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M"	IMP-8	SECTOR DISPLAY PROGRAM
N'	IMP-8	PFLUX, RFLUX
O'	IMP-7 & 8	DOSE ANALIMP

JOB CONTROL CARDS NEEDED TO RUN THE IMP-I
DATA PROCESSING SYSTEM

1. SOLAR ELECTRON - EXPERIMENT #10

```
//  JOB  (JOBCARD)
// EXEC LINK6Q,REGION.GO=250K
//LINK.SYSLIB DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
 INCLUDE SYSLIB(EX10)
 ENTRY MAIN
//GO.FT01F001 DD UNIT=(2400-9,,DEFER),DISP=(NEW,KEEP),
// DCB=(RECFM=FB,LRECL=3056,DEN=3,EROPT=SKP,BLKSIZE=9168),
// VOL=SER=SEDUM,LABEL=(1,SL,,OUT),DSN=IMPI
//GO.FT02F001 DD UNIT=(2400-9,,DEFER),DISP=(OLD,KEEP),
// DCB=(RECFM=FB,LRECL=3056,DEN=3,EROPT=SKP,BLKSIZE=9168),
// VOL=SER=SEDUM2,LABEL=(1,SL,,IN),DSN=IMPI
//GO.FT03F001 DD UNIT=(2400-9,,DEFER),DISP=(NEW,KEEP),
// DCB=(RECFM=FB,LRECL=3056,DEN=3,EROPT=SKP,BLKSIZE=9168),
// VOL=SER=SEDUM1,LABEL=(1,SL,,OUT),DSN=IMPI
//GO.FT10F001 DD UNIT=2314,SPACE=(3056,250),DCB=BLKSIZE=3056
//GO.INTAPE1 DD UNIT=(2400-7,,DEFER),DISP=(OLD,KEEP),
// LABEL=(1,BLP,,IN),DSN=EXP.TAPE1,VOL=SER=SDECOM
//GO.INTAPE2 DD UNIT=(2400-7,,DEFER),DISP=(OLD,KEEP),
// LABEL=(1,BLP,,IN),DSN=EXP.TAPE2,VOL=SER=DECOM
//GO.FT08F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=3429)
//GO.FT09F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=3429)
//GO.FT25F001 DD DSN=K3.SBJPH.DEX10CAT,UNIT=2314,
//  DCB=(RECFM=F,LRECL=3060,BLKSIZE=3060),VOL=SER=K3USR2,
//  DISP=(OLD,KEEP)
//GO.SYSUDUMP DD SYSOUT=A
//GO.DATA5 DD *

      **  PARAMETER CARDS  **

/*
```

Cosmic ray

II. COSMIC RAY - EXPERIMENT #11

```
//  JOB  (JOBCARD)
// EXEC LINKGO,REGION.GO=250K
//LINK.SYSLIB DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
 INCLUDE SYSLIB(EX11)
 ENTRY MAIN
//GO.FT01F001 DD UNIT=(2400-9,,DEFER),DISP=(NEW,KEEP),
// DCB=(RECFM=FB,LRECL=4120,DEN=3,EROPT=SKP,BLKSIZE=12360),
// VOL=SER=DUMMY,LABEL=(1,SL,,OUT),DSN=IMPI
//GO.FT02F001 DD UNIT=(2400-9,,DEFER),DISP=(OLD,KEEP),
// DCB=(RECFM=FB,LRECL=4120,DEN=3,EROPT=SKP,BLKSIZE=12360),
// VOL=SER=DUMMY2,LABEL=(1,SL,,IN),DSN=IMPI
//GO.FT03F001 DD UNIT=(2400-9,,DEFER),DISP=(NEW,KEEP),
// DCB=(RECFM=FB,LRECL=4120,DEN=3,EROPT=SKP,BLKSIZE=12360),
// VOL=SER=DUMMY1,LABEL=(1,SL,,OUT),DSN=IMPI
//GO.FT10F001 DD UNIT=2314,SPACE=(4120,250),DCB=BLKSIZE=4120
//GO.INTAPE1 DD UNIT=(2400-7,,DEFER),DISP=(OLD,KEEP),
// LABEL=(1,BLP,,IN),DSN=EXP.TAPE1,VOL=SER=DECOM1
//GO.INTAPE2 DD UNIT=(2400-7,,DEFER),DISP=(OLD,KEEP),
// LABEL=(1,BLP,,IN),DSN=EXP.TAPE2,VOL=SER=DECOM2
//GO.FT08F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=3429)
//GO.FT09F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=3429)
//GO.FT25F001 DD DSN=K3.SBJPH.DEX11CAT,UNIT=2314,
//  DCB=(RECFM=F,LRECL=3060,BLKSIZE=3060),VOL=SER=K3USR2,
//  DISP=(OLD,KEEP)
//GO.SYSUDUMP DD SYSOUT=A
//GO.DATA5 DD *

    **  PARAMETER CARDS  **

/*
```

Section 2

USER'S GUIDE FOR THE COSMIC RAY DATA BASE GENERATOR

The Data Base Generator creates Counts and PHA tapes for the Cosmic Ray experiment on board the IMP-I spacecraft. Encyclopedia tapes, Counts tapes, PHA tapes, a parameter card, and a Tape Catalog are input to the program. Counts tapes, PHA tapes and an updated Tape Catalog are the output. When full each Counts tape and PHA tape will contain five pre-specified orbits of data. Orbits 1 to 5 are on tape number 1, 6 to 10 on tape 2, etc.

The program is set-up so that the JCL never needs to be changed. Cards may be added or removed, but the information on the cards always remains the same.

The format for the input parameter card is as follows:

Name	Columns	Format	Description
IORBIT	1-5	I5	Orbit number of data to be processed (if zero, start and stop times must be specified)
IPHASW	10	I1	PHA tape switch 0 - do not process 1 - process
ICNTSW	11	I1	Counts tape switch 0 - do not process 1 - process
IYR1	21-24	I4	Start year - use only if IORBIT=0
IDAY1	26-28	I3	Start day of year
IHR1	30-31	I2	Start hour
IMIN1	33-34	I2	Start minute
IYR2	41-44	I4	Stop year
IDAY2	46-48	I3	Stop day of year
IHR2	50-51	I2	Stop hour
IMIN2	53-54	I2	Stop minute

Description of Parameter Card

Data may be processed either by whole orbit or by selected time period. Normal processing is by orbit, however, if a quick run of a special time period is desired, start and stop times may be specified. If start and stop times are specified, the time must be entirely contained on one Encyclopedia Tape.

If processing is done by orbit, only IORBIT, IPHASW, and ICNTSW must be specified on the card. If processing is done by time period, IORBIT must be zero and all other parameters must be specified.

JOB CONTROL CARDS NEEDED TO RUN THE DATA BASE GENERATOR

```
//    JOB  (JOBCARD)
//   EXEC  LINKGO,REGION.GO=200K
//LINK.SYSLIB  DD  DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
  INCLUDE SYSLIB(IMPIMN)
//GO.FT20F001  DD  UNIT=(2400-9,,DEFER),DISP=(OLD,KEEP),
//    DCB=(RECFM=FB,DEN=3,EROPT=ACC,LRECL=4120,BLKSIZE=12360),
//    VOL=SER=ENCYIN,DSN=IMPI
//GO.FT21F001  DD  UNIT=(2400-9,,DEFER),DISP=(MOD,KEEP),
//    DCB=(RECFM=FB,DEN=3,EROPT=ACC,LRECL=1444,BLKSIZE=4332),
//    VOL=SER=PHAINN,DSN=IMPI
//GO.FT22F001  DD  UNIT=(2400-9,,DEFER),DISP=(MOD,KEEP),
//    DCB=(RECFM=FB,DEN=3,EROPT=ACC,LRECL=1492,BLKSIZE=4476),
//    VOL=SER=CNTINN,DSN=IMPI
//GO.FT25F001  DD  DSN=K3.SBJPH.DEX11CAT,UNIT=2314,
//    DCB=(RECFM=F,LRECL=3060,BLKSIZE=3060),VOL=SER=K3USR2,
//    DISP=(OLD,KEEP)  DISP=SHR
//GO.FT31F001  DD  UNIT=(2400-9,,DEFER),DISP=(NEW,KEEP),
//    DCB=(RECFM=FB,DEN=3,EROPT=ACC,LRECL=1444,BLKSIZE=4332),
//    VOL=SER=PHAOUT,DSN=IMPI
//GO.FT32F001  DD  UNIT=(2400-9,,DEFER),DISP=(NEW,KEEP),
//    DCB=(RECFM=FB,DEN=3,EROPT=ACC,LRECL=1492,BLKSIZE=4476),
//    VOL=SER=CNTOUT,DSN=IMPI
//GO.SYSUDUMP DD  SYSOUT=A
//GO.DATA5  DD  *

        ** PARAMETER CARD **

/*
```

The JCL deck listed on the previous page will run the Data Base Generator for any type of job. However, to make more efficient use of the computer, it is advisable to remove cards for tapes which will not be used during a particular job. By doing so, unnecessary tape drives are not allocated.

The cards which may be removed are the FT21, FT22, FT31, and FT32 cards. FT21 and FT31 may be removed any time no PHA tape is being produced. FT22 and FT32 may be removed any time no Counts tape is being produced.

FT21 and FT22 describe the input Counts and PHA tapes and may be removed any time there are no input Counts or PHA tapes. That is, whenever an orbit is being processed and no tapes exist for the other four orbits that will be on the same tape with it; for example, processing orbit 6, when 7 through 10 have not been processed.

FT31 and FT32 describe the new output Counts and PHA tapes and may be removed any time the new data can be written on the end of the input tape and still keep the orbits in sequential order. For example, orbit 8 can be written on the end of tapes containing orbits 6 and 7 and still maintain sequential order. In this case, the cards can be removed. However, if the input tape contained 6, 7, and 9, orbit 8 could not be added and still maintain order; therefore, the cards must be present.

Section 3

USER'S GUIDE FOR THE COSMIC RAY PHA SUMMARIZER

The PHA Summarizer creates PHA summary tapes and Low Gain data tapes for the Cosmic ray experiment on board the IMP-I spacecraft. PHA tapes, Summary tapes, Low Gain tapes, a Tape Catalog, and a parameter card are input to the program. Summary tapes, Low Gain tapes, and an updated Tape Catalog are the output. When full, each Summary tape and Low Gain tape will contain sixty prespecfied orbits of data. Orbits 1 to 60 are on tape number 1, 61 to 120 are on tape 2, etc.

The program is set-up so that the JCL deck never needs to be changed, only the parameter card will change.

The format for the input parameter card for the PHA Summarizer is as follows:

Name	Columns	Format	Description
IORBIT	1-5	I5	Orbit number. If zero, time period will be processed.
IMATSW	10	I1	Summary tape switch 0 - do not process 1 - process
ILOWSW	11	I1	Low Gain tape switch 0 - do not process 1 - process
IYEAR1	21-24	I4	Start year for time period
IDAY1	26-28	I3	Start day
IHR1	30-31	I2	Start hour
IMIN1	33-34	I2	Start minute
IYEAR2	41-44	I4	Stop year
IDAY2	46-48	I3	Stop day
IHR2	50-51	I2	Stop hour
IMIN2	53-54	I2	Stop minute
ITPSW	61	I1	Perigee switch for time periods 0 - process perigee data 1 - omit perigee data

Description of Parameter Card

Data may be processed either by whole orbit or by selected time period. Normal processing is done by orbit, however, if a quick run of a special time is desired, start and stop times may be specified.

When processing is done by orbit, only IORBIT, IMATSW, and ILOWSW must be specified. The data is written out onto the appropriate tape and entered into the catalog. That is, orbits 1 to 60 will be on one tape, 61 to 120 on another, etc. The data readout during perigee is automatically eliminated.

