RECORDER DATA.                                       DCRF0080
C     PARAMETERS  RATIO IS RETURNED WITH THE CORRECTION FACTOR.         DCRF0090
C                 D IS THE MEAN DEPTH FOR THE RECORD.(RANGE 00.1 TO 99.9DCRF0100
C                 TZ IS THE TIME ZERO CROSSING VALUE.                   DCRF0110
C     ON EACH CALL TO DCORF LAMDA IS COMPUTED BY NEWTON-RAPHSON METHOD  DCRF0120
C     OF ITERATION AND IS SUBSTITUTED INTO THE DEPTH CORRECTION FORMULA.DCRF0130
C     SIGNF IS THE VALUE BELOW WHICH THE ERROR IN LAMDA MAY BE IGNORED  DCRF0140
      REAL LAMDA                                                        DCRF0150
      SIGNF=.5                                                          DCRF0160
      G=32.1741                                                         DCRF0170
      PI=3.14159265                                                     DCRF0180
      LAMDA=(G*TZ*TZ)/(2.*PI)                                           DCRF0190
 6    LAMDA=LAMDA*0.5                                                   DCRF0200
 1    X=2.*PI*D/LAMDA                                                   DCRF0210
      Y=G/(2.*PI*LAMDA)                                                 DCRF0220
      FL=TANH(X)                                                        DCRF0230
      DFL=FL*FL-1.                                                      DCRF0240
      DFL=DFL*X-FL                                                      DCRF0250
      DFL=DFL*Y/LAMDA                                                   DCRF0260
      FL=FL*Y                                                           DCRF0270
      FL=FL-1./(TZ*TZ)                                                  DCRF0280
      IF(DFL)2,4,2                                                      DCRF0290
 2    ERROR=FL/DFL                                                      DCRF0300
      IF(ERROR-LAMDA)5,6,6                                              DCRF0310
 5    LAMDA=LAMDA-ERROR                                                 DCRF0320
      IF(ABS(ERROR)-SIGNF)3,3,1                                         DCRF0330
 4    CONTINUE                                                          DCRF0340
      RATIO=1.16                                                        DCRF0350
      RETURN                                                            DCRF0360
 3    CONTINUE                                                          DCRF0370
      X=2.*PI*D/LAMDA                                                   DCRF0380
      RATIO=EXP(X)                                                      DCRF0390
      RATIO=RATIO+1./RATIO                                              DCRF0400
      RATIO=RATIO*0.5+0.16                                              DCRF0410
      RETURN                                                            DCRF0420
      END                                                               DCRF0430

VARIABLE ALLOCATIONS
 LAMDA(R )=0000      SIGNF(R )=0003          G(R )=0006         PI(R )=0009           X(R )=000C          Y(R )=000F
    FL(R )=0012        DFL(R )=0015      ERROR(R )=0018

STATEMENT ALLOCATIONS
 6    =0062  1    =0068  2    =00AE  5    =00BB  4    =00CB  3    =00D1

FEATURES SUPPORTED
 NONPROCESS
 ONE WORD INTEGERS
 EXTENDED PRECISION
```

```
CALLED SUBPROGRAMS
 ETANH   EABS     EEXP     EADD     ESUB     EMPY     EDIV     ELD      ESTO     ESBR     EDVR     LDFAC    SUBIN

REAL CONSTANTS
   .500000000E 00=001E      .321741000E 02=0021      .314159265E 01=0024      .200000000E 01=0027      .100000000E 01=002A
   .116000000E 01=002D      .160000000E 00=0030

CORE REQUIREMENTS FOR DCORF
 COMMON       0   INSKEL COMMON       0
  VARIABLES      30   PROGRAM     212


END OF COMPILATION
```

```
DCORF
DMP FUNCTION COMPLETED
*DELETE             DCORF                                                   DCRF0440
DMP FUNCTION COMPLETED
*STORE              DCORF                                                   DCRF0450
DCORF
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   02 AUG 73 17.187 HRS                      SBWR0000
// FOR SBWRO             VERSION 21 MODIFICATION 0 89                   SBWR0010
*IOCS(CARD,1443 PRINTER, DISK)                                          SBWR0020
*EXTENDED PRECISION                                                     SBWR0030
*LIST ALL
      DEFINE FILE 1(3000,42,U,IREC)                                     SBWR0040
C                                                                       SBWR0050
C     NIO PROGRAM 89 WRITTEN FOR L.P. AND RECORD RESULTS ON DISK        SBWR0060
C     DISK FILE DEFINED AS HAVING 3000 RECORDS EACH OF 42 WORDS         SBWR0070
C     LOGICAL UNIT NUMBERS ARE  2=CARD READ/PUNCH, 3=LINEPRINTER        SBWR0080
C                                                                       SBWR0090
      INTEGER TIME,ZERO,CREST,N,R,TITLE(36)                             SBWR0100
      DIMENSION IDAT(500),H(8),Z(2),W(2),F(2),E(2),K(2),SPACE(11)       SBWR0110
      CALL CBUFA                                                        SBWR0120
      CALL PBUFA                                                        SBWR0130
      IREC=1                                                            SBWR0140
      IFM=-14784                                                        SBWR0150
      JCALM=-15552                                                      SBWR0160
      JFLTY=-14784                                                      SBWR0170
      JMISS=-11200                                                      SBWR0180
      JLESS=19520                                                       SBWR0190
      JSLAS=24896                                                       SBWR0200
      JSPAC=16448                                                       SBWR0210
      INCOR=19264                                                       SBWR0220
      DO 999 I=1,11                                                     SBWR0230
      SPACE (I)=16448                                                   SBWR0240
999   CONTINUE                                                          SBWR0250
      ZER=0.                                                            SBWR0260
      READ(2,1)IFM                                                      SBWR0270
1     FORMAT (A1)                                                       SBWR0280
      READ (2,22) LINEC                                                 SBWR0290
      READ (2,44) TITLE                                                 SBWR0300
      WRITE (3,55) TITLE                                                SBWR0310
C                                                                       SBWR0320
C     DATA TITLE PRINTED ON L.P.                                        SBWR0330
C                                                                       SBWR0340
16    I=0                                                               SBWR0350
      J=1                                                               SBWR0360
      READ (2,66) MONTH,IYEAR,CORF                                      SBWR0370
      WRITE (1'IREC) MONTH,IYEAR                                        SBWR0380
C                                                                       SBWR0390
C     MONTH AND YEAR WRITTEN TO DISK                                    SBWR0400
C                                                                       SBWR0410
14    READ (2,88) N,IDAT(J),TIME,ALNTH,A,B,C,D,ZERO,CREST,DEPTH,R       SBWR0420
C                                                                       SBWR0430
C     ONE RECORD READ FROM CARD                                         SBWR0440
C                                                                       SBWR0450
      ATIME=TIME/100                                                    SBWR0460
      IF (R-JCALM) 63,24,63                                             SBWR0470
63    IF (R-JFLTY) 64,24,64                                             SBWR0480
64    IF (R-JMISS) 65,24,65                                             SBWR0490
C                                                                       SBWR0500
C     TEST FOR CALM, MISSING OR FAULTY RECORD                           SBWR0510
C                                                                       SBWR0520
65    IF (IFM+14784)650,660,650
660   A=A*CORF
      B=B*CORF                                                          SBWR0540
      C=C*CORF
      D=D*CORF
650   H(1)=A+C
      H(2)=B+D
C
C     H(1) AND H(2) ARE THE TWO HIGHEST WAVES IN THE RECORD
C
      Z(1)=120.0*ALNTH/ZERO
C
C     Z(1) = WAVE PERIOD
C
      W(1)=60.0*ALNTH/CREST
      IF (2*CREST-ZERO) 100,85,85
85    E(2)=SQRT(1.0-(W(1)**2/Z(1)**2))
C
C     E(2) IS THE SPECTRAL WIDTH PARAMETER
C
      IF (IFM+14784)300,301,300
301   CALL DCORF(RATIO,DEPTH,Z(1))
      H(3)=RATIO*H(1)
      H(4)=RATIO*H(2)
      GO TO 302
300   G=2.0*3.14159/Z(1)
      X=1.0/(77.44*G*G)
      X=SQRT(X+1.0)
      X=(0.83*X*X*X)
      E(1)=X*EXP(2.5*DEPTH*G*G/32.174)
      H(3)=E(1)*H(1)
      H(4)=E(1)*H(2)
C
C     H(3) AND H(4) ARE H(1) AND H(2)
C     CORRECTED FOR INSTRUMENTAL RESPONSE
C
302   F(2)=ALOG(ZERO/2.)
      F(1)=SQRT(2.0*F(2))
      H(5)=2.0*H(3)/(F(1)*(1.0+0.289/F(2)-0.247/F(2)**2))
      H(6)=2.0*H(4)/(F(1)*(1.0-0.211/F(2)-0.103/F(2)**2))
C
C     H(5) AND H(6) ARE THE MEAN HEIGHT OF
C     THE HIGHEST ONE-THIRD OF THE WAYES
C
      H(7)=(H(5)+H(6))/2.0
C
C     H(7) EQUALS H (SIGNIFICANT)
C
      Y=SQRT(ALOG(90.0*ZERO/ALNTH))
      H(8)=H(7)*(0.7071*(0.006361*Y**4-0.073968*Y**3+0.330573*Y**2+0.316
     1548*Y+0.566405))
C
C     H(8) EQUALS H MAX(3HRS)
C
24    IF(I-1) 25,25,15
C
```

```
C      PRINT OUT SECTION
C
25     CALL HEAD (MONTH,IYEAR)
C
C      PRINT PAGE HEADINGS IF REQUIRED
C
       K(1)=11
15     IF(J-1) 19,18,19
19     IF(IDAT(J)-IDAT(J-1)) 21,18,21
21     LINEC=LINEC+1
C
C      RAISE LINE COUNTS IF A NEW DAY IS BEING STARTED
C
18     IF(R-JCALM) 13,23,13
13     IF(R-JFLTY) 42,43,42
42     IF(R-JMISS) 45,46,45
C      LABEL 23 FOR CALM, 43 FOR FAULTY, 46 FOR MISSING
23     IF(J-1) 47,48,47
47     IF(IDAT(J)-IDAT(J-1)) 49,48,49
49     IF(K(1)-11) 48,48,200
200    WRITE(3,41)
48     WRITE (3,53) IDAT(J),ATIME,DEPTH,LINEC
       WRITE (1'IREC)JCALM,IDAT(J),ATIME,SPACE,DEPTH,LINEC
       LINEC=LINEC+1
C
C      PRINT CALM RESULTS ON LINEPRINTER AND DISK
C
       GO TO 56
43     IF(J-1) 57,58,57
57     IF(IDAT(J)-IDAT(J-1)) 59,58,59
59     IF(K(1)-11) 58,58,201
201    WRITE(3,41)
58     WRITE (3,68) IDAT(J),ATIME,DEPTH,LINEC
       WRITE (1'IREC)JFLTY,IDAT(J),ATIME,SPACE,DEPTH,LINEC
       LINEC=LINEC+1
C
C      PRINT FAULTY RESULTS ON LINEPRINTER AND DISK
C
       GO TO 56
46     IF (J-1) 69,70,69
69     IF (IDAT(J)-IDAT(J-1)) 71,70,71
71     IF(K(1)-11) 70,70,202
202    WRITE(3,41)
70     WRITE (3,74) IDAT(J),ATIME,DEPTH,LINEC
       WRITE (1'IREC)JMISS,IDAT(J),ATIME,SPACE,DEPTH,LINEC
       LINEC=LINEC+1
C
C      PRINT MISSING RESULTS ON LINEPRINTER AND DISK
C
       GO TO 56
45     IF(J-1) 76,78,76
76     IF(IDAT(J)-IDAT(J-1)) 79,78,79
79     IF(K(1)-12) 78,78,203
```

```
203    WRITE(3,41)
78     Z(1)=Z(1)+0.005
       H(1)=H(1)+0.05
       H(2)=H(2)+0.05
       E(2)=E(2)+0.0005
       H(3)=H(3)+0.05
       H(4)=H(4)+0.05
       H(5)=H(5)+0.05
       H(6)=H(6)+0.05
       H(7)=H(7)+0.05
       H(8)=H(8)+0.05
C
C      CORRECT RESULTS BY ROUNDING
C
       WRITE (3,75) IDAT(J),ATIME,Z(1),H(1),H(2),E(2),H(3),H(4),H(5)
      2,H(6),H(7),H(8),ALNTH,DEPTH,LINEC
       WRITE(1'IREC)JSPAC,IDAT(J),ATIME,Z(1),H(1),H(2),E(2),H(3),H(4),H(5
      3),H(6),H(7),H(8),ALNTH,DEPTH,LINEC
       LINEC=LINEC+1
56     K(1)=K(1)+1
C
C      WRITE RESULTS TO LINEPRINTER AND DISK
C
       IF (N-JLESS) 61,997,61
61     IF (N-JSLAS) 998,17,998
C
C      TEST FOR END OF MONTH OR DATA
C
998    IF (51-K(1)) 82,82,83
82     CALL HEAD (MONTH,IYEAR)
C
C      TEST FOR NEW PAGE
C
       K(1)=11
83     I=2
       J=J+1
       GO TO 14
997    LINEC=LINEC+1
       GO TO 16
100    IF(J-1) 303,51,303
303    IF (IDAT(J)-IDAT(J-1)) 89,51,89
89     IF(K(1)-11) 205,205,204
204    WRITE (3,41)
205    LINEC=LINEC+1
51     WRITE (3,91) IDAT(J),ATIME,DEPTH,LINEC
       WRITE (1'IREC)INCOR,IDAT(J),ATIME,SPACE,DEPTH,LINEC
C
C      ROUTINE FOR AN INCORRECT RECORD I.E. IF (2*NO OF CRESTS
C      -NO OF ZERO CROSSINGS ) IS LESS THAN ZERO
C
C      LINEC=LINEC+1
       K(1)=K(1)+1
       IF (51-K(1)) 92,92,93
```

```
 92      WRITE (3,98)                                                    SBWR2140
         CALL HEAD (MONTH,IYEAR)                                         SBWR2150
 C                                                                       SBWR2160
 C       TEST FOR NEW PAGE                                               SBWR2170
 C                                                                       SBWR2180
         K(1)=11                                                         SBWR2190
 93      I=2                                                             SBWR2200
         J=J+1                                                           SBWR2210
         GO TO 14                                                        SBWR2220
 17      WRITE (3,97)                                                    SBWR2230
         CALL CBUFX                                                      SBWR2240
         CALL PBUFX                                                      SBWR2250
 41      FORMAT(1H )                                                     SBWR2260
 22      FORMAT (I5)                                                     SBWR2270
 44      FORMAT (36A2)                                                   SBWR2280
 55      FORMAT (1H1,24(/),36A2,/)                                       SBWR2290
 66      FORMAT (I2/I4,2X,F4.2)                                          SBWR2300
 88      FORMAT (A1,I2,I6,1X,5F6.1,2I7,F6.1,A1)                          SBWR2310
 53      FORMAT (1H ,1X,I2,F7.2,'    CALM',92X,F4.1,1X,I4)               SBWR2320
 68      FORMAT (1H ,1X,I2,F7.2,86X,'RECORD FAULTY',1X,F4.1,1X,I4)       SBWR2330
 74      FORMAT (1H ,1X,I2,F7.2,86X,'RECORD MISSING',F4.1,1X,I4)         SBWR2340
 91      FORMAT (1H ,1X,I2,F7.2,100X,F4.1,1X,I4)                         SBWR2350
 98      FORMAT (1H1,5(/))                                               SBWR2360
 97      FORMAT (1H ,3(/),'1 END OF DATA')                               SBWR2370
 75      FORMAT (1H ,1X,I2,F7.2,F8.2,F6.1,F7.1,F9.3,4F7.1,F6.1,F9.1,F10.2,1SBWR2380
        47X,F4.1,1X,I4)                                                  SBWR2390
         CALL EXIT                                                       SBWR2400
         END                                                             SBWR2410

VARIABLE ALLOCATIONS
     H(R )=0018-0006      Z(R )=0021-001E      W(R )=0027-0024      F(R )=002D-002A      E(R )=0033-0030 SPACE(R )=0054-0036
   ZER(R )=0057        CORF(R )=005A       ALNTH(R )=005D           A(R )=0060           B(R )=0063          C(R )=0066
     D(R )=0069       DEPTH(R )=006C       ATIME(R )=006F       RATIO(R )=0072           G(R )=0075          X(R )=0078
     Y(R )=007B        IDAT(I )=027D-008A      K(I )=027F-027E   TIME(I )=0280        ZERO(I )=0281      CREST(I )=0282
     N(I )=0283           R(I )=0284       TITLE(I )=02A8-0285   IREC(I )=02A9         IFM(I )=02AA      JCALM(I )=02AB
 JFLTY(I )=02AC       JMISS(I )=02AD       JLESS(I )=02AE       JSLAS(I )=02AF       JSPAC(I )=02B0      INCOR(I )=02B1
     I(I )=02B2       LINEC(I )=02B3           J(I )=02B4       MONTH(I )=02B5       IYEAR(I )=02B6

STATEMENT ALLOCATIONS
 1     =0318  41    =031A  22    =031D  44    =031F  55    =0322  66    =032B  88    =0331  53    =033C  68    =034B  74    =035E
 91    =0370  98    =037A  97    =0380  75    =038E  999   =03DB  16    =0402  14    =041C  63    =044B  64    =0451  65    =0457
 660   =045D  650   =0475  85    =04AC  301   =04CD  300   =04EF  302   =0543  24    =05F7  25    =05FD  15    =0607  19    =060D
 21    =0621  18    =0627  13    =062D  42    =0633  23    =063B  47    =0641  49    =0655  200   =065D  48    =0661  43    =068D
 57    =0693  59    =06A7  201   =06AF  58    =06B3  46    =06DF  69    =06E5  71    =06F9  202   =0701  70    =0705  45    =0731
 76    =0737  79    =074B  203   =0753  78    =0757  56    =081A  61    =0828  998   =082E  82    =0836  83    =0840  997   =084C
 100   =0854  303   =085A  89    =086E  204   =0876  205   =087A  51    =0880  92    =08B4  93    =08C2  17    =08CE

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
```

```
 CBUFA    PBUFA    ESQRT    DCORF    EEXP     EALOG    HEAD     CBUFX    PBUFX    EADD     EADDX    EMPY     EMPYX    EDIV     EDIVX
 ELD      ELDX     ESTO     ESTOX    ESBR     EDVR     EAXI     FLOAT    ISTOX    MRED     MWRT     MCOMP    MIOAI    MIOFX    MIOIX
 MIOF     MIOI     SUBSC    MDWRT    MDCOM    MDAF     MDFX     MDIX     MDF      MDI      HOLEB    PRNTN    EBPRT    CARDN

REAL CONSTANTS
   .000000000E 00=02C0     .120000000E 03=02C3     .600000000E 02=02C6     .100000000E 01=02C9     .200000000E 01=02CC
   .314159000E 01=02CF     .774400000E 02=02D2     .830000000E 00=02D5     .250000000E 01=02D8     .321740000E 02=02DB
   .289000000E 00=02DE     .247000000E 00=02E1     .211000000E 00=02E4     .103000000E 00=02E7     .900000000E 02=02EA
   .707100000E 00=02ED     .636100000E-02=02F0     .739680000E-01=02F3     .330573000E 00=02F6     .316548000E 00=02F9
   .566405000E 00=02FC     .500000000E-02=02FF     .500000000E-01=0302     .500000000E-03=0305

INTEGER CONSTANTS
     1=0308  14784=0309  15552=030A  11200=030B  19520=030C  24896=030D  16448=030E  19264=030F      11=0310      2=0311
     3=0312      0=0313    100=0314      4=0315     12=0316     51=0317

CORE REQUIREMENTS FOR SBWRO
 COMMON       0  INSKEL COMMON       0
  VARIABLES     704  PROGRAM    1560



END OF COMPILATION





SBWRO
DMP FUNCTION COMPLETED
// DMP                                                                                     SBWR2420
*DELETE             1 SBWRO                                                                SBWR2430
DMP FUNCTION COMPLETED
*STORE              1 SBWRO                                                                SBWR2440
SBWRO
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73 12.069 HRS                      PRNT0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                              PRNT0010
// FOR PRINT            VERSION20 MODIFICATION 1 121                    PRNT0020
*EXTENDED PRECISION                                                     PRNT0030
*LIST ALL                                                               PRNT0040
      SUBROUTINE PRINT (MONTH,YEAR)                                     PRNT0060
      INTEGER YEAR                                                      PRNT0070
      GO TO (1,2,3,4,5,6,7,8,9,10,11,12),MONTH                          PRNT0080
1     WRITE (3,27) YEAR                                                 PRNT0090
      GO TO 20                                                          PRNT0100
2     WRITE (3,28) YEAR                                                 PRNT0110
      GO TO 20                                                          PRNT0120
3     WRITE (3,29) YEAR                                                 PRNT0130
      GO TO 20                                                          PRNT0140
4     WRITE (3,30) YEAR                                                 PRNT0150
      GO TO 20                                                          PRNT0160
5     WRITE (3,31) YEAR                                                 PRNT0170
      GO TO 20                                                          PRNT0180
6     WRITE (3,32) YEAR                                                 PRNT0190
      GO TO 20                                                          PRNT0200
7     WRITE (3,34) YEAR                                                 PRNT0210
      GO TO 20                                                          PRNT0220
8     WRITE (3,35) YEAR                                                 PRNT0230
      GO TO 20                                                          PRNT0240
9     WRITE (3,36) YEAR                                                 PRNT0250
      GO TO 20                                                          PRNT0260
10    WRITE (3,37) YEAR                                                 PRNT0270
      GO TO 20                                                          PRNT0280
11    WRITE (3,38) YEAR                                                 PRNT0290
      GO TO 20                                                          PRNT0300
12    WRITE (3,39) YEAR                                                 PRNT0310
20    WRITE (3,40)                                                      PRNT0320
27    FORMAT (1H1,5(/),'+JANUARY',2X,I4,/)                              PRNT0330
28    FORMAT (1H1,5(/),'+FEBRUARY',2X,I4,/)                             PRNT0340
29    FORMAT (1H1,5(/),'+MARCH',2X,I4,/)                                PRNT0350
30    FORMAT (1H1,5(/),'+APRIL',2X,I4,/)                                PRNT0360
31    FORMAT (1H1,5(/),'+MAY',2X,I4,/)                                  PRNT0370
32    FORMAT (1H1,5(/),'+JUNE',2X,I4,/)                                 PRNT0380
34    FORMAT (1H1,5(/),'+JULY',2X,I4,/)                                 PRNT0390
35    FORMAT (1H1,5(/),'+AUGUST',2X,I4,/)                               PRNT0400
36    FORMAT (1H1,5(/),'+SEPTEMBER',2X,I4,/)                            PRNT0410
37    FORMAT (1H1,5(/),'+OCTOBER',2X,I4,/)                              PRNT0420
38    FORMAT (1H1,5(/),'+NOVEMBER',2X,I4,/)                             PRNT0430
39    FORMAT (1H1,5(/),'+DECEMBER',2X,I4,/)                             PRNT0440
40    FORMAT (116H DATE  TIME     TZ      H1      H2        E        H1'    H2PRNT0450
     1'    HS1    HS2     HS    HMAX(3HRS) DURATION               DEPTH,/) PRNT0460
      RETURN                                                            PRNT0470
      END                                                               PRNT0480


STATEMENT ALLOCATIONS
 27    =0001  28    =000F  29    =001E  30    =002B  31    =0038  32    =0044  34    =0051  35    =005E  36    =006C  37    =007B
 38    =0089  39    =0098  40    =00A7  1     =0106  2     =010E  3     =0116  4     =011E  5     =0126  6     =012E  7     =0136
 8     =013E  9     =0146  10    =014E  11    =0156  12    =015E  20    =0164

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION

CALLED SUBPROGRAMS
 COMGO   MWRT    MCOMP   MIOI    SUBIN

INTEGER CONSTANTS
     3=0000

CORE REQUIREMENTS FOR PRINT
 COMMON       0  INSKEL COMMON       0
  VARIABLES       0  PROGRAM    362



END OF COMPILATION







PRINT
DMP FUNCTION COMPLETED
// DMP                                                                    PRNT0490
*DELET                PRINT                                               PRNT0500
DMP FUNCTION COMPLETED
*STORE                PRINT                                               PRNT0510
PRINT
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73  12.089 HRS
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY
// FOR LISTO                VERSION20 MODIFICATION 1 121
*LIST ALL
*IOCS (CARD,1443 PRINTER,DISK)
*EXTENDED PRECISION
      DEFINE FILE 1(3000,42,U,IREC)
C----
C     N.I.O. PROGRAM 121-LISTO
C----
C     THIS PROGRAM LISTS ON THE 1443 PRINTER THE SBWRO OUTPUT STORED
C     ON DISK. THE HEADINGS ON EACH PAGE ARE PROGRAM OUTPUT AS THEY
C     ARE NOT STORED ON DISK
C
      INTEGER TITLE(36),YEAR,TEST,P,PI,CINT
      DIMENSION NAMFL(3)
      CALL PBUFA
      READ (2,30) NAMFL
30    FORMAT (3A2)
      CALL DFT(1,NAMFL,IERR)
      IF (IERR) 31,32,31
31    WRITE (3,33) IERR
33    FORMAT (1H ,'IERR=' I3)
      GO TO 7
32    IREC=1
      JCALM=-15552
      JFLTY=-14784
      JSPAC=16448
      INCOR=19264
      INT=-14016
      CINT=-10944
      PI=1
      READ (2,100) TITLE
      WRITE (3,101) TITLE
      READ (2,102) P
11    READ (1'IREC) MONTH,YEAR
      M=0
      GO TO (1,2,1,3,1,3,1,1,3,1,3,1),MONTH
C
C     PRINT DATA TITLE, AND INPUT MONTH NUMBER AND YEAR
C
1     N=248
      GO TO 6
2     IF (YEAR-4*(YEAR/4)) 4,5,4
3     N=240
      GO TO 6
4     N=224
      GO TO 6
5     N=232
      GO TO 6
C
C     TEST THE NUMBER OF RECORDS IN THE MONTH AND SET N ACCORDINGLY
C
6     CALL PRINT (MONTH,YEAR)
C
C     PRINT MONTH,YEAR,HEADINGS AT THE TOP OF EVERY PAGE
C
```

