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National Aeronautics & Space Administration
Goddard Space Flight Center
Greenbelt, Md. 20771

Subject: Final Report

Reference: Contract No. NAS5-25069, SASC WA No. 2096

Gentlemen:

Enclosed herewith please find the subject report entitled A Program and Data Base for Evaluating SMMR Algorithms dated September 28, 1979. This report constitutes the final deliverable and includes all necessary descriptions and computer program summaries. Distribution has been made in accordance with requirements of the above referenced contract.

Very truly yours,

Jerome Bohse

Jerome Bohse
Manager, Special Projects

JB:cab

Enclosure

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A PROGRAM AND DATA BASE FOR EVALUATING SMMR ALGORITHMS

FINAL REPORT

R-SAC-79-02

A PROGRAM AND DATA BASE FOR EVALUATING SMMR ALGORITHMS

Final Report

Contract No. NAS5-25069

September 28, 1979

Prepared For:

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ABSTRACT

The program described in this report enables a user to compare the values of meterological parameters derived from data obtained by the SMMR instrument on NIMBUS-7 with surface observations made over the ocean. The input to this program is a data base, also described here, which contains the surface observations and coincident SMMR data. The evaluation of meteorological parameters using SMMR data is done by a user-supplied subroutine. Instructions are given for executing the program and writing the subroutine.

TABLE OF CONTENTS

		Page
I.	INTRODUCTION	1
II.	THE DATA BASE	2
III.	HOW TO USE PARAM	4
	APPENDIX 1. NAMELIST INPUT	6
	APPENDIX 2. HOW TO USE THE SUBROUTINE PARMS	9
	APPENDIX 3. SAMPLE OUTPUT FROM PARAM AND THE NAMELIST INPUT THAT GENERATED IT	11
	APPENDIX 4. SUMMARY OF COMPUTER PROGRAMS	
	A. PROCESSING THE STATION REPORTS	21
	B. SMMR CELL TAPE PROCESSING SYSTEM	25
	C. PARAM	29
	APPENDIX 5. LISTING OF STATION REPORT TAPE PROCESSING SYSTEM	30
	APPENDIX 6. LISTING OF SMMR CELL TAPE PROCESSING SYSTEM	54
	APPENDIX 7. LISTING OF PARAM	100

I. INTRODUCTION

This report describes a program (PARAM) and data base that can be used for testing algorithms which are used to infer the values of meteorological parameters from data obtained by the SMMR instrument on NIMBUS-7. Each record in the data base combines a surface observation with coincident SMMR brightness temperatures. A coincidence is defined here as an observation by SMMR of the position where a surface observation was made where the time difference between the observations is less than 1.5 hours. All surface observations referred to in this report were taken over the ocean.

PARAM calls the user-supplied subroutine PARMS which may evaluate up to seven meteorological parameters from SMMR brightness temperatures. These parameters are freezing level, rain rate, wind speed, sea surface temperature, the amount of non-precipitating liquid water, the fraction of the field of view (FOV) of SMMR covered by rain, and the water vapor column density. Surface observations of wind speed, sea surface temperature, and water vapor column density are currently available in the data base.

Sec. II describes the data base in more detail, and Sec. III tells how to use PARAM. Appendix 4 summarizes PARAM and all programs used to produce the data base. Listings of these programs are given in Appendices 5,6, and 7.

II. THE DATA BASE

The input to PARAM is a data base which consists of information from surface observations and brightness temperatures obtained by SMMR. The surface observations come from tapes containing ship, buoy, and radiosonde reports (hereafter referred to as "station reports") which have been supplied by the National Climatic Center in Asheville, North Carolina. The brightness temperatures are read from SMMR CELL tapes.

Station reports are included for which there exists a SMMR observation of the station's position at a time less than 1.5 hours before or after the time of the station report. The time limit of 1.5 hours is imposed in order to assure the validity of the comparison between the SMMR and station observations; this also prevents the same SMMR observation from being matched with more than one station report.

There are other criteria for rejecting coincidences of station and SMMR reports. In the case of the ship and buoy reports, rejection occurs when both the wind speed and the sea surface temperature values are unusable. Radiosonde reports are rejected when the integration to determine the amount of water vapor above a point on the earth's surface fails.

Brightness temperatures are available for the station's position and for the surrounding area as well. Each block on a CELL tape covers a box 780 km. on a side on the earth's

surface. For each coincidence between station and SMMR observations, all of th. brightness temperatures from the coincident CELL tape block are written into the database record along with the coincident station observation.

Each database tape covers one month beginning with November 1978. The records on each tape are sorted in order of increasing SMMR observation time.

III. HOW TO USE PARAM

PARAM is a main program, controlled by the namelist CNTL, which reads the database tapes, calls a user-supplied subroutine PARMS to evaluate meteorological parameters from the SMMR data, and produces printed output on request. The namelist CNTL, which is read in by PARAM on unit 5, is described in Appendix 1. Note that a user may restrict his analysis to a limited area on the earth's surface by specifying values for the namelist variables ALATL, ALATU, ALONL, and ALONU.

The subroutine PARMS may evaluate up to seven meteorological parameters: freezing level, rain rate, wind speed, sea surface temperature, the amount of non-precipitating liquid water, the fraction of the field of view (FOV) covered by rain, and the amount of water vapor. The parameters must always be passed back to PARAM in this order (see Appendix 2). Appendix 2 also describes the way the brightness temperatures are passed to PARMS.

On return from PARMS, PARAM tests the value of the error flag, IERR. If IERR is zero, an error has occurred in the calculation of the parameters, and PARAM will ignore the current record and read the next database tape record. If PARMS returns normally, IERR is set to a non-zero number. There are three parameters for which the values computed by PARMS can be compared with surface truth: wind speed, sea surface temperature, and water vapor. Water vapor is the only

parameter available from the radiosonde reports. Wind speed and sea surface temperature, but not water vapor, are given by the ship and buoy reports.

After processing of the database tape has been completed, PARAM will print the average difference between SMMR values (as given by PARMS) and surface truth for any of the three parameters mentioned in the preceding paragraph (if the user has specified that they are to be evaluated). The standard deviation of the difference and the number of usable measurements will be printed at the same time. Unusable measurements are those for which ground truth or SMMR parameters are not available.

The user can make several different analyses with the same database tape by varying the namelist input. When PARAM finishes processing the tape, it checks for new namelist input. If more input exists, it rewinds the tape and processing starts from the beginning.

Sample output from PARAM and the namelist input used to produce it are shown in Appendix 3. For each record of the database tape, there is a maximum of two lines of output. When two lines are printed, the first line refers to the first set of headings, and the second line belongs with the second set of headings. As described in Appendix 1, the user can specify that no printed output is to be produced, but that will not affect the printing of the average difference and standard deviation of the difference of the appropriate parameters.

APPENDIX 1. NAMELIST INPUT

KOBS, KPARM, and KGRID must be specified by the user. Default values of the other namelist variables are given here.

Variable	Type	Comments
KOBS	I*4	KOBS controls the type of station reports which are accepted. If KOBS is divisible by 2, ship reports are accepted. If it is divisible by 3, buoy reports are accepted. If it is divisible by 5, radiosonde reports are accepted. For example, if KOBS equals 10, only buoy reports are rejected. The minimum value of KOBS is 2 and the maximum is 30.
KPARM	I*4	KPARM tells PARAM which parameters are to be computed, so that it can set up the format to print them out. If KPARM is divisible by 2: freezing level is computed 3: rain rate is computed 5: wind speed is computed 7: sea surface temperature is computed 11: the amount of non-precipitating liquid water is computed 13: the fraction of the field of view covered by rain is computed

17: the amount of water vapor is computed

The minimum value of KPARM is 2 and the maximum is 510,510.

KGRID	I*4	KGRID = 1. Take brightness temperature from 156 km. cells. 2. Take brightness temperature from 97.5 km. cells. 3. Take brightness temperature from 60 km. cells. 4. Take brightness temperature from 30 km. cells.
LPRINT	I*4	Controls the amount of printed output LPRINT = 0: No printed output 1: Print parameters 2: Print parameters and station position and observation time. 3: Print station position and observation time. The default is 2.

The following four variables allow the user to reject reports from stations which are not within a specified area of the earth's surface. Note that the range of latitude is $[-90^{\circ}, +90^{\circ}]$, and the range of longitude is $[-180^{\circ}, +180^{\circ}]$ where longitude is positive to the east.

ALATL	R*8	Lower limit of latitude. Default is -90°.
ALATU	R*8	Upper limit of latitude. Default is $+90^{\circ}$.
ALONL	R*8	Lower limit of longitude. Default is -180°.
ALONU	R*8	Upper limit of longitude. Default is $+180^{\circ}$.

APPENDIX 2. HOW TO USE THE SUBROUTINE PARMS

Brightness temperatures are passed to PARMS in the array TB which has 10 elements (five channels, two polarizations). Each element occupies a halfword of storage, i.e. TB is an INTEGER*2 array. The number of elements of TB which are filled depends on the grid size chosen:

KGRID	Cell Size (km.)	Number of Brightness Temperature	Frequency (GHz)
1	156	10	6.6, 10.7, 18, 21, 37
2	97.5	8	10.7, 18, 21, 37
3	60	6	18, 21, 37
4	30	2	37

The elements of TB are filled in the following order:

Element	Frequency (GHz)	Polarization
1	6.6	V
2	6.6	H
3	10.7	V
4	10.7	H
5	18	V
6	18	H
7	21	V
8	21	H
9	37	V
10	37	H

The brightness temperatures passed to PARMS are taken from the cell which covers the station's position.

The parameters calculated by PARMS are passed to PARAM in the array PARM. PARM is a REAL*4 array with seven elements which are filled in the following order:

Element	Parameter
1	Freezing level (km)
2	Rain rate (mm/hr)
3	Wind speed (m/sec)
4	Sea surface temperature (K)
5	Non-precipitating liquid water (cm)
6	Fraction of FOV covered by rain
7	Water vapor (gm/cm^2)

If any errors are encountered which render the results of the calculations in PARMS unusable, set the error flag IERR to zero. Conversely, if everything is normal, make sure that IERR is not zero.

The first three lines of code in PARMS must be the following:

```
SUBROUTINE PARMS (TB,PARM,IERR)
DIMENSION PARM(7)
INTEGER*2 TB(10)
```

APPENDIX 3. SAMPLE OUTPUT FROM PARAM AND THE NAMELIST INPUT THAT GENERATED IT

```
$CNTL
KOBS=          2,KPARM=      510510,KGRID=          1,ALATL= -90.000000000000000    ,ALATU=  90.000000000000000    ,ALONL=
 -180.000000000000000    ,ALONU=  180.000000000000000    ,LPRINT=          2
$END
```

TYPE	STATION POS. LAT	LON	STA. OBS. TIME YR	DAY	HR	DIFF(SMMR-STA.) IN HRS	FREEZING LEVEL	RAIN RATE	WIND SPEED SMMR	SMMR-STA	SEA TEMP. SMMR	SMMR-STA	NON-PRECIP. LIQ. WATER	FRACTION FOV RAINED ON	WATER VAPOR SMMR	SMMR-STA
SHIP	11.30	128.10	1978	304	3.00	-0.082										
							0.0	0.0	0.0	0.0	0.0	-9999.	0.0	0.0	0.0	-9999.
SHIP	11.90	130.30	1978	304	3.00	-0.081										
							0.0	0.0	0.0	-2.574	0.0	-9999.	0.0	0.0	0.0	-9999.
SHIP	17.70	131.10	1978	304	3.00	-0.057										
							0.0	0.0	0.0	-6.692	0.0	-9999.	0.0	0.0	0.0	-9999.
SHIP	1.80	108.00	1978	304	6.00	-1.397										
							0.0	0.0	0.0	-1.030	0.0	-302.1	0.0	0.0	0.0	-9999.
SHIP	3.50	105.80	1978	304	6.00	-1.387										
							0.0	0.0	0.0	-3.089	0.0	-303.1	0.0	0.0	0.0	-9999.
SHIP	5.90	108.20	1978	304	6.00	-1.380										
							0.0	0.0	0.0	-10.30	0.0	-301.1	0.0	0.0	0.0	-9999.
SHIP	6.00	107.40	1978	304	6.00	-1.379										
							0.0	0.0	0.0	-9.781	0.0	-299.9	0.0	0.0	0.0	-9999.
SHIP	5.70	104.30	1978	304	6.00	-1.376										
							0.0	0.0	0.0	-3.089	0.0	-301.3	0.0	0.0	0.0	-9999.
SHIP	7.80	108.00	1978	304	6.00	-1.370										
							0.0	0.0	0.0	-1.030	0.0	-302.1	0.0	0.0	0.0	-9999.
SHIP	9.30	109.90	1978	304	6.00	-1.363										
							0.0	0.0	0.0	-18.02	0.0	-301.1	0.0	0.0	0.0	-9999.

TYPE	STATION POS. LAT	LON	STA. OBS. TIME YR	DAY	HR	DIFF(SMMR-STA.) IN HRS	FREEZING LEVEL	RAIN RATE	WIND SPEED SMMR	SMMR-STA	SEA TEMP. SMMR	SMMR-STA	NON-PRECIP. LIQ. WATER	FRACTION FOV RAINED ON	WATER VAPOR SMMR	SMMR-STA
SHIP	9.50	108.60	1978	304	6.00	-1.362										
							0.0	0.0	0.0	-15.44	0.0	-9999.	0.0	0.0	0.0	-9999.
SHIP	9.90	109.70	1978	304	6.00	-1.360										
							0.0	0.0	0.0	-17.50	0.0	-301.1	0.0	0.0	0.0	-9999.
SHIP	68.10	-56.60	1978	304	6.00	-0.875										
							0.0	0.0	0.0	-4.633	0.0	-9999.	0.0	0.0	0.0	-9999.

```
 SHIP       48.10 -56.70     1978 304  6.00   -0.875
 0.0          0.0          0.0          -6.692      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       50.10 -66.40     1978 304  6.00   -0.789
 0.0          0.0          0.0          -3.604      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       50.00 -66.80     1978 304  6.00   -0.789
 0.0          0.0          0.0          -1.030      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       49.60 -67.10     1978 304  6.00   -0.787
 0.0          0.0          0.0          -4.633      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       49.20 -64.60     1978 304  6.00   -0.785
 0.0          0.0          0.0          -3.604      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       49.20 -66.80     1978 304  6.00   -0.785
 0.0          0.0          0.0          -12.35      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       39.20 -72.20     1978 304  6.00   -0.734
 0.0          0.0          0.0          -6.177      0.0           -289.8      0.0        0.0        0.0          -9999.
AVERAGE DIFFERENCE OF WIND SPEED MEASUREMENTS= -6.56 STD. DEV. OF DIFFERENCE=    5.56   NUMBER OF MEASUREMENTS=      20


AVERAGE DIFFERENCE OF SEA TEMPERATURE MEASUREMENTS=-300.23 STD. DEV. OF DIFFERENCE=     4.00  NUMBER OF MEASUREMENTS=       9

&CNTL
KOBS=          2,KPARM=    510510,KGRID=          1,ALATL= -60.0000000000000    ,ALATU=  60.0000000000000    ,ALONL=
 -70.0000000000000    ,ALONU=  70.0000000000000    ,LPRINT=          2
&END


            STATION POS.      STA. OBS. TIME   DIFF(SMMR-STA.)
   TYPE     LAT    LON        YR   DAY HR      IN HRS

FREEZING    RAIN            WIND SPEED               SEA TEMP.             NON-PRECIP.  FRACTION FOV    WATER VAPOR
LEVEL       RATE        SMMR         SMMR-STA     SMMR          SMMR-STA    LIQ. WATER   RAINED  ON   SMMR            SMMR-STA


 SHIP       50.10 -66.40     1978 304  6.00   -0.789
 0.0          0.0          0.0          -3.604      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       50.00 -66.80     1978 304  6.00   -0.789
 0.0          0.0          0.0          -1.030      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       49.60 -67.10     1978 304  6.00   -0.787
 0.0          0.0          0.0          -4.633      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       49.20 -64.60     1978 304  6.00   -0.785
 0.0          0.0          0.0          -3.604      0.0           -9999.      0.0        0.0        0.0          -9999.

 SHIP       49.20 -66.80     1978 304  6.00   -0.785
 0.0          0.0          0.0          -12.35      0.0           -9999.      0.0        0.0        0.0          -9999.
AVERAGE DIFFERENCE OF WIND SPEED MEASUREMENTS= -5.04 STD. DEV. OF DIFFERENCE=    4.30   NUMBER OF MEASUREMENTS=       5

&CNTL
KOBS=          2,KPARM=    510510,KGRID=          1,ALATL=  20.0000000000000    ,ALATU= -20.0000000000000    ,ALONL=
 -70.0000000000000    ,ALONU=  70.0000000000000    ,LPRINT=          2
&END

              ******** ALATL=   20.000000     IS GREATER THAN ALATU= -20.000000     ********
```

******** SKIP TO NEXT NAMELIST RECORD********

```
$CNTL
KOBS=          35,KPARM=      510510,KGRID=           1,ALATL=  20.00000000000000     ,ALATU= -20.00000000000000     ,ALONL=
 -70.00000000000000     ,ALONU=  70.00000000000000     ,LPRINT=           2
$END
```

******** KOBS=   35 IS OUT OF RANGE********

******** SKIP TO NEXT NAMELIST RECORD********

```
$CNTL
KOBS=           2,KPARM=      510510,KGRID=           1,ALATL= -90.00000000000000     ,ALATU=  90.00000000000000     ,ALONL=
 -180.0000000000000     ,ALONU=  180.0000000000000     ,LPRINT=           1
$END
```

FREEZING LEVEL	RAIN RATE	WIND SPEED SMMR	WIND SPEED SMMR-STA	SEA TEMP. SMMR	SEA TEMP. SMMR-STA	NON-PRECIP. LIQ. WATER	FRACTION FOV RAINED ON	WATER VAPOR SMMR	WATER VAPOR SMMR-STA
0.0	0.0	0.0	0.0	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-2.574	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-6.692	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-1.030	0.0	-302.1	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-3.089	0.0	-303.1	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-10.30	0.0	-301.1	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-9.781	0.0	-299.9	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-3.089	0.0	-301.3	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-1.030	0.0	-302.1	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-18.02	0.0	-301.1	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-15.44	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-17.50	0.0	-301.1	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-4.633	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-6.692	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-3.604	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-1.030	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-4.633	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-3.604	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-12.35	0.0	-9999.	0.0	0.0	0.0	-9999.
0.0	0.0	0.0	-6.177	0.0	-289.8	0.0	0.0	0.0	-9999.

AVERAGE DIFFERENCE OF WIND SPEED MEASUREMENTS= -6.56 STD. DEV. OF DIFFERENCE= 5.56 NUMBER OF MEASUREMENTS= 20

AVERAGE DIFFERENCE OF SEA TEMPERATURE MEASUREMENTS=-300.23 STD. DEV. OF DIFFERENCE= 4.00 NUMBER OF MEASUREMENTS= 9

```
$CNTL
KOBS=           2,KPARM=      510510,KGRID=           1,ALATL= -90.00000000000000     ,ALATU=  90.00000000000000     ,ALONL=
 -180.0000000000000     ,ALONU=  180.0000000000000     ,LPRINT=           3
$END
```

TYPE	STATION POS. LAT	LON	STA. OBS. TIME YR	DAY	HR	DIFF(SMMR-STA.) IN HRS
SHIP	11.30	128.10	1978	304	3.00	-0.082
SHIP	11.90	130.30	1978	304	3.00	-0.081
SHIP	17.70	131.10	1978	304	3.00	-0.057
SHIP	1.80	108.00	1978	304	6.00	-1.397

```
   SHIP        3.50 105.80     1978 304  6.00   -1.387
   SHIP        5.90 108.20     1978 304  6.00   -1.380
   SHIP        6.00 107.40     1978 304  6.00   -1.379
   SHIP        5.70 104.30     1978 304  6.00   -1.376
   SHIP        7.80 108.00     1978 304  6.00   -1.370
   SHIP        9.30 109.90     1978 304  6.00   -1.363
   SHIP        9.50 108.60     1978 304  6.00   -1.362
   SHIP        9.90 109.70     1978 304  6.00   -1.360
   SHIP       68.10 -56.60     1978 304  6.00   -0.875
   SHIP       68.10 -56.70     1978 304  6.00   -0.875
   SHIP       50.10 -66.40     1978 304  6.00   -0.789
   SHIP       50.00 -66.80     1978 304  6.00   -0.789
   SHIP       49.60 -67.10     1978 304  6.00   -0.787
   SHIP       49.20 -64.60     1978 304  6.00   -0.785
   SHIP       49.20 -66.80     1978 304  6.00   -0.785
   SHIP       39.20 -72.20     1978 304  6.00   -0.734
AVERAGE DIFFERENCE OF WIND SPEED MEASUREMENTS= -6.56 STD. DEV. OF DIFFERENCE=    5.56   NUMBER OF MEASUREMENTS=      20

AVERAGE DIFFERENCE OF SEA TEMPERATURE MEASUREMENTS=-300.23 STD. DEV. OF DIFFERENCE=      4.00  NUMBER OF MEASUREMENTS=       9

&CNTL
KOBS=          2,KPARM=        770,KGRID=          1,ALATL= -90.00000000000000    ,ALATU=  90.00000000000000    ,ALONL=
 -180.0000000000000    ,ALONU=  180.0000000000000    ,LPRINT=          2
&END


           STATION POS.      STA. OBS. TIME   DIFF(SMMR-STA.)
   TYPE     LAT    LON       YR   DAY HR      IN HRS

FREEZING         WIND SPEED                  SEA TEMP.              NON-PRECIP.
LEVEL        SMMR          SMMR-STA      SMMR          SMMR-STA     LIQ. WATER

   SHIP       11.30 128.10     1978 304  3.00   -0.082
   0.0          0.0           0.0          0.0          -289.8        0.0
   SHIP       11.90 130.30     1978 304  3.00   -0.081
   0.0          0.0          -2.574        0.0          -9999.        0.0
   SHIP       17.70 131.10     1978 304  3.00   -0.057
   0.0          0.0          -6.692        0.0          -9999.        0.0
   SHIP        1.80 108.00     1978 304  6.00   -1.397
   0.0          0.0          -1.030        0.0          -302.1        0.0
```

SHIP	5.50	105.80	1978	304	6.00	-1.387		
0.0	0.0		-3.089		0.0		-303.1	0.0
SHIP	5.90	108.20	1978	304	6.00	-1.380		
0.0	0.0		-10.30		0.0		-301.1	0.0
SHIP	6.00	107.40	1978	304	6.00	-1.379		
0.0	0.0		-9.781		0.0		-299.9	0.0
SHIP	5.70	104.30	1978	304	6.00	-1.376		
0.0	0.0		-3.089		0.0		-301.3	0.0
SHIP	7.80	108.00	1978	304	6.00	-1.370		
0.0	0.0		-1.030		0.0		-302.1	0.0
SHIP	9.30	109.90	1978	304	6.00	-1.363		
0.0	0.0		-18.02		0.0		-301.1	0.0

TYPE	STATION POS. LAT	LON	STA. YR	OBS. TIME DAY	HR	DIFF(SNMR-STA.) IN HRS		
FREEZING LEVEL	WIND SPEED SNMR	SNMR-STA		SEA TEMP. SNMR		SNMR-STA	NON-PRECIP. LIQ. WATER	
SHIP	9.50	108.60	1978	304	6.00	-1.362		
0.0	0.0		-15.44		0.0		-9999.	0.0
SHIP	9.90	109.70	1978	304	6.00	-1.360		
0.0	0.0		-17.50		0.0		-301.1	0.0
SHIP	68.10	-56.60	1978	304	6.00	-0.875		
0.0	0.0		-4.633		0.0		-9999.	0.0
SHIP	68.10	-56.70	1978	304	6.00	-0.875		
0.0	0.0		-6.692		0.0		-9999.	0.0
SHIP	50.10	-66.40	1978	304	6.00	-0.789		
0.0	0.0		-3.604		0.0		-9999.	0.0
SHIP	50.00	-66.80	1978	304	6.00	-0.789		
0.0	0.0		-1.030		0.0		-9999.	0.0
SHIP	49.60	-67.10	1978	304	6.00	-0.787		
0.0	0.0		-4.633		0.0		-9999.	0.0
SHIP	49.20	-64.60	1978	304	6.00	-0.785		
0.0	0.0		-3.604		0.0		-9999.	0.0
SHIP	49.20	-66.80	1978	304	6.00	-0.785		
0.0	0.0		-12.35		0.0		-9999.	0.0
SHIP	39.20	-72.20	1978	304	6.00	-0.734		
0.0	0.0		-6.177		0.0		-289.8	0.0

AVERAGE DIFFERENCE OF WIND SPEED MEASUREMENTS= -6.56 STD. DEV. OF DIFFERENCE= 5.56 NUMBER OF MEASUREMENTS= 20

AVERAGE DIFFERENCE OF SEA TEMPERATURE MEASUREMENTS=-300.23 STD. DEV. OF DIFFERENCE= 4.00 NUMBER OF MEASUREMENTS= 9

IDENTI
NOBS= 2,NPARM= 595,NGRID= 1,ALATL= -90.00000000000000 ,ALATU= 90.00000000000000 ,ALONL=

-180.0000000000000 ,ALONU= 180.0000000000000 ,IPRINT= 2
&END

TYPE	STATION POS. LAT	LON	STA. OBS. TIME YR	DAY	HR	DIFF(SMMR-STA.) IN HRS					
	WIND SPEED		SEA TEMP.				WATER VAPOR				
SMMR	SMMR-STA		SMMR		SMMR-STA		SMMR		SMMR-STA		
SHIP	11.30	128.10	1978	304	3.00	-0.082					
0.0	0.0		0.0		-9999.		0.0		-9999.		
SHIP	11.90	130.30	1978	304	3.00	-0.081					
0.0	-2.574		0.0		-9999.		0.0		-9999.		
SHIP	17.70	131.10	1978	304	3.00	-0.057					
0.0	-6.692		0.0		-9999.		0.0		-9999.		
SHIP	1.80	108.00	1978	304	6.00	-1.397					
0.0	-1.030		0.0		-302.1		0.0		-9999.		
SHIP	3.50	105.80	1978	304	6.00	-1.387					
0.0	-3.089		0.0		-303.1		0.0		-9999.		
SHIP	5.90	108.20	1978	304	6.00	-1.380					
0.0	-10.30		0.0		-301.1		0.0		-9999.		
SHIP	6.00	107.40	1978	304	6.00	-1.379					
0.0	-9.781		0.0		-299.9		0.0		-9999.		
SHIP	5.70	104.30	1978	304	6.00	-1.376					
0.0	-3.089		0.0		-301.3		0.0		-9999.		
SHIP	7.80	108.00	1978	304	6.00	-1.370					
0.0	-1.030		0.0		-302.1		0.0		-9999.		
SHIP	9.30	109.90	1978	304	6.00	-1.363					
0.0	-18.02		0.0		-301.1		0.0		-9999.		

TYPE	STATION POS. LAT	LON	STA. OBS. TIME YR	DAY	HR	DIFF(SMMR-STA.) IN HRS					
	WIND SPEED		SEA TEMP.				WATER VAPOR				
SMMR	SMMR-STA		SMMR		SMMR-STA		SMMR		SMMR-STA		
SHIP	9.50	108.60	1978	304	6.00	-1.362					
0.0	-15.44		0.0		-9999.		0.0		-9999.		
SHIP	9.90	109.70	1978	304	6.00	-1.360					
0.0	-17.50		0.0		-301.1		0,0		-9999.		
SHIP	68.10	-56.60	1978	304	6.00	-0.875					
0.0	-4.633		0.0		-9999.		0.0		-9999.		
SHIP	68.10	-56.70	1978	304	6.00	-0.875					
0.0	-6.692		0.0		-9999.		0.0		-9999.		
SHIP	50.10	-66.40	1978	304	6.00	-0.789					
0.0	-3.604		0.0		-9999.		0.0		-9999.		

```
  SHIP        50.00 -66.80     1978 304  6.00   -0.789
  0.0           1.030       0.0           -9999.        0.0           -9999.

  SHIP        49.60 -67.10     1978 304  6.00   -0.787
  0.0          -4.633       0.0           -9999.        0.0           -9999.

  SHIP        49.20 -64.60     1978 304  6.00   -0.785
  0.0          -3.604       0.0           -9999.        0.0           -9999.

  SHIP        49.20 -66.80     1978 304  6.00   -0.785
  0.0          -12.35       0.0           -9999.        0.0           -9999.

  SHIP        39.20 -72.20     1978 304  6.00   -0.734
  0.0          -6.177       0.0           -289.8        0.0           -9999.
AVERAGE DIFFERENCE OF WIND SPEED MEASUREMENTS= -6.56 STD. DEV. OF DIFFERENCE=    5.56   NUMBER OF MEASUREMENTS=      20


AVERAGE DIFFERENCE OF SEA TEMPERATURE MEASUREMENTS=-300.23 STD. DEV. OF DIFFERENCE=      4.00  NUMBER OF MEASUREMENTS=       9


&CNTL
NOBS          2,NPARM=       429,NGRID=           1,ALATL= -90.0000000000000     ,ALATU=  90.0000000000000     ,ALONL=
 -180.0000000000000     ,ALONU=  180.0000000000000     ,LPRINT=          2
&END


              STATION POS.      STA. OBS. TIME    DIFF(SMMR-STA.)
  TYPE        LAT    LON        YR   DAY HR       IN HRS

RAIN          NON-PRECIP.  FRACTION FOV
RATE          LIQ. WATER   RAINED  ON


  SHIP        11.30 128.10     1978 304  3.00   -0.082
  0.0           0.0         0.0

  SHIP        11.90 130.30     1978 304  3.00   -0.081
  0.0           0.0         0.0

  SHIP        17.70 131.10     1978 304  3.00   -0.057
  0.0           0.0         0.0

  SHIP         1.80 108.00     1978 304  6.00   -1.397
  0.0           0.0         0.0

  SHIP         3.50 105.80     1978 304  6.00   -1.387
  0.0           0.0         0.0

  SHIP         5.90 108.20     1978 304  6.00   -1.380
  0.0           0.0         0.0

  SHIP         6.00 107.40     1978 304  6.00   -1.379
  0.0           0.0         0.0

  SHIP         5.70 104.30     1973 304  6.00   -1.376
  0.0           0.0         0.0

  SHIP         7.80 108.00     1978 304  6.00   -1.370
  0.0           0.0         0.0

  SHIP         9.30 109.90     1978 304  6.00   -1.363
  0.0           0.0         0.0
```

TYPE	STATION POS. LAT	LON	STA. OBS. TIME YR	DAY	HR	DIFF(SHWR-STA.) IN HRS
RAIN RATE	NON-PRECIP. LIQ. WATER	FRACTION FOV RAINED	ON			
SHIP	9.50	108.60	1978	304	6.00	-1.362
0.0	0.0		0.0			
SHIP	9.90	109.70	1978	304	6.00	-1.360
0.0	0.0		0.0			
SHIP	68.10	-56.60	1978	304	6.00	-0.875
0.0	0.0		0.0			
SHIP	68.10	-56.70	1978	304	6.00	-0.875
0.0	0.0		0.0			
SHIP	50.10	-66.40	1978	304	6.00	-0.789
0.0	0.0		0.0			
SHIP	50.00	-66.80	1978	304	6.00	-0.789
0.0	0.0		0.0			
SHIP	49.60	-67.10	1978	304	6.00	-0.787
0.0	0.0		0.0			
SHIP	49.20	-64.60	1978	304	6.00	-0.785
0.0	0.0		0.0			
SHIP	49.20	-66.80	1978	304	6.00	-0.785
0.0	0.0		0.0			
SHIP	39.20	-72.20	1978	304	6.00	-0.734
0.0	0.0		0.0			

```
//GO.DATA5 DD *
 $CNTL KGRS=2, KPARM=510510, KGRID=5,  $END
 $CNTL ALATL=-60.D0,ALATU=60.D0,ALONL=-70.D0,ALONU=70.D0, $END
 $CNTL ALATL=20.D0, ALATU=-20.D0, $END
 $CNTL KOBS=35, $END
 $CNTL ALATL=-90.D0,ALATU=90.D0,ALONL=-180.D0,ALONU=180.D0,KOBS=2,
    LPRINT=1, $END
 $CNTL LPRINT=3, $END
 $CNTL KPARM=770, LPRINT=2, $END
 $CNTL KPARM=595, $END
 $CNTL KPARM=429, $END
```

APPENDIX 4. SUMMARY OF COMPUTER PROGRAMS

A. Processing the Station Reports

The first step in producing the data base tapes is the processing of the station report tapes from the National Climatic Center. A block diagram of the tape processing system is given in Figs. A4-1, A4-2, and A4-3. More detailed information can be obtained by consulting the listing in Appendix 5.

