

Data Set Catalog # 148

Allmag Program
Package

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1. INTRODUCTION:

The documentation for this data set was originally on paper, kept in NSSDC's Data Set Catalogs (DSCs). The paper documentation in the Data Set Catalogs have been made into digital images, and then collected into a single PDF file for each Data Set Catalog. The inventory information in these DSCs is current as of July 1, 2004. This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system. The information existing in the DSCs is now not needed for locating the data files, but we did not remove that inventory information.

The offline tape datasets have now been migrated from the original magnetic tape to Archival Information Packages (AIP's).

A prior restoration may have been done on data sets, if a requestor of this data set has questions; they should send an inquiry to the request office to see if additional information exists.

2. ERRATA/CHANGE LOG:

NOTE: Changes are made in a text box, and will show up that way when displayed on screen with a PDF reader.

When printing, special settings may be required to make the text box appear on the printed output.

Version	Date	Person	Page	Description of Change
01				
02				

3 LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC
INFORMATION SYSTEM:

<http://nssdc.gsfc.nasa.gov/nmc/>

[NOTE: This link will take you to the main page of the NSSDC Master Catalog. There you will be able to perform searches to find additional information]

4. CATALOG MATERIALS:

- a. Associated Documents To find associated documents you will need to know the document ID number and then click here.
<http://nssdcftp.gsfc.nasa.gov/miscellaneous/documents/>

- b. Core Catalog Materials

MODELING PROGRAMS

PG - 12A

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED TWO 9-TRACK, 1600 BPI TAPES WRITTEN IN ASCII. THERE IS ONE RESTORED TAPE. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL D008548 WAS CREATED ON THE MODCOMP IV COMPUTER AND D000101 WAS CREATED ON THE IBM 3081 COMPUTER AND THEY WERE RESTORED ON THE MODCOMP CLASSIC II COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	NSDF ID
DR004300	DS004300	D008548	1-16	SEE BELOW
		D018182	17-20	PG-12A

FILE	PROGRAM NAME	NSDF ID
1	FIELD/FIELD WITH 7094 JCL	PG-11A
2	ONEMAG WITH IGRF 1965	PG-12E
2	DEKMAG	PG-12D
3	LINTRA PACKAGE WITH 360 JCL	PG-12B
4	SHELLG/FIELDG WITH IGRF 1965 1970	PG-13A
5	SHELLG/FIELDG WITH 7094 JCL	PG-13A
6	INTLEG PACKAGE	PG-13A
7	INTELG PACKAGE WITH 7094 JCL	PG-13A
8	IGRF/SPHRC PACKAGE (OLD VERSION)	PG-14A
9	IGRF/SPHRC PACKAGE WITH 260 JCL	PG-14A
10	INVAR PACKAGE N/NEWMAG WITH 7094 JCL	PG-16A
11	TSFORM/DIPFLD	PG-17A
12	TSFORM/DIPFLD WITH 7094 JCL	PG-17A
13	PFITZER'S B L RETRIEVAL PACKAGE	PG-18A
14	PROGRAM TRAJLST	PG-18B
15	INVARA PACKAGE (B&L) WITH 360 JCL	PG-19A
16	ONEMAG WITH IGRF 1980	PG-12C

October 6, 1971

To: Joseph R. Johns
From: R. H. Hilberg
Subject: RA7143

The ALLMAG package is available in both EBCDIC (029) and BCD (026) decks, and contains the programs and the data cards used for test runs listed in Table 1. The EBCDIC decks were checked out on the 360/75 and 360/91. The BCD decks were checked out on the 1108 and the 360/75. The ALLMAG variable tables were too long to run on the 7094.

Anomalous operation was noted in several cases.

1. A keypunch error in the main program for GDALMG EBCDIC deck was fixed.
2. The output format of LINTRA was modified to allow space between several columns that ran together.
3. The long (double precision) version of ALLMAG would run only using the G level compiler on the 360/91. It would not run using the H level compiler on the 360/91 or using any compiler on the 360/75.

All BCD decks worked correctly on the 1108.


```

ARCX3<V*ARC2<
DNRX1<V*V21,1<
R1A2<R1/ON
R1A3<R1P/ON*SI1<
DO 5 1/1,3
6 V*1,1<V*1,2<-ARC2<*R1<R2<1<</2.
SI1<ABS<SI1<V*2,1<<<
IS=IS+1
GO TO 23,7<,15
7 DO 5 1/1,3
8 V*1,3<V*1,2<+ARC3<*V*1,5<*R2<1<-5*R1<1<<
RETURN
END
SUBROUTINE LINESA(R1,R2,R3,B,ARC,ERR,J,VP,VN,MODEL,TM<
C ***** SINGLE PRECISION DECK FOR OCTAL MACHINES 8BCD, 026 PUNCH
DIMENSION BX200<,ARC<200<,R1<3<,R2<3<,R3<3<,VN<3<,VP<3<,RA<3<
CUE=0.25
IFERR=0.15625<74,75,75
74 CUE=ERR**0.33333333<
75 A3=ARC<3<
AAR=ABS<A3<
SNA=A3/AAR
A1=ARC<1<
A2=ARC<2<
A06=A3*A3/6.0
J=3
ILP=1
IS=1
GO TO 87
60 IS=1
A3=1
A06=A3*A3/6.0
ARC=1+A1+A2+A3
AD=ASUM<A1</AA
BD=ASUM<A2</BB
CD=AI/CC
66 DO 5 1/1,3
DNR<R1</AA-R2</BB-R3</CC
GO TO 26,PK,15
8 RI<R1<1<-8AD*R1<1<-8D*R2<1<-8CD*R3<1<-DD*ARC<J<*ARC<J
RA<1<R1<1<
R1<1<R2<1<
R2<1<R3<1<
R3<1<RT
VP<1<VN<1<
8 RBAR<R2<1<R3<1<</2.-DD*A06
5 VN<1<VP<1<+A3*RBAR
87 IFVN<2<<76,77,77
76 VN<2<#-VN<2<
77 IFVN<2<<-3.141592653<78,78,79
79 VN<2<+6.283185307-VN<2<
GO TO 77
78 IFVN<3<<80,81,81
81 VN<3<VN<3<+6.283185307
GO TO 78
81 IFVN<2<<-6.283185307<82,82,83
83 VN<3<VN<3<+6.283185307
GO TO 81
82 GO TO 29,10<,15
9 SI1<ABS<SI1<VN<2<<<
R1=VN<1<
R2=2.2<R1*VN<2<
R3=1.1<SI1<VN<3<

```

```

STR1A084
STR1A084
STR1A084
STR1A090
STR1A092
STR1A094
STR1A096
STR1A098
STR1A100
STR1A102
STR1A104
STR1A106
STR1A108
LINE$002
LINE$004
LINE$006
LINE$008
LINE$010
LINE$012
LINE$014
LINE$016
LINE$018
LINE$020
LINE$022
LINE$024
LINE$026
LINE$028
LINE$030
LINE$032
LINE$034
LINE$036
LINE$038
LINE$040
LINE$042
LINE$044
LINE$046
LINE$048
LINE$050
LINE$052
LINE$054
LINE$056
LINE$058
LINE$060
LINE$062
LINE$064
LINE$066
LINE$068
LINE$070
LINE$072
LINE$074
LINE$076
LINE$078
LINE$080
LINE$082
LINE$084
LINE$086
LINE$088
LINE$090
LINE$092
LINE$094
LINE$096
LINE$098
LINE$100

```



```

8 IF KK-4<14,11,20
11 KK=KK-1
14 ASB=KK-1</B>2<
X2=B<X</B>2<
X3=B<X</B>2<
ASUM=ARC<KK<&ARC<KK&1<
DN=ARC<KK<&ARC<KK&1<*ASUM
BB=2-A*ARC<KK&1<*ARC<KK<&ASUM<&X2*ASUM**2</DN
C4=2*ARC<KK&1<-X2*ASUM&X3*ARC<KK<</DN
FI=157079632E&01*41.0-A&BB*BB/24.0<C<</ SORTX ABS<C<<
RETURN
20 TH= SORTX1.0E0-BEND<X2</B>2<<
FI=2.0<T-ALOG<X1.0&1</41.0-T<<</EOD<X2<
IF<B>2<-BEND<KK<<21,21,25
25 KK=KK&1
21 TH= SORTX ABS<X1.0-BEG<KK</B>2<<<
FI=FI-2.0<T-ALOG<X1.0&1</41.0-T<<</EOD<KK<
KK=KK-1
22 DO 5 I=3, KK
ARG1=1.-BEND<1</B>2<
IF<BEND<1</B>2<.LT.1.E-7< ARG1=1.-1.E-7
IF<ARG1<26,26,27
26 IF<1.E-5
GO TO 28
27 TH= SORTX<ARG1<
28 ARG1=1.-BEG<X1</B>2<
IF<BEG<1</B>2<.LT.1.E-7< ARG1=1.-1.E-7
IF<ARG1<29,29,31
31 TH= SORTX<ARG1<
GO TO 32
29 TH=1.E-5
32 IF<ABS<EOD<X1<<-2.E-5< 23,23,24
23 FI=FI&X<TEST<X<&ARC<1<&ARC<1&1<<</4.
GO TO 5
24 FI=FI&X<2.*X<1E-TR<-ALOG<X1.&TE<X<1.-TR</X<1.-TE<X<1.&TR<<<</EOD<X1<
5 CONTINUE
30 RETURN
END
SUBROUTINE CARNLA XB,XI,VLC
C **** SINGLE PRECISION DECK FOR OCTAL MACHINES 8BCD, 026 PUNCH<
C COMPUTE L
IF<XI-1.0E-36<14,14,15
14 VL=X0.311653/B<***1./3.<
RETURN
15 XX=3.0*ALOG<X1<
XX=XX&ALOG<XB/0.311653<
IF<XX&22.<1,1,8
8 IF<XX&83.<2,2,9
9 IF<XX-3.<3,3,10
10 IF<XX-11.7<4,4,11
11 IF<XX-23.<5,5,6
1 GGX=333338*XX&30062102
GO TO 7
2 GGX=XX&333338-8.1537735E-14*XX&8.3232531E-13<*XX&1.0066362E-9<*XX&
1X.1043663E-9<*XX&3.2916354E-6<*XX&8.2711095E-5<*XX&1.3714667E-3<*
2XX&8.015017245<*XX&8.43432642<*XX&8.62337691
GO TO 7
3 GGX=XX&333338&2.6047023E-10*XX&2.3027767E-9<*XX-2.1997983E-8<*XX-
15.3977662E-7<*XX-3.5408822E-6<*XX&83.8379917E-5<*XX&1.1784234E-3<*
2XX&81.4492441E-2<*XX&8.43352738<*XX&8.6228644E0
GO TO 7
4 GGX=XX&333338&6.3271665E-10*XX-3.958306E-8<*XX&9.9766148E-07<*XX-
11.2211032E-5<*XX&7.9451813E-5<*XX-3.2077037E-4<*XX&2.1680398E-3<*

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```

INTGA010
INTGA012
INTGA014
INTGA016
INTGA018
INTGA020
INTGA022
INTGA024
INTGA026
INTGA028
INTGA030
INTGA032
INTGA034
INTGA036
INTGA038
INTGA040
INTGA042
INTGA044
INTGA046
INTGA048
INTGA050
INTGA052
INTGA054
INTGA056
INTGA058
INTGA060
INTGA062
INTGA064
INTGA066
INTGA068
INTGA070
INTGA072
INTGA074
INTGA076
INTGA078
INTGA080
INTGA082
INTGA084
CRMLA002
CRMLA004
CRMLA006
CRMLA008
CRMLA010
CRMLA012
CRMLA014
CRMLA016
CRMLA018
CRMLA020
CRMLA022
CRMLA024
CRMLA026
CRMLA028
CRMLA030
CRMLA032
CRMLA034
CRMLA036
CRMLA038
CRMLA040
CRMLA042
CRMLA044
CRMLA046
CRMLA048
CRMLA050