```
      L=0
      K=11
13    READ (1'IREC) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,J
      IF (TEST-JSPAC) 15,14,15
15    IF (TEST-JCALM) 17,16,17
17    IF (TEST-JFLTY) 19,18,19
19    IF (TEST-INCOR)121,22,121
121   IF(TEST-INT) 21,122,21
21    IF(TEST-CINT)123,124,123
123   WRITE (3,105) I,A,V,J
      GO TO 20
16    WRITE (3,106) I,A,V,J
      GO TO 20
122   WRITE (3,110) I,A,B,C,D,E,F,G,H,W,X,Y,J
110   FORMAT(1H ,1X,I2,F7.2,F8.2,F6.1,F7.1,F9.3,4F7.1,F6.1,F9.1,12X
     1,         'INTERPOLATED',8X,I4)
      GO TO 20
124   WRITE (3,111) I,A,J
111   FORMAT (1H,1X,I2,F7.2,'     CALM',77X,'INTERPOLATED',8X,I4)
      GO TO 20
18    WRITE (3,107) I,A,V,J
      GO TO 20
22    WRITE (3,108) I,A,V,J
      GO TO 20
14    WRITE (3,109) I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,J
20    IF(P-PI) 7,7,8
8     PI=PI+1
C
C     PRINT A RECORD. TEST RECORD COUNT ,IF EQUAL TO P STOP
C
      L=L+1
      IF (8-L) 9,9,10
9     WRITE (3,104)
      L=0
      PI=PI+1
      K=K+1
10    M=M+1
      IF (N-M) 11,11,12
C
C     TEST FOR END OF DAY AND END OF MONTH
C
12    K=K+1
      IF (56-K) 6,6,13
C
C     TEST FOR NEW PAGE
C
100   FORMAT (36A2)
101   FORMAT (1H1,24(/),44X,36A2)
102   FORMAT (I4)
104   FORMAT (1H )
105   FORMAT (1X ,1X,I2,F7.2,86X,'RECORD MISSING',F4.1,1X,I4)
106   FORMAT (1H ,1X,I2,F7.2,'     CALM',92X,F4.1,1X,I4)
107   FORMAT (1H ,1X,I2,F7.2,86X,'RECORD FAULTY',1X,F4.1,1X,I4)
```

```
108    FORMAT (1H ,1X,I4,F7.2,100X,F4.1,1X,I4)                          LIST1100
109    FORMAT (1H ,1X,I2,F7.2,F8.2,F6.1,F7.1,F9.3,4F7.1,F6.1,F9.1,F10.2,1LIST1110
      17X,F4.1,1X,I4)                                                   LIST1120
7      CALL PBUFX                                                       LIST1130
       CALL EXIT                                                        LIST1140
       END                                                              LIST1150

VARIABLE ALLOCATIONS
     A(R )=0006          B(R )=0009          C(R )=000C          D(R )=000F          E(R )=0012          F(R )=0015
     G(R )=0018          H(R )=001B          W(R )=001E          X(R )=0021          Y(R )=0024          Z(R )=0027
     V(R )=002A      NAMFL(I )=002F-002D TITLE(I )=0053-0030  YEAR(I )=0054       TEST(I )=0055          P(I )=0056
    PI(I )=0057       CINT(I )=0058       IREC(I )=0059       IERR(I )=005A      JCALM(I )=005B      JFLTY(I )=005C
 JSPAC(I )=005D      INCOR(I )=005E        INT(I )=005F      MONTH(I )=0060          M(I )=0061          N(I )=0062
     L(I )=0063          K(I )=0064          I(I )=0065          J(I )=0066

STATEMENT ALLOCATIONS
 30    =007A  33    =007D  110   =0085  111   =009D  100   =00B2  101   =00B5  102   =00BE  104   =00C0  105   =00C3  106   =00D4
 107   =00E3  108   =00F6  109   =0100  31    =0125  32    =012D  11    =0165  1     =0181  2     =0187  3     =0197  4     =019D
 5     =01A3  6     =01A9  13    =01B5  15    =01DF  17    =01E5  19    =01EB  121   =01F1  21    =01F7  123   =01FD  16    =020B
 122   =0219  124   =0239  18    =0245  22    =0253  14    =0261  20    =0283  8     =0289  9     =029B  10    =02AF  12    =02BB
 7     =02C9

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 PBUFA    DFT      PRINT    PBUFX    COMGO    STFAC    SBFAC    MRED     MWRT     MCOMP    MIOAI    MIOF     MIOI     MDRED    MDCOM
 MDF      MDI      HOLEB    PRNTN    EBPRT    CARDN

INTEGER CONSTANTS
     2=0068      1=0069      3=006A  15552=006B  14784=006C  16448=006D  19264=006E  14016=006F  10944=0070      0=0071
   248=0072      4=0073    240=0074    224=0075    232=0076     11=0077      8=0078     56=0079

CORE REQUIREMENTS FOR LISTO
 COMMON      0  INSKEL COMMON      0
  VARIABLES    104  PROGRAM    614



END OF COMPILATION
```

```
LISTO
DMP FUNCTION COMPLETED
// DMP                                                                  LIST1160
*DELETE             1 LISTO                                             LIST1170
DMP FUNCTION COMPLETED
*STORECIL           1 LISTO LISTO                                       LIST1180

*FILES(1,DOWS,2)                                                        LIST1190
*CCEND                                                                  LIST1200
```

```
 MPX, BUILD LISTO

 CORE LOAD  MAP
 TYPE NAME  ARG1  ARG2

 *CDW TABLE 4D8C  0012
 *FIO TABLE 4D9E  001E
 *ETV TABLE 4DBC  000F
 *VTV TABLE 4DCB  002A
 *CNT TABLE 4DF6  0004
 MAIN LISTO 4F0D
 CLNT LISTO 4DF8
 CALL PBUFA 50C8
 LIBF MRED  5344  4DCB  R
 LIBF MIOAI 53CE  4DCE
 LIBF MCOMP 538F  4DD1
 CALL DFT   586A
 LIBF MWRT  5348  4DD4
 LIBF MIOI  53AC  4DD7
 LIBF MDRED 5941  4DDA  R
 LIBF MDI   58EC  4DDD
 LIBF MDCOM 598E  4DE0
 LIBF COMGO 5B35  4DE3  R
 LIBF STFAC 5B8A  4DE6  R
 LIBF SBFAC 5B8E  4DE9
 CALL PRINT 5C7C
 LIBF MDF   58E2  4DEC
 LIBF MIOF  53A8  4DEF
 CALL PBUFX 50F5
 CALL FEROR 5D05        R
 CALL SBCAL 5E36
 CALL GETBF 5D43
 CALL FREBF 5D35
 CALL FIOXT 5D39
 CALL FLETM 5E4E
 LIBF SUBIN 5F2C  4DF2  R
 CALL FREUP 5E15        R
 FIOB       5F6A  0142
 CORE       60AC  1F54
 MPX, LISTO LD XQ

CL WC OF  11DE STORED AT  15E5
DMP FUNCTION COMPLETED
```

```
// JOB    03 AUG 73 12.143 HRS                                                    INCR0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                                        INCR0010
// FOR INCR              VERSION20 MODIFICATION 0 -107                            INCR0020
*LIST ALL                                                                         INCR0030
*ONE WORD INTEGERS                                                                INCR0040
*EXTENDED PRECISION                                                               INCR0050
*NON PROCESS PROGRAM                                                              INCR0060
      SUBROUTINE INCR (J,NI,JA,P,NO)                                              INCR0070
      IF (P-JA) 1,2,1                                                             INCR0080
1     IF (J-NI) 3,4,3                                                             INCR0090
4     J=0                                                                         INCR0100
      GO TO 3                                                                     INCR0110
2     WRITE (3,7) NO                                                              INCR0120
7     FORMAT (1H ,' END OF YEAR REACHED WITH NO= ',I3)                            INCR0130
3     RETURN                                                                      INCR0140
      END                                                                         INCR0150


STATEMENT ALLOCATIONS
 7     =0002  1     =002C   4     =0032   2     =0038   3     =003E

FEATURES SUPPORTED
 NONPROCESS
 ONE WORD INTEGERS
 EXTENDED PRECISION

CALLED SUBPROGRAMS
 ESBR     FLOAT    LDFAC    MWRT     MCOMP    MIOI     SUBIN

INTEGER CONSTANTS
     0=0000       3=0001

CORE REQUIREMENTS FOR INCR
 COMMON       0  INSKEL COMMON      0
  VARIABLES       0  PROGRAM      64



END OF COMPILATION




INCR
DMP FUNCTION COMPLETED
// DUP                                                                            INCR0160
*DELETE              INCR                                                         INCR0170
DMP FUNCTION COMPLETED
*STORE               INCR                                                         INCR0180
INCR
DMP FUNCTION COMPLETED
```

```
// JOB         X     X     X   03 AUG 73  12.162 HRS                    COR20000
// *NIO PROGRAM LIBRARY MASTER COPY                                     COR20010
// FOR CORR2               VERSION 20 MODIFICATION 1 214                COR20020
*LIST ALL                                                               COR20030
*IOCS (DISK,1443 PRINTER,CARD)                                          COR20040
*EXTENDED PRECISION                                                     COR20050
      DEFINE FILE 1(3000,42,U,NREC)                                     COR20060
      INTEGER TEST,YEAR,P,PARA,CINT                                     COR20070
      DIMENSION ITITL(36),CORR(6,15),NAMFL(3)                           COR20080
C----                                                                   COR20090
C---- NIO PROGRAM 214 CORR2                                             COR20100
C----                                                                   COR20110
C---- THIS PROGRAM ADDS INTERPOLATED RESULTS FOR 'FAULTY','MISSING', ANDCOR20120
C---- INCORRECT RECORDS IN SBWRO OUTPUT. IF PARA = 1, GAPS OF 4 OR LESS COR20130
C---- RESULTS ARE LINEARLY INTERPOLATED, STORED ON DISK AND THEN LISTED COR20140
C---- USING PROGRAM LISTO. IF PARA = 2, THE SMALL GAPS ARE INTERPOLATED COR20150
C---- AND STORED AS BEFORE , THEN PROGRAM CORR2 IS EXECUTED.            COR20160
C----                                                                   COR20170
C---- LNO= NUMBER OF MISSING RECORDS AT END OF YEAR                     COR20180
C---- JNO= NUMBER OF MISSING RECORDS AT START OF YEAR                   COR20190
C---- KNO= IF SET  4 GAP AT START OF YEAR IS IGNORED                    COR20200
C---- INO= IF SET =1 ANY GAP DURING THE YEAR IS  4 RECORDS              COR20210
C----      AND IS IGNORED                                               COR20220
C---- J  = COUNTER FOR NUMBER OF RECORDS READ IN A MONTH                COR20230
C----                                                                   COR20240
      INO=0                                                             COR20250
      LNO=0                                                             COR20260
      JNO=0                                                             COR20270
      KNO=0                                                             COR20280
      JSPAC=16448                                                       COR20290
      JCALM=-15552                                                      COR20300
      INT=-14016                                                        COR20310
      CINT=-10944                                                       COR20320
      J=0                                                               COR20330
      NREC=1                                                            COR20340
      NO=0                                                              COR20350
      READ (2,1) PARA,NAMFL,P,MAX                                       COR20360
1     FORMAT (I2,2X,3A2,2(2X,I5))                                       COR20370
      CALL DFT(1,NAMFL,IERR)                                            COR20380
      IF (IERR) 2,3,2                                                   COR20390
2     WRITE (3,4) IERR                                                  COR20400
4     FORMAT(' IERR =',I2,' IN CORR2')                                  COR20410
      CALL EXIT                                                         COR20420
3     READ (2,5) ITITL                                                  COR20430
5     FORMAT (36A2)                                                     COR20440
      WRITE (3,6) ITITL                                                 COR20450
6     FORMAT (1H1,24(/),44X,36A2)                                       COR20460
13    READ (1'NREC) MONTH,YEAR                                          COR20470
C----                                                                   COR20480
C---- CALCULATE NUMBER OF RECORDS IN EACH MONTH                         COR20490
C----                                                                   COR20500
      GO TO (7,8,7,9,7,9,7,7,9,7,9,7),MONTH                             COR20510
7     NI=248                                                            COR20520
      GO TO 21                                                          COR20530
8     IF (YEAR-4*(YEAR/4)) 11,12,11                                     COR20540
9     NI=240                                                            COR20550
      GO TO 21                                                          COR20560
```

```
11    NI=224                                                            COR20570
      GO TO 21                                                          COR20580
12    NI=232                                                            COR20590
21    READ (1'NREC) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA                 COR20600
      J=J+1                                                             COR20610
      IF (JA-1) 100,101,100                                             COR20620
C----                                                                   COR20630
C---- TEST FOR MISSING RECORDS AT START OF YEAR . SET KNO = NUMBER      COR20640
C---- OF MISSING RECORDS.                                               COR20650
C----                                                                   COR20660
101   IF (TEST-JCALM) 102,15,102                                        COR20670
102   IF (TEST-JSPAC) 109,15,109                                        COR20680
109   CALL INCR(J,N1,JA,P,NO)                                           COR20690
      KNO=KNO+1                                                         COR20700
199   READ (1'NREC) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA                 COR20710
      J=J+1                                                             COR20720
      GO TO 101                                                         COR20730
100   IF (TEST-JCALM) 14,15,14                                          COR20740
14    IF (TEST-JSPAC) 16,15,16                                          COR20750
16    IF (INO-1) 160,19,160                                             COR20760
160   NO=NO+1                                                           COR20770
      IF (NO-1) 17,18,17                                                COR20780
17    IF (NO-5) 19,20,20                                                COR20790
C----                                                                   COR20800
C---- IF GAP IN MIDDLE OF YEAR IS LONGER THAN 4 RECORDS RESET 'NO'      COR20810
C---- AND SET INO = 1                                                   COR20820
C----                                                                   COR20830
20    NO=0                                                              COR20840
      INO=1                                                             COR20850
19    CALL INCR(J,NI,JA,P,NO)                                           COR20860
C----                                                                   COR20870
C---- TEST FOR END OF MONTH OR YEAR                                     COR20880
C----                                                                   COR20890
      IF (P-JA) 25,25,26                                                COR20900
26    IF (J) 21,13,21                                                   COR20910
C----                                                                   COR20920
C---- STORE POSITION OF LAST CORRECT DISK RECORD, AND STORE VALUES      COR20930
C---- IN FIRST RECORD OF CORR ARRAY. IF THE RECORD IS CALM, STORE       COR20940
C---- ZERO IN CORR ARRAY.                                               COR20950
C----                                                                   COR20960
18    LAST=NREC-2                                                       COR20970
      READ (1'LAST) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA                 COR20980
      IF (TEST+15552) 22,23,22                                          COR20990
22    CORR(1,1)=I                                                       COR21000
      CORR(1,2)=A                                                       COR21010
      CORR(1,3)=B                                                       COR21020
      CORR(1,4)=C                                                       COR21030
      CORR(1,5)=D                                                       COR21040
      CORR(1,6)=E                                                       COR21050
      CORR(1,7)=F                                                       COR21060
      CORR(1,8)=G                                                       COR21070
      CORR(1,9)=H                                                       COR21080
      CORR(1,10)=W                                                      COR21090
      CORR(1,11)=X
      CORR(1,12)=Y
      CORR(1,13)=Z
      CORR(1,14)=V
      CORR(1,15)=JA
      GO TO 24
23    CORR(1,1)=I
      CORR(1,2)=A
      DO 65 IX=3,14
65    CORR(1,IX)=0.
      CORR(1,15)=JA
24    NREC=NREC+1
      CALL INCR(J,NI,JA,P,NO)
      IF (P-JA) 25,25,27
27    IF (J) 21,13,21
C----
C---- IF RECORD IS CORRECT TEST 'NO' TO SEE WHETHER IT IS PRECEDED BY
C---- A GAP OR NOT. IF NOT, OR IF GAP IS LARGER THAN 4 RECORDS, TEST
C---- FOR END OF MONTH OR YEAR. IF THERE IS A GAP. STORE THE LAST
C---- CORRECT RECORD IN RECORD (NO+2) OF CORR ARRAY.
C----
15    IF (NO) 28,29,28
29    IMNTH=MONTH
      INO=0
      CALL INCR(J,NI,JA,P,NO)
      IF (P-JA) 25,25,30
30    IF (J) 21,13,21
28    IF (INO-1) 105,107,105
107   NO=0
      INO=0
      GO TO 108
105   IFST=NREC-1
      IF (TEST+15552) 31,32,31
31    CORR(NO+2,1)=I
      CORR(NO+2,2)=A
      CORR(NO+2,3)=B
      CORR(NO+2,4)=C
      CORR(NO+2,5)=D
      CORR(NO+2,6)=E
      CORR(NO+2,7)=F
      CORR(NO+2,8)=G
      CORR(NO+2,9)=H
      CORR(NO+2,10)=W
      CORR(NO+2,11)=X
      CORR(NO+2,12)=Y
      CORR(NO+2,13)=Z
      CORR(NO+2,14)=V
      CORR(NO+2,15)=JA
      GO TO 108
32    CORR(NO+2,1)=I
      CORR(NO+2,2)=A
      DO 66 IX=3,14
66    CORR(NO+2,IX)=0.
```

```
      CORR(NO+2,15)=JA
108   CALL INCR (J,NI,JA,P,NO)
C----
C---- CONVERT DATE TO DAY NUMBER. STORE DATE AND TIME IN EACH CORR
C---- RECORD, USING JULAN TO CHANGE DATE IF NECESSARY. LINEARLY
C---- INTERPOLATE ALL OTHER ELEMENTS OF THE RECORDS. STORE NEW LINE
C---- NUMBERS.
C----
33    YEAR=MOD(YEAR,1900)
      I=CORR(1,1)
      JJNO=NO+1
      DO 35 IK=2,JJNO
      IF (CORR(IK-1,2)-21) 36,37,37
36    CORR(IK,1)=I
      CORR(IK,2)=CORR(IK-1,2)+3
      GO TO 35
37    IDAY=0
      CALL JULAN(YEAR,IDAY,IMNTH,I)
      IDAY=IDAY+1
      I=0
      IMNTH=0
      CALL JULAN(YEAR,IDAY,IMNTH,I)
      CORR(IK,1)=I
      CORR(IK,2)=0
35    CONTINUE
      DO 38 IK=3,12
      IF(CORR(1,IK)-CORR(NO+2,IK)) 39,40,41
39    AINC=(CORR(NO+2,IK)-CORR(1,IK))/(NO+1)
      DO 42 JA=2,JJNO
42    CORR(JA,IK)=CORR(JA-1,IK)+AINC
      GO TO 38
40    DO 43 JA=2,JJNO
43    CORR(JA,IK)=CORR(JA-1,IK)
      GO TO 38
41    AINC=(CORR(1,IK)-CORR(NO+2,IK))/(NO+1)
      DO 44 JA=2,JJNO
44    CORR(JA,IK)=CORR(JA-1,IK)-AINC
38    CONTINUE
      DO 45 JA=2,JJNO
      CORR(JA,13)=JSPAC
      CORR(JA,14)=JSPAC
      IF (CORR(JA,2)-1) 47,47,46
46    CORR(JA,15)=CORR(JA-1,15)+1
      GO TO 45
47    CORR(JA,15)=CORR(JA-1,15)+2
45    CONTINUE
      NREC=LAST+1
      DO 48 JA=2,JJNO
      IF (CORR(JA,1)-1) 49,50,49
50    IF (CORR(JA,2)-1) 49,51,49
51    NREC=NREC+1
49    ICOR=CORR(JA,3)
      IF (ICOR) 200,201,200
```

```
201    TEST=CINT                                                        COR22160
       GO TO 202                                                        COR22170
200    TEST=INT                                                         COR22180
202    I=CORR(JA,1)                                                     COR22190
       JB=CORR(JA,15)                                                   COR22200
       WRITE(1'NREC) TEST,I,(CORR(JA,JK),JK=2,14),JB                    COR22210
48     CONTINUE                                                         COR22220
       NO=0                                                             COR22230
       NREC=IFST+1                                                      COR22240
       IF (P-JA) 25,25,125                                              COR22250
125    IF (J) 21,13,21                                                  COR22260
C----                                                                   COR22270
C---- TEST FOR GAP AT END OF YEAR THAT IS 4 OR LESS RECORDS LONG.       COR22280
C----                                                                   COR22290
25     IF (KNO+NO) 52,52,500                                            COR22300
500    IF (KNO-5) 54,52,52                                              COR22310
54     IF (INO-1) 55,52,52                                              COR22320
55     IF (KNO+NO-5) 56,52,52                                           COR22330
56     NREC=MAX                                                         COR22340
C----                                                                   COR22350
C---- READ BACKWARDS FROM END OF YEAR UNTIL CORRECT RECORD IS FOUND.    COR22360
C---- STORE IT IN RECORD 1 OF CORR ARRAY AND STORE NUMBER OF MISSING    COR22370
C---- RECORDS IN LNO                                                    COR22380
C----                                                                   COR22390
59     READ (1'NREC) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA                COR22400
       IF (TEST-JCALM) 60,61,60                                         COR22410
60     IF (TEST-JSPAC) 62,63,62                                         COR22420
62     LNO=LNO+1                                                        COR22430
       NREC=NREC-2                                                      COR22440
       GO TO 59                                                         COR22450
61     CORR(1,1)=I                                                      COR22460
       CORR(1,2)=A                                                      COR22470
       DO 64 IX=3,14                                                    COR22480
64     CORR(1,IX)=0.                                                    COR22490
       CORR(1,15)=JA                                                    COR22500
       GO TO 67                                                         COR22510
63     CORR(1,1)=I                                                      COR22520
       CORR(1,2)=A                                                      COR22530
       CORR(1,3)=B                                                      COR22540
       CORR(1,4)=C                                                      COR22550
       CORR(1,5)=D                                                      COR22560
       CORR(1,6)=E                                                      COR22570
       CORR(1,7)=F                                                      COR22580
       CORR(1,8)=G                                                      COR22590
       CORR(1,9)=H                                                      COR22600
       CORR(1,10)=W                                                     COR22610
       CORR(1,11)=X                                                     COR22620
       CORR(1,12)=Y                                                     COR22630
       CORR(1,13)=Z                                                     COR22640
       CORR(1,14)=V                                                     COR22650
       CORR(1,15)=JA                                                    COR22660
C----                                                                   COR22670
C---- READ START OF YEAR UNTIL CORRECT RECORD IS FOUND AND STORE IT.     COR22680
```

```
C---- STORE NUMBER OF MISSING RECORDS IN JNO                                  COR22690
C----                                                                         COR22700
67     NREC=2                                                                 COR22710
72     READ (1'NREC) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA                      COR22720
        IF (TEST-JCALM) 68,69,68                                              COR22730
68     IF (TEST-JSPAC) 70,71,70                                               COR22740
70     JNO=JNO+1                                                              COR22750
       GO TO 72                                                               COR22760
69     KA=LNO+JNO+2                                                           COR22770
       CORR(KA,1)=I                                                           COR22780
       CORR(KA,2)=A                                                           COR22790
       DO 73 IX=3,14                                                          COR22800
73     CORR(KA,IX)=0.                                                         COR22810
       CORR(KA,15)=JA                                                         COR22820
       GO TO 74                                                               COR22830
71     KA=LNO+JNO+2                                                           COR22840
       CORR(KA,1)=I                                                           COR22850
       CORR(KA,2)=A                                                           COR22860
       CORR(KA,3)=B                                                           COR22870
       CORR(KA,4)=C                                                           COR22880
       CORR(KA,5)=D                                                           COR22890
       CORR(KA,6)=E                                                           COR22900
       CORR(KA,7)=F                                                           COR22910
       CORR(KA,8)=G                                                           COR22920
       CORR(KA,9)=H                                                           COR22930
       CORR(KA,10)=W                                                          COR22940
       CORR(KA,11)=X                                                          COR22950
       CORR(KA,12)=Y                                                          COR22960
       CORR(KA,13)=Z                                                          COR22970
       CORR(KA,14)=V                                                          COR22980
       CORR(KA,15)=JA                                                         COR22990
C----                                                                         COR23000
C---- INTERPOLATE THE MISSING RECORDS                                         COR23010
C----                                                                         COR23020
74     DO 75 IK=3,12                                                          COR23030
       KKA=KA-1                                                               COR23040
       IF (CORR(1,IK)-CORR(KA,IK)) 76,77,78                                   COR23050
76     AINC=(CORR(KA,IK)-CORR(1,IK))/(KA-1)                                   COR23060
       DO 79 JA=2,KKA                                                         COR23070
79     CORR(JA,IK)=CORR(JA-1,IK)+AINC                                         COR23080
       GO TO 75                                                               COR23090
77     DO 80 JA=2,KKA                                                         COR23100
80     CORR(JA,IK)=CORR(JA-1,IK)                                              COR23110
       GO TO 75                                                               COR23120
78     AINC=(CORR(1,IK)-CORR(KA,IK))/(KA-1)                                   COR23130
       DO 81 JA=2,KKA                                                         COR23140
81     CORR(JA,IK)=CORR(JA-1,IK)-AINC                                         COR23150
75     CONTINUE                                                               COR23160
       DO 82 JA=2,KKA                                                         COR23170
       CORR(JA,13)=JSPAC                                                      COR23180
       CORR(JA,14)=JSPAC                                                      COR23190
C----                                                                         COR23200
C---- STORE CORRECT TIMES,DAY NUMBER AND LINE COUNT.                          COR23210
```

```
C----
      IF (CORR(JA-1,2)-21) 83,84,84
83    CORR(JA,2)=CORR(JA-1,2)+3
      CORR(JA,1)=CORR(JA-1,1)
      IF (CORR(JA-1,15)-P)800,801,801
801   CORR(JA,15)=1
      GO TO 82
800   CORR(JA,15)=CORR(JA-1,15)+1
      GO TO 82
84    CORR(JA,2)=0
      CORR(JA,1)=1
      IF(CORR(JA-1,15)-P)803,802,802
802   CORR(JA,15)=1
      GO TO 82
803   CORR(JA,15)=CORR(JA-1,15)+2
82    CONTINUE
      IF (LNO) 89,89,90
89    IXL=2
      GO TO 93
90    NREC=MAX-LNO+1
      DO 88 IX=1,LNO
      ICOR=CORR(IX+1,3)
      IF (ICOR) 203,204,203
204   TEST=CINT
      GO TO 205
203   TEST=INT
205   I=CORR(IX+1,1)
      JB=CORR(IX+1,15)
      WRITE (1'NREC) TEST,I,(CORR(IX+1,JK),JK=2,14),JB
      IXL=IX+2
88    CONTINUE
93    IF (JNO) 91,91,92
92    NREC=2
91    DO 930 IX=IXL,5
      ICOR=CORR(IX,3)
      IF (ICOR) 206,207,206
207   TEST=CINT
      GO TO 208
206   TEST=INT
208   I=CORR(IX,1)
      JB=CORR(IX,15)
      WRITE (1'NREC) TEST,I,(CORR(IX,JK),JK=2,14),JB
930   CONTINUE
C----
C---- IF PARA = 1 EXECUTE LISTING PROGRAM, IF NOT CARRY ON TO
C---- SECOND CORRECTION PROGRAM
C----
52    WRITE (3,300)
300   FORMAT (1H ,' CORR2 EXECUTED')
      IF (PARA-1) 94,94,95
94    CALL LINK(LISTO)
95    CALL LINK(CORR3)
96    END
```

```
VARIABLE ALLOCATIONS
  CORR(R )=0111-0006      A(R )=0114          B(R )=0117          C(R )=011A          D(R )=011D          E(R )=0120
     F(R )=0123           G(R )=0126          H(R )=0129          W(R )=012C          X(R )=012F          Y(R )=0132
     Z(R )=0135           V(R )=0138       AINC(R )=013B      ITITL(I )=0164-0141 NAMFL(I )=0167-0165 TEST(I )=0168
  YEAR(I )=0169           P(I )=016A       PARA(I )=016B       CINT(I )=016C       NREC(I )=016D        INO(I )=016E
   LNO(I )=016F         JNO(I )=0170        KNO(I )=0171      JSPAC(I )=0172      JCALM(I )=0173        INT(I )=0174
     J(I )=0175          NO(I )=0176        MAX(I )=0177       IERR(I )=0178      MONTH(I )=0179         NI(I )=017A
     I(I )=017B          JA(I )=017C         N1(I )=017D       LAST(I )=017E         IX(I )=017F      IMNTH(I )=0180
  IFST(I )=0181        JJNO(I )=0182         IK(I )=0183       IDAY(I )=0184       ICOR(I )=0185         JB(I )=0186
    JK(I )=0187          KA(I )=0188        KKA(I )=0189        IXL(I )=018A