If ship and buoy reports are being processed, MAIN calls BUSHIP. MAIN calls RADSON to process the radiosonde reports. Two subroutines are necessary because the radiosonde tape format is not the same as the ship and buoy tape format.

BUSHIP calls the system subroutines POSN and FREAD to position the tape to the appropriate file and to read the tape. UNPKSB unpacks data concerning the station's position and the time it made an observation. These data are passed to OTIME which determines when SMMR could have observed the station's position in an interval of 48 hours centered about the station's observation time. OTIME assumes that SMMR is always turned on (see pt. B). If SMMR observed the station within 1.5 hours of the station's observation time, WRITSB unpacks the meterological data on the station report tape and writes out a record into the output file.

This system possesses a restart capability. After every 300 records are read from the station report tape, LTIME is called to check the amount of CPU and I/O time remaining. It does this by calling the system subroutine REMTIM. If less

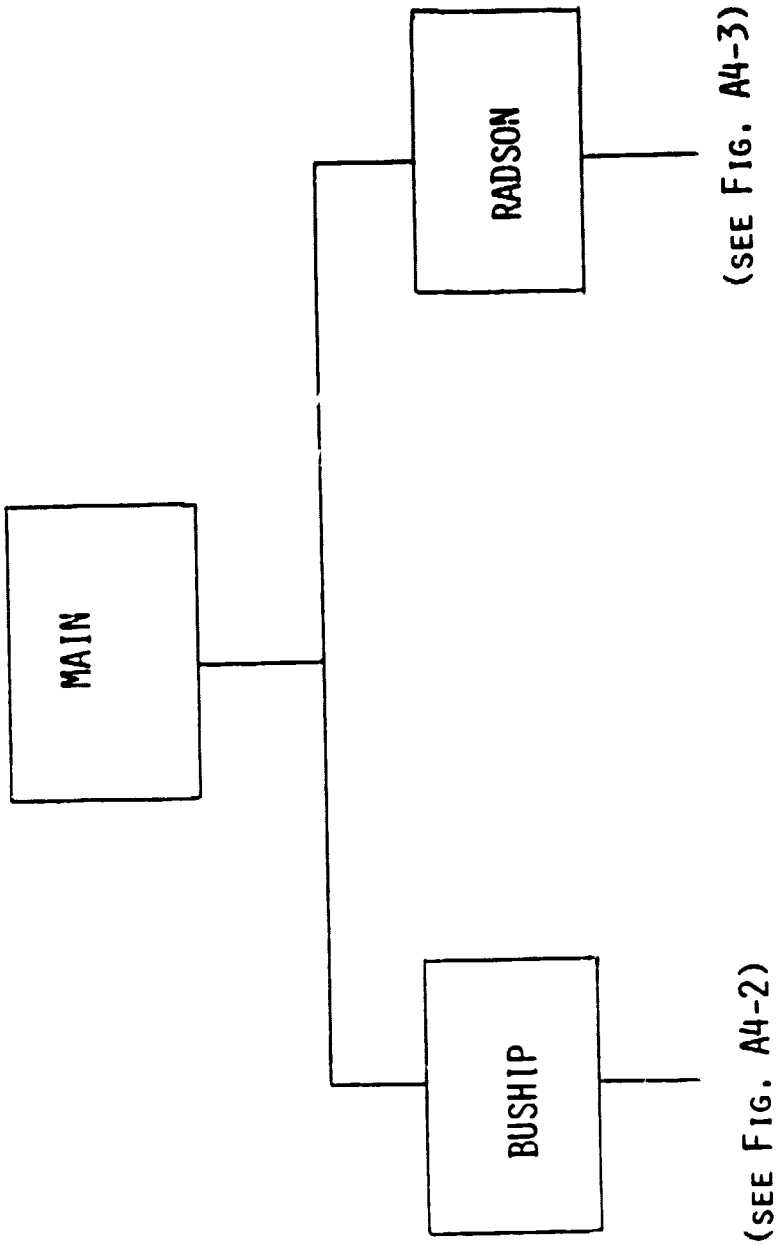

Fig. A4-1 Subroutines called by MAIN

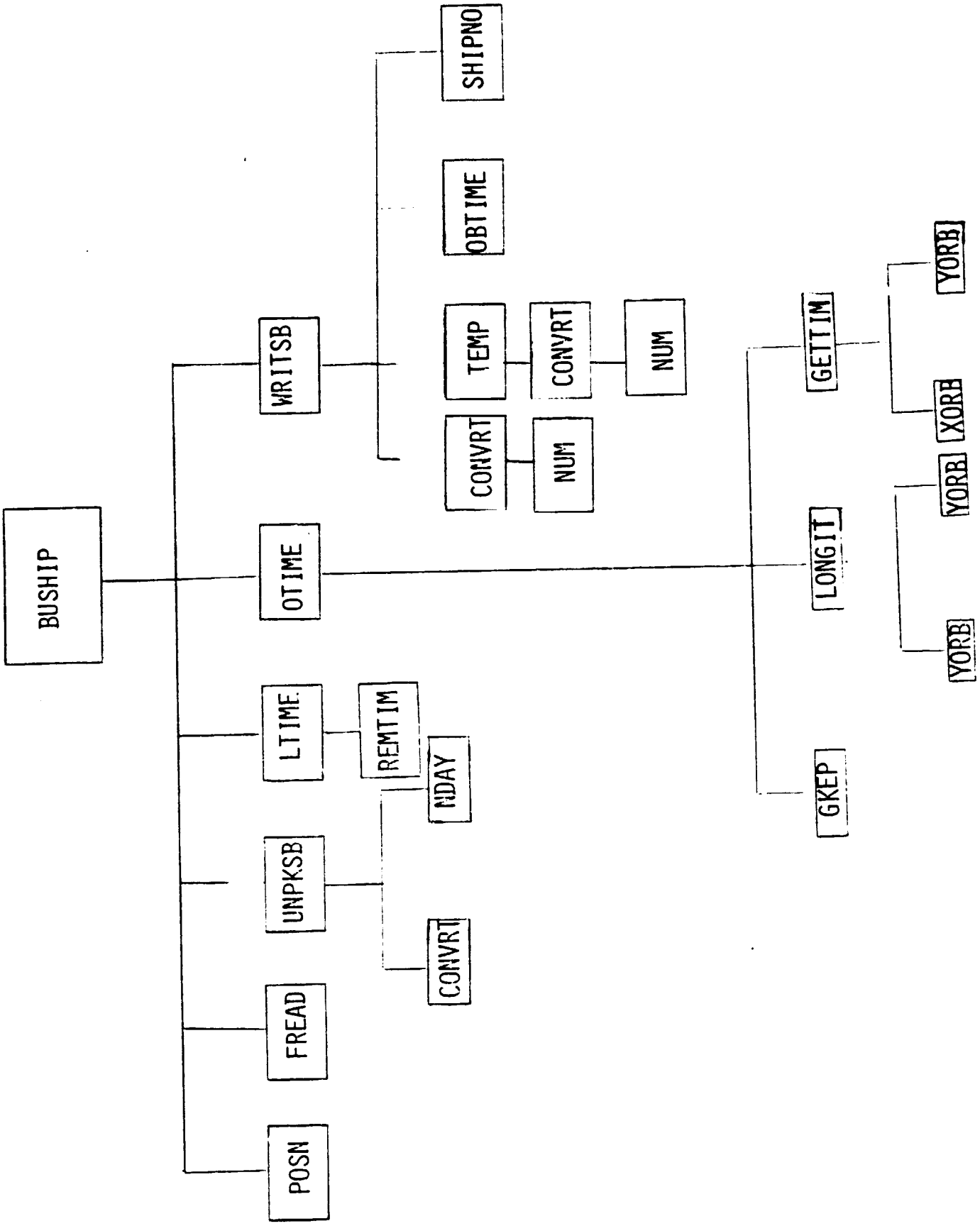

Fig. A4-2 Subroutines called by BUSHIP

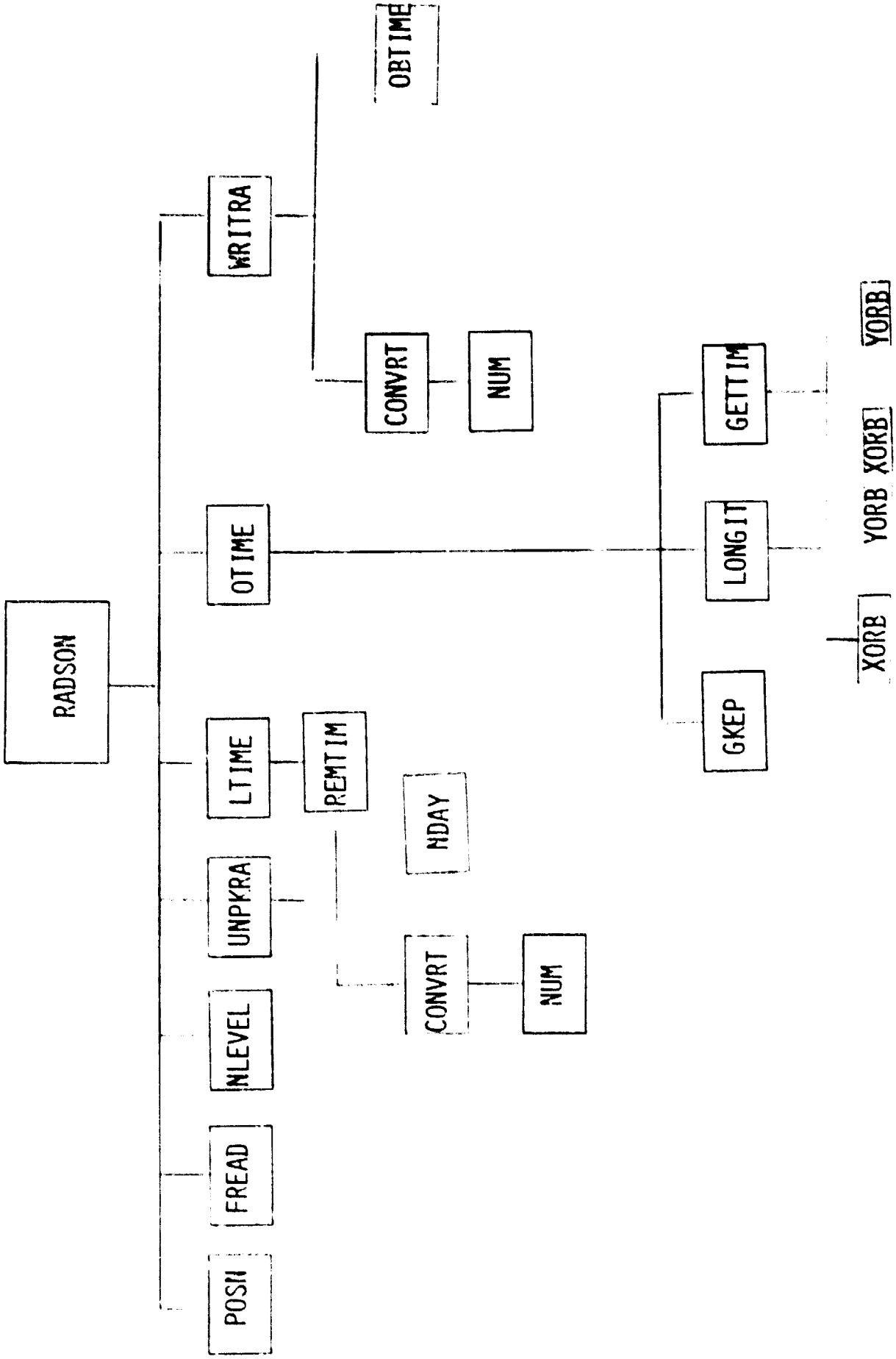

Fig. A4-3 Subroutines called by RADSON

than 10 seconds of CPU or I/O time remain, the number of records read is printed and the job step is terminated. By setting the namelist variable ISKPRC to this number, the records which have been processed can be skipped the next time the station report tape is read.

The block diagram for RADSON is similar to that for BUSHIP. The function NLEVEL determines the number of pressure levels at which the radiosonde made observations.

After the tape is processed, the output file is sorted so that the records appear in order of increasing SMMR observation time. This is done to facilitate reading the SMMR CELL tapes. Processing of the station report tapes is completed by merging the sorted files into a single file.

JCL used to run this system is given in Appendix 5 along with the listing.

B. SMMR CELL Tape Processing System

The purpose of this system is to find the block on a CELL tape which corresponds to the SMMR observation of the surface station. The output file created by this system is a database tape which is used as input to PARAM. Each record in this file consists of a station report and brightness temperatures from the corresponding CELL tape block. A block diagram of the system is shown in Figs. A4-4 and A4-5.

MAIN calls NUFILE which positions the CELL tape to file 2, the first data file. GETSHP reads a station report, and GETCEL reads a block on the CELL tape. If the time of the SMMR observation, as given by the station report, is not within about 2 minutes of the time corresponding to the CELL tape block, GETCEL

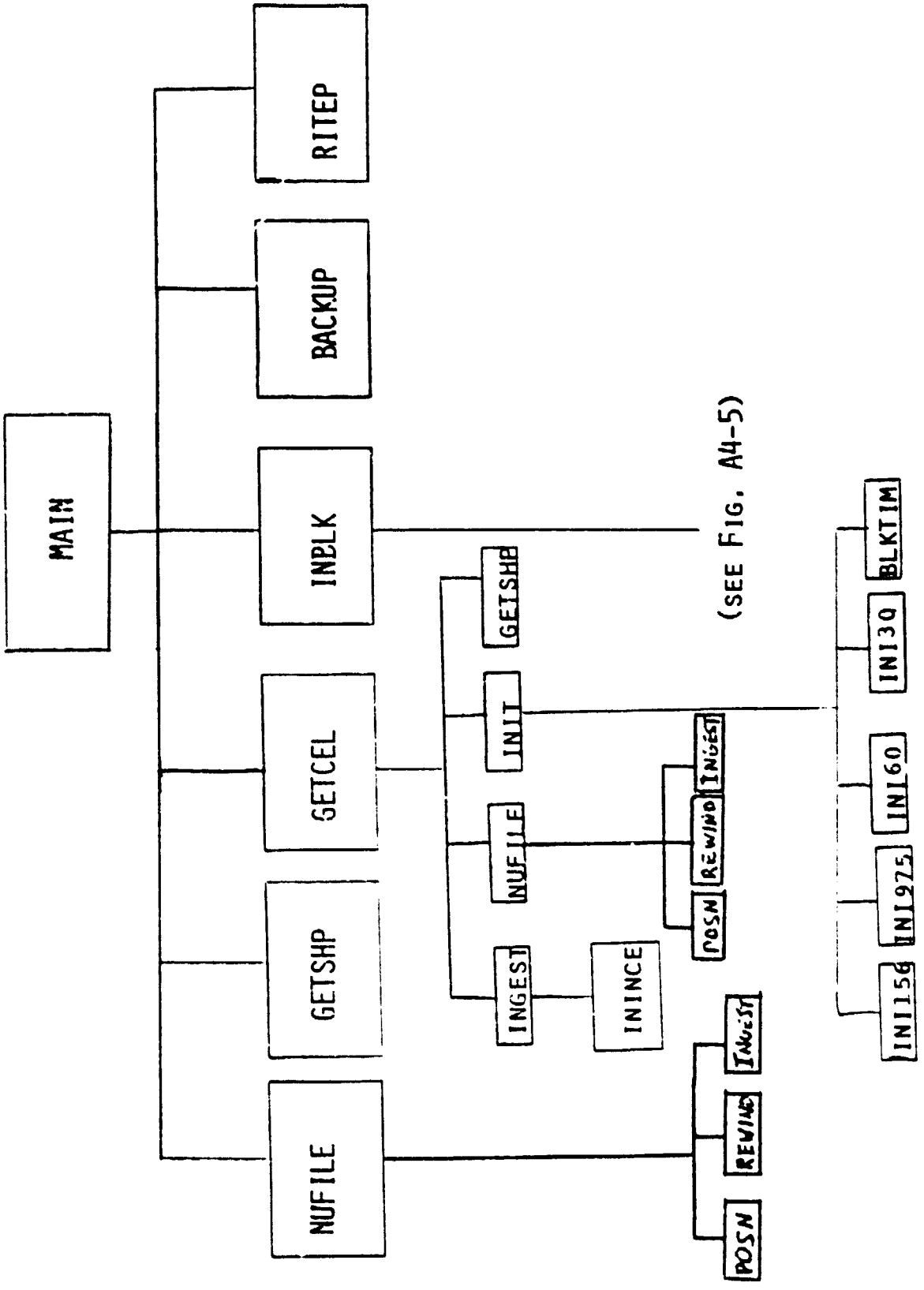

Fig. A4-4 SMMR CELL Tape Processing System

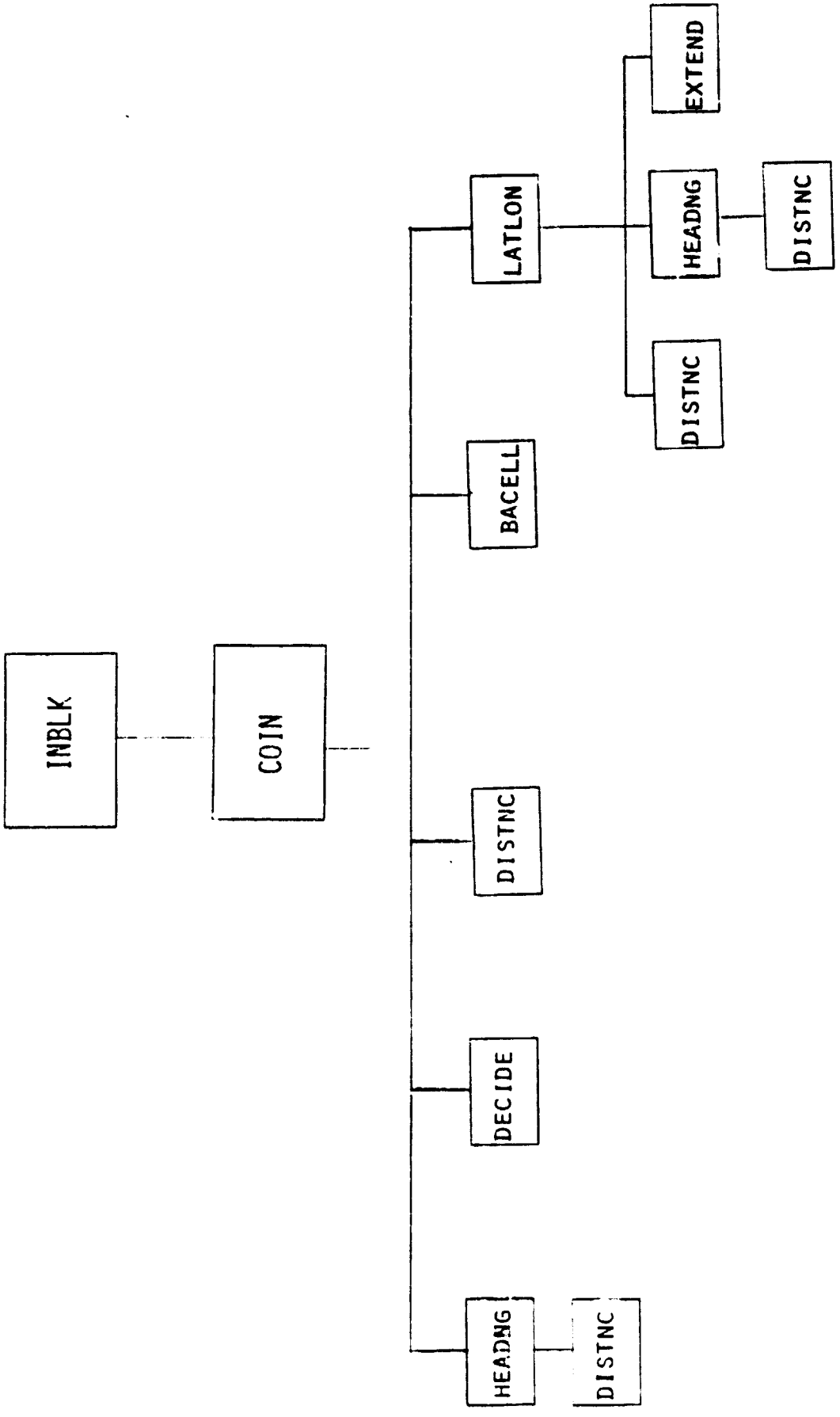

Fig. A4-5 SMMR CELL Tape Processing System (continued)

will read forward in either the station or the CELL tape file until this condition is met.

MAIN then calls INBLK to determine whether the area of the earth's surface covered by the CELL tape block includes the station's position. If the station is too far from the subsatellite track to be included in a CELL block, BACELL sets ICODE to zero, and the procedure is started again from the beginning, i.e. a new station report is read. If the station is not too far from the subsatellite track, INBLK performs a test to determine whether the SMMR observation of the station occurred in the current block or the next block or the preceeding block. If INBLK tells MAIN to read the preceeding block, BACKUP is called. If INBLK tells MAIN to read the next block, GETCEL is called. Once the new CELL block is read, the procedure described in this paragraph is repeated until INBLK decides that the current block covers the station's position. However, if INBLK decides to read forward on the CELL tape when it has previously decided to back up or vice-versa, MAIN will ignore the current ship record and read a new one in order to avoid getting into an infinite loop. The situation just described will occur when a block corresponding to the SMMR observation time as given by OTIME (see pt. A) is not written on the CELL tape either because SMMR was not on at that time or for some other reason.

When INBLK decides that the appropriate block has been found MAIN calls RITEP to write a record onto the database as described in the first paragraph of this section. A listing of this system is given in Appendix 6.

C. PARAM

The first task performed by PARAM (see listing in Appendix 7) is to check the namelist input. If the user has specified that the parameters calculated by PARMS are to be printed, PARAM sets up an execution-time format which allows for the printing of only those parameters and the corresponding surface truth (if any exists).

The next block of code begins with the statement which reads a data base record. If the ship is within the area specified by the user (see Sec. III and App. 1), the brightness temperatures are placed in the array TB as described in Appendix 2. Then PARAM calls the subroutine PARMS, and operation of PARAM proceeds as described in Sec. III.

APPENDIX 5. LISTING OF STATION REPORT TAPE PROCESSING SYSTEM

```
// EXEC FORTRANG
//SOURCE.SYSIN DD DSN=ZMMHT.BUOY.FORT,DISP=SHR
// EXEC FORTRANH
//SOURCE.SYSIN DD DSN=ZMMHT.BUOY.H.FORT,DISP=SHR
// EXEC LINKGO,REGION.GO=148K,OUT=X,TERMOUT=X
//GO.FT05F001 DD *
 &INPUT KIND=1,ISKPRC=0, MAXREC=1000000,LPRINT=F,ATAPE='NCC001', &END
//GO.FT06F001 DD SYSOUT=X
//GO.FT09F001  DD  DSN=ZMMHT.NOV78DAT,DISP=SHR
//GO.FT15F001 DD LABEL=(1,NL,,IN),
//  DCB=(LRECL=140,BLKSIZE=1400,RECFM=FB,DEN=3),
//  VOL=SER=BUOY1,UNIT=(9TRACK,,DEFER)
//GO.FT17F001 DD UNIT=DISK,DSN=ZMMHT.NOV7811.US.DATA,
//           DISP=(NEW,CATLG),SPACE=(CYL,10),
//           DCB=(RECFM=VBS,LRECL=92,BLKSIZE=924)
//GO.FT11F001 DD DSN=ZMMHT.ELTS.NOV78,DISP=SHR
//SORT EXEC SORTD,PARM='CORE=250K,OPT=D'
//SORTIN DD DSN=ZMMHT.NOV7811.US.DATA,DISP=(OLD,DELETE)
//SORTWK01 DD UNIT=SYSDA,SPACE=(CYL,2)
//SORTWK02 DD UNIT=SYSDA,SPACE=(CYL,2)
//SORTWK03 DD UNIT=SYSDA,SPACE=(CYL,2)
//SORTWK04 DD UNIT=SYSDA,SPACE=(CYL,2)
//SORTWK05 DD UNIT=SYSDA,SPACE=(CYL,2)
//SORTOUT DD UNIT=DISK,DSN=ZMMHT.NOV7811.SORTED.DATA,
//           DISP=(NEW,CATLG),SPACE=(CYL,10),
//           DCB=(RECFM=VBS,LRECL=92,BLKSIZE=924)
  SORT FIELDS=(37,4,BI,A,41,4,BI,A,45,8,BI,A),SIZE=E1000009
  RECORD TYPE=V,LENGTH=(92,92,92)
  END
```

Fig. A5-1. JCL used to process a ship tape and sort the output. This is run as one job.