```



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2XX&1.2817956E-2<*XX&2.49510529<*XX&6.6222355E0
GO TO 7
5 GG*XX&2.8212095E-8<*XX&3.8049276E-6<*XX&2.170224E-4<*XX&6.7310329E-6<*XX&
16-3<*XX&8.12038224<*XX&-1.8461796<*XX&2.0007187
GO TO 7
6 GG*XX&3.0660681
7 VI*XX&1.0E EXP 3GG<<0.311653</B<*21.73.<
END COMPUTE 1
RETURN
END
SUBROUTINE CONVRT&1,GDLAT,ALT,GCLAT,RKM<
C SINGLE PRECISION DECK FOR OCTAL MACHINES XBCD, 026 PUNCH<
C CONVERTS SPACE POINT FROM GEODETIC TO GEOCENTRIC OR VICE VERSA
C REFERENCE GEOID IS THAT ADOPTED BY IAU IN 1964
C A=6378.16, B=6356.7746, F=1/298.25
C 1 * 1 GEODETIC TO GEOCENTRIC
C 1 * 2 GEOCENTRIC TO GEODETIC
C GDLAT = GEODETIC LATITUDE IN DEGREES
C ALT = ALTITUDE ABOVE GEOID IN KILOMETERS
C GCLAT = GEOCENTRIC LATITUDE IN DEGREES
C RKM = GEOCENTRIC DISTANCE IN KILOMETERS
DATA A,RAD,AB2,EP2/6378.16,57.29578,1.0067397,.0067397/
IF 1.EQ.2< GO TO 2
1 SINLAT = SIN&GDLAT/RAD<
COSLAT = SORT&1.-SINLAT**2<
COSTH = SINLAT / SORT&AB2*COSLAT<*2<SINLAT**2<
SINTH = SORT&1.-COSTH**2<
RGEOID = A / SORT&1.EP2*COSTH**2<
X = RGEOID*SINTH & ALT*COSLAT
Y = RGEOID*COSTH & ALT*SINLAT
RKM = SORT&X**2&Y**2<
GCLAT = RAD * ATAN&Y/X<
RETURN
2 RER=RKM/A
C SEE ASTRON. J. VOL.66 P.15, 1961, FOR FORMULAS BELOW.
A2*42-1.4127348E-8/RER&8.94339131E-8</RER&8.33520288E-2</RER
A4*XX&-1.2545063E-10/RER&8.11760996E-9</RER&8.11238084E-4</RER
1 -.2814244E-5</RER
A6*XX&54.939685E-9/RER-28.301730E-9</RER&3.5435979E-9</RER
A8*XX&320.00/RER-252.00</RER&64.00</RER-5.00</RER*98008304E-12
SCL = SIN&GCLAT/RAD<
CCL = SORT&1.-SCL*SCL<
S2CL#2.*SCL*CCL
C2CL#2.*CCL*CCL-1.0
S4CL#2.*S2CL*C2CL
C4CL#2.*C2CL*C2CL-1.0
S8CL#2.*S4CL*C4CL
S6CL#S2CL*C4CL&C2CL*S4CL
DLTCL#S2CL*A2&S4CL*A4&S6CL*A6&S8CL*A8
GDLAT#DLTCL/RAD&GCLAT
ALT = RKM - A/SORT&1.8EP2*SCL*SCL<
RETURN
END
2 F 1965.0
50.000 10.000 1000.000
30.000 10.000 1000.000
10.000 10.000 1000.000
-10.000 10.000 1000.000
-30.000 10.000 1000.000
-50.000 10.000 1000.000
50.000 60.000 1000.000
30.000 60.000 1000.000
10.000 60.000 1000.000

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CRMLA052
CRMLA054
CRMLA056
CRMLA058
CRMLA060
CRMLA062
CRMLA064
CRMLA066
CRMLA068
CRMLA070
CNVRT002
CNVRT004
CNVRT006
CNVRT008
CNVRT010
CNVRT012
CNVRT014
CNVRT016
CNVRT018
CNVRT020
CNVRT022
CNVRT024
CNVRT026
CNVRT028
CNVRT030
CNVRT032
CNVRT034
CNVRT036
CNVRT038
CNVRT040
CNVRT042
CNVRT044
CNVRT046
CNVRT048
CNVRT050
CNVRT052
CNVRT054
CNVRT056
CNVRT058
CNVRT060
CNVRT062
CNVRT064
CNVRT066
CNVRT068
CNVRT070
CNVRT072
CNVRT074
CNVRT076
CNVRT078
CNVRT080
CNVRT082
CNVRT084
CNVRT086
00000100

```


-10.000	60.000	1000.000
-30.000	60.000	1000.000
-50.000	60.000	1000.000
-70.000	110.000	1000.000
-90.000	110.000	1000.000
-10.000	110.000	1000.000
-30.000	110.000	1000.000
-50.000	110.000	1000.000
-70.000	160.000	1000.000
-90.000	160.000	1000.000
-10.000	160.000	1000.000
-30.000	160.000	1000.000
-50.000	160.000	1000.000
-70.000	210.000	1000.000
-90.000	210.000	1000.000
-10.000	210.000	1000.000
-30.000	210.000	1000.000
-50.000	210.000	1000.000
-70.000	260.000	1000.000
-90.000	260.000	1000.000
-10.000	260.000	1000.000
-30.000	260.000	1000.000
-50.000	260.000	1000.000
-70.000	310.000	1000.000
-90.000	310.000	1000.000
-10.000	310.000	1000.000
-30.000	310.000	1000.000
-50.000	310.000	1000.000
-70.000	360.000	1000.000
-90.000	360.000	1000.000
-10.000	360.000	1000.000
-30.000	360.000	1000.000
-50.000	360.000	1000.000

85.0	180.0	0.0
85.0	0.0	0.0
100.0	-90.0	0.0
90.0	00.0	0.0
95.0	-90.0	0.0
85.0	90.0	0.0
92.0	-90.0	0.0
88.0	90.0	0.0

```

C ***** MAIN DECK FOR LINTRA
C ***** MODIFIED FIELD LINE TRACING ROUTINE AS OF JAN 1971,
C ***** DEVELOPED AND TESTED BY R. S. STASSTHOOPDUIN AND G. D. MEAD,
C ***** CODE 641, NASA-GODDARD SPACE FLT CTR, GREENBELT, MD 20771
C ***** SINGLE PRECISION DECK FOR OCTAL MACHINES 2500, 026 PUNCH
C ***** RECORDS SINGLE PRECISION SUBROUTINES CONVRT, ITERAT, AND ALLRAG
C ***** ACCEPTING INPUT COORDINATES OF STARTING POINTS IN EITHER
C ***** GECENTRIC OR GEODETIC SYSTEM AND RETURNING COORDINATES
C ***** FOR ORBITAL INTERSECT POSITIONS IN BOTH SYSTEMS
C ***** INTERSECTS MAY BE OBTAINED AT ANY SPECIFIED ALTITUDE LEVEL
C ***** DIRECTION OF TRACING INPUT-CONTROLLED THROUGH PARAMETER "DIR"
C ***** FOR SURFACE POINTS "DIR" SHOULD ALWAYS BE 2&1K
C ***** FOR SPACE POINTS, 2&1P>OK WILL TRACE THE FIELD LINE TO THE
C ***** IMMEDIATE HEMISPHERE "DIR"OK WILL TRACE THE FIELD LINE TO ARBITRARY 02
C ***** OF SURFACE IN THE SAME HEMISPHERE
C ***** CHARGE OF 7 AND 15 READ ALL TRACK

```

00000150
 00000200
 00000300
 00000400
 00000500
 00000600
 00000700
 00000800
 LINTRO02
 LINTRO04
 LINTRO06
 LINTRO08
 LINTRO10
 LINTRO12
 LINTRO14
 LINTRO16
 LINTRO18
 LINTRO20
 LINTRO22
 LINTRO24
 LINTRO26
 LINTRO28
 LINTRO30
 LINTRO32


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C *****      TM      TIME IN YEARS FOR DESIRED FIELD      LINTRO34
C *****      NPRINT    PARAMETER CONTROLLING OUTPUT      LINTRO35
C *****      40 NO RUNNING PRINTOUT: AT PRINT STEPS      LINTRO38
C *****      ICCORD    REFERENCE SYSTEM OF INPUT COORDINATES LINTRO40
C *****      #1 GEODETIC: #2 GEOCENTRIC      LINTRO42
C *****      GDLAT, GLON, ALT GEODETIC STARTING POINT COORDS DEGR., KKM LINTRO44
C *****      GCLAT, GLON, RKM GEOCENTRIC STARTING POINT COORDS " " < LINTRO46
C *****      DS      TRACING STEPSIZE IN KILOMETERS      LINTRO48
C *****      DIR      PARAMETER CONTROLLING DIRECTION OF TRACE LINTRO50
C *****      #1. STARTS TRACING TOWARDS HIGHER ALT.      LINTRO52
C *****      -1. STARTS TRACING TOWARDS LOWER ALT.      LINTRO54
C *****      HALT      GEODETIC ALTITUDE OF CONJUGATE INTERSECT LINTRO56
C *****      LABEL     NAME OF ORIGIN & STARTING POINT < LINTRO58
C *****      OUTPUT: PLAT, PLON, PRKM GEOCENTRIC COORD. OF CONJUGATE INTERSECT LINTRO60
C *****      PGLAT, PLON, PALT GEODETIC COORD. OF CONJUGATE INTERSECT LINTRO62
C *****      ARC      ARC LENGTH OF FIELD LINE TRACED, IN KM LINTRO64
C *****      BMIN     MINIMUM FIELD STRENGTH ALONG LINE      LINTRO66
C *****      BMLNLT, BMLNLR, GEOCENTRIC COORD. OF BMIN POSITION, IN LINTRO68
C *****      BMINR     DEGREES AND KILOMETERS      LINTRO70
C *****      COMMON /ITER/ L,R,DLAT,DLON,RP,DLATP,DLONP,BR,BT,BP,BST,SGN,DS LINTRO72
C *****      DATA RAD/57.295779517, C1/.00673977, RA/6378.167, MAXS/200/ LINTRO74
10 FORMAT(6F10.3,2A4< LINTRO76
11 FORMAT(1H0,57X,4HSTEP,7X,3HLAT,5X,3ELON,4X,3HRKM,5X,3HALT,7X,2HR, LINTRO78
16X,2HBT,6X,2HBP,7X,1H3,7< LINTRO80
12 FORMAT(30X,24HOLD COORDINATES FOR STEP,16,3H **,2F9.3,2F6.0,4F9.3< LINTRO82
13 FORMAT(7H1MODEL,18/,6H,TIME,7F9.2/,7H PRINT,18/,7H COORD,18/,7< LINTRO84
14 FORMAT(10X,89HGEOCENTRIC COORDINATES - GEODETIC COORDINATES - SE LINTRO86
1EPSTX/ARCLNGTH DIR HALT LABEL,/,12X,18HLAT LONG RKM, LINTRO88
27X,18HLAT LONG ALT,9X,6HDS/ARC,/,11X,19HDEGR< 2DEGR< %K<, LINTRO90
36X,19HDEGR< 2DEGR< %K<,9X,4HKK<,7< LINTRO92
15 FORMAT(3H ORIGIN,2F8.2,F8.1,1X,2F8.2,F8.1,F11.0,9X,2F7.0,5X,2A4< LINTRO94
16 FORMAT(15,F10.2,2I5< LINTRO96
17 FORMAT(10H0INTERSECT, F6.2,F8.2,F8.1,1X,2F8.2,F8.1,F11.0,///< LINTRO98
18 FORMAT(18H CHECK INPUT: ALTA,F8.0,9X,4HDIR,F8.0,9X,5HHALT,F8.0/< LINTRO100
19 FORMAT(54H0LINE TRACING TERMINATED: INTERACTION EXCEEDS 200 STEPS/< LINTRO102
READ*5,15,END*5< MODEL,TM,NPRINT,ICCORD LINTRO104
WRITE*6,13< MODEL,TM,NPRINT,ICCORD LINTRO106
18X,NPRINT,F8.0< WRITE*6,14< LINTRO108
IF ICCORD.EQ.2< GO TO 2 LINTRO110
1 READ*5,10,END*6< GDLAT,GLON,ALT,DS,DIR,HALT,LABEL1,LABEL2 LINTRO112
CALL CONVTR*1,GDLAT,ALT,GCLAT,RKM< LINTRO114
GO TO 3 LINTRO116
2 READ*5,10,END*6< GCLAT,PLON,RKM,DS,DIR,HALT,LABEL1,LABEL2 LINTRO118
CALL CONVTR*2,GDLAT,ALT,GCLAT,RKM< LINTRO120
3 IF NPRINT.EQ.1< WRITE*6,14< LINTRO122
DS=.01988*RKM/51.-.98015*SIN(GCLAT/RAD<8.1926*COS(GCLAT/RAD<8.1926*GLON/69.716</RAD< << 2<-110. LINTRO124
1F*DIR,LT.0.<,AND,DS.GT,XALT-HALT</20.<< DS*ALT-HALT</20. LINTRO126
WRITE*6,15< GCLAT,GLON,RKM,GDLAT,GLON,ALT,DS,DIR,HALT,LABEL1,LABEL2 LINTRO128
IF ALT<DIR*HALT,66.0.0< GO TO 7 LINTRO130
WRITE*6,16< ALT,DIR,HALT LINTRO132
GO TO 21,<<,ICCORD LINTRO134
7 18X,NPRINT,F8.1< WRITE*6,11< LINTRO136
DTUN=5.0 LINTRO138
DLAT=GCLAT LINTRO140
DLON=GLON LINTRO142
R=RKM LINTRO144
L=0 LINTRO146
4 G=57.295779517/RAD LINTRO148
S=SQR(1.-G*G) LINTRO150
SP=57.295779517/RAD LINTRO152
CP=COS(DLON/RAD LINTRO154
CALL CONVTR*3,DLAT,DLON,SP,CP,HR,BT,RP,BK LINTRO156