When processing is done by time period, IORBIT must be set to zero and all other parameters must be specified. The data is written out on a unique tape and entered into the catalog. No other data will be written on the tape. Therefore, it is advisable to remove the tape from the catalog as soon as it is no longer needed.

JOB CONTROL CARDS NEEDED TO RUN THE IMPI PHA SUMMARIZER

```
//    JOB    (JOBCARD)
//   EXEC  LINKGO,REGION.GO=350K
//LINK.SYSLIB  DD  DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
 INCLUDE SYSLIB(SUMMN)
 ENTRY MAIN
//GO.FT20F001  DD  UNIT=(2400-9,,DEFER),DISP=(OLD,KEEP),
//    DCB=(RECFM=FB,DEN=3,EROPT=ACC,LRECL=1444,BLKSIZE=4332),
//    VOL=SER=PHA,DSN=IMPI
//GO.FT21F001  DD  UNIT=(2400-9,,DEFER),DISP=(OLD,KEEP),
//    DCB=(RECFM=FB,DEN=3,EROPT=ACC,LRECL=[redacted],BLKSIZE=[redacted]),
//    VOL=SER=LOWIN,DSN=IMPI
//GO.FT22F001  DD  UNIT=AFF=FT21F001,DISP=(OLD,KEEP),
//    DCB=(RECFM=F,DEN=3,EROPT=ACC,BLKSIZE=7280),
//    VOL=SER=MATIN,DSN=IMPI
//GO.FT31F001  DD  UNIT=(2400-9,,DEFER),DISP=(NEW,KEEP),
//    DCB=(RECFM=FB,DEN=3,EROPT=ACC,LRECL=[redacted],BLKSIZE=[redacted]),
//    VOL=SER=LOWOUT,DSN=IMPI
//GO.FT32F001  DD  UNIT=AFF=FT31F001,DISP=(NEW,KEEP),
//    DCB=(RECFM=F,DEN=3,EROPT=ACC,BLKSIZE=7280),
//    VOL=SER=MATOUT,DSN=IMPI
//GO.FT25F001  DD  DSN=K3.SBJPH.DEX11CAT,[redacted]
//    DCB=(RECFM=F,LRECL=3060,BLKSIZE=3060),VOL=SER=K3USR3,
//    DISP=(OLD,KEEP)
//GO.FT26F001  DD UNIT=2314,SPACE=(7280,(20,10)),DCB=BLKSIZE=7280
//GO.FT27F001  DD UNIT=2314,SPACE=(7280,(20,10)),DCB=BLKSIZE=7280
//GO.FT28F001  DD UNIT=2314,SPACE=(7280,(150,10)),DCB=BLKSIZE=7280
//GO.FT29F001  DD UNIT=2314,SPACE=(7280,(150,10)),DCB=BLKSIZE=7280
//GO.SYSUDUMP DD  SYSOUT=A
//GO.DATA5  DD  *

      ** PARAMETER CARD **

/*
```

DISP=SHR

236

3540

236

3540

Section 4

USER'S GUIDE FOR THE IMP-6 and IMP-7 COSMIC RAY EXPERIMENT HIGH GAIN PLOT PROGRAM

USER'S GUIDE FOR THE IMP-6 COSMIC RAY HIGH GAIN PLOT PROGRAM

The High Gain Plot Program produces up to 20 matrices from IMP-6 Summary Tapes specified either explicitly by volume-serial number of implicitly by 4-day interval number (in which case the tapes are found through the catalog). The program has the capability to merge data from up to 100 intervals (not necessarily consecutive), to optionally provide histograms.

Processing is controlled by Event Identification cards and by Time Indicator cards. Each Event Identification card (maximum of 20) specified the detectors, event type, compression factor, histogram parameters, and E-band (DvsF only) for one matrix. Each Time Indicator card specifies either start and stop interval numbers or the volume-serial number and file number of a tape to be processed; and, optionally, specifies gain shift factors to be applied to that data. All matrices specified by Event Identification cards are produced for all time periods specified by Time Indicator cards.

As mentioned above, a maximum of 100 intervals may be processed in any run. A file of an explicitly specified tape counts as one interval toward that limit.

1) The gain shift techniquesparameter on the Event Identification Card provides for one of 3 different methods of performing gain shifting of the data. If ITECH = 0 (or is left blank), one pair of random numbers is used to gain shift the entire contents of a matrix cell, in the following fashion:

$$X' = (X + RANDOM) * GF$$

This method, although very quick, is not recommended, especially with small numbers of intervals (channeling of the shifted data will occur).

The formats of the Event Identification and Time Indicator cards follow:

2) If ITECH = 1, a separate pair of random numbers are used to gain shift each event on the matrix. This technique requires the most computer time, especially with large numbers of events.

If ITECH = 2, dispersion techniques are employed. This method is also used with the ANALIMP Programs, except that here event count is always conserved. This technique is generally recommended for all cases.

ITECH values for all even cards should be the same. Only one technique is used per run.

```
//*HIGHGAIN PLOTIMP6
//CHECK EXEC SRCHDS,DSN='SEIMP.HGPLT6.LOAD'
//RESTORE EXEC PGM=LIBMAN,PARM='REST,Z',REGION=200K,
//     COND=(0,EQ,CHECK.SEARCH)
//STEPLIB  DD  DSN=SBHAP.LIBMAN.LOAD,DISP=SHR
//*****************************************************************
//LIBVOLS  DD  DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
//  UNIT=(,,DEFER)
//LODIN    DD  DUMMY
//LODPRINT DD  SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2 DD  DSN=SEIMP.HGPLT6.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(7,1,1))
//LODWORK1 DD  UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//SYSUDUMP DD  SYSOUT=A
//SNAP     DD  SYSOUT=A
//HGPLT6  EXEC PGM=HGPLT6,REGION=350K
//STEPLIB DD DSN=SEIMP.HGPLT6.LOAD,DISP=SHR
//FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT20F001  DD       UNIT=(800,,DEFER),VOL=SER=MATR,DSN=NSD,DISP=SHR
//FT25F001  DD       DSN=SEIMP.DEX11CAT.DATA,DISP=SHR
//FT36F001  DD       DSN=SEIMP.IMP6GAIN.DATA,DISP=SHR
//POOLSTOR  DD       UNIT=SYSDA,DISP=(NEW,DELETE),SPACE=(TRK,(20,40)),
//    DCB=(RECFM=F,BLKSIZE=7284)
//FT05F001      DD       *
DVSE     2 4   00  00                          0
DVSF     3 4   25  60                          0
AVSB     0 4   00  00                          0
//FT08F001  DD       *
1 099 1040.0   0.0   0.00 0.00 0.00                1
0 105 1056.0   0.0   0.0  0.00 0.00                1
```

IMP-6 High Gain Plot Program JCL

TABLE 4-1

EVENT IDENTIFICATION CARD

Name	Column	Format	Description
ITYPE	1-4	A4	Plot type (AVSB, DVSE, DVSF
IEV	6-9	I4	Event type (omitted for A vs B plots) 1 - D·E·F·G 2 - D·E·F·G 3 - D·E·F·G 4 - (D+E)2·E·F·G
ICMP	11	I1	Compression factor 1 - first 128 channels on each axis of matrix with no compression 2 - first 256 channels on each axis compresse to a 128x128 matrix 4 - first 512 channels on each axis compresse to a 128x128 matrix
IEB			bands of E for DVSF plots
HEB (1)	13-15	I3	lower bound of E
HEB (2)	17-19	I3	uppper bound of E
IHIST (1)			range of histogram along the abscissa of the matrix (do not provide any values if this optio is not desired)
HIST (1)	21-23	I3	lower bound along abscissa
HIST (2)	25-27	I3	upper bound along abscissa
IHIST (2)			range of histogram along the ordinate of the matrix (do not p vide any values if this option is not desired)
HIST (3)	29-31	I3	lower bound along ordinate
HIST (4)	33-35	I3	upper bound along ordinate
ITECH	39	I1	Gain Shift Technique

TABLE 4-2

TIME INDICATOR CARD

Name	Column	Format	Description
HSW	1	I1	matrix print indicator: Ø, print each accumulated matrix 1, do not print accumulated matrices-more data accumulaton will follow
IORBS	3-5	I3	start orbit number
IORBE	7-9	I3	end orbit number
GFACT (1)	10-14	F5.3	gain shift factor for A element of LED
GFACT (2)	15-19	F5.3	gain shift factor for B element of LED
GFACT (3)	20-24	F5.3	gain shift factor for D element of MED
GFACT (4)	25-29	F5.3	gain shift factor for E element of MED
GFACT (5)	30-34	F5.3	gain shift factor for F element of MED
DTAPE	36-41	A6	input tape volume serial number (optional, if omitted tape will be chosen from tape catalog)
IFILE	43-44	I2	starting file number (only required if DTAPE ≠ blank)
GTABLE	46	I 1	GAIN FACTOR TABLE SWITCH (See next page)

* Gain tables may be accessed if desired for D, E and F events. A and B events must specify gain factors on the time card if gain factor correction is desired.

For D, E, F events:

GTABLE = 0	Gain factors must be on the time cards if gain correction is desired
GTABLE = 1	The gain tables will be accessed for gain correction factors
GTABLE = 2	(applicable to IMP-7 only) The Imp-6 normalization factors will be applied to the gain table values in gain correcting the data.

10/28

SECTION 5

USER'S GUIDE FOR THE COSMIC RAY LOW GAIN PLOT PROGRAM

for IMP-6 and IMP-7

[redacted]

[redacted]

(replaces previous [redacted])

A. Functional Description

The Low Gain Plot Program analyzes low gain data transmitted from the IMP-6 spacecraft. The program has the capabilities of providing matrix plots by orbit, by specific time periods or by intervals of time with designated lengths for different event types. Histograms can be produced if needed. Corresponding statistics are printed for each matrix and/or histogram printed.

In addition, the program has the option to merge data for as many orbits (or time intervals) desired. These orbits or time intervals need not be consecutive. The statistics printed will reflect the accumulated values.

Gain shifting of data on any time period is possible.

B. Program Constraints

The limitations to this program are as follows:

1) 1 A vs B and up to 3 D vs E (different event type) or up to 20 D vs F
2) Histogram plots are allowed only for the following combinations:
   a) D vs E; DE Gain = Low (10); F Gain = All Gains
   b) D vs F; DE Gain = Low (10); F Gain = Low (10)
   c) D vs F; DE Gain = Low (10); F Gain = High

C. Description of Input

Two control cards are required to execute the program. The Event identification card (see table 5-1) and the Time Indicator card (see table 5-2). The Event Identification card specifies the type of matrix to be processed and the corresponding histogram limits (optional). The time indicator card contains the time period(s) to be processed and any desired gain shifting of the data.