Subroutines appear in alphabetical order after the main program. OTIME, GKEP, LONGIT, GETTIM, XORB, and YORB are listed in the report "Finding the Times that SMMR Observed a Ship" and do not appear here.

```
//MERGE EXEC SORTD,PARM='CORE=250K,OPT=D'
//SORTIN01  DD  UNIT=DISK,DSN=ZMMHT.NOV7811.SORTED.DATA,DISP=OLD
//SORTIN02  DD  UNIT=DISK,DSN=ZMMHT.NOV7821.SORTED.DATA,DISP=OLD
//SORTIN03  DD  UNIT=DISK,DSN=ZMMHT.NOV7831.SORTED.DATA,DISP=OLD
//SORTOUT   DD  UNIT=(9TRACK,,DEFER),LABEL=(1,NL,,OUT),DISP=(NEW,KEEP),
//    DCB=(RECFM=VBS,LRECL=92,BLKSIZE=924,DEN=3),
//    VOL=SER=MHT004
//SYSIN     DD  *
  MERGE FIELDS=(37,4,BI,A,41,4,BI,A,45,8,BI,A),SIZE=E1000009
  RECORD TYPE=V,LENGTH=(92,92,92)
  END
```

Fig. A5-2. JCL used to merge sorted ship, buoy, and radiosonde files.

```
               C-----------------------------------------------------------------
               C         M A I N
               C-----------------------------------------------------------------
               C   THIS PROGRAM READS USER INPUT  NAMELIST VARIABLES READS THE
               C REQUESTED  DATA FILE AND WRITES A SUBSET OF THAT DATA FILE.
               C THIS SUBSET SHOULD CONTAIN DATA RECORDS FOR SHIPS,BOOYS AND/OR
               C RADIOSONDE, WHICH NIMBUS MAY HAVE OVERFLOWN WITHIN A SPECIFIED
               C TIME LIMIT.
               C
0001                 IMPLICIT REAL*8 (D)
               C
0002                COMMON /SHIPRC/DLAT,DLCN,DTOBS,IPOBS,IHR,IDAY,IMO,IYR,LPILL,
                   &               ICURSP,ISHPAR,IPRINT,ITOTSP
0003                 INTEGER ISHPAR(100)
0004                REAL*8 DLAT,DLCN,DTOBS(4)
0005                 DIMENSION IPOBS(4)
0006                LOGICAL LPILL
0007                COMMON /NAMEIN/ATYPE,ATAPE,KIND,MAXREC,ISKPRC,LPRINT
0008                 REAL*8 ATYPE(3),ATAPE
0009                LOGICAL LPRINT
0010                COMMON/TIME  /XCPU,XIO
               C
0011                 NAMELIST /INPUT/KIND,ISKPRC,MAXREC,ATAPE,LPRINT
0012                 READ(5,INPUT)
0013                 WRITE(6,INPUT)
0014                 IF(KIND.LE.0.OR.KIND.GT.3)STOP
               C
               C   CALL THE ROUTINE TO PROCESS THE TYPE OF DATA REQUESTED IN
               C THE NAMELIST.
               C KIND=1 FOR SHIP DATA
               C KIND=2 FOR BUOY DATA
               C KIND=3 FOR RADIOSONDE DATA
               C
0015                 ICOINS=0
0016                 IF(KIND.LE.2)CALL BUSHIP(KIND,ISKPRC,MAXREC,IREC,IKEPT,IERSUM,
                   &                 ICOINS)
0017                 IF(KIND.EQ.3)CALL RAISON(ISKPRC,MAXREC,IREC,IKEPT,IERSUM,ICOINS)
               C
               C   WRITE A BRIEF SUMMARY OF PROCESSING FOR THIS TAPE.
               C
0018                 WRITE(6,100)ATAPE,ATYPE(KIND),IREC,ICOINS,IKEPT,IERSUM,
                   & XCPU,XIO
0019                 WRITE(6,101)(ISHPAR(J),J=1,ITOTSP)
0020                 STOP
0021           100   FORMAT(//1X,'PROCESSING COMPLETED FOR TAPE ',A6,1X,
                   &            A8,1X,'DATA WAS PROCESSED',
                   &        /1X,I6,1X,'RECORDS WERE READ'
                   &        /1X,I6,1X,'COINCIDENCES WERE FOUND'
                   &         /1X,I6,1X,'COINCIDENCES WERE WITHIN RANGE'
                   &        /1X,I6,1X,'ERRORS WERE ENCOUNTERED'
                   &/1X,F6.2,1X,'SEC CPU AND ',F6.2,1X,'SEC I-O TIME WAS REMAINING'
                   &/1X,7X,'THE FOLLOWING SHIPS CONTRIBUTED')
0022           101   FORMAT(1X,I4)
0023                 END
```

```
                C-----------------------------------------------------------------      00000010
0001                  BLOCK DATA                                                       00000020
                C-----------------------------------------------------------------      00000030
                C                                                                      00000040
                CSTART                                                                 00000050
                C                                                                      00000060
0002                  COMMON /INBUF /LICATA                                            00000070
0003                  LOGICAL*1 LICATA(6000)                                           00000080
                C                                                                      00000090
0004                  COMMON /SHIPRC/DLAT,DLOB,DTOBS,IFOBS,INB,IDAY,IMO,IYR,LFILL,     00000100
                     &                 ICURSP,ISHPAR,IPRINT,ITOTSP                   00000110
0005                   INTEGER ISHPAR(100)                                           00000120
0006                  REAL*8 DLAT,DLOB,DTOBS(4)                                      00000130
0007                   INTEGER IFOBS(4)                                              00000140
0008                  LOGICAL LFILL                                                    00000150
                C                                                                      00000160
0009                  COMMON /BABEIN/ATYPE,ATAPE,KIND,MAXREC,ISKPRC,LPRINT             00000170
0010                   REAL*8 ATYPE(3),ATAPE                                         00000180
0011                  LOGICAL LPRINT                                                   00000190
0012                  COMMON/TIME  /ICPU,XIO                                           00000200
                C                                                                      00000210
                CS10P                                                                  00000220
                C                                                                      00000230
0013                  DATA ICURSP/'0000'/,ITOTSP/0/                                    00000240
0014                  DATA KIND/0/,MAXREC/10000/,LPRINT/1/,ATAPE/'XXXXXX'/             00000250
0015                  DATA ATYPE/'SHIP','BUOY','BAOBS'/                                00000260
0016                  DATA ICPU,XIO/20*99.99/                                          00000270
0017                  END                                                              00000280
```

```
                C-------------------------------------------------------------------  00000290
0001                  SUBROUTINE BUSHIP(IFILE,ISHPRC,MAXREC,IREC,IKEPT,IERSUM,ICOINS)  00000300
                C-------------------------------------------------------------------  00000310
                C                                                                     00000320
                C     THIS PROGRAM PROCESSES BUOY AND SHIP REPORT DATA. IT READS      00000330
                C   THROUGH THE DATA FILE TO A MAXIMUM NUMBER OF RECORDS, AND         00000340
                C   TESTS EACH DATA RECORD TO SEE IF SAMR COULD HAVE OBSERVED IT.     00000350
                C   IF SUCH A COINCIDENCE IS FOUND THEN THE RECORD IS WRITTEN TO      00000360
                C   TO AN INTERMEDIATE DISK FILE.                                    00000370
                C                                                                     00000380
0002                    IMPLICIT REAL*8 (D)                                           00000390
                C                                                                     00000400
0003                  COMMON /INBUF /L1DATA                                           00000410
0004                  LOGICAL*1 L1DATA(6000)                                          00000420
0005                  COMMON /SHIPRC/DLAT,DLON,DTOBS,IFOBS,IMO,IDAY,IYR,LFILL,        00000430
                     &                ICURSP,ISHPAR,IPRINT,ITOTSP                    00000440
0006                    INTEGER ISHPAR(100)                                           00000450
0007                  REAL*8 DLAT,DLON,DTOBS(4)                                       00000460
0008                    DIMENSION IFOBS(4)                                            00000470
0009                  LOGICAL LFILL                                                   00000480
0010                  COMMON/TIME  /ICPU,IIO                                          00000490
                C                                                                     00000500
0011                    LOGICAL LCOIN,LTIMOT                                          00000510
0012                    DTLIM=0.01D0/60.D0                                            00000520
0013                    IHALF=17                                                      00000530
0014                    ITER=3                                                        00000540
                C                                                                     00000550
                C   POSITION TAPE TO FILE 2 FOR THE START OF THE BUOY DATA           00000560
                C OR TO FILE 1 FOR SHIP DATA                                        00000570
                C                                                                     00000580
0015                    CALL POSB(1,15,IFILE)                                         00000590
0016                    IREC=0                                                        00000600
0017                    IPRINT=0                                                      00000610
0018                    IKEPT=0                                                       00000620
0019                    IERSUM=0                                                      00000630
0020                  LTIMOT=.FALSE.                                                  00000640
                C                                                                     00000650
                C   READ A DATA RECORD AND UNPACK VARIABLES NEEDED TO TEST FOR      00000660
                C A COINCIDENCE. IF THIS RECORD CONTAINED FILL DATA THEN DISREGARD   00000670
                C IT AND GO ON TO THE NEXT.                                         00000680
                C                                                                     00000690
0021              1    CONTINUE                                                      00000700
0022                  LCOIN=.FALSE.                                                   00000710
0023                    IF(IREC.GT.MAXREC) RETURN                                     00000720
0024                    CALL FDTAB(L1DATA(1),15,ILENGT,62,63)                         00000730
0025                    IREC=IREC+1                                                   00000740
0026                    IF(IREC.LE.ISHPRC) GO TO 1                                    00000750
0027                    CALL UNPKSH                                                   00000760
0028                    IF(LFILL)GO TO 1                                              00000770
                C                                                                     00000780
                C   EVERY HUNDRED RECORDS CHECK TO SEE HOW MUCH TIME IS            00000790
                C REMAINING. IF LESS THAN  15 SECS TIME IS REMAINING IN EITHER      00000800
                C CPU OR IO TIME THEN TERMINATE JOB AND WRITE A RESTART RECORD      00000810
                C                                                                     00000820
```

54

```
0029            IF((MOD(IREC,300)).EQ.0)CALL LTIME(LTIMOT,IREC)
0030            IF(LTIMCT)RETURN
          C
          C CALL MIKE TOPOREK'S PROGRAM OTIME TO TEST FOR A SMMR
          C COINCIDENCE. IF A COINCIDENCE IS FOUND , THEN A CORRESPONDING
          C ELEMENT IN IPOBS SHOULD HAVE BEEN SET.
          C
0031            CALL OTIME(DLON,ELAT,DTOBS,DTLIM,IPOBS,IERP,IWALP,ITFB,
               &            INN,IDAT,ITN)
          C
          C   IF A COINCIDENCE WAS FOUND THEN CALL WRITSB TO CHOOSE THE
          C OBSERVATION CLOSEST TO THE SMMR OVERFLIGHT AND WRITE IT OUT
          C
0032            DO 11 I=1,4
0033               IF(IPOBS(I).EQ.1.AND.IERF.EQ.0)LCOIN=.TRUE.
0034         11 CONTINUE
0035            IF(LCOIN)ICOINS=ICOINS+1
0036            IF(LCOIN)CALL WRITSB(IREPT)
0037            IF(IERF.GT.0)IERSUM=IERSUM+1
0038            GO TO 1
          C
          C   WHEN AN END OF FILE IS ENCOUNTERED ON THE BUOY OR SHIP FILE
          C   WRITE MESSAGE AND RETURN
          C
0039       2    CONTINUE
0040            WRITE(6,100)
0041            RETURN
          C
          C   IF A PHYSICAL READ ERROR IS ENCOUNTERED, THEN INCREMENT THE
          C ERROR COUNTER AND TRY TO READ AGAIN UNTIL THE SYSTEM ABORTS
          C
0042       3    CONTINUE
0043            IERSUM=IERSUM+1
0044            GO TO 1
0045       100  FORMAT(1X,'EOF ON UNIT 15')
0046            END
```

```
        COMPILER OPTIONS - NAME=  MAIN,OPT=02,LINECNT=56,SIZE=0000K,
                           SOURCE,EBCDIC,NOLIST,NODECK,LOAD,MAP,NOEDIT,ID,NOXREF
                C-----------------------------------------------------------------
ISN 0002              SUBROUTINE CONVRT(ISTART,ILENGT,INUMBR,RNUMBR,LNEGTV,LERROR)
                C-----------------------------------------------------------------
                C
                C      THIS SUBROUTINE CONVRTS S9 PICTURE FORMAT CHARACTER STRINGS
                C TO REAL OR INTEGER NUMBERS
                C
ISN 0003              COMMON /INPUT /LIDATA
ISN 0004              LOGICAL*1 LIDATA(6000)
                C
ISN 0005               LOGICAL LNEGTV,LERROR
ISN 0006               LOGICAL*1 ANUM(10)/'1','2','3','4','5','6','7','8','9','0'/
ISN 0007               INUMBR=0
ISN 0008               ISTOP=ISTART+ILENGT-1
ISN 0009               IF(LNEGTV) ISTOP=ISTOP-1
ISN 0011               DO 1 J=ISTART,ISTOP
ISN 0012                  LERROR=.TRUE.
ISN 0013                  IEXPNT=ISTOP-J
ISN 0014                  DO 11 I=1,9
ISN 0015                     IF(ANUM(I).EQ.LIDATA(J)) INUMBR=INUMBR+I*10**IEXPNT
ISN 0017                     IF(ANUM(I).EQ.LIDATA(J)) LERROR=.FALSE.
ISN 0019          11      CONTINUE
ISN 0020                  IF(LIDATA(J).EQ.ANUM(10))LERROR=.FALSE.
ISN 0022          1    CONTINUE
ISN 0023               IF(LNEGTV)CALL BNR(INUMBR,LIDATA(ISTART+ILENGT-1))
ISN 0025               RNUMBR=INUMBR
ISN 0026               RETURN
ISN 0027               END
```

```
                C-------------------------------------------------------------------000C2050
0001                  SUBROUTINE LTIME(LTIMCT,IREC)                                 00002060
                C-------------------------------------------------------------------000C2070
                C                                                                   00002080
                C   THIS SUBROUTINE CALCULATE THE TIME REMAINING  IN THE JOB        00002090
                C AND ,IF EITHER CPU OR IO TIME IS LESS THAN 10 SECONDS THEN        00002100
                C IT SETS A FLAG TO TERMINATE THE JOB.                              00002110
                C                                                                   00002120
0002                  COMMON/TIME  /XCPU,XIO                                        00002130
                C                                                                   00002140
0003                   LOGICAL LTIMOT                                               00002150
0004                   LTIMOT=.FALSE.                                               00002160
0005                   CALL REMTIM(ICPU,IIO)                                        00002170
0006                   XCPU=ICPU                                                    00002180
0007                   XIO=IIO                                                      00002190
0008                   ITREC=IREC-1                                                 00002200
0009                   IF(XCPU.LT.10..OR.XIO.LT.10.)LTIMOT=.TRUE.                   00002210
0010                   IF(LTIMOT)WRITE(6,100)XCPU,XIO,ITREC                         00002220
0011              100  FORMAT(1X,'JOB BEING TERMINATED BY TIME OUT ROUTINE'         00002230
                     6/1X,'CPU=',F6.2,1X,'IO=',F6.2,1X,'TOTAL RECORDS READ=',I6)    00002240
0012                   &RETURN                                                      00002250
0013                   END                                                          00002260
```

```
          C-------------------------------------------------------------
0001            FUNCTION NDAY(IYR,IMO,IDAY)
          C-------------------------------------------------------------
          C
          C   THIS FUNCTION CONVERTS YEAR MONTH AND DAY OF MONTH TO YEAR
          C AND DAY OF YEAR.
          C
0002            DIMENSION NUMDAY(12)
0003            DATA NUMDAY/0,31,59,90,120,151,181,212,243,273,304,334/
0004            IF((MOD(IYR,4).EQ.0).AND.(IMO.GT.2))IDAY=IDAY+1
0005            NDAY=NUMDAY(IMO)+IDAY-1
0006          IF(IYR.GT.1978) NDAY=NDAY+(IYR-1978)*365
0007          IF(IYR.GT.1980) NDAY=NDAY+1
0008            RETURN
0009          END
```

```
0001          FUNCTION BLEVEL(ILOC)                                    00015260
0002          COMMON /IBBUF /LIDATA                                    00015270
0003          LOGICAL*1 LIDATA(6000)                                   00015280
0004          LOGICAL LERROR                                           00015290
0005          CALL CONVRT(ILOC,2,BL,IERR,.FALSE.,LERROR)               00015300
0006          IF((LERROR).OR.(BL.EQ.99)) ILOC=-ILOC                    00015310
0007          BLEVEL=BL                                                00015320
0008          RETURN                                                   00015330
0009          END                                                      00015340
```

```
LEVEL  21.6  (EEC 72)                    03/360  FORTRAN H                              DATE  79.274/18.01.56

          COMPILER OPTIONS - NAME=  MAIN,OPT=02,LINECNT=56,SIZE=0000K,
                             SOURCE,EBCDIC,NOLIST,NODECK,LOAD,MAP,NOEDIT,ID,NOXREF
   ISN 0002            SUBROUTINE SUB(IFLD,ISGN)                                    00000290
   ISN 0003            LOGICAL*1 ISGN                                               00000300
   ISN 0004            LOGICAL*1 IP                                                 00000310
   ISN 0005            LOGICAL*1 LAST                                               00000320
   ISN 0006            LOGICAL*1 MIN                                                00000330
   ISN 0007            DIMENSION IP(11),MIN(11),NN(11)                              00000340
   ISN 0008            DATA IP/1HA,1HB,1HC,1HD,1HE,1HF,1HG,1HH,1HI,1H7,1H /         00000350
   ISN 0009            DATA MIN/1HJ,1HK,1HL,1HM,1HN,1HO,1HP,1HQ,1HR,1HI,1H /        00000360
   ISN 0010            DATA NN/1,2,3,4,5,6,7,8,9,0,0/,LAST/1H*/                     00000370
   ISN 0011            IF(ISGN.EQ.LAST)GO TO 20                                     00000380
   ISN 0012            DO 10 K=1,11                                                 00000390
   ISN 0013            IF(ISGN.EQ.IP(K))GO TO 30                                    00000400
   ISN 0014            IF(ISGN.EQ.MIN(K))GO TO 40                                   00000410
   ISN 0015      10    CONTINUE                                                     00000420
   ISN 0016      20    IFLD=10*IFLD                                                 00000430
   ISN 0017            RETURN                                                       00000440
   ISN 0018      30    IFLD=IFLD*10+NN(K)                                           00000450
   ISN 0019            RETURN                                                       00000460
   ISN 0020      40    IFLD=-(IFLD*10+NN(K))                                        00000470
   ISN 0021            RETURN                                                       00000480
   ISN 0022            END                                                          00000490
```