```


IF L.EQ.05 SGN=SIGN(1.-BR*DIR<

IF 3MIN.LT.4< GO TO 5

BRIN=16

BRINL=DLAT

BRINL=DLON

BRINRR

171.81

IF 1.LT.1000< GO TO 8

WRITE(6,19<

GO TO 81.2<,1000<

8 CALL ITERAT

HR=RP-RA/SORT(1.&C1*CT*CT<

IF XNPRINT.EQ.1< WRITE(6,12< 1.DLATP,DLONP,RP,HR,BR,BT,BP,<

IF X.R.GT.RP< GO TO 4

HR=RA/SORT(1.&C1*SIN(DLAT/RAD<**2<

IF X.H.GT.HALT< GO TO 4

PLAT=DLATP<+HR-HALT<+DLAT-PLATP</+HR-H<

PLON=DLONP<+HR-HALT<+DLON-PLONP</+HR-H<

PRKM=HALT*RA/SORT(1.&C1*SIN(PLAT/RAD<**2<

ARC=DS*2*PI-5<+HR-HALT</+HR-H<

IF PLON.LT.-180.0< PLON=PLON+360.0

IF PLON.GT.180.0< PLON=PLON-360.0

CALL CONV(12,PDLAT,PGLT,PLAT,PRKM<

WRITE(6,17< PLAT,PLON,PRKM,PDLAT,PLON,PGLT,ARC<

GO TO 91.2<,1000<

6 STOP

END

SUBROUTINE ITERAT

C*** SINGLE PRECISION DECK FOR OCTAL MACHINES 2800, 025 PUNCH<

C*** FIELD LINE INTEGRATION PROGRAM USING A 4-POINT ADAMS FORMULA AFTER ITRAT006

C*** INITIALIZATION. FIRST 7 ITERATIONS ADVANCE POINT BY 5*DS

C*** INPUT: L STEP COUNT. SET L=1 FIRST TIME THRU: ITRAT010

C*** SET (171.81) THEREAFTER. ITRAT012

C*** Y(1-3<: R,DLAT,DLON GEDCENTR TRACING POINT COORD. XH,DEON< ITRAT014

C*** B,BR,BT,BP FIELD X COMPONENTS AT POINT Y(1-3< ITRAT016

C*** ST SINE OF GEDCENTR C LATITUDE ITRAT018

C*** SGN SGN=1: TRACES IN DIRECTION OF FIELD ITRAT020

C*** SGN=-1: TRACES OPPOSITE TO FIELD DIR ITRAT022

C*** DS INTERGR. STEPSIZE B ARC INCREMENT< IN KM ITRAT024

C*** OUTPUT: Y(1-3<: R,DLAT,DLON NEW IMPLEMENTED TRACING POINT COORD ITRAT026

C*** YOLD(1-3<: RP,DLATP,DLONP OLD Y(1-3<. BEFORE IMPLEMENTATION ITRAT028

COMMON X(16) L,Y,YOLD,BR,BT,BP,B,ST,SGN,DS

DIMENSION Y(3<,YOLD(3<,Y(3,4<

DATA RAD /57.2957795/

Y(1,4<=SGN*3BR/B<

FAC=SGN*RAD/2*B*Y(1,4<

Y(2,4<=-BT*FAC

Y(3,4<=BP*FAC/ST

IF L.EQ.7< GO TO 9

DO 8 1,3

GO TO(1,2,3,4,5,6,7<,1

D2=DS/2.

D4=DS/4.

D12=DS/12.

D24=DS/24.

Y(1,1<= Y(1,4<

YOLD(1<= Y(1,1<

Y(1,1<= YOLD(1,1<+DS*Y(1,1,1<

GO TO 8

R Y(1,2<= Y(1,4<

Y(1,1<= YOLD(1,1<+D2*Y(1,2,2<+Y(1,1,1<

GO TO 8

Y(1,1<= YOLD(1,1<+D2*Y(1,2,2<+Y(1,1,1<

ITRAT000

ITRAT002

ITRAT004

ITRAT006

ITRAT008

ITRAT010

ITRAT012

ITRAT014

ITRAT016

ITRAT018

ITRAT020

ITRAT022

ITRAT024

ITRAT026

ITRAT028

ITRAT030

ITRAT032

ITRAT034

ITRAT036

ITRAT038

ITRAT040

ITRAT042

ITRAT044

ITRAT046

ITRAT048

ITRAT050

ITRAT052

ITRAT054

ITRAT056

ITRAT058

ITRAT060

ITRAT062

ITRAT064

ITRAT066

ITRAT068

ITRAT070

ITRAT072


```

GO TO 8
4 YP41,2K = YP41,1K
YOLD1K = Y41K
Y41K = YOLD1K + DZ * 25 * YP41,2K = YP41,1K
GO TO 8
5 Y41K = YOLD1K + D12 * 25 * YP41,4K + 8 * YP41,2K = YP41,1K
GO TO 8
6 YP41,3K = YP41,4K
YOLD2K = Y41K
Y41K = YOLD2K + D12 * 25 * YP41,3K + 16 * YP41,2K + 8 * YP41,1K
GO TO 8
7 Y41K = YOLD2K + D24 * 25 * YP41,4K + 16 * YP41,3K + 8 * YP41,2K = YP41,1K
8 CONTINUE
RETURN
9 DO 10 I=1,3
YOLD1K = Y41K
Y41K = YOLD1K + D24 * 25 * YP41,4K + 16 * YP41,3K + 8 * YP41,2K = YP41,1K
DO 10 I=1,3
10 YP41,1K = YP41,1K
RETURN
END

```

SUBROUTINE CONVRTXI,GDLAT,ALT,GCLAT,RKM

C SINGLE PRECISION DECK FOR OCTAL MACHINES ABC, 026 PUNCH
C CONVERTS SPACE POINT FROM GEODETIC TO GEOCENTRIC OR VICE VERSA
C REFERENCE GEOID IS THAT ADOPTED BY IAU IN 1964
C A=6378.16, B=6356.7746, F=1/298.25

C I = 1 GEODETIC TO GEOCENTRIC
C I = 2 GEOCENTRIC TO GEODETIC
C GDLAT = GEODETIC LATITUDE IN DEGREES
C ALT = ALTITUDE ABOVE GEOID IN KILOMETERS
C GCLAT = GEOCENTRIC LATITUDE IN DEGREES
C RKM = GEOCENTRIC DISTANCE IN KILOMETERS

DATA A,RAD,AR2,EP2/6378.16,27.29578,1.0067397,1.0067397
TEXT,10,2< GO TO 2

```

1 SINLAT = SIN(GDLAT/RAD)
COSLAT = SORT(1.-SINLAT**2)
COSTH = SINLAT / SORT(AR2*COSLAT**2+26SINLAT**2)
SINTH = SORT(1.-COSTH**2)
RGEOID = A / SORT(1.+EP2*COSTH**2)
X = RGEOID*SINTH + ALT*COSLAT
Y = RGEOID*COSTH + ALT*SINLAT
RKM = SORT(X**2+Y**2)
GCLAT = RAD * ATAN(Y/X)
RETURN
2 RER=RKM/A

```

C SEE ASTRON. J. VOL.66 P.15, 1961, FOR FORMULAS BELOW.
A2=7-1.4127348E-8/RER, 94339131E-4</RER, 3352328E-2</RER
A4=888-1.2545063E-10/RER, 11760995E-9</RER, 11238084E-4</RER

```

1 -.2814244E-5</RER
A5=254.939685E-9/RER-24.301730E-9</RER, 3439979E-9</RER
A7=22.820.00/RER-252.00</RER, 864.00</RER, 5.00</RER, 1.000000E-10
SCL = SIN(GCLAT/RAD)
CCL = SORT(1.-SCL**2)
S2CL/2 = SCL**2
C4CL/2 = CCL**2-1.0
S4CL/2 = S2CL**2
C4CL/2 = C2CL**2-1.0
S6CL/2 = S2CL*C4CL/2
C6CL/2 = C2CL*C4CL/2
DLTCL = S2CL*A2+S4CL*A4+A6S4CL*A6+A8S4CL*A8
GULAT = DLTCL/RAD+GCLAT
ALT = RKM - 1/SORT(1.+EP2*SCL**2)