UNREFERENCED STATEMENTS
 199      33

STATEMENT ALLOCATIONS
 1      =01AF  4      =01B8  5      =01C5  6      =01C8  300    =01D1  2      =0222  3      =022A  13     =0238  7      =0250  8      =0256
 9      =0266  11     =026C  12     =0272  21     =0276  101    =02A6  102    =02AC  109    =02B2  199    =02BF  100    =02EB  14     =02F1
 16     =02F7  160    =02FD  17     =0309  20     =030F  19     =0317  26     =0324  18     =032A  22     =035A  23     =03B8  65     =03C9
 24     =03E2  27     =03F5  15     =03FB  29     =03FF  30     =0414  28     =041A  107    =0420  105    =042A  31     =0436  32     =04C1
 66     =04D8  108    =04F6  33     =04FD  36     =0521  37     =0540  35     =0572  39     =0598  42     =05BB  40     =05DC  43     =05E0
 41     =05FF  44     =0622  38     =0641  46     =066F  47     =0684  45     =0697  50     =06B7  51     =06C4  49     =06CA  201    =06D8
 200    =06DE  202    =06F2  48     =0715  125    =072E  25     =0734  500    =073A  54     =0740  55     =0746  56     =074E  59     =0752
 60     =077C  62     =0782  61     =0790  64     =07A1  63     =07BC  67     =0818  72     =081C  68     =0846  70     =084C  69     =0854
 73     =0873  71     =0893  74     =0924  76     =0947  79     =096A  77     =098B  80     =098F  78     =09AE  81     =09D1  75     =09F0
 83     =0A1E  801    =0A4E  800    =0A5A  84     =0A6F  802    =0A90  803    =0A9C  82     =0AAF  89     =0ABC  90     =0AC2  204    =0ADC
 203    =0AE2  205    =0AE6  88     =0B1F  93     =0B28  92     =0B2C  91     =0B30  207    =0B42  206    =0B48  208    =0B4C  930    =0B7F
 52     =0B88  94     =0B92  95     =0B96

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 DFT      INCR     MOD      JULAN    EADD     EADDX    ESUB     ESUBX    ELD      ELDX     ESTO     ESTOX    ESBRX    EDVR     IFIX
 FLOAT    COMGO    LDFAC    STFAC    SBFAC    MRED     MWRT     MCOMP    MIOAI    MIOI     SUBSC    MDRED    MDWRT    MDCOM    MDFX
 MDF      MDI      HOLEB    PRNTN    EBPRT    CARDN

REAL CONSTANTS
  .000000000E 00=019A

INTEGER CONSTANTS
     0=019D  16448=019E  15552=019F  14016=01A0  10944=01A1      1=01A2      2=01A3      3=01A4    248=01A5      4=01A6
   240=01A7    224=01A8    232=01A9      5=01AA     14=01AB   1900=01AC     21=01AD     12=01AE

CORE REQUIREMENTS FOR CORR2
 COMMON      0  INSKEL COMMON      0
  VARIABLES    410  PROGRAM   2560
```

```
END OF COMPILATION




CORR2
DMP FUNCTION COMPLETED
*DELET            1 CORR2                                               COR23750
DMP FUNCTION COMPLETED
*STORECIL         1 CORR2 CORR2                                         COR23760

*FILES(1,DOWS,2)
*CCEND                                                                  COR23780
```

```
MPX, BUILD CORR2

CORE LOAD  MAP
TYPE NAME  ARG1  ARG2

*CDW TABLE 4D8C  0012
*FIO TABLE 4D9E  001F
*ETV TABLE 4DBC  000F
*VTV TABLE 4DCB  005A
*CNT TABLE 4E26  000C
MAIN CORR2 500F
CLNT CORR2 4E28
LIBF MRED  5BC6  4DCB  R
LIBF MIOI  5C2E  4DCE
LIBF MIOAI 5C50  4DD1
LIBF MCOMP 5C11  4DD4
CALL DFT   60EC
LIBF MWRT  5BCA  4DD7
LIBF MDRED 61C3  4DDA  R
LIBF MDI   616E  4DDD
LIBF MDCOM 6210  4DE0
LIBF COMGO 63B7  4DE3  R
LIBF STFAC 640C  4DE6  R
LIBF SBFAC 6410  4DE9
LIBF MDF   6164  4DEC
CALL INCR  6430
LIBF ESTOX 645A  4DEF
LIBF ELD   6490  4DF2
CALL MOD   64A6
LIBF ELDX  648C  4DF5
LIBF ESBRX 64CD  4DF8
LIBF LDFAC 6401  4DFB
LIBF EADDX 64E0  4DFE
CALL JULAN 6574
LIBF ESUBX 64D8  4E01
LIBF ESTO  647E  4E04
LIBF EDVR  65BF  4E07
LIBF EADD  64DC  4E0A
LIBF ESUB  64D4  4E0D
LIBF MDWRT 62D5  4E10
LIBF MDFX  6182  4E13
CLNT LISTO 4E2C
CLNT CORR3 4E30
CALL FEROR 6649        R
CALL SBCAL 677A
CALL GETBF 6687
CALL FREBF 6679
CALL FIOXT 667D
CALL FLETM 6792
LIBF SUBIN 6870  4E16  R
LIBF ESBR  64C9  4E19
LIBF FARC  68AC  4E1C
LIBF XDD   68DE  4E1F
CALL FREUP 6759        R
LIBF XMD   69A2  4E22
FIOB       69E8  0142
CORE       6B2A  14D6
```

```
 MPX, CORR2 LD XO

CL WC OF  1C5C STORED AT  15F4
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X    03 AUG 73 12.272 HRS                                           TITL0000
// *NIO MPX PROGRAM LIBRARY MASTER COPY                                                       TITL0010
// FOR TITLE             VERSION20 MODIFICATION 1 136                                         TITL0020
*LIST ALL                                                                                     TITL0030
*EXTENDED PRECISION                                                                           TITL0040
      SUBROUTINE TITLE (MONTH,YEAR,M)                                                         TITL0050
      INTEGER YEAR                                                                            TITL0060
      GO TO (1,2,3,4,5,6,7,8,9,10,11,12),MONTH                                                TITL0070
1     WRITE (5,14) YEAR                                                                       TITL0080
      M=M+7                                                                                   TITL0090
      GO TO 13                                                                                TITL0100
2     WRITE (5,15) YEAR                                                                       TITL0110
      M=M+7                                                                                   TITL0120
      GO TO 13                                                                                TITL0130
3     WRITE (5,16) YEAR                                                                       TITL0140
      M=M+7                                                                                   TITL0150
      GO TO 13                                                                                TITL0160
4     WRITE (5,17) YEAR                                                                       TITL0170
      M=M+7                                                                                   TITL0180
      GO TO 13                                                                                TITL0190
5     WRITE (5,18) YEAR                                                                       TITL0200
      M=M+7                                                                                   TITL0210
      GO TO 13                                                                                TITL0220
6     WRITE (5,19) YEAR                                                                       TITL0230
      M=M+7                                                                                   TITL0240
      GO TO 13                                                                                TITL0250
7     WRITE (5,20) YEAR                                                                       TITL0260
      M=M+7                                                                                   TITL0270
      GO TO 13                                                                                TITL0280
8     WRITE (5,21) YEAR                                                                       TITL0290
      M=M+7                                                                                   TITL0300
      GO TO 13                                                                                TITL0310
9     WRITE (5,22) YEAR                                                                       TITL0320
      M=M+7                                                                                   TITL0330
      GO TO 13                                                                                TITL0340
10    WRITE (5,23) YEAR                                                                       TITL0350
      M=M+7                                                                                   TITL0360
      GO TO 13                                                                                TITL0370
11    WRITE (5,24) YEAR                                                                       TITL0380
      M=M+7                                                                                   TITL0390
      GO TO 13                                                                                TITL0400
12    WRITE (5,25) YEAR                                                                       TITL0410
      M=M+7                                                                                   TITL0420
13    WRITE (5,26)                                                                            TITL0430
14    FORMAT (1H1,5(/),'+JANUARY',2X,I4,/)                                                    TITL0440
15    FORMAT (1H1,5(/),'+FEBRUARY',2X,I4,/)                                                   TITL0450
16    FORMAT (1H1,5(/),'+MARCH',2X,I4,/)                                                      TITL0460
17    FORMAT (1H1,5(/),'+APRIL',2X,I4,/)                                                      TITL0470
18    FORMAT (1H1,5(/),'+MAY',2X,I4,/)                                                        TITL0480
19    FORMAT (1H1,5(/),'+JUNE',2X,I4,/)                                                       TITL0490
20    FORMAT (1H1,5(/),'+JULY',2X,I4,/)                                                       TITL0500
21    FORMAT (IH1,5(/),'+AUGUST',2X,I4,/)                                                     TITL0510
22    FORMAT (1H1,5(/),'+SEPTEMBER',2X,I4,/)                                                  TITL0520
23    FORMAT (1H1,5(/),'+OCTOBER',2X,I4,/)                                                    TITL0530
24    FORMAT (1H1,5(/),'+NOVEMBER',2X,I4,/)                                                   TITL0540
25    FORMAT (1H1,5(/),'+DECEMBER',2X,I4,/)                                                   TITL0550
26    FORMAT (116H DATE  TIME      TZ      H1       H2        F        H1'      H2TITL0560
      1'     HS1     HS2     HS    HMAX(3HRS) DURATION              DEPTH,/) TITL0570
       M=M+2                                                                 TITL0580
       RETURN                                                                TITL0590
       END                                                                   TITL0600

STATEMENT ALLOCATIONS
 14   =0003  15   =0011  16   =0020  17   =002D  18   =003A  19   =0046  20   =0053  21   =0060  22   =006E  23   =007D
 24   =008B  25   =009A  26   =00A9  1    =0123  2    =0131  3    =013F  4    =014D  5    =015B  6    =0169  7    =0177
 8    =0185  9    =0193  10   =01A1  11   =01AF  12   =01BD  13   =01C9

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION

CALLED SUBPROGRAMS
 COMGO    MWRT    MCOMP    MIOI     SUBIN

INTEGER CONSTANTS
     5=0000        7=0001        2=0002

CORE REQUIREMENTS FOR TITLE
 COMMON        0   INSKEL COMMON       0
  VARIABLES        0   PROGRAM      470


END OF COMPILATION




TITLE
DMP FUNCTION COMPLETED
*DELET             TITLE                                                   TITL0610
DMP FUNCTION COMPLETED
*STORE             TITLE                                                   TITL0620
TITLE
DMP FUNCTION COMPLETED
```

```
// JOB       X    X    X   03 AUG 73 12.293 HRS                           COR30000
// *NIO MPX PROGRAM LIBRARY MASTER COPY                                   COR30010
// FOR CORR3              VERSION20 MODIFICATION 1 215                    COR30020
*IOCS(DISK,1443 PRINTER,MAGNETIC TAPE,CARD)                               COR30030
*LIST ALL                                                                 COR30040
*EXTENDED PRECISION                                                       COR30050
      DEFINE FILE 1(3000,42,U,NREC)                                       COR30060
      DEFINE FILE 201(301,5,U,JREC)                                       COR30070
      INTEGER TEST,YEAR,P,SUB,SUBC,TTEST                                  COR30080
      DIMENSION NAMFL(6),ITITL(36)                                        COR30090
      DIMENSION NMAG(3)                                                   COR30100
      DATA NMAG(1)/'M9'/,NMAG(2)/'  '/,NMAG(3)/'  '/                      COR30110
      CALL NEXTM(5,NMAG,N,M)                                              COR30120
C----                                                                     COR30130
C---- THIS PROGRAM CORRECTS GAPS OF MORE THAN FOUR RECORDS IN SBWRO        COR30140
C---- OUTPUT AND STORES THE CORRECTED OUTPUT ON MAGNETIC TAPE.             COR30150
C----                                                                     COR30160
C---- NO = CHECKS WHETHER A GAP HAS BEEN FOUND OR NOT                      COR30170
C---- J = COUNT FOR NUMBER OF DISK RECORDS READ                            COR30180
C---- M = COUNT OF NUMBER OF RECORDS WRITTEN TO TAPE                       COR30190
C----                                                                     COR30200
      NO=0                                                                COR30210
      CINT=-10944                                                         COR30220
      JSPAC=16448                                                         COR30230
      JCALM=-15552                                                        COR30240
      SUB=-7616                                                           COR30250
      SUBC=-6080                                                          COR30260
      INT=-14016                                                          COR30270
      KTEST=0                                                             COR30280
      IFLAG=0                                                             COR30290
      J=0                                                                 COR30300
      M=0                                                                 COR30310
      NREC=1                                                              COR30320
      READ(2,1) NAMFL,P,MAX                                               COR30330
1     FORMAT (6A2,2X,2(I5))                                               COR30340
      CALL DFT(2,NAMFL,IERR)                                              COR30350
      IF(IERR) 2,3,2                                                      COR30360
2     WRITE(3,4) IERR                                                     COR30370
4     FORMAT (' IERR=',I2,' IN CORR3')                                    COR30380
      CALL EXIT                                                           COR30390
3     READ (2,5) ITITL                                                    COR30400
5     FORMAT (36A2)                                                       COR30410
      WRITE (3,6) ITITL                                                   COR30420
      WRITE (5,6) ITITL                                                   COR30430
6     FORMAT (1H1,24(/),44X,36A2)                                         COR30440
      M=M+25                                                              COR30450
C----                                                                     COR30460
C---- SET COUNTS FOR MONTH                                                 COR30470
C----                                                                     COR30480
130   READ (1'NREC) MONTH,YEAR                                            COR30490
      GO TO (7,8,7,9,7,9,7,7,9,7,9,7),MONTH                               COR30500
7     NI=248                                                              COR30510
      GO TO 100                                                           COR30520
8     IF (YEAR-4*(YEAR/4)) 11,12,11                                       COR30530
9     NI=240                                                              COR30540
      GO TO 100                                                           COR30550
11    NI=224                                                              COR30560
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      GO TO 100                                                         COR30570
12    NI=232                                                            COR30580
C----                                                                   COR30590
C---- READ DISK UNTIL A GAP IS FOUND. STORE LIMITS OF GAP IN            COR30600
C---- ILST AND IFST                                                     COR30610
C----                                                                   COR30620
100   READ (1'NREC) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA                 COR30630
      J=J+1                                                             COR30640
      IF (TEST-JSPAC) 13,14,13                                          COR30650
13    IF (TEST-JCALM) 15,14,15                                          COR30660
15    IF (TEST-INT) 117,14,117                                          COR30670
117   IF (TEST-CINT) 17,14,17                                           COR30680
14    IF (NO) 999,16,999                                                COR30690
16    IF (P-JA) 160,70,160                                              COR30700
160   IF (J-NI) 100,29,100                                              COR30710
29    J=0                                                               COR30720
      GO TO 130                                                         COR30730
17    NO=NO+1                                                           COR30740
      IF (JA-1) 31,310,31                                               COR30750
310   IF (KTEST-1) 303,31,303                                           COR30760
303   IFLAG=1                                                           COR30770
      GO TO 100                                                         COR30780
31    IF (NO-1) 33,35,33                                                COR30790
35    ILST=NREC-2                                                       COR30800
33    IF (P-JA) 34,36,34                                                COR30810
 36   KTEST=1                                                           COR30820
      NREC=2                                                            COR30830
      NI=248                                                            COR30840
      J=0                                                               COR30850
      GO TO 100                                                         COR30860
34    IF (J-NI) 100,38,100                                              COR30870
38    J=0                                                               COR30880
      GO TO 130                                                         COR30890
999   IF (IFLAG-1) 9990,990,990                                         COR30900
990   NO=0                                                              COR30910
      IFLAG=0                                                           COR30920
      GO TO 100                                                         COR30930
9990  NEXT=NREC                                                         COR30940
      IFST=NREC-1                                                       COR30950
C----                                                                   COR30960
C---- CALCULATE NUMBER OF RECORDS TO BE FOLDED IN                       COR30970
C----                                                                   COR30980
      IF (ILST-IFST) 300,300,301                                        COR30990
301   NOREC=IFST+(MAX-ILST)-2                                           COR31000
      GO TO 302                                                         COR31010
300   NOREC=IFST-ILST-1                                                 COR31020
302   IF(NOREC-2*(NOREC/2)) 40,41,40                                    COR31030
40    IN=(NOREC+1)/2                                                    COR31040
      GO TO 42                                                          COR31050
41    IN=NOREC/2                                                        COR31060
C----                                                                   COR31070
C---- FOLD IN FIRST HALF OF DATA, KEEPING CORRECT DATE, TIME AND LINE   COR31080
C---- NUMBER. IF THE END OF YEAR IS REACHED, ALTER                      COR31090
```

```
C---- NREC ACCORDINGLY
C----
42     DO 43 JK=1,IN
       JY=JK-1
       NREC=ILST-JY
       IF (NREC) 420,420,430
420    NREC=MAX+NREC
       GO TO 44
430    IF (NREC-MAX) 44,44,45
45     NREC=NREC-MAX
44     READ (1'NREC) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA
       IF (I-31) 46,46,43
46     NREC=ILST+JK
       IF (NREC) 47,47,48
47     NREC=MAX+NREC
       GO TO 49
48     IF (NREC-MAX) 49,49,51
51     NREC=NREC-MAX
49     READ (1'NREC) TTEST,II,AA,BB,CC,DD,EE,FF,GG,HH,WW,XX,YY,ZZ,VV,JJA
       IF (II-31) 149,149,49
149    NREC=NREC-1
       Z=JSPAC
       VV=JSPAC
       IF (TEST-JCALM)150,52,150
150    IF (TEST-CINT) 50,52,50
52     TEST=SUBC
       WRITE (1'NREC) TEST,II,AA,B,C,D,E,F,G,H,W,X,Y,Z,VV,JJA
       GO TO 43
50     TEST=SUB
       WRITE (1'NREC) TEST,II,AA,B,C,D,E,F,G,H,W,X,Y,Z,VV,JJA
43     CONTINUE
       IF (NOREC-2*(NOREC/2)) 55,56,55
55     IN=(NOREC-1)/2
       GO TO 57
56     IN=NOREC/2
C----
C---- FOLD IN SECOND HALF OF DATA SIMILARLY
C----
57     DO 580 JK=1,IN
       JY=JK-1
       NREC=IFST+JY
       IF (NREC) 58,58,59
58     NREC=MAX+NREC
       GO TO 61
59     IF (NREC-MAX) 61,61,62
62     NREC=NREC-MAX
61     READ (1'NREC) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA
       IF (I-31) 63,63,61
63     NREC=IFST-JK
       IF (NREC) 64,64,65
64     NREC=MAX+NREC
       GO TO 66
65     IF (NREC-MAX) 66,66,67
```

```
67     NREC=NREC-MAX                                                     COR31630
66     READ (1'NREC) TTEST,II,AA,BB,CC,DD,EE,FF,GG,HH,WW,XX,YY,ZZ,VV,JJA COR31640
       IF (II-31) 166,166,66                                             COR31650
166    NREC=NREC-1                                                       COR31660
       Z=JSPAC                                                           COR31670
       V=JSPAC                                                           COR31680
       IF (TEST-JCALM) 168,69,168                                        COR31690
168    IF (TEST-CINT) 68,69,68                                           COR31700
69     TEST=SUBC                                                         COR31710
       WRITE (1'NREC) TEST,II,AA,B,C,D,E,F,G,H,W,X,Y,Z,V,JJA             COR31720
       GO TO 580                                                         COR31730
68     TEST=SUB                                                          COR31740
       WRITE (1'NREC) TEST,II,AA,B,C,D,E,F,G,H,W,X,Y,Z,V,JJA             COR31750
580    CONTINUE                                                          COR31760
C----                                                                    COR31770
C---- TEST FOR END OF YEAR. IF NOT, READ NEXT RECORD, OTHERWISE WRITE    COR31780
C---- CORRECTED DISK FILE TO MAG TAPE                                     COR31790
C----                                                                    COR31800
       NREC=NEXT                                                         COR31810
       NO=0                                                              COR31820
       IF (KTEST-1) 700,70,700                                           COR31830
700    IF (NREC-MAX) 16,70,70                                            COR31840
70     NREC=1                                                            COR31850
       J=0                                                               COR31860
71     READ (1'NREC) MONTH,YEAR                                          COR31870
       GO TO (72,73,72,74,72,74,72,72,74,72,74,72),MONTH                 COR31880
72     NI=248                                                            COR31890
       GO TO 75                                                          COR31900
73     IF (YEAR-4*(YEAR/4)) 76,77,76                                     COR31910
74     NI=240                                                            COR31920
       GO TO 75                                                          COR31930
76     NI=224                                                            COR31940
       GO TO 75                                                          COR31950
77     NI=232                                                            COR31960
75     CALL TITLE (MONTH,YEAR,M)                                         COR31970
       L=0                                                               COR31980
       K=11                                                              COR31990
78     READ (1'NREC) TEST,I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA                 COR32000
       J=J+1                                                             COR32010
       IF (TEST-JSPAC) 79,80,79                                          COR32020
79     IF (TEST-JCALM) 81,82,81                                          COR32030
81     IF (TEST-INT) 83,84,83                                            COR32040
83     IF (TEST-CINT) 85,86,85                                           COR32050
85     IF (TEST-SUB) 87,88,87                                            COR32060
80     WRITE (5,89) I,A,B,C,D,E,F,G,H,W,X,Y,Z,V,JA                       COR32070
89     FORMAT (1H ,1X,I2,F7.2,F8.2,F6.1,F7.1,F9.3,4F7.1,F6.1,F9.1,F10.2, COR32080
     117X,F4.1,1X,I4)                                                    COR32090
       GOTO 200                                                          COR32100
82     WRITE (5,90) I,A,V,JA                                             COR32110
90     FORMAT (1H ,1X,I2,F7.2,'    CALM',92X,F4.1,1X,I4)                 COR32120
       GO TO 200                                                         COR32130
84     WRITE (5,91) I,A,B,C,D,E,F,G,H,W,X,Y,JA                           COR32140
91     FORMAT (1H ,1X,I2,F7.2,F8.2,F6.1,F7.1,F9.3,4F7.1,F6.1,F9.1,     14COR32150
     1X,'INTERPOLATED',6X,I4)                                          COR32160
      GO TO 200                                                        COR32170
86    WRITE (5,92) I,A,JA                                              COR32180
92    FORMAT (1H ,1X,I2,F7.2,'     CALM',79X,'INTERPOLATED',6X,I4)     COR32190
      GO TO 200                                                        COR32200
88    WRITE (5,93) I,A,B,C,D,E,F,G,H,W,X,Y,JA                          COR32210
93    FORMAT (1H ,1X,I2,F7.2,F8.2,F6.1,F7.1,F9.3,4F7.1,F6.1,F9.1,    14COR32220
     1X,'SUBSTITUTED '6X,I4)                                           COR32230
      GOTO 200                                                         COR32240
87    WRITE (5,940) I,A,JA                                             COR32250
940   FORMAT (1H ,1X,I2,F7.2,'     CALM',79X,'SUBSTITUTED',7X,I4)      COR32260
200   M=M+1                                                            COR32270
      L=L+1                                                            COR32280
      K=K+1                                                            COR32290
      IF (L-8) 94,95,94                                                COR32300
95    WRITE (5,25)                                                     COR32310
25    FORMAT (1H )                                                     COR32320
      M=M+1                                                            COR32330
      K=K+1                                                            COR32340
      L=0                                                              COR32350
94    IF (P-JA) 26,27,26                                               COR32360
26    IF (J-NI) 28,290,28                                              COR32370
28    IF (56-K) 75,75,78                                               COR32380
290   J=0                                                              COR32390
      GO TO 71                                                         COR32400
27    WRITE (3,30) M                                                   COR32410
30    FORMAT (1H ,4(/),' END OF YEAR',I4,' RECORDS HAVE BEEN TRANSFERREDCOR32420
     1 TO MAGNETIC TAPE ')                                             COR32430
C----                                                                  COR32440
C---- END TAPE FILE AND STORE FILE NUMBER ON DISK. EXECUTE MALIS        COR32450
C---- TO LIST TAPE                                                     COR32460
C----                                                                  COR32470
      ENDFILE 5                                                        COR32480
      M=1                                                              COR32490
      CALL STORM (NMAG,N,M)                                            COR32500
      REWIND 5                                                         COR32510
      CALL LINK(MALIS)                                                 COR32520
      END                                                              COR32530

VARIABLE ALLOCATIONS
  CINT(R )=000C           A(R )=000F            B(R )=0012            C(R )=0015            D(R )=0018            E(R )=001B
     F(R )=001E           G(R )=0021            H(R )=0024            W(R )=0027            X(R )=002A            Y(R )=002D
     Z(R )=0030           V(R )=0033           AA(R )=0036           BB(R )=0039           CC(R )=003C           DD(R )=003F
    EE(R )=0042          FF(R )=0045           GG(R )=0048           HH(R )=004B           WW(R )=004E           XX(R )=0051
    YY(R )=0054          ZZ(R )=0057           VV(R )=005A        NAMEL(I )=0062-005D ITITL(I )=0086-0063  NMAG(I )=0089-0087
  TEST(I )=008A        YEAR(I )=008B            P(I )=008C          SUB(I )=008D         SUBC(I )=008E        TTEST(I )=008F
  NREC(I )=0090        JREC(I )=0091            N(I )=0092            M(I )=0093           NO(I )=0094        JSPAC(I )=0095
 JCALM(I )=0096         INT(I )=0097        KTEST(I )=0098        IFLAG(I )=0099            J(I )=009A          MAX(I )=009B
  IERR(I )=009C       MONTH(I )=009D           NI(I )=009E            I(I )=009F           JA(I )=00A0         ILST(I )=00A1
  NEXT(I )=00A2        IFST(I )=00A3        NOREC(I )=00A4           IN(I )=00A5           JK(I )=00A6           JY(I )=00A7
    II(I )=00A8         JJA(I )=00A9            L(I )=00AA            K(I )=00AB

STATEMENT ALLOCATIONS
```

```
 1     =00C1  4     =00C8  5     =00D4  6     =00D7  89    =00E0  90    =00F3  91    =0102  92    =011A  93    =012F  940   =0147
 25    =015C  30    =015F  2     =01D6  3     =01DE  130   =01F9  7     =0211  8     =0217  9     =0227  11    =022D  12    =0233
 100   =0237  13    =0267  15    =026D  117   =0273  14    =027B  16    =027F  160   =0285  29    =028B  17    =0291  310   =029D
 303   =02A3  31    =02A9  35    =02AF  33    =02B5  36    =02BB  34    =02CD  38    =02D3  999   =02D9  990   =02DF  9990  =02E9
 301   =02F9  300   =0305  302   =030D  40    =031B  41    =0326  42    =032D  420   =0341  430   =0349  45    =034F  44    =0355
 46    =037F  47    =0389  48    =0391  51    =0397  49    =039D  149   =03C7  150   =03DD  52    =03E5  50    =040F  43    =0437
 55    =044E  56    =0459  57    =0460  58    =0474  59    =047C  62    =0482  61    =0488  63    =04B2  64    =04BC  65    =04C4
 67    =04CA  66    =04D0  166   =04FA  168   =0510  69    =0518  68    =0542  580   =056A  700   =0581  70    =0587  71    =058F
 72    =05A7  73    =05AD  74    =05BD  76    =05C3  77    =05C9  75    =05CD  78    =05DA  79    =060A  81    =0610  83    =0616
 85    =061E  80    =0626  82    =064A  84    =0658  86    =0678  88    =0684  87    =06A4  200   =06AE  95    =06C6  94    =06DA
 26    =06E0  28    =06E6  290   =06EE  27    =06F4