04

```
            C---------------------------------------------------------------    00002940
                                                                                00002950
 0001             SUBROUTINE OBTIME(IYS,IDAY,DHR,IHR,DMINTM)
            C---------------------------------------------------------------    00002960
 0002             IMPLICIT REAL*8 (D)                                           00002970
            C                                                                   00002980
            C   THIS SUBROUTINE CONVERTS TIME SINCE NIMBUS OBSERVATION TIME     00002990
            C 10 NIMBUS OBSERVATION TIME.                                       00003000
            C                                                                   00003010
 0003             DHR=DFLOAT(IHR)+DMINTM                                        00003020
            C                                                                   00003030
 0004             IF(DHR.GT.24.D0) IDAY=IDAY+1                                  00003040
 0005             IF(DHR.GT.24.D0) DHR=DHR-24.D0                                00003050
            C                                                                   00003060
 0006             IF(DHR.LT.0.D0) IDAY=IDAY-1                                   00003070
 0007             IF(DHR.LT.0.D0) DHR=DHR+24.D0                                 00003080
            C                                                                   00003090
 0008             RETURN                                                        00003100
 0009             END                                                           00003110
```

```
                C-----------------------------------------------------------------      00001120
0001                  SUBROUTINE RADSON(ISKPRC,MAXREC,IREC,IKEPT,IERSUM,ICOINS)        00001130
                C-----------------------------------------------------------------      00001140
                C                                                                      00001150
                C     THIS PROGRAM PROCESSES RADIOSONDE REPORT DATA. IT READS          00001160
                C   THROUGH THE DATA FILE TO A MAXIMUM NUMBER OF RECORDS, AND          00001170
                C   TESTS EACH DATA RECORD TO SEE IF SHAR COULD HAVE OBSERVED IT.      00001180
                C   IF SUCH A COINCIDENCE IS FOUND THEN THE RECORD IS WRITTEN TO       00001190
                C   TO AN INTERMDIATE DISK FILE.                                      00001200
                C                                                                      00001210
0002                    IMPLICIT REAL*8 (D)                                            00001220
                C                                                                      00001230
0003                  COMMON /INBUF /L1DATA                                            00001240
0004                  LOGICAL*1 L1DATA(6000)                                           00001250
0005                  COMMON /SHIPRC/DLAT,DLON,DTOBS,IPOBS,IHR,IDAY,IMO,IYR,LFILL,     00001260
                     &                ICURSR,ISHPAR,IPRINT,ITOTSP                     00001270
0006                    INTEGER ISHPAR(100)                                            00001280
0007                  REAL*8 DLAT,DLON,DTOBS(4)                                        00001290
0008                   DIMENSION IPOBS(4)                                              00001300
0009                  LOGICAL LFILL                                                    00001310
0010                  COMMON/TIME  /ICPU,XIO                                           00001315
                C                                                                      00001320
0011                   LOGICAL LCOIN,LTIMOT                                            00001330
0012                   DTLIM=0.01D0/60.D0                                              00001340
0013                   IHALF=17                                                        00001350
0014                   ITER=3                                                          00001360
                C                                                                      00001400
0015                   CALL PGSN(1,15,1)                                               00001410
0016                   IREC=0                                                          00001420
0017                   IPRINT=0                                                        00001430
0018                   IKEPT=0                                                         00001440
0019                   IERSUM=0                                                        00001450
0020                  LTIMOT=.FALSE.                                                   00001460
                C                                                                      00001470
                C   READ A DATA RECORD AND UNPACK VARIABLES NEEDED TO TEST FOR        00001480
                C A COINCIDENCE. IF THIS RECORD CONTAINED FILL DATA THEN DISREGARD     00001490
                C IT AND GO ON TO THE NEXT.                                           00001500
                C                                                                      00001510
0021              1    CONTINUE                                                       00001520
0022                  ILOC=3                                                         00001530
0023                  IPREV=0                                                        00001540
0024                  LENGOB=23                                                      00001550
0025                   IF(IREC.GT.MAXREC) RETURN                                     00001560
0026                   CALL FREAD(L1DATA(1),15,ILENGT,&2,&3)                         00001570
0027                   IREC=IREC+1                                                   00001580
0028                   IF(IREC.LE.ISKPRC) GO TO 1                                    00001590
0029              777 ILOC=LENGOB+ILOC                                               00001600
0030                  ILEVEL=NLEVEL(ILOC)                                            00001610
0031                  IF(ILOC.LT.0) GO TO 1                                          00001620
0032                  CALL UNPKBA(IPREV)                                             00001630
0033                  IF(LFILL) GO TO 20                                             00001640
                C   EVERY HUNDRED RECORDS UREAL CHECK TO SEE HOW MUCH TIME IS       00001650
                C REMAINING. IF LESS THAN  15 SECS TIME IS REMAINING IN EITHER      00001660
                C CPU OR IO TIME THEN TERMINATE JOB AND WRITE A RESTART RECORD      00001670
```

```
                C                                                               00003680
0034                  IF((MOD(ISEC,300)).EQ.0)CALL LTIME(LTIMOT,IREC)           00003690
0035                  IF(LTIMCT)RETURN                                          00003700
                C                                                               00003710
                C CALL MIKE TCIOREK'S PROGRAM OTIME TO TEST FOR A SHAR          00003730
                C COINCIDENCE. IF A COINCIDENCE IS FOUND , THEN A CORRESPONDING 00003740
                C ELEMENT IN IPOBS SHOULD HAVE BEEN SET.                        00003750
                C                                                               00003760
0036                  CALL OTIME(DLON,DLAT,DTOPS,DTLIM,IPOBS,IERP,INALP,ITER,   00003780
                     &             IHR,IDAY,ITH)                                00003790
                C                                                               00003800
                C   IF A COINCIDENCE WAS FOUND THEN CALL WRITRA TO CHOOSE THE  00003810
                C OBSERVATION CLOSEST TO THE SHAR OVERFLIGHT AND WRITE IT OUT    00003820
                C                                                               00003830
0037                  LCOIN=.FALSE.                                             00003840
0038                  DO 11 I=1,4                                               00003850
0039                     IF(IPOBS(I).EQ.1.AND.IERP.EQ.0)LCOIN=.TRUE.            00003860
0040               11 CONTINUE                                                  00003870
0041                  IF(LCOIN)ICOINS=ICOINS+1                                  00003880
0042                  IF(LCOIN)CALL WRITRA(IREPT,ILEVEL,IPREV)                  00003890
0043                  IF(IERP.GT.0)IERSUM=IERSUM+1                              00003900
0044               20 LENGOB=29+25*ILEVEL                                       00003910
0045                  IPREV=IPREV+LENGOB                                        00003920
0046                  IF(IPREV.LT.ILENGT) GO TO 777                             00003930
0047                  GO TO 1                                                   00003940
                C                                                               00003950
                C   WHEN AN END OF FILE IS ENCOUNTERED, WRITE A MESSAGE AND RETURN 00003960
                C                                                               00003970
0048               2  CONTINUE                                                  00003980
0049                  WRITE(6,100)                                              00003990
0050                  RETURN                                                    00004000
                C                                                               00004010
                C   IF A PHYSICAL READ ERROR IS ENCOUNTERED, THEN INCREMENT THE 00004020
                C ERROR COUNTER AND TRY TO READ AGAIN UNTIL THE SYSTEM ABORTS    00004030
                C                                                               00004040
0051               3  CONTINUE                                                  00004050
0052                  IERSUM=IERSUM+1                                           00004060
0053                  GO TO 1                                                   00004070
0054             100  FORMAT(1X,'EOF ON UNIT 15')                              00004080
0055                  END                                                       00004090
```

```
      C-----------------------------------------------------------------------  00004100
0001        SUBROUTINE SHIENC(ISHIEN)                                          00004110
      C-----------------------------------------------------------------------  00004120
      C                                                                        00004130
      C   THIS SUBROUTINE SETS THE CURRENT SHIP NO EQUAL TO THE NEW           00004140
      C SHIP NUMBER AND SEARCHES THE SHIP NUMBER ARRAY TO SEE IF THE           00004150
      C NEW SHIP HAS BEEN ENCOUNTERED BEFORE                                   00004160
      C                                                                        00004170
0002        COMMON /SHIPNC/DLAT,DLCN,DTOBS,IFOBS,INN,IDAY,IMO,IYR,LFILL,     00004180
           &               ICURSP,ISHPAR,IPRINT,ITOTSP                       00004190
0003         INTEGER ISHPAR(100)                                             00004200
0004        REAL*8 DLAT,DLCN,DTOBS(4)                                        00004210
0005         DIMENSION IFOBS(4)                                              00004220
0006        LOGICAL LFILL                                                    00004230
      C                                                                        00004240
0007         ICURSP=ISHIEN                                                   00004250
0008         DO 1 I=1,ITOTSP                                                 00004260
0009            IF(ISHPAR(I).EQ.ICURSP) RETURN                               00004270
0010       1    CONTINUE                                                     00004280
0011         ITOTSP=ITOTSP+1                                                 00004290
0012         ISHPAR(ITOTSP)=ICURSP                                           00004300
0013         RETURN                                                          00004310
0014        END                                                              00004320
```

```
          C-----------------------------------------------------------------
0001            SUBROUTINE TEMP(ISTART,ISNLOC,XCELTP,XKELTP)
          C-----------------------------------------------------------------
          C
          C   THIS SUBROUTINE CONVRTS AN EBCIDIC CHARACTER STRING (S9 PICTURE
          C FORMAT) TO A SIGNED TEMPERATURE IN BOTH CELSIUS AND KELVIN
          C
0002           COMMON /INBUF /LIDATA
0003           LOGICAL*1 LIDATA(6000)
0004            LOGICAL LERROR
          C
          C   IF THE TEMP INDICATOR EXISTS, UNPACK IT AND DETERMINE SCALING
          C FACTOR FOR TEMPERATURES
          C
0005            CALL CONVRT(45,1,IFACTR,IDUMMY,.FALSE.,LERROR)
0006            IF(LERROR)GO TO 1
0007            XFACTR=1.
0008            IF(IFACTR.EQ.1)XFACTR=.1
0009            IF(IFACTR.EQ.5)XFACTR=.5
          C
          C   FIND LENGTH OF VARIIBLE AND UNPACK INTEGER PORTION OF
          C FIELD
          C
0010            ILENGT=(ISNLOC-ISTART)+1
0011            CALL CONVRT(ISTART,ILENGT,IDUMMY,XCELTP,.TRUE.,LERROR)
0012            IF(LERROR)GO TO 1
          C
          C   CONVRT TEMP TO KELVIN AND SCALE BOTH TEMPERATURES USING THE
          C SCALING FACTOR
          C
0013            XCELTP=XCELTP*XFACTR
0014            XKELTP=XCELTP+273.15
0015            RETURN
0016        1   XCELTP=-99.99
0017            XKELTP=-99.99
0018            RETURN
0019           END
```

```
0001              SUBROUTINE UNPKBA(IPREV)                                  00004700
0002              IMPLICIT REAL*8 (D)                                       00004710
                C                                                           00004720
0003              COMMON /INBUF /LIDATA                                     00004730
0004              LOGICAL*1 LIDATA(6000)                                    00004740
0005              COMMON /SHIPRC/DLAT,DLON,FSOBS,IFOBS,IMO,IDAY,IYR,LPILL,  00004750
                 &                ICURSP,ISHPAR,IPRINT,ITOTSP             00004760
0006               INTEGER ISHPAR(100)                                      00004770
0007              REAL*8 DLAT,DLCN,FTOBS(4)                                 00004780
0008               DIMENSION IFOBS(4)                                       00004790
0009              LOGICAL LPILL                                             00004800
                C                                                           00004810
0010              LOGICAL LERROR                                            00004820
                C                                                           00004830
0011              LPILL=.TRUE.                                              00004840
                C                                                           00004850
                C   CHECK TO SEE IF THIS IS A SHIP RECORD                   00004860
                C                                                           00004870
0012              CALL CONVRT((IPREV+9),2,ISHIP,IDUM,.FALSE.,LERROR)        00004880
0013              IF((ISHIP.NE.99).OR.(LERROR)) RETURN                      00004890
                C                                                           00004900
                C   GET LATITUDE                                           00004910
                C                                                           00004920
0014                CALL CONVRT((IPREV+11),3,IDUM,XLAT,.TRUE.,LERROR)       00004930
0015              IF((LERROR).OR.(ABS(XLAT).GT.900.)) RETURN                00004940
0016              DLAT=DBLE(XLAT)*0.100                                     00004950
                C                                                           00004960
                C   LONGITUDE                                              00004970
                C                                                           00004980
0017              CALL CONVRT((IPREV+24),2,ISHIP,IDUM,.FALSE.,LERROR)       00004990
0018              IF((ISHIP.NE.99).OR.(LERROR)) RETURN                      00005000
0019              CALL CONVRT(30,4,IDUM,XLON,.FALSE.,LERROR)                00005010
0020              IF((LERROR).OR.(XLON.GT.3600.)) RETURN                    00005020
0021              DLON=DBLE(XLON)*0.100                                     00005030
                C                                                           00005040
                C   YEAR                                                   00005050
                C                                                           00005060
0022              CALL CONVRT((IPREV+14),2,IYR,IDUM,.FALSE.,LERROR)         00005070
0023              IF((LERROR).OR.(IYR.EQ.99)) RETURN                        00005080
0024              IYR=IYR+1900                                              00005090
                C                                                           00005100
                C   MONTH                                                  00005110
                C                                                           00005120
0025              CALL CONVRT((IPREV+16),2,IMO,IDUM,.FALSE.,LERROR)         00005130
0026              IF((LERROR).OR.(IMO.LT.1).OR.(IMO.GT.12)) RETURN          00005140
                C                                                           00005150
                C   DAY                                                    00005160
                C                                                           00005170
0027              CALL CONVRT((IPREV+18),2,IDAY,IDUM,.FALSE.,LERROR)        00005180
0028              IF((LERROR).OR.(IDAY.LT.1).OR.(IDAY.GT.31)) RETURN        00005190
0029              IDAY=NDAY(IYR,IMO,IDAY)                                   00005200
                C                                                           00005210
                C   HOUR                                                   00005220
                C                                                           00005230
```

```
0030              CALL CONVRT((IPREV+20),2,INR,XDUM,.FALSE.,LERROR)          00005240
0031              IF((LERROR).OR.(INR.GT.23)) RETURN                         00005250
                C                                                            00005260
                C   EVERYTHING OK, SO RESET LFILL                           00005270
                C                                                            00005280
0032              LFILL=.FALSE.                                              00005290
0033              RETURN                                                     00005300
0034              END                                                        00005310
```

```
      C-----------------------------------------------------------------
0001        SUBROUTINE UNPKSE
      C-----------------------------------------------------------------
      C
      C  THIS PROGRAM UNPACKS THE VALUES NECESSARY TO TEST FOR A
      C SHHH COINCIDENCE AND STORES THEM INTO COMMON SHIPRC. IT ALSO
      C TESTS THE FIRST VALUE UNPACKED TO SEE IF THIS RECORD HAS
      C BEEN FILLED WITH FILL DATA.
      C
0002        IMPLICIT REAL*8 (D)
      C
0003       COMMON /INBUF /LIDATA
0004       LOGICAL*1 LIDATA(6000)
0005       COMMON /SHIPRC/DLAT,DLON,DTOBS,IPOBS,INS,IDAT,IMO,ITR,LFILL,
          &            ICUBSP,ISNPAR,IPRINT,ITOTSP
0006        INTEGER ISNPAR(100)
0007       REAL*8 CLAT,DLCN,DTOBS(4)
0008        DIMENSION IPOBS(4)
0009       LOGICAL LFILL
      C
0010        LOGICAL LERROR
0011        LFILL=.TRUE.
      C
0012        CALL CCNVRT(13,4,IDUMMY,ILON,.FALSE.,LERROR)
0013        IF((ILON.GT.1800.).OR.(LERROR)) RETURN
0014        DLON=DBLE(ILON)*0.1D0
      C
0015        CALL CCNVRT(10,3,IDUMMY,ILAT,.FALSE.,LERROR)
0016       IF((LERROR).OR.(ILAT.GT.900.)) RETURN
0017        DLAT=DBLE(ILAT)*0.1D0
      C
0018        CALL CCNVRT(9,1,IQDRNT,IDUMMY,.FALSE.,LERROR)
0019       IF((LERROR).OR.(IQDRNT.LT.1).OR.(IQDRNT.GT.4)) RETURN
0020        IF(IQDRNT.GT.2) DLAT=DLAT*(-1.)
0021        IF((MOD(IQDRNT,2)).EQ.0) DLON=360.-DLON
0022       IF(((DLAT.EQ.0.D0).AND.(DLON.EQ.0.D0)).OR.(LERROR))
          $      RETURN
      C
0023        CALL CCNVRT(17,4,ITR,IDUMMY,.FALSE.,LERROR)
0024       IF(LERROR) RETURN
      C
0025        CALL CCNVRT(21,2,IMO,IDUMMY,.FALSE.,LERROR)
0026        IF((LERROR).OR.(IMO.LT.1).OR.(IMO.GT.12)) RETURN
      C
0027        CALL CONVRT(23,2,IDAT,IDUMMY,.FALSE.,LERROR)
0028        IF((LERROR).OR.(IDAT.LT.1).OR.(IDAT.GT.31)) RETURN
0029        IDAT=NDAT(ITR,IMO,IDAT)
      C
0030        CALL CCNVRT(25,2,INR,IDUMMY,.FALSE.,LERROR)
0031        IF((LERROR).OR.(INR.GT.23)) RETURN
0032       LFILL=.FALSE.
0033        RETURN
0034        END
```

```
                C-----------------------------------------------------------------      00013810
0001                  SUBROUTINE WRITRA(IREPT,ILEVEL,IPREV)                           00013820
                C-----------------------------------------------------------------      00013830
                C                                                                      00013840
                C   THIS SUBROUTINE SELECTS THE OBSERVATION THAT IS CLOSEST TO        00013850
                C THE SHAR OBSERVATION TIME , UNPACKS THE REMAINING RET DATA,          00013860
                C AND WRITES THE RECORD TO AN INTERMEDIATE DISK FILE                   00013870
                C                                                                      00013880
0002                   IMPLICIT REAL*8 (D)                                             00013890
                C                                                                      00013900
0003                  COMMON /INBUF /LIDATA                                           00013910
0004                  LOGICAL*1 LIDATA(6000)                                          00013920
0005                  COMMON /SHIPRC/DLAT,DLON,DTOBS,IPOBS,INR,IDAY,IMO,IYR,LFILL,    00013930
                     &                ICURSE,ISHPAR,IPRINT,ITOTSP                    00013940
0006                   INTEGER ISHPAR(100)                                            00013950
0007                  REAL*8 DLAT,DLON,DTOBS(8)                                       00013960
0008                   DIMENSION IPOBS(8)                                             00013970
0009                  LOGICAL LFILL                                                   00013980
0010                  COMMON /HANDIN/RTYPE,ATAPE,KIND,MAXREC,ISKPRC,LPRINT            00013990
0011                   REAL*8 RTYPE(3),ATAPE                                          00014000
0012                  LOGICAL LPRINT                                                  00014010
                C                                                                      00014020
0013                   LOGICAL LERROR                                                 00014030
0014                   REAL*8 T(98),RR(98),P(98),RVRA(98),VAV(98),DP(98)              00014040
0015                  DATA ISORFT,RMRTBT,RASDIF/3*-99.99/,IPRESR/-1/                  00014050
                C                                                                      00014070
0016                  IRTRAP=-99.99                                                   00014080
0017                  LINTRG=1                                                        00014090
0018                  ICURSP=-999                                                     00014100
                C                                                                      00014110
                C   SELECT THE CLOSEST OBSERVATION BY FINDING THE MINIMUM OF THE      00014120
                C OBSERVATION TIMES ARRAY.                                          00014130
                C                                                                      00014140
0019                   DMINTM=99999.DO                                                00014150
0020                   DO 1 I=1,8                                                     00014160
0021                      IF(DABS(DTOBS(I)).LT.DABS(DMINTM).AND.IPOBS(I).EQ.1)        00014170
                     &DMINTM=DTOBS(I)                                                00014180
0022                1    CONTINUE                                                     00014190
0023                   IF(DABS(DMINTM).GT.1.500)RETURN                                00014200
                C                                                                      00014220
0024                   CALL CONVRT((IPREV+49),3,IDUMMY,XWSPED,.FALSE.,LERROR)         00014230
0025                  IF(.NOT.LERROR) XWSPED=0.514579*XWSPED                          00014240
0026                  IF(LERROR) XWSPED=-99.99                                        00014250
0027                  ITEMP=IPREV+8                                                   00014260
0028                  CALL CONVRT(ITEMP,1,IDUMMY,XDRYBT,.TRUE.,LERROR)                00014270
0029                  IF((.NOT.LERROR).AND.(XDRYBT.NE.-999.)) XDRYBT=(XDRYBT*0.8)+273.15  00014280
0030                  IF((LERROR).OR.(XDRYBT.EQ.-999.)) XDRYBT=-99.99                 00014290
0031                  IF((LERROR).OR.(XDRYBT.EQ.-999.)) LINTRG=0                      00014300
                C                                                                      00014310
                C   SURFACE PRESSURE                                                 00014320
                C                                                                      00014330
0032                   IPR=IPREV+30                                                   00014340
0033                   CALL CONVRT(IPR,5,IDUMMY,XPRESR,.FALSE.,LERROR)                00014350
0034                   IF(LERROR) XPRESR=-9999.                                       00014360
```

```
0035              IF((LERROR).OR.(IPRESS.EQ.99999.)) LINTEG=0                    000 18810
0036              IPRESS=IPRESS*0.1                                              000 18820
                  C                                                              000 18830
0037               IREPT=IREPT+1                                                 000 18840
                  C                                                              000 18850
                  C   CONVERT OBSERVATION TIME TO ACTUAL WINDOS OBSERVATION TIME 000 18860
                  C                                                              000 18870
0038               IYRSTA=IYR                                                    000 18880
0039               IDASTA=IDAY                                                   000 18890
0040               DHRSTA=IHR                                                    000 18900
0041               CALL OPTIME(IYR,IDAY,DHR,IHR,DMIBTH)                          000 18910
                  C                                                              000 18553
                  C   WATER VAPOR INTEGRATION                                   000 18560
                  C                                                              000 18570
0042               NTOP=1                                                        000 18580
                  C    IF(LINTEG.EQ.0) RETURN                                    000 18590
0043               T(1)=IDRYBT-273.15                                            000 18600
0044               P(1)=IPRESS                                                   000 18610
0045               IRH=IPREV*63                                                  000 18620
0046               CALL CONVRT(IRH,3,IDUMMY,RH(1),.TRUE.,LERROR)                 000 18630
0047               IF((LERROR).OR.(RH(1).LT.0.  ) LINTEG=0                       000 18640
0048               IF(LINTEG.EQ.0) RETURN                                        000 18650
                  C                                                              000 18660
0049               DO 777 I=2,ILEVEL                                             000 18670
0050               INCR=25*(I-1)                                                 000 18680
0051               CALL CONVRT((ITEMP+INCR),3,IDUMMY,T(I),.TRUE.,LERROR)         000 18690
0052               IF((LERROR).OR.(T(I).EQ.-999.)) GO TO 666                     000 18700
0053               T(I)=T(I)*0.1                                                 000 18710
0054               CALL CONVRT((IPR+INCR),5,IDUMMY,P(I),.FALSE.,LERROR)          000 18720
0055               IF((LERROR).OR.(P(I).GT.11000.)) GO TO 666                    000 18730
0056               P(I)=P(I)*0.1                                                 000 18740
0057               CALL CONVRT((IRH+INCR),3,IDUMMY,RH(I),.TRUE.,LERROR)          000 18750
0058               IF((LERROR).OR.(RH(I).LT.0.)) GO TO 666                       000 18760
0059               NTOP=NTOP+1                                                   000 18770
0060               IF(P(I).LE.300.) GO TO 888                                    000 18780
0061               GO TO 777                                                     000 18790
0062           666 IF(P(NTOP).GT.800.) NTOP=NTOP+1                               000 18800
0063               IF(P(NTOP-1).GT.800.) RETURN                                  000 18810
0064               GO TO 888                                                     000 18820
0065           777 CONTINUE                                                      000 18830
0066               IF(P(NTOP).GT.800.) RETURN                                    000 18835
0067           888 DO 1440 I=1,NTOP                                              000 18840
0068               EP=(7.5*T(I))/(237.3+T(I))                                    000 18850
0069               VAPOR=(RH(I)*.01)*6.11*(10.**EP)                              000 18860
0070               RVRA(I)=0.622*VAPOR/(P(I)-0.378*VAPOR)                        000 18870
0071          1440 CONTINUE                                                      000 18880
0072               NTPP=NTOP-1                                                   000 18890
0073               DO 1450 I=1,NTPP                                              000 18900
0074               VAV(I)=(RVRA(I)+RVRA(I+1))*.5                                 000 18910
0075               DP(I)=P(I)-P(I+1)                                             000 18920
0076          1450 CONTINUE                                                      000 18930
0077               SUM=0.                                                        000 18940
0078               DO 1455 I=1,NTPP                                              000 18950
0079          1455 SUM=SUM+VAV(I)*DP(I)                                          000 18960
```

```
                C                                                                       00014970
                C   DIVIDE BY G TO GET CORRECT UNITS                                   00014980
                C                                                                       00014990
0080                  XWTVAP=(SOM/980.665)*1000.                                        00015000
                C                                                                       00015010
0081              999 IF(XWTVAP.LT.0.) RETURN                                           00015020
0082                  IF(LPRINT) IPRINT=IPRINT+1                                        00015025
0083                   IF(MOD((IPRINT+30),31).EQ.0)WRITE(6,100)                         00015030
0084                   IF(LPRINT)WRITE(6,101)ICURSP,DLAT,DLON,IYRSTA,IDASTA,            00015040
                     &                       DHRSTA,IYR,IDAY,DHR,XWSPED,XSURFT,       00015050
                     &                       XPRESR,XDRYBT,XWETBT,XASDIF,IPRESW,      00015060
                     &                        ATYPE(KIND),XWTVAP,ILEVEL               00015070
0085                    WRITE(17)ICURSP,DLAT,DLON,IYRSTA,IDASTA,                        00015080
                     &          DHRSTA,IYR,IDAY,DHR,XWSPED,XSURFT,XPRESR,            00015090
                     &          XDRYBT,XWETBT,XASDIF,IPRESW,KIND,XWTVAP              00015100
                C      WRITE(6,103)  (T(I),P(I),RH(I),I=1,NTOP)                       00015110
0086                    RETURN                                                          00015120
0087              100   FORMAT(//1X,'STA',3X,'STATION',8X,'STATION',8X,'NIMBUS',      00015130
                     &               10X,'WIND',2X,'SURFCE',1X,'SURFCE',1X,'DRY',     00015140
                     &               4X,'BRT',5X,'A/S',4X,'PRES',6X,'WATER'           00015150
                     &         /1X,'NUM',3X,'LAT',4X,'LON',5X,'YR',3X,'DAY',          00015160
                     &          1X,'HR',4X,'YR',3X,'DAY',1X,'HR',5X,'SPEED',         00015170
                     &          1X,'TEMP',3X,'PRESSR',1X,'TEMP',3X,'TEMP',4X,'DIFF', 00015180
                     &          3X,'METH',1X,'TYPE',1X,'VAPOR')                      00015190
0088              101   FORMAT(1X,I4,1X,F6.2,1X,F6.2,3X,I4,1X,I3,                     00015200
                     &         1X,F5.2,1X,I4,1X,I3,1X,F5.2,1X,F6.2,                  00015210
                     &         1X,F6.2,1X,F6.1,1X,F6.2,1X,F6.2,1X,F6.2,              00015220
                     &         2X,I3,2X,A6,1X,F6.2,2X,'ILEVEL=',I4)                  00015230
0089              103 FORMAT(1X,T5,1PG12.5,T20,1PG12.5,T35,1PG12.5)                   00015240
0090                  END                                                           00015250
```

```
           C------------------------------------------------------------
0001             SUBROUTINE WRITSE(IKEPT)
           C-----------------------------------------------------------------
           C
           C   THIS SUBROUTINE SELECTS THE OBSERVATION THAT IS CLOSEST TO
           C THE SMMR OBSERVATION TIME , UNPACKS THE REMAINING MET DATA,
           C AND WRITES THE RECORD TO AN INTERMEDIATE DISK FILE
           C
0002             IMPLICIT REAL*8 (D)
           C
0003            COMMON /INBUF /LIDATA
0004            LOGICAL*1 LIDATA(6000)
0005            COMMON /SHIPBC/CLAT,DLON,DTOBS,IFOBS,INB,IDAT,INO,ITB,LFILL,
              &                ICURSP,ISHPAR,IPRINT,ITOTSP
0006             INTEGER ISHPAR(100)
0007            REAL*8 CLAT,DLON,DTOBS(4)
0008             DIMENSION IFOBS(4)
0009            LOGICAL LFILL
0010            COMMON /NAMEIN/ATYPE,ATAPE,KIND,MAXREC,ISKPRC,LPRINT
0011             REAL*8 ATYPE(3),ATAPE
0012            LOGICAL LPRINT
           C
0013             LOGICAL LERROR
           C   SELECT THE CLOSEST OBSERVATION BY FINDING THE MINIMUM OF THE
           C OBSERVATION TIMES ARRAY.
           C
0014            IERRCT=0
0015             DMINTM=99999.D0
0016             DO 1 I=1,4
0017                IF(DABS(DTOBS(I)).LT.DABS(DMINTM).AND.IFOBS(I).EQ.1)
              &DMINTM=DTOBS(I)
0018        1    CONTINUE
0019            IF(KIND.EQ.1.AND.DABS(DMINTM).GT.1.5D0)RETURN
0020            IF(KIND.EQ.2.AND.DABS(DMINTM).GT.1.5D0)RETURN
           C
           C    IF AN ERROR OCCURED IN WIND SPEED AND SURFACE TEMP THEN
           C DISREGARD THIS RECORD
           C
           C
0021             CALL CONVRT(31,3,IDUMMY,IWSPED,.FALSE.,LERROR)
0022             IF((LERROR).OR.(IWSPED.EQ.999)) IERRCT=IERRCT+1
0023            IF((LERROR).OR.(IWSPED.EQ.999)) IWSPED=-99.99
0024             IF((.NOT.LERROR).AND.(IWSPED.NE.999)) IWSPED=IWSPED*0.51479
0025             CALL TEMP(55,57,IDUM,ISURFT)
0026            IF(ISURFT.LT.0) IERRCT=IERRCT+1
0027            IF(IERRCT.EQ.2) RETURN
0028             IKEPT=IKEPT+1
           C
           C   CONVERT OBSERVATION TIME TO ACTUAL NIMBUS OBSERVATION TIME
           C
0029             ITRSTA=ITR
0030             IDASTA=IDAT
0031             DNRSTA=INR
0032             CALL OBTIME(ITR,IDAT,DNR,INR,DMINTM)
```

```
                C                                                                00006400
                C   UNPACK RET VALUES OF INTEREST FOR BUOY AND SHIP DATA       00006410
                C                                                                00006420
0033                  CALL CONVRT(40,5,IDUMMY,XPRESR,.FALSE.,LERROR)           * 00006430
0034                  IF(LERROR)XPRESR=-9999.                                    00006440
0035                 XPRESR=XPRESR*0.1                                           00006450
0036                  CALL TEMP(46,48,IDUM,XDRYBT)                               00006460
0037                  CALL TEMP(49,51,IDUM,XWETBT)                               00006470
0038                  CALL TEMP(58,60,XASDIF,IDUM)                               00006480
0039                  CALL CONVRT(37,2,IPRESW,IDUM,.FALSE.,LERROR)               00006490
0040                  IF(LERROR)IPRESW=-99                                       00006500
0041                  CALL CONVRT(91,2,ISHIPN,IDUM,.TRUE.,LERROR)                00006510
0042                  IF(LERROR)ISHIPN=99                                        00006520
0043                  IF(ISHIPN.NE.ICURSP)CALL SHIPNO(ISHIPN)                    00006530
                C                                                                00006540
                C   WRITE THE OBSERVATION TO AN INTERMEDIATE DISK FILE AND      00006550
                C WRITE DEBUG OUTPUT TO A PRINTER IF DEBUG OUTPUT HAS BEEN       00006560
                C REQUESTED.                                                     00006570
                C                                                                00006580
0044                  IF(LPRINT)IPRINT=IPRINT+1                                  00006590
0045                  IF(MOD((IPRINT+30),31).EQ.0)WRITE(6,100)                   00006600
0046                  IF(LPRINT)WRITE(6,101) ICURSP,DLAT,DLON,IYRSTA,IDASTA,     00006610
                     &                       DHRSTA,IYR,IDAY,DHR,XWSPED,XSURFT,  00006620
                     &                       XPRESR,XDRYBT,XWETBT,XASDIF,IPRESW, 00006630
                     &                       ATYPE(KIND)                         00006640
0047                  WRITE(17)ICURSP,DLAT,DLON,IYRSTA,IDASTA,                   00006650
                     &         DHRSTA,IYR,IDAY,DHR,XWSPED,XSURFT,XPRESR,         00006660
                     &         XDRYBT,XWETBT,XASDIF,IPRESW,KIND,XWTVAP           00006670
0048                  RETURN                                                     00006680
0049                100 FORMAT(//1X,'STA',3X,'STATION',0X,'STATION',8X,'NIMBUS', 00006690
                     &          10X,'WIND',2X,'SURFCE',1X,'SURFCE',1X,'DRY',     00006700
                     &          9X,'WET',5X,'A/S',4X,'PRES'                      00006710
                     &        /1X,'NUM',3X,'LAT',4X,'LON',5X,'YR',3X,'DAY',      00006720
                     &         1X,'HR',4X,'YR',3X,'DAY',1X,'HR',5X,'SPEED',     00006730
                     &         1X,'TEMP',3X,'PRESSR',1X,'TEMP',3X,'TEMP',4X,'DIFF',00006740
                     &         3X,'METH',1X,'TYPE')                             00006750
0050                101 FORMAT(1X,I4,1X,F6.2,1X,F6.2,3X,I4,1X,I3,                00006760
                     &        1X,F5.2,1X,I4,1X,I3,1X,F5.2,1X,F6.2,               00006770
                     &        1X,F6.2,1X,F6.1,1X,F6.2,1X,F6.2,1X,F6.2,           00006780
                     &        2X,I3,2X,A6)                                       00006790
0051                  END                                                        00006800
```

APPENDIX 6. LISTING OF SMMR CELL TAPE PROCESSING SYSTEM

```
//STEP1 EXEC FORTRANG,OUT=A
//SOURCE.SYSIN DD DSN=ZMMHT.LHB.FORT,DISP=SHR
//    DD  DSN=ZMMHT.CELL.FORT,DISP=SHR
//STEP2 EXEC LOADER,REGION=198K,PARM='SIZE=150K',OUT=A,TERMOUT=A
//FT06F001 DD SYSOUT=A
//FT11F001 DD UNIT=(9TRACK,,DEFER),
// DCB=(LRECL=15120,BLKSIZE=15120,RECFM=FB,DEN=3),
//  LABEL=(2,NL,,IN),VOL=SER=L8329,
//  DISP=(OLD,KEEP)
//GO.FT14F001 DD UNIT=(9TRACK,,DEFER),LABEL=(1,NL,,OUT),
//    DCB=(RECFM=VBS,LRECL=6496,BLKSIZE=6500,DEN=3),
//    DISP=(NEW,KEEP),VOL=SER=MHT001
//GO.FT20F001 DD UNIT=(9TRACK,,DEFER),LABEL=(1,NL,,IN),
//    DCB=(RECFM=VBS,LRECL=92,BLKSIZE=924,DEN=3),
//    DISP=(OLD,KEEP),VOL=SER=MHT004
```

Fig. A6-1. JCL used to run SMMR CELL tape processing system.

Subroutines appear in alphabetical order following the main program.

```
                C-------------------------------------------------------------------00002320
                C       M A I N                                                     00002330
                C-------------------------------------------------------------------00002340
                C                                                                   00002350
                C   THIS PROGRAM SETS UP THE CALL TO NICK'S COINCIDENCE PROGRAM.     00002360
                C IT LOCATES A SHIP REPORT WITHIN A CELL RECORD AND WRITES A         00002370
                C &EPORT IF IT FINDS ONE                                            00002380
0001                  IMPLICIT REAL*8 (D)                                           00002390
0002                 INTEGER*4 OPTION                                               00002400
                C                                                                   00002410
                COPY    PROCES                                                      00002420
                C                                                                   00002430
                C*******************************************************************00002440
                C                                                                   00002450
0003                 COMMON /PROCES/LPREV,LFOUND,LNEXT,ICELL,ISHIP,LEOV,LEND,       00002460
                    &ICLREC,NFILE,LEXIST,LSKIP,LFIRST                               00002470
0004                  LOGICAL  LPREV,LFOUND,LNEXT,LEOV,LEND,LEXIST,LSKIP,LFIRST     00002480
                C                                                                   00002490
                C                                                                   00002500
                C*******************************************************************00002510
                C                                                                   00002520
0005                1  FORMAT(1X,I3,'TAPES WERE PROCESSED'                         00002530
                   &/1X,I8,1X,'STATION OBSERVATIONS WERE READ'                      00002540
                   &/1X,I8,1X,'CELL RECORDS WERE READ'                              00002550
                   &/1X,I8,1X,'COINCIDENCES WERE FOUND')                            00002560
                C                                                                   00002570
0006                   D2R85=128.D0/86400.D0                                        00002580
0007                   LEND=.FALSE.                                                 00002590
0008                   LEOV=.FALSE.                                                 00002600
0009                   LPREV=.FALSE.                                                00002610
0010                   OPTION=6                                                     00002620
0011                    IFOUND=0                                                    00002630
0012                    NFILE=1                                                     00002640
                C                                                                   00002650
                C*******************************************************************00002660
                C                                                                   00002670
0013                   ISUB=1                                                       00002680
0014                   CALL NUFILE                                                  00002690
0015                   IF(LEOV) GO TO 130                                           00002700
                C                                                                   00002710
                C*******************************************************************00002720
                C                                                                   00002730
                C                                                                   00002740
0016                 100 ILOOP=1                                                    00002750
0017                   ISUB=2                                                       00002760
0018                   CALL GETSHP                                                  00002770
0019                   IF((LEND).OR.(LEOV)) GO TO 130                               00002780
0020                   CALL GETCEL(D2R85)                                           00002790
0021                   IF(LSKIP) GO TO 100                                          00002800
0022                   IF((LEND).OR.(LEOV)) GO TO 110                               00002810
0023                   GO TO 115                                                    00002820
0024                 110 ILOOP=ILOOP+1                                              00002830
0025                   ISUB=1                                                       00002840
0026                   IF(LPREV) CALL BACKUP                                        00002850
```