```

ITER1074
ITER1075
ITER1076
ITER1077
ITER1078
ITER1079
ITER1080
ITER1081
ITER1082
ITER1083
ITER1084
ITER1085
ITER1086
ITER1087
ITER1088
ITER1089
ITER1090
ITER1091
ITER1092
ITER1093
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ITER1100
ITER1101
ITER1102
ITER1103
ITER1104
ITER1105
ITER1106
ITER1107
ITER1108
ITER1109
ITER1110
ITER1111
ITER1112
ITER1113
ITER1114
CNVRT002
CNVRT004
CNVRT006
CNVRT008
CNVRT010
CNVRT012
CNVRT014
CNVRT016
CNVRT018
CNVRT020
CNVRT022
CNVRT024
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CNVRT028
CNVRT030
CNVRT032
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CNVRT042
CNVRT044
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CNVRT048
CNVRT050
CNVRT052
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CNVRT058
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CNVRT062
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CNVRT180
CNVRT182
CNVRT184
CNVRT186
CNVRT188
CNVRT190
CNVRT192
CNVRT194
CNVRT196
CNVRT198
CNVRT200


```

SIND = ST*SINLAT - GT*GOSLAT
GOSD = GT*SINLAT + ST*GOSLAT
X = -GT*GOSD - BR*SIND
Z = BT*SIND - DR*GOSD
H = SORT(XXXXXYXYX)
DEC = RAD * ATAN2ZY,XS
ATNC = RAD * ATAN2Y/HX
RETURN
END

```

```

SUBROUTINE ALLMA (MODEL, TM, RKM, ST, GT, SPH, CPH, BR, BT, BP, HX)

```

```

C **** GEOCENTRIC VERSION OF GEOMAGNETIC FIELD ROUTINE
C **** SINGLE PRECISION DECK FOR OCTAL MACHINES, 250, 126 PUNCH
C **** SHORT DECK, USES SUBSCRIPTED VARIABLES AND DO LOOPS
C **** EXECUTION TIME PER CALL 3 TIMES GREATER THAN LONG DECK
C **** PROGRAM DESIGNED AND TESTED BY E. G. STASSA, GODDARD AND G. D. HEAD,
C **** CODE 641, NASA GODDARD SPACE FLT CTR, GREENBELT, MD 20761
C **** INPUT: MODEL - CHOICE OF 7 MODELS - SEE BELOW
C ****          RKM - GEOCENTRIC DISTANCE IN KILOMETERS
C ****          TM - TIME IN YEARS FOR DESIRED FIELD
C ****          ST,GT - SIN & COS OF GEOCENTRIC COLATITUDE
C ****          SPH,CPH - SIN & COS OF EAST LONGITUDE
C **** OUTPUT: BR,BT,BP - GEOCENTRIC FIELD COMPONENTS IN GAUSS
C ****          B - FIELD MAGNITUDE IN GAUSS

```

```

C **** NOTE: FOR GREATEST EFFICIENCY, COMPLETE ALL CALCULATIONS WITH
C **** ONE MODEL AND ONE TIME BEFORE CHANGING MODELS OR TIME.

```

```

DIMENSION TOT(7),NMXX(7),ISUM(7),K(8),G(13,13),LSUM(7,13)

```

```

DATA TOT/4*1960.,2*1965.,1970.,NMXX/10,11,12,11,9,9,13/

```

```

DATA LSUM /7,-1646106.,-1793169.,-1865298.,-1771057.,-150672,

```

```

A=-156856.,-2191704.,-62661.,-70778.,-181519.,-83555.,-9569.,-9599,

```

```

B=-593,1.,-10610.,2*1/

```

```

INITIAL G(1,13,13),G(1,13,13),G(1,13,13),G(2,13,13),G(2,13,13),

```

```

1 G(12,13,13),G(13,13,13),G(13,13,13),G(13,13,13),G(13,13,13),

```

```

2 G(14,13,13),G(14,13,13),G(14,13,13),G(15,13,13),G(15,13,13),

```

```

3 G(16,13,13),G(16,13,13),G(16,13,13),G(17,13,13),G(17,13,13),

```

```

4 LG(13,13,7),LG(13,13,7),LG(13,13,7),LG(13,13,7),

```

```

REAL G(13,13,7),GG(13,13,7),GG(13,13,7),GG(13,13,7),GG(13,13,7),

```

```

EQUIVALENCE (G(1,13,13),LG(1,13,13),GG(1,13,13),GG(1,13,13),GG(1,13,13),

```

```

A GG(1,13,13),GG(1,13,13),GG(1,13,13),GG(1,13,13),GG(1,13,13),

```

```

B GG(2,13,13),GG(2,13,13),GG(2,13,13),GG(2,13,13),GG(2,13,13),

```

```

C GG(3,13,13),GG(3,13,13),GG(3,13,13),GG(3,13,13),GG(3,13,13),

```

```

D GG(4,13,13),GG(4,13,13),GG(4,13,13),GG(4,13,13),GG(4,13,13),

```

```

E GG(5,13,13),GG(5,13,13),GG(5,13,13),GG(5,13,13),GG(5,13,13),

```

```

F GG(6,13,13),GG(6,13,13),GG(6,13,13),GG(6,13,13),GG(6,13,13),

```

```

G GG(7,13,13),GG(7,13,13),GG(7,13,13),GG(7,13,13),GG(7,13,13)

```

```

C **** THE FOLLOWING DATA CARDS CONTAIN THE FIELD COEFFICIENTS

```

```

C **** FOR THE FOLLOWING SEVEN MODELS:

```

```

C **** 1,GT1: REYNOLDS & CALIN 40-TERM GSEC 9/65 EPOCH 1960,

```

```

C **** 2,GT2: REYNOLDS & CALIN 120-TERM GSEC 12/66 EPOCH 1960,

```

```

C **** 3,GT3: CALIN & LANGR 120-TERM PEGD 10/66 EPOCH 1960,

```

```

C **** 4,GT4: CALIN & LANGR 120-TERM PEGD 6/69 EPOCH 1960,

```

```

C **** 5,GT5: LORR 1967,0 20-TERM 10/73 EPOCH 1965,

```

```

C **** 6,GT6: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

```

```

C **** 7,GT7: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

```

```

C **** 8,GT8: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

```

```

C **** 9,GT9: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

```

```

C **** 10,GT10: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

```

```

C **** 11,GT11: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

```

```

C **** 12,GT12: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

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```

C **** 13,GT13: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

```

```

C **** 14,GT14: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

```

```

C **** 15,GT15: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

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```

C **** 16,GT16: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

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C **** 17,GT17: LORR CALIN & EVANS 1965 20-TERM 10/73 EPOCH 1965,