D. JCL

A listing of the Job Control Language (JCL) required to run the IMP-6 and IMP-17 Low Gain plot programs is presented in figures 1 and 2, respectively

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Table 5-1

EVENT IDENTIFICATION CARD

Name	Column	Type	Description
ITYPE	I-4	A4	Plot Type: AVSB, DVSE, DVSF
IEU	6	I1	Event Type: blank for AVSB 1 for $DEF\bar{G}$ 2 for $DE\bar{F}G$ 3 for $(D+E)2\cdot E\bar{F}\bar{G}$ (Note: 3 is for DVSE only)
ICMP	8	I1	Compression Factor: 1- first 128 channels on each axis of matrix with no compression 2- first 256 channels on each axis compressed to a 128x128 matrix 4- first 512 channels on each axis is compressed to a 128x128 matrix
IDEGAN	1Ø	I1	DE Gain Ø = High; 1 = Low(10); 2 = Low(50)
IFGAIN	12	I1	F Gain Ø = High; 1 = Low(10); 2 = Low(50); 3 = All Gains (Note: 2 is not used for DVSF)
HEB(1)	14-16	I3	Lower bound of E for DVSF (1-512)
HEB(2)	18-2Ø	I3	Upper bound of E for DVSF (1-512)
HIST(1)	22-24	I3	Abscissa lower bound for histogram (if Ø no histogram printed)
HIST(2)	26-28	I3	Abscissa upper bound for histogram
HIST(3)	3Ø-32	I3	Ordinate lower bound for histogram
HIST(4)	34-36	I3	Ordinate upper bound for histogram
HHSW	38	I1	Ø = matrices + histograms will be printed 1 = only histograms printed
HPUN	40	I1	≠0 Punched output of the 128 X 128 matrix

Table 5-2

TIME IDENTIFICATION CARD

Name	Column	Type	Description
MORE	1	I1	Ø = print each accumulated matrix 1 = do not print accumulated matrix (more data accumulation will follow)
IORB1	3-5	I3	If special tape was specified in DTAPE, IORB1 is the file to be plotted. Otherwise, it is the start orbit to be plotted. If zero, processing will be done by time period.
IORB2	7-9	I3	End orbit for plot.
IYR1	11-14	I4	Start YR for time period processing
IDAY1	16-18	I3	Start day
IHR1	2Ø-21	I2	Start hour
IMIN1	23-24	I2	Start minute
IYR2	26-29	I4	End YR. If ZERO, ILEN + INO are used to compute intervals.
IDAY2	31-33	I3	End day
IHR2	35-36	I2	End hour
IMIN2	38-39	I2	End minute
ILEN	41-43	I3	Length (in hours) of time periods to be plotted (ignored if end time was specified)
INO	45-46	I2	Number of time periods to be plotted (ignored if end time was specified)
GFACT(1)	48-52	F5.3	Gain shift factor for A element of LED
GFACT(2)	53-57	F5.3	Gain shift factor for B element of LED
GFACT(3)	58-62	F5.3	Gain shift factor for D element of MED
GFACT(4)	63-67	F5.3	Gain shift factor for E element of MED

Table 5-2 (con't.)

TIME IDENTIFICATION CARD

Name	Column	Type	Description
GFACT(5)	68-72	F5.3	Gain shift factor for F element of MED
DTAPE	74-79	A6	Input tape volume serial number (optional, if omitted tape will be chosen from tape catalog)
GTABLE	80	I1	Gain factor table switch *

* Gain tables may be accessed if desired for D, E and F events. A and B events must specify gain factors on the time card if gain factor correction is desired.

For D, E, F events:

GTABLE = 0 — gain factors must be on the time cards if gain correction is desired

GTABLE = 1 — the gain tables will be accessed for gain correction factors

GTABLE = 2 — (applicable to IMP-7 only) The IMP-6 normalization factors will be applied to the gain table values in gain correcting the data.

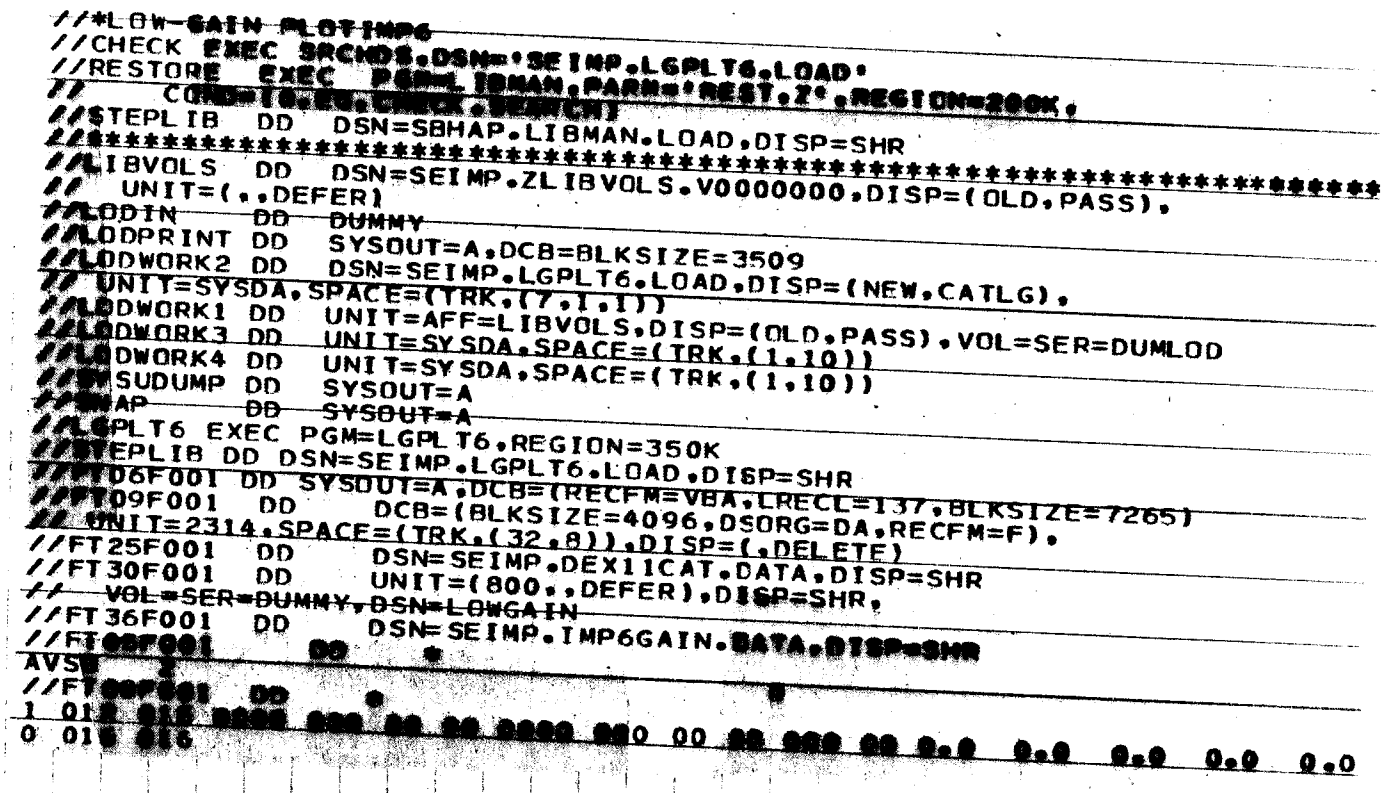
//*LOW-GAIN PLOTIMP6
//CHECK EXEC SRCHDS,DSN='SEIMP.LGPLT6.LOAD'
//RESTORE EXEC PGM=IBMAN,PARM='REST,Z',REGION=200K,
//STEPLIB DD DSN=SBHAP.LIBMAN.LOAD,DISP=SHR
//LIBVOLS DD DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
// UNIT=(,,DEFER)
//LODIN DD DUMMY
//LODPRINT DD SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2 DD DSN=SEIMP.LGPLT6.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(7,1,1))
//LODWORK1 DD UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3 DD UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4 DD UNIT=SYSDA,SPACE=(TRK,(1,10))
//SUDUMP DD SYSOUT=A
//SYSMAP DD SYSOUT=A
//LGPLT6 EXEC PGM=LGPLT6,REGION=350K
//STEPLIB DD DSN=SEIMP.LGPLT6.LOAD,DISP=SHR
//FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT09F001 DD DCB=(BLKSIZE=4096,DSORG=DA,RECFM=F),
// UNIT=2314,SPACE=(TRK,(32,8)),DISP=(,DELETE)
//FT25F001 DD DSN=SEIMP.DEX11CAT.DATA,DISP=SHR
//FT30F001 DD UNIT=(800,,DEFER),DISP=SHR,
// VOL=SER=DUMMY,DSN=LOWGAIN
//FT36F001 DD DSN=SEIMP.IMP6GAIN.DATA,DISP=SHR
//FT05F001 DD *
AVS
//FT06F001 DD *
1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0 0.0 0.0

Figure 1

```
//*LOW-GAIN PLOTIMP-7
//CHECK EXEC SRCHDS,DSN='SEIMP.LGPLT7.LOAD'
//RESTORE  EXEC  PGM=LIBMAN,PARM='REST,2',REGION=200K,
//     COND=(0,EQ,CHECK.SEARCH)
//STEPLIB  DD  DSN=SBRAP.LIBMAN.LOAD,DISP=SHR
//*****************************************************************
//LIBVOLS  DD  DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
//  UNIT=(,,DEFER)
//LODIN    DD  DUMMY
//LODPRINT DD  SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2 DD  DSN=SEIMP.LGPLT7.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(6,1,1))
//LODWORK1 DD  UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//SYSUDUMP DD  SYSOUT=A
//SNAP     DD  SYSOUT=A
//LGPLT7 EXEC PGM=LGPLT7,REGION=350K
//STEPLIB DD DSN=SEIMP.LGPLT7.LOAD,DISP=SHR
//FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT09F001  DD     DCB=(BLKSIZE=4096,DSORG=DA,RECFM=F),
//  UNIT=SYSDA,SPACE=(TRK,(32,8)),DISP=(,DELETE)
//FT25F001  DD     DSN=SEIMP.DEX32CAT.DATA,DISP=SHR
//FT30F001  DD     UNIT=(2400-9,,DEFER),DISP=SHR,
//  VOL=SER=DUMMY,DSN=LOWGAIN
//FT37F001  DD     DSN=SEIMP.INPTGAIN.DATA,DISP=SHR
//FT05F001      DD     *
AVSB    2
//FT08F001  DD     *
1 000 000 1976 130 00 00 1976 132 00 00
```

1
1

A. Functional Description

The Low Gain Plot Program analyzes low gain data transmitted from the IMP-6 spacecraft. The program has the capabilities of providing matrix plots by orbit, by specific time periods or by intervals of time with designated lengths for different event types. Histograms can be produced if needed. Corresponding statistics are printed for each matrix and/or histogram printed.

In addition, the program has the option to merge data for as many orbits (or time intervals) desired. These orbits or time intervals need not be consecutive. The statistics printed will reflect the accumulated values.

Gain shifting of data on any time period is possible.

B. Program Constraints

The limitations to this program are as follows:

1) 1 A vs B and up to 3 D vs E (different event type) or up to 20 D vs F
2) Histogram plots are allowed only for the following combinations:
   a) D vs E; DE Gain = Low (10); F Gain = All Gains
   b) D vs F; DE Gain = Low (10); F Gain = Low (10)
   c) D vs F; DE Gain = Low (10); F Gain = High

C. Description of Input

Two control cards are required to execute the program. The Event identification card (see table 5-1) and the Time Indicator card (see table 5-2). The Event Identification card specifies the type of matrix to be processed and the corresponding histogram limits (optional). The time idicator card contains the time period(s) to be processed and any desired gain shifting of the data.

M E M O R A N D U M

April 13, 1984

To: P. McGuire
P. Lal
T. Von Rosenvinge
P. Eng

From: P. Mortman

Copies: S. Reddy
P. Schuster
P. Mortman
P. Smith
J. McGovern
P. Shen

Subject: Time indicator input card changes for LGPLT7 program

---

Format and position changes on Time Indicator Card

To allow processing of INTERVALs greater than 999 and to eliminate the use of column 73-80 format changes were required.

The following are corrected formats and positions for the input variables listed, which are located on the time indicator card. The second input card is optional and is to be used only for gain factors. A character is required in column 72 of the first card when specifying gain factors.