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 NEXTM   DFT     TITLE   STORM   ESUB    FSTO    FLOAT   COMGO   LDFAC   STFAC   SBFAC   MRED    MWRT    MCOMP   MIOAI
 MIOF    MIOI    EOF     REWND   MDRED   MDWRT   MDCOM   MDF     MDI     HOLEB   MAGT    PRNTN   EBPRT   CARDN

INTEGER CONSTANTS
      5=00AC        0=00AD  10944=00AE  16448=00AF  15552=00B0   7616=00B1   6080=00B2  14016=00B3      1=00B4      2=00B5
      3=00B6       25=00B7    248=00B8      4=00B9    240=00BA    224=00BB    232=00BC     31=00BD     11=00BE      8=00BF
     56=00C0

CORE REQUIREMENTS FOR CORR3
 COMMON       0  INSKEL COMMON       0
  VARIABLES     172  PROGRAM    1632



END OF COMPILATION




CORR3
DMP FUNCTION COMPLETED
// DUP                                                        COR32540
*DELET              1 CORR3                                   COR32550
DMP FUNCTION COMPLETED
*STORECIL           1 CORR3 CORR3                             COR32560

*FILES(201,MFILE,0)                                           COR32570
*FILES(1,DOWS,2)
*CCEND                                                        COR32590
```

```
MPX, BUILD CORR3

CORE LOAD  MAP
TYPE NAME  ARG1  ARG2

*CDW TABLE 4D8C  0012
*FIO TABLE 4D9E  001F
*ETV TABLE 4DBC  000F
*VTV TABLE 4DCB  0042
*CNT TABLE 4E0E  0008
MAIN CORR3 4F9C
CLNT CORR3 4E10
CALL MAGT  5522            R
CALL NEXTM 5830
LIBF ESTO  58DE  4DCB
LIBF MRED  5B00  4DCE      R
LIBF MIOAI 5B8A  4DD1
LIBF MIOI  5B68  4DD4
LIBF MCOMP 5B4B  4DD7
CALL DFT   6026
LIBF MWRT  5B04  4DDA
LIBF MDRED 60FD  4DDD      R
LIBF MDI   60A8  4DE0
LIBF MDCOM 614A  4DE3
LIBF COMGO 62F1  4DE6      R
LIBF STFAC 6346  4DE9      R
LIBF SBFAC 634A  4DEC
LIBF MDF   609E  4DEF
LIBF ESUB  6372  4DF2
LIBF LDFAC 633B  4DF5
LIBF MDWRT 620F  4DF8
CALL TITLE 64E2
LIBF MIOF  5B64  4DFB
LIBF EOF   65F7  4DFE      R
CALL STORM 678A
LIBF REWND 65FB  4E01
CLNT MALIS 4E14
CALL ABRTQ 67FE            R
LIBF SUBIN 682C  4E04      R
CALL UNPAC 6868
LIBF MDAI  60B0  4E07
CALL NCOMP 68A8
CALL FINDM 68DB
CALL FEROR 6925            R
CALL SBCAL 6A56
CALL GETBF 6963
CALL FREBF 6955
CALL FIOXT 6959
CALL FLETM 6A6E
LIBF FARC  6B4C  4E0A
CALL FILE2 6B9B
CALL FREUP 6A35            R
CALL MAGOP 6BF6
CALL IADDR 6C2A            R
FIOB       6C32  0142
CORE       6D74  128C
MPX, CORR3 LD XQ

CL WC OF  1EA6 STORED AT  1482
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73 12.375 HRS                                                MALS0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                                                        MALS0010
// FOR MALIS                VERSION20 MODIFICATION 0 137                                          MALS0020
*LIST ALL                                                                                         MALS0030
*IOCS (CARD,1443 PRINTER,MAGNETIC TAPE)                                                           MALS0040
*EXTENDED PRECISION                                                                               MALS0050
*ONE WORD INTEGERS                                                                                MALS0060
*NONPROCESS PROGRAM                                                                               MALS0070
C      N.I.O PROGRAM 137-MALIS                                                                    MALS0080
       DIMENSION LIST (72)                                                                        MALS0090
       READ (2,100) N                                                                             MALS0100
100    FORMAT (I4)                                                                                MALS0110
       CALL FINDM(5,N,1)
C                                                                                                 MALS0130
       READ (2,100) M                                                                             MALS0140
       DO 1 J=1,M                                                                                 MALS0150
       READ (5,101) LIST                                                                          MALS0160
       WRITE (3,101) LIST                                                                         MALS0170
101    FORMAT (72A2)                                                                              MALS0180
1      CONTINUE                                                                                   MALS0190
       CALL EXIT                                                                                  MALS0200
       END                                                                                        MALS0210

VARIABLE ALLOCATIONS
  LIST(I )=0047-0000     N(I )=0048            M(I )=0049            J(I )=004A

STATEMENT ALLOCATIONS
 100  =0050  101  =0052  1     =0078

FEATURES SUPPORTED
 NONPROCESS
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 FINDM   MRED    MWRT    MCOMP   MIOAI   MIOI    HOLEB   MAGT    PRNTN   ERPRT   CARDN

INTEGER CONSTANTS
     2=004C       5=004D       1=004E       3=004F

CORE REQUIREMENTS FOR MALIS
 COMMON       0  INSKEL COMMON       0
  VARIABLES      76  PROGRAM      56



END OF COMPILATION
```

```
MALIS
DMP FUNCTION COMPLETED
// DMP                                                                         MALS0220
*DELET          '      1 MALIS                                                 MALS0230
DMP FUNCTION COMPLETED
*STORECIL              1 MALIS MALIS                                           MALS0240

*CCEND                                                                         MALS0250
```

```
 MPX, BUILD MALIS

 CORE LOAD  MAP
 TYPE NAME  ARGI  ARG2

 *CDW TABLE 4D8C  0012
 *FID TABLE 4D9E  001E
 *ETV TABLE 4DBC  000F
 *VTV TABLE 4DCB  0012
 *CNT TABLE 4DDE  0004
 MAIN MALIS 4E37
 CLNT MALIS 4DE0
 CALL MAGT  4E66        R
 LIBF MRED  5320  4DCB  R
 LIBF MIOI  5388  4DCE
 LIBF MCOMP 536B  4DD1
 CALL FINDM 584F
 LIBF MIOAI 53AA  4DD4
 LIBF MWRT  5324  4DD7
 CALL ABRTQ 5896        R
 CALL FEROR 58C7        R
 CALL SBCAL 59F8
 CALL GETBF 5905
 CALL FREBF 58F7
 CALL FIOXT 58FB
 LIBF SUBIN 5A10  4DDA  R
 CALL FILE2 5A69
 CALL FREUP 59D7        R
 CALL MAGOP 5AC4
 CALL IADDR 5AF8        R
 FIOB       5B00  0054
 CORE       5B54  24AC
 MPX, MALIS LD XQ

CL WC OF  0D74 STORED AT  1635
DMP FUNCTION COMPLETED
```

```
// JOB              X    10 AUG 73 16.428 HRS
// ASM NPBSY NPB    10 AUG 73 16.429 HRS
*LIST                                                                          NPB00010
*MACLIB PLUS                                                                   NPB00020
                    1           DEFSY                                          NPB00030

0016     155C28A8   195         ENT      NPBSY       ENTRY POINT               NPB00040
                    196     *      VERSION 0, MODIFICATION 0                *  NPB00050
                    197     *       RELATIVE LOCATIONS IN COMM AREA IN PHASI   NPB00060
FFDA                198     PBUSY EQU      -38       PROCESS BUSY IND          NPB00070
FFDB                199     BUSYI EQU      -37       SPOOLING BUSY IND         NPB00080
FFE2                200     LCEMP EQU      -30       ADDRS OF EMPTY QUEUE LCT  NPB00090
FFE3                201     LCUPQ EQU      -29       ADDRS OF UP QUEUE LCT     NPB00100
FFE5                202     TIME  EQU      -27       TIME BUFF LAST PASSED PHSE2 NPB00110
FFEE                203     PLOTU EQU      -18       PLOT ON IF NON-ZERO       NPB00120
                    204     *       RELATIVE LOCATIONS IN LEVEL WORK AREA      NPB00130
0007                205     #LN   EQU      7         LEVEL NO.IN EXECUTION     NPB00140
0005                206     #PRIA EQU      5         ADDRS OF LEVEL LCT        NPB00150
                    207     *                                                  NPB00160
                    208     *       FIXED AREA LOCATIONS                       NPB00170
007F                209     V     EQU      127       POINTER TO FIXED AREA     NPB00180
0085                210     $D1   EQU      /0085     MPX CONSTANT +1           NPB00190
0068                211     LEVWK EQU      104       LEVEL WK AREA             NPB00200
0109                212     $GETQ EQU      /109      ADDR OF GETQ0 ENTRY       NPB00210
010A                213     $PUTQ EQU      /10A      ADDR OF PUTQ0 ENTRY       NPB00220
00B6                214     $EXIT EQU      /B6       ADDR OF EXIT ENTRY        NPB00230
0032                215     $MK1  EQU      /0032     MASK LEVELS  0-13         NPB00240
0034                216     $MK2  EQU      /0034     MASK LEVELS 14-23         NPB00250
002E                217     $UMK1 EQU      /002E     UNMASK LEVELS  0-13       NPB00260
0030                218     $UMK2 EQU      /0030     UNMASK LEVELS 14-23       NPB00270
005C                219     $CLK  EQU      /005C     REAL TIME CLOCK           NPB00280
0022                220     TMOUT EQU      34        TIME COUNT 1627 CLEAR     NPB00290
                    221     ************************************************** NPB00300
0000 0   2200       222     H2200 DC       /2200     CONSTANT /2200            NPB00310
0001 0   FFFF       223     DM1   DC       -1        CONSTANT -1               NPB00320
0002 0   0E10       224     D3600 DC       3600      TO CONVERT HRS,.001 HRS   NPB00330
0003 0   0022       225     TOLER DC       TMOUT     COUNT TOLERANCE TO CLR IND. NPB00340
0004 00 67800068    226     RTRN  LDX   I3 104       XR3=ADDR OF LEVEL WK AREA NPB00350
0006 0   C307       227           LD     3 7         GET LEVEL NO.             NPB00360
0007 01 4C28000B    228           BSC   L  UNMSK,+Z  IGNORE CALL FROM NONP     NPB00370
0009 0   D2DA       229           STO    2 PBUSY     SET PROCESS PLOT BUSY     NPB00380
000A 0   D2DB       230           STO   X2 BUSYI     SET SPOOL BSY WITH LVL NO. NPB00390
000B 00 0C00002E    231     UNMSK XIO   L  $UMK1     UNMASK LEVELS 0-13        NPB00400
000D 00 0C000030    232           XIO   L  $UMK2     UNMASK LEVELS 14-23       NPB00410
000F                233           ORG      *-2*MKLEV REMOVE EXTRA XIO IF APPLIC NPB00420
000F 00 65000000    234     SVXR1 LDX   L1 *-*       RESTORE XR1               NPB00430
0011 00 66000000    235     RSXR2 LDX   L2 *-*       RESTORE XR2               NPB00440
0013 00 67000000    236     SVXR3 LDX   L3 *-*       RESTORE XR3               NPB00450
0015 00 4C000000    237           BSC   L  *-*       RETURN ADDR               NPB00460
0016                238     NPBSY EQU      *-1       ENTRY POINT               NPB00470
0017 00 0C000032    239           XIO   L  $MK1      MASK LEVELS 0-13          NPB00480
0019 00 0C000034    240           XIO   L  $MK2      MASK LEVELS 14-23         NPB00490
001B                241           ORG      *-2*MKLEV REMOVE EXTRA XIO IF APPLIC NPB00500
001B 0   69F4       242           STX    1 SVXR1+1   SAVE XR1                  NPB00510
001C 0   6AF5       243           STX    2 RSXR2+1   SAVE XR2                  NPB00520
001D 0   6BF6       244           STX    3 SVXR3+1   SAVE XR3                  NPB00530
001E 0   C002       245           LD       DUMCL     BSI L OR BSI I            NPB00540
```

```
001F 0  E8E0        246           OR       H2200      MODIFY TO LOAD XR2 INSTR     NPB00550
0020 0  0000        247           STO      DUMCL      STORE MODIFIED INSTR         NPB00560
0021 30 17222171    248      DUMCL CALL    PHSE1      XR2=ADDRS OF PHASE 1         NPB00570
                    249      *************************************************** NPB00580
                    250      *************************************************** NPB00590
                    251      *             IS SPOOLING ON                      * NPB00600
                    252      *************************************************** NPB00610
0023 0  C2EE        253           LD     2 PLOTU      IS SPOOLING IN EFFECT        NPB00620
0024 01 4C18000B    254           BSC  L   UNMSK,+-   RETURN IF NO SPOOLING        NPB00630
0026 0  C2DB        255           LD     2 BUSYI      IS A PLOT IN PROGRESS        NPB00640
0027 01 4C180004    256           BSC  L   RTRN,+-    BR IF SPOOL NOT BUSY         NPB00650
0029 0  617F        257           LDX    1 V          RESET XR1 TO FIXED AREA      NPB00660
002A 0  C9DD        258           LDD    1 $CLK-V     REAL TIME CLOCK              NPB00670
002B 0  A8D6        259           D        D3600      CONVERT TO HRS, .001 HRS     NPB00680
002C 0  92E5        260           S      2 TIME       LAST CALL TO PHSE2           NPB00690
002D 0  90D5        261           S        TOLER      ALLOW 2 MINUTES TOLERANCE    NPB00700
002E 01 4C08003A    262           BSC  L   TTTTT,+    IF + RESET PTRS              NPB00710
0030 00 67800068    263           LDX   I3 104        XR3=ADDR OF LEVEL WK AREA    NPB00720
0032 0  C307        264           LD     3 7          GET LEVEL NO.                NPB00730
0033 0  D2DB        265           STO    2 BUSYI      INDICATE A PLOT IN PROGRESS  NPB00740
0034 0  09AF        266           XIO    1 $UMK1-V    UNMASK                       NPB00750
0035 0  09B1        267           XIO    1 $UMK2-V    UNMASK                       NPB00760
0036                268           ORG      *-1*MKLEV  REMOVE EXTRA XIO IF APPLIC   NPB00770
0036 30 055445D3    269           CALL     ENDPL      SET UP FOR NEXT PLOT         NPB00780
0038 0  09B3        270           XIO    1 $MK1-V     MASK ALL LEVELS              NPB00790
0039 0  09B5        271           XIO    1 $MK2-V     MASK ALL LEVELS              NPB00800
003A                272           ORG      *-1*MKLEV  REMOVE EXTRA XIO IF APPLIC   NPB00810
003A 0  C2DB        273      TTTTT LD     2 BUSYI      IS A PLOT IN PROGRESS        NPB00820
003B 01 4C180004    274           BSC  L   RTRN,+-    BR IF SPOOL NOT BUSY         NPB00830
003D 00 67800068    275           LDX   I3 104        XR3=ADDR OF LEVEL WK AREA    NPB00840
003F 0  C307        276           LD     3 7          GET LEVEL NO.                NPB00850
0040 01 4C28000B    277           BSC  L   UNMSK,+Z   IGNORE CALL FROM NON-PR.     NPB00860
0042 0  C2F2        278           LD     2 LCEMP      GET ADDR EMPTY BUFFER LCT    NPB00870
0043 0  D002        279           STO      *+2        SET UP CALL                  NPB00880
0044 00 44800109    280           BSI  I   $GETQ      FIND NEXT QUEUE ENTRY        NPB00890
0046 0  0000        281           DC       *-*        ADDR OF EMPTY QUEUE LCT      NPB00900
0047 00 449800B6    282           BSI  I   $EXIT,+-   EXIT IF NO FREE QUEUE BUFF   NPB00910
0049 0  D016        283           STO      QADD       SAVE QUEUE ADDR              NPB00920
004A 0  C2E3        284           LD     2 LCUPQ      GET ADDR OF UPQ LCT          NPB00930
004B 0  D013        285           STO      LADD       SAVE UPQ LCT ADDR            NPB00940
004C 01 65800060    286           LDX   I1 QADD       XR1=ADDRS OF FREE BUFFER     NPB00950
004E 00 66800068    287           LDX   I2 LEVWK      XR2=ADDR OF LEVEL WK AREA    NPB00960
0050 0  C207        288           LD     2 #LN        GET LEVEL NO.AND SAVE        NPB00970
0051 0  1888        289           SRT      8          COMBINE WITH AREA NO.        NPB00980
0052 0  C205        290           LD     2 #PRIA      GET ADDRS OF LEVEL LCT       NPB00990
0053 00 84000085    291           A    L   $D1        ADD +1                       NPB01000
0055 0  D001        292           STO      *+1                                     NPB01010
0056 00 66800000    293           LDX   I2 *-*        XR2=ADDRS OF XEQ LINK/BUSY   NPB01020
0058 0  C201        294           LD     2 1          GET AREA NO. AND COMBINE     NPB01030
0059 0  1088        295           SLT      8          WITH LEVEL NO.               NPB01040
005A 0  D101        296           STO    1 1          PUT RESULT IN BUFFER         NPB01050
005B 0  CA02        297           LDD    2 2          GET WC AND SA                NPB01060
005C 0  D902        298           STD    1 2          SAVE WC AND SA               NPB01070
005D 00 4480010A    299           BSI  I   $PUTQ      SAVE FOR LATER EXECUTION     NPB01080
```

```
005E 0  0000          300     LADD  DC       *-*         LCT ADDRS                NPB01090
0060 0  0000          301     QADD  DC       *-*         FREE QUEUE BUFFER ADDRS  NPB01100
0061 0  0000          302           DC       0           EXIT PROCESS CORELOAD    NPB01110
0062 00 44800086      303           BSI   I  $EXIT                                NPB01120
0064                  304           END                                           NPB01130

000 ERROR(S) AND 000 WARNING(S) IN ABOVE ASSEMBLY.
```

```
NPBSY
DMP FUNCTION COMPLETED
```

```
// JOB             X    10 AUG 73 16.396 HRS
// *JOB SERIAL NUMBER 44595
// ASM ENDPL EPL   10 AUG 73 16.396 HRS
*LIST                                                                            EPL00010
*MACLIB PLUS                                                                     EPL00020
                         1              DEFSY                                       EPL00030

0007      055445D3      195            ENT       ENDPL      ENTRY EXECUTION POINT      EPL00040
                        196       *    VERSION 0, MODIFICATION 0                     * EPL00050
                        197       ************************************************** EPL00060
                        198       *                   FIXED AREA EQUATES             * EPL00070
                        199       ************************************************** EPL00080
007F                    200       V     EQU      /007F      FIXED AREA POINTER          EPL00090
010A                    201       $PUTO EQU      /10A       ADDR OF PUTQO ENTRY         EPL00100
0109                    202       $GETO EQU      /109       ADDR OF GETQO ENTRY         EPL00110
0032                    203       $MK1  EQU      /0032      MASK LEVELS  0-13           EPL00120
0034                    204       $MK2  EQU      /0034      MASK LEVELS 14-23           EPL00130
002E                    205       $UMK1 EQU      /002E      UNMASK LEVELS  0-13         EPL00140
0030                    206       $UMK2 EQU      /0030      UNMASK LEVELS 14-23         EPL00150
0111                    207       $QLEV EQU      /0111      CALL TO QLEVL               EPL00160
00C2                    208       $TSPR EQU      /00C2                                  EPL00170
                        209       ************************************************** EPL00180
                        210       *                   ENDPL EQUATES (PHASE I)        * EPL00190
                        211       ************************************************** EPL00200
FFDA                    212       PBUSY EQU      -38        PROCESS BUSY IND            EPL00210
FFDB                    213       BUSYI EQU      -37        SPOOLING BUSY IND           EPL00220
FFE2                    214       LCEMP EQU      -30        ADDRS OF EMPTY QUEUE LCT    EPL00230
FFE3                    215       LCUPQ EQU      -29        ADDRS OF UP QUEUE LCT       EPL00240
FFEE                    216       PLOTU EQU      -18        PLOT ON IF NON-ZERO         EPL00250
FFEF                    217       YCNT  EQU      -17        Y COUNT AS SAVED IN PH1 F/A EPL00260
FFF0                    218       XPCNT EQU      -16        X PRESENT COUNT AS SAVED    EPL00270
FFF1                    219       XMCNT EQU      -15        X MAX COUNT AS SAVED        EPL00280
                        220       ************************************************** EPL00290
                        221       *               ENDPL COMMUNICATION AREA           * EPL00300
                        222       ************************************************** EPL00310
0000 0   012C           223       D300  DC       300        CONSTANT                    EPL00320
0001 0   0001           224       H0001 DC       /0001      +Y CONTROL WORD             EPL00330
0002 0   0003           225       H0003 DC       /0003      +X CONTROL WORD             EPL00340
0003 0   0005           226       H0005 DC       /0005      -Y CONTROL WORD             EPL00350
0004 0   0009           227       H0009 DC       /0009      PEN UP CONTROL WORD         EPL00360
                        228       ************************************************** EPL00370
                        229       *                       PLOT I/O LIST              * EPL00380
                        230       ************************************************** EPL00390
0005 0   0000           231       LIST  DC       *-*        ERROR PARAMETER             EPL00400
0006 0   0000           232       PLOT  DC       *-*        CONTROL PARAMETER           EPL00410
                        233       ************************************************** EPL00420
                        234       *               START OF ENDPL ROUTINE             * EPL00430
                        235       ************************************************** EPL00440
0007 0   0000           236       ENDPL DC       *-*        ENTRY POINT                 EPL00450
0008 01 6D000043        237             STX   L1 SAVXR+1    SAVE XR1                    EPL00460
000A 01 6E000045        238             STX   L2 SAVXR+3    SAVE XR2                    EPL00470
000C 01 6F000047        239             STX   L3 SAVXR+5    SAVE XR3                    EPL00480
000E 0   637F           240             LDX    3 V          SET XR3 EQUAL FIXED AREA    EPL00490
000F 30 17222171        241             CALL     PHSE1      DUMMY CALL TO PHSE1         EPL00500
0011                    242             ORG      *-2        SET UP TO LOAD XR1          EPL00510
000F 0   6580           243             DC       /6580      * EQUAL TO PHSE1 ENTRY      EPL00520
0010                    244             ORG      *+1        ** POINT (INDIRECT LOAD)    EPL00530
```

```
                    **************************************************** EPL00540
                    *                IS SPOOLING ON                    * EPL00550
                    **************************************************** EPL00560
0011 0  C1EE              LD    1 PLOTW     IS SPOOLING IN EFFECT        EPL00570
0012 01 4C180042          BSC   L SAVXR,+-  IF NOT EXIT                  EPL00580
                    **************************************************** EPL00590
                    *                CALCULATF X COUNT                 * EPL00600
                    **************************************************** EPL00610
0014 0  C1F1        CALX  LD    1 XMCNT     X MAXIMUM COUNT              EPL00620
0015 0  91F0              S     1 XPCNT     PRESENT POSITION OF X        EPL00630
0016 0  80E9              A       D300      ADD 3 INCHES OF PAPER(+X)    EPL00640
0017 0  D001              STO     *+1       SET UP TO PUT COUNT IN       EPL00650
0018 00 66000000          LDX   L2 *-*      * INDEX REGISTER 2           EPL00660
001A 0  C0E7              LD      H0003     +X PLOT CONTROL WORD         EPL00670
001B 0  D0EA              STO     PLOT      PUT IN I/O LIST              EPL00680
001C 0  402D              BSI     DOPLT     BRANCH TO DO ACTUAL PLOT     EPL00690
                    **************************************************** EPL00700
                    *                CALCULATE Y COUNT                 * EPL00710
                    **************************************************** EPL00720
001D                CALY  EQU     *                                      EPL00730
001D 0  C1EF              LD    1 YCNT      LOAD Y COUNT FROM PH1 F/A    EPL00740
001E 01 4C180031          BSC   L CLRPL,+-  IF 0 CLEAR POOL              EPL00750
0020 01 4C080029          BSC   L NEGY,+    IF - GO TO NEGY              EPL00760
0022 0  D001              STO     *+1       SET UP TO LOAD COUNT         EPL00770
0023 00 66000000          LDX   L2 *-*      * IN INDEX REGISTER 2        EPL00780
0025 0  C0DD              LD      H0005     - CONTROL WORD               EPL00790
0026 0  D0DF              STO     PLOT      STORE IN I/O LIST            EPL00800
0027 0  4022              BSI     DOPLT     BRANCH TO DO ACTUAL PLOT     EPL00810
0028 0  7008              MDX     CLRPL     CLEAR SECTOR                 EPL00820
0029 0  1010        NEGY  SLA     16        GET - COUNT                  EPL00830
002A 0  91EF              S     1 YCNT                                   EPL00840
002B 0  D001              STO     *+1       SET UP TO LOAD COUNT         EPL00850
002C 00 66000000          LDX   L2 *-*      * IN INDEX REGISTER 2        EPL00860
002E 0  C0D2              LD      H0001     +Y CONTROL WORD              EPL00870
002F 0  D0D6              STO     PLOT      STORE IN I/O LIST            EPL00880
0030 0  4019              BSI     DOPLT     BRANCH TO DO ACTUAL PLOT     EPL00890
                    **************************************************** EPL00900
                    *            CLEAR PARTIAL SECTOR POOL             * EPL00910
                    **************************************************** EPL00920
0031 00 67000280    CLRPL LDX   L3 640      MAXIMUM SECTOR PACK          EPL00930
0033 0  6201        LOOP  LDX   2 1                                      EPL00940
0034 0  C0CC              LD      H0001                                  EPL00950
0035 0  D0D0              STO     PLOT      STORE IN I/O LIST            EPL00960
0036 0  4013              BSI     DOPLT     DO ACTUAL PLOTTING           EPL00970
0037 0  6201              LDX   2 1                                      EPL00980
0038 0  C0CA              LD      H0005                                  EPL00990
0039 0  D0CC              STO     PLOT                                   EPL01000
003A 0  400F              BSI     DOPLT     DO ACTUAL PLOTTING           EPL01010
003B 0  73FF              MDX   3 -1                                     EPL01020
003C 0  70F6              MDX     LOOP                                   EPL01030
                    **************************************************** EPL01040
                    *             RESET X&Y POINTERS TO ZERO           * EPL01050
                    **************************************************** EPL01060
003D                XYRST EQU     *                                      EPL01070
```