55

```
0027              IF(LNEXT) CALL GETCEL(02B0S)                                  00002860
0028              IF(LSKIP) GO TO 1[illegible]                                  00002870
0029              IF((LEND).OR.(LEC[illegible]) GO TO 130                       00002880
0030           115 CALL INBLK                                                   00002890
0031              IF(.NOT.LEXIST) GO TO 100                                     00002900
0032              IF(LFOUND) GO TO 120                                          00002910
0033              ISUB=4                                                        00002920
0034              IF((ILOOP.EQ.1).AND.(LPREV)) LDIR=-1                          00002930
0035              IF((ILOOP.EQ.1).AND.(LPREV)) GO TO 110                        00002940
0036              IF((ILOOP.EQ.1).AND.(LNEXT)) LDIR=1                           00002950
0037              IF((ILOOP.EQ.1).AND.(LNEXT)) GO TO 110                        00002960
0038              IF((LDIR.EQ.-1).AND.(LNEXT)) GO TO 100                        00002970
0039              IF((LDIR.EQ.1).AND.(LPREV)) GO TO 100                         00002980
0040              GO TO 110                                                     00002990
                  C                                                           00001000
                  C   IF THE COINCIDENCE WAS FOUND THEN INCREMENT THE FOUND COUNTER AND  00003010
                  C                                                           00003020
0041           120 IFOUND=IFOUND+1                                            00003030
0042              ISUB=5                                                      00003040
0043              IF(LFOUND) CALL WRITEP(OPTION,IRCODE)                       00003050
0044              GO TO 100                                                   00003060
                  C                                                           00003070
                  C   IF THE END OF PROCESSING WAS ENCOUNTERED THEN WRITE A BRIEF  00003080
                  C SUMMARY OF THE PROCESSING                                 00003090
                  C                                                           00003100
0045           130  WRITE(6,1)ITAPE,ISKIP,ICELL,IFOUND                        00003110
0046              STOP                                                        00003120
0047              DEBUG INIT(ISUB,IFOUND)                                     00003130
0048              END                                                         00003140
```

```
0001         SUBROUTINE BACELL(DISOTH,HORZ,VLENGT,NLENGT,ICODE)              00000010
       C                                                                     00000020
0002         REAL*8 DISOTH,HORZ,CELLVE,CELLHO,VLENGT,NLENGT                  00000030
0003         REAL*8 RBAND,NCELL                                              00000040
0004         INTEGER*4 BANDNM(4),CELLNM(4)                                   00000050
       C                                                                     00000060
0005         COMMON /WHERE/IAMINM,CELLNM                                     00000070
       C                                                                     00000080
       C ***************************************************************    *00000090
       C *                                                                  *00000100
       C * COMPUTE WHICH 156 KM BAND AND CELL THE SOP RESIDES IN            *00000110
       C *                                                                  *00000120
0006         ICODE=0                                                         00000130
0007         CELLVE = VLENGT/5.D0                                            00000140
0008         CELLHO = NLENGT/5.D0                                            00000150
       C                                                                     00000160
0009         RBAND = DISOTH/CELLVE                                           00000170
0010         BANDNM(1) = IDINT(RBAND) + 1                                    00000180
       C                                                                     00000190
0011         NCELL = HORZ/CELLHO                                             00000200
0012         CELLNM(1) = IDINT(NCELL) + 1                                    00000210
       C                                                                     00000220
       C ***************************************************************     00000230
       C *                                                                 * 00000240
       C * COMPUTE WHICH 97.5 KM BAND AND CELL THE SOP RESIDES IN          * 00000250
       C *                                                                 * 00000260
0013         CELLVE = VLENGT/8.D0                                            00000270
0014         CELLHO = NLENGT/8.D0                                            00000280
       C                                                                     00000290
0015         RBAND = DISOTH/CELLVE                                           00000300
0016         BANDNM(2) = IDINT(RBAND) + 1                                    00000310
       C                                                                     00000320
0017         NCELL = HORZ/CELLHO                                             00000330
0018         CELLNM(2) = IDINT(NCELL) + 1                                    00000340
       C                                                                     00000350
       C ***************************************************************     00000360
       C *                                                                 * 00000370
       C * COMPUTE WHICH 60 KILOMETER BAND AND CELL THE SOP RESIDES IN     * 00000380
       C *                                                                 * 00000390
0019         CELLVE = VLENGT/13.D0                                           00000400
0020         CELLHO = NLENGT/13.D0                                           00000410
       C                                                                     00000420
0021         RBAND = DISOTH/CELLVE                                           00000430
0022         BANDNM(3) = IDINT(RBAND) + 1                                    00000440
       C                                                                     00000450
0023         NCELL = HORZ/CELLHO                                             00000460
0024         CELLNM(3) = IDINT(NCELL) + 1                                    00000470
       C                                                                     00000480
       C ***************************************************************     00000490
       C *                                                                 * 00000500
       C * COMPUTE WHICH 30 KM BAND AND CELL THE SOP RESIDES IN            * 00000510
       C *                                                                 * 00000520
0025         CELLVE = VLENGT/26.D0                                           00000530
0026         CELLHO = NLENGT/26.D0                                           00000540
```

```
              C
0027                RBAND = DISOTH/CELLVE
0028                BANDNR(N) = IDINT(RBAND) + 1
              C
0029                RCELL = HORZ/CELLNO
0030                CELLNR(N) = IDINT(RCELL) + 1
0031                PRINT 1
0032              1 FORMAT(/1X,T20,'BAND NUMBER',T40,'CELL NUMBER')
0033                PRINT 2,(BANDNR(I),CELLNR(I),I=1,N)
0034                IF((CELLNR(N).LT.1).OR.(CELLNR(N).GT.26)) RETURN
0035                ICODE=1
0036              2 FORMAT(1X,'156 KM CELLS',T20,I6,T40,I6/
                   & 1X,'97.5 KM CELLS',T20,I6,T40,I6/1X,'60 KM CELLS',
                   & T20,I6,T40,I6/1X,'30 KM CELLS',T20,I6,T40,I6)
0037                RETURN
0038                END
```

```
                C-------------------------------------------------------------------000000010
                      SUBROUTINE BACKUP                                            000000020
0001                                                                               000000030
                C-------------------------------------------------------------------000000040
                C                                                                  000000050
                C   THIS PROGRAM DECREMENTS COUNTS FOR THE CELL TAPE AND BACKS      000000060
                C IT UP TWO RECORDS                                                000000070
                C                                                                  000000080
                      IMPLICIT REAL*8(D)                                           000000090
0002                                                                               000000100
                C                                                                  000000110
                CCEI     PROCES                                                    000000120
                C                                                                  000000130
                C******************************************************************000000140
                C                                                                  000000150
                      COMMON /PROCES/LPREV,LFOUND,LNEXT,ICELL,ISKIP,LEOV,LEND,     000000160
0003                 1ICLREC,NFILE,LEXIST,LSKIP,LFIRST                             000000170
                      LOGICAL  LPREV,LFOUND,LNEXT,LEOV,LEND,LEXIST,LSKIP,LFIRST    000000180
0004                                                                               000000190
                C                                                                  000000200
                C                                                                  000000210
                C******************************************************************000000220
                C                                                                  000000230
                C                                                                  000000240
                      ICELL=ICELL-1                                                000000250
0005                  ICLREC=ICLREC-1                                              000000260
0006                                                                               000000270
                C                                                                  000000280
                C   SET THE FLAG TO INDICATE THAT THE NEXT CELL RECORD SHOULD      000000290
                C BE READ                                                          000000300
                C                                                                  000000310
                      LNEXT=.TRUE.                                                 000000320
0007                                                                               000000330
                C                                                                  000000340
                C   IF POSITIONED AT THE BEGINNING OF THE FILE THEN BACKSPACING    000000350
                C IS IMPOSSIBLE                                                    000000360
                C                                                                  000000370
                      IF(ICLREC.LE.1)RETURN                                        000000380
0008                                                                               000000390
                C                                                                  000000400
                C   BACKSPACE CELL TAPE 2 RECORDS SO THAT THE NEXT ONE READ WILL   000000410
                C BE ONE RECORD PREVIOUS TO THE CURRENT RECORD                     000000420
                C                                                                  000000430
                      BACKSPACE 11                                                 000000440
0009                  BACKSPACE 11                                                 000000450
0010                  RETURN                                                       000000460
0011                  END                                                          000000470
0012
```

```
                C-------------------------------------------------------------------  00000620
0001                  BLOCK DATA                                                      00000630
                C-------------------------------------------------------------------  00000640
                C                                                                     00000650
                CSTART                                                                00000660
                C                                                                     00000670
0002                  COMMON /SHIPRC/                                                 00000680
                     &           OHRSTA,DLAT,DLON,DHR,IDASTA,                       00000690
                     &           ICURSP,IYR,IDAY,ITPSTA,IWSPED,ISURPT,IPRESR,       00000700
                     &           IDRYBT,IWETBT,IASDIP,IPRESW,KIND,IWTVAP            00000710
0003                   REAL*8 DLAT,DLON,DHRSTA,DHR                                    00000720
                C                                                                     00000730
0004                  COMMON /PROCES/LPREV,LFOUND,LNEXT,ICELL,ISHIP,LEOV,LEND,        00000750
                     &ICLREC,NFILE,LEXIST,LSKIP,LFIRST                                00000760
0005                   LOGICAL  LPREV,LFOUND,LNEXT,LEOV,LEND,LEXIST,LSKIP,LFIRST      00000770
0006                  DATA ICELL,ICLREC/2*0/,ISHIP/0/                                 00000780
                C                                                                     00000790
                CSTOP                                                                 00000800
                C                                                                     00000810
0007                  END                                                             00000820
```

```
0001            SUBROUTINE COIN(SOPLAT,SOPLON,LATS,LONS,ICODE)                  00001210
                C                                                               00001220
                C ***************************************************************00001230
                C *                                                             *00001240
                C * SUBROUTINE: COIN (SHORT FOR COINCIDENCE)                    *00001250
                C * PURPOSE: TO DETERMINE IF A SURFACE OBSERVATION POINT WITH   *00001260
                C *          COORDINATES SOPLAT & SOPLON RESIDES WITHIN A 780 BY*00001270
                C *          780 KILOMETERS BLOCK OF SIMAN DATA                 *00001280
                C * FUNCTIONS USED: DPLCAT,DSIN,DARSIN,DTAN,DCOTAN,IDINT       *00001290
                C * SUBROUTINES CALLED: DISTNC,HEADNG,EXTEND                   *00001300
                C * VARIABLES USED:                                            *00001310
                C * SOPLAT - SURFACE OBSERVATION POINT (IN DEGREES) LATITUDE    *00001320
                C * SOPLON - SURFACE OBSERVATION POINT (IN DEGREES) LONGITUDE   *00001330
                C * BANDNM - BAND NUMBER WHERE COINCIDENCE OCCURS              *00001340
                C * CELNUM - CELL NUMBER WHERE COINCIDENCE OCCURS              *00001350
                C * CENLAT - LATITUDE (IN DEGREES) OF CENTER OF SIMAN BLOCK    *00001360
                C * CENLON - LONGITUDE (IN DEGREES) OF CENTER OF SIMAN BLOCK   *00001370
                C * ENLAT1 - LATITUDE OF BAND XX CELL XX                      *00001380
                C * ENLON1 - LONGITUDE OF BAND XX CELL XX                     *00001390
                C * ENLAT2 - LATITUDE OF BAND XX CELL XX                      *00001400
                C * ENLON2 - LONGITUDE OF BAND XX CELL XX                     *00001410
                C *                                                             *00001420
                C ***************************************************************00001430
                C                                                               00001440
0002            INTEGER*4 SOD60(13),SOD30(26)                                   00001450
0003            INTEGER*4 ILAT1,ILON1,NLAT1,NLON1,NLAT2,NLON2                   00001460
0004            INTEGER*4 ICELL1,ICELL2,RIGHTA,RANDNM(4),CELLNM(4)              00001470
                C                                                               00001480
0005            INTEGER*2 POS60(13,13,2),GQ60(13,13),TB60(13,13,3,2),DNT60(13)  00001490
0006            INTEGER*2 POS30(26,26,2),GQ30(26,26),TB30(26,26,2),DNT30(26)    00001500
0007            INTEGER*2 CELL(7560)                                            00001510
                C                                                               00001520
0008            REAL*8 CENLAT,CENLON,DIST,SOPLAT,SOPLON,ENLAT1,ENLON1           00001530
0009            REAL*8 RPAD1,ENLAT2,ENLON2,HEAD2,VLENGT                         00001540
0010            REAL*8 RPAD3,ANGA,DISTC,SIDEA,SIDEAR,SIDEB,SIDEBR               00001550
0011            REAL*8 RADDEG,DEGRIL,DISOTN,RBAND                               00001560
0012            REAL*8 DEGRAD,KILDEG,ANGAR,DISTCR,HORZ                          00001570
0013            REAL*8 CELLNO,CELLVE,SIDELA,SIDELO,NLENGT,SDELA,SDELO           00001580
0014            REAL*8 LATS(4),LONS(4)                                          00001590
                C                                                               00001600
0015            COMMON /CEL60/SOD60,POS60,GQ60,TB60,DNT60                       00001610
0016            COMMON /CEL30/SOD30,POS30,GQ30,TB30,DNT30                       00001620
0017            COMMON /CELALL/CELL                                             00001630
0018            COMMON /WHERE/RANCNM,CELLNM                                     00001640
0019            DATA DEGRIL/111.19104E0/,DEGRAD/.01745329251D0/                 00001650
0020            DATA KILDEG/.00899353049D0/,RADDEG/57.29577951D0/               00001660
                C     PAINT 5                                                   00001670
0021            5 FORMAT(/1X,'SUBROUTINE COIN')                                 00001680
0022              PRINT 6,SOPLAT,SOPLON                                         00001690
0023            6 FORMAT(/1X,'SOPLAT = ',1PG15.9,2X,'SOPLON = ',1PG15.9)        00001700
                C234567                                                         00001710
                C *                                                             *00001720
                C                                                               00001730
                C * THE HEADING FROM THE THE CENTER OF THE SIMAN BLOCK (BAND 7   *00001740
```

```
          C * CELL 7 OF 60 KM CELLS) TO BAND 1 CELL 7 IS FIRST DETERMINED    *
          C *                                                                 *
0024            NLAT1 = POS60(1,7,1)
0025            ENLAT1 = DFLOAT(NLAT1)/100.D0
0026            NLON1 = POS60(1,7,2)
0027            ENLON1 = DFLOAT(NLON1)/100.D0
0028            PRINT 8,ENLAT1,ENLON1
0029          8 FORMAT(/1X,'ENLAT1 = ',1PG15.9,2X,'ENLON1 = ',1PG15.9)
          C
          C
          C *                                                                 *
0030            NLAT2 = POS60(13,7,1)
0031            ENLAT2 = DFLOAT(NLAT2)/100.D0
0032            NLON2 = POS60(13,7,2)
0033            ENLON2 = DFLOAT(NLON2)/100.D0
0034            PRINT 10,ENLAT2,ENLON2
0035         10 FORMAT(/1X,'ENLAT2 = ',1PG15.9,2X,'ENLON2 = ',1PG15.9)
          C
          C *                                                                 *
          C *                                                                 *
0036            CALL DISTNC(ENLAT1,ENLON1,ENLAT2,ENLON2,VLENGT)
          C * THE DISTANCE VLENGT NOW REPRESENTS THE DISTANCE OF 12           *
          C * 60 KILOMETER CELLS. TO FIND THE DISTANCE THRU 13 SUCH CELLS     *
          C * THE FOLLOWING IS DONE.                                          *
          C
0037            VLENGT = VLENGT * 13.D0/12.D0
          C     PRINT 22,VLENGT
0038         22 FORMAT(/1X,'VLENGT = ',1PG15.9)
          C
          C *                                                                 *
          C ******************************************************************
          C
          C ******************************************************************
          C *                                                                 *
          C * WE NEED TO DETERMINE SOME SPHERICAL TRIGONOMETRIC VALUES IN     *
          C * ORDER TO SOLVE FOR THE DISTANCE FROM THE NEW IMPROVED           *
          C * EXTENDED TRACK TO THE SOP AND THE DISTANCE ALONG THE TRACK      *
          C * TO THE POINT WHERE THE PERPENDICULAR FROM THE SOP LANDS         *
          C *                                                                 *
          C * FIRST, THE ANGLE DEFINED BY THE TRACK AND A LINE FROM THE END  *
          C * OF THE TRACK TO THE SOP IS DETERMINED. THIS IS DONE BY TAKING  *
          C * THE DIFFERENCE BETWEEN THE TRACK HEADING AND THE END-OF-THE-    *
          C * TRACK-TO-SOP HEADING. HEAD1 (THE TRACK HEADING FROM TRACK       *
          C * CENTER TO BAND 1 CELL 7) HAS ALREADY BEEN DETERMINED.          *
          C *                                                                 *
0039            CALL HEADNG(ENLAT2,ENLON2,SOPLAT,SOPLON,HEAD2)
          C ****************
0040            CALL HEADNG(ENLAT2,ENLON2,ENLAT1,ENLON1,HEAD1)
          C ****************
          C     PRINT 13,HEAD2,HEAD1
0041         13 FORMAT(/1X,'HEAD2 = ',1PG15.9,2X,'HEAD1 = ',1PG15.9)
0042            ANGA = HEAD2 - HEAD1
0043            CALL DECIDE(ANGA,RIGHTA)
          C     PRINT 33,RIGHTA
```

```
0044          33 FORMAT(1X,'RIGHTA = ',I3)                                    00002290
              C *                                                           *   00002300
              C * THE DISTANCE FROM THE END OF THE TRACK TO THE SOP IS       *   00002310
              C * DETERMINED NEXT                                          *   00002320
              C *                                                           *   00002330
0045              CALL DISTBC(ENLAT2,ENLON2,SOPLAT,SOPLON,DISTC)              00002340
              C   PRINT 10,DISTC                                              00002350
0046          10 FORMAT(/1X,'DISTC = ',1PG15.9)                               00002360
              C *                                                           *   00002370
              C * WE HAVE NOW DEFINED 2 VALUES OF A RIGHT SPHERICAL TRIANGLE. *   00002380
              C * WE NEXT DETERMINE THE PERPENDICULAR DISTANCE OF THE SOP FROM *   00002390
              C * THE EXTENDED TRACK. THIS IS THE SIDE OF THE RST OPPOSITE ANGLE*  00002400
              C * ANGA. FOR THIS WE USE THE RIGHT SPHERICAL TRIANGLE FORMULA  *   00002410
              C * SIN(SIDEA) = SIN(SIDEC) * SIN(ANGA)                        *   00002420
              C *                                                           *   00002430
0047              ANGAR = DEGRAD * ANGA                                       00002440
0048              DISTCR = KILDEG * DEGRAD * DISTC                            00002450
0049              SIDEA = DSIN(ANGAR) * DSIN(DISTCR)                          00002460
0050              SIDEA = DARSIN(SIDEA)                                       00002470
0051              SIDEAK = RADDEG * DEGKIL * SIDEA                            00002480
0052              SIDEAK = DABS(SIDEAK)                                       00002490
              C   PRINT 20,ANGA,DISTC,SIDEAK                                  00002500
0053          20 FORMAT(/1X,'ANGA = ',1PG15.9,'DISTCR = ',1PG15.9,            00002510
             &  'SIDEAK = ',1PG15.9)                                          00002520
              C *                                                           *   00002530
              C * NOW WE DETERMINE HOW FAR ALONG THE TRACK THE PERPENDICULAR  *   00002540
              C * FROM THE SOP IS. WE USE THE ST RELATIONSHIP                *   00002550
              C * SIN(SIDEB) = TAN(SIDEA) * COT(ANGA)                        *   00002560
              C *                                                           *   00002570
0054              SIDEB = DTAN(SIDEA) * DCOTAN(ANGAR)                         00002580
0055              SIDEB = DABS(SIDEB)                                         00002590
0056              SIDEBK = RADDEG * DEGKIL * SIDEB                            00002600
0057              SIDEBK = DABS(SIDEBK)                                       00002610
              C   PRINT 21,SIDEBK                                             00002620
0058          21 FORMAT(/1X,' SIDEBK = ',1PG15.9)                             00002630
              C *                                                           *   00002640
              C * FOR PURPOSES OF EASY COMPUTATION, WE WISH TO USE THE DIS-   *   00002650
              C * TANCE FROM THE FIRST BAND OF THE DATA BLOCK TO THE POINT OF *   00002660
              C * INTERSECTION WITH THE PERPENDICULAR FROM THE SOP, RATHER    *   00002670
              C * THAN THE DISTANCE MEASURED FROM THE LAST BAND.              *   00002680
              C *                                                           *   00002690
0059              DISOTH = ((25.00/26.00) * VLENGT) - SIDEBK                  00002700
0060              IF (DABS(ANGA).GT.90.00.AND.DABS(ANGA).LT.270.00)           00002710
             &  DISOTH = ((25.00/26.00) * VLENGT) + SIDEBK                    00002720
              C *                                                           *   00002730
              C * TO ARRIVE AT THE 30 KILOMETER BAND THAT THE SOP RESIDES IN, *   00002740
              C * THE FOLLOWING COMPUTATIONS ARE PERFORMED -                  *   00002750
              C *                                                           *   00002760
              C *                                                           *   00002770
              C * THERE ARE 2 POSSIBILITIES, GIVEN THE DISTANCE FROM THE      *   00002780
              C * TRACK, AS TO WHICH CELL OF BAND BJOBUN THE SOP IS IMBEDDED. *   00002790
              C * BOTH POSSIBILITIES WILL BE CALCULATED AND THEN A TEST WILL  *   00002800
              C * DETERMINE WHICH ONE IS TO BE USED.                          *   00002810
              C *                                                           *   00002820
```

47

```
0061              ISIDE = POS60(7,13,1)                                  00002830
0062              SIDELA = DFLOAT(ISIDE)/100.D0                          00002840
0063              ISIDE = POS60(7,13,2)                                  00002850
0064              SIDELO = DFLOAT(ISIDE)/100.D0                          00002860
0065              ISIDE = POS60(7,1,1)                                   00002870
0066              SDELA = DFLOAT(ISIDE)/100.D0                           00002880
0067              ISIDE = POS60(7,1,2)                                   00002890
0068              SDELO = DFLOAT(ISIDE)/100.D0                           00002900
0069              CALL DISTNC(SDELA,SDELO,SIDELA,SIDELO,HLENGT)          00002910
0070              HLENGT = (13.D0/12.D0) * HLENGT                        00002920
                C     PRINT 83,HLENGT                                    00002930
0071             83 FORMAT(1X,'HLENGT = ',1PG15.9)                       00002940
0072                HORZ = .5D0 * HLENGT - SIDEAR                       00002950
                C     PRINT 82,SIDEAR,HORZ                               00002960
0073                IF (RIGHTA.NE.1) HORZ = .5D0 * HLENGT + SIDEAR      00002970
                C     PRINT 82,SIDEAR,HORZ                               00002980
0074             82 FORMAT(1X,'SIDEAR = ',1PG15.9,2X,'HORZ = ',1PG15.9) 00002990
0075                CALL BACELL(DISOTH,HORZ,VLENGT,HLENGT,ICODE)        00003000
0076                IF(ICODE.NE.1) RETURN                               00003010
                C ***** DETERMINE THE FOUR CORNER POINTS OF THE DATA BLOCK *****  00003020
                C                                                         00003030
0077                CALL LATLON                                         00003040
0078                RETURN                                              00003050
0079                END                                                 00003060
```

```
0001            SUBROUTINE DECIDE(ANGLE,RIGHT)                          00003070
0002            REAL*8 ANGLE,TEST                                       00003080
0003            INTEGER*4 RIGHT                                         00003090
                C                                                       00003100
0004            RIGHT = 1                                               00003110
0005            TEST = CABS(ANGLE)                                      00003120
                C                                                       00003130
0006            IF (ANGLE.LT.0.DO.AND.TEST.GT.180.DO)                   00003140
               & ANGLE = 360.DO + ANGLE                                 00003150
                C                                                       00003160
0007            IF (ANGLE.LT.0.DO.AND.TEST.LT.180.DO)                   00003170
               & RIGHT = 0                                              00003180
0008            IF (ANGLE.LT.0.DO.AND.TEST.LT.180.DO)                   00003190
               & ANGLE = -ANGLE                                         00003200
                C                                                       00003210
0009            IF (ANGLE.GT.0.DO.AND.TEST.GT.180.DO)                   00003220
               & RIGHT = 0                                              00003230
0010            IF (ANGLE.GT.0.DO.AND.TEST.GT.180.DO)                   00003240
               & ANGLE = 360.DO - ANGLE                                 00003250
                C                                                       00003260
0011            RETURN                                                  00003270
0012            END                                                     00003280
```

```
0001          SUBROUTINE DISTNC(LATS,LONG1,LATP,LONG2,DIST)
         C ****************************************************************
         C *                                                              *
         C * SUBROUTINE DISTNC                                            *
         C * PURPOSE: TO DETERMINE THE DISTANCE (IN KILOMETERS) BETWEEN   *
         C *          2 KNOWN POINTS                                      *
         C * FUNCTIONS USED: DSIN,DCOS,DARCOS                             *
         C * VARIABLES USED:                                              *
         C * DEGRAD - DEGREES TO RADIANS CONVERSION FACTOR                *
         C * RADKIL - RADIANS TO KILOMETERS CONVERSION FACTOR             *
         C * LATS - LATITUDE (IN DEGREES) OF START POINT                  *
         C * LONG1 - LONGITUDE (IN DEGREES) OF START POINT                *
         C * LATP - LATITUDE (IN DEGREES) OF END POINT                    *
         C * LONG2 - LONGITUDE (IN DEGREES) OF END POINT                  *
         C * RLAT1 - LAT1 CONVERTED TO RADIANS                            *
         C * RLAT2 - LAT2 CONVERTED TO RADIANS                            *
         C * RLONG1 - LONG1 CONVERTED TO RADIANS                          *
         C * RLONG2 - LONG2 CONVERTED TO RADIANS                          *
         C * DELONG - DIFFERENCE BETWEEN RLONG1 AND RLONG2                *
         C * DIST - DISTANCE (IN KILOMETERS) BETWEEN 2 POINTS             *
         C * REFERENCE: TEXAS INSTRUMENTS PROGRAMMABLE SLIDE-RULE         *
         C *            CALCULATOR SR56 APPLICATIONS LIBRARY,             *
         C *            1976,NAVIGATION PROGRAMS, GREAT CIRCLE            *
         C *            NAVIGATION                                        *
         C *                                                              *
         C ****************************************************************
         C
0002          REAL*8 LATS,LONG1,LATP,LONG2,DIST,RLONG1,RLONG2
0003          REAL*8 DEGRAD,RADKIL,DELONG
0004          REAL*8 RLAT1,RLAT2
         C
         C    PRINT 1,LATS,LONG1,LATP,LONG2
0005        1 FORMAT(/1X,'SUBROUTINE DISTNC'/1X,'LATS = ',1PG15.9,2X,
           &  'LONG1 = ',1PG15.9,2X,'LATP =  ',1PG15.9,2X,'LONG2= ',1PG15.9)
         C
0006          DEGRAD = .01745329252D0
0007          RADKIL = 6370.777312D0
         C
0008          RLONG1 = -DEGRAD * LONG1
0009          RLONG2 = -DEGRAD * LONG2
         C
0010          DELONG = RLONG2 - RLONG1
         C
0011          RLAT1 = DEGRAD * LATS
0012          RLAT2 = DEGRAD * LATP
         C
         C
         C    PRINT 2,RLAT1,RLAT2,DELONG
0013        2 FORMAT(/1X,'RLAT1 = ',1PG15.9,2X,'RLAT2 = ',1PG15.9,2X,
           & 'DELONG = ',1PG20.12)
         C
         C
0014          DIST = DSIN(RLAT1) * DSIN(RLAT2)
0015          DIST = DIST + (DCOS(RLAT1) * DCOS(RLAT2) * DCOS(DELONG))
```

```
                C       PRINT 4,DIST                                            00003810
0016                4 FORMAT(/1X,'DIST = ',1PG15.9)                             00003840
                C                                                               00003850
0017                    DIST = RADKIL * DARCOS(DIST)                            00003860
                C       PRINT 3,DIST                                            00003870
0018                3 FORMAT(/1X,'DISTANCE = ',T20,1PG15.9,' KILOMETERS')       00003880
                C                                                               00003890
                C                                                               00003900
0019                    RETURN                                                  00003910
0020                    END                                                     00003920
```

```
                C234567                                                          00003930
0001                  SUBROUTINE EXTEND(LAT1,LONG1,HEAD,DIST,LAT2,LONG2)         00003940
                C                                                                00003950
                C ***************************************************************00003960
                C *                                                             *00003970
                C * SUBROUTINE: EXTEND                                          *00003980
                C * PURPOSE: FROM A KNOWN LATITUDE AND LONGITUDE, GIVE THE      *00003990
                C *          LATITUDE AND LONGITUDE OF A POINT LOCATED DIST     *00004000
                C *          KILOMETERS AWAY AT A HEADING OF HEAD               *00004010
                C * FUNCTIONS USED: DCOS,DSIN,DARCOS,DATAN                      *00004020
                C * VARIABLES USED:                                             *00004030
                C * LAT1 - INITIAL LATITUDE (IN DEGREES)                        *00004040
                C * LONG1 - INITIAL LONGITUDE (IN DEGREES)                     *00004050
                C * HEAD - HEADING (IN DEGREES) FROM INITIAL POINT             *00004060
                C * DIST - DISTANCE (IN KILOMETERS) FROM INITIAL POINT         *00004070
                C * LAT2 - LATITUDE (IN DEGREES) OF NEW POINT                 *00004080
                C * LONG2 - LONGITUDE (IN DEGREES) OF NEW POINT               *00004090
                C * DEGKIL - CONVERSION FACTOR FROM DEGREES TO KILOMETERS     *00004100
                C *                                                             *00004110
                C ***************************************************************00004120
                C234567                                                          00004130
0002                  REAL*8 LAT1,LONG1,LAT2,LONG2,HEAD,DIST,KILDEG              00004140
0003                  REAL*8 DEGRAD,RADDEG,A,B,C,S,P,ANGC,HEADB                  00004150
0004                  REAL*8 DISTA,DISTB,DISTC                                   00004160
                C                                                                00004170
0005                  DATA KILDEG/.008993530400/,DEGRAD/.017453292500/           00004180
0006                  DATA RADDEG/57.295779510D0/                                00004190
                C                                                                00004200
                C     PRINT 1                                                    00004210
0007                1 FORMAT(/1X,'SUBROUTINE EXTEND')                            00004220
                C     PRINT 2,LAT1,LONG1,HEAD,DIST                               00004230
0008                2 FORMAT(/1X,'LAT1 = ',1PG15.9,2X,'LONG1 = ',1PG15.9,        00004240
                 & 2X,'HEAD = ',1PG15.9,2X,'DIST = ',1PG15.9)                    00004250
0009                  DISTA = 90.D0 - LAT1                                       00004260
0010                  DISTC = DIST * KILDEG                                      00004270
                C     PRINT 3,DISTA,DISTC                                        00004280
0011                3 FORMAT(/1X,'DISTA = ',1PG15.9,2X,'DISTC = ',1PG15.9)       00004290
0012                  DISTA = DEGRAD * DISTA                                     00004300
0013                  DISTC = DEGRAD * DISTC                                     00004310
                C     PRINT 3,DISTA,DISTC                                        00004320
0014                  HEADB = DEGRAD * HEAD                                      00004330
0015                  DISTB = DCOS(DISTA) * DCOS(DISTC) +                        00004340
                 & (DSIN(DISTA) * DSIN(DISTC) * DCOS(HEADB))                     00004350
                C     PRINT 4,HEAD,HEADB,DISTB                                   00004360
0016                4 FORMAT(/1X,'HEAD = ',1PG15.9,2X,'HEADB = ',1PG15.9,2X,'DISTB = ', 00004370
                 & 1PG15.9)                                                      00004380
                C                                                                00004390
0017                  DISTB = DARCOS(DISTB)                                      00004400
                C     PRINT 4,HEAD,HEADB,DISTB                                   00004410
0018                  LAT2 = 90.D0 - RADDEG * DISTB                              00004420
                C     PRINT 5,LAT2                                               00004430
0019                5 FORMAT(/1X,'LAT2 = ',1PG15.9)                              00004440
                C                                                                00004450
0020                  S = .5D0 * (DISTA + DISTB + DISTC)                         00004460
```

```
      C                                                                 00004470
0021                A = S - DISTA                                       00004480
0022                B = S - DISTB                                       00004490
0023                C = S - DISTC                                       00004500
      C           PRINT 6,A,B,C,S                                       00004510
0024              6 FORMAT(/1X,'A = ',1PG15.9,2X,'B = ',1PG15.9,2X,'C = ',1PG15.9,  00004520
     &  2X,'S = ',1PG15.9)                                              00004530
0025                A = DSIN(A)                                         00004540
0026                B = DSIN(B)                                         00004550
0027                C = DSIN(C)                                         00004560
0028                S = DSIN(S)                                         00004570
      C           PRINT 6,A,B,C,S                                       00004580
      C                                                                 00004590
0029                P = A * B * C / S                                   00004600
      C           PRINT 7,P                                             00004610
0030              7 FORMAT(/1X,'P = ',1PG15.9)                          00004620
0031                P = DSQRT(P)                                        00004630
      C           PRINT 7,P                                             00004640
      C                                                                 00004650
0032                ANGC = S - DISTC                                    00004660
0033                ANGC = P/DSIN(ANGC)                                 00004670
0034                ANGC = 2 * DATAN(ANGC)                              00004680
0035                ANGC = RADDEG * ANGC                                00004690
0036                LONG2 = LONG1 - ANGC                                00004700
0037                IF (HEAD.LT.180.00) LONG2 = LONG1 + ANGC            00004710
      C           PRINT 8,ANGC,LONG2                                    00004720
0038              8 FORMAT(/1X,'ANGC = ',1PG15.9,2X,'LONG2 = ',1PG15.9) 00004730
      C                                                                 00004740
0039                RETURN                                              00004750
0040                END                                                 00004760
```

```
                C-------------------------------------------------------------------00000630
0001                   SUBROUTINE GETCEL(D2A8S)                                    00000640
                C-------------------------------------------------------------------00000650
                C                                                                  00000660
                C   THIS PROGRAM READ THEN NEXT CELL DATA RECORD INTO CORE AND      00000670
                C CALLS INIT TO UNPACK THE NECESSARY VARIABLES FROM IT.             00000680
                C                                                                  00000690
0002                   IMPLICIT REAL*8(D)                                          00000700
                C                                                                  00000710
                COPY    SHIPBC  PROCES                                             00000720
                C                                                                  00000730
                C*******************************************************************00000740
                C                                                                  00000750
0003                  COMMON /SHIPBC/                                              00000760
                     &          DHRSTA,DLAT,DLON,DHR,IDASTA,                       00000770
                     &          ICURSP,IYR,IDAY,IYRSTA,IWSPED,ISURFT,IPRESR,       00000780
                     &          IDRIBT,IWETOT,IASDIP,IPRESW,KIND,IWTYAP            00000790
0004                   REAL*8 DLAT,DLON,DHRSTA,DHR                                 00000800
                C                                                                  00000820
0005                  COMMON /PROCES/LPREV,LFOUND,LNEXT,ICELL,ISKIP,LEOV,LEND,     00000830
                     &ICLREC,NFILE,LEXIST,LSKIP,LFIRST                             00000840
0006                   LOGICAL  LPREV,LFOUND,LNEXT,LEOV,LEND,LEXIST,LSKIP,LFIRST   00000850
                C                                                                  00000860
                C                                                                  00000870
                C*******************************************************************00000880
                C                                                                  00000890
                C                                                                  00000900
0007                  IF(LFIRST) GO TO 5                                           00000910
0008                  LSKIP=.TRUE.                                                 00000920
0009                1  CONTINUE                                                    00000930
                C                                                                  00000940
                C   CALL INGEST TO READ A CELL DATA BLOCK INTO CORE                00000950
                C                                                                  00000960
0010                   CALL INGEST(IRCODE,IRCEND,ID)                               00000970
0011                   ICLREC=ICLREC+1                                             00000980
0012                   ICELL=ICELL+1                                               00000990
0013                   IF(MOD(ICELL,300).EQ.0)WRITE(6,100)ICELL,NFILE,ICLREC       00001000
0014                  IF((LPREV).AND.(ID.NE.17)) RETURN                            00001010
0015                  LSKIP=.FALSE.                                                00001020
                C                                                                  00001030
                C   CHECK TO SEE IF THIS IS A DATA RECORD                         00001040
                C                                                                  00001050
0016                   IF((ID.NE.17).AND.(IRCEND.NE.1)) GO TO 1                    00001060
                C                                                                  00001070
                C   IF AN END OF FILE WAS ENCOUNTERED ON THE CELL TAPE THEN        00001080
                C CALL NUFILE TO GET THE NEXT FILE                                 00001090
                C                                                                  00001100
0017                   IF(IRCEND.EQ.1)CALL NUFILE                                  00001110
0018                  IF(LEOV) RETURN                                              00001120
                C                                                                  00001130
                C   CALL INIT TO UNPACK THE CELL DATA                             00001140
                C                                                                  00001150
0019                5 LFIRST=.FALSE.                                               00001155
0020                   CALL INIT(IRCODE,ISTYR,DSTDAY,ISPYR,DSPDAY)                 00001160
```