```

GDAL1077

GDAL1080

GDAL1082

GDAL1085

GDAL1088

GDAL1090

GDAL1092

GDAL1094

ALHGS002

ALHGS004

ALHGS006

ALHGS008

ALHGS010

ALHGS012

ALHGS014

ALHGS016

ALHGS018

ALHGS020

ALHGS022

ALHGS024

ALHGS026

ALHGS028

ALHGS030

ALHGS032

ALHGS034

ALHGS036

ALHGS038

ALHGS040

ALHGS042

ALHGS044

ALHGS046

ALHGS048

ALHGS050

ALHGS052

ALHGS054

ALHGS056

ALHGS058

ALHGS060

ALHGS062

ALHGS064

ALHGS066

ALHGS068

ALHGS070

ALHGS072

ALHGS074

ALHGS076

ALHGS078

ALHGS080

ALHGS082

ALHGS084

ALHGS086

ALHGS088

ALHGS090

ALHGS092

ALHGS094

ALHGS096

ALHGS098

ALHGS100

ALHGS102

ALHGS104

ALHGS106

ALHGS108

ALHGS110

ALHGS112

ALHGS114

I 194,-8,99,6*0,-1369,-1578,-70,153,-117,153,85,6*0,649,293,-924, ALMGS110
J -133,-54,-42,214,4*0,-177,-154,313,-548,-417,-72,157,6*0,304,788, ALMGS112
K -185,125,80,154,-9,6*0,-139,12,153,-73,-6,4,0,6*0, ALMGS114
L DATA GT11 /1,108*0/ ALMGS116
M DATA GT2 /10,-304012,-15401,13071,9493,-2335,392,722,85,10,-29, ALMGS118
N A 2*0,57782,-21008,29979,-19889,8035,2557,515,-537,65,53,-9, ALMGS120
B 2*0,-19320,2029,15903,12768,5029,2284,-6,79,-93,75,-22,2*0,-4254, ALMGS122
C 2278,-1338,8812,-3977,-288,-2383,156,-96,-151,8,2*0,1603,-2743, ALMGS124
D 23,-2406,2565,-1572,-15,-243,-61,121,-28,2*0,51,173,-1148,-1049, ALMGS126
E 824,-622,-20,-36,55,47,6,2*0,-121,1044,5,6,-234,-148,-133,-108, ALMGS128
F 155,-81,2,47,2*0,-537,-274,-81,70,273,-225,-214,36,130,16,-2,2*0, ALMGS130
G 54,-117,42,-153,46,219,-7,-171,74,9,18,2*0,-224,138,63,-30,-19, ALMGS132
H 99,115,1,-15,2,20,2*0,-1,45,-10,26,-44,-13,-36,40,10,-20,11,2*0, ALMGS134
I DATA GT12 /100,-1403,-2329,-93,145,161,-42,-57,35,-10,-1,2*0,-371, ALMGS136
J 876,-9,-1062,91,60,82,-34,50,-13,-13,2*0,-1431,-1662,-456,231, ALMGS138
K -175,334,82,-154,170,-120,83,2*0,520,253,-498,-589,65,-4,235,-90, ALMGS140
L -11,6,-15,2*0,-219,-14,183,-652,-301,-60,83,3,34,-6,17,2*0,224, ALMGS142
M 189,-261,60,-12,176,1,-60,-7,-39,-2,2*0,5,9,255,-119,33,84,23,-17, ALMGS144
N 43,-36,5,2*0,-96,1,43,75,-33,49,90,-64,-15,47,17,2*0,-20,-21,3, ALMGS146
O -79,5,10,-36,-43,-42,37,16,2*0,66,54,3,35,-3,-1,45,-5,75,-46,31, ALMGS148
P DATA GT13 /1000,-62,-154,-123,1,45,-6,-14,6,-3,-3,2*0,-43,114,-10, ALMGS150
Q -27,-44,1,13,-6,-1,-3,2*0,34,-16,-253,28,17,75,10,-34,39,-27,20, ALMGS152
R 230,95,-7,79,-33,7,8,50,-4,-8,5,-3,2*0,4,56,-35,-47,-97,15,-11, ALMGS154
S -6,13,-7,7,2*0,-46,7,-7,1,-24,56,26,-27,-2,-6,1,2*0,20,-11,15, ALMGS156
T -29,29,-10,23,-1,5,-9,1,2*0,-1,1,1,1,5,-3,16,11,-4,-8,8,1,2*0, ALMGS158
U -15,-12,5,-11,0,-3,-3,-3,-7,5,2*0,22,7,-2,9,0,-1,9,-6,19,-9,4, ALMGS160
V DATA GT14 /10,-304650,-15414,15295,959d,-2343,491,759,74,110,-26, ALMGS162
W A 23,0,57910,-21623,29763,-19837,8196,3577,545,-524,60,66,-20,-15, ALMGS164
B 0,-19772,1586,16075,13169,4864,2339,48,80,-61,18,10,-21,0,-4453, ALMGS166
C 2334,-949,8420,-3724,-210,-2491,100,-92,-125,-55,55,0,1554,-2007, ALMGS168
D 207,-2413,2562,-1471,17,-361,-6,158,-7,-15,0,188,1133,-1287,-1181, ALMGS170
E 1303,-432,-37,-3,91,17,73,24,0,-96,1064,568,-272,-149,-43,-916, ALMGS172
F 66,-114,26,78,-35,0,-219,-250,-8,63,95,-117,-276,-227,79,87,17, ALMGS174
G -13,0,101,-130,115,-164,55,223,-49,-262,351,51,-53,25,0,-204,144, ALMGS176
H 6,-15,14,34,145,24,-3,-24,13,-12,0,11,9,-3,75,-23,14,-5,43,80, ALMGS178
I -137,-27,127,0,-8,44,-1,-39,-6,18,-32,8,-59,-17,105,50,14*0, ALMGS180
J DATA GT15 /100,2542,-2390,-559,-62,272,-61,-89,61,-24,-1,3,0,-466, ALMGS182
K -988,350,-1152,-231,48,106,-21,-12,30,-9,11,0,-707,-1070,-214,-441, ALMGS184
L -122,317,52,-108,87,4,12,5,0,848,68,-1489,287,-296,-265,396,70, ALMGS186
M -33,4,19,-30,0,345,-39,-87,-652,56,-89,-94,107,-14,-40,-20,1,0,5, ALMGS188
N 300,32,311,-635,-315,149,96,-85,-28,-2,-34,0,-26,-48,258,-80,50, ALMGS190
O 82,-167,101,29,-57,-43,48,0,-7,-46,-102,25,188,-243,232,573,81, ALMGS192
P -132,-33,52,0,-15,-10,-122,-26,15,-37,29,91,-498,-14,103,-19,0, ALMGS194
Q -32,16,67,-14,-83,130,-33,-38,99,50,22,-3,0,21,5,54,-26,-30,-3, ALMGS196
R -39,-2,-104,79,46,-165,0,35,-26,-17,17,18,-50,23,-34,37,22,-159, ALMGS198
S DATA GT16 /1,168*0/ ALMGS200
T DATA GT17 /10,-304706,-15425,13334,9847,-2375,448,792,99,96,-17, ALMGS202
U A 2*0,57571,-21702,29893,-19326,8108,3566,594,-516,32,93,-22,2*0, ALMGS204
B -19753,2661,15559,12922,3068,2498,-37,-3,-56,31,13,2*0,-4249, ALMGS206
C 2416,-1740,6330,-3973,-143,-2324,89,-165,-120,16,2*0,1374,-3037, ALMGS208
D 196,-2764,2247,-1497,96,-135,-35,153,-27,2*0,51,1080,-1073,-1083, ALMGS210
E 1171,-757,26,-23,50,7,94,2*0,-76,1181,583,4141,-270,1,-831,100, ALMGS212
F -170,8,87,2*0,-544,-212,-87,52,151,-235,-272,39,104,4,3,2*0,98, ALMGS214
G -104,98,-152,105,206,-2,-207,147,62,-24,2*0,-254,128,31,-25,-21, ALMGS216
H 73,177,47,7,-38,-1,2*0,29,35,-7,66,-50,10,-28,21,42,-68,53,280, ALMGS218
I DATA GT18 /100,7687,-2566,-724,-157,359,12,-160,19,17,-3,2*0,223, ALMGS220
J 1103,130,-1142,-118,41,36,-25,27,-8,-8,2*0,-664,-2838,792,44, ALMGS222
K -53,-27,225,72,35,-46,17,2*0,449,-96,177,327,107,-326,128,86,83, ALMGS224
L -94,-37,2*0,268,560,-109,-208,334,-108,-277,82,42,-37,-12,2*0,234, ALMGS226
M DATA GT19 /100,7687,-2566,-724,-157,359,12,-160,19,17,-3,2*0,223, ALMGS228
N 1103,130,-1142,-118,41,36,-25,27,-8,-8,2*0,-664,-2838,792,44, ALMGS230
O -53,-27,225,72,35,-46,17,2*0,449,-96,177,327,107,-326,128,86,83, ALMGS232
P -94,-37,2*0,268,560,-109,-208,334,-108,-277,82,42,-37,-12,2*0,234, ALMGS234
Q DATA GT20 /100,7687,-2566,-724,-157,359,12,-160,19,17,-3,2*0,223, ALMGS236


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M -259,-130,101,43,-48,-33,2*0,-168,-114,54,123,94,40,60,-140,73,
N -21,2*0,1,39,-106,-9,-49,56,-67,-3,-1,6,-12,77,2*0,43,-42,17,
O -61,-22,2,-1,-113,18,33,49,2*0,-14,-37,51,-2,4,-19,7,40,-53,31,
P -75,28*0/
DATA GT14 /1,16*0/
DATA G6 / 1,-30339,-1654,1247,958,-223,47,71,10,2*0,5758,-2123,
A 2994,-2036,300,357,50,-54,9,4*0,-2006,130,1567,1289,992,246,4,0,
B -3,4*0,-403,2*2,-176,843,-392,-26,-229,12,-12,4*0,143,-200,0,-209,
C -256,-161,0,-25,-4,4*0,16,125,-173,-107,77,-55,-4,-3,7,4*0,12,-13,
D 106,68,-32,-10,-13,-112,18,-5,4*0,-57,-27,-8,9,23,-19,-17,-2,12,
E 4*0,3,-13,5,-17,4,22,-3,-16,6,56*0/
DATA GT15 / 10, 155,-244,2,-7,19,-1,-5,1,4*0,-20,77,5,-105,2,11,-3,4,
F -3,4*0,-113,-167,-20,7,-30,28,11,-7,6,4*0,42,7,-77,-38,-1,6,19,
G -5,5*0,-1,16,29,-42,-21,0,-4,3,3*0,25,17,-24,8,-3,13,-4,0,-1,4*0,
H -9,-4,20,-11,1,4,-2,-2,3,4*0,-11,3,4,2,4,2,3,-6,-3,4*0,1,-2,-3,-2,4,
I -3,-4,-3,-3,-5,56*0/
DATA GT16 /1,16*0/
DATA G6 / 1,-30339,-1654,1247,958,-223,47,71,10,2*0,5758,-2123,
A 2994,-2036,300,357,50,-54,9,4*0,-2006,130,1567,1289,992,246,4,0,
B -3,4*0,-403,2*2,-176,843,-392,-26,-229,12,-12,4*0,143,-200,0,-209,
C -256,-161,0,-25,-4,4*0,16,125,-173,-107,77,-55,-4,-3,7,4*0,12,-13,
D 106,68,-32,-10,-13,-112,18,-5,4*0,-57,-27,-8,9,23,-19,-17,-2,12,
E 4*0,3,-13,5,-17,4,22,-3,-16,6,56*0/
DATA GT16 / 10, 155,-244,2,-7,19,-1,-5,1,4*0,-20,77,5,-105,2,11,-3,4,
F -3,4*0,-113,-167,-20,7,-30,28,11,-7,6,4*0,42,7,-77,-38,-1,6,19,
G -5,5*0,-1,16,29,-42,-21,0,-4,3,3*0,25,17,-24,8,-3,13,-4,0,-1,4*0,
H -9,-4,20,-11,1,4,-2,-2,3,4*0,-11,3,4,2,4,2,3,-6,-3,4*0,1,-2,-3,-2,4,
I -3,-4,-3,-3,-5,56*0/
DATA GT16 /1,16*0/
DATA G7 /10,-302059,-17917,12899,9475,-2145,460,734,127,107,-30,16,
A -4,57546,-20664,29971,-20708,8009,3595,651,-596,77,57,-28,-31,30,
B -20582,430,16086,12760,4579,24*0,95,46,-32,23,7,-36,5,-3699,2456,
C -1860,8344,-3960,-290,-2188,175,-124,-110,-19,37,-3,1617,-2758,
D 185,-2738,2436,-1669,20,-210,-44,131,-15,-3,-15,157,1420,-1310,
E -911,308,-202,-22,-32,45,33,74,-6,4,-171,1146,25,-323,-78,38,
F -1125,143,54,2,46,-8,-14,-556,-265,-34,81,205,-240,-166,41,121,
G 15,6,1,-12,121,-160,22,-176,46,169,-46,-127,98,8,-8,2,-12,-17,
H 163,14,-27,-32,30,137,-4,-14,-6,22,-24,-1,27,19,0,35,-45,22,-31,
I 96,-1,-63,14,-4,10,-2,26,-26,-9,21,-1,11,-14,-22,-17,-14,6,-4,-3,
J 4,9,-1,-10,26,-32,13,-6,-19,7,19,12/
DATA GT7 /10,251,-244,-19,-7,12,-7,0,3,4*0,-46,112,-1,90,-6,7,6,
K -5,3,4*0,-104,-166,40,-29,-36,12,14,3,6,4*0,72,21,-52,-54,-11,0,
L 17,5,1,4*0,22,-5,16,-24,-23,-15,0,3,-1,4*0,1,25,-14,9,1,11,-3,2,
M -5,4*0,-5,11,2,-3,7,22,-5,1,9,4*0,-17,-3,7,1,-2,-3,-2,-1,-2,4*0,
N 2,-5,-3,-4,1,-2,-2,-1,5,56*0/
DATA GT17 /1,16*0/
DATA SHMIT1,1,K / 0,0 /, THOLD / 0,0 /, MUDDO / 0 /
C ***** SUBSCRIPTED DO-LOOP VERSION BEGINS HERE
DIMENSION CONST13,13<,FN13<,FN13<
DIMENSION R13,13<,DP13,13<,SP13<,CP13<
DATA I1,1<,CP13<,DP13<,SP13< / 2*7,2*0, /
D ***** BEGIN PROGRAM
IF SHMIT1,1,EQ,-1,< GO TO 3
***** INITIALIZE * ONCE ONLY, FIRST TIME SUBROUTINE IS CALLED
SHMIT1,1,K=-1,
DO 18 Q=1,13
F1=CONST1
DO 18 P=1,13
F2=F1-1
F3=F2-1
CONSTN,K = FLOAT(XN-2**2-M-1K**2)/ 3.2**N-3**2**N-5<<
DO 20 N=1,13
SHMITN,1< = 2**N-3< = SHMITN-1,1< / 2**N-1<
JJ=2
DO 20 I=1,2,4
SHMITI,K = SHMITI,1< * SHMITI,10< / 4-21<-10< / 2**N-1<<<