First card:

NAME	COLUMNS	FORMAT
HSK	1	I1
INTS2	3-6	I4
INTE	8-11	I4
IYF1	13-16	I4

IDAY1	18-20	I3
IHR1	22-23	I2
IMN1	25-26	I2
IYR2	28-31	I4
IDAY2	33-35	I3
IHR2	37-38	I2
IMN2	40-41	I2
IDEN	43-45	I3
INC	47-48	I2
DTAPE	50-55	A6
GTABLE	56	I1
TEST	72	A1

Second card:

NAME	COLUMNS	FORMAT
GFACT(5)	1-25	5F5.0

These changes are effective as of APRIL 12, 1984.

Table 5-1

EVENT IDENTIFICATION CARD

Name	Column	Type	Description
ITYPE	I-4	A4	Plot Type: AVSB, DVSE, DVSF
IEU	6	I1	Event Type: blank for AVSB 1 for $DE\underline{FG}$ 2 for $DE\underline{FG}$ 3 for $(D+E)2\cdot E\overline{F}\,\overline{G}$ (Note: 3 is for DVSE only)
ICMP	8	I1	Compression Factor: 1- first 128 channels on each axis of matrix with no compression 2- first 256 channels on each axis compressed to a 128x128 matrix 4- first 512 channels on each axis is compressed to a 128x128 matrix
IDEGAN	1Ø	I1	DE Gain Ø = High; 1 = Low(10); 2 = Low(50)
IFGAIN	12	I1	F Gain Ø = High; 1 = Low(10); 2 = Low(50); 3 = All Gains (Note: 2 is not used for DVSF)
HEB(1)	14-16	I3	Lower bound of E for DVSF (1-512)
HEB(1)	18-2Ø	I3	Upper bound of E for DVSF (1-512)
HIST(1)	22-24	I3	Abscissa lower bound for histogram (if Ø no histogram printed)
HIST(2)	26-28	I3	Abscissa upper bound for histogram
HIST(3)	3Ø-32	I3	Ordinate lower bound for histogram
HIST(4)	34-36	I3	Ordinate upper bound for histogram
HHSW	38	I1	Ø = matrices + histograms will be printed 1 = only histograms printed

Table 5-D

TIME IDENTIFICATION CARD

Name	Column	Type	Description
MORE	1	I1	Ø = print each accumulated matrix 1 = do not print accumulated matrix (more data accumulation will follow)
IORB 1	3-5	I3	If special tape was specified in DTAPE, IORB1 is the file to be plotted. Otherwise, it is the start orbit to be plotted. If zero, processing will be done by time period.
IORB2	7-9	I3	End orbit for plot.
IYR1	11-14	I4	Start YR for time period processing
IDAY1	16-18	I3	Start day
IHR1	2Ø-21	I2	Start hour
IMIN1	23-24	I2	Start minute
IYR2	26-29	I4	End YR. If ZERO, ILEN + INO are used to compute intervals.
IDAY2	31-33	I3	End day
IHR2	35-36	I2	End hour
IMIN2	38-39	I2	End minute
ILEN	41-43	I3	Length (in hours) of time periods to be plotted (ignored if end time was specified)
INO	45-46	I2	Number of time periods to be plotted (ignored if end time was specified)
GFACT(1)	48-52	F5.3	Gain shift factor for A element of LED
GFACT(2)	53-57	F5.3	Gain shift factor for B element of LED
GFACT(3)	58-62	F5.3	Gain shift factor for D element of MED
GFACT(4)	63-67	F5.3	Gain shift factor for E element of MED

Table 5-D (con't.)

TIME IDENTIFICATION CARD

Name	Column	Type	Description
GFACT(5)	68-72	F5.3	Gain shift factor for F element of MED
DTAPE	74-79	A6	Input tape volume serial number (optional, if omitted tape will be chosen from tape catalog)

Section 5

USER'S GUIDE FOR THE COSMIC RAY LOW GAIN PLOT PROGRAM

The Low Gain Plot Program creates printer plots of the low gain data collected by the Cosmic Ray experiment on board the IMP-I satellite. Low Gain Data tapes, a Tape Catalog, and parameter cards are input to the program. A maximum of seven plots per time period can be produced, one A vs B and 6 D vs E.

There are two types of parameter cards needed as input to the program. One Low Gain Plot card followed by as many Time cards as desired. The formats for the parameter cards are as follows:

Low Gain Plot Card

Name	Column	Format	Description
IAB	1	I1	Compression factor for A vs B plot 0 - do not plot 1 - 1st 128x128 channels with no compression 2 - 1st 256x256 channels compressed to 128x128 4 - 1st 512x512 channels compressed to 128x128
IDE(1)	3	I1	Compression factor for $D \cdot E \cdot F \cdot G$ LOW(10) GAIN
IDE(2)	5	I1	Compression factor for $D \cdot E \cdot F \cdot \bar{G}$ LOW(10) GAIN
IDE(3)	7	I1	Compression factor for (D&E) $2 \cdot E \cdot \bar{F} \cdot \bar{G}$ LOW(10) GAIN
IDE(4)	9	I1	Compression factor for $D \cdot E \cdot F \cdot G$ LOW(50) GAIN
IDE(5)	11	I1	Compression factor for $D \cdot E \cdot F \cdot \bar{G}$ LOW(50) GAIN
IDE(6)	13	I1	Compression factor for (D&E) $2 \cdot E \cdot \bar{F} \cdot \bar{G}$ LOW(50) GAIN

Time Card

Name	Column	Format	Description
DTAPE	1-8	A8	Blank - tape is to be selected from Tape Catalog 'DISK ϕ ϕ ϕ ϕ - input is disk data set 6 EBCDIC characters - volume serial of special tape to be used
IORB1	9-11	I3	If special tape was specified in DTAPE, IORB1 is the file to be plotted. Otherwise, it is the start orbit to be plotted. If zero, processing will be done by time period.
IORB2	13-15	I3	End orbit for plot
IYR1	17-20	I4	Start year for time period processing
IDAY1	22-24	I3	Start day
IHR1	26-27	I2	Start hour
IMIN1	29-30	I2	Start minute
IYR2	32-35	I4	End year - if zero, ILEN and INO are used to compute intervals.
IDAY2	37-39	I3	End day
IHR2	41-42	I2	End hour
IMIN2	44-45	I2	End minute
ILEN	47-49	I3	Length (in hours) of time periods to be plotted (ignored if end time was specified)
INO	51-52	I2	Number of time periods to be plotted (ignored if end time was specified)

Description of Parameter Cards

Low Gain Plot Card:

Compression factors specified on this card are in effect through the entire job. Values other than 0, 1, 2, or 4 are invalid and will result in no plot being done for that event.

Time Card:

One Time card must be present for each time period or group of identical time intervals to be plotted.

Input can be from disk, special tape, or tapes in the Catalog. If input is from disk or special tape, the job will terminate after plotting one file. If processing is done using the Tape Catalog, plots will be produced until there are no more time cards to be read.

Processing can be done by orbit, by time period, or by groups of time intervals. If tapes from the Catalog are used the start orbit must be contained on the tape, otherwise, the Time card will be skipped. The start time must be greater than or equal to the start time on the tape, or the Time card will be skipped.

JOB CONTROL CARDS NEEDED TO RUN THE
LOW GAIN PLOT PROGRAM

```
//    JOB  (JOBCARD)
// EXEC LINKGO,REGION.GO=300K
//LINK.SYSLIB DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
 INCLUDE SYSLIB(LGPLOT)
 ENTRY MAIN
//GO.FT25F001 DD DSN=K3.SBJPH.DEX11CAT,UNIT=2314,
//    DCB=(RECFM=F,LRECL=3060,BLKSIZE=3060),VOL=SER=K3USR2,
//     DISP=(OLD,KEEP)
//GO.FT30F001 DD UNIT=(2400-9,,DEFER),DISP=(OLD,KEEP),
//    DCB=(RECFM=FB,DEN=3,BLKSIZE=5028,LRECL=1676,EROPT=ACC),
//    DSN=IMPI,VOL=SER=DUMMY
//GO.SYSUDUMP DD SYSOUT=A
//GO.DATA5 DD *

        ** PARAMETER CARDS **

/*
```

The JCL setup on the previous page is used to run the Low Gain Plot Program whenever tape input is used. If the input is on disk, the following DD card must be substituted for FT31:

```
//GO.FT31F001 DD UNIT = 2314, DISP = (OLD, DELETE),
//           DSN = &LOWGAIN, DCB = (RECFM=F, BLKSIZE = 1676)
```

where &LOWGAIN is the data set name used when the data set was created. This JCL will delete the data set at the end of the job. DISP = (OLD, KEEP) may be substituted if the data set is to be kept. If the data set was not passed from a previous job step or is not cataloged, a volume serial parameter is also needed.

OLD

Section 6

USER'S GUIDE FOR UTILITY PROGRAMS

1. BLANKCAT

This program changes the status of specified tapes in the Catalog to blank. Input consists of a Tape Catalog and parameter cards. Output is an updated Tape Catalog.

This program will not enter new tapes in the Catalog; the tapes referenced on the parameter cards must already be present in the Catalog. A maximum of 100 tapes can be blanked in one run. The format for the parameter cards is as follows:

Name	Column	Format	Description
TAPENO	1-6	A6	Tape number as it appears in Catalog (i.e., no leading or trailing blanks) E00700
TYPE	8-11	A4	TYPE ('ENCY', 'PHAS', 'CNTS', 'MATR', 'LOWG', 'MERG', etc)
IDATE	13-17	I5	Date created - YYJJJ
IRESEQ	19-28	I10	Reel sequence number

If the parameters on the card do not match those on the Tape Catalog, the tape will not be blanked.

200 I3
A3 — char.

JOB CONTROL CARDS NEEDED TO RUN THE BLANKCAT PROGRAM

```
//*BLANKCAT THISDATE
//CHECK EXEC SRCHDS,DSN='SEIMP.UTILITY.LOAD'
//RESTORE EXEC PGM=LIBMAN,PARM='REST;Z',REGION=200K,
//     COND=(0,EQ,CHECK.SEARCH)
//STEPLIB  DD  DSN=SBHAP.LIBMAN.LOAD,DISP=SHR
//*************************************************************
//LIBVOLS  DD  DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
//   UNIT=(,,DEFER)
//LODIN    DD  DUMMY
//LODPRINT DD  SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2 DD  DSN=SEIMP.UTILITY.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(35,3,9)),VOL=SER=USER05
//LODWORK1 DD  UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//SYSUDUMP DD  SYSOUT=A
//SNAP     DD  SYSOUT=A
//BLANKCAT EXEC PGM=BLANKCAT,REGION=100K
//STEPLIB DD DSN=SEIMP.UTILITY.LOAD,DISP=SHR
//FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT25F001 DD DSN=SEIMP.DEX32CAT.DATA,DISP=(OLD,KEEP)
//FT05F001 DD *
```

2. READCAT

This program reads the Tape Catalog and prints a listing of its contents on the on-line printer. No parameter cards are necessary to run this program. The JCL deck needed is listed on the following page.

JOB CONTROL CARDS NEEDED TO RUN THE READCAT PROGRAM

```
//*DEXIICAT THISDATE
//CHECK EXEC SRCHDS,DSN='SEIMP.UTILITY.LOAD'
//RESTORE  EXEC  PGM=LIBMAN,PARM='REST,Z',REGION=200K,
//     COND=(0,EQ,CHECK.SEARCH)
//STEPLIB  DD  DSN=SUMAP.LIBMAN.LOAD,DISP=SHR
//*****************************************************
//LIBVOLS  DD  DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
//  UNIT=(,,DEFER)
//LODIN    DD  DUMMY
//LODPRINT DD  SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2 DD  DSN=SEIMP.UTILITY.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(35,5,9)),VOL=SER=USER05
//LODWORK1 DD  UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//SYSUDUMP DD  SYSOUT=A
//SNAP     DD  SYSOUT=A
//READCAT1 EXEC PGM=READCAT1,REGION=100K
//STEPLIB DD DSN=SEIMP.UTILITY.LOAD,DISP=SHR
//FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT25F001 DD DSN=SEIMP.DEXIICAT.DATA,DISP=SHR
```

3. DUMPCAT

This program creates a backup tape copy of the Catalog to be used in the event that the disk copy of the Catalog is destroyed. No parameter cards are needed to run this program. The JCL deck needed is listed on the following page.