```
003D 0   1010        299          SLA      16          CLEAR A REG              EPL01080
003E 0   D1EF        300          STO    1 YCNT        Y COUNT                  EPL01090
003F 0   D1F0        301          STO    1 XPCNT       X PRESENT COUNT          EPL01100
0040 0   D1F1        302          STO    1 XMCNT       X MAXIMUM COUNT          EPL01110
0041 0   401C        303          BSI      REQUE       GO TO 'REQUE'            EPL01120
                     304    ***************************************************** EPL01130
                     305    *             RETURN TO CALLER                      * EPL01140
                     306    ***************************************************** EPL01150
0042 00 65000000     307    SAVXR LDX   L1 *-*         RESTORE XR1              EPL01160
0044 00 66000000     308          LDX   L2 *-*         RESTORE XR2              EPL01170
0046 00 67000000     309          LDX   L3 *-*         RESTORE XR3              EPL01180
0048 01 4C800007     310          BSC   I  ENDPL       RETURN VIA ENTRY POINT   EPL01190
                     311    ************************** ************************** EPL01200
                     312    *        PLOT ROUTINE--XR2 EQUALS COUNT             * EPL01210
                     313    ************************** ************************** EPL01220
004A 0   0000        314    DOPLT DC       *-*         ENTRY POINT              EPL01230
004B 30 174D68E7     315    RETRY CALL     PLOTX       IOCR TO PLOT             EPL01240
004D 1   0005        316          DC       LIST        I/O LIST ADDRESS         EPL01250
004E 01 74FF0005     317          MDX   L  LIST,-1     CHECK ERROR PARAMETER    EPL01260
0050 0   70FA        318          MDX      RETRY       ERROR CONDITION          EPL01270
0051 0   72FF        319          MDX    2 -1          DECREMENT XR2            EPL01280
0052 0   70F8        320          MDX      RETRY       MORE COUNT(LOOP)         EPL01290
0053 01 4C80004A     321          BSC   I  DOPLT       RETURN                   EPL01300
                     322    ***************************************************** EPL01310
                     323    *     REQUE REQUES STACKED PROCESS PLOTTING JOBS    * EPL01320
                     324    ***************************************************** EPL01330
0055 0   D2DA        325    RTRN  STO    2 PBUSY       CLEAR PROCESS & SPOOL BSY EPL01340
0056 0   D2DB        326          STO    2 BUSYI                                EPL01350
0057 00 0C00002E     327          XIO   L  $UMK1       UNMASK LEVELS 0-13       EPL01360
0059 00 0C000030     328          XIO   L  $UMK2       UNMASK LEVELS 14-23      EPL01370
005B                 329          ORG      *-2*MKLEV REMOVE EXTRA XIO IF APPLIC EPL01380
005B 00 66000000     330    RSXR2 LDX   L2 *-*         RESTORE XR2              EPL01390
005D 00 4C000000     331          BSC   L  *-*         RETURN                   EPL01400
005E                 332    REQUE EQU      *-1         ENTRY POINT              EPL01410
005F 0   6AFC        333          STX    2 RSXR2+1     SAVE XR2                 EPL01420
0060 0   C002        334          LD       DUMCL       BSI L OR BSI I           EPL01430
0061 0   E837        335          OR       H2200       MODIFY TO LOAD XR2 INSTR EPL01440
0062 0   D000        336          STO      DUMCL       STORE MODIFIED INSTR     EPL01450
0063 30 17222171     337    DUMCL CALL     PHSE1       XR2=ADDRS OF PHASE 1     EPL01460
0065 0   C2E3        338          LD     2 LCUPQ       ADDR OF UP QUEUE LCT     EPL01470
0066 0   D006        339          STO      ADR         SAVE                     EPL01480
0067 00 0C000032     340          XIO   L  $MK1        MASK LEVELS 0-13         EPL01490
0069 00 0C000034     341          XIO   L  $MK2        MASK LEVELS 14-23        EPL01500
006B                 342          ORG      *-2*MKLEV REMOVE EXTRA XIO IF APPLIC EPL01510
006B 00 44800109     343          BSI   I  $GETQ       FIND NEXT QUEUE ENTRY    EPL01520
006D 0   0000        344    ADR   DC       *-*         ADDR OF EMPTY QUEUE LCT  EPL01530
006E 01 4C180055     345          BSC   L  RTRN,+-     BR IF NO MORE REQUE'S    EPL01540
0070 0   D005        346          STO      QADD                                 EPL01550
0071 0   C2E2        347          LD     2 LCEMP       ADDR OF EMPTY QUEUE LCT  EPL01560
0072 0   D002        348          STO      LADD        SAVE ADDR                EPL01570
0073 00 4480010A     349          BSI   I  $PUTQ       RETURN TO FREE BUFF QUE  EPL01580
0075 0   0000        350    LADD  DC       *-*                                  EPL01590
0076 0   0000        351    QADD  DC       *-*                                  EPL01600
0077 0   0000        352          DC       0                                    EPL01610
```

```
0078 01 65800076    353            LDX   I1 QADD       XR1=ADDRS OF QUEUE ENTRY       EPL01620
007A 0  C101        354            LD     1 1          AREA/LEVEL                     EPL01630
007B 0  D2DA        355            STO    2 PBUSY      TURN ON PROCESS BUSY           EPL01640
007C 0  1888        356            SRT      8          AREA IN A REG,LEVEL IN Q       EPL01650
007D 0  801C        357            CMP      MNLN       IS IT MAINLINE (AREA 24)       EPL01660
007E 0  7002        358            MDX      *+2        NO,USE IT AS IS                EPL01670
007F 0  7001        359            MDX      *+1        NO,USE IT AS IS                EPL01680
0080 0  1808        360            SRA      8          CLEAR A REG                    EPL01690
0081 0  D015        361            STO      AREA                                      EPL01700
0082 01 4C080086    362            BSC   L  STLV,+     BR IF MAINLINE TO LEVEL 0      EPL01710
0084 0  1808        363            SRA      8          CLEAR A REG                    EPL01720
0085 0  1088        364            SLT      8          GET LEVEL NO.                  EPL01730
0086 0  D00F        365    STLV    STO      LEVEL                                     EPL01740
0087 0  1808        366            SRA      8          CLEAR A REG                    EPL01750
0088 0  D2DB        367            STO    2 BUSYI      CLEAR SPOOL BUSY IND           EPL01760
0089 0  C902        368            LDD    1 2          WC AND SA                      EPL01770
008A 0  D809        369            STD      CLNAM      SACW WC AND SA                 EPL01780
008B 00 44800111    370            BSI   I  $QLEV      (EQU TO TO /111) QUE           EPL01790
008D 0  0000        371            DC       0                                         EPL01800
008E 1  0094        372            DC       CLNAM      ADDR WC AND SA                 EPL01810
008F 0  00C2        373            DC       $TSPR      (EQU TO /C2)                   EPL01820
0090 1  0096        374            DC       LEVEL                                     EPL01830
0091 1  0097        375            DC       AREA                                      EPL01840
0092 1  0098        376            DC       ERR                                       EPL01850
0093 0  70C7        377            MDX      RSXR2      RETURN                         EPL01860
0094    0000        378            BSS   E  0          START AT EVEN ADDR             EPL01870
0094 0  0000        379    CLNAM   DC       *-*        WORD COUNT                     EPL01880
0095 0  0000        380            DC       *-*        SECTOR ADDR                    EPL01890
0096 0  0000        381    LEVEL   DC       *-*        LEVEL                          EPL01900
0097 0  0000        382    AREA    DC       *-*        AREA                           EPL01910
0098 0  0000        383    ERR     DC       *-*        ERROR PARAMETER                EPL01920
0099 0  2200        384    H2200   DC       /2200      CONSTANT /2200                 EPL01930
009A 0  0018        385    MNLN    DC       24         MAINLINE AREA NO               EPL01940
009C                386            END                                                EPL01950

000 ERROR(S) AND 000 WARNING(S) IN ABOVE ASSEMBLY.
```

```
ENDPL
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73 12.415 HRS                    STLA0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                             STLA0010
// FOR SETLA              VERSION20 MODIFICATION 0 112                 STLA0020
*LIST ALL
*EXTENDED PRECISION                                                    STLA0040
      INTEGER RI,NAMT(3)                                               STLA0070
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36) STLA0080
      INTEGER S,YEAR,DATES(30),P,PI,R                                  STLA0090
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMSTLA0100
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI      STLA0110
C----                                                                  STLA0120
C---- THIS LINK SETS LAB=1 THEN CALLS WAST                             STLA0130
C----                                                                  STLA0140
      CALL NPBSY
      LAB=1                                                            STLA0150
      IREC = 1                                                         STLA0160
      JREC = 1                                                         STLA0170
      KREC = 1                                                         STLA0180
      LREC = 1                                                         STLA0190
      MREC = 1                                                         STLA0200
      NREC = 1                                                         STLA0210
      II = 0                                                           STLA0220
      DO 1 J=1,42                                                      STLA0230
1     SWPA(J)=0                                                        STLA0240
      DO 2 J=1,40                                                      STLA0250
      DO 2 IK=1,37                                                     STLA0260
2     SCAT (J,IK)=0                                                    STLA0270
      DO 3 J=1,120                                                     STLA0280
      HS(J)=0                                                          STLA0290
3     HMAX(J)=0                                                        STLA0300
      DO 4 J=1,2                                                       STLA0310
      DO 4 IK=1,22                                                     STLA0320
4     TZ(J,IK)=0                                                       STLA0330
      CALL LINK(WAST)                                                  STLA0340
      END                                                              STLA0350

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E    HS(IC)=FA0D-F9A8  HMAX(IC)=F9A7-F942     TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914         LAB(IC)=F913       MAXH(IC)=F912          N(IC)=F911           MM(IC)=F910        II(IC)=F90F
 TITLE(IC)=F90E-F8EB      S(IC)=F8EA       NAMT(IC)=F8E9-F8E7     M(IC)=F8E6         YEAR(IC)=F8E5     DATES(IC)=F8E4-F8C7
     P(IC)=F8C6        KREC(IC)=F8C5       LREC(IC)=F8C4       MREC(IC)=F8C3         NREC(IC)=F8C2         R(IC)=F8C1
     K(IC)=F8C0           L(IC)=F8BF         PI(IC)=F8BE        KNT(IC)=F8BD        IHMAX(IC)=F8BC        RI(IC)=F8BB
     J(I )=0000          IK(I )=0001

STATEMENT ALLOCATIONS
 1     =0032  2     =004C  3     =0076  4     =008D

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION

CALLED SUBPROGRAMS
 NPBSY    ISTOX    SUBSC

INTEGER CONSTANTS
     1=0004       0=0005      42=0006      40=0007      37=0008     120=0009       2=000A      22=000B
```

```
CORE REQUIREMENTS FOR SETLA
 COMMON   1862  INSKEL COMMON       0
  VARIABLES       4  PROGRAM    170



END OF COMPILATION







SETLA
DMP FUNCTION COMPLETED
// DMP                                                                      STLA0360
*DELET              1 SETLA                                                 STLA0370
DMP FUNCTION COMPLETED
*STORECI            1 SETLA SETLA                                           STLA0380

*CCEND                                                                      STLA0390







 MPX, BUILD SETLA

 MPX, SETLA LD XQ

CL WC OF  021A STORED AT  160B
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73 12.447 HRS                      WAST0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                              WAST0010
// FOR WAST              VERSION20 MODIFICATION 0 112                   WAST0020
*EXTENDED PRECISION                                                     WAST0040
*LIST ALL
*IOCS(DISK,MAGNETIC TAPE,1443 PRINTER)                                  WAST0060
*IOCS (CARD)                                                            WAST0070
      INTEGER RI                                                        WAST0090
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36) WAST0100
      INTEGER S,YEAR,DATES(30),P,PI,R                                   WAST0110
      DIMENSION MONTH(4),NAMT(3)                                        WAST0120
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMWAST0130
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI       WAST0140
      DEFINE FILE 201(301,5,U,ILREC)                                    WAST0150
C----                                                                   WAST0160
C---- THIS LINK TESTS FOR THE START OF A SEASON AT THE BEGINNING OF THE WAST0170
C---- MAG TAPE, AND SETS VARIOUS COUNTS BEFORE EXECUTING READW          WAST0180
C----                                                                   WAST0190
      GO TO (1,20,25),LAB                                               WAST0200
1     READ(2,103) NAMT                                                  WAST0210
103   FORMAT(3A2)                                                       WAST0220
      CALL NEXTM(5,NAMT,N,MM)                                           WAST0230
      READ (5,100) TITLE                                                WAST0240
100   FORMAT (1H1,24(/),44X,36A2)                                       WAST0250
 700  FORMAT(I7,1X,3(F7.2,1X))                                          WAST0260
C                                                                       WAST0270
      READ (5,102) MONTH                                                WAST0280
102   FORMAT (1H1,5(/),4A1,3(/))                                        WAST0290
      READ (2,101) DATES,YEAR,MAXH,IHMAX                                WAST0300
101   FORMAT (30A2,2X,I4,2X,I2,2X,I3)                                   WAST0310
      KNT=0                                                             WAST0320
C----                                                                   WAST0330
C---- TEST FIRST MONTHS DATA ON MAG TAPE. IF IT IS NOT THE BEGINNING OF WAST0340
C----A SEASON ABORT THE JOB, OTHERWISE SET COUNTS AS FOLLOWS -          WAST0350
C----      S= SEASON NUMBER (JAN - MARCH =1 ETC )                       WAST0360
C----      M= MONTH NUMBER                                              WAST0370
C----      P= NUMBER OF RECORDS IN SEASON                               WAST0380
C----      R= NUMBER OF RECORDS IN MONTH                                WAST0390
C----      K= NUMBER OF RECORDS ON PAGE                                 WAST0400
C----      L= NUMBER OF RECORDS IN DAY                                  WAST0410
C----      PI=COUNT OF RECORDS IN SEASON WHICH HAVE BEEN ANALYSED       WAST0420
C----                                                                   WAST0430
C----      KNT= COUNT OF NUMBER OF SEASONS ANALYSED                     WAST0440
C----                                                                   WAST0450
      IF (MONTH(2)+11968) 2,3,2                                         WAST0460
2     IF (MONTH(2)+10688) 4,5,4                                         WAST0470
4     IF (MONTH(2)+16064) 6,7,6                                         WAST0480
6     WRITE (3,8)N,MONTH                                                WAST0490
8     FORMAT (' DATA ON MAGNETIC TAPE FILE ',I3,' STARTS AT MONTH',4A1,'WAST0500
     1. THE JOB HAS BEEN ABORTED.')                                     WAST0510
      REWIND 5                                                          WAST0520
      MM=1                                                              WAST0530
      CALL STORM(NAMT,N,MM)                                             WAST0540
      CALL ENDPL
      CALL EXIT                                                         WAST0550
7     IF (MONTH(3)+10432) 6,9,6                                         WAST0560
5     IF (MONTH(3)+15552) 6,10,6                                        WAST0570
```

```
3      IF (MONTH(3)+16064) 11,12,11                                        WAST0580
11      IF (MONTH(3)+7104) 6,13,6                                          WAST0590
13     IF (MONTH(4)+11456) 6,14,6                                          WAST0600
12     S=1                                                                 WAST0610
23     M=1                                                                 WAST0620
       IF (YEAR-4*(YEAR/4)) 15,16,15                                       WAST0630
15     P=720                                                               WAST0640
       GO TO 17                                                            WAST0650
16     P=728                                                               WAST0660
17     R=248                                                               WAST0670
       RI=0                                                                WAST0680
       GO TO 18                                                            WAST0690
9      S=2                                                                 WAST0700
26     M=4                                                                 WAST0710
       P=728                                                               WAST0720
       R=240                                                               WAST0730
       RI=0                                                                WAST0740
       GO TO 18                                                            WAST0750
14     S=3                                                                 WAST0760
28     M=7                                                                 WAST0770
       P=736                                                               WAST0780
       GO TO 17                                                            WAST0790
10     S=4                                                                 WAST0800
29     M=10                                                                WAST0810
       P=736                                                               WAST0820
       GO TO 17                                                            WAST0830
18     K=0                                                                 WAST0840
       L=0                                                                 WAST0850
       PI=0                                                                WAST0860
C----                                                                      WAST0870
C----CALL LINK TO READ ONE SEASONS DATA                                    WAST0880
C----                                                                      WAST0890
       CALL LINK(READW)                                                    WAST0900
C----                                                                      WAST0910
C----INCREASE COUNTS AT END OF A SEASON                                    WAST0920
C----                                                                      WAST0930
20     S=S+1                                                               WAST0940
       IF (S-4) 22,22,21                                                   WAST0950
21     S=S-4                                                               WAST0960
22     IF (S-1) 23,23,24                                                   WAST0970
24     IF (S-2) 26,26,27                                                   WAST0980
27     IF (S-3) 28,28,29                                                   WAST0990
C----                                                                      WAST1000
C---- STORE MAG TAPE STARTING POSITION FOR NEXT YEARS ANALYSIS             WAST1010
C----                                                                      WAST1020
25     REWIND 5                                                            WAST1030
       MM=1                                                                WAST1040
       N=N+1                                                               WAST1050
       CALL STORM(NAMT,N,MM)                                               WAST1060
       CALL ENDPL
       CALL EXIT                                                           WAST1070
       END                                                                 WAST1080
```

```
VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E     HS(IC)=FA0D-F9A8  HMAX(IC)=F9A7-F942     TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914         LAB(IC)=F913       MAXH(IC)=F912            N(IC)=F911            MM(IC)=F910         II(IC)=F90F
 TITLE(IC)=F90E-F8EB      S(IC)=F8EA       NAMT(IC)=F8E9-F8E7       M(IC)=F8E6          YEAR(IC)=F8E5      DATES(IC)=F8E4-F8C7
     P(IC)=F8C6        KREC(IC)=F8C5       LREC(IC)=F8C4         MREC(IC)=F8C3          NREC(IC)=F8C2          R(IC)=F8C1
     K(IC)=F8C0           L(IC)=F8BF         PI(IC)=F8BE          KNT(IC)=F8BD         IHMAX(IC)=F8BC         RI(IC)=F8BB
 MONTH(I )=0009-0006 ILREC(I )=000A

UNREFERENCED STATEMENTS
 700

STATEMENT ALLOCATIONS
 103   =0020  100   =0023  700   =002C  102   =0033  101   =003E  8     =0047  1     =0079  2     =00AD  4     =00B5  6     =00BD
 7     =00D5  5     =00DF  3     =00E9  11    =00F1  13    =00F9  12    =0103  23    =0107  15    =0119  16    =011F  17    =0123
 9     =012D  26    =0131  14    =0143  28    =0147  10    =0151  29    =0155  18    =015F  20    =016F  21    =017B  22    =0181
 24    =0187  27    =018D  25    =0195

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 NEXTM    STORM    ENDPL    COMGO    STFAC    SBFAC    MRED     MWRT     MCOMP    MIOAI    MIOI     REWND    HOLEB    MAGT     PRNTN
 EBPRT    CARDN

INTEGER CONSTANTS
     2=000C        5=000D        0=000E  11968=000F  10688=0010  16064=0011        3=0012        1=0013  10432=0014  15552=0015
  7104=0016    11456=0017        4=0018    720=0019    728=001A    248=001B      240=001C        7=001D    736=001E     10=001F

CORE REQUIREMENTS FOR WAST
 COMMON    1862  INSKEL COMMON      0
  VARIABLES      12  PROGRAM     414


END OF COMPILATION
```

```
WAST
DMP FUNCTION COMPLETED
// DMP                                                                  WAST1D90
*DELET            1 WAST                                                WAST1100
DMP FUNCTION COMPLETED
*STORECI          1 WAST  WAST                                          WAST1110

*FILES(201,MFILE,0)                                                     WAST1120
*CCEND                                                                  WAST1130



 MPX, BUILD WAST

 MPX, WAST  LD XQ

CL WC OF  157A STORED AT  160D
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73 12.502 HRS                      REDW0000
// *NIO MPX PROGRAM LIBRARY MASTER COPY                                 REDW0010
// FOR READW             VERSION20 MODIFICATION 0 112                   REDW0020
*EXTENDED PRECISION                                                     REDW0030
*LIST ALL
*IOCS(MAGNETIC TAPE,DISK)                                               REDW0050
      INTEGER RI,NAMT(3)                                                REDW0070
      INTEGER EPSI                                                      REDW0080
      INTEGER TZV(4),TZAC                                               REDW0090
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36) REDW0100
      INTEGER S,YEAR,DATES(30),P,PI,R                                   REDW0110
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMREDW0120
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI       REDW0130
      DEFINE FILE 6(3000,1,U,NREC)                                      REDW0140
C----                                                                   REDW0150
C---- THIS LINK READS ONE SEASONS DATA AND SORTS IT INTO ARRAYS         REDW0160
C----                                                                   REDW0170
27    READ (5,1) TZV(1),TZV(2),TZV(3),TZV(4),EPSI,BHS,JHMAX             REDW0180
1     FORMAT (14X,2A1,1X,2A1,19X,I3,30X,F4.1,4X,I3)                     REDW0190
C----                                                                   REDW0200
C---- TEST FOR CALM RECORD                                              REDW0210
C----                                                                   REDW0220
      IF (TZV(4)+11200) 2,3,2                                           REDW0230
3     SWPA(1)=SWPA(1)+1                                                 REDW0240
      SCAT(1,1)=SCAT(1,1)+1                                             REDW0250
      TZ(1,1)=TZ(1,1)+1                                                 REDW0260
      HS(1)=HS(1)+1                                                     REDW0270
      HMAX(1)=HMAX(1)+1                                                 REDW0280
      IHS=0                                                             REDW0290
      WRITE (6'NREC) IHS                                                REDW0300
      GO TO 20                                                          REDW0310
C----                                                                   REDW0320
C---- STORE DATA IN CORRECT ELEMENTS OF EACH ARRAY                      REDW0330
C----                                                                   REDW0340
2     A=GET (TZV,1,4,0.01)+0.0000000005                                 REDW0350
      IHS=BHS                                                           REDW0360
      HS(IHS+2)=HS(IHS+2)+1                                             REDW0370
      HMAX(JHMAX+2)=HMAX(JHMAX+2)+1                                     REDW0380
      WRITE (6'NREC) IHS                                                REDW0390
      TZAC=A                                                            REDW0400
      TZAB=A-TZAC                                                       REDW0410
      IF(TZAB-0.5) 4,5,5                                                REDW0420
4     TZ(1,TZAC+2)=TZ(1,TZAC+2)+1                                       REDW0430
      GO TO 6                                                           REDW0440
5     TZ(2,TZAC+2)=TZ(2,TZAC+2)+1                                       REDW0450
6     IM=2                                                              REDW0460
      DO 8 IL=25,1000,25                                                REDW0470
      IF (IL-1-EPSI) 7,9,9                                              REDW0480
7     IM=IM+1                                                           REDW0490
8     CONTINUE                                                          REDW0500
9     SWPA(IM)=SWPA(IM)+1                                               REDW0510
      IL=1                                                              REDW0520
      IK=1                                                              REDW0530
      DO 11 I=50,2000,50                                                REDW0540
      ZI=(I-1)/100.                                                     REDW0550
      IF (ZI-A) 10,12,12                                                REDW0560
10    IK=IK+1                                                           REDW0570
```

```
11    CONTINUE                                                          REDW0580
12    IF (MAXH-20) 121,120,121                                          REDW0590
120   DO 150 IM=50,2000,50                                              REDW0600
      ZN=(IM-1.)/100.                                                   REDW0610
      IF (ZN-BHS) 170,16,16                                             REDW0620
170   IL=IL+1                                                           REDW0630
150   CONTINUE                                                          REDW0640
121   IF (MAXH-40) 13,14,13                                             REDW0650
14    DO 15 IM= 10,400,10                                               REDW0660
      ZN=(IM-1.)/10.                                                    REDW0670
      IF (ZN-IHS) 17,16,16                                              REDW0680
17    IL=IL+1                                                           REDW0690
15    CONTINUE                                                          REDW0700
13    DO 18 IM=20,800,20                                                REDW0710
      ZN=(IM-1.)/10.                                                    REDW0720
      IF (ZN-IHS)19,16,16                                               REDW0730
19    IL=IL+1                                                           REDW0740
18    CONTINUE                                                          REDW0750
16    SCAT(IL,IK)=SCAT(IL,IK)+1                                         REDW0760
C----                                                                   REDW0770
C---- INCREASE COUNTS. AT THE END OF A SEASON EXECUTE HSLOT              REDW0780
C----                                                                   REDW0790
20    II=II+1                                                           REDW0800
      PI=PI+1                                                           REDW0810
      RI=RI+1                                                           REDW0820
      L=L+1                                                             REDW0830
      K=K+1                                                             REDW0840
      IF (P-PI) 21,22,21                                                REDW0850
21    IF (R-RI) 23,24,23                                                REDW0860
23    IF (K-40) 25,26,26                                                REDW0870
25    IF (L-8) 27,28,28                                                 REDW0880
28    READ (5,29)                                                       REDW0890
29    FORMAT (1X)                                                       REDW0900
      L=0                                                               REDW0910
      GO TO 27                                                          REDW0920
26    READ (5,30)                                                       REDW0930
30    FORMAT (9(/))                                                     REDW0940
      K=0                                                               REDW0950
      L=0                                                               REDW0960
      GO TO 27                                                          REDW0970
24    READ (5,30)                                                       REDW0980
      M=M+1                                                             REDW0990
      GO TO (31,32,31,33,31,33,31,31,33,31,33,31),M                     REDW1000
31    R=248                                                             REDW1010
      GO TO 34                                                          REDW1020
32    IF (YEAR-4*(YEAR/4)) 35,36,35                                     REDW1030
35    R=224                                                             REDW1040
      GO TO 34                                                          REDW1050
36    R=232                                                             REDW1060
      GO TO 34                                                          REDW1070
33    R=240                                                             REDW1080
34    RI=0                                                              REDW1090
      K=0                                                               REDW1100
      L=0                                                                  REDW1110
      GO TO 27                                                             REDW1120
22    IF (KNT-3) 38,37,37                                                  REDW1130
38    READ (5,30)                                                          REDW1140
37    CALL LINK(HSLOT)                                                     REDW1150
      END                                                                  REDW1160

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E     HS(IC )=FA0D-F9A8  HMAX(IC)=F9A7-F942     TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914        LAB(IC)=F913        MAXH(IC)=F912           N(IC)=F911          MM(IC)=F910        II(IC)=F90F
 TITLE(IC)=F90E-F8EB     S(IC)=F8EA        NAMT(IC)=F8E9-F8E7      M(IC)=F8E6        YEAR(IC)=F8E5     DATES(IC)=F8E4-F8C7
     P(IC)=F8C6       KREC(IC)=F8C5        LREC(IC)=F8C4        MREC(IC)=F8C3        NREC(IC)=F8C2         R(IC)=F8C1
     K(IC)=F8C0          L(IC)=F8BF          PI(IC)=F8BE         KNT(IC)=F8BD       IHMAX(IC)=F8BC        RI(IC)=F8BB
   BHS(R )=0006          A(R )=0009        TZAB(R )=000C          ZI(R )=000F          ZN(R )=0012      EPSI(I )=0015
   TZV(I )=0019-0016  TZAC(I )=001A      JHMAX(I )=001B         IHS(I )=001C          IM(I )=001D        IL(I )=001E
    IK(I )=001F          I(I )=0020

STATEMENT ALLOCATIONS
 1     =004E  29    =005B  30    =005D  27    =0061  3     =0083  2     =00B7  4     =00F5  5     =0102  6     =010D  7     =011D
 8     =0123  9     =012D  10    =0154  11    =015A  12    =0164  120   =016A  170   =017E  150   =0184  121   =018E  14    =0194
 17    =01A9  15    =01AF  13    =01B9  19    =01CE  18    =01D4  16    =01DE  20    =01EB  21    =020F  23    =0215  25    =021B
 28    =0221  26    =022B  24    =0239  31    =0253  32    =0259  35    =0267  36    =026D  33    =0273  34    =0277  22    =0285
 38    =028B  37    =028F