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ALMGS360

SHMITN-1,N<SHMITN,M<

2 JJ = 1

DO 7 K=1,7

FL=LG*1,1,K<

F2=LG*1,1,K<

F3=LG*1,1,K<

1 NMAX=NIN<K<

1 X=0

DO 3 I=1,3

3 ISUMK,1<# 0

DO 4 N=1,NMAX

DL=4*N+1,NMAX

1 X=1&J

ISUMK,1<ISUMK,1<GL*LG*1,1,K<

ISUMK,2<ISUMK,2<GL*LG*1,1,K<

4 ISUMK,3<ISUMK,3<GL*LG*1,1,K<

DO 6 I=1,3

IF ISUMK,1<0,ISUMK,1<0,GO TO 5

***** ERROR IN DATA CARDS - NOTE WRITE AND STOP STATEMENTS

WRITE(3,5< K,1,ISUMK,1<,ISUMK,1<

5 FORMAT(//720H DATA ERROR IN ALL DATA MODEL,12,3X,20H,11,3X,

WITH PRECALCULATED SUM,110,3X,170H THIS MACHINE GETS,110<

STOP

6 CONTINUE

DO 7 N=1,NMAX

DO 8 K=1,NMAX

GGX=N,K<LG*1,1,K<SHMITN,M</F1

GGTX=N,K<LG*1,1,K<SHMITN,M</F2

7 GGTX=N,K<LG*1,1,K<SHMITN,M</F3

8 IFX=MODEL,EO,MODELDS,AND,STM,EO,MODEL< GO TO 11

C ***** NOTE WRITE STATEMENT - /123/ ADDS FOR NEW TIME

IF MODEL,1<1,MODEL,1<1< STOP

IF MODEL,EO,1<1,MODEL,1<1< STOP

IF MODEL,EO,2<1,MODEL,1<1< STOP

IF MODEL,EO,3<1,MODEL,1<1< STOP

IF MODEL,EO,4<1,MODEL,1<1< STOP

IF MODEL,EO,5<1,MODEL,1<1< STOP

IF MODEL,EO,6<1,MODEL,1<1< STOP

IF MODEL,EO,7<1,MODEL,1<1< STOP

21 FORMAT(1H0,20X,41HMODEL 1 HENDRICKS&CAIN GSFC 9/65 FOR TM 49.37/<ALGS440

22 FORMAT(1H0,20X,41HMODEL 2 CAIN ET AL GSFC 12/66< FOR TM 49.37/<ALGS442

23 FORMAT(1H0,20X,41HMODEL 3 CAIN&LANGEL PGD 10/68< FOR TM 49.37/<ALGS444

24 FORMAT(1H0,20X,41HMODEL 4 CAIN&SHEELEY PGD 8/69< FOR TM 49.37/<ALGS446

25 FORMAT(1H0,20X,41HMODEL 5 SIGR 1965,0< FOR TM 49.37/<ALGS448

26 FORMAT(1H0,20X,41HMODEL 6 LEATON MALIN EVANS 1965< FOR TM 49.37/<ALGS450

27 FORMAT(1H0,20X,41HMODEL 7 MURKIN USC&S 1970< FOR TM 49.37/<ALGS452

MODEL=DEL

TIME=DEL

NMAX=NIN<MODEL<

1 X=1-TO-MODEL<

DO 10 N=1,NMAX

DO 11 I=1,NMAX

10 GGX=N,K<LG*1,1,K<SHMITN,M</F1,MODEL<GGTX=N,K<LG*1,1,K<SHMITN,M</F2

***** CALCULATION USUALLY BEGINS HERE

11 SP=2<SP=1

CP=2<CP=1

DO 12 I=3,NMAX

SP=2<SP=1<CP=2<CP=1<SP=2<SP=1<CP=2<CP=1<

12 SP=2<SP=1<CP=2<CP=1<SP=2<SP=1<CP=2<CP=1<

WRITE(3,1,2/)

ALGS440

ALGS442

ALGS444

ALGS446

ALGS362

ALGS364

ALGS366

ALGS368

ALGS370

ALGS372

ALGS374

ALGS376

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ALGS488

C ***** 63,GT1: CAIN & LANGELE 143-TERM EPOCH 10/66 EPOCH 1960,ALNGLO46
 C ***** 64,GT4: CAIN & SNEYDEY 120-TERM EPOCH 8/69 EPOCH 1960,ALNGLO47
 C ***** 65,GT5: GRIFFIN 1965, 80-TERM 10/68 EPOCH 1965,ALNGLO48
 C ***** 66,GT6: LEATON, HALL & EVANS 1965 80-TERM EPOCH 1965,ALNGLO49
 C ***** FOR MODEL 2, LINE 1965< SET RKN 7, 8371, 2, 8, ALNGLO46
 C ***** 67,GT7: HIRSHFELD, CHAST & MURPHY 166-TERM EPOCH 1970,ALNGLO49
 DATA GT1 / 10, -304249,-15461,13009,9576,-2277,892,709,66,59,340, ALNGLO46
 A 5774,-21616,30002,-19470,6027,3595,607,-572,61,29,340,-19698, ALNGLO47
 B 2043,15453,12904,5026,2313,45,56,-58,74,340,-4310,2208,-1300,3412,ALNGLO48
 C -2940,-312,-2417,75,-133,-156,340,1520,-2686,29,-2505,2714, ALNGLO49
 D -1573,-12,-245,-33,114,340,86,1212,-1160,-1106,729,-652,5,-15,71,ALNGLO50
 E 111,340,-119,1028,609,-272,-121,-116,-1091,141,-36,16,345,-544, ALNGLO51
 F -244,-91,22,276,-244,-201,58,117,440,69,-122,58,-170,26,256,-23, ALNGLO52
 G -165,64,15,340,-220,155,51,-35,-10,96,121,2,-53,16,4240, ALNGLO53
 DATA GT1 / 100, 2059,-2907,33,-5,255,-70,640,-394,602,121,-1003,ALNGLO54
 H 194,-8,99,340,-1369,-1578,-70,163,-117,153,85,640,645,293,-574, ALNGLO55
 I -130,-54,-42,211,640,-177,-154,318,-548,-417,-72,137,640,504,288,ALNGLO56
 J -195,125,80,164,-9,640,-139,12,153,-73,-6,45,6,8440, ALNGLO57
 DATA GT1 / 1,16840, ALNGLO58
 DATA G2 / 10, -304249,-15461,13071,9493,-2335,492,722,85,104,-29, ALNGLO59
 A 240,57737,-21638,29979,-19889,8035,3551,575,-937,65,58,-9, ALNGLO60
 B 240,-19320,2029,15903,12755,6029,2284,-8,19,-93,15,-22,240,-4254,ALNGLO61
 C 2278,-1328,8812,-3977,-288,-2383,156,-96,-151,8,240,1603,-2743, ALNGLO62
 D 23,-2466,2605,-1579,-15,-243,-61,121,-23,240,51,1178,-1148,-1089,ALNGLO63
 E 324,-622,-20,-36,55,47,64,240,-121,104,563,-234,-148,-133,-1089,ALNGLO64
 F 155,-81,2,47,240,-557,-276,-81,70,243,-275,-274,36,130,16,-2,240,ALNGLO65
 G 54,-117,42,-153,46,210,-7,-171,74,9,18,240,-226,134,834,-30,-19, ALNGLO66
 H 90,118,1,-14,2,20,240,-1,45,-10,28,-44,-13,-36,40,10,-20,11,2840,ALNGLO67
 DATA GT2 / 100, 1402,-2329,-93,148,161,-42,-57,35,-10,-1,240,-371,ALNGLO68
 I 876,-9,-1062,90,60,52,-34,50,-13,-13,240,-1431,-1662,-456,231, ALNGLO69
 J -175,334,82,-144,170,-120,88,240,520,253,698,-589,66,-4,235,-90,ALNGLO70
 K -11,8,-18,240,-219,-14,188,-652,-301,-60,23,3,38,-11,240,224, ALNGLO71
 L 189,-261,50,-12,176,1,-60,-7,-39,-2,240,5,9,255,-119,33,24,25,-17,ALNGLO72
 M 48,-36,5,240,-96,1,43,73,-33,49,90,-64,-15,47,17,240,-50,-21,3, ALNGLO73
 N -79,5,10,-36,-43,-42,37,16,240,66,58,3,35,-3,-1,45,-5,75,-46,31, ALNGLO74
 O 240,-61,-64,2,5,-63,-7,7,-3,-2,-45,-23,2840, ALNGLO75
 DATA GT2 / 1000,-62,-154,-123,1,45,-6,-14,6,-5,-3,240,-43,114,-14,ALNGLO76
 P -27,-64,1,15,-6,8,-1,-3,240,54,-16,-253,23,17,73,10,-34,39,-27,20,ALNGLO77
 Q 240,95,-7,79,-183,7,4,50,-4,-8,5,-3,240,4,56,-35,-47,-97,15,-11,ALNGLO78
 R -4,15,-7,7,240,-6,7,-7,1,24,10,26,-27,-2,-6,1,240,20,-11,13, ALNGLO79
 S -29,29,-10,23,-1,5,-9,1,240,-14,16,14,5,-8,16,11,-6,-1,6,1,240,ALNGLO80
 T -15,-12,5,-11,0,-2,-9,-3,-7,5,5,240,22,7,-2,9,6,-1,9,-4,19,-9,4,ALNGLO81
 U 240,-12,-14,1,1,-11,-1,1,-1,1,-6,-2,2840, ALNGLO82
 DATA G3 / 10, -304650,-15414,13258,9591,-2343,491,759,74,110,-26, ALNGLO83
 A 23,0,57910,-21633,29763,-19837,8196,3577,545,-524,60,66,-20,-18,ALNGLO84
 B 0,-19772,1566,16075,1316,4864,2329,48,50,-81,18,10,21,0,-1452,ALNGLO85
 C 2334,-949,8420,-3724,-210,-2491,100,-92,-125,-3,55,0,1354,-2667,ALNGLO86
 D 207,-2415,2562,-1471,17,-367,-8,56,-7,-15,0,169,1133,-1247,-1151,ALNGLO87
 E 1303,-452,-37,-83,91,17,75,24,0,-96,1064,563,-272,-149,-6,916,ALNGLO88
 F 66,-114,26,78,-33,0,-579,-254,-8,63,95,-117,-375,-227,79,87,17,ALNGLO89
 G -13,0,107,-130,115,-164,55,223,-49,-262,351,51,-33,25,0,-204,144,ALNGLO90
 H 6,-15,14,34,143,24,-9,-24,13,-12,0,11,9,-3,75,-23,14,-5,43,80,ALNGLO91
 I -137,-27,127,0,-6,44,-1,-59,18,-32,8,-59,-17,105,50,1430, ALNGLO92
 DATA G13 / 100,2762,-2302,-559,-62,272,-61,-19,61,-24,-1,3,0,-466,ALNGLO93
 J 988,350,-1152,-251,48,106,-21,-12,30,-9,11,0,-707,-1070,-112,-431,ALNGLO94
 K -127,317,62,-108,87,4,12,5,0,348,63,-1489,287,-285,-246,396,70,ALNGLO95
 L -33,4,19,-30,0,345,-39,-67,-652,84,-89,-94,107,-14,-40,-20,1,0,5,ALNGLO96
 M 300,-1,311,-35,-315,149,26,-15,-28,-2,-37,0,-26,-48,258,-80,50,ALNGLO97
 N 82,-157,101,97,-57,-43,40,0,-17,-46,-102,25,188,-243,232,565,1,ALNGLO98
 O -132,-35,52,0,-19,-10,-122,-27,16,-37,29,91,-498,-14,103,-1,ALNGLO99
 P -36,16,67,-144,33,130,-29,-24,99,50,72,-3,0,21,0,54,-26,-30,-1,ALNGLO100
 Q -50,-2,-104,70,45,-145,0,13,-95,217,17,18,-50,24,-54,57,22,-153,ALNGLO101
 R -10,1440, ALNGLO102