JOB CONTROL CARDS NEEDED TO RUN THE DUMPCAT PROGRAM

```
//  JOB  (JOBCARD)
//*DUMPCAT DEX11CAT
//CHECK EXEC SRCHDS,DSN='SEIMP.UTILITY.LOAD'
//RESTORE  EXEC  PGM=LIBMAN,PARM='REST,Z',REGION=200K,
//    COND=(0,EQ,CHECK.SEARCH)
//STEPLIB  DD  DSN=SBHAP.LIBMAN.LOAD,DISP=SHR
//*****************************************************************
//LIBVOLS  DD  DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
//  UNIT=(,,DEFER)
//LODIN    DD  DUMMY
//LODPRINT DD  SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2 DD  DSN=SEIMP.UTILITY.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(35,5,9)),VOL=SER=USER05
//LODWORK1 DD  UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//SYSUDUMP DD  SYSOUT=A
//SNAP     DD  SYSOUT=A
//DUMPCAT EXEC PGM=DUMPCAT,REGION=100K
//STEPLIB DD DSN=SEIMP.UTILITY.LOAD,DISP=SHR
//FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT30F001 DD UNIT=6250,DISP=(NEW,KEEP),LABEL=(1,SL,,OUT),


// DCB=(RECFM=F,LRECL=3060,BLKSIZE=3060,DEN=3,EROPT=ABE),
// DSN=BACKUP,VOL=SER=Z693
//*DSN=BACKUP,VOL=SER=ACW006
//FT25F001 DD DSN=SEIMP.DEX11CAT.DATA,DISP=SHR
```

4. RESTORE

This program restores the Tape Catalog from the backup on tape. It is used in the event that the original Catalog is destroyed. Input consists of the backup tape created by DUMPCAT and a parameter card specifying the date the backup was taken. The format of the parameter card is as follows:

Name	Column	Format	Description
IDATE	1-5	I5	Date backup copy of Catalog was created - YYJJJ

This date can be found on the output listing produced at the time DUMPCAT was run.

JOB CONTROL CARDS NEEDED TO RUN THE RESTORE PROGRAM

```
//  JOB  (JOBCARD)
//*RESTORE DEXIICAT
//CHECK EXEC SRCHDS,DSN='SEIMP.UTILITY.LOAD'
//RESTORE  EXEC  PGM=L IBMAN,PARM='REST,2',REGION=200K,
//     COND=(0,EQ,CHECK.SEARCH)
//STEPLIB  DD  DSN=SBHAP.LIBMAN.LOAD,DISP=SHR
//*************************************************************
//LIBVOLS  DD  DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
//  UNIT=(,,DEFER)
//LODIN    DD  DUMMY
//LODPRINT DD  SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2 DD  DSN=SEIMP.UTILITY.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(35,5,9)),VOL=SER=USER05
//LODWORK1 DD  UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//SYSUDUMP DD  SYSOUT=A
//SNAP     DD  SYSOUT=A
//RESTORE EXEC PGM=RESTORE,REGION=100K
//STEPLIB DD DSN=SEIMP.UTILITY.LOAD,DISP=SHR
//FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT30F001 DD DSN=BACKUP,UNIT=(6250,,DEFER),
//     DISP=(OLD,KEEP),VOL=SER=Z693,LABEL=(1,SL,,IN)
//FT25F001 DD UNIT=SYSDA,DISP=(,CATLG,DELETE),SPACE=(TRK,3),
//    DSN=SEIMP.DEXIICAT.DATA,VOL=SER=USER05,
//    DCB=(RECFM=F,LRECL=3060,BLKSIZE=3060)
//SYSUDUMP DD SYSOUT=A
//FT05F001 DD *
```

5. LISTALL

This program produces a listing of the contents of either the Cosmic Ray or Solar Electron decom tape. Input consists of parameter cards and one or more decom tapes. In any given run, this program will list either Cosmic Ray data or Solar Electron data but not both.

For Cosmic Ray data, there are two list types available, file headers only or entire data records. For Solar Electron, in addition to file headers and entire data records, three different rates lists are also available.

The format for the parameter cards is as follows:

Card 1 - One per Job

Name	Column	Format	Description
ILEN	1-5	I5	Length (in bytes) of input tape record 2124 for Solar Electron 4212 for Cosmic Ray
ITYPE	6-10	I5	List type 1 - Entire record 2 - Rates group 1 (RE-R1 to RE-R8 and digital scan) 3 - Rates groups 2 (RE-1 to RE-6, RE-8, RE-10, RE-12, RE-14, and RE-15) 4 - Rates group 3 (RE-17 to RE-22, RE-24, RE-26, RE-28, RE-30, and RE-31) (Types 2, 3, and 4 pertain only to Solar Electron)

Card 2 - One per Tape

Name	Column	Format	Description
DTAPE	1-6	A6	Input tape number
MREEL	7-10	I4	Reel type 0 - first reel of orbit 1 - not first reel of orbit
IFILE1	11-15	I5	Start file -1 - list file headers only (ITYPE in Card 1 is ignored if IFILE1 = -1) 0 - list entire tape >0 - start file number
IREC1	16-20	I5	Start record
IFILE2	21-25	I5	End file (if zero, remainder of tape is listed)
IREC2	26-30	I5	End record

JOB CONTROL CARDS NEEDED TO RUN THE LISTALL PROGRAM

I. SOLAR ELECTRON - EXPERIMENT #10

```
//  JOB  (JOBCARD)
// EXEC LINKGO
//LINK.SYSLIB DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
 INCLUDE SYSLIB(LISTALL,EX10LIST)
 ENTRY MAIN
//GO.FT03F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//GO.INTAPE1 DD UNIT=(2400-7,,DEFER),DISP=(OLD,KEEP),
// LABEL=(1,BLP),VOL=SER=DECOM1
//GO.INTAPE2 DD UNIT=(2400-7,,DEFER),DISP=(OLD,KEEP),
// LABEL=(1,BLP),VOL=SER=DECOM2
//GO.DATA5 DD *

   ** PARAMETER CARDS **

/*
```

II. COSMIC RAY - EXPERIMENT #11

```
//  JOB  (JOBCARD)
// EXEC LINKGO
//LINK.SYSLIB DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
 INCLUDE SYSLIB(LISTALL,EX11LIST)
 ENTRY MAIN
//GO.FT03F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//GO.INTAPE1 DD UNIT=(2400-7,,DEFER),DISP=(OLD,KEEP),
// LABEL=(1,BLP),VOL=SER=DECOM1
//GO.INTAPE2 DD UNIT=(2400-7,,DEFER),DISP=(OLD,KEEP),
// LABEL=(1,BLP),VOL=SER=DECOM2
//GO.DATA5 DD *

   ** PARAMETER CARDS **

/*
```

See also analimp8 user guide + updates

USER'S GUIDE FOR ANALIMP-6 AND ANALIMP-7

ANALIMP-6 and ANALIMP-7 create printer plots and histograms displaying data collected by the Cosmic Ray Experiment on-board the IMP-I and IMP-H satellites. Summary tapes, Merged Summary tapes, Low Gain tapes, PHA tapes, a Tape catalog, and parameter cards are input to the program. Plots, data summaries, and up to 10 histograms per plot are the output.

The formats for the parameter cards are as follows:

Card 1

Name	Columns	Format	Description
ISPEC	1	I1	Histogram option = 0, compute histograms = 1, no histograms
KGAIN	3	I1	Gain Indicator = 0, High Gain = 1, Low Gain
IEVENT	5	I1	Event to be analyzed = 1, $A.B.\overline{C}$ and $A.\overline{B}.\overline{C}$ = 2, $D.E.\overline{F}.\overline{G}$ (valid only when KGAIN=0) = 3, $(D+E)2.E.\overline{F}.\overline{G}$ LOW (10) (valid only when KGAIN=1) = 4, $(D+E)2.E.\overline{F}.\overline{G}$ LOW (50) (valid only when KGAIN=1)
ICMP	7	I1	Compression factor (1, 2, or 4)
STD(1)	11-20	F10.0	A standard endpoint for gain factor computation. If omitted, program default values are used (default=1.0)
STD(2)	21-30	F10.0	B standard endpoint for gain factor computation. If omitted, program default values are used (default=1.0)
STD(3)	31-40	F10.0	D standard endpoint for gain factor computation. If omitted, program default values are used (default=1.0)

Name	Columns	Format	Description
STD(4)	41-50	F10.0	E standard endpoint for gain factor computation. If omitted, program default values are used (default=1.0)

If ISPEC = 1, cards 2 through 14 are omitted. Time cards (card 15) follow immediately after card 1.

Card 2

Name	Columns	Format	Description
COM	1-16	A	User comment - written on page 1 of output listing
NZ	19-20	I2	Particle atomic number
XA	21-30	F10.0	Particle atomic mass (in proton units)
IDIST	32	I1	Distance selector = 0, Perpendicular distance = 1, Vertical distance
IPRINT	34	I1	Debug Printout option = 0, no printout = 1, Diagnostic printout requested
NCHOF	36-40	I5	Number of channels offset (Center of histograms offset from curve)
MXNCL	41-45	I5	Maximum number of iterations allowed to compute perpendicular distance of any given point to event line

Card 3

Name	Columns	Format	Description
NLX	1-5	I5	X channel for lower vertical scanning line
NUX	6-10	I5	X channel for upper vertical scanning line
NLY	16-20	I5	Y channel for left horizontal scanning line

Name	Columns	Format	Description
NUY	21-25	I5	Y channel for right horizontal scanning line
NIX1	31-35	I5	X coordinate of point (X1, 0)
NIY1	36-40	I5	Y coordinate of point (0, Y1) Points (X1, 0) and (0, Y1) are connected to form lower scanning line
NIX2	46-50	I5	X coordinate of point (X2, 0)
NIY2	51-55	I5	Y coordinate of point (0, Y2) Points (X2, 0) and (0, Y2) are connected to form upper scanning line

Card 4

Name	Columns	Format	Description
NB	1-2	I2	Number of histograms (also number of histogram energy limit cards to follow) maximum = 10
CHW	3-10	F8.0	Histogram bin width - in channels

Cards 5 through N (where N = 4 + NB of card 4, maximum N = 14)

Note: One card for each histogram (maximum of 10)

Name	Columns	Format	Description
ELOW	1-10	F10.0	Lower energy limit for histogram
EUP	11-20	F10.0	Upper energy limit for histogram

Card 15 through end (Time Card)

Name	Columns	Format	Description
IOPT	1	I1	Operation = 0, Read data specified on card = 1, Plot data in core (no other data should appear on card)

Name	Columns	Format	Description
IORB1	3-5	I3	Start interval number (if zero, time period will be used)
IORB2	7-9	I3	End interval number (if zero, only start will be read). Also used as increment (in hrs.) when start and stop times are given (if zero, no increment used)
IMSW	11	I1	High gain tape format (ignored if low gain) = 0, Summary tape = 1, Merged summary tape
IYR1	13-16	I4	Start year for time period (ignored if IORB1 is greater than zero)
IDAY1	18-20	I3	Start day of year
IHR1	22-23	I2	Start hour
IMIN1	25-26	I2	Start minute
IYR2	28-31	I4	Stop year
IDAY2	33-35	I3	Stop day of year
IHR2	37-38	I2	Stop hour
IMIN2	40-41	I2	Stop minute
TAPENO	43-48	A6	Tape number (used only if IORB1 = 0 and IYR1 = 0). The special tapes must have either a summary tape or a low gain tape data format
IFILE1	50-53	I4	Start file
IFILE2	55-58	I4	Stop file (if zero, only start file is read)

Name	Columns	Format	Description
END1	60-69	F10.0	Endpoint for gain factor computation (ignored if IMSW=1) for LED, A endpoint for MED, D endpoint
END2	70-79	F10.0	Endpoint for gain factor computation for LED, B endpoint for MED, E endpoint
GTABLE	80	I1	Gain factor table switch[1]

Description of Parameter Cards

All data specified on cards 1 through 14 is held constant for the entire run. Invalid combinations for gain and event on card 1 will cause the job to be terminated.