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 GET      EADD     ESUB     EDIV     ELD      ESTO     ESBR     IFIX     FLOAT    COMGO    ISTOX    LDFAC    STFAC    SBFAC    MRED
 MCOMP    MIOIX    MIOF     MIOI     SUBSC    MDWRT    MDCOM    MDI      MAGT

REAL CONSTANTS
  .100000000E-01=0026    .500000000E-09=0029    .500000000E 00=002C    .100000000E 03=002F    .100000000E 01=0032
  .100000000E 02=0035

INTEGER CONSTANTS
     5=0038  11200=0039      1=003A      0=003B      6=003C      4=003D      2=003E     25=003F   1000=0040     50=0041
  2000=0042     20=0043     40=0044     10=0045    400=0046    800=0047      8=0048    248=0049    224=004A    232=004B
   240=004C      3=004D

CORE REQUIREMENTS FOR READW
 COMMON    1862  INSKEL COMMON       0
  VARIABLES      38  PROGRAM     622


END OF COMPILATION
```

```
READW
DMP FUNCTION COMPLETED
*DELET            1 READW                                               REDW1170
DMP FUNCTION COMPLETED
*STORECIL         1 READW READW                                         REDW1180

*FILES(6,HSG,2)                                                         REDW1190
*CCEND                                                                  REDW1200
```

```
MPX, BUILD READW

CORE LOAD  MAP
TYPE NAME  ARG1   ARG2

*CDW TABLE 4D8C   0012
*FIO TABLE 4D9E   001E
*ETV TABLE 4DBC   000F
*VTV TABLE 4DCB   0049
*CNT TABLE 4E14   0008
MAIN READW 4E7D
CLNT READW 4E16
CALL MAGT  50B0          R
LIBF MRED  556A   4DCB   R
LIBF MIOIX 55DD   4DCE
LIBF MIOI  55D2   4DD1
LIBF MIOF  55CE   4DD4
LIBF MCOMP 55B5   4DD7
LIBF ISTOX 5A90   4DDA   R
LIBF MDWRT 5C23   4DDD   R
LIBF MDI   5ABC   4DE0
LIBF MDCOM 5B5E   4DE3
CALL GET   5CF8
LIBF EADD  5D88   4DE6
LIBF ESTO  5E2E   4DE9
LIBF ELD   5E40   4DEC
LIBF ESBR  5D75   4DEF
LIBF ESUB  5D80   4DF2
LIBF LDFAC 5E69   4DF5   R
LIBF EDIV  5F99   4DF8
LIBF COMGO 5F19   4DFB   R
LIBF STFAC 5E74   4DFF
LIBF SBFAC 5E78   4E01
CLNT HSLOT 4F1A
CALL ABRTQ 5F50          R
CALL FEROR 5F81          R
CALL SBCAL 60B2
CALL GETBF 5FBF
CALL FREBF 5FB1
CALL FIOXT 5FB5
CALL NZONE 60CA
LIBF EMPY  611E   4E04
LIBF SNR   615C   4E07
LIBF FARC  6170   4E0A
LIBF XDD   61A2   4E0D
CALL FREUP 6091          R
LIBF XMD   6266   4E10
FIOB       62AC   0142
CORE       63FE   14BC
COMM       78BA   0746
MPX, READW LD XQ

CL WC OF  1520 STORED AT  156B
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73 12.559 HRS                                 HSL00000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                                        HSL00010
// FOR HSLOT               VERSION20 MODIFICATION 0 112                           HSL00020
*EXTENDED PRECISION                                                               HSL00040
*LIST ALL
 IOCS(DISK)                                                                       HSL00060
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36) HSL00080
      INTEGER RI,NAMT(3)                                                          HSL00090
      INTEGER S,YEAR,DATES(30),P,PI,R                                             HSL00100
      DIMENSION AHS(102),ATZ(44),ASWP(42)                                         HSL00110
      DATA ISPAC/' '/,IAST/'*'/,IPLUS/'+'/                                        HSL00120
      DATA AHS/102*0./,ATZ/44*0./,ASWP/42*0./                                     HSL00130
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMHSL00140
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI              HSL00150
      DEFINE FILE 1(4,306,U,IREC),2(4,306,U,JREC),3(4,132,U,KREC)                HSL00160
      DEFINE FILE 4(1,126,U,LREC),5(40,37,U,MREC)                                 HSL00170
C----                                                                             HSL00180
C---- THIS LINK SORTS EACH SEASONS DATA INTO GRAPHICAL FORM AND                   HSL00190
C---- STORES ON DISK. RETURN TO READW UNLESS END OF YEAR, THEN                    HSL00200
C---- CALCULATE SWPA AND SCAT ARRAYS AND PLOT                                     HSL00210
C----                                                                             HSL00220
      API=PI                                                                      HSL00230
      IF (S-1) 1,2,1                                                              HSL00240
1     IF (S-2) 3,4,3                                                              HSL00250
3     IF (S-3) 5,6,5                                                              HSL00260
2     IREC=1                                                                      HSL00270
      JREC=1                                                                      HSL00280
      KREC=1                                                                      HSL00290
      GO TO 7                                                                     HSL00300
4     IREC=2                                                                      HSL00310
      JREC=2                                                                      HSL00320
      KREC=2                                                                      HSL00330
      GO TO 7                                                                     HSL00340
6     IREC=3                                                                      HSL00350
      JREC=3                                                                      HSL00360
      KREC=3                                                                      HSL00370
      GO TO 7                                                                     HSL00380
5     IREC=4                                                                      HSL00390
      JREC=4                                                                      HSL00400
      KREC=4                                                                      HSL00410
C----                                                                             HSL00420
C---- FORM CUMULATIVE PERCENTAGE OF HS AND HMAX AND STORE ON DISK.                HSL00430
C---- CALCULATE PERCENTAGE OCCURRENCE OF TZ AND STORE ON DISK.                    HSL00440
C----                                                                             HSL00450
7     AHS(102)=HS(102)/API*100.                                                   HSL00460
      DO 8 J=1,101                                                                HSL00470
      JI=102-J                                                                    HSL00480
8     AHS(JI)=(HS(JI)/API*100.)+AHS(JI+1)                                         HSL00490
      WRITE (1'IREC) (AHS(J),J=1,102)                                             HSL00500
      DO 26 JII=1,102                                                             HSL00510
26    AHS(JII)=0.                                                                 HSL00520
      AHS(102)=HMAX(102)/API*100.                                                 HSL00530
      DO 9 J=1,101                                                                HSL00540
      JI=102-J                                                                    HSL00550
9     AHS(JI)=(HMAX(JI)/API*100.)+AHS(JI+1)                                       HSL00560
      WRITE (2'JREC) (AHS(J),J=1,102)                                             HSL00570
      ATZ(1)=(TZ(1,1)*100./P)                                                     HSL00580
      DO 10 IL=2,22                                                     HSL00590
      DO 10 IJ=1,2                                                      HSL00600
      JI=2*IL+IJ-3                                                      HSL00610
10    ATZ(JI)=(TZ(IJ,IL)*100./P)                                        HSL00620
      WRITE (3'KREC) (ATZ(J),J=1,44)                                    HSL00630
      KNT=KNT+1                                                         HSL00640
      IF (KNT-4) 11,12,11                                               HSL00650
11    DO 13 J=1,102                                                     HSL00660
      HS(J)=0                                                           HSL00670
      HMAX(J)=0                                                         HSL00680
13    AHS(J)=0.                                                         HSL00690
      DO 14 J=1,44                                                      HSL00700
14    ATZ(J)=0.                                                         HSL00710
      DO 15 J=1,22                                                      HSL00720
      DO 15 IK=1,2                                                      HSL00730
15    TZ(IK,J)=0                                                        HSL00740
      LAB=2                                                             HSL00750
      CALL LINK(WAST)                                                   HSL00760
C----                                                                   HSL00770
C---- CALCULATE PERCENTAGE OCCURRENCE OF SPECTRAL WIDTH PARAMETER AND    HSL00780
C---- STORE ON DISK. FORM SCATTER DIAGRAM AND STORE ON DISK.            HSL00790
C----                                                                   HSL00800
12    ASWP(1)=(SWPA(1)*100./II)                                         HSL00810
      DO 16 J=2,42                                                      HSL00820
16    ASWP(J)=(SWPA(J)*100./II)                                         HSL00830
      WRITE (4'LREC) (ASWP(J),J=1,42)                                   HSL00840
      DO 17 J=1,40                                                      HSL00850
      DO 18 IK=1,37                                                     HSL00860
      IF (SCAT(J,IK)) 19,20,19                                          HSL00870
20    SCAT(J,IK)=ISPAC                                                  HSL00880
      GO TO 18                                                          HSL00890
19    IF (SCAT(J,IK)-1) 21,22,21                                        HSL00900
22    SCAT(J,IK)=IAST                                                   HSL00910
      GO TO 18                                                          HSL00920
21    IF (SCAT(J,IK)-2) 23,24,23                                        HSL00930
24    SCAT(J,IK)=IPLUS                                                  HSL00940
      GO TO 18                                                          HSL00950
23    SCAT(J,IK)=((SCAT(J,IK)*1000.)/II)+0.5                            HSL00960
      IF (SCAT(J,IK)) 18,25,18                                          HSL00970
25    SCAT(J,IK)=1                                                      HSL00980
18    CONTINUE                                                          HSL00990
      WRITE (5'MREC) (SCAT(J,IK),IK=1,37)                               HSL01000
17    CONTINUE                                                          HSL01010
      CALL LINK(PERS)                                                   HSL01020
      END                                                               HSL01030

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E    HS(IC)=FA0D-F9A8  HMAX(IC)=F9A7-F942     TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914        LAB(IC)=F913       MAXH(IC)=F912          N(IC)=F911          MM(IC)=F910        II(IC)=F90F
 TITLE(IC)=F90E-F8EB     S(IC)=F8EA       NAMT(IC)=F8E9-F8E7     M(IC)=F8E6        YEAR(IC)=F8E5   DATES(IC)=F8E4-F8C7
     P(IC)=F8C6       KREC(IC)=F8C5       LREC(IC)=F8C4       MREC(IC)=F8C3        NREC(IC)=F8C2         R(IC)=F8C1
     K(IC)=F8C0          L(IC)=F8BF         PI(IC)=F8BE        KNT(IC)=F8BD       IHMAX(IC)=F8BC        RI(IC)=F8BB
   AHS(R )=014D-001E   ATZ(R )=01D1-0150  ASWP(R )=024F-01D4    API(R )=0252           J(I )=0258        JI(I )=0259
  JII(I )=025A          IL(I )=025B          IJ(I )=025C          IK(I )=025D        ISPAC(I )=025E        IAST(I )=025F
 IPLUS(I )=0260

STATEMENT ALLOCATIONS
 1     =0288  3     =028E  2     =0296  4     =02A4  6     =02B2  5     =02C0  7     =02CC  8     =02E3  26    =0323  9     =034C
 10    =03AB  11    =03FC  13    =040F  14    =0425  15    =043F  12    =0464  16    =0478  20    =04C5  19    =04D2  22    =04DF
 21    =04EC  24    =04F9  23    =0506  25    =0524  18    =052F  17    =0551

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 EADD     EADDX    EMPY     EDIV     ELD      ESTO     ESTOX    EDVR     IFIX     FLOAT    ISTOX    SUBSC    MDWRT    MDCOM    MDFX
 MDIX

REAL CONSTANTS
  .100000000E 03=0264     .000000000E 00=0267     .100000000E 04=026A     .500000000E 00=026D

INTEGER CONSTANTS
     1=0270        2=0271        3=0272        4=0273      101=0274      102=0275       22=0276       44=0277        0=0278       42=0279
    40=027A       37=027B        5=027C

CORE REQUIREMENTS FOR HSLOT
 COMMON    1862  INSKEL COMMON       0
  VARIABLES     612  PROGRAM     762


END OF COMPILATION
```

```
HSLOT
DMP FUNCTION COMPLETED
// DMP                                                                  HSL01040
*DELET             1 HSLOT                                              HSL01050
DMP FUNCTION COMPLETED
*STORECIL          1 HSLOT HSLOT                                        HSL01060

*FILES(1,HS,2),(2,HMAX,2),(3,TZ,2),(4,SWPA,2),(5,SCAT,2)                HSL01070
*CCEND                                                                  HSL01080
```

```
 MPX, BUILD HSLOT

 CORE LOAD  MAP
 TYPE NAME  ARG1  ARG2

 *CDW TABLE 4D8C  0012
 *FIO TABLE 4D9E  001F
 *ETV TABLE 4DBC  000F
 *VTV TABLE 4DCB  0030
 *CNT TABLE 4DFC  000C
 MAIN HSLOT 5085
 CLNT HSLOT 4DFE
 LIBF ESTO  538A  4DCB
 LIBF EDIV  53C9  4DCE
 LIBF EMPY  5442  4DD1
 LIBF ESTOX 5366  4DD4
 LIBF EADDX 54A8  4DD7
 LIBF MDWRT 5699  4DDA  R
 LIBF MDFX  5546  4DDD
 LIBF MDCOM 55D4  4DE0
 LIBF ELD   539C  4DE3
 LIBF EDVR  53B5  4DE6
 LIBF ISTOX 576E  4DE9  R
 CLNT WAST  4E02
 LIBF EADD  54A4  4DEC
 LIBF MDIX  554B  4DEF
 CLNT PERS  4E06
 LIBF XDD   578E  4DF2
 LIBF FARC  5852  4DF5
 LIBF XMD   5884  4DF8
 CALL FEROR 58CB        R
 CALL FREBF 58FB
 CALL FIOXT 58FF
 CALL SBCAL 59FC
 CALL GETBF 5909
 CALL FREUP 59DB        R
 FIOB       5A16  0142
 CORE       5B58  1D62
 COMM       78BA  0746
 MPX, HSLOT LD XQ

CL WC OF  0C8A STORED AT  157C
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73  12.609 HRS                         PERS0000
// *NIO MPX MASTER LIBRARY PROGRAM                                          PERS0010
// FOR PERS                  VERSION 20 MODIFICATION 1 112                  PERS0020
*EXTENDED PRECISION                                                         PERS0030
*IOCS(DISK)                                                                 PERS0040
*LIST ALL
*IOCS(TYPEWRITER)                                                           PERS0050
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36) PERS0060
      INTEGER S,YEAR,DATES(30),P,PI,R                                       PERS0070
      INTEGER RI,IHS(2928),NAMT(3)                                          PERS0080
      DIMENSION NAMFL(6),LIST(40),KRAY(320)                                 PERS0090
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMPERS0100
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI           PERS0110
      EQUIVALENCE (SWPA(1),KRAY(1))                                         PERS0120
      DATA LIST/'02','04','06','08','10','12','14','16','18','20','22','PERS0130
     124','26','28','30','32','34','36','38','40','42','44','46','48','5PERS0140
     20','52','54','56','58','60','62','64','66','68','70','72','74','76PERS0150
     3','78','80'/                                                          PERS0160
      DATA NAMFL(1)/'HS'/,NAMFL(2)/'G '/,NAMFL(3)/'  '/                     PERS0170
      DATA NAMFL(4)/'PE'/,NAMFL(6)/'  '/,IZERO/0/                           PERS0180
      DEFINE FILE 2(3000,1,U,NREC),1(320,1,U,IKREC)                         PERS0190
C----                                                                       PERS0200
C---- STORE ZERO IN DISK ARRAYS BEFORE USE                                  PERS0210
C----                                                                       PERS0220
      LHMAX=IHMAX/2                                                         PERS0230
      DO 12 J=1,LHMAX                                                       PERS0240
      IKREC = 1                                                             PERS0250
      NAMFL(5)=LIST(J)                                                      PERS0260
      CALL DFT(2,NAMFL,IERR)                                                PERS0270
      IF (IERR) 13,14,13                                                    PERS0280
13    WRITE (1,15) IERR                                                     PERS0290
15    FORMAT ('IERR=',I3,' IN PROGRAM PERS')                                PERS0300
      CALL ENDPL                                                            PERS0310
      CALL EXIT                                                             PERS0320
14    DO 16 IK=1,320                                                        PERS0330
16    WRITE (1'IKREC) IZERO                                                 PERS0340
12    CONTINUE                                                              PERS0350
      NREC=1                                                                PERS0360
      IF (YEAR-4*(YEAR/4)) 1,2,1                                            PERS0370
1     NOREC=2920                                                            PERS0380
      GO TO 3                                                               PERS0390
2     NOREC=2928                                                            PERS0400
C----                                                                       PERS0410
C---- CALCULATE DURATION FOR WHICH WAVES EXCEEDED A GIVEN HEIGHT.           PERS0420
C---- STORE RESULTS ON DISK                                                 PERS0430
C----                                                                       PERS0440
3     NREC=1                                                                PERS0450
      DO 4 J=1,NOREC                                                        PERS0460
4     READ (2'NREC) IHS(J)                                                  PERS0470
      DO 5 J=2,IHMAX,2                                                      PERS0480
      IVAL=0                                                                PERS0490
      DO 6 IJ=1,NOREC                                                       PERS0500
      IF (IHS(IJ)-J) 7,8,8                                                  PERS0510
8     IVAL=IVAL+1                                                           PERS0520
      IF (IJ-NOREC) 6,7,7                                                   PERS0530
7     IF (IVAL) 6,6,19                                                      PERS0540
19    IKREC=IVAL                                                            PERS0550
```

```
      IF (IKREC-320) 30,30,66                                           PERS0560
30    JA=J/2                                                            PERS0570
      NAMFL(5)=LIST(JA)                                                 PERS0580
      CALL DFT(2,NAMFL,IFRR)                                            PERS0590
      IF (IERR) 9,10,9                                                  PERS0600
9     WRITE (1,11) IERR                                                 PERS0610
11    FORMAT ('IERR=',I2)                                               PERS0620
      CALL ENDPL                                                        PERS0630
      CALL EXIT                                                         PERS0640
10    READ (1'IKREC) KVAL                                               PERS0650
      KVAL=KVAL+1                                                       PERS0660
      IKREC=IKREC-1                                                     PERS0670
      WRITE (1'IKREC) KVAL                                              PERS0680
66    IVAL = 0                                                          PERS0690
6     CONTINUE                                                          PERS0700
5     CONTINUE                                                          PERS0710
      DO 20 JK=1,LHMAX                                                  PERS0720
      IKREC=1                                                           PERS0730
      NAMFL(5)=LIST(JK)                                                 PERS0740
      CALL DFT(2,NAMFL,IERR)                                            PERS0750
      IF(IERR) 21,22,21                                                 PERS0760
21    WRITE (1,23) IERR                                                 PERS0770
23    FORMAT (' IERR=',I2,' IN PERS')                                   PERS0780
      CALL ENDPL                                                        PERS0790
      CALL EXIT                                                         PERS0800
22    DO 24 LK=1,320                                                    PERS0810
24    READ (1'IKREC) KRAY(LK)                                           PERS0820
      DO 25 MK=1,319                                                    PERS0830
      NK=320-MK                                                         PERS0840
25    KRAY(NK)=KRAY(NK)+KRAY(NK+1)                                      PERS0850
      IKREC=1                                                           PERS0860
      DO 26 LK=1,320                                                    PERS0870
26    WRITE (1'IKREC) KRAY(LK)                                          PERS0880
20    CONTINUE                                                          PERS0890
      WRITE(1,28)                                                       PERS0900
28    FORMAT ('PLEASE LOAD BLACK INK PEN SIZE 0.5MM TO PLOTTER AND PRESSPERS0910
     1START')                                                           PERS0920
      PAUSE                                                             PERS0930
      CALL LINK(HPLOT)                                                  PERS0940
      END                                                               PERS0950

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E     HS(IC)=FA0D-F9A8  HMAX(IC)=F9A7-F942     TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914        LAB(IC)=F913        MAXH(IC)=F912           N(IC)=F911          MM(IC)=F910        II(IC)=F90F
 TITLE(IC)=F90E-F8EB     S(IC)=F8EA        NAMT(IC)=F8E9-F8E7      M(IC)=F8E6        YEAR(IC)=F8E5     DATES(IC)=F8E4-F8C7
     P(IC)=F8C6       KRFC(IC)=F8C5        LREC(IC)=F8C4        MREC(IC)=F8C3        NREC(IC)=F8C2         R(IC)=F8C1
     K(IC)=F8C0          L(IC)=F8BF          PI(IC)=F8BE         KNT(IC)=F8BD       IHMAX(IC)=F8BC        RI(IC)=F8BB
  KRAY(IC)=FFFF-FEC0 NAMFL(I )=0011-000C   LIST(I )=0039-0012    IHS(I )=0BA9-003A IKREC(I )=0BAA     LHMAX(I )=0BAB
     J(I )=0BAC       IERR(I )=0BAD          IK(I )=0BAE       IZERO(I )=0BAF      NOREC(I )=0BB0      IVAL(I )=0BB1
    IJ(I )=0BB2         JA(I )=0BB3        KVAL(I )=0BB4          JK(I )=0BB5         LK(I )=0BB6        MK(I )=0BB7
    NK(I )=0BB8

STATEMENT ALLOCATIONS
```

```
 15    =0BC5  11    =0BD4  23    =0BDA  28    =0BE5  13    =0C29  14    =0C33  16    =0C37  12    =0C46  1     =0C61  2     =0C67
 3     =0C6B  4     =0C73  8     =0C9E  7     =0CAA  19    =0CAE  30    =0CB8  9     =0CD3  10    =0CDD  66    =0CF5  6     =0CF9
 5     =0D02  21    =0D28  22    =0D32  24    =0D36  25    =0D54  26    =0D7B  20    =0D8F

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 DFT      ENDPL    ISTOX    STFAC    SBFAC    MWRT     MCOMP    MIOI     SUBSC    PAUSE    MDRED    MDWRT    MDCOM    MDIX     MDI
 TYPEN    EBPRT

INTEGER CONSTANTS
      2=0BBC       1=0BBD     320=0BBE       4=0BBF    2920=0BC0    2928=0BC1       0=0BC2     319=0BC3       0=0BC4

CORE REQUIREMENTS FOR PERS
 COMMON   1862  INSKEL COMMON       0
  VARIABLES   3004  PROGRAM    486



END OF COMPILATION




PERS
DMP FUNCTION COMPLETED
// DMP                                                                PERS0960
*DELET             1 PERS                                             PERS0970
DMP FUNCTION COMPLETED
*STORECI           1 PERS  PERS                                       PERS0980

*FILES(1,PE02,2),(2,HSG,2)                                            PERS0990
*CCEND                                                                PERS1000




 MPX, BUILD PERS

 MPX, PERS  LD XQ

CL WC OF  1B14 STORED AT  1549
DMP FUNCTION COMPLETED
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```
// JOB         X      X      X    03 AUG 73  12.660 HRS                          HPLT0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                                        HPLT0010
// FOR HPLOT                VERSION20 MODIFICATION 0 112                          HPLT0020
*EXTENDED PRECISION                                                               HPLT0040
*LIST ALL
*IOCS(DISK,PLOTTER)                                                               HPLT0050
      INTEGER RI,NAMT(3)                                                          HPLT0070
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36)          HPLT0080
      INTEGER S,YEAR,DATES(30),P,PI,R                                             HPLT0090
      DIMENSION A(9),AHS(102),AHMAX(102),B(24),IB(24)                             HPLT0100
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMHPLT0110
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI             HPLT0120
      DATA A/1.5,0.875,0.625,0.5,0.4,0.3375,0.3,0.25,0.25/                        HPLT0130
      DATA B/-0.03,1.47,2.345,2.97,3.47,3.87,4.207,4.507,4.757,5.007,5.3HPLT0140
     107,5.607,5.907,6.207,6.507,6.944,7.390,8.020,8.520,8.920,9.260,9.5HPLT0150
     260,9.820,10.075/                                                            HPLT0160
      DATA IB/3,4,5,6,7,8,9,10,11,12,14,16,18,20,22,27,32,42,52,62,72,82HPLT0170
     1,92,102/                                                                    HPLT0180
      DEFINE FILE 1(4,306,U,IREC),2(4,306,U,JREC)                                 HPLT0190
C----                                                                             HPLT0200
C---- PLOT HS AND HMAX FOR EACH SEASON                                            HPLT0210
C----                                                                             HPLT0220
      IREC=1                                                                      HPLT0230
      JREC=1                                                                      HPLT0240
      PII=3.14159                                                                 HPLT0250
      CALL SCALE (1.,1.,0.,0.)                                                    HPLT0260
      CALL ECHAR (0.,0.,0.15,0.15,PII/2)                                          HPLT0270
      WRITE (7,50) TITLE                                                          HPLT0280
50    FORMAT (36A2)                                                               HPLT0290
      CALL ECHAR (2.,0.,0.15,0.15,PII/2)                                          HPLT0300
      WRITE (7,51) DATES                                                          HPLT0310
51    FORMAT (30A2)                                                               HPLT0320
      CALL EPLOT (0,0.,0.)                                                        HPLT0330
      CALL EPLOT (0,24.,10.)                                                      HPLT0340
      DO 10 IL=1,4                                                                HPLT0350
C----                                                                             HPLT0360
C---- PLOT LOGARITHMIC SCALE                                                      HPLT0370
C----                                                                             HPLT0380
      CÁLL SCALE (1.5,0.075,0.,0.)                                                HPLT0390
      CALL EPLOT (1,0.,100.)                                                      HPLT0400
      CALL EGRID (3,0.,100.,2.,50)                                                HPLT0410
      IY=100                                                                      HPLT0420
      DO 3 I=1,11                                                                 HPLT0430
      Y=IY                                                                        HPLT0440
      CALL ECHAR (-.3,Y,0.1,0.1,0)                                                HPLT0450
      WRITE (7,4) IY                                                              HPLT0460
4     FORMAT (I3)                                                                 HPLT0470
3     IY=IY-10                                                                    HPLT0480
      CALL ECHAR (-0.5,30.,0.1,0.1,PII/2)                                         HPLT0490
      WRITE (7,7)                                                                 HPLT0500
7     FORMAT ('PERCENTAGE EXCEEDANDCE')                                           HPLT0510
      CALL EPLOT(0,0.,0.)                                                         HPLT0520
      DO 2 IK=1,2                                                                 HPLT0530
      DO 1 J=1,9                                                                  HPLT0540
      CALL SCALE (A(J),0.075,0.,0.)                                               HPLT0550
      CALL EGRID (0,0.,0.,1.,1)                                                   HPLT0560
1     CONTINUE                                                                    HPLT0570
```