DATA GTT3 /1,168*0/
DATA G4 / 10,-304704,-15425,13332,9647,-2375,448,793,92,95,-17,
A 2*0,57571,-21702,29893,-19326,8108,1366,594,-576,32,93,-22,2*0,
B -19793,2661,15559,12927,5068,7493,-37,-3,-56,31,13,2*0,-4249,
C 2417,-1740,8336,-3975,-143,-2424,89,-155,-120,16,2*0,1344,-3037,
D 194,-2754,2247,-1497,46,-325,-25,153,-27,2*0,51,1080,-1073,-1685,
E 1171,-757,20,-33,50,7,94,2*0,-76,1181,583,-181,-270,1,-831,100,
F -120,-247,2*0,-544,-212,-87,55,151,-235,-672,39,102,4,3,2*0,98,
G -162,90,-189,105,206,-2,-207,147,52,-76,2*0,236,125,4,-23,-21,
H 78,127,47,7,-38,-1,2*0,29,35,-7,65,-50,10,-28,21,42,-58,65,2*0,
DATA GTT4 / 100,2682,-2366,-724,-157,354,12,-160,19,17,-3,2*0,225,
I 1003,150,-1142,-118,26,35,-26,27,-8,-7,2*0,-684,-2812,772,14,
J -536,-27,235,72,33,-44,17,2*0,117,-76,177,327,10,-24,125,95,2*0,
K -9,-87,2*0,369,564,-109,-205,334,-108,-277,64,42,-37,-17,2*0,234,
L 401,-484,64,-804,504,2,-57,0,-1,-33,2*0,-65,-230,249,-170,234,
M -259,-130,101,89,-48,-24,2*0,-164,-116,58,123,94,40,60,-140,7,
N 64,-21,2*0,1,39,-106,-9,-49,56,-67,-1,-149,-13,27,2*0,48,42,17,
O -41,-27,21,1,-115,16,33,49,2*0,-14,-37,31,-2,0,-19,7,60,-5,31,
P -75,2*0/
DATA GTT4 /1,168*0/
DATA G5 / 1,-30339,-1694,1297,958,-223,47,71,10,4*0,5150,-2123,
A 2094,-2036,805,357,68,-54,9,4*0,-2006,130,1567,121,432,245,4*0,
B -3,6*0,-505,242,-175,42,-392,-26,-229,12,-12,4*0,149,-230,8,-2654,
C 256,-161,3,-25,-4,4*0,16,125,-123,-107,77,-51,-4,-9,7,4*0,-14,
D 106,68,-32,-10,-13,-112,13,-5,4*0,-57,-27,-8,9,26,-17,-17,-2,12,
E 4*0,3,-13,5,-17,4,22,-8,-14,6,36*0/
DATA GTT5 / 10,153,-244,2,-1,19,-1,-5,1,4*0,-2,7,3,-108,2,11,-3,ALGL127
F -5,4,4*0,-118,-167,-16,7,-40,29,11,-7,6,4*0,27,-77,-32,-1,3,34,ALGL130
G -5,3*0,-7,36,29,-42,-21,0,-4,3,4*0,23,17,-3,13,-4,0,-1,4*0,ALGL131
H -4,204-11,1,9,-2,-2,3,4*0,-11,3,2,4,2,3,-6,-3,4*0,1,-2,-5,-2,ALGL132
I -3,-3,-3,-3,-3,36*0/
DATA GTT5 /1,168*0/
DATA G6 / 1,-30379,-1647,1164,430,-774,42,77,11,4*0,5769,-2067,
A 2934,-2038,111,357,557,-56,73,4*0,-1995,116,1572,1299,440,343,12,ALGL133
B -5,-6,4*0,-389,230,-141,660,-402,-20,-239,5,-17,4*0,142,-276,5,ALGL137
C -264,262,-171,16,-35,7,4*0,30,135,-123,-100,84,-64,8,-16,20,4*0,ALGL138
D -18,101,60,-32,-27,312,-110,9,-1,4*0,-47,-35,-9,2,27,-17,-24,2,ALGL139
E 12,4*0,5,-7,5,-20,5,5,10,-12,7,56*0/
DATA G6 / 10,155,-266,0,6,8,7*0,6,85,-13,-95,10,4,-5,6*0,-114,ALGL141
F -192,13,-19,-22,16,18,6*0,32,16,-85,-6,2,-3,14,6*0,39,-7,47,-27,ALGL142
G -30,-11,6,6*0,19,23,-10,14,5,17,2,6*0,-22,2,5,-21,-16,-2,22,64*0/ALGL143
H 10,616 /1,168*0/
DATA GTT6 / 10,-302659,-17917,12399,9475,-2145,460,734,121,107,-39,16,ALGL145
A -6,57440,-20664,29971,-26708,8009,3595,651,-546,77,57,-26,-31,30,ALGL146
B -20552,439,15045,12760,4579,2450,95,66,-27,23,1,-36,5,-3699,2456,ALGL147
C -1860,5334,-3960,-290,-2155,175,-124,-130,-19,25,-3,1617,-272,ALGL148
D 189,-2788,2436,-1659,0,-210,-131,-15,-5,-13,157,1420,-1310,ALGL149
E -911,608,-542,-22,-37,45,33,7,-6,4,-171,1146,625,-323,-75,3,ALGL150
F -1125,145,34,2,46,-8,-14,-666,-265,-14,31,208,-243,-185,1,125,ALGL151
G 15,6,1,-12,121,-160,22,-176,5,139,-16,-117,94,5,-8,2,-12,-17,ALGL152
H 163,13,-27,-32,40,137,-4,-14,-4,22,-24,-1,27,19,0,35,-45,22,-31,ALGL153
I 35,-1,-52,14,1,10,-2,26,-26,-9,21,-1,18,-14,-28,-17,-14,6,-6,73,ALGL154
J 4,4,-3,-10,26,-32,13,-5,-29,7,19,12/
DATA GTT7 / 10,251,-244,-19,-7,12,-7,0,3,4*0,-46,112,-1,-90,-6,7,6,ALGL156
K -3,6,4*0,-104,-166,40,-23,36,12,1,2,4,4*0,72,21,-52,-54,-11,0,ALGL157
L 17,6,1,4*0,22,-5,14,-24,-25,-15,0,3,-1,4*0,1,25,-1,5,1,11,-3,2,ALGL158
M 2,4*0,-5,11,2,-3,7,2,-5,1,9,4*0,-17,-3,7,1,-2,-3,-2,-1,-2,440,ALGL159
N 2,-6,-3,-4,1,-2,-2,-1,6,56*0/
DATA GTT7 /1,168*0/
DATA GTT7 /1,168*0/
DATA SINTT1:1:1: / 0.0 /; TPOD / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: / 0.0 /; A: / 0.0 /; B: / 0.0 /; C: / 0.0 /; D: / 0.0 /; E: / 0.0 /; F: / 0.0 /; G: / 0.0 /; H: / 0.0 /; I: / 0.0 /; J: / 0.0 /; K: / 0.0 /; L: / 0.0 /; M: / 0.0 /; N: / 0.0 /; O: / 0.0 /; P: / 0.0 /; Q: / 0.0 /; R: / 0.0 /; S: / 0.0 /; T: / 0.0 /; U: / 0.0 /; V: / 0.0 /; W: / 0.0 /; X: / 0.0 /; Y: / 0.0 /; Z: /

C. ***** INITIALIZE * ONCE ONLY, FIRST TIME SUBROUTINE IS CALLED

SHMITN,1<-1.

DO 2 N=2,N3

SHMITN,1<# 22*N-3<* SHMITN-1,1</N-1<

DO 2

DO 2 N=2,N

SHMITN,1<# SHMITN,N-1<* SORT:FLDATT%N-M&1<*JJS/YN&M-2<<

SHMITN-1,1<#SHMITN,N<

2. JJ=1.

DO 7 K=1,7

F1=LG&1,1,<<

F2=LG&1,1,<<

F3=LG&1,1,<<

NMAX=NMAX<<

L=0

DO 3 I=1,3

ISUM&K,1<0

DO 4 N=1,NMAX

DO 4 N=1,NMAX

L=L&1

ISUM&K,1<#ISUM&K,1<#L&1*LG&N,M,<<

ISUM&K,2<#ISUM&K,2<#L&1*LG&N,M,<<

ISUM&K,3<#ISUM&K,3<#L&1*LG&N,M,<<

DO 6 I=1,3

IF ISUM&K,1<0,ISUM&K,1<< GO TO 6

C. ***** ERROR IN DATA CARDS - NOTE WRITE AND STOP STATEMENTS

WRITE&6,5<K,1,ISUM&K,1<,ISUM&K,1<

5 FORMAT(//29H DATA ERROR IN ALLM&L--MODEL ,12,5X,2H1,11,3X,

ATHERECALCULATED SUM,110,5X,17HTHIS MACHINE GETS,110<

STOP

6 CONTINUE

DO 7 N=1,NMAX

DO 7 N=1,NMAX

GG&N,M,<<#LG&N,M,<<#SHMITN,N</F1

GG&N,M,<<#LG&N,M,<<#SHMITN,N</F2

GG&N,M,<<#LG&N,M,<<#SHMITN,N</F3

8 IF&MODEL,EO,MOD&LD<<AND,AT,EO,THOLD<< GO TO 12

C. ***** NOTE WRITE STATEMENT - NEW MODEL OR NEW TIME

IF&MODEL,LT,1,OR,&MODEL,GT,7< STOP

IF&MODEL,EO,1< WRITE&6,21< TM

IF&MODEL,EO,2< WRITE&6,22< TM

IF&MODEL,EO,3< WRITE&6,23< TM

IF&MODEL,EO,4< WRITE&6,24< TM

IF&MODEL,EO,5< WRITE&6,25< TM

IF&MODEL,EO,6< WRITE&6,26< TM

IF&MODEL,EO,7< WRITE&6,27< TM

21 FORMAT(1H0,20X,41HMODEL 1 HENDRICKS&ALIN GSFC 9/65 FOR TM &F9,37/<ALGL212

22 FORMAT(1H0,20X,41HMODEL 2 &C&H ET AL GSFC 12/66< FOR TM &F9,37/<ALGL213

23 FORMAT(1H0,20X,41HMODEL 3 &C&H&ELANGEL 3/60 10/68< FOR TM &F9,37/<ALGL214

24 FORMAT(1H0,20X,41HMODEL 4 &C&H&S&RENEY P&O 6/69< FOR TM &F9,37/<ALGL215

25 FORMAT(1H0,20X,41HMODEL 5 &T&G&F 1965,0< FOR TM &F9,37/<ALGL216

26 FORMAT(1H0,20X,41HMODEL 6 &L&A&O&N &A&L&N &V&A&N&S 1965< FOR TM &F9,37/<ALGL217

27 FORMAT(1H0,20X,41HMODEL 7 &H&U&R&M&I&Z &U&S&C&A&G&S 1970< FOR TM &F9,37/<ALGL218

MOD&LD=&MODEL

THOLD=AT

AT=AT&NMAX

T=TM-TO&MODEL<

DO 10 N=1,NMAX

DO 10 N=1,NMAX

10 &N,<<#GG&N,M,<<#MODEL<#GG&N,M,<<#MODEL<#GG&N,M,<<#MODEL<#N<

C. ***** CALCULATION USUALLY BEGINS HERE

11 &21

&22

&23

ALGL166

ALGL167

ALGL168

ALGL169

ALGL170

ALGL171

ALGL172

ALGL173

ALGL174

ALGL175

ALGL176

ALGL177

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ALGL220

ALGL221

ALGL222

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ALGL228

ALGL229

ALGL230

ALGL231

AR#A371.2/RKM
CP2=SPH
CP2=CPH
DP21=P22
DP22=P21
ADR#AR#AR#AR
C2#G2.2<*CP2G2.1,2<*SP2
BR#BR#AOR#AOR#G2.1<*P21G2*P22<
BT#AOR#G2.1<*DP21G2*DP22<
BP#AOR#G2.1,2<*CP2-G2.2<*SP2<*P22
IF RMAY,LE. 2< GO TO 1