17

```
0021                IF(LPREV) RETURN                                          00001170
                C                                                             00001180
                C   IF THE CELL RECORD  IS EARLIER THAN THE SAMP OR THEN       00001190
                C GET ANOTHER RECORD                                          00001200
                C                                                             00001210
0022                IYR=IYR                                                   00001220
0023                 IF(ISTYR.LT.IYR)GO TO 1                                  00001230
0024              10  DTHR=(DHR/24.D0)+DFLOAT(IDAY)                           00001240
0025                DIFF=DABS(DSTDAY-DTHR)                                    00001250
0026                 IF((DSTDAY.LT.DTHR).AND.(DIFF.GT.D2H8S)) GO TO 1         00001260
0027                IF((DSTDAY.GT.DTHR).AND.(DIFF.GT.D2H8S)) CALL GETSMP      00001270
0028                IF((DSTDAY.GT.DTHM).AND.(DIFF.GT.D2H8S)) GO TO 10         00001280
                C                                                             00001290
0029                IGETCL=999                                                00001300
0030                  RETURN                                                  00001310
0031              100   FORMAT(1X,I10,1X,'CELL RECORDS READ',1X,'FILE',1X,I3,  00001320
                     6'FILE RECORD',1X,I5)                                    00001330
0032                DEBUG INIT(ISTYR,IYR,DSTDAY,DTHR,IGETCL)                  00001340
0033                 END                                                      00001350
```

72

```
                C-------------------------------------------------------------------- 00001360
0001                  SUBROUTINE GETSHP                                               00001370
                C-------------------------------------------------------------------- 00001380
                C                                                                     00001390
                C   THIS PROGRAM READ A STATION REPORT INTO CORE AND KEEPS TRACK     00001400
                C OF RECORDS READ.                                                    00001410
                C                                                                     00001420
0002                  IMPLICIT REAL*8 (D)                                             00001430
                C                                                                     00001440
                COPY    SHIPRC  PROCES                                              00001450
                C                                                                     00001460
                C*******************************************************************00001470
                C                                                                     00001480
0003                 COMMON /SHIPRC/                                                  00001490
                    &           DHRSTA,CLAT,DLON,DHR,IDASTA,                        00001500
                    &           ICURSP,IYR,IDAY,IYRSTA,IWSPED,ISURFT,IPRESR,        00001510
                    &           IDRYBT,IWETBT,IASDIF,IPRESW,KIND,IWTVAP             00001520
0004                  REAL*8 DLAT,DLON,DHRSTA,DHR                                   00001530
                C                                                                     00001550
0005                 COMMON /PROCES/LPREV,LFOUND,LNEXT,ICELL,ISHIP,LEOV,LEND,       00001560
                    &ICLREC,NFILE,LEXIST,LSKIP,LFIRST                               00001570
0006                  LOGICAL  LPREV,LFOUND,LNEXT,LEOV,LEND,LEXIST,LSKIP,LFIRST     00001580
                C                                                                     00001590
                C                                                                     00001600
                C*******************************************************************00001610
                C                                                                     00001620
                C                                                                     00001630
0007                  READ(20,END=2)ICURSP,DLAT,DLON,IYRSTA,IDASTA,                 00001640
                    &           DHRSTA,IYR,IDAY,DHR,IWSPED,ISURFT,IPRESR,           00001650
                    &           IDRYBT,IWETBT,IASDIF,IPRESW,KIND,IWTVAP             00001660
                C                                                                     00001670
                C   CONVERT LONGITUDE TO NOPS CONVENTION, I.E. POSITIVE TO THE EAST  00001680
                C                                                                     00001690
0008                  IF(DLON.LE.180) DLON=-DLON                                    00001700
0009                  IF(DLON.GT.180) DLON=360.D0-DLON                              00001710
0010                  ISHIP=ISHIP+1                                                 00001720
0011                  IF(MOD(ISHIP,100).EQ.0)WRITE(6,100)ISHIP                      00001730
0012            100   FORMAT(1X,I10,'STATION REPORTS HAVE BEEN READ')               00001740
0013                  RETURN                                                        00001750
0014            2     LEND=.TRUE.                                                   00001760
0015                  RETURN                                                        00001770
0016                  END                                                           00001780
```

```
                C                                                                00004770
                C234567                                                          00004780
0001                  SUBROUTINE HEADNG(LAT1,LONG1,LAT2,LONG2,HEAD)              00004790
                C                                                                00004800
                C ***************************************************************00004810
                C *                                                             *00004820
                C * --------------SUBROUTINE HEADNG ---------------------------- *00004830
                C * PURPOSE: TO DETERMINE HEADING FROM ONE POINT TO ANOTHER      *00004840
                C * SUBROUTINES CALLED: DISTNC                                  *00004850
                C * FUNCTIONS USED: DSIN,DCOS,DARCOS                            *00004860
                C * VARIABLES USED:                                             *00004870
                C * DEGRAD - DEGREES TO RADIANS CONVERSION CONSTANT             *00004880
                C * KILRAD - KILOMETERS TO RADIANS CONVERSION CONSTANT          *00004890
                C * RADDEG - RADIANS TO DEGREE CONVERSION CONSTANT             *00004900
                C * LAT1 - LATITUDE (IN DEGREES) OF INITIAL POINT              *00004910
                C * LONG1 - LONGITUDE (IN DEGREES) OF INITIAL POINT            *00004920
                C * LAT2 - LATITUDE (IN DEGREES) OF DESTINATION POINT          *00004930
                C * LONG2 - LONGITUDE (IN DEGREES) OF DESTINATION POINT        *00004940
                C * RALATS - LAT1 CONVERTED TO RADIANS                        *00004950
                C * RALATP - LAT2 CONVERTED TO RADIANS                        *00004960
                C * DIST - DISTANCE (IN KILOMETERS) BETWEEN 2 POINTS          *00004970
                C * HEAD - HEADING (IN DEGREES)                               *00004980
                C * REFERENCE: TEXAS INSTRUMENTS PROGRAMMABLE SLIDE-RULE      *00004990
                C *            CALCULATOR SR-56 APPLICATIONS LIBRARY,         *00005000
                C *            1976,NAVIGATION PROGRAMS,GREAT CIRCLE          *00005010
                C *            NAVIGATION                                     *00005020
                C *                                                           *00005030
                C ***************************************************************00005040
                C                                                                00005050
0002                  REAL*8 KILRAD,DEGRAD,LAT1,LONG1,LAT2,LONG2,RADDEG          00005060
0003                  REAL*8 RALATS,RALATP,RADIST,HEAD,DIST,TEST                 00005070
                C     NAMELIST /POSIT/LAT1,LONG1,LAT2,LONG2                      00005080
0004                  DATA DEGRAD/.0174532925D0/,KILRAD/.0001569667D0/           00005090
0005                  DATA RADDEG/57.2957795D0/                                  00005100
                C     PRINT 1                                                    00005110
0006                1 FORMAT(/1X,'SUBROUTINE HEADNG')                          00005120
                C     PRINT 2,LAT1,LONG1,LAT2,LONG2                              00005130
0007                2 FORMAT(/1X,'LAT1 = ',1PG15.9,2X,'LONG1 = ',1PG15.9,2X,   00005140
                 &  'LAT2 = ',1PG15.9,2X,'LONG2 = ',1PG15.9)                     00005150
                C                                                                00005160
                C  10 WRITE(6,5)                                                 00005170
                C      READ(5,6) LAT1,LONG1,LAT2,LONG2                           00005180
                C      READ(5,POSIT)                                             00005190
                C     WRITE(6,7) LAT1,LONG1,LAT2,LONG2                           00005200
                C     WRITE(6,POSIT)                                             00005210
                C     IF (LAT1.GT.90) GO TO 20                                   00005220
0008                5 FORMAT(/1X,'INPUT LAT1,LONG1,LAT2,LONG2 UNDER RESPECTIVE 00005230
                 &   ASTERISKS'/1X,T5,'LAT1',T15,'LONG1',T25,'LAT2',T35,        00005240
                 & 'LONG2'/1X,T5,'********',T15,'*********',T25,'********',     00005250
                 & T35,'*********')                                              00005260
0009                6 FORMAT(T4,F7.3,T14,F8.3,T24,F7.3,T34,F8.3)               00005270
0010                7 FORMAT(/1X,T4,F7.3,T14,F8.3,T24,F7.3,T34,F8.3)           00005280
                C                                                                00005290
0011                  CALL DISTNC(LAT1,LONG1,LAT2,LONG2,DIST)                    00005300
```

```
0012            C
                      RALATS = DEGRAD * LAT1                                    00005310
0013                  RALATF = DEGRAD * LAT2                                    00005320
                C                                                               00005330
0014                  RADIST = KILRAD * DIST                                    00005340
                C                                                               00005350
                C     HEAD = DSIN(RALATF) - (DSIN(RALATS)*DCOS(RADIST))         00005360
0015                  HEAD = HEAD/(DSIN(RADIST)*DCOS(RALATS))                   00005370
0016                  HEAD = RADDEG * DARCOS(HEAD)                              00005380
0017                  TEST = LONG2 - LONG1                                      00005390
0018                  TEST = DEGRAD * TEST                                      00005400
0019            C     PRINT 32,HEAD                                             00005410
0020              32  FORMAT(/1X,'HEAD BEFORE IF = ',1PG15.9)                   00005420
0021                  IF (DSIN(TEST).LT.0D0) HEAD = 360.D0 - HEAD               00005430
                C                                                               00005440
                C     PRINT 3,DIST,HEAD                                         00005450
0022                3 FORMAT(/1X,'DISTANCE = ',1PG15.9,' KILOMETERS',2X,        00005460
                &   'HEADING = ',1PG15.9,' DEGREES')                            00005470
                C                                                               00005480
0023                  RETURN                                                    00005490
0024                  END                                                       00005500
                                                                                00005510
```

75

```
                C-----------------------------------------------------------------------00001790
0001                  SUBROUTINE INBLK                                                  00001800
                C-----------------------------------------------------------------------00001810
                C                                                                       00001820
                C   THIS PROGRAM EXAMINES THE CURRENT BLOCK OF CELL DATA TO            00001830
                C DETERMINE IF THE COINCIDENCE IS WITHIN IT. IF IT IS IT ALSO          00001840
                C RECORDS THE BAND AND CELL NUMBER                                      00001850
                C                                                                       00001860
0002                   IMPLICIT REAL*8(D)                                               00001870
                C                                                                       00001880
                COPY    PROCES  SHIPRC                                                  00001890
                C                                                                       00001900
                C***********************************************************************00001910
                C                                                                       00001920
0003                 COMMON /SHIPRC/                                                    00001930
                    &           DHRSTA,DLAT,DLON,DHR,IDASTA,                            00001940
                    &           ICURSP,ITR,IDAY,ITRSTA,IWSPED,ISURPT,IPRESR,            00001950
                    &           IDRYBT,IWETBT,IASDIF,IPRESH,KIND,INTVAP                 00001960
0004                 REAL*8 DLAT,DLON,DHRSTA,DHR                                        00001970
0005                 INTEGER*4 OPTION                                                   00001980
                C                                                                       00002000
0006                 COMMON /PROCES/LPREV,LFOUND,LEXIT,ICELL,ISKIP,LEOV,LEND,           00002010
                    &ICLREC,NFILE,LEXIST,LSKIP,LFIRST                                   00002020
0007                 LOGICAL  LPREV,LFOUND,LEXIT,LEOV,LEND,LEXIST,LSKIP,LFIRST          00002030
                C                                                                       00002040
                C                                                                       00002050
                C***********************************************************************00002060
                C                                                                       00002070
                C                                                                       00002080
0008                   INTEGER*4 BANDNM(4),CELLNM(4)                                    00002090
0009                   DIMENSION DLATAB(4),DLONAB(4)                                    00002100
0010                   COMMON /WHERE/BANDNM,CELLNM                                      00002110
0011                    LPREV=.FALSE.                                                   00002120
0012                    LEXIT=.FALSE.                                                   00002130
0013                    LFOUND=.FALSE.                                                  00002140
0014                   LEXIST=.TRUE.                                                    00002150
                C                                                                       00002160
                C   CALL COIN TO DETERMINE LOCATION OF COINCIDENCE                     00002170
                C                                                                       00002180
0015                    CALL COIN(DLAT,DLON,DLATAB,DLONAB,ICODE)                        00002190
                C                                                                       00002200
                C   SET LOGICAL FLAG TO TELL IF THE COINCIDENCE IS IN THE PREVIOUS      00002210
                C RECORD, IN THE CURRENT RECORD OR IN THE NEXT RECORD.                  00002220
                C                                                                       00002230
0016                   IF(ICODE.NE.1) LEXIST=.FALSE.                                    00002240
0017                   IF(.NOT.LEXIST) RETURN                                           00002250
0018                    IF(BANDNM(4).LT.1) LPREV=.TRUE.                                 00002260
0019                    IF(BANDNM(4).GT.26) LEXIT=.TRUE.                                00002270
0020                    IF(LPREV.OR.LEXIT) RETURN                                       00002280
0021                    LFOUND=.TRUE.                                                   00002290
0022                   IF(BANDNM(1).LT.1)  BANDNM(1)=1                                  00002291
0023                   IF(BANDNM(1).GT.5)  BANDNM(1)=5                                  00002292
0024                   IF(BANDNM(2).LT.1)  BANDNM(2)=1                                  00002293
0025                   IF(BANDNM(2).GT.8)  BANDNM(2)=8                                  00002294
```

```
0026              IF(BANDNM(3).LT.1) BANDNM(3)=1                          00002295
0027              IF(BANDNM(3).GT.13) BANDNM(3)=13                        00002296
0028               RETURN                                                 00002300
0029               END                                                    00002310
```

77

```
0001            SUBROUTINE INGEST(IRCODE,RECEND,ID)                                  00005520
                C                                                                    00005530
0002            INTEGER*2 CELL(7560)                                                 00005540
0003            INTEGER*4 RECEND                                                     00005550
0004            INTEGER*4 PIZREC,PILREC,RECID,LOGREC,TRABUN,DAYBUN,OBSBUN            00005560
0005            COMMON /CELIRC/PIZREC,PILREC,RECID,LOGREC,TRABUN,DAYBUN,OBSBUN       00005570
0006            COMMON /CELALL/CELL                                                  00005580
                C                                                                    00005590
0007          1 FORMAT(189(80A2))                                                    00005600
                C                                                                    00005610
0008            RECEND = 0                                                           00005620
0009            IRCODE = 1                                                           00005630
                C                                                                    00005640
                C                                                                    00005650
                C ********************************************************************00005660
                C *                                                                  *00005670
                C *                                                                  *00005680
0010            READ(11,1,ERR=300,END=400) (CELL(II),II=1,7560)                      00005690
                C                                                                    00005700
                C   UNPACK INCIDENTAL DATA AT BEGINNING OF EACH RECORD                00005710
                C                                                                    00005720
0011            CALL IRINCE                                                          00005730
0012            ID=RECID                                                             00005740
0013            RETURN                                                               00005750
                C *                                                                  *00005760
                C *                                                                  *00005770
                C ********************************************************************00005780
                C                                                                    00005790
                C                                                                    00005800
0014          300 RECEND = -1                                                        00005810
0015            RETURN                                                               00005820
0016          400 RECEND = 1                                                         00005830
0017            RETURN                                                               00005840
0018            END                                                                  00005851
```

78

```
0001             SUBROUTINE INIMCE                                           00005860
           C                                                                 00005870
           C ************************************************************   00005880
           C *                                                          *   00005890
           C * SUBROUTINE INIMCE ASSIGNS THE PROPER VALUES FROM THE MASTER * 00005900
           C * ARRAY CELL TO THE ARRAYS USED FOR THE INCIDENTAL DATA FOUND * 00005910
           C * AT THE BEGINNING OF THE RECORD. THIS DATA CONSISTS OF THE *  00005920
           C * FOLLOWING VARIABLES:                                     *   00005930
           C * FIZREC: PHYSICAL RECORD NUMBER.                          *   00005940
           C * FILREC: FILE/RECORD STATUS.                              *   00005950
           C * RECID:  TYPE OF RECORD.                                  *   00005960
           C * LOGREC: LOGICAL RECORD NUMBER.                           *   00005970
           C * YEARNM: LAST 2 DIGITS OF YEAR.                           *   00005980
           C * DAYNUM: DAY OF YEAR.                                     *   00005990
           C *                                                          *   00006000
           C ************************************************************   00006010
           C                                                                 00006020
0002             INTEGER*4 FIZREC,FILREC,RECID,LOGREC,YEARNM,DAYNUM,ORBNUM   00006030
0003             INTEGER*4 SHFTR,SHFTL                                       00006040
0004             INTEGER*2 CELL(7560)                                        00006050
0005             COMMON /CELALL/CELL                                         00006060
0006             COMMON /CELINC/FIZREC,FILREC,RECID,LOGREC,YEARNM,DAYNUM,ORBNUM 00006070
           C                                                                 00006080
0007             FIZREC = CELL(1)                                            00006090
0008             FIZREC = SHFTR(FIZREC,4)                                    00006100
           C                                                                 00006110
0009             FILREC = CELL(2)                                            00006120
0010             FILREC = SHFTR(FILREC,14)                                   00006130
           C                                                                 00006140
0011             RECID = CELL(2)                                             00006150
0012             RECID = SHFTL(RECID,2)                                      00006160
0013             RECID = SHFTR(RECID,10)                                     00006170
           C                                                                 00006180
0014             LOGREC = CELL(2)                                            00006190
0015             LOGREC = SHFTL(LOGREC,24)                                   00006200
0016             LOGREC = SHFTR(LOGREC,24)                                   00006210
           C                                                                 00006220
0017             YEARNM = CELL(3)                                            00006230
           C                                                                 00006240
0018             DAYNUM = CELL(4)                                            00006250
           C                                                                 00006260
0019             ORBNUM = CELL(5)                                            00006270
           C                                                                 00006280
0020             RETURN                                                      00006290
0021             END                                                         00006300
```

```
0001                  SUBROUTINE INIT(IRCODE,YEARF,DAYF,YEARL,DAYL)                    00006310
                      C                                                                00006320
                      C234567                                                          00006330
0002                  INTEGER * 4 YEAR1,YEAR2,YEARF,YEARL                              00006340
0003                  REAL * 8 DAY1,DAY2,DAYF,DAYL                                     00006350
0004                  COMMON /BTIME/DAY1,DAY2,YEAR1,YEAR2                              00006360
                      C                                                                00006370
                      C ***************************************************************00006380
                      C *                                                             *00006390
                      C * THIS SECTION OF SUBROUTINE INIT SETS UP THE ARRAYS FOR THE  *00006400
                      C *   6 KILOMETER CELLS.                                        *00006410
                      C *                                                             *00006420
                      C ***************************************************************00006430
                      C *                                                             *00006440
                      C *                                                             *00006450
0005                  CALL IN156                                                       00006460
                      C *                                                             *00006470
                      C *                                                             *00006480
                      C ***************************************************************00006490
                      C                                                                00006500
                      C                                                                00006510
                      C                                                                00006520
                      C ***************************************************************00006530
                      C *                                                             *00006540
                      C * THIS SECTION OF SUBROUTINE INIT SETS UP ARRAYS FOR THE      *00006550
                      C * 97.5 KILOMETER CELLS                                        *00006560
                      C *                                                             *00006570
                      C ***************************************************************00006580
                      C *                                                             *00006590
                      C *                                                             *00006600
0006                  CALL IN1975                                                      00006610
                      C *                                                             *00006620
                      C *                                                             *00006630
                      C ***************************************************************00006640
                                                                                       00006650
                      C                                                                00006660
                      C ***************************************************************00006670
                      C *                                                             *00006680
                      C * THIS SECTION OF SUBROUTINE INIT SETS UP ARRAYS FOR THE      *00006690
                      C * 60 KILOMETER CELLS.                                         *00006700
                      C *                                                             *00006710
                      C ***************************************************************00006720
                      C *                                                             *00006730
                      C *                                                             *00006740
0007                  CALL IN160                                                       00006750
                      C *                                                             *00006760
                      C *                                                             *00006770
                      C ***************************************************************00006780
                      C                                                                00006790
                      C                                                                00006800
                      C ***************************************************************00006810
                      C *                                                             *00006820
                      C * THIS SECTION OF SUBROUTINE INIT SETS UP ARRAYS FOR THE      *00006830
                      C * 30 KILOMETER CELLS.                                         *00006840
```

```
      C *                                                             *     00006850
      C ***************************************************************     00006860
      C *                                                             *     00006870
      C *                                                             *     00006880
0008          CALL IBI30                                                    00006890
      C *                                                             *     00006900
      C *                                                             *     00006910
      C ***************************************************************     00006920
      C                                                                     00006930
0009          CALL BLKTIM                                                   00006940
0010          YEARF = YEAR1+1900                                            00006950
0011          YEARL = YEAR2+1900                                            00006960
0012          DAYF = DAY1                                                   00006970
0013          DAYL = DAY2                                                   00006980
0014          RETURN                                                        00006990
0015          END                                                           00007000
```

18

```
0001          SUBROUTINE INI156
         C
         C ***************************************************************
         C *                                                             *
         C * SUBROUTINE INI156  ASSIGNS THE PROPER VALUES FROM THE MASTER *
         C * ARRAY CELL TO THE ARRAYS USED FOR 156 KILOMETER DATA.        *
         C *                                                             *
         C ***************************************************************
         C
0002          INTEGER*4 SOD156(5),SHFTL,SHFTR
0003          INTEGER*2 CELL(7560),POS156(5,5,2),GQ156(5,5),TB156(5,5,5,2),
             &  DNT156(5)
         C
0004          COMMON /CELALL/CELL
0005          COMMON /CEL156/SOD156,POS156,GQ156,TB156,DNT156
         C
         C ***************************************************************
         C *                                                             *
         C * IBAND: BAND COUNTER.                                        *
         C * NNB156: THE POSITION IN ARRAY CELL WHERE THE NEEDED DATA FOR *
         C *         BAND NUMBER IBAND BEGINS.                           *
         C * ICELL: CELL COUNTER.                                        *
         C * ICLNUM: THE POSITION IN ARRAY CELL WHERE THE NEEDED DATA FOR *
         C *         CELL ICELL OF BAND IBAND BEGINS.                    *
         C *                                                             *
         C ***************************************************************
         C
0006          DO 1000 IBAND = 1,5
         C
0007          NNB156 = -43 + IBAND*76
         C
0008          DNT156(IBAND) = CELL(NNB156+3)
         C
0009          SOD156(IBAND) = SHFTL(CELL(NNB156+4),8)
0010          SOD156(IBAND) = SHFTR(SOD156(IBAND),8)
         C
0011          DO 900 ICELL = 1,5
         C
0012          ICLNUM = NNB156 - 8 + ICELL*14
         C
0013          POS156(IBAND,ICELL,1) = CELL(ICLNUM)
0014          POS156(IBAND,ICELL,2) = CELL(ICLNUM+1)
         C
0015          GQ156(IBAND,ICELL) = CELL(ICLNUM+3)
         C
0016          TB156(IBAND,ICELL,1,1) = CELL(ICLNUM+4)
0017          TB156(IBAND,ICELL,1,2) = CELL(ICLNUM+5)
         C
0018          TB156(IBAND,ICELL,2,1) = CELL(ICLNUM+6)
0019          TB156(IBAND,ICELL,2,2) = CELL(ICLNUM+7)
         C
0020          TB156(IBAND,ICELL,3,1) = CELL(ICLNUM+8)
0021          TB156(IBAND,ICELL,3,2) = CELL(ICLNUM+9)
         C
```

```
0022              TB156(IBAND,ICELL,4,1) = CELL(ICLNUM+10)                  00007550
0023              TB156(IBAND,ICELL,4,2) = CELL(ICLNUM+11)                  00007560
                  C                                                         00007570
0024              TB156(IBAND,ICELL,5,1) = CELL(ICLNUM+12)                  00007580
0025              TB156(IBAND,ICELL,5,2) = CELL(ICLNUM+13)                  00007590
                  C                                                         00007600
0026                900 CONTINUE                                            00007610
0027               1000 CONTINUE                                            00007620
                  C                                                         00007630
0028              RETURN                                                    00007640
0029              END                                                       00007650
```

```
0001                SUBROUTINE IBI30                                                  00007660
                    C                                                                 00007670
                    C ****************************************************************00007680
                    C *                                                              *00007690
                    C * SUBROUTINE IBI30 ASSIGNS THE PROPER VALUES FROM THE MASTER   *00007700
                    C * ARRAY CELL TO THE ARRAYS USED FOR 30 KILOMETER DATA.         *00007710
                    C *                                                              *00007720
                    C ****************************************************************00007730
                    C                                                                 00007740
0002                     INTEGER*4 SOD30(26),SFTIL,SHFTR                              00007750
0003                     INTEGER*2 CELL(7560),POS30(26,26,2),GQ30(26,26),             00007760
                        &    TB30(26,26,2),DNT30(26)                                 00007770
                    C                                                                 00007780
0004                     COMMON /CELALL/CELL                                          00007790
0005                     COMMON /CEL30/SOD30,POS30,GQ30,TB30,DNT30                    00007800
                    C                                                                 00007810
                    C ****************************************************************00007820
                    C *                                                              *00007830
                    C * IBAND: BAND COUNTER.                                         *00007840
                    C * NNB30: THE POSITION IN ARRAY CELL WHERE THE NEEDED DATA FOR  *00007850
                    C *        BAND NUMBER IBAND BEGINS.                             *00007860
                    C * ICELL: CELL COUNTER.                                        *00007870
                    C * ICLNUM: THE POSITION IN ARRAY CELL WHERE THE NEEDED DATA FOR*00007880
                    C *         CELL ICELL OF BAND IBAND BEGINS.                     *00007890
                    C *                                                              *00007900
                    C ****************************************************************00007910
                    C                                                                 00007920
0006                    1 FORMAT(1X,'CELL( ',I5,' ) = ',Z4,2X,'CELL( ',I5,' ) = ',Z4) 00007930
0007                    2 FORMAT(1X,'SOD30( ',I5,' ) = ',Z8)                          00007940
0008                     DO 1000 IBAND = 1,26                                         00007950
                    C                                                                 00007960
0009                     NNB30 = 3175 + 162*IBAND                                     00007970
                    C                                                                 00007980
0010                     DNT30(IBAND) = CELL(NNB30+3)                                 00007990
                    C                                                                 00008000
0011                     IZ1 = NNB30 + 4                                              00008010
0012                     IZ2 = IZ1 + 1                                                00008020
                    C        PRINT 1,IZ1,CELL(IZ1),IZ2,CELL(IZ2)                      00008030
0013                     SOD30(IBAND) = SHFTL(CELL(NNB30+4),8)                        00008040
                    C        PRINT 2,IBAND,SOD30(IBAND)                               00008050
0014                     SOD30(IBAND) = SHFTR(SOD30(IBAND),8)                         00008060
                    C        PRINT 2,IBAND,SOD30(IBAND)                               00008070
                    C                                                                 00008080
0015                     DO 900 ICELL = 1,26                                          00008090
                    C                                                                 00008100
0016                     ICLNUM = NNB30 + 6*ICELL                                     00008110
                    C                                                                 00008120
0017                     POS30(IBAND,ICELL,1) = CELL(ICLNUM)                          00008130
0018                     POS30(IBAND,ICELL,2) = CELL(ICLNUM+1)                        00008140
                    C                                                                 00008150
0019                     GQ30(IBAND,ICELL) = CELL(ICLNUM+3)                           00008160
                    C                                                                 00008170
0020                     TB30(IBAND,ICELL,1) = CELL(ICLNUM+4)                         00008180
0021                     TB30(IBAND,ICELL,2) = CELL(ICLNUM+5)                         00008190
```