Cards 2 through 14 pertain to histograms. If no histograms are required (ISPEC=1), they must be omitted.

Figure 1 contains a diagram of the scanning box derived from the data on card 3. All values specified on card 3 should be greater than or equal to zero.

[1]GTABLE = 0: A, B events must use only this option. Gains are calculated from card input

(a) If STD values are zero, the program defaults to the internal A-B or D-E endpoints and uses them along with the END values to calculate gain factors.

(b) If END 1 and END 2 are zero, the program will bypass gain correction (effectively gains = 1)

(c) If the STD and END values do not give reasonable gain factors (STD(I)/END(I) ≤ 3) the gain factors are set to 1.0.

GTABLE = 1: D-E events only. Neither STD nor END values need be coded on the time card. The gain tables are accessed for each interval in the time span/or bit(s) requested.

GTABLE = 2: (Applicable only to IMP-7). D-E events only. Neither STD nor END values need be coded on the time card. The gain tables are accessed for gain factors, and the data will be normalized to IMP-6 data.

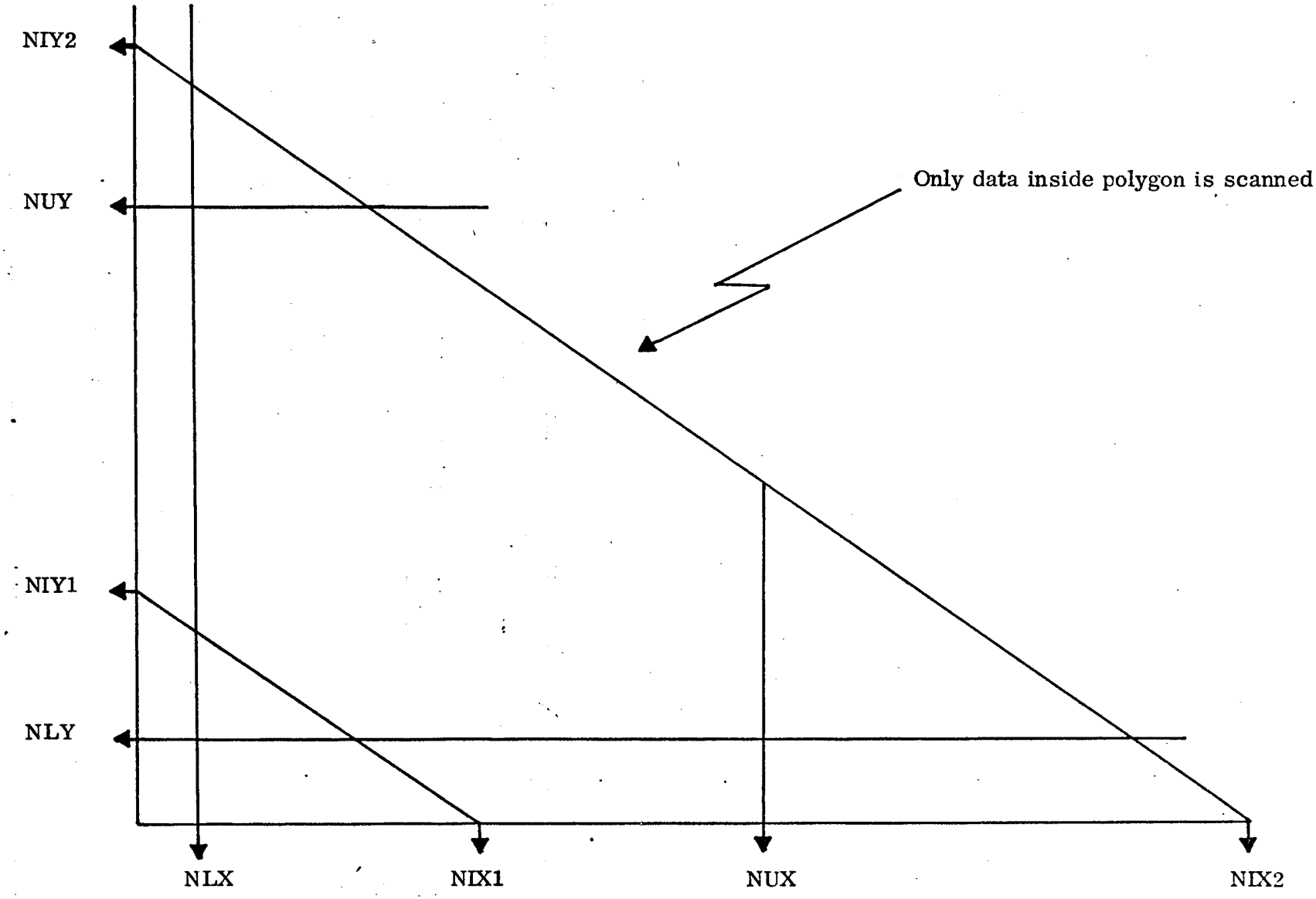

Figure 1 - Scanning Box Diagram (Card 3 Parameters)

On card 4, an NB of less than one or greater than ten will cause job termination. CHW must be greater than zero and, unless specifically requested otherwise, should be the same value as the compression factor (ICMP on card 1).

Card 15 (Time card) may be repeated as many times as are necessary to analyze all requested data. If partial orbits are requested, the time cards should be in ascending chronological order. When IOPT=1, all other data on that card is ignored. For all further discussion of this card, it is assumed that IOPT=0. When IMSW=1, END1 and END2 are ignored and the gain factors are set to 1.0 for the data on that card. When the data being analyzed is low gain, IMSW is ignored.

By specifying IORB1=0, IORB2 > 0 a time span can be broken up into time increments of IORB2 (hours). For each increment, data is accumulated and a plot (with histogram, if requested) is printed. Increment processing stops when the start time of an increment is larger than the stop time on the input data card. If IORB2 is zero, the entire time period is processed.

The parameter GTABLE specifies what kind, if any, of gain correction factors are to be used in data processing. The use of GTABLE is as follows:

- GTABLE = 0--This is the only option available for IEV .LE.2 (A, B events). The program expects to use the card input values END1 and END2, along with the STD values to calculate gain factors.

  The gain factors are used for the entire time span/orbit(s) on the time card.

  - If STD values are zero, the program defaults to the internal standard A-B or D-E endpoints and uses them along with the END values to calculate gain factors.
  - If END1 and END2 are zero, the program will bypass gain correction.

- If the STD and END values do not give reasonable gain factors (STD(I)/END(I) ≤ 3) the gain factors are set to 1.0.

- GTABLE = 1--Only D-E events may request this option. Neither STD nor END values need be coded on the time card. The gain tables are accessed for each interval in the time span/orbit(s) requested.

- GTABLE = 2 (Applicable only to IMP-7)--Only D-E events may request this option. Neither STD nor END values need be coded on the time card. The gain tables are accessed for gain factors, and the data will be normalized to IMP-6 data.

Job Control Language

A listing of the Job Control Language (JCL) required to run ANALIMP-6 and ANALIMP-7 is presented in Figures 2 and 3, respectively.

```
 /*ANALIMP6
//*DATA CARDS MUST BE PART OF A "NONUM" DA  SET; JCL CAN BE NUMBERED
//*CHECK EXEC SRCHDS,DSN='SEIMP.ANALIMP6.LOAD'
//RESTORE  EXEC  PGM=LIBMAN,PARM='REST,Z',REGION=200K,
//      COND=(0,EQ,CHECK.SEARCH)
//STEPLIB  DD  DSN=SBHAP.LIBMAN.LOAD,DISP=SHR
//**********************************************************************
//LIBVOLS  DD  DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
//   UNIT=(,,DEFER)
//LODIN    DD  DUMMY
//LODPRINT DD  SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2 DD  DSN=SEIMP.ANALIMP6.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(10,1,1))
//LODWORK1 DD  UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//SYSUDUMP DD  SYSOUT=A
//SNAP     DD  SYSOUT=A
//ANALIMP6 EXEC PGM=ANALIMP6,REGION=350K
//STEPLIB DD DSN=SEIMP.ANALIMP6.LOAD,DISP=SHR
//FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT15F001  DD     UNIT=(2400-9,,DEFER),DISP=SHR,
// VOL=SER=HIGHG,DSN=IMPI
//FT20F001  DD     UNIT=AFF=FT15F001,DISP=SHR,
// VOL=SER=LOWIN,DSN=IMPI
//FT22F001  DD     UNIT=(2400-9,,DEFER),DISP=SHR,
// VOL=SER=PHA,DSN=IMPI
//FT25F001  DD     DSN=SEIMP.DEKALCAI.DATA,DISP=SHR
//FT36F001  DD     DSN=SEIMP.IMPSAER.DATA,DISP=SHR
//FT[illegible]  DD  *
  0 0 1 2 0        25.0      160.0       20.0       84.0
           ALPHAS     2        4.0 1 0      0     0
      2  200          10  180          80    60        240   180
   6     2.0
          4.8         6.8
          6.8         8.8
          8.8        12.0
         12.0        15.0
         15.0        20.0
         20.0        23.5
  0 000  000 0 1973 345 10 00 1973 346 10 00          0000 0000 0          0          0
  1
  END OF DATA
```

Figure 2 - ANALIMP-6 JCL

```
//*ANALIMP7
//*DATA CARDS MUST BE "NONUM"; JCL CAN     NUMBERED
//CHECK EXEC SRCHDS,DSN='SEIMP.ANALIMP7.LOAD'
//RESTORE  EXEC  PGM=LIBMAN,PARM='REST,Z',REGION=200K,
//     COND=(0,EQ,CHECK.SEARCH)
//STEPLIB  DD  DSN=SBHAP.LIBMAN.LOAD,DISP=SHR
//*****************************************************
//LIBVOLS  DD  DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
//  UNIT=(,,DEFER)
//LODIN    DD  DUMMY
//LODPRINT DD  SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2 DD  DSN=SEIMP.ANALIMP7.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(10,1,1))
//LODWORK1 DD  UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4 DD  UNIT=SYSDA,SPACE=(TRK,(1,10))
//SYSUDUMP DD  SYSOUT=A
//SNAP     DD  SYSOUT=A
//ANALIMP7   EXEC PGM=ANALIMP7,REGION=270K
//STEPLIB DD DSN=SEIMP.ANALIMP7.LOAD,DISP=SHR
//FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT15F001 DD UNIT=(2400-9,,DEFER),DISP=SHR,
// VOL=SER=MATIN,DSN=IMPH
//FT20F001 DD UNIT=AFF=FT15F001,DISP=SHR,
// VOL=SER=LOWIN,DSN=IMPH
//FT22F001   DD  UNIT=(2400-9,,DEFER),DISP=SHR,

//    VOL=SER=PHA,DSN=IMPH
//FT[illegible] DD [illegible]DSN=SEIMP.ANALIMP7.DATA,DISP=SHR
//FT37F001   DD  DSN=SEIMP.IMPTRAIN.DATA,DISP=SHR
//FT05F001 DD *
0 0 2 4 0 1.0        1.0        1.0        1.0
STANDARD ORBITS     2        4.0 0 0      0    99
     0  500          40  520         280  280         700  700
 7      4.0
      19.05      24.25
      24.05      28.74
      28.74      35.20
      35.20      42.93
      42.93      51.03
      51.03      63.12
      63.12      85.00
0 110 120 0 0000 000 00 00 0000 000 00 00          0000 0000  1.0        1.0        1
1

END OF DATA
```

Figure 3 - ANALIMP-7 JCL

To: R. Mcguire
N. Lal
T. Von Rosenvinge
E. Eng

From: V. Parikh, P. Schuster

Date: January 29, 1988

cc: S. Reddy
A. Lukasiak
H. Lo
K. Wortman
N. Smith.
J. McGovern

Subject: Changes in Analimp7 and Anlimp7f Time & Parameter Card Formats

As previously done for IMP-8,the IMP-7 time card format has been changed so that it uses only 72 columns.The revised time card format is shown on next page.

Additionally, a problem was discovered by Bob, and an option which allows a work-around solution has been added to ANALIMP7 and ANLIMP7F.

For sparse matrices, gain factor application leads to fractional channel counts whose values are truncated to zero when the plot is made. To avoid this truncation,an option was added which multiplies the real PHA matrix first formed (and plotted truncated) by 10.0 and then replots the matrix. The user subsequently can add up the counts by hand (and divide by 10.0) to get the mass line statistics. This option is enabled by setting a true/false flag on the parameter card,column 52 to "t".(See the following page)

Time Card

Name	Columns	Format
IOPT	1	I1
IORB1	3-5	I3
IORB2	7-9	I3
IMSW	11	I1
IYR1	13-16	I4
IDAY1	18-20	I3
IHR1	22-23	I2
IMIN1	25-26	I2
IYR2	28-31	I4
IDAY2	33-35	I3
IHR2	37-38	I2
IMIN2	40-41	I2
TAPENO	43-48	A6
IFILE1	50-53	I4
IFILE2	55-58	I4
END1	60-64	F5.0
END2	66-70	F5.0
GTABLE	72	I1

Parameter Card

NAME	COLUMNS	FORMAT
ISPEC	1	I1
KGAIN	3	I1
IEVENT	5	I1
ICMP	6-7	I2
STD(1)	11-20	F10.0
STD(2)	21-30	F10.0
STD(3)	31-40	F10.0
STD(4)	41-50	F10.0
LPAM	52	L1

```
**** TSO FOREGROUND HARDCOPY ****
DSNAME=SB#IM.LIB.CNTL                                    (ANALIMP8)

//XRMYSANA JOB (SB016,BF3,20),NEWANA8,TIME=(0,30),MSGCLASS=X          00000010
//**************************************************                  00000020
//* JCL FILE FOR PSEUDO FTIO ANALIMP8 RUN *                           00000030
//**************************************************                  00000040
//ANALIMP8 EXEC PGM=PANALIM8,REGION=600K                              00000060
//STEPLIB DD DSN=SB#IM.ANALIMP8.LOAD,DISP=SHR                         00000070
//SYSUDUMP DD SYSOUT=*                                                00000080
//ABNLDUMP DD DUMMY                                                   00000090
//FT06F001 DD SYSOUT=*,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)         00000100
//FT10F001  DD    UNIT=(2400-9,,DEFER),DISP=SHR,                      00000110
// VOL=SER=MATIN1,DSN=IMPJ                                            00000120
//FT20F001   DD    UNIT=AFF=FT10F001,DISP=SHR,                        00000130
//  VOL=SER=LOWIN1,DSN=IMPJ                                           00000140
//FT22F001  DD    UNIT=(2400-9,,DEFER),DISP=SHR,                      00000150
// VOL=SER=PHAIN1,DSN=IMPJ                                            00000160
//FT25F001  DD    DSN=SB#IM.DEX52CAT.DATA,DISP=SHR                    00000170
//FT02F001  DD    DSN=SB#IM.CORRCAT8,DISP=SHR                         00000180
//FT38F001  DD    DSN=SB#IM.IMP8GAIN.DATA,DISP=SHR                    00000190
//*0  0121 0123                                                       00000200
//FT05F001     DD    *                                              00000210
0 0 1 1 000                                                          00000220
  ISOTOPES          1          1 1             8                     00000230
    4   60          4   60         14   12         80   70           00000240
 3      1                                                            00000250
  5.9        8.65                                                    00000260
8.65        13.6                                                    00000270
  13.6      21.9                                                    00000280
0  0000 00001978 293 00  0 1978 296 00 00                            00000290
1                                                                    00000300
/*                                                                   00000310
// EXEC NOTIFYTS                                                     00000320
```

```
**** TSO FOREGROUND HARDCOPY ****
DSNAME=SB#IM.LIB.CNTL                                    (ANALIMP7)

//XRMYSANA JOB (SB016,BF3,20),'PSEUDO ANA7 RUN',TIME=(0,30),MSGCLASS=X  00000010
//**************************************                               00000020
//* JCL FILE FOR PSEUDO FTIO ANALIMP7 RUN *                            00000030
//**************************************                               00000040
//*DATA CARDS AND JCL CAN BE NUMBERED                                  00000060
//ANALIMP7   EXEC PGM=PANALIM7,REGION=900K                             00000070
//STEPLIB DD DSN=SB#IM.ANALIMP7.LOAD,DISP=SHR                          00000080
//FT06F001 DD SYSOUT=*,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)          00000090
//FT15F001 DD UNIT=(2400-9,,DEFER),DISP=SHR,                           00000100
// VOL=SER=MATIN,DSN=IMPH                                              00000110
//FT20F001 DD UNIT=AFF=FT15F001,DISP=SHR,                              00000120
// VOL=SER=LOWIN,DSN=IMPH                                              00000130
//FT22F001  DD  UNIT=(2400-9,,DEFER),DISP=SHR,                         00000140
//  VOL=SER=PHA,DSN=IMPH                                               00000150
//FT25F001 DD DSN=SB#IM.DEX32CAT.DATA,DISP=SHR                         00000160
//FT02F001 DD DSN=SB#IM.CORRCAT7,DISP=SHR                              00000170
//FT37F001  DD  DSN=SB#IM.IMP7GAIN.DATA,DISP=SHR                       00000180
//FT05F001 DD *                                                        00000190
0 0 1 2                                          T                   00000195
  ISOTOPES         2         4 0           8                         00000200
    4  180         4  220        90   70       220  260               00000205
 3       1                                                           00000210
 5.95       8.76                                                     00000215
 8.76       13.71                                                    00000220
 13.71     22.04                                                     00000225
0           1977 018 08 00 1977 022 12 00                 0.0   0.0  000000230
1                                                                    00000235
// EXEC NOTIFYTS                                                     00000240
//*NEW  TIME CARD FORMAT 1/88; ALSO X10MATRIX OPT ON CARD 1           00000245
```

```
**** TSO FOREGROUND HARDCOPY ****
DSNAME=SB#IM.LIB.CNTL                                          (ANALIMP8)

//XRMYSANA JOB (SB016,BF3,20),NEWANA8,TIME=(0,30),MSGCLASS=X                00000010
//**************************************************                        00000020
//* JCL FILE FOR PSEUDO FTIO ANALIMP8 RUN *                                 00000030
//**************************************************                        00000040
//ANALIMP8 EXEC PGM=PANALIM8,REGION=600K                                    00000060
//STEPLIB DD DSN=SB#IM.ANALIMP8.LOAD,DISP=SHR                               00000070
//SYSUDUMP DD SYSOUT=*                                                      00000080
//ABNLDUMP DD DUMMY                                                         00000090
//FT06F001 DD SYSOUT=*,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)               00000100
//FT10F001  DD    UNIT=(2400-9,,DEFER),DISP=SHR,                            00000110
// VOL=SER=MATIN1,DSN=IMPJ                                                  00000120
//FT20F001   DD    UNIT=AFF=FT10F001,DISP=SHR,                              00000130
//  VOL=SER=LOWIN1,DSN=IMPJ                                                 00000140
//FT22F001  DD    UNIT=(2400-9,,DEFER),DISP=SHR,                            00000150
// VOL=SER=PHAIN1,DSN=IMPJ                                                  00000160
//FT25F001  DD    DSN=SB#IM.DEX52CAT.DATA,DISP=SHR                          00000170
//FT02F001  DD    DSN=SB#IM.CORRCAT8,DISP=SHR                               00000180
//FT38F001  DD    DSN=SB#IM.IMP8GAIN.DATA,DISP=SHR                          00000190
//*0  0121 0123                                                             00000200
//FT05F001    DD    *                                                       00000210
0 0 1 1 000                                                                 00000220
  ISOTOPES          1          1 1              8                          00000230
    4   60          4   60         14   12         80   70                  00000240
 3        1                                                                 00000250
  5.9         8.65                                                          00000260
8.65         13.6                                                           00000270
  13.6       21.9                                                          00000280
0  0000 00001978 293 00  0 1978 296 00 00                                   00000290
1                                                                           00000300
/*                                                                          00000310
// EXEC NOTIFYTS                                                            00000320
```

```
**** TSO FOREGROUND HARDCOPY ****
DSNAME=SB#IM.LIB.CNTL                                    (ANLIMP7F)

//XRPASANA JOB (SB016,350,20),'PSEUDO ANA7F RUN',TIME=(0,30),MSGCLASS=X 00000010
//********************************************************************* 00000020
//* JCL FILE FOR PSEUDO FTIO ANLIMP7F FINEGAIN VERSION*                 00000030
//********************************************************************* 00000040
//*DATA CARDS AND JCL CAN BE NUMBERED                                    00000050
//ANLIMP7F   EXEC PGM=PANLIM7F,REGION=900K                              00000060
//STEPLIB DD DSN=SB#IM.ANLIMP7F.LOAD,DISP=SHR                           00000070
//FT06F001 DD SYSOUT=*,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)           00000080
//FT15F001 DD UNIT=(2400-9,,DEFER),DISP=SHR,                            00000090
// VOL=SER=MATIN,DSN=IMPH                                               00000100
//FT20F001 DD UNIT=AFF=FT15F001,DISP=SHR,                               00000110
// VOL=SER=LOWIN,DSN=IMPH                                               00000120
//FT22F001  DD  UNIT=(2400-9,,DEFER),DISP=SHR,                          00000130
//  VOL=SER=PHA,DSN=IMPH                                                00000140
//FT25F001 DD DSN=SB#IM.DEX32CAT.DATA,DISP=SHR                          00000150
//FT02F001 DD DSN=SB#IM.CORRCAT7,DISP=SHR                               00000160
//FT37F001  DD  DSN=SB#IM.IMP7GAIN.DATA,DISP=SHR                        00000170
//FT40F001  DD  DSN=SB#IM.FINEGAIN.DATA,DISP=SHR                        00000180
//FT05F001 DD *                                                         00000210
1 0 2 1 000                                                 T           00000215
0 000 000 0 1978 127 03 20 1978 127 03 25                               200000220
PICK T F                                                                00000225
1                                                                       00000230
0 000 000 0 1978 127 03 25 1978 127 03 30                               200000235
PICK T F                                                                00000240
1                                                                       00000245
0 000 000 0 1978 127 03 30 1978 127 03 35                               200000250
PICK T F                                                                00000255
1                                                                       00000260
// EXEC NOTIFYTS                                                        00000290
```

```
**** TSO FOREGROUND HARDCOPY ****
DSNAME=SB#IM.LIB.CNTL                                    (ANLIMP8F)

//XRPASANA JOB (SB016,350,20),NEWANLIMP8F,TIME=(0,30),MSGCLASS=X        00000010
//**************************************************                    00000020
//* JCL FILE FOR PSEUDO FTIO ANLIMP8F RUN *                             00000030
//**************************************************                    00000040
//ANLIMP8F EXEC PGM=PANLIM8F,REGION=600K                                00000060
//STEPLIB DD DSN=SB#IM.ANLIMP8F.LOAD,DISP=SHR                           00000070
//SYSUDUMP DD SYSOUT=*                                                  00000080
//ABNLDUMP DD DUMMY                                                     00000090
//FT06F001 DD SYSOUT=*,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)           00000100
//FT10F001  DD    UNIT=(2400-9,,DEFER),DISP=SHR,                        00000110
// VOL=SER=MATIN1,DSN=IMPJ                                              00000120
//FT20F001   DD    UNIT=AFF=FT10F001,DISP=SHR,                          00000130
//  VOL=SER=LOWIN1,DSN=IMPJ                                             00000140
//FT22F001  DD    UNIT=(2400-9,,DEFER),DISP=SHR,                        00000150
// VOL=SER=PHAIN1,DSN=IMPJ                                              00000160
//FT25F001  DD    DSN=SB#IM.DEX52CAT.DATA,DISP=SHR                      00000170
//FT02F001  DD    DSN=SB#IM.CORRCAT8,DISP=SHR                           00000180
//FT38F001  DD    DSN=SB#IM.IMP8GAIN.DATA,DISP=SHR                      00000190
//FT40F001  DD    DSN=SB#IM.FINEGAIN.DATA,DISP=SHR                      00000195
//*0  0121 0123                                                         00000200
//FT05F001     DD    *                                                  00000210
0 0 1 1 000                                                             00000220
  ISOTOPES          1          1 1            8                        00000230
    4   60          4   60         14   12         80   70              00000240
 3        1                                                             00000250
  5.9         8.65                                                      00000260
8.65         13.6                                                       00000270
  13.6       21.9                                                       00000280
0  0000 00001978 293 00  0 1978 296 00 00                               00000290
1                                                                       00000300
/*                                                                      00000310
// EXEC NOTIFYTS                                                        00000320
```