```
2     CONTINUE
      CALL SCALE (1.,0.075,10.125,0.)
      CALL EPLOT(0,0.,0.)
      CALL SCALE(1.5,0.075,0.,0.)
      CALL ECHAR (0.,-5.,0.1,0.1,0)
      WRITE (7,5)
5     FORMAT('1                  2            3       4       5     6     7     8      10
     1        20         30        40      50      60    70  80    100')
      CALL ECHAR (3.,-10.,0.1,0.1,0)
      WRITE (7,6)
6     FORMAT ('WAVE HEIGHT IN FEET')
      CALL ECHAR(0.,115.,0.2,0.2,0)
      WRITE (7,8)
8     FORMAT ('PERCENTAGE EXCEEDANCE OF HS AND HMAX')
      CALL ECHAR(0.,105.,0.2,0.2,0)
      GO TO (9,11,12,13),IL
9     WRITE (7,14)
14    FORMAT ('WINTER - JANUARY TO MARCH')
      GO TO 32
11    WRITE (7,15)
15    FORMAT ('SPRING - APRIL TO JUNE')
      GO TO 32
12    WRITE (7,16)
16    FORMAT ('SUMMER - JULY TO SEPTEMBER')
      GO TO 32
13    WRITE (7,17)
17    FORMAT ('AUTUMN - OCTOBER TO DECEMBER')
32    CALL EPLOT (0,0.02,100.)
      DO 30 IK=1,2
      DO 31 J=1,9
      CALL SCALE (A(J),0.075,0.,0.)
      CALL EGRID (0,0.,0.,1.,1)
31    CONTINUE
30    CONTINUE
      CALL SCALE (1.5,0.075,0.,0.)
      CALL EGRID (3,0.,0.,2.,50)
      CALL EPLOT (0,-6.716,-100.)
C----
C---- PLOT SELECTED POINTS ON HS AND HMAX CURVES - + FOR HS POINTS,
C---- X FOR HMAX POINTS, AND * WHERE THE TWO POINTS COINCIDE
C----
      CALL SCALE (1.,0.075,0.,0.)
      READ (1'IREC) (AHS(J),J=1,102)
      READ (2'JREC) (AHMAX(K),K=1,102)
      DO 19 J=1,24
      IJ=IB(J)
      CALL EPLOT(-2,B(J),AHS(IJ))
      CALL POINT(0)
19    CALL RAISE
      CALL EPLOT(0,0.,0.)
      DO 20 J=1,24
      IJ=IB(J)
      CALL EPLOT(-2,B(J),AHMAX(IJ))
      CALL POINT(1)                                                     HPLT1110
20    CALL RAISE                                                        HPLT1120
C----                                                                   HPLT1130
C---- LABEL THE TWO CURVES                                              HPLT1140
C----                                                                   HPLT1150
      CALL ECHAR(B(6),AHS(7),0.1,0.1,0)                                 HPLT1160
      WRITE (7,21)                                                      HPLT1170
21    FORMAT ('HS')                                                     HPLT1180
      CALL ECHAR(B(6),AHMAX(7),0.1,0.1,0)                               HPLT1190
      WRITE (7,22)                                                      HPLT1200
22    FORMAT ('HMAX(3HRS)')                                             HPLT1210
      CALL EPLOT(1,20.,0.)                                              HPLT1220
10    CONTINUE                                                          HPLT1230
      CALL LINK(TPLOT)                                                  HPLT1240
      END                                                               HPLT1250

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E    HS(IC)=FA0D-F9A8  HMAX(IC)=F9A7-F942    TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914         LAB(IC)=F913      MAXH(IC)=F912          N(IC)=F911         MM(IC)=F910         II(IC)=F90F
 TITLE(IC)=F90E-F8EB      S(IC)=F8EA      NAMT(IC)=F8E9-F8E7     M(IC)=F8E6       YEAR(IC)=F8E5    DATES(IC)=F8E4-F8C7
     P(IC)=F8C6        KREC(IC)=F8C5      LREC(IC)=F8C4       MREC(IC)=F8C3       NREC(IC)=F8C2          R(IC)=F8C1
     K(IC)=F8C0           L(IC)=F8BF        PI(IC)=F8BE        KNT(IC)=F8BD      IHMAX(IC)=F8BC         RI(IC)=F8BB
     A(R )=0024-000C    AHS(R )=0156-0027 AHMAX(R )=0288-0159     B(R )=02D0-028B    PII(R )=02D3          Y(R )=02D6
    IB(I )=02F6-02DF     IL(I )=02F7        IY(I )=02F8           I(I )=02F9          IK(I )=02FA          J(I )=02FB
    IJ(I )=02FC

STATEMENT ALLOCATIONS
 50    =0352  51    =0355  4     =0358  7     =035A  5     =0367  6     =039D  8     =03A9  14    =03BD  15    =03CC  16    =03D9
 17    =03E8  21    =03F8  22    =03FB  3     =047D  1     =04C7  2     =04D0  9     =0524  11    =052A  12    =0530  13    =0536
 32    =053A  31    =055E  30    =0567  19    =05F2  20    =0634  10    =0676

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 SCALE    ECHAR    EPLOT    EGRID    POINT    RAISE    ELD      ESTO     EDVR     FLOAT    COMGO    MWRT     MCOMP    MIOAI    MIOI
 SUBSC    SNR      MDRED    MDCOM    MDFX     ECHRI

REAL CONSTANTS
   .314159000E 01=0300    .100000000E 01=0303    .000000000E 00=0306    .150000000E 00=0309    .200000000E 01=030C
   .240000000E 02=030F    .100000000E 02=0312    .150000000E 01=0315    .750000000E-01=0318    .100000000E 03=031B
   .300000000E 00=031E    .100000000E 00=0321    .500000000E 00=0324    .300000000E 02=0327    .101250000E 02=032A
   .500000000E 01=032D    .300000000E 01=0330    .115000000E 03=0333    .200000000E 00=0336    .105000000E 03=0339
   .200000000E-01=033C    .671600000E 01=033F    .200000000E 02=0342

INTEGER CONSTANTS
     1=0345       2=0346       7=0347       0=0348       4=0349       3=034A      50=034B     100=034C      11=034D      10=034E
     9=034F     102=0350      24=0351

CORE REQUIREMENTS FOR HPLOT
 COMMON    1862  INSKEL COMMON       0
```

```
  VARIABLES     768  PROGRAM     900


END OF COMPILATION




HPLOT
DMP FUNCTION COMPLETED
// DMP                                                                  HPLT1260
*DELET              1 HPLOT                                             HPLT1270
DMP FUNCTION COMPLETED
*STORECI            1 HPLOT HPLOT                                       HPLT1280

*FILES(1,HS,2),(2,HMAX,2)                                               HPLT1290
*CCEND                                                                  HPLT1300




 MPX, BUILD HPLOT

 MPX, HPLOT LD XQ

CL WC OF  1B5E STORED AT  1533
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73 12.721 HRS                      TPLT0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                              TPLT0010
// FOR TPLOT             VERSION 20 MODIFICATION 1 112                  TPLT0020
*EXTENDED PRECISION                                                     TPLT0030
*LIST ALL
*IOCS(DISK,PLOTTER)                                                     TPLT0040
      INTEGER RI,NAMT(3)                                                TPLT0050
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36) TPLT0060
      INTEGER S,YEAR,DATES(30),P,PI,R                                   TPLT0070
      DIMENSION ATZ(44)                                                 TPLT0080
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMTPLT0090
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI       TPLT0100
      DEFINE FILE 3(4,132,U,KREC)                                       TPLT0110
C----                                                                   TPLT0120
C---- PLOT TZ GRAPH FOR EACH SEASON                                     TPLT0130
C----                                                                   TPLT0140
      PII=3.14159                                                       TPLT0150
      KREC=1                                                            TPLT0160
      DO 1 J=1,4                                                        TPLT0170
      READ (3'KREC)(ATZ(JJ),JJ=1,44)                                    TPLT0180
C----                                                                   TPLT0190
C---- PLOT X AND Y AXIS                                                 TPLT0200
C----                                                                   TPLT0210
      A=0.25                                                            TPLT0220
      CALL SCALE (0.25,0.2,0.,0.)                                       TPLT0230
      CALL EPLOT (1,0.,30.)                                             TPLT0240
      CALL EGRID (3,0.,30.,1.,30)                                       TPLT0250
      CALL EGRID (0,0.,0.,1.,20)                                        TPLT0260
      CALL EGRID (1,20.,0.,1.,30)                                       TPLT0270
      CALL EGRID (2,20.,30.,1.,20)                                      TPLT0280
      CALL ECHAR(-6.,38.,0.2,0.2,0)                                     TPLT0290
      WRITE (7,8)                                                       TPLT0300
8     FORMAT ('GRAPH OF PERCENTAGE OCCURRENCE OF TZ')                   TPLT0310
      CALL ECHAR(-6.,35.,0.15,0.15,0)                                   TPLT0320
      WRITE (7,9)                                                       TPLT0330
9     FORMAT ('WITHIN HALF-SECOND INTERVALS')                           TPLT0340
      CALL ECHAR(-6.,32.,0.2,0.2,0)                                     TPLT0350
      GO TO (10,11,12,13),J                                             TPLT0360
10    WRITE (7,14)                                                      TPLT0370
14    FORMAT ('WINTER - JANUARY TO MARCH')                              TPLT0380
      GO TO 18                                                          TPLT0390
11    WRITE (7,15)                                                      TPLT0400
15    FORMAT ('SPRING - APRIL TO JUNE')                                 TPLT0410
      GO TO 18                                                          TPLT0420
12    WRITE (7,16)                                                      TPLT0430
16    FORMAT ('SUMMER - JULY TO SEPTEMBER')                             TPLT0440
      GO TO 18                                                          TPLT0450
13    WRITE (7,17)                                                      TPLT0460
17    FORMAT ('AUTUMN - OCTOBER TO DECEMBER')                           TPLT0470
18    IY=30                                                             TPLT0480
      DO 30 I=1,4                                                       TPLT0490
      Y=IY                                                              TPLT0500
      CALL ECHAR (-1.5,Y,0.1,0.1,0)                                     TPLT0510
      WRITE (7,2) IY                                                    TPLT0520
                                                                        TPLT0530
                                                                        TPLT0540
2     FORMAT (I2)                                                       TPLT0550
```

```
30    IY=IY-10                                                          TPLT0560
      CALL ECHAR (-4.,5.,0.1,0.1,PII/2)                                 TPLT0570
      WRITE (7,7)                                                       TPLT0580
7     FORMAT ('PERCENTAGE OCCURRENCE')                                  TPLT0590
      IX=0                                                              TPLT0600
      DO 4 IK=1,6                                                       TPLT0610
      X=IX-0.5                                                          TPLT0620
      CALL ECHAR (X,-1.5,0.1,0.1,0)                                     TPLT0630
      WRITE (7,2) IX                                                    TPLT0640
4     IX=IX+4                                                           TPLT0650
      CALL ECHAR(20.5,-1.5,0.1,0.1,0)                                   TPLT0660
      WRITE(7,20)                                                       TPLT0670
20    FORMAT ('SECONDS')                                                TPLT0680
      CALL ECHAR (1.,-4.,0.1,0.1,0)                                     TPLT0690
      WRITE (7,5)                                                       TPLT0700
5     FORMAT ('ZERO CROSSING PERIOD IN HALF SECOND INTERVALS')          TPLT0710
      CALL ECHAR (8.,-6.,0.1,0.1,0)                                     TPLT0720
      WRITE (7,6) ATZ(1)                                                TPLT0730
6     FORMAT ('CALM = ',F5.2,' PER CENT')                               TPLT0740
C----                                                                   TPLT0750
C---- PLOT VALUES FOR APPROPRIATE SEASON                                TPLT0760
C----                                                                   TPLT0770
      CALL EPLOT(-2,0.,0.)                                              TPLT0780
      DO 19 IK=2,42                                                     TPLT0790
      Y=ATZ(IK)                                                         TPLT0800
      X=A                                                               TPLT0810
      CALL EPLOT(0,X,Y)                                                 TPLT0820
      A=A+0.5                                                           TPLT0830
19    CONTINUE                                                          TPLT0840
      CALL EPLOT(1,80.,0.)                                              TPLT0850
1     CONTINUE                                                          TPLT0860
      CALL LINK(SWPLT)                                                  TPLT0870
      END                                                               TPLT0880

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E    HS(IC)=FA0D-F9A8  HMAX(IC)=F9A7-F942     TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914         LAB(IC)=F913      MAXH(IC)=F912          N(IC)=F911          MM(IC)=F910          II(IC)=F90F
 TITLE(IC)=F90E-F8EB      S(IC)=F8EA      NAMT(IC)=F8E9-F8E7     M(IC)=F8E6        YEAR(IC)=F8E5       DATES(IC)=F8E4-F8C7
     P(IC)=F8C6        KREC(IC)=F8C5      LREC(IC)=F8C4       MREC(IC)=F8C3        NREC(IC)=F8C2           R(IC)=F8C1
     K(IC)=F8C0           L(IC)=F8BF        PI(IC)=F8BE        KNT(IC)=F8BD       IHMAX(IC)=F8BC          RI(IC)=F8BB
   ATZ(R )=0087-0006    PII(R )=008A         A(R )=008D          Y(R )=0090           X(R )=0093           J(I )=009C
    JJ(I )=009D          IY(I )=009E         I(I )=009F         IX(I )=00A0          IK(I )=00A1

STATEMENT ALLOCATIONS
 8     =00EC  9     =0100  14    =0110  15    =011F  16    =012C  17    =013B  2     =014B  7     =014D  20    =015A  5     =0160
 6     =0179  10    =0208  11    =020E  12    =0214  13    =021A  18    =021E  30    =023D  4     =0284  19    =02ED  1     =02FB

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
```

```
 SCALE    EPLOT    EGRID    ECHAR    EADD     ESUB     ELD      ELDX     ESTO     EDVR     FLOAT    COMGO    MWRT     MCOMP    MIOFX
 MIOI     SUBSC    SNR      MDRED    MDCOM    MDFX     ECHRI

REAL CONSTANTS
   .314159000E 01=00A4     .250000000E 00=00A7     .200000000E 00=00AA     .000000000E 00=00AD     .300000000E 02=00B0
   .100000000E 01=00B3     .200000000E 02=00B6     .600000000E 01=00B9     .380000000E 02=00BC     .350000000E 02=00BF
   .150000000E 00=00C2     .320000000E 02=00C5     .150000000E 01=00C8     .100000000E 00=00CB     .400000000E 01=00CE
   .500000000E 01=00D1     .500000000E 00=00D4     .205000000E 02=00D7     .800000000E 01=00DA     .800000000E 02=00DD

INTEGER CONSTANTS
     1=00E0      4=00F1      3=00E2     44=00E3     30=00E4      0=00E5     20=00E6      2=00E7      7=00E8     10=00E9
     6=00EA     42=00EB

CORE REQUIREMENTS FOR TPLOT
 COMMON    1862  INSKEL COMMON       0
  VARIABLES     164  PROGRAM     612



END OF COMPILATION



TPLOT
DMP FUNCTION COMPLETED
// DMP                                                                  TPLT0890
*DELET              1 TPLOT                                             TPLT0900
DMP FUNCTION COMPLETED
*STORECI            1 TPLOT TPLOT                                       TPLT0910

*FILES(3,TZ,2)                                                          TPLT0920
*CCEND                                                                  TPLT0930



 MPX, BUILD TPLOT

 MPX, TPLOT LD XO

CL WC OF  17D2 STORED AT  151F
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X   03 AUG 73 12.777 HRS                                SWPT0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                                        SWPT0010
// FOR SWPLT                VERSION20 MODIFICATION 0 112                          SWPT0020
*EXTENDED PRECISION                                                               SWPT0040
*LIST ALL
*IOCS(DISK,PLOTTER)                                                               SWPT0050
      INTEGER RI,NAMT(3)                                                          SWPT0070
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36)           SWPT0080
      INTEGER S,YEAR,DATES(30),P,PI,R                                             SWPT0090
      DIMENSION ASWP(42)                                                          SWPT0100
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMSWPT0110
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI                 SWPT0120
      DEFINE FILE 4(1,126,U,LREC)                                                 SWPT0130
C----                                                                             SWPT0140
C---- THIS LINK PLOTS THE SPECTRAL WIDTH PARAMETER FOR THE YEAR                   SWPT0150
C----                                                                             SWPT0160
      PII=3.14159                                                                 SWPT0170
      LREC=1                                                                      SWPT0180
      READ (4'LREC) (ASWP(J),J=1,42)                                              SWPT0190
C----                                                                             SWPT0200
C---- PLOT X AND Y AXIS AND SCALES                                                SWPT0210
C----                                                                             SWPT0220
      A=0.25                                                                      SWPT0230
      CALL SCALE (0.25,0.4,-16.,0.)                                               SWPT0240
      CALL EPLOT (1,0.,15.)                                                       SWPT0250
      CALL EGRID (3,0.,15.,1.,15)                                                 SWPT0260
      CALL EGRID (0,0.,0.,1.,40)                                                  SWPT0270
      CALL EGRID (1,40.,0.,1.,15)                                                 SWPT0280
      CALL EGRID (2,40.,15.,1.,40)                                                SWPT0290
      CALL ECHAR (2.,19.,0.2,0.2,0)                                               SWPT0300
      WRITE (7,8)                                                                 SWPT0310
8     FORMAT ('GRAPH OF SPECTRAL WIDTH PARAMETER')                                SWPT0320
      CALL ECHAR (2.,17.,0.2,0.2,0)                                               SWPT0330
      WRITE (7,9)                                                                 SWPT0340
9     FORMAT ('FOR A WHOLE YEAR')                                                 SWPT0350
      IY=15                                                                       SWPT0360
      DO 3 I=1,4                                                                  SWPT0370
      Y=IY                                                                        SWPT0380
      CALL ECHAR (-2.,Y,0.1,0.1,0)                                                SWPT0390
      WRITE (7,1) IY                                                              SWPT0400
1     FORMAT (I2)                                                                 SWPT0410
3     IY=IY-5                                                                     SWPT0420
      CALL ECHAR (-4.,3.,0.1,0.1,PII/2)                                           SWPT0430
      WRITE (7,7)                                                                 SWPT0440
7     FORMAT ('PERCENTAGE OCCURRENCE')                                            SWPT0450
      XX=0.25                                                                     SWPT0460
      DO 2 IK=1,11                                                                SWPT0470
      X=XX-1.0                                                                    SWPT0480
      CALL ECHAR (X,-1.,0.1,0.1,0)                                                SWPT0490
      BK=((IK-1)/10.)                                                             SWPT0500
      WRITE (7,4) BK                                                              SWPT0510
4     FORMAT (F3.1)                                                               SWPT0520
2     XX=XX+4                                                                     SWPT0530
      CALL ECHAR(4.,-2.,0.1,0.1,0)                                                SWPT0540
      WRITE (7,5)                                                                 SWPT0550
5     FORMAT ('SPECTRAL WIDTH PARAMETER IN TENTHS WITHIN INTERVALS OF 0.SWPT0560
     1025')                                                                       SWPT0570
```

```
      CALL ECHAR (13.,-3.,0.1,0.1,0)                                  SWPT0580
      WRITE (7,6) ASWP(1)                                             SWPT0590
6     FORMAT ('CALM = ',F5.2,' PER CENT')                             SWPT0600
      CALL EPLOT(-2,0.,0.)                                            SWPT0610
C----                                                                 SWPT0620
C---- PLOT GRAPH FOR YEAR                                             SWPT0630
C----                                                                 SWPT0640
      DO 19 IJ=2,42                                                   SWPT0650
      Y=ASWP(IJ)                                                      SWPT0660
      X=A                                                             SWPT0670
      CALL EPLOT(0,X,Y)                                               SWPT0680
      A=A+1.0                                                         SWPT0690
19    CONTINUE                                                        SWPT0700
      CALL EPLOT(1,60.,0.)                                            SWPT0710
      CALL LINK(SCATP)                                                SWPT0720
      END                                                             SWPT0730

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E    HS(IC )=FA0D-F9A8  HMAX(IC)=F9A7-F942    TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914         LAB(IC)=F913      MAXH(IC )=F912          N(IC)=F911           MM(IC)=F910        II(IC)=F90F
 TITLE(IC)=F90E-F8EB      S(IC)=F8EA      NAMT(IC )=F8E9-F8E7     M(IC)=F8E6         YEAR(IC)=F8E5     DATES(IC)=F8E4-F8C7
     P(IC)=F8C6        KREC(IC)=F8C5      LREC(IC )=F8C4       MREC(IC)=F8C3         NREC(IC)=F8C2         R(IC)=F8C1
     K(IC)=F8C0           L(IC)=F8BF        PI(IC )=F8BE        KNT(IC)=F8BD        IHMAX(IC)=F8BC        RI(IC)=F8BB
  ASWP(R )=0081-0006    PII(R )=0084         A(R )=0087          Y(R )=008A           XX(R )=008D          X(R )=0090
    BK(R )=0093           J(I )=009C        IY(I )=009D          I(I )=009E           IK(I )=009F         IJ(I )=00A0

STATEMENT ALLOCATIONS
 8    =00E3  9    =00F6  1    =0100  7    =0102  4    =010F  5    =0111  6    =0131  3    =01C2  2    =0211  19   =026B

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 SCALE    EPLOT    EGRID    ECHAR    EADD     ESUB     EDIV     ELD      ELDX     ESTO     EDVR     FLOAT    MWRT     MCOMP    MIOFX
 MIOF     MIOI     SUBSC    SNR      MDRED    MDCOM    MDFX     ECHRI

REAL CONSTANTS
  .314159000E 01=00A2    .250000000E 00=00A5    .400000000E 00=00A8    .160000000E 02=00AB    .000000000E 00=00AE
  .150000000E 02=00B1    .100000000E 01=00B4    .400000000E 02=00B7    .200000000E 01=00BA    .190000000E 02=00BD
  .200000000E 00=00C0    .170000000E 02=00C3    .100000000E 00=00C6    .400000000E 01=00C9    .300000000E 01=00CC
  .100000000E 02=00CF    .130000000E 02=00D2    .600000000E 02=00D5

INTEGER CONSTANTS
    1=00D8       4=00D9      42=00DA       3=00DB      15=00DC       0=00DD      40=00DE       2=00DF       7=00E0       5=00E1
   11=00E2

CORE REQUIREMENTS FOR SWPLT
 COMMON   1862  INSKEL COMMON      0
  VARIABLES     162  PROGRAM     476
```

```
END OF COMPILATION




SWPLT
DMP FUNCTION COMPLETED
// DMP                                                                          SWPT0740
*DELET             1 SWPLT                                                      SWPT0750
DMP FUNCTION COMPLETED
*STORECI           1 SWPLT SWPLT                                                SWPT0760

*FILES(4,SWPA,2)                                                                SWPT0770
*CCEND                                                                          SWPT0780




 MPX, BUILD SWPLT

 MPX, SWPLT LD XQ

CL WC OF  1708 STORED AT  150C
DMP FUNCTION COMPLETED
```

```
// JOB        X     X     X    08 AUG 73 16.879 HRS                          SCTP0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                                    SCTP0010
// FOR SCATP              VERSION20 MODIFICATION 0 112                        SCTP0020
*EXTENDED PRECISION                                                           SCTP0040
*IOCS(DISK,PLOTTER)                                                           SCTP0050
*LIST ALL
      INTEGER RI,NAMT(3)                                                      SCTP0070
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36)       SCTP0080
      INTEGER S,YEAR,DATES(30),P,PI,R                                         SCTP0090
      DIMENSION LIST(114)                                                     SCTP0100
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMSCTP0110
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI             SCTP0120
      DATA ISPAC/' '/,IAST/'*'/,IPLUS/'+'/,LIST/114*' '/                      SCTP0130
      DEFINE FILE 5(40,37,U,MREC)                                             SCTP0140
C----                                                                         SCTP0150
C---- THIS LINK PLOTS A SCATTER DIAGRAM FOR THE YEAR                          SCTP0160
C----                                                                         SCTP0170
      PII=3.14159                                                             SCTP0180
      MREC=1                                                                  SCTP0190
C----                                                                         SCTP0200
C---- PLOT SCALES AND AXIS                                                    SCTP0210
C----                                                                         SCTP0220
      CALL SCALE (0.6,0.2,-10.,0.)                                            SCTP0230
      CALL EPLOT (1,0.,40.)                                                   SCTP0240
      CALL EGRID (3,0.,40.,1.,40)                                             SCTP0250
      CALL EGRID (0,0.,0.,0.5,36)                                             SCTP0260
      CALL EGRID (1,18.,0.,1.,40)                                             SCTP0270
      CALL EGRID (2,18.,40.,0.5,36)                                           SCTP0280
      CALL ECHAR (-2.,45.,0.2,0.2,0)                                          SCTP0290
      WRITE (7,100)                                                           SCTP0300
100   FORMAT ('SCATTER DIAGRAM FOR THE WHOLE YEAR')                           SCTP0310
      CALL ECHAR (-2.,43.,0.15,0.15,0)                                        SCTP0320
      WRITE (7,200)                                                           SCTP0330
200   FORMAT ('IN PARTS PER THOUSAND      * = 1 OCCURRENCE, + = 2 OCCURRESCTP0340
     1NCES')                                                                  SCTP0350
      CALL ECHAR (-2.,10.,0.1,0.1,PII/2)                                      SCTP0360
      WRITE (7,9)                                                             SCTP0370
9     FORMAT ('SIGNIFICANT WAVE HEIGHT IN FEET')                              SCTP0380
      CALL EPLOT (0,-1.0,40.)                                                 SCTP0390
      IF (MAXH-20) 30,31,30                                                   SCTP0400
30    IF (MAXH-40) 32,33,32                                                   SCTP0410
31    IY=20                                                                   SCTP0420
      DO 34 I=1,11                                                            SCTP0430
      Y=IY*2                                                                  SCTP0440
      CALL ECHAR (-1.0,Y,0.1,0.1,0)                                           SCTP0450
      WRITE (7,35) IY                                                         SCTP0460
35    FORMAT (I2)                                                             SCTP0470
34    IY=IY-2                                                                 SCTP0480
      GO TO 36                                                                SCTP0490
33    IY=40                                                                   SCTP0500
      DO 5 I=1,9                                                              SCTP0510
      Y=IY                                                                    SCTP0520
      CALL ECHAR (-1.0,Y,0.1,0.1,0)                                           SCTP0530
      WRITE (7,35) IY                                                         SCTP0540
5     IY=IY-5                                                                 SCTP0550
      GO TO 36                                                                SCTP0560
32    IY=80                                                                   SCTP0570
```

```
      DO 8 I=1,9                                                        SCTP0580
      Y=IY/2.                                                           SCTP0590
      CALL ECHAR (-1.0,Y,0.1,0.1,0)                                     SCTP0600
      WRITE (7,35) IY                                                   SCTP0610
8     IY=IY-10                                                          SCTP0620
36    CALL ECHAR(0.,-1.,0.1,0.1,0)                                      SCTP0630
      WRITE (7,37)                                                      SCTP0640
37    FORMAT (' C     1     2     3     4     5     6     7     8     9 SCTP0650
     1  10    11    12    13    14    15    16    17    18')            SCTP0660
      CALL ECHAR (4.,-2.5,0.1,0.1,0)                                    SCTP0670
      WRITE (7,4)                                                       SCTP0680
4     FORMAT ('ZERO CROSSING PERIOD IN HALF SECOND INTERVALS')          SCTP0690
C----                                                                   SCTP0700
C---- CONVERT EACH LINE OF SCAT ARRAY TO A1 FORMAT USING INECB          SCTP0710
C---- PRINT EACH LINE ON GRAPH                                          SCTP0720
C----                                                                   SCTP0730
      DO 11 J=1,40                                                      SCTP0740
      READ (5'MREC) (SCAT(J,JJ),JJ=1,37)                                SCTP0750
      DO 12 JK=1,37                                                     SCTP0760
      ILEM= JK*3                                                        SCTP0770
      IF (SCAT(J,JK)-16448) 13,12,13                                    SCTP0780
13    IF (SCAT(J,JK)-23616) 15,16,15                                    SCTP0790
15    IF (SCAT(J,JK)-20032) 17,18,17                                    SCTP0800
16    LIST(ILEM)=IAST                                                   SCTP0810
      GO TO 12                                                          SCTP0820
18    LIST(ILEM)=IPLUS                                                  SCTP0830
      GO TO 12                                                          SCTP0840
17    ILEM=ILEM-5                                                       SCTP0850
      CALL INECB(SCAT(J,JK),ILEM,LIST)                                  SCTP0860
12    CONTINUE                                                          SCTP0870
      DO 22 MAC=1,114                                                   SCTP0880
      IF (LIST(MAC)-16448) 21,22,21                                     SCTP0890
22    CONTINUE                                                          SCTP0900
      GO TO 11                                                          SCTP0910
21    AJ=J-0.5                                                          SCTP0920
      CALL ECHAR(0.,AJ,0.1,0.1,0)                                       SCTP0930
      WRITE (7,14) LIST                                                 SCTP0940
14    FORMAT (114A1)                                                    SCTP0950
C----                                                                   SCTP0960
C---- CLEAR LIST ARRAY                                                  SCTP0970
C----                                                                   SCTP0980
      DO 19 IL=1,114                                                    SCTP0990
19    LIST(IL)=ISPAC                                                    SCTP1000
11    CONTINUE                                                          SCTP1010
      CALL EPLOT(1,30.,0.)                                              SCTP1020
      CALL LINK(PERPL)                                                  SCTP1030
      END                                                               SCTP1040