L8

```
                C                                                       000C8200
0022              900 CONTINUE                                          000C8210
0023             1000 CONTINUE                                          000C8220
                C                                                       000C8230
0024                  RETURN                                            000C8240
0025                  END                                               000C8250
```

```
0001            SUBROUTINE INI60                                                 00008260
           C                                                                     00008270
           C *****************************************************************  00008280
           C *                                                              *   00008290
           C * SUBROUTINE INI60 ASSIGNS THE PROPER VALUES FROM THE MASTER    *   00008300
           C * ARRAY CELL TO THE ARRAYS USED FOR 156 KILOMETER DATA.         *   00008310
           C *                                                              *   00008320
           C *****************************************************************  00008330
           C                                                                     00008340
0002            INTEGER*4 SOD60(13),SHFTL,SHFTR                                  00008350
0003            INTEGER*2 CELL(7560),POS60(13,13,2),GQ60(13,13),                 00008360
              &   TB60(13,13,3,2),DNT60(13)                                      00008370
           C                                                                     00008380
0004            COMMON /CELALL/CELL                                              00008390
0005            COMMON /CEL60/SOD60,POS60,GQ60,TB60,DNT60                        00008400
           C                                                                     00008410
           C *****************************************************************  00008420
           C *                                                              *   00008430
           C * IBAND: BAND COUNTER.                                         *   00008440
           C * NNB60: THE POSITION IN ARRAY CELL WHERE THE NEEDED DATA FOR  *   00008450
           C *        BAND NUMBER IBAND BEGINS.                              *   00008460
           C * ICELL: CELL COUNTER.                                          *   00008470
           C * ICLNUM: THE POSITION IN ARRAY CELL WHERE THE NEEDED DATA FOR *   00008480
           C *         CELL ICELL OF BAND IBAND BEGINS.                      *   00008490
           C *                                                              *   00008500
           C *****************************************************************  00008510
           C                                                                     00008520
0006          1 FORMAT(1X,'CELL( ',I5,' ) = ',Z4,2X,'CELL( ',I5,' ) = ',Z4)      00008530
0007          2 FORMAT(1X,'SOD60( ',I5,' ) = ',Z8)                               00008540
0008            DO 1000 IBAND = 1,13                                             00008550
           C                                                                     00008560
0009            NNB60 = 1069 + IBAND*162                                         00008570
           C                                                                     00008580
0010            DNT60(IBAND) = CELL(NNB60+3)                                     00008590
           C                                                                     00008600
0011            IZ1 = NNB60 + 4                                                  00008610
0012            IZ2 = IZ1 + 1                                                    00008620
           C    PRINT 1,IZ1,CELL(IZ1),IZ2,CELL(IZ2)                              00008630
0013            SOD60(IBAND) = SHFTL(CELL(NNB60+4),8)                            00008640
           C    PRINT 2,IBAND,SOD60(IBAND)                                       00008650
0014            SOD60(IBAND) = SHFTR(SOD60(IBAND),8)                             00008660
           C    PRINT 2,IBAND,SOD60(IBAND)                                       00008670
           C                                                                     00008680
0015            DO 900 ICELL = 1,13                                              00008690
           C                                                                     00008700
0016            ICLNUM = NNB60 - 6 + 12*ICELL                                    00008710
           C                                                                     00008720
0017            POS60(IBAND,ICELL,1) = CELL(ICLNUM)                              00008730
0018            POS60(IBAND,ICELL,2) = CELL(ICLNUM+1)                            00008740
           C                                                                     00008750
0019            GQ60(IBAND,ICELL) = CELL(ICLNUM+3)                               00008760
           C                                                                     00008770
0020            TB60(IBAND,ICELL,1,1) = CELL(ICLNUM+4)                           00008780
0021            TB60(IBAND,ICELL,1,2) = CELL(ICLNUM+5)                           00008790
```

```
                C
0022                 TB60(IBAND,ICELL,2,1) = CELL(ICLNUM+6)                     000C8800
0023                 TB60(IBAND,ICELL,2,2) = CELL(ICLNUM+7)                     000C8810
                C                                                               000C8820
0024                 TB60(IBAND,ICELL,3,1) = CELL(ICLNUM+8)                     000C8830
0025                 TB60(IBAND,ICELL,3,2) = CELL(ICLNUM+9)                     000C8840
                C                                                               000C8850
0026               900 CONTINUE                                                 000C8860
0027              1000 CONTINUE                                                 000C8870
                C                                                               000C8880
0028                 RETURN                                                     000C8890
0029                 END                                                        000C8900
```

```
0001              SUBROUTINE IN1975                                                    00008920
            C                                                                          00008930
            C ****************************************************************        00008940
            C *                                                              *        00008950
            C * SUBROUTINE IN1975 ASSIGNS THE PROPER VALUES FROM THE MASTER  *        00008960
            C * ARRAY CELL TO THE ARRAYS USED FOR 97.5 KILOMETER DATA.       *        00008970
            C *                                                              *        00008980
            C ****************************************************************        00008990
            C                                                                          00009000
0002              INTEGER*4 SOD975(8),SHFTL,SHFTR                                      00009010
0003              INTEGER*2 CELL(7560),POS975(8,8,2),GQ975(8,8),TB975(8,8,4,2),        00009020
                 6   DNT975(8)                                                         00009030
            C                                                                          00009040
0004              COMMON /CELALL/CELL                                                  00009050
0005              COMMON /CEL975/SOD975,POS975,GQ975,TB975,DNT975                      00009060
            C                                                                          00009070
            C ****************************************************************        00009080
            C *                                                              *        00009090
            C * IBAND: BAND COUNTER.                                         *        00009100
            C * NNB975: THE POSITION IN ARRAY CELL WHERE THE NEEDED DATA FOR *        00009110
            C *           BAND NUMBER IBAND BEGINS.                          *        00009120
            C * ICELL: CELL COUNTER.                                         *        00009130
            C * ICLNUM: THE POSITION IN ARRAY CELL WHERE THE NEEDED DATA FOR *        00009140
            C *           CELL ICELL OF BAND IBAND BEGINS.                   *        00009150
            C *                                                              *        00009160
            C ****************************************************************        00009170
            C                                                                          00009180
0006              DO 1000 IBAND = 1,8                                                  00009190
0007              NNB975 = 311 + IBAND*102                                             00009200
            C                                                                          00009210
0008              DNT975(IBAND) = CELL(NNB975+3)                                       00009220
            C                                                                          00009230
0009              SOD975(IBAND) = SHFTL(CELL(NNB975+4),8)                              00009240
0010              SOD975(IBAND) = SHFTR(SOD975(IBAND),8)                               00009250
            C                                                                          00009260
0011              DO 990 ICELL = 1,8                                                   00009270
            C                                                                          00009280
0012              ICLNUM = NNB975 - 6 + 12*ICELL                                       00009290
            C                                                                          00009300
0013              POS975(IBAND,ICELL,1) = CELL(ICLNUM)                                 00009310
0014              POS975(IBAND,ICELL,2) = CELL(ICLNUM+1)                               00009320
            C                                                                          00009330
0015              GQ975(IBAND,ICELL) = CELL(ICLNUM+3)                                  00009340
            C                                                                          00009350
0016              TB975(IBAND,ICELL,1,1) = CELL(ICLNUM+4)                              00009360
0017              TB975(IBAND,ICELL,1,2) = CELL(ICLNUM+5)                              00009370
            C                                                                          00009380
0018              TB975(IBAND,ICELL,2,1) = CELL(ICLNUM+6)                              00009390
0019              TB975(IBAND,ICELL,2,2) = CELL(ICLNUM+7)                              00009400
            C                                                                          00009410
0020              TB975(IBAND,ICELL,3,1) = CELL(ICLNUM+8)                              00009420
0021              TB975(IBAND,ICELL,3,2) = CELL(ICLNUM+9)                              00009430
            C                                                                          00009440
0022              TB975(IBAND,ICELL,4,1) = CELL(ICLNUM+10)                             00009450
```

```
0023                IB975(IBAND,ICELL,4,2) = CELL(ICLNUM+11)                    00009860
                                                                                00009870
                                                                                00009880
0024              900 CONTINUE                                                  00009890
0025             1000 CONTINUE                                                  00009900
                                                                                00009910
0026                RETURN                                                      00009920
0027                END
```

```
0001                  SUBROUTINE LATLCB                                          00009530
                C                                                                00009540
0002                  REAL * 8 LATS(6),LONS(6),LT11,LT113,LT131,LT1313           00009550
0003                  REAL * 8 FACTOR,DIST,BEAR,CENLAT,CENLON                    00009560
0004                  REAL * 8 LAT(6),LON(6),LN11,LN113,LN131,LN1313             00009570
0005                  INTEGER * 4 SOD60(13),DUMMY                                00009580
0006                  INTEGER * 2 POS60(13,13,2),GQ60(13,13),TB60(13,13,3,2),    00009590
                     & DNT60(13)                                                 00009600
0007                  COMMON /CEL60/SOD60,POS60,GQ60,TB60,DNT60                  00009610
0008                  COMMON /CCBBER/LATS,LONS                                   00009620
                C                                                                00009630
0009                  DATA FACTOR/1.08333D0/                                     00009640
                C                                                                00009650
                C ***** DETERMINE CENTER POINT *****                             00009660
                C                                                                00009670
0010                  DUMMY = POS60(7,7,1)                                       00009680
0011                  CENLAT = DFLOAT(DUMMY)/100.D0                              00009690
0012                  DUMMY = POS60(7,7,2)                                       00009700
0013                  CENLON = DFLOAT(DUMMY)/100.D0                              00009710
                C                                                                00009720
                C ***** DETERMINE POINT AT BAND 1, CELL 1 *****                  00009730
                C                                                                00009740
0014                  DUMMY = POS60(1,1,1)                                       00009750
0015                  LT11 = DFLOAT(DUMMY)/100.D0                                00009760
0016                  DUMMY = POS60(1,1,2)                                       00009770
0017                  LN11 = DFLOAT(DUMMY)/100.D0                                00009780
                C                                                                00009790
                C ***** DETERMINE POINT AT BAND 1, CELL 13 *****                 00009800
                C                                                                00009810
0018                  DUMMY = POS60(1,13,1)                                      00009820
0019                  LT113 = DFLOAT(DUMMY)/100.D0                               00009830
0020                  DUMMY = POS60(1,13,2)                                      00009840
0021                  LN113 = DFLOAT(DUMMY)/100.D0                               00009850
                C                                                                00009860
                C ***** DETERMINE POINT AT BAND 13, CELL 1 *****                 00009870
                C                                                                00009880
0022                  DUMMY = POS60(13,1,1)                                      00009890
0023                  LT131 = DFLOAT(DUMMY)/100.D0                               00009900
0024                  DUMMY = POS60(13,1,2)                                      00009910
0025                  LN131 = DFLOAT(DUMMY)/100.D0                               00009920
                C                                                                00009930
                C ***** DETERMINE POINT AT BAND 13, CELL 13 *****                00009940
                C                                                                00009950
0026                  DUMMY = POS60(13,13,1)                                     00009960
0027                  LT1313 = DFLOAT(DUMMY)/100.D0                              00009970
0028                  DUMMY = POS60(13,13,2)                                     00009980
0029                  LN1313 = DFLOAT(DUMMY)/100.D0                              00009990
                C                                                                00010000
                C                                                                00010010
0030                  LAT(1) = LT11                                              00010020
0031                  LON(1) = LN11                                              00010030
0032                  LAT(2) = LT113                                             00010040
0033                  LON(2) = LN113                                             00010050
0034                  LAT(3) = LT1313                                            00010060
```

```
0015              LON(3) = LN1313                                          000010070
0016              LAT(4) = LT131                                           000010080
0017              LON(4) = LN131                                           000010090
                  C      DO 25 INDX = 1,4                                  000010100
                  C      PRINT 2,INDX,LAT(INDX),INDX,LON(INDX)             000010110
                  C   25 CONTINUE                                          000010120
0018                2 FORMAT(1X,'LAT( ',I2,' ) = ',1PG15.9,' LON( ',I2,' ) = ',  000010130
                   & 1PG15.9)                                              000010140
                  C                                                        000010150
                  C ***** NOW DETERMINE THE LATITUDE AND LONGITUDES OF THE POINTS  000010160
                  C ***** AT THE VERY CORNERS OF THE DATA BLOCK. *****     000010170
                  C                                                        000010180
0019                  DO 100 INDEX = 1,4                                   000010190
0020                  CALL DISTNC(CENLAT,CENLON,LAT(INDEX),LON(INDEX),DIST)  000010200
0021                  CALL HEADBG(CENLAT,CENLON,LAT(INDEX),LON(INDEX),HEAD)  000010210
0022                  DIST = FACTOR * DIST                                 000010220
0023                  CALL EXTEND(CENLAT,CENLON,HEAD,DIST,LATS(INDEX),LONS(INDEX))  000010230
                  C       PRINT 1,INDEX,LATS(INDEX),INDEX,LONS(INDEX)     000010240
0024                100 CONTINUE                                           000010250
0025                  1 FORMAT(1X,'LATS( ',I2,' ) = ',1PG15.9,' LONS( ',I2,' ) = ',  000010260
                   & 1PG15.9)                                              000010270
                  C                                                        000010280
0026                  RETURN                                               000010290
0027                  END                                                  000010300
```

```
                C-----------------------------------------------------------------
0001                  SUBROUTINE NUFILE
                C-----------------------------------------------------------------
                C
                CCIT    PROCES
                C
                C*****************************************************************
                C
0002                COMMON /PROCES/LPREV,LFOUND,LNEXT,ICELL,ISKIP,LEOV,LEND,
                   &ICLREC,NFILE,LEXIST,LSKIP,LFIRST
0003                  LOGICAL  LPREV,LFOUND,LNEXT,LEOV,LEND,LEXIST,LSKIP,LFIRST
                C
                C
                C*****************************************************************
                C
0004                LFIRST=.TRUE.
                C
                C   REWIND TO CLOSE FILE FOR FORTRAN IO
                C
0005                  REWIND 11
0006             90 ICLREC=0
0007                  NFILE=NFILE+1
0008                  CALL PCSR(1,11,NFILE)
                C
                C   CALL REWIND TO CLOSE FILE FOR FTIO IO
                C
0009                  CALL REWIND(11)
0010                  WRITE(6,100)NFILE
0011            100  FORMAT(1X,'TAPE XXXX ',1X,'POSITIONED TO FILE ',I3)
0012            110 CALL INGEST(INCODE,IRECND,ID)
0013                 IF(IRECND.EQ.1) GO TO 120
0014                 ICLREC=ICLREC+1
0015                 ICELL=ICELL+1
0016                 IF(ID.EQ.17) RETURN
0017                 GO TO 110
0018            120 IF(ICLREC.EQ.1) LEOV=.TRUE.
0019                 IF(ICLREC.NE.1) GO TO 90
0020                  RETURN
0021                  END
```

```
0001            SUBROUTINE RITEP(OPTION,IRCODE)                                 000 10310
                C                                                               000 10320
                C ***************************************************************000 10330
                C *                                                             *000 10340
                C * SUBROUTINE RITEP OUTPUTS CELL DATA TO PRINTER. THE TYPE OF  *000 10350
                C * CELL DATA REQUIRED IS GIVEN IN OPTION. THE OPTIONS ARE AS   *000 10360
                C * FOLLOWS:                                                    *000 10370
                C * OPTION = 1: DATA FOR 156 KILOMETER CELLS.                   *000 10380
                C * OPTION = 2: DATA FOR 97.5 KILOMETER CELLS.                  *000 10390
                C * OPTION = 3: DATA FOR 60 KILOMETER CELLS.                   *000 10400
                C * OPTION = 4: DATA FOR 30 KILOMETER CELLS.                   *000 10410
                C * OPTION = 5: DATA FOR ALL CELLS.                            *000 10420
                C * OPTION = 6: WRITE ALL PERTINENT CELL DATA TO TAPE.         *000 10430
                C *                                                             *000 10440
                C ***************************************************************000 10450
                C                                                               000 10460
0002                 REAL*4 FREQ(5)                                             000 10470
0003                 INTEGER*4 OPTION,CPT                                       000 10480
0004                 REAL*8 DASH(15),ASTER(15)                                  000 10490
0005                 COMMON /SHIPRC/ IERSTA,DLAT,DLON,DHR,IDASTA,ICURSP,IYR,IDAY,000 10500
                    $      IYRSTA,IWSPEC,ISURFT,IPRESR,IDRYDT,IWETDT,IASDIF,IPRESW,000 10510
                    $      KIND,IWTVAP                                          000 10520
0006                 REAL*8 DLAT,DLON,DHRSTA,DHR                                000 10530
                C                                                               000 10540
                C ***************************************************************000 10550
                C *                                                             *000 10560
                C *                                                             *000 10570
0007                 INTEGER*4 FIZREC,FILREC,RECID,LOGREC,YEARNM,DAYNUM,ORBNUM  000 10580
0008                 COMMON /CELINC/FIZREC,FILREC,RECID,LOGREC,YEARNM,DAYNUM,ORBNUM000 10590
                C *                                                             *000 10600
                C ***************************************************************000 10610
                C                                                               000 10620
                C                                                               000 10630
                C                                                               000 10640
                C ***************************************************************000 10650
                C *                                                             *000 10660
                C *                                                             *000 10670
0009                 INTEGER*4 SOD156(5)                                        000 10680
0010                 INTEGER*2 POS156(5,5,2),GQ156(5,5),TB156(5,5,5,2),         000 10690
                    &    DNT156(5)                                              000 10700
0011                 COMMON /CEL156/SOD156,POS156,GQ156,TB156,DNT156            000 10710
                C *                                                             *000 10720
                C *                                                             *000 10730
                C ***************************************************************000 10740
                C                                                               000 10750
                C                                                               000 10760
                C ***************************************************************000 10770
                C *                                                             *000 10780
                C *                                                             *000 10790
0012                 INTEGER*4 SOD975(8)                                        000 10800
0013                 INTEGER*2 POS975(8,8,2),GQ975(8,8),TD975(8,8,4,2),         000 10810
                    &    DN1975(8)                                              000 10820
0014                 COMMON /CEL975/SOD975,POS975,GQ975,TB975,DN1975            000 10830
                C *                                                             *000 10840
```

```
      C *                                                             *     000010850
      C ***************************************************************     000010860
      C                                                                     000010870
      C                                                                     000010880
      C ***************************************************************     000010890
      C *                                                             *     000010900
      C *                                                             *     000010910
0015        INTEGER*4 SOB60(13)                                             000010920
0016        INTEGER*2 POS60(13,13,2),GQ60(13,13),TB60(13,13,3,2),           000010930
           &   BBT60(13)                                                    000010940
0017        COMMON /CEL60/SOB60,POS60,GQ60,TB60,BBT60                       000010950
      C *                                                             *     000010960
      C *                                                             *     000010970
      C ***************************************************************     000010980
      C                                                                     000010990
      C                                                                     000011000
      C ***************************************************************     000011010
      C *                                                             *     000011020
      C *                                                             *     000011030
0018        INTEGER*4 SOB30(26)                                             000011040
0019        INTEGER*2 POS30(26,26,2),GQ30(26,26),TB30(26,26,2),             000011050
           &   BBT30(26)                                                    000011060
0020        COMMON /CEL30/SOB30,POS30,GQ30,TB30,BBT30                       000011070
      C *                                                             *     000011080
      C *                                                             *     000011090
      C ***************************************************************     000011100
      C                                                                     000011110
      C                                                                     000011120
      C ***************************************************************     000011130
      C *                                                             *     000011140
      C *                                                             *     000011150
0021        INTEGER * 4 BABIBB(4),CELLBB(4)                                 000011160
0022        COMMON /WHERE/BABIBB,CELLBB                                     000011170
0023        REAL * 8 LATS(4),LONS(4)                                        000011180
0024        COMMON /COORDS/LATS,LONS                                        000011190
0025        REAL * 8 DAY1,DAY2                                              000011200
0026        INTEGER * 4 YEAR1,YEAR2                                         000011210
0027        COMMON /RTIME/DAY1,DAY2,YEAR1,YEAR2                             000011220
      C *                                                             *     000011230
      C *                                                             *     000011240
      C ***************************************************************     000011250
      C                                                                     000011260
0028        IF (OPTION.EQ.6) GO TO 700                                      000011270
0029      1 FORMAT(/1X,'THIS IS SUBROUTINE RITEP')                          000011280
0030      2 FORMAT(/1X,'OPTION CHOSEN IS GT 5. OPTION = ',I6)               000011290
0031      3 FORMAT(/1X,'OPTION CHOSEN IS LT 1. OPTION = ',I6)               000011300
0032      4 FORMAT(/1X,'OPTION CHOSEN IS ',I3)                              000011310
0033      5 FORMAT('1')                                                     000011320
0034      6 FORMAT(1X,15A8)                                                 000011330
0035      8 FORMAT('1')                                                     000011340
      C                                                                     000011350
0036        DATA DASH/15*'--------'/,BBQ/37.,21.,18.,10.69,6./               000011360
0037        DATA ASTER/15*'********'/                                       000011370
0038        DATA ILEP1/1/                                                   000011380
```

```
0039              IRCODE = 5                                                    00011390
                C                                                               00011400
0040              WRITE(6,1)                                                    00011410
                C                                                               00011420
                C ************************************************************* 00011430
                C *                                                           * 00011440
                C * THESE STATEMENTS WRITE OUT INCIDENTAL DATA FOUND AT THE   * 00011450
                C * BEGINNING OF EACH CELL DATA RECORD.                      * 00011460
                C *                                                           * 00011470
0041              WRITE(6,8)                                                    00011480
0042            7 FORMAT(/1X,5X,'PHYSICAL RECORD NUMBER = ',I6/                 00011490
                &  1X,5X,'LOGICAL RECORD NUMBER = ',I6/                         00011500
                &  1X,5X,'FILE/RECORD STATUS = ',I6/                            00011510
                &  1X,5X,'RECORD ID = ',I6/                                     00011520
                &  1X,5X,'YEAR NUMBER = ',I3/                                   00011530
                &  1X,5X,'DAY NUMBER =  ',I6/                                   00011540
                &  1X,5X,'ORBIT NUMBER = ',I6/)                                 00011550
                C                                                               00011560
0043              WRITE(6,6) (ASTER(I),I=1,15)                                  00011570
0044              WRITE(6,7) PIZREC,LOGREC,FILREC,RECID,YEARNR,DAYNUM,ORBNUM    00011580
0045              WRITE(6,6) (ASTER(I),I=1,15)                                  00011590
                C *                                                           * 00011600
                C ************************************************************* 00011610
                C                                                               00011620
                C                                                               00011630
0046              IF (OPTION.GT.6) WRITE(6,2) OPTION                            00011640
0047              IF (OPTION.GT.6) GO TO 1000                                   00011650
                C                                                               00011660
0048              IF (OPTION.LT.1) WRITE(6,3) OPTION                            00011670
0049              IF (OPTION.LT.1) GO TO 1000                                   00011680
                C                                                               00011690
0050              IF (OPTION.EQ.5) WRITE(6,4) OPTION                            00011700
0051              IF (OPTION.EQ.5) OPT = 1                                      00011710
0052              IF (OPTION.EQ.5) ILEFT=4                                      00011720
                C                                                               00011730
0053              IF (OPTION.NE.5) WRITE(6,4) OPTION                            00011740
0054              IF (OPTION.NE.5) OPT = OPTION                                 00011750
                C                                                               00011760
0055            10 GO TO (100,200,300,400),OPT                                  00011770
                C                                                               00011780
                C ************************************************************* 00011790
                C *                                                           * 00011800
                C * THESE STATEMENTS WRITE OUT 156 KILOMETER CELL DATA        * 00011810
                C *                                                           * 00011820
0056            100 CONTINUE                                                    00011830
                C                                                               00011840
0057              WRITE(6,8)                                                    00011850
0058            22 FORMAT(1X,T5,'D/T/N NUMBER = ',T21,I3/1X,T21,'0 = DAY'/      00011860
                &   1X,T21,'1 = TWILIGHT'/1X,T21,'2 = NIGHT')                   00011870
0059            23 FORMAT(/1X,T5,'SECONDS OF DAY = ',I7)                        00011880
0060            24 FORMAT(/1X,T10,'CELL 1',T20,'CELL 2',T30,'CELL 3',           00011890
                &   T40,'CELL 4',T50,'CELL 5'/)                                 00011900
0061            25 FORMAT(1X,'LAT',T10,5(I6,4X))                                00011910
0062            26 FORMAT(1X,'LON',T10,5(I6,4X))                                00011920
```

95

```
0063            27 FORMAT(1X,'G/Q',T10,5(I6,4X))                                        00011930
0064            28 FORMAT(1X,'BRIGHTNESS TEMPS ',F5.2,' GHZ')                           00011940
0065            29 FORMAT(1X,'VERT',T10,5(I6,4X))                                       00011950
0066            30 FORMAT(1X,'HORZ',T10,5(I6,4X))                                       00011960
0067            31 FORMAT(1X,'DATA FOR 156 KILOMETER CELLS'/)                           00011970
0068            32 FORMAT(/1X,'***** BAND ',I3,' *****  156 KILOMETER CELLS *****')    00011980
                C                                                                       00011990
0069                WRITE(6,5)                                                          00012000
                C                                                                       00012010
0070                WRITE(6,6) (DASH(I),I=1,15)                                         00012020
0071                WRITE(6,31)                                                         00012030
0072                DO 150 IBAND = 1,5                                                  00012040
0073                WRITE(6,32) IBAND                                                   00012050
0074                WRITE(6,22) DST156(IBAND)                                           00012060
0075                WRITE(6,23) SOE156(IBAND)                                           00012070
0076                WRITE(6,24)                                                         00012080
0077                WRITE(6,25) (POS156(IBAND,ICELL,1),ICELL=1,5)                       00012090
0078                WRITE(6,26) (POS156(IBAND,ICELL,2),ICELL=1,5)                       00012100
0079                WRITE(6,27) (GQ156(IBAND,ICELL),ICELL=1,5)                          00012110
0080                DO 140 IGHZ=1,5                                                     00012120
0081                WRITE(6,28) FREQ(IGHZ)                                              00012130
0082                WRITE(6,29) (TB156(IBAND,ICELL,IGHZ,1),ICELL=1,5)                   00012140
0083                WRITE(6,30) (TB156(IBAND,ICELL,IGHZ,2),ICELL=1,5)                   00012150
0084              140 CONTINUE                                                          00012160
0085              150 CONTINUE                                                          00012170
0086                WRITE(6,6) (DASH(I),I=1,15)                                         00012180
0087                GO TO 600                                                           00012190
                C *                                                           *         00012200
                C *                                                           *         00012210
                C *************************************************************       00012220
                C                                                                       00012230
                C                                                                       00012240
                C *************************************************************       00012250
                C *                                                           *         00012260
                C * THESE STATEMENTS WRITE OUT 97.5 KILOMETER CELL DATA       *         00012270
                C *                                                           *         00012280
0088              200 CONTINUE                                                          00012290
0089                WRITE(6,8)                                                          00012300
                C                                                                       00012310
                C  22 FORMAT                                                            00012320
                C  23 FORMAT                                                            00012330
0090               44 FORMAT(/1X,T10,'CELL 1',T20,'CELL 2',T30,'CELL 3',T40,           00012340
                  & 'CELL 4',T50,'CELL 5',T60,'CELL 6',T70,'CELL 7',                    00012350
                  & T80,'CELL 8'/)                                                      00012360
0091               45 FORMAT(1X,'LAT',T10,8(I6,4X))                                     00012370
0092               46 FORMAT(1X,'LON',T10,8(I6,4X))                                     00012380
0093               47 FORMAT(1X,'G/Q',T10,8(I6,4X))                                     00012390
                C  28 FORMAT                                                            00012400
0094               49 FORMAT(1X,'VERT',T10,8(I6,4X))                                    00012410
0095               50 FORMAT(1X,'HORZ',T10,8(I6,4X))                                    00012420
0096               51 FORMAT(1X,'DATA FOR 97.5 KILOMETER CELLS'/)                       00012430
0097               52 FORMAT(/1X,'***** BAND ',I3,' ***** 97.5 KILOMETER CELLS *****')  00012440
                C                                                                       00012450
0098                WRITE(6,5)                                                          00012460
```