SP3#SP2&SP2<*CP2
CP3#CP2&SP2<*CP2-SP2<
P31=P21*P21-0.333333333
P32=P21*P22
P33=P22*P22
DP31=P32-P32
DP32=P21*P21-P33
DP33=P31

AOR#AOR#AR
C2#G3.2<*CP2G3.1,3<*SP2
C3#G3.3<*CP3G3.2,3<*SP3
BR#BR-3.0*AOR#G3.1<*P31G3*P32G3*P33<
BT#BT#AOR#G3.1<*DP31G3*DP32G3*DP33<
BP#BP-AOR#G3.2<*SP2-G3.1,3<*CP2<*P32G3.0*G3.3<*SP3-G3.2,3<*CP3<
IF RMAY,LE. 3< GO TO 1

SP4#SP2*CP3GCP2*SP3
CP4#CP2*CP3-SP2*SP3
P41=P21*P31-0.266666666*P21
DP41=P21*DP31*DP21*P21-0.266666666*DP21
P42=P21*P32-0.200000000*P22
DP42=P21*DP32*DP21*P32-0.200000000*DP22
P43=P21*P33
DP43=P21*DP33*DP21*P33
P44=P22*P33
DP44=P22*DP33*DP21*P33

ADR#AOR#AR
C2#G4.2<*CP2G4.1,4<*SP2
C3#G4.3<*CP3G4.2,4<*SP3
C4#G4.4<*CP4G4.3,4<*SP4
BR#BR-4.0*AOR#G4.1<*P41G4*P42G4*P43G4*P44<
BT#BT#AOR#G4.1<*DP41G4*DP42G4*DP43G4*DP44<
BP#BP-AOR#G4.2<*SP2-G4.1,4<*CP2<*P42G4.0*G4.3<*SP3-G4.2,4<*CP3<
IF RMAY,LE. 4< GO TO 1

SP5#SP2&SP3<*CP3
CP5#CP4&SP3<*CP3-SP3<
P51=P21*P41-0.257142857*P31
DP51=P21*DP41*DP21*P41-0.257142857*DP31
P52=P21*P42-0.228571428*P32
DP52=P21*DP42*DP21*P42-0.228571428*DP32
P53=P21*P43-0.192857142*P33
DP53=P21*DP43*DP21*P43-0.192857142*DP33
P54=P21*P44
DP54=P21*DP44*DP21*P44
P55=P22*P44
DP55=P22*DP44*DP21*P44

ADR#AOR#AR
C2#G5.2<*CP2G5.1,5<*SP2
C3#G5.3<*CP3G5.2,5<*SP3
C4#G5.4<*CP4G5.3,5<*SP4
C5#G5.5<*CP5G5.4,5<*SP5
BR#BR-5.0*AOR#G5.1<*P51G5*P52G5*P53G5*P54G5*P55<
BT#BT#AOR#G5.1<*DP51G5*DP52G5*DP53G5*DP54G5*DP55<
BP#BP-AOR#G5.2<*SP2-G5.1,5<*CP2<*P52G5.0*G5.3<*SP3-G5.2,5<*CP3<
IF RMAY,LE. 5< GO TO 1

ALMGL229
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C5*G25.5<*CP38G2.5<*SP3
C6*G25.5<*CP48G2.5<*SP4
C5*G25.5<*CP58G2.5<*SP5
BR*BR-5.0*AUR*2G25.1<*P518C2*P528C3*P538C4*P548C5*P558
BT*BT*AD*2G25.1<*DP518C2*DP528C3*DP538C4*DP548C5*DP558
EP*EP-AD*2G25.2<*SP2-G21.5<*CP2<*P528.0*2G25.5<*SP3-G22.5<*CP3<*P538
1*P538.0*2G25.4<*SP4-G23.5<*CP4<*P548.0*2G25.5<*SP5-G24.5<*CP5<*P558
258<
IF 2NMAX.LE. 5< GU TO 1

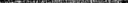
N/ 6

SP6*SP2*CP58CP2*SP5
CP6*CP2*CP5-SP2*SP5
P61*P21*P51-0.25396825*P41
DP61*P21*DP51DP21*P51-0.25396825*DP41
P62*P21*P52-0.23409523*P42
DP62*P21*DP52DP21*P52-0.23409523*DP42
P63*P21*P53-0.19047619*P43
DP63*P21*DP53DP21*P53-0.19047619*DP43
P64*P21*P54-0.11111111*P44
DP64*P21*DP54DP21*P54-0.11111111*DP44
P65*P21*P55
DP65*P21*DP55DP21*P55
P66*P22*P55
DP66*P22*DP55
AUR*AD*AR
C2*P26.2<*CP28G2.1.6<*SP2
C2*P26.2<*CP38G2.2.6<*SP3
C6*G25.5<*CP58G2.3.6<*SP4
C5*G25.5<*CP58G2.4.6<*SP5
C6*G25.5<*CP58G2.5.6<*SP6
BR*BR-6.0*AUR*2G25.1<*P618C2*P628C3*P638C4*P648C5*P658C6*P668
BT*BT*AD*2G25.1<*DP618C2*DP628C3*DP638C4*DP648C5*DP658C6*DP668
EP*EP-AD*2G25.2<*SP2-G21.6<*CP2<*P628.0*2G25.5<*SP3-G22.6<*CP3<*P638
1*P638.0*2G25.4<*SP4-G23.6<*CP4<*P648.0*2G25.5<*SP5-G24.6<*CP5<*P658
2658.0*2G25.6<*SP6-G25.6<*CP6<*P668
IF 3NMAX.LE. 6< GU TO 1

N/ 7

SP7*SP4*SP4<*CP4
CP7*CP4*CP4<*CP4*CP4
P71*P21*P61-0.25252525*P41
DP71*P21*DP61DP21*P61-0.25252525*DP41
P72*P21*P62-0.24242424*P52
DP72*P21*DP62DP21*P62-0.24242424*DP52
P73*P21*P63-0.21212121*P53
DP73*P21*DP63DP21*P63-0.21212121*DP53
P74*P21*P64-0.16161616*P54
DP74*P21*DP64DP21*P64-0.16161616*DP54
P75*P21*P65-0.14141414*P55
DP75*P21*DP65DP21*P65-0.14141414*DP55
P76*P21*P66
DP76*P21*DP66DP21*P66
P77*P22*P66
DP77*P22*DP66
AUR*AD*AR
C2*P27.2<*CP28G2.1.7<*SP2
C2*P27.2<*CP38G2.2.7<*SP3
C6*G25.5<*CP58G2.3.7<*SP4
C5*G25.5<*CP58G2.4.7<*SP5
C6*G25.5<*CP58G2.5.7<*SP6
BR*BR-7.0*AUR*2G25.1<*P718C2*P728C3*P738C4*P748C5*P758C6*P768
BT*BT*AD*2G25.1<*DP718C2*DP728C3*DP738C4*DP748C5*DP758C6*DP768
EP*EP-AD*2G25.2<*SP2-G21.7<*CP2<*P728.0*2G25.5<*SP3-G22.7<*CP3<*P738
1*P738.0*2G25.4<*SP4-G23.7<*CP4<*P748.0*2G25.5<*SP5-G24.7<*CP5<*P758
2758.0*2G25.6<*SP6-G25.7<*CP6<*P768
IF 4NMAX.LE. 7< GU TO 1

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DP123#P21#DP11#DP21#P11#-0.12781954*DP10#
 P125#P21#P11#-0.09022556*DP10#
 DP129#P21#DP11#DP21#P11#-0.09022556*DP10#
 P1210#P21#P11#-0.04761904*DP10#
 DP1210#P21#DP11#DP21#P11#-0.04761904*DP10#
 P1211#P21#P11#
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 P1212#P22#P11#
 DP1212#P11#DP121#
 ACR#AOR#AP
 C2#G#12,2<*CP2#G#1,12<*SP2
 C3#G#12,3<*CP3#G#2,12<*SP3
 C4#G#12,4<*CP4#G#3,12<*SP4
 C5#G#12,5<*CP5#G#4,12<*SP5
 C6#G#12,6<*CP6#G#5,12<*SP6
 C7#G#12,7<*CP7#G#6,12<*SP7
 C8#G#12,8<*CP8#G#7,12<*SP8
 C9#G#12,9<*CP9#G#8,12<*SP9
 C10#G#12,10<*CP10#G#9,12<*SP10
 C11#G#12,11<*CP11#G#10,12<*SP11
 C12#G#12,12<*CP12#G#11,12<*SP12
 PR#BK-12,0#AOR#G#12,1<*P121#C2#P122#C3#P123#C4#P124#C5#P125#C6#P126#C7#P127#C8#P128#C9#P129#C10#P1210#C11#P1211#C12#P1212#
 PR#BK#AOR#G#12,1<*P121#C2#P122#C3#P123#C4#P124#C5#P125#C6#P126#C7#P127#C8#P128#C9#P129#C10#P1210#C11#P1211#C12#P1212#
 BP#BP-AOR#G#12,2<*SP2-G#1,12<*CP2<*P122#2,0#G#12,3<*SP3-G#2,12<*CP3<*P123#3,0#G#12,4<*SP4-G#3,12<*CP4<*P124#4,0#G#12,5<*SP5-G#4,12<*CP5<*P125#5,0#G#12,6<*SP6-G#5,12<*CP6<*P126#6,0#G#12,7<*SP7-G#6,12<*CP7<*P127#7,0#G#12,8<*SP8-G#7,12<*CP8<*P128#8,0#G#12,9<*SP9-G#8,12<*CP9<*P129#9,0#G#12,10<*SP10-G#9,12<*CP10<*P1210#10,0#G#12,11<*SP11-G#10,12<*CP11<*P1211#11,0#G#12,12<*SP12-G#11,12<*CP12<*P1212#
 IF=X#MAX,1B,12<GO TO 1
 SP13#SP7#SP7<*CP7
 CP13#CP7#SP7<*CP7-SP7<
 P131#P21#P121-0.25051759*P11#
 DP131#P21#DP121#DP21#P121-0.25051759*DP11#
 P132#P21#P122-0.24844720*P11#
 DP132#P21#DP122#DP21#P122-0.24844720*DP11#
 P133#P21#P123-0.24223602*P11#
 DP133#P21#DP123#DP21#P123-0.24223602*DP11#
 P134#P21#P124-0.23188405*P11#
 DP134#P21#DP124#DP21#P124-0.23188405*DP11#
 P135#P21#P125-0.21739130*P11#
 DP135#P21#DP125#DP21#P125-0.21739130*DP11#
 P136#P21#P126-0.19875776*P11#
 DP136#P21#DP126#DP21#P126-0.19875776*DP11#
 P137#P21#P127-0.17598393*P11#
 DP137#P21#DP127#DP21#P127-0.17598393*DP11#
 P138#P21#P128-0.15321010*P11#
 DP138#P21#DP128#DP21#P128-0.15321010*DP11#
 P139#P21#P129-0.11401242*P11#
 DP139#P21#DP129#DP21#P129-0.11401242*DP11#
 P140#P21#P1210-0.08741573*P11#
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 P142#P21#P1212-0.00000000*P11#
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