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6   SCAT(IC)=FFD5-FA0E    HS(IC)=FA0D-F9A8   HMAX(IC)=F9A7-F942     TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914         LAB(IC)=F913       MAXH(IC)=F912          N(IC)=F911            MM(IC)=F910          II(IC)=F90F
 TITLE(IC)=F90E-F8EB      S(IC)=F8EA       NAMT(IC)=F8E9-F8E7     M(IC)=F8E6          YEAR(IC)=F8E5     DATES(IC)=F8E4-F8C7
     P(IC)=F8C6        KREC(IC)=F8C5       LREC(IC)=F8C4       MREC(IC)=F8C3          NREC(IC)=F8C2           R(IC)=F8C1
     K(IC)=F8C0            L(IC)=F8BF           PI(IC)=F8BE         KNT(IC)=F8BD      IHMAX(IC)=F8BC          RI(IC)=F8BB
   PII(R )=0006            Y(R )=0009           AJ(R )=000C        LIST(I )=0086-0015    IY(I )=0087           I(I )=0088
     J(I )=0089           JJ(I )=008A           JK(I )=008B        ILEM(I )=008C       IAST(I )=008D       IPLUS(I )=008E
   MAC(I )=008F           IL(I )=0090         ISPAC(I )=0091

STATEMENT ALLOCATIONS
 100   =0009  200   =00EC   9     =010D  35    =011F  37    =0121  4     =015A  14    =0173  30    =01F1  31    =01F9  34    =021B
 33    =022C  5     =024B  32     =025C  8     =027D  36    =028C  13    =02E1  15    =02EE  16    =02FD  18    =0308  17    =0313
 12    =032A  22    =0342  21     =034D  19    =0366  11    =0378

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 SCALE    EPLOT    EGRID    ECHAR    INECB    ESUB     EDIV     ELD      ESTO     EDVR     FLOAT    ISTOX    MWRT     MCOMP    MIOAI
 MIOI     SUBSC    SNR      MDRED    MDCOM    MDIX     ECHRI

REAL CONSTANTS
   .314159000E 01=0094     .600000000E 00=0097     .200000000E 00=009A     .100000000E 02=009D     .000000000E 00=00A0
   .400000000E 02=00A3     .100000000E 01=00A6     .500000000E 00=00A9     .180000000E 02=00AC     .200000000E 01=00AF
   .450000000E 02=00B2     .430000000E 02=00B5     .150000000E 00=00B8     .100000000E 00=00BB     .400000000E 01=00BE
   .250000000E 01=00C1     .300000000E 02=00C4

INTEGER CONSTANTS
      1=00C7        3=00C8       40=00C9        0=00CA       36=00CB        2=00CC        7=00CD       20=00CE       11=00CF        9=00D0
      5=00D1       80=00D2       10=00D3       37=00D4    16448=00D5    23616=00D6    20032=00D7      114=00D8

CORE REQUIREMENTS FOR SCATP
 COMMON     1862  INSKEL COMMON        0
  VARIABLES     148  PROGRAM      758


END OF COMPILATION
```

```
SCATP
DMP FUNCTION COMPLETED
// DMP                                                                  SCTP1050
*DELET            1 SCATP                                               SCTP1060
DMP FUNCTION COMPLETED
*STORECI          1 SCATP SCATP                                         SCTP1070

*FILES(5,SCAT,2)                                                        SCTP1080
*CCEND                                                                  SCTP1090
```

```
 MPX, BUILD SCATP

 MPX, SCATP LD XQ

CL WC OF  19FE STORED AT  14F4
DMP FUNCTION COMPLETED
```

```
// JOB       X    X    X   03 AUG 73  12.885 HRS                         PRPL0000
// *NIO MPX MASTER LIBRARY PROGRAM
// FOR PERPL            VERSION20 MODIFICATION 0 1.12.70                PRPL0010
*EXTENDED PRECISION                                                     PRPL0030
*LIST ALL
*IOCS(DISK,PLOTTER,TYPEWRITER)                                          PRPL0040
      INTEGER RI,NAMT(3)                                                PRPL0060
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36) PRPL0070
      INTEGER S,YEAR,DATES(30),P,PI,R                                   PRPL0080
      DIMENSION NAMFL(6),KAT(320),A(9),B(17),IB(17)                     PRPL0090
      DIMENSION LIST(40)                                                PRPL0100
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMPRPL0110
     UT, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI       PRPL0120
      EQUIVALENCE (SWPA(1),KAT(1))                                      PRPL0130
      DATA NAMFL(1)/'PE'/,NAMFL(3)/'  '/                                PRPL0140
      DATA NAMFL(4)/'PE'/,NAMFL(5)/'04'/,NAMFL(6)/'  '/                 PRPL0150
      DATA A/1.5,0.875,0.625,0.5,0.4,0.3375,0.3,0.25,0.25/              PRPL0160
      DATA B/2.375,3.9,4.787,5.337,6.237,6.755,7.412,7.787,8.137,8.577,8PRPL0170
     1.937,9.424,9.824,10.049,10.464,10.824,11.6/                       PRPL0180
      DATA IB/3,6,9,12,18,24,30,36,42,51,60,75,90,99,126,150,177/       PRPL0190
      DATA        PII/3.14159/                                          PRPL0200
      DATA LIST/'02','04','06','08','10','12','14','16','18','20','22','PRPL0210
     124','26','28','30','32','34','36','38','40','42','44','46','48','5PRPL0220
     20','52','54','56','58','60','62','64','66','68','70','72','74','76PRPL0230
     3','78','80'/                                                      PRPL0240
      DEFINE FILE 1(320,1,U,IKREC)                                      PRPL0250
      DEFINE FILE 2(320,1,U,LKREC)                                      PRPL0260
      IKREC=1                                                           PRPL0270
C---                                                                    PRPL0280
C---- PLOT AXIS AND SCALES                                              PRPL0290
C---                                                                    PRPL0300
      READ (1'1) KAT(1)                                                 PRPL0310
      READ(2'1) KAT(2)                                                  PRPL0320
      IF (KAT(1)-KAT(2))31,31,32                                        PRPL0330
31    IF (KAT(2)-80)20,20,33                                            PRPL0340
33    IF (KAT(2)-180)22,22,23                                           PRPL0350
32    IF (KAT(1)-80) 20,20,21                                           PRPL0360
21    IF (KAT(1)-180) 22,22,23                                          PRPL0370
20    III=21                                                            PRPL0380
      IY=100                                                            PRPL0390
      BY=8.0                                                            PRPL0400
      FY=100.                                                           PRPL0410
      JY=5                                                              PRPL0420
      ZY=-8.                                                            PRPL0430
      Y=0.07                                                            PRPL0440
      EY=5.                                                             PRPL0450
      IFY=20                                                            PRPL0460
      GO TO 24                                                          PRPL0470
22    III=21                                                            PRPL0480
      IY=200                                                            PRPL0490
      BY=14.0                                                           PRPL0500
      FY=200.                                                           PRPL0510
      JY=10                                                             PRPL0520
      ZY=-8.                                                            PRPL0530
      Y=0.04                                                            PRPL0540
      EY=10.                                                            PRPL0550
      IFY=20                                                            PRPL0560
      GO TO 24                                                          PRPL0570
23    III=16                                                            PRPL0580
      IY=300                                                            PRPL0590
      BY=22.0                                                           PRPL0600
      FY=300.                                                           PRPL0610
      JY=20                                                             PRPL0620
      ZY=-16.                                                           PRPL0630
      Y=0.025                                                           PRPL0640
      EY=10.                                                            PRPL0650
      IFY=30                                                            PRPL0660
24    CALL SCALE (1.,1.,-12.,0.)                                        PRPL0670
      CALL EPLOT (1,0.,0.)                                              PRPL0680
      CALL SCALE (1.5,Y,0.,0.)                                          PRPL0690
      CALL EPLOT (1,0.,FY)                                              PRPL0700
      CALL EGRID (3,0.,FY,EY,IFY)                                       PRPL0710
      DO 25 I=1,III                                                     PRPL0720
      AY=IY                                                             PRPL0730
      CALL ECHAR (-.3,AY,0.1,0.1,0)                                     PRPL0740
      WRITE (7,26) IY                                                   PRPL0750
26    FORMAT (I3)                                                       PRPL0760
25    IY=IY-JY                                                          PRPL0770
      CALL ECHAR (-0.8,20.,0.1,0.1,PII/2)                               PRPL0780
      WRITE (7,27)                                                      PRPL0790
27    FORMAT ('NUMBER OF OCCURRENCES OF WAVE CONDITIONS')               PRPL0800
      CALL ECHAR (-0.5,25.,0.1,0.1,PII/2)                               PRPL0810
      WRITE (7,28)                                                      PRPL0820
28    FORMAT ('EXCEEDING A GIVEN DURATION')                             PRPL0830
      CALL EPLOT (0,0.,0)                                               PRPL0840
      DO 1 IK=1,2                                                       PRPL0850
      DO 2 J=1,9                                                        PRPL0860
      CALL SCALE (A(J),Y,0.,0.)                                         PRPL0870
      CALL EGRID (0,0.,0.,1.,1)                                         PRPL0880
2     CONTINUE                                                          PRPL0890
1     CONTINUE                                                          PRPL0900
      CALL SCALE (A(1),Y,0.,0.)                                         PRPL0910
      CALL EGRID (0,0.,0.,1.,1)                                         PRPL0920
      CALL ECHAR (-6.716,ZY,0.1,0.1,0)                                  PRPL0930
      WRITE (7,5)                                                       PRPL0940
5     FORMAT ('1              2         3     4    5   6  7  8   10     PRPL0950
     1       20       30    40   50  60   70 80  100             200')  PRPL0960
      ZY=2*ZY                                                           PRPL0970
      CALL ECHAR (-4.,ZY,0.1,0.1,0)                                     PRPL0980
      WRITE (7,6)                                                       PRPL0990
6     FORMAT ('DURATION IN HOURS')                                      PRPL1000
      CALL EPLOT (0,-6.718,FY)                                          PRPL1010
      DO 29 IK=1,2                                                      PRPL1020
      DO 30 J=1,9                                                       PRPL1030
      CALL SCALE (A(J),Y,0.,0.)                                         PRPL1040
      CALL EGRID (0,0.,0.,1.,1)                                         PRPL1050
30    CONTINUE                                                          PRPL1060
29    CONTINUE                                                          PRPL1070
      CALL SCALE (A(1),Y,0.,0.)                                         PRPL1080
      CALL EGRID (0,0.,0.,1.,1)                                         PRPL1090
      CALL ECHAR (-5.,BY,0.2,0.2,0)                                  PRPL1100
      WRITE (7,9)                                                    PRPL1110
9     FORMAT ('PERSISTENCE DIAGRAM FOR THE WHOLE YEAR')              PRPL1120
      CALL EGRID (3,1.,0.,EY,IFY)                                    PRPL1130
C----                                                                PRPL1140
C---- PLOT PERSISTENCE CURVE FOR EACH EVEN HS VALUE                  PRPL1150
C----                                                                PRPL1160
      FY=-FY                                                         PRPL1170
      CALL EPLOT (0,-6.718,FY)                                       PRPL1180
      LHMAX=IHMAX/2                                                  PRPL1190
      DO 10 JJ=1,LHMAX                                               PRPL1200
      IKREC=1                                                        PRPL1210
      NAMFL(2)=LIST(JJ)                                              PRPL1220
      CALL DFT(2,NAMFL,IERR)                                         PRPL1230
      IF (IERR) 11,12,11                                             PRPL1240
11    WRITE (1,13) IERR                                              PRPL1250
13    FORMAT ('IERR=',I3,' IN PROGRAM PERPL')                        PRPL1260
      CALL ENDPL
      CALL EXIT                                                      PRPL1270
12    CALL SCALE (1.,Y,0.,0.)                                        PRPL1280
      READ (1'IKREC) (KAT(I),I=1,320)                                PRPL1290
      DO 14 J=1,17                                                   PRPL1300
      IJ=IB(J)                                                       PRPL1310
      IJ=IJ/3                                                        PRPL1320
      AY=KAT(IJ)                                                     PRPL1330
14    CALL EPLOT(-2,B(J),AY)                                         PRPL1340
      AY=KAT(1)                                                      PRPL1350
      CALL ECHAR(2.,AY,0.1,0.1,0)                                    PRPL1360
      JJA=JJ*2                                                       PRPL1370
      WRITE (7,15) JJA                                               PRPL1380
15    FORMAT (I2,'FT')                                               PRPL1390
      CALL EPLOT(0,0.,0.)                                            PRPL1400
10    CONTINUE                                                       PRPL1410
      CALL EPLOT(1,14.,-200)                                         PRPL1420
C----                                                                PRPL1430
C----- SET LAB FOR RETURN TO WAST                                    PRPL1440
C----                                                                PRPL1450
      LAB=3                                                          PRPL1460
      CALL LINK(DUMP)                                                PRPL1470
      END                                                            PRPL1480

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E    HS(IC)=FA0D-F9A8  HMAX(IC)=F9A7-F942    TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914        LAB(IC)=F913        MAXH(IC)=F912         N(IC)=F911           MM(IC)=F910         II(IC)=F90F
 TITLE(IC)=F90E-F8EB     S(IC)=F8EA        NAMT(IC)=F8E9-F8E7    M(IC)=F8E6         YEAR(IC)=F8E5      DATES(IC)=F8E4-F8C7
     P(IC)=F8C6       KREC(IC)=F8C5        LREC(IC)=F8C4      MREC(IC)=F8C3         NREC(IC)=F8C2          R(IC)=F8C1
     K(IC)=F8C0          L(IC)=F8BF          PI(IC)=F8BE       KNT(IC)=F8BD        IHMAX(IC)=F8BC         RI(IC)=F8BB
   KAT(IC)=FFFF-FEC0     A(R )=0024-000C      B(R )=0057-0027   BY(R )=005A           FY(R )=005D         ZY(R )=0060
     Y(R )=0063         EY(R )=0066          AY(R )=0069       PII(R )=006C       NAMFL(I )=007A-0075     IB(I )=008B-007B
  LIST(I )=00B3-008C IKREC(I )=00B4       LKREC(I )=00B5       III(I )=00B6           IY(I )=00B7         JY(I )=00B8
   IFY(I )=00B9          I(I )=00BA          IK(I )=00BB         J(I )=00BC        LHMAX(I )=00BD         JJ(I )=00BE
  IERR(I )=00BF         IJ(I )=00C0         JJA(I )=00C1
 26    =012A  27    =012C  28    =0142  5     =0151  6     =018E  9     =0199  13    =01AE  15    =01BE  31    =01E0  33    =01E8
 32    =01F2  21    =01FA  20    =0204  22    =022B  23    =0252  24    =0277  25    =02B4  2     =0315  1     =031E  30    =038B
 29    =0394  11    =03FA  12    =0404  14    =043F  10    =047C

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 SCALE   EPLOT   EGRID   ECHAR   DFT     ENDPL   EMPY    ELD     ESTO    EDVR    FLOAT   ISTOX   MWRT    MCOMP   MIOI
 SUBSC   SNR     MDRED   MDCOM   MDIX    ECHRI   TYPEN   EBPRT

REAL CONSTANTS
   .800000000E 01=00C6     .100000000E 03=00C9     .700000000E-01=00CC     .500000000E 01=00CF     .140000000E 02=00D2
   .200000000E 03=00D5     .400000000E-01=00D8     .100000000E 02=00DB     .220000000E 02=00DE     .300000000E 03=00E1
   .160000000E 02=00E4     .250000000E-01=00E7     .100000000E 01=00EA     .120000000E 02=00ED     .000000000E 00=00F0
   .150000000E 01=00F3     .300000000E 00=00F6     .100000000E 00=00F9     .800000000E 00=00FC     .200000000E 02=00FF
   .500000000E 00=0102     .250000000E 02=0105     .671600000E 01=0108     .400000000E 01=010B     .671800000E 01=010E
   .200000000E 00=0111     .200000000E 01=0114

INTEGER CONSTANTS
     1=0117       2=0118      80=0119     180=011A      21=011B     100=011C       5=011D      20=011E     200=011F      10=0120
    16=0121     300=0122      30=0123       3=0124       0=0125       7=0126       9=0127     320=0128      17=0129

CORE REQUIREMENTS FOR PERPL
 COMMON    1862  INSKEL COMMON       0
  VARIABLES     198  PROGRAM     978


END OF COMPILATION
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```
PERPL
DMP FUNCTION COMPLETED
// DMP                                                                   PRPL1490
*DELET             1 PERPL                                               PRPL1500
DMP FUNCTION COMPLETED
*STORECI           1 PERPL PERPL                                         PRPL1510

*FILES(1,PE02,2)                                                         PRPL1520
*FILES(2,PE04,2)                                                         PRPL1530
*CCEND                                                                   PRPL1540




 MPX, BUILD PERPL

 MPX, PERPL LD XQ

CL WC OF  1B2C STORED AT  14DE
DMP FUNCTION COMPLETED
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```
// JOB        X     X     X   03 AUG 73  12.950 HRS                            DUMP0000
// *N.I.O. MPX PROGRAM LIBRARY MASTER COPY                                     DUMP0010
// FOR DUMP                VERSION 20 MODIFICATION 1 112                       DUMP0020
*EXTENDED PRECISION                                                            DUMP0030
*LIST ALL
*IOCS(DISK,1443 PRINTER)                                                       DUMP0050
      INTEGER TSCAT(37),TPE(320)                                               DUMP0060
      INTEGER RI,NAMT(3)                                                       DUMP0070
      INTEGER SWPA(42),SCAT(40,37),HS(102),HMAX(102),TZ(2,22),TITLE(36)  DUMP0080
      INTEGER S,YEAR,DATES(30),P,PI,R                                          DUMP0090
      DIMENSION CHS(102),CHMAX(102),CTZ(44),CSWPA(42),LIST(40),NAMFL(18)DUMP0100
      COMMON SWPA,SCAT,HS,HMAX,TZ,IREC,JREC,LAB,MAXH,N,MM,II,TITLE,S,NAMDUMP0110
     1T, M,YEAR,DATES,P,KREC,LREC,MREC,NREC,R,K,L,PI,KNT,IHMAX,RI            DUMP0120
      DATA LIST/'02','04','06','08','10','12','14','16','18','20','22','DUMP0130
     124','26','28','30','32','34','36','38','40','42','44','46','48','5DUMP0140
     20','52','54','56','58','60','62','64','66','68','70','72','74','76DUMP0150
     3','78','80'/                                                             DUMP0160
      DATA NAMFL(1)/'HS'/,NAMFL(2)/'  '/,NAMFL(3)/'  '/,NAMFL(4)/'HM'/,NDUMP0170
     1AMFL(5)/'AX'/,NAMFL(6)/'  '/,NAMFL(7)/'TZ'/,NAMFL(8)/'  '/,NAMFL(9DUMP0180
     2)/'  '/,NAMFL(10)/'SW'/,NAMFL(11)/'PA'/,NAMFL(12)/'  '/,NAMFL(13)/DUMP0190
     3'SC'/,NAMFL(14)/'AT'/,NAMFL(15)/'  '/,NAMFL(16)/'PE'/,NAMFL(18)/'  DUMP0200
     4 '/                                                                      DUMP0210
      DATA CHS/102*0./,CHMAX/102*0./,CTZ/44*0./,CSWPA/42*0./,TSCAT/37*0/DUMP0220
     1,TPE/320*0/                                                              DUMP0230
      DEFINE FILE 1(4,306,U,IREC),2(4,306,U,JREC),3(4,132,U,KREC)        DUMP0240
      DEFINE FILE 4(1,126,U,LREC),5(40,37,U,MREC),6(320,1,U,IKREC)       DUMP0250
C----                                                                           DUMP0260
C---- THIS PROGRAM LISTS THE CONTENTS OF ALL DISK FILES WHICH                  DUMP0270
C---- HAVE BEEN PLOTTED IN WAST                                                DUMP0280
C----                                                                           DUMP0290
      WRITE (3,1)                                                              DUMP0300
1     FORMAT (1H1,' HS FOR WINTER,SPRING,SUMMER,AUTUMN FROM 0-101 FT'/)  DUMP0310
      DO 2 LK=1,4                                                              DUMP0320
      READ (1'LK) (CHS(LJ),LJ=1,102)                                           DUMP0330
2     WRITE (3,3) CHS                                                          DUMP0340
3     FORMAT (1H0,(20F5.1))                                                    DUMP0350
      WRITE (3,4)                                                              DUMP0360
4     FORMAT (1H1,' HMAX FOR WINTER,SPRING,SUMMER,AUTUMN FROM 1-101FT'/)DUMP0370
      DO 5 LK=1,4                                                              DUMP0380
      READ (2'LK) (CHMAX(LJ),LJ=1,102)                                         DUMP0390
5     WRITE (3,3) CHMAX                                                        DUMP0400
      WRITE (3,6)                                                              DUMP0410
6     FORMAT (1H1,' TZ FOR WINTER,SPRING,SUMMER,AUTUMN. IN HALF SECOND IDUMP0420
     1NTERVALS. FIRST NO. = CALM'/)                                            DUMP0430
      DO 7 LK=1,4                                                              DUMP0440
      READ (3'LK) (CTZ(LJ),LJ=1,44)                                            DUMP0450
7     WRITE (3,8) CTZ                                                          DUMP0460
8     FORMAT (1H0,(22F5.1))                                                    DUMP0470
      WRITE (3,9)                                                              DUMP0480
9     FORMAT (1H1,' SPECTRAL WIDTH PARAMETER FOR THE YEAR IN INTERVALS ODUMP0490
     1F 0.025'/)                                                               DUMP0500
      READ (4'1)(CSWPA(LJ),LJ=1,42)                                            DUMP0510
      WRITE (3,10) CSWPA                                                       DUMP0520
10    FORMAT (1H0,(21F5.1))                                                    DUMP0530
      WRITE (3,14)                                                             DUMP0540
14    FORMAT (1H1,' PERSISTENCE VALUES -. 2FT,4FT ETC,IN THREE HOURLY READUMP0550
     1DINGS'/)                                                                 DUMP0560
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      LHMAX=IHMAX/2                                                      DUMP0570
      DO 15 LK=1,LHMAX                                                   DUMP0580
      NAMFL(17)=LIST(LK)                                                 DUMP0590
      CALL DFT(6,NAMFL,IERR)                                             DUMP0600
      IF (IERR) 16,17,16                                                 DUMP0610
16    WRITE (3,18) IERR                                                  DUMP0620
18    FORMAT (1H1,' IERR=',I2,' IN DUMP')                                DUMP0630
      CALL EXIT                                                          DUMP0640
17    IKREC=1                                                            DUMP0650
      READ (6'IKREC) (TPE(LJ),LJ=1,320)                                  DUMP0660
15    WRITE (3,19) TPE                                                   DUMP0670
19    FORMAT (1H0,(30I4))                                                DUMP0680
      CALL LINK(WAST)                                                    DUMP0690
      END                                                                DUMP0700

VARIABLE ALLOCATIONS
  SWPA(IC)=FFFF-FFD6  SCAT(IC)=FFD5-FA0E    HS(IC)=FA0D-F9A8  HMAX(IC)=F9A7-F942     TZ(IC)=F941-F916  IREC(IC)=F915
  JREC(IC)=F914        LAB(IC)=F913       MAXH(IC)=F912          N(IC)=F911          MM(IC)=F910        II(IC)=F90F
 TITLE(IC)=F90E-F8EB     S(IC)=F8EA       NAMT(IC)=F8E9-F8E7     M(IC)=F8E6        YEAR(IC)=F8E5     DATES(IC)=F8E4-F8C7
     P(IC)=F8C6       KREC(IC)=F8C5       LREC(IC)=F8C4       MREC(IC)=F8C3        NREC(IC)=F8C2         R(IC)=F8C1
     K(IC)=F8C0          L(IC)=F8BF         PI(IC)=F8BE        KNT(IC)=F8BD       IHMAX(IC)=F8BC        RI(IC)=F8BB
   CHS(R )=0153-0024 CHMAX(R )=0285-0156   CTZ(R )=0309-0288 CSWPA(R )=0387-030C  LIST(I )=03B1-038A NAMFL(I )=03C3-03B2
 TSCAT(I )=03E8-03C4   TPE(I )=0528-03E9 IKREC(I )=0529           LK(I )=052A          LJ(I )=052B     LHMAX(I )=052C
  IERR(I )=052D

STATEMENT ALLOCATIONS
 1     =0539  3     =0557  4     =055C  6     =057A  8     =05A7  9     =05AC  10    =05CF  14    =05D4  18    =05F6  19    =0603
 2     =0627  5     =0656  7     =0685  16    =06DA  17    =06E2  15    =06FD

FEATURES SUPPORTED
 ONE WORD INTEGERS
 EXTENDED PRECISION
 IOCS

CALLED SUBPROGRAMS
 DFT      ISTOX    MWRT     MCOMP    MIOAI    MIOAF    MIOI     SUBSC    MDRED    MDCOM    MDFX     MDIX     PRNTN    EBPRT

INTEGER CONSTANTS
     3=0530       1=0531       4=0532     102=0533       2=0534      44=0535      42=0536       6=0537     320=0538

CORE REQUIREMENTS FOR DUMP
 COMMON    1862  INSKEL COMMON      0
  VARIABLES    1328  PROGRAM     482


END OF COMPILATION
```

```
DUMP
DMP FUNCTION COMPLETED
// DMP                                                                  DUMP0710
*DELET              1 DUMP                                              DUMP0720
DMP FUNCTION COMPLETED
*STORECI            1 DUMP  DUMP                                        DUMP0730

*FILES(1,HS,2),(2,HMAX,2),(3,TZ,2),(4,SWPA,2),(5,SCAT,2),(6,PEO2,2)     DUMP0740
*CCEND                                                                  DUMP0750
```

```
 MPX, BUILD DUMP

 MPX, DUMP  LD XQ

CL WC OF  13A2 STORED AT  149B
DMP FUNCTION COMPLETED
```