13.5 USER'S GUIDE

13.5.1 General Information

The IMP Intermediate Flux Programs sort PHA events from IMP PHA tapes into the 23 LED and 35 MED flux boxes. Selected rates information in addition to the box counts are summarized over 5-minute intervals and written out as IMP Flux tape records.

13.5.2 Run Control Cards

Two cards are required for the input, a run card and at least one time card. The run card contains the standard endpoints for the five detector elements, A, B, D, E, F. Each time card contains a range of orbits to be processed and the endpoint values to be used for gain factor calculations.

Run Card:

Name	Column	Format	Description
STD(1)	6-10	F5.0	standard endpoint for A
STD(2)	11-15	F5.0	standard endpoint for B
STD(3)	16-20	F5.0	standard endpoint for D
STD(4)	21-25	F5.0	standard endpoint for E
STD(5)	26-30	F5.0	standard endpoint for F

Time Card:

Name	Column	Format	Description
IORB1	1-5	I5	first orbit in range
IORB2	6-10	I5	last orbit in range
ENDPT(1)	11-15	F5.0	orbit endpoint for A
ENDPT(2)	16-20	F5.0	orbit endpoint for B
ENDPT(3)	21-25	F5.0	orbit endpoint for D
ENDPT(4)	26-30	F5.0	orbit endpoint for E
ENDPT(5)	31-35	F5.0	orbit endpoint for F

13.5.3 Tapes and Output

The input and output tape attributes are as follows:

	RECFM	LRECL	BLKSIZE	ORBITS/tape
IMP-6 PHA	FB	1444	4332	5
IMP-7 PHA	FB	1504	4512	5
IMP-8 PHA	FB	1552	4656	5
IMP-6 FLUX	FB	452	4520	60
IMP-7 FLUX	FB	520	5200	60
IMP-8 FLUX	FB	588	5880	60

All PHA tapes are 9-track, 1600 BPI and single-file.

13.5.4 Processing Information

The processing time for the IMP Intermediate Flux Program is roughly 2 1/2 minutes CPU and 1/2 minute I/O for one orbit on the 360/75. Ten orbits takes roughly 22.5 minutes CPU and 4.0 I/O. This time may vary according to the nature of the data (quiet times would take slightly less CPU time per orbit, flares more). The CPU time estimate will increase a minute or so if the first orbit to be processed is near the end of the PHA tape.

The program will run comfortably in less than 200K.

The gain factors are determined as follows:

1. If the input standard endpoint and orbit endpoint values are zero (or left blank), then the LED gain factors are set to 1.0 and the MED gain factors are found from the IMP-6 gain factor tables (on disk). This is the normal mode of operation.

2. If non-zero values for the standard endpoint and orbit endpoint are entered for any of the five detector elements, then the gain factor for that element will be calculated as

$$GAIN(I) = STD(I)/ENDPT(I)$$

Note that you could override the IMP-6 gain tables for just one of the MED elements if you so desired.

A sample JCL deck is shown in Figure 13-6. The following FORTRAN units are defined:

Unit Number	
15	input PHA tape
20	old FLUX tape (for copying), if it exists
25	IMP-6, 7 or 8 tape catalog (disk)
30	output FLUX tape
36, 37, 38	IMP-6, 7 or 8 MED gain factor catalog

Note that if you are using override endpoint values for all elements, you need not define FORTRAN unit numbers 36, 37, or 38

```
// EXEC LINKGO,REGION.GO=150K
//LINK.SYSLIB DD DSN=K3.ZBJDC.IMPFLUX,DISP=SHR
//            DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
 INCLUDE SYSLIB(FLUX6,FLX6BL)
 INCLUDE OIMPHLIB(EXTRC)
 ENTRY FLUX6
//OIMPHLIB DD DSN=K3.AIJTD.SB008.OIMPHLIB,DISP=SHR
//GO.FT15F001 DD UNIT=(1600,,DEFER),DISP=(OLD,KEEP),DSN=DUMY,
//  VOL=SER=PHAIN,DCB=DEN=3
//GO.FT20F001 DD UNIT=(1600,,DEFER),DISP=(OLD,KEEP),
//  VOL=SER=FLUXIN,DSN=DUMY,DCB=DEN=3
//GO.FT25F001 DD DSN=K3.SBJPH.DEX11CAT,DISP=(OLD,KEEP)
//GO.FT30F001 DD UNIT=(1600,,DEFER),DISP=(,KEEP),
//  DCB=(RECFM=FB,LRECL=452,BLKSIZE=4520,DEN=3),
//  VOL=SER=FLXOUT,DSN=DUMY
//GO.FT36F001 DD DSN=K3.ZBJDC.IMP6GAIN,DISP=SHR
//GO.SYSUDUMP DD SYSOUT=A
//GO.DATA5 DD *
      0.0   0.0   0.0   0.0   0.0
  241  2410.0   0.0   0.0   0.0   0.0
```

Figure B-4

```
// EXEC LINKGO,REGION.GO=150K
//LINK.SYSLIB DD DSN=K3.ZBJDC.IMPFLUX,DISP=SHR
//            DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
 INCLUDE SYSLIB(FLUX7,FLX7BL)
 INCLUDE OIMPHLIB(DATE,EXTRC)
 ENTRY FLUX7
//OIMPHLIB DD DSN=K3.AIJTD.SB008.OIMPHLIB,DISP=SHR
//GO.FT15F001 DD UNIT=(1600,,DEFER),DISP=(OLD,KEEP),DSN=DUMY,
//  VOL=SER=PHAIN,DCB=DEN=3
//GO.FT20F001 DD UNIT=(1600,,DEFER),DISP=(OLD,KEEP),
//  VOL=SER=FLUXIN,DSN=DUMY,DCB=DEN=3
//GO.FT25F001 DD DSN=K3.AIJTD.SB010.DEX32CAT,DISP=SHR
//GO.FT30F001 DD UNIT=(1600,,DEFER),DISP=(,KEEP),
//  DCB=(RECFM=FB,LRECL=520,BLKSIZE=5200,DEN=3),
//  VOL=SER=FLXOUT,DSN=DUMY
//GO.FT37F001 DD DSN=K3.ZBJDC.IMP7GAIN,DISP=SHR
//GO.SYSUDUMP DD SYSOUT=A
//GO.DATA5 DD *
      0.0   0.0   0.0   0.0   0.0
  121  1210.0   0.0   0.0   0.0   0.0
```

```
// EXEC LINKGO,REGION.GO=150K
//LINK.SYSLIB DD DSN=K3.ZBJDC.IMPFLUX,DISP=SHR
//          DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
//LINK.SYSLIN DD *
 INCLUDE SYSLIB(FLUXE,FLX8BL)
 INCLUDE OIMPHLIB(DATE)
 ENTRY FLUX8
//OIMPHLIB DD DSN=K3.AIJTD.SB008.OIMPHLIB,DISP=SHR
//GO.FT15F001 DD UNIT=(1600,,DEFER),DISP=(OLD,KEEP),DSN=DUMY,
// VOL=SER=PHAIN,DCB=DEN=3
//GO.FT20F001 DD UNIT=(1600,,DEFER),DISP=(OLD,KEEP),
// VOL=SER=FLUXIN,DSN=DUMY,DCB=DEN=3
//GO.FT25F001 DD DSN=K3.SBJPH.SB016.DEX52CAT,DISP=SHR
//GO.FT30F001 DD UNIT=(1600,,DEFER),DISP=(,KEEP),
// DCB=(RECFM=FB,LRECL=588,BLKSIZE=5880,DEN=3),
//    VOL=SER=FLXOUT,DSN=DUMY
//GO.FT38F001 DD DSN=K3.ZBJDC.IMP8GAIN,DISP=SHR
//GO.SYSUDUMP DD SYSOUT=A
//GO.DATA5 DD *
      0.0   0.0   0.0   0.0   0.0
  110  1100.0   0.0   0.0   0.0   0.0
```

INTERMEDIATE FLUX

IMP-6

```
//*I-6 FLUX
//CHECK  EXEC SRCHDS,DSN='SEIMP.FLXPMN6.LOAD'
//RESTORE  EXEC  PGM=LIBMAN,PARM='REST,2',REGION=200K,
//      COND=(0,EQ,CHECK,SEARCH)


//STEPLIB   DD   DSN=SBHAP.LIBMAN.LOAD,DISP=SHR
//*****************************************************************
//LIBVOLS   DD   DSN=SEIMP.ZLIBVOLS.V0000000,DISP=(OLD,PASS),
//   UNIT=(,,DEFER)
//LODIN     DD   DUMMY
//LODPRINT  DD   SYSOUT=A,DCB=BLKSIZE=3509
//LODWORK2  DD   DSN=SEIMP.FLXPMN6.LOAD,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(TRK,(11,1,1))
//LODWORK1  DD   UNIT=AFF=LIBVOLS,DISP=(OLD,PASS),VOL=SER=DUMLOD
//LODWORK3  DD   UNIT=SYSDA,SPACE=(TRK,(1,10))
//LODWORK4  DD   UNIT=SYSDA,SPACE=(TRK,(1,10))
//SYSUDUMP  DD   SYSOUT=A
//SNAP      DD   SYSOUT=A
//FLXPMN6  EXEC  PGM=FLXPMN6,REGION=225K
//STEPLIB DD DSN=SEIMP.FLXPMN6.LOAD,DISP=SHR
//FT06F001  DD  SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
//FT16F001  DD  UNIT=