96

```
0099              WRITE(6,6)  (DASH(I),I=1,15)                                  00012870
0100              WRITE(6,51)                                                   00012880
0101              DO 250 IBAND = 1,8                                            00012890
                  C                                                             00012900
0102              WRITE(6,52)  IBAND                                            00012910
0103              WRITE(6,22)  DBT575(IBAND)                                    00012920
0104              WRITE(6,23)  SOD975(IBAND)                                    00012930
0105              WRITE(6,99)                                                   00012940
0106              WRITE(6,85)  (POS975(IBAND,ICELL,1),ICELL=1,8)                00012950
0107              WRITE(6,86)  (POS975(IBAND,ICELL,2),ICELL=1,8)                00012960
0108              WRITE(6,87)  (GQ975(IBAND,ICELL),ICELL=1,8)                   00012970
0109              DO 240 IGHZ = 1,8                                             00012980
0110              WRITE(6,28)  FREQ(IGHZ)                                       00012990
0111              WRITE(6,89)  (TB975(IBAND,ICELL,IGHZ,1),ICELL=1,8)            00013000
0112              WRITE(6,90)  (TB975(IBAND,ICELL,IGHZ,2),ICELL=1,8)            00013010
0113            240 CONTINUE                                                    00013020
0114            250 CONTINUE                                                    00013030
0115              WRITE(6,6)  (DASH(I),I=1,15)                                  00013040
                  C                                                             00013050
0116              GO TO 600                                                     00013060
                  C *                                                       *   00013070
                  C *                                                       *   00013080
                  C ***********************************************************00013090
                  C                                                             00013100
                  C                                                             00013110
                  C ***********************************************************00013120
                  C *                                                       *   00013130
                  C * THESE STATEMENTS WRITE OUT 60 KILOMETER CELL DATA       *   00013140
                  C *                                                       *   00013150
                  C *                                                       *   00013160
0117              300 CONTINUE                                                  00013170
0118              WRITE(6,8)                                                    00013180
                  C                                                             00013190
                  C  22 FORMAT                                                  00013200
                  C  23 FORMAT                                                  00013210
0119              64 FORMAT(/1X,T10,'CELL 1',T18,'CELL 2',T26,'CELL 3',T34,'CELL 4',  00013220
                    &   T42,'CELL 5',T50,'CELL 6',T58,'CELL 7',T66,'CELL 8',T74,      00013230
                    &   'CELL 9',T82,'CELL 10',T90,'CELL 11',T98,'CELL 12',           00013240
                    &   T106,'CELL 13'/)                                            00013250
0120              65 FORMAT(1X,'LAT',T10,13(I6,2X))                             00013260
0121              66 FORMAT(1X,'LON',T10,13(I6,2X))                             00013270
0122              67 FORMAT(1X,'G/Q',T10,13(I6,2X))                             00013280
0123              69 FORMAT(1X,'VERT',T10,13(I6,2X))                            00013290
0124              70 FORMAT(1X,'HORZ',T10,13(I6,2X))                            00013300
0125              71 FORMAT(1X,'DATA FOR 60 KILOMETER CELLS'/)                  00013310
0126              72 FORMAT(/1X,'***** BAND ',I3,' ***** 60 KILOMETER CELLS *****')  00013320
                  C                                                             00013330
0127              WRITE(6,5)                                                    00013340
0128              WRITE(6,6)  (DASH(I),I=1,15)                                  00013350
0129              WRITE(6,71)                                                   00013360
0130              DO 350 IBAND = 1,13                                           00013370
0131              WRITE(6,72)  IBAND                                            00013380
                  C                                                             00013390
0132              WRITE(6,22)  DBT60(IBAND)                                     00013400
```

```
0133          WRITE(6,23)  SDD60(IBAND)
0134          WRITE(6,64)
0135          WRITE(6,65)  (POS60(IBAND,ICELL,1),ICELL=1,13)
0136          WRITE(6,66)  (POS60(IBAND,ICELL,2),ICELL=1,13)
0137          WRITE(6,67)  (GQ60(IBAND,ICELL),ICELL=1,13)
        C
0138          DO 340 IGHZ = 1,3
0139          WRITE(6,28)  FREQ(IGHZ)
0140          WRITE(6,69)  (TB60(IBAND,ICELL,IGHZ,1),ICELL=1,13)
0141          WRITE(6,70)  (TB60(IBAND,ICELL,IGHZ,2),ICELL=1,13)
0142      340 CONTINUE
0143      350 CONTINUE
0144          WRITE(6,6)  (DASH(I),I=1,15)
        C
0145          GO TO 600
        C *                                                              *
        C *                                                              *
        C ****************************************************************
        C
        C
        C ****************************************************************
        C *                                                              *
        C * THESE STATEMENTS WRITE OUT 30 KILOMETER CELL DATA            *
        C *                                                              *
0146      400 CONTINUE
0147          WRITE(6,8)
        C
        C  22 FORMAT
        C  23 FORMAT
0148       84 FORMAT(/1X,T10,'CELL 14',T18,'CELL 15',T26,'CELL 16',T34,
          &    'CELL 17',T42,'CELL 18',T50,'CELL 19',T58,'CELL 20',T66,
          &    'CELL 21',T74,'CELL 22',T82,'CELL 23',T90,'CELL 24',
          &    T98,'CELL 25',T106,'CELL 26'/)
0149       91 FORMAT(1X,'DATA FOR 30 KILOMETER CELLS'/)
0150       92 FORMAT(/1X,'***** BAND ',I3,' ***** 30 KILOMETER CELLS *****')
        C
0151          WRITE(6,5)
        C
0152          WRITE(6,6)  (DASH(I),I=1,15)
0153          WRITE(6,91)
0154          DO 450 IBAND = 1,26
0155          WRITE(6,92)  IBAND
        C
0156          WRITE(6,22)  DHT30(IBAND)
0157          WRITE(6,23)  SDD30(IBAND)
0158          WRITE(6,64)
0159          WRITE(6,65)  (POS30(IBAND,ICELL,1),ICELL=1,13)
0160          WRITE(6,66)  (POS30(IBAND,ICELL,2),ICELL=1,13)
0161          WRITE(6,67)  (GQ30(IBAND,ICELL),ICELL=1,13)
0162          IGHZ = 1
0163          WRITE(6,28)  FREQ(IGHZ)
0164          WRITE(6,69)  (TB30(IBAND,ICELL,1),ICELL=1,13)
0165          WRITE(6,70)  (TB30(IBAND,ICELL,2),ICELL=1,13)
0166      450 CONTINUE
```

```
0 167              DO 470 IBAND = 1,26                                          00013550
0 168              WRITE(6,92) IBAND                                            00013560
                 C                                                              00013570
0 169              WRITE(6,22) DW130(IBAND)                                     00013580
0 170              WRITE(6,23) SOE30(IBAND)                                     00013590
0 171              WRITE(6,84)                                                  00013600
0 172              WRITE(6,65) (POS30(IBAND,ICELL,1),ICELL=10,26)               00013610
0 173              WRITE(6,66) (POS30(IBAND,ICELL,2),ICELL=10,26)               00013620
0 174              WRITE(6,67) (GQ30(IBAND,ICELL),ICELL=10,26)                  00013630
0 175              IGNZ = 1                                                     00013640
0 176              WRITE(6,28) FREQ(IGNZ)                                       00013650
0 177              WRITE(6,69) (TB30(IBAND,ICELL,1),ICELL=10,26)                00013660
0 178              WRITE(6,70) (TB30(IBAND,ICELL,2),ICELL=10,26)                00013670
0 179            470 CONTINUE                                                   00013680
0 180              WRITE(6,6) (DASH(I),I=1,15)                                  00013690
                 C *                                                        *   00013700
                 C *                                                        *   00013710
                 C **********************************************************   00013720
                 C                                                              00013730
0 181            600 ILEFT = ILEFT - 1                                          00013740
0 182              IF (ILEFT.EQ.0) GO TO 1000                                   00013750
0 183              OPT = 5 - ILEFT                                              00013760
0 184              GO TO 10                                                     00013770
                 C                                                              00013780
                 C **********************************************************   00013790
                 C *                                                        *   00013800
                 C * THESE STATEMENTS WRITE CELL DATA TO TAPE                *   00013810
0 185            700 PRINT 109                                                  00013820
0 186            109 FORMAT(/1X,'GO1 TEIS FAR')                                 00013830
0 187              WRITE(10) FIZREC,FILREC,RECID,LOGREC,YEARRM,DAYRUN,OBSRUN,   00013840
                  & BANDRR,CELLRM,LATS,LONS,YEAR1,DAY1,YEAR2,DAY2,              00013850
                  & ICURSP,DLAT,DLON,IYRSTA,IDASTA,DHRSTA,IYR,IDAY,DHR,         00013860
                  & NWSPED,NSUBPT,IPRESR,IDRYBT,IWETBT,IASDIF,IPRESW,KIND,IOTVAP,00013870
                  & TB156,TB975,TB60,TB30                                       00013880
                 C                                                              00013890
0 188            1000 CONTINUE                                                  00013900
0 189              RETURN                                                       00013910
0 190              END                                                          00013920
```

APPENDIX 7. LISTING OF PARAM

```
// EXEC FORTG1
//SOURCE.SYSIN DD DSN=ZMMHT.LIB2.FORT(PARAM),DISP=SHR
// EXEC LINKGO,REGION.GO=98K,OUT=A,TERMOUT=A
//GO.FT06F001 DD SYSOUT=A
//GO.FT11F001  DD  UNIT=(9TRACK,,DEFER),LABEL=(1,NL,,IN),
//      DISP=(OLD,KEEP),VOL=SER=MHT001,
//      DCB=(RECFM=VBS,LRECL=6496,BLKSIZE=6500,DEN=3)
//GO.DATA5 DD *
 &CNTL KOBS=2, KPARM=510510, KGRID=1,  &END
```

Fig. A7-1. JCL used to run PARAM.

```
0001        DIMENSION PARM(7),ICNT(3),DIFF(3),SQDIFF(3),AVE(3),STD(3),          00000010
           $     OPARM(3),IPARM(10)                                              00000020
0002        INTEGER*2 TB(10),TB156(5,5,5,2),TB975(8,8,4,2),TB60(13,13,3,2),     00000030
           $     TB30(26,26,2)                                                   00000040
0003        INTEGER*4 FIZREC,FILREC,RECID,YEARNM,DATNUM,ORBNUM,BANDNM(4),       00000050
           $     CELLNM(4),YEAR1,YEAR2,LPARM(7),IPCT1(7),IPCT2(7),IFMT1(4,7),  00000060
           $     IFMT2(5,7),NPRIME(7)                                            00000070
0004        REAL*8 LATS(4),LONS(4),DAY1,DAY2,DLAT,DLON,DNRSTA,DNR,FMTDAT(37),   00000080
           $     FMT(60),CKIND(3),ALATL,ALATU,ALONL,ALONU,BLANK,FMTNUM(12),      00000090
           $     FMTDT2(2)                                                       00000095
0005        DATA ALATL/-90.D0/,ALATU/90.D0/,ALONL/-180.D0/,ALONU/180.D0/,       00000100
           $     KPRESW/-1/,LPRINT/2/                                            00000120
0006        DATA FMTDAT/'(1X,','T2,','T15,','T28,','T41,','T54,','T67,',        00000130
           $     'T80,','T93,','T106,','T119,','4X,','3X,',''' FREEZIN',         00000140
           $     'G''',',''' LEVEL''',',''' RAIN''',',''' RATE''',',             00000150
           $     ''' WIND SP','EED''',','''SEA TEM','P.''',',''' NON-PRE',      00000160
           $     'CIP.''',',''' LIQ. WA','TER''',',''' FRACTIO','N POV''',',     00000170
           $     ''' RAINED',' ON''',',''' WATER V','APOR''',',''' SMMR''',',    00000180
           $     '''-STA''',',','/)',',',',','/1X,'/                             00000190
0007        DATA BLANK/'        '/,IPCT1/3,2,4,4,3,4,4/,                        00000200
           $     IPCT2/2,2,5,5,3,3,5/,NPRIME/2,3,5,7,11,13,17/                   00000210
0008        DATA IFMT1/2,14,15,0,3,17,0,0,4,12,19,20,6, 12,21,22,8,23,24,0,     00000220
           $     9,27,28,36,10,13,31,32/                                         00000230
0009        DATA IFMT2/2,16,0,0,0,3,18,0,0,0,4,33,5,33,34,6,33,7,33,34,         00000240
           $     8,25,26,0,0,9,29,30,0,0,10,33,11,33,34/                         00000250
0010        DATA CKIND/'SHIP','BUOY','RAOBS'/                                   00000260
0011        DATA PARM/7*0./,OPARM/3*-9999./                                     00000265
0012        DATA FMTDT2/'1PG13.4,',')'/,FMTNUM/'(1X,T2,'/                       00000266
0013        NAMELIST /CNTL/ KOBS,KPARM,KGRID,ALATL,ALATU,ALONL,ALONU,LPRINT     00000270
0014      1 FORMAT(/20X,'********* KGRID=',I5,' IS OUT OF RANGE*********')      00000290
0015      2 FORMAT(/20X,'********* KIND=',I5,' IS OUT OF RANGE*********',       00000300
           $     /20X,'********* RECORD SKIPPED *********'/)                     00000310
0016      3 FORMAT(/20X,'********* KOBS=',I5,' IS OUT OF RANGE*********')       00000320
0017      4 FORMAT(/1X,'AVERAGE DIFFERENCE OF WIND SPEED MEASUREMENTS=',F6.2,   00000330
           $     ' STD. DEV. OF DIFFERENCE=',F8.2,'   NUMBER OF MEASUREMENTS='  00000340
           $     ,I8//)                                                          00000345
0018      5 FORMAT(/1X,'AVERAGE DIFFERENCE OF SEA TEMPERATURE MEASUREMENTS=',   00000350
           $     F7.2,' STD. DEV. OF DIFFERENCE=',F10.2,'  NUMBER OF MEASURE',  00000360
           $     'MENTS=',I8//)                                                  00000365
0019      6 FORMAT(/1X,'AVERAGE DIFFERENCE OF WATER VAPOR MEASUREMENTS=',1PG13  00000370
           $     .4,' STD. DEV. OF DIFFERENCE=',1PG15.4,'  NUMBER OF MEASURE',  00000380
           $     'MENTS=',I8//)                                                  00000385
0020      7 FORMAT(///1X,T15,'STATION POS.',T33,'STA. OBS. TIME',T50,           00000390
           $     'DIFF(SMMR-STA.)'/1X,T5,'TYPE',T15,'LAT',T22,'LON',T33,        00000400
           $     'YR',T38,'DAY',T42,'HR',T50,'IN HRS'/)                          00000410
0021      8 FORMAT(/1X,T5,A6,T15,F6.2,T21,F7.2,T33,I4,T38,I3,T41,F6.2,T49,      00000420
           $     F7.3)                                                           00000430
0022     11 FORMAT(/20X,'********* SKIP TO NEXT NAMELIST RECORD*********'/)     00000450
0023     12 FORMAT(/20X,'********* KPARM=',I9,' IS OUT OF RANGE*********'/)     00000460
0024     14 FORMAT(/20X,'********* ALATL=',1PG15.8,' IS OUT OF RANGE*********'/)00000480
0025     15 FORMAT(/20X,'********* ALATU=',1PG15.8,' IS OUT OF RANGE*********') 00000490
0026     16 FORMAT(/20X,'********* ALATL=',1PG15.8,' IS GREATER THAN ALATU=',   00000500
           $     1PG15.8,' *********'/)                                          00000510
0027     17 FORMAT(/20X,'********* LPARM=',I4,' IS OUT OF RANGE*********'/)     00000520
```

```
0028          18 FORMAT(/20X,'********* KOBS=',I5,' IS NOT DIVISIBLE BY 2, 3, ',   00000530
                $     'OR 5*********'/)                                            00000540
0029          19 FORMAT(/20X,'********* KPASS=',I9,' IS NOT DIVISIBLE BY 2, 3, ',  00000550
                $     '5, 7, 11, 13, OR 17*********'/)                            00000560
0030          20 FORMAT(/20X,'********* WATER VAPOR MEASUREMENTS ARE NOT TAKEN ',   00000570
                $     'AT ',A6,' *********'/)                                      00000580
0031          21 FORMAT(/20X,'********* TAPE READ ERROR, TRY READING IT ',         00000581
                $     'AGAIN *********'/)                                          00000582
0032          22 FORMAT(/20X,'********* ALATL=',1PG15.8,' IS GREATER THAN ',       00000583
                $     'ALATU=',1PG15.8,' *********'/)                              00000584
0033          23 FORMAT(/20X,'********* ALONL=',1PG15.8,' IS GREATER THAN ',       00000585
                $     'ALONU=',1PG15.8,' *********'/)                              00000586
0034          90 READ(5,CNTL,END=270)                                              00000590
0035             WRITE(6,CNTL)                                                     00000600
0036             REWIND 11                                                         00000610
               C                                                                   00000612
               C   SET CONTROL VARIABLES, COUNTERS, AND EXECUTION-TIME FORMATS     00000613
               C                                                                   00000614
0037             DO 55 K=1,7                                                       00000615
0038          55 LPASS(K)=0                                                        00000616
0039             NPRT=1                                                            00000617
0040             ILINE1=3                                                          00000618
0041             IPRINT=0                                                          00000619
0042             DO 66 L=1,3                                                       00000620
0043             DIFF(L)=0.00                                                      00000621
0044             SUDIFF(L)=0.00                                                    00000622
0045          66 ICNT(L)=0                                                         00000623
0046             DO 77 I=1,60                                                      00000624
0047          77 PAT(I)=BLANK                                                      00000625
0048             DO 88 K=3,12                                                      00000626
0049          88 PATSUM(K)=BLANK                                                   00000627
               C                                                                   00000629
               C   CHECK ALL NAMELIST PARAMETERS                                  00000630
               C                                                                   00000640
0050             IF((KOBS.GE.2).AND.(KOBS.LE.30)) GO TO 91                         00000650
0051             WRITE(6,1) KOBS                                                   00000660
0052             WRITE(6,11)                                                       00000670
0053             GO TO 90                                                          00000680
0054          91 IF((KGRID.LE.4).AND.(KGRID.GE.1)) GO TO 92                        00000690
0055             WRITE(6,1) KGRID                                                  00000700
0056             WRITE(6,11)                                                       00000710
0057             GO TO 90                                                          00000720
0058          92 IF((KPASS.GE.2).AND.(KPASS.LE.510510,) GO TO 94                   00000730
0059             WRITE(6,12) KPASS                                                 00000740
0060             WRITE(6,11)                                                       00000750
0061             GO TO 90                                                          00000760
0062          94 IF((LPRINT.GE.0).AND.(LPRINT.LE.3)) GO TO 95                      00000810
0063             WRITE(6,17) LPRINT                                                00000820
0064             WRITE(6,11)                                                       00000830
0065             GO TO 90                                                          00000840
0066          95 IF(ALATL.GT.90.00) WRITE(6,13) ALATL                              00000850
0067             IF(ALATL.GT.90.00) WRITE(6,11)                                    00000860
0068             IF(ALATL.GT.90.00) GO TO 90                                       00000870
0069             IF(ALATU.LT.-90.00) WRITE(6,15) ALATU                             00000880
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      IF(ALATO.LT.-90.D0) WRITE(6,11)                                   00000890
      IF(ALATO.LT.-90.D0) GO TO 90                                      00000900
      IF(ALATL.GT.ALATU) WRITE(6,22) ALATL,ALATU                        00000901
      IF(ALATL.GT.ALATU) WRITE(6,11)                                    00000902
      IF(ALATL.GT.ALATU) GO TO 90                                       00000903
      IF(ALONL.GT.ALONU) WRITE(6,23) ALONL,ALONU                        00000904
      IF(ALONL.GT.ALONU) WRITE(6,11)                                    00000905
      IF(ALONL.GT.ALONU) GO TO 90                                       00000906
      DO 96 L=1,3                                                       00000910
      IF(MOD(KOBS,NPRIME(L)).EQ.0) GO TO 97                             00000920
   96 CONTINUE                                                          00000930
      WRITE(6,18) KOBS                                                  00000940
      WRITE(6,11)                                                       00000950
      GO TO 90                                                          00000960
   97 DO 98 L=1,7                                                       00000970
      IF(MOD(KPARM,NPRIME(L)).EQ.0) GO TO 100                           00000980
   98 CONTINUE                                                          00000990
      WRITE(6,19) KPARM                                                 00001000
      WRITE(6,11)                                                       00001010
C                                                                       00001020
C     SET UP FORMAT FOR PRINTING DATA READING                           00001030
C                                                                       00001040
  100 IF((LPRINT.EQ.0).OR.(LPRINT.EQ.3)) GO TO 106                      00001050
      ICNTL=1                                                           00001051
      JCT1=2                                                            00001052
      JCT2=2                                                            00001053
      ILINE2=2                                                          00001060
      DO 101 I=1,7                                                      00001070
      IF(MOD(KPARM,NPRIME(I)).EQ.0) LPARM(I)=1                          00001080
      IF(LPARM(I).EQ.1) ILINE2=ILINE2+IFCT1(I)                          00001090
  101 CONTINUE                                                          00001100
      FMT(1)=FMTCAT(1)                                                  00001110
      FMT(2)=FMTDAT(2)                                                  00001120
      FMT(ILINE2)=FMTDAT(37)                                            00001130
      FMT(ILINE2+1)=FMTCAT(2)                                           00001140
      ILINE2=ILINE2+2                                                   00001150
      DO 104 I=1,7                                                      00001160
      IF(LPARM(I).NE.1) GO TO 104                                       00001170
      N=IFCT1(I)                                                        00001180
      IF(ICNTL.EQ.1) GO TO 979                                          00001182
      JCT1=JCT1+1                                                       00001183
      IF((IFMT1(1,LAST+1)-IFMT1(1,LAST)).EQ.2) JCT1=JCT1+1              00001184
      FMT(ILINE1)=FMTCAT(JCT1)                                          00001185
      ILINE1=ILINE1+1                                                   00001186
  979 DO 102 J=2,N                                                      00001190
      FMT(ILINE1)=FMTCAT(IFMT1(J,I))                                    00001200
      ILINE1=ILINE1+1                                                   00001210
  102 CONTINUE                                                          00001220
      NN=IFCT2(I)                                                       00001230
      IF(ICNTL.EQ.1) GO TO 969                                          00001232
      JCT2=JCT2+1                                                       00001233
      IF((IFMT2(1,LAST+1)-IFMT2(1,LAST)).EQ.2) JCT2=JCT2+1              00001234
      FMT(ILINE2)=FMTCAT(JCT2)                                          00001235
      ILINE2=ILINE2+1                                                   00001236
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0121          569 DO 103 J=2,NB                                                 00001240
0122              IF(IPNT2(J,I).LT.12) IPNT=JCT2+1                              00001245
0123              IF(IPNT2(J,I).GE.12) IPNT=IPNT2(J,I)                          00001246
0124              PNT(ILINE2)=PNTBAT(IPNT)                                      00001250
0125              ILINE2=ILINE2+1                                               00001260
0126          103 CONTINUE                                                      00001270
0127              ICNTL=0                                                       00001273
0128              LAST=I                                                        00001270
0129          104 CONTINUE                                                      00001275
0130              PNT(ILINE2)=PNTBAT(35)                                        00001280
                C                                                             00001283
                C   SET UP FORMAT FOR PRINTING DATA                           00001284
                C                                                             00001285
0131              DO 105 K=1,7                                                  00001290
0132              IF(LPARM(K).EQ.0) GO TO 105                                   00001300
0133              NPNT=NPNT+1                                                   00001310
0134              FMTBUF(NPNT)=FMTDT2(1)                                        00001315
0135              IF((K.EQ.3).OR.(K.EQ.4).OR.(K.EQ.7)) NPNT=NPNT+1              00001320
0136              FMTBUF(NPNT)=FMTDT2(1)                                        00001325
0137          105 CONTINUE                                                      00001330
0138              FMTBUF(NPNT+1)=FMTDT2(2)                                      00001341
0139              NPNT=NPNT-1                                                   00001342
                C                                                             00001345
                C   READ IN DATA BASE RECORD                                  00001350
                C                                                             00001360
0140          106 READ (11,END=200,ERR=267) FIXREC,FILREC,RECID,LOGREC,TRABUF,DAYBUF00001370
                $      ,ORBBUF,BANDBF,CRLLBF,LATS,LONS,YEAR1,DAY1,YEAR2,DAY2,  00001380
                $      ICORSP,DLAT,DLOB,IYRSTA,IDASTA,DHRSTA,IYR,IDAY,DHR,     00001390
                $      IWSPED,ISORFT,EPRESR,IDMYBT,IWETBT,IASDIF,IPRESW,KIND,INTVAP,00001400
                $      TB156,TB975,TB60,TB30                                    00001410
                C                                                             00001420
0141              DO 107 I=1,3                                                  00001430
0142              IF((KIND.EQ.I).AND.(MOD(KOBS,NPRINT(I)).EQ.0)) GO TO 110      00001440
0143              IF((KIND.EQ.I).AND.(MOD(KOBS,NPRINT(I)).NE.0)) GO TO 106      00001450
0144          107 CONTINUE                                                      00001460
                C                                                             00001470
                C   IF KIND IS OUT OF RANGE, PRINT ERROR MESSAGE AND READ ANOTHER 00001480
                C   RECORD                                                     00001490
                C                                                             00001500
0145              WRITE(6,2) KIND                                               00001510
0146              GO TO 106                                                     00001520
                C                                                             00001530
                C   TEST FOR POSITION OF THE SHIP                             00001540
                C                                                             00001550
0147          110 IF((DLAT.LT.ALATL).OR.(DLAT.GT.ALATU)) GO TO 106              00001560
0148              IF((DLOB.LT.ALOBL).OR.(DLOB.GT.ALOBU)) GO TO 106              00001570
                C                                                             00001580
                C   PUT BRIGHTNESS TEMPERATURES INTO ARRAY                    00001590
                C                                                             00001600
0149          120 IF(NGNIB.EQ.1) GO TO 180                                      00001610
0150              IF(NGNIB.EQ.2) GO TO 160                                      00001620
0151              IF(NGNIB.EQ.3) GO TO 140                                      00001630
                C                                                             00001640
                C   GRID SIZE=30 KM                                           00001650
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H31

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               C                                                           00001660
 0152                DO 130 I=9,10                                         00001670
 0153                M=I-8                                                 00001680
 0154            130 TB(I)=TB30(BANDNR(4),CELLNR(4),M)                     00001690
 0155                GO TO 200                                             00001700
               C                                                           00001710
               C   GRID SIZE=60 KM                                         00001720
               C                                                           00001730
 0156            140 I=4                                                   00001740
 0157                DO 150 J=1,3                                          00001750
 0158                DO 150 M=1,2                                          00001760
 0159                I=I+1                                                 00001770
 0160            150 TB(I)=TB60(BANDNR(3),CELLNR(3),J,M)                   00001780
 0161                GO TO 200                                             00001790
               C                                                           00001800
               C   GRID SIZE=97.5 KM                                       00001810
               C                                                           00001820
 0162            160 I=2                                                   00001830
 0163                DO 170 J=1,4                                          00001840
 0164                DO 170 M=1,2                                          00001850
 0165                I=I+1                                                 00001860
 0166            170 TB(I)=TB975(BANDNR(2),CELLNR(2),J,M)                  00001870
 0167                GO TO 200                                             00001880
               C                                                           00001890
               C   GRID SIZE=156 KM                                        00001900
               C                                                           00001910
 0168            180 I=0                                                   00001920
 0169                DO 190 J=1,5                                          00001930
 0170                DO 190 M=1,2                                          00001940
 0171                I=I+1                                                 00001950
 0172            190 TB(I)=TB156(BANDNR(1),CELLNR(1),J,M)                  00001960
               C                                                           00001970
               C   CALL SUBROUTINE TO CALCULATE PARAMETERS                 00001980
               C                                                           00001990
 0173            200 CALL PARMS(TB,PARM,IERR)                              00002000
 0174                IF(IERR.EQ.0) GO TO 106                               00002005
               C                                                           00002010
               C   CALCULATE DIFFERENCE BETWEEN SHIP AND SMMR PARAMETERS   00002020
               C                                                           00002030
               C   FIRST DO WIND SPEED                                     00002040
               C                                                           00002050
 0175                IF(MOD(KPARM,5).NE.0) GO TO 210                       00002060
 0176                IF(WSPED.LT.0.E0) GO TO 210                           00002070
 0177                DPARM(1)=PARM(3)-WSPED                                00002080
 0178                DIFF(1)=DIFF(1)+DPARM(1)                              00002090
 0179                SQDIFF(1)=SQDIFF(1)+DPARM(1)*DPARM(1)                 00002100
 0180                ICNT(1)=ICNT(1)+1                                     00002110
               C                                                           00002120
               C   SEA TEMPERATURE                                         00002130
               C                                                           00002140
 0181            210 IF(MOD(KPARM,7).NE.0) GO TO 220                       00002150
 0182                IF(ISURFT.LT.0.E0) GO TO 220                          00002160
 0183                DPARM(2)=PARM(4)-ISURFT                               00002170
 0184                DIFF(2)=DIFF(2)+DPARM(2)                              00002180
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0185                SQDIFF(2)=SQDIFF(2)+DPARM(2)*DPARM(2)                    00002190
0186                ICNT(2)=ICNT(2)+1                                        00002200
                C                                                            00002210
                C   WATER VAPOR                                             00002220
                C                                                            00002230
0187              220 IF(MOD(KPARM,17).NE.0) GO TO 230                       00002240
0188                  IF(KIND.NE.3) GO TO 230                                00002260
0189                  DPARM(3)=PARM(7)-INTVAP                                00002280
0190                  DIFF(3)=DIFF(3)+DPARM(3)                               00002290
0191                  SQDIFF(3)=SQDIFF(3)+DPARM(3)*DPARM(3)                  00002300
0192                  ICNT(3)=ICNT(3)+1                                      00002310
                C                                                            00002320
                C   CHECK TO SEE IF PRINT WANTED                            00002330
                C                                                            00002340
0193              230 IF(LPRINT.EQ.0) GO TO 106                              00002350
0194                  IF(LPRINT.EQ.1) GO TO 234                              00002360
                C                                                            00002370
                C   CALCULATE TIME DIFFERENCE IN HOURS                      00002380
                C                                                            00002390
0195                  IF(IDASTA.LT.IDAY) DHR=DHR+24.00                       00002400
0196                  IF(IDASTA.GT.IDAY) DHR=DHR-24.00                       00002410
0197                  TIMDIF=DHR-DHRSTA                                      00002420
                C                                                            00002430
                C   PRINT POSITION HEADING, IF NECESSARY                    00002440
                C                                                            00002450
0198                  IF(MOD(IPRINT,60).EQ.0) WRITE(6,7)                     00002460
                C                                                            00002470
                C   PRINT DATA HEADING, IF NECESSARY                        00002480
                C                                                            00002490
0199              234 IF((LPRINT.LE.2).AND.(MOD(IPRINT,60).EQ.0)) WRITE(6,PRT) 00002500
                C                                                            00002510
                C   PRINT POSITION DATA, IF NECESSARY                       00002520
                C                                                            00002530
0200                  IF(LPRINT.LT.2) GO TO 236                              00002540
0201                  WRITE(6,8) CKIND(KIND),DLAT,DLON,IYRSTA,IDASTA,DHRSTA,TIMDIF 00002550
0202                  IPRINT=IPRINT+3                                        00002560
                C                                                            00002570
                C   PRINT PARAMETERS, IF NECESSARY                          00002580
                C                                                            00002590
0203                  IF(LPRINT.EQ.3) GO TO 106                              00002600
0204              236 J=0                                                    00002601
0205                  DO 237 I=1,7                                           00002602
0206                  IF(LPARM(I).NE.1) GO TO 237                            00002603
0207                  J=J+1                                                  00002604
0208                  XPARM(J)=PARM(I)                                       00002605
0209                  IF((I.EQ.3).OR.(I.EQ.4).OR.(I.EQ.7)) J=J+1             00002606
0210                  IF(I.EQ.3) XPARM(J)=DPARM(1)                           00002607
0211                  IF(I.EQ.4) XPARM(J)=DPARM(2)                           00002608
0212                  IF(I.EQ.7) XPARM(J)=DPARM(3)                           00002609
0213              237 CONTINUE                                               00002610
0214                  WRITE(6,FRTNUM) (XPARM(I),I=1,NPRT)                    00002615
0215                  IPRINT=IPRINT+3                                        00002620
                C                                                            00002623
                C   RESET DPARM                                             00002624
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                C                                                                       00002625
0216                 DO 239 K=1,3                                                       00002626
0217              239 DPARR(K)=-9999.                                                   00002627
0218                 GO TO 106                                                          00002630
                C                                                                       00002640
                C   CALCULATE AVERAGE AND VARIANCE OF DIFFERENCES                      00002650
                C                                                                       00002660
0219              240 IF(ICNT(1).LT.2) GO TO 250                                        00002670
0220                 AVE(1)=DIFF(1)/ICNT(1)                                             00002680
0221                 STD(1)=SQRT((SQDIFF(1)/(ICNT(1)-1))-(AVE(1)*AVE(1)*ICNT(1)/(ICNT(100002690
                    $     )-1)))                                                       00002695
0222                 WRITE(6,4) AVE(1),STD(1),ICNT(1)                                   00002700
0223              250 IF(ICNT(2).LT.2) GO TO 260                                        00002710
0224                 AVE(2)=DIFF(2)/ICNT(2)                                             00002720
0225                 STD(2)=SQRT((SQDIFF(2)/(ICNT(2)-1))-(AVE(2)*AVE(2)*ICNT(2)/(ICNT(200002730
                    $     )-1)))                                                       00002735
0226                 WRITE(6,5) AVE(2),STD(2),ICNT(2)                                   00002740
0227              260 IF(ICNT(3).LT.2) GO TO 265                                        00002750
0228                 AVE(3)=DIFF(3)/ICNT(3)                                             00002760
0229                 STD(3)=SQRT((SQDIFF(3)/(ICNT(3)-1))-(AVE(3)*AVE(3)*ICNT(3)/(ICNT(300002770
                    $     )-1)))                                                       00002775
0230                 WRITE(6,6) AVE(3),STD(3),ICNT(3)                                   00002780
0231              265 GO TO 90                                                          00002790
0232              267 WRITE(6,21)                                                       00002795
0233                 GO TO 106                                                          00002796
0234              270 STOP                                                              00002800
0235                 END                                                                00002810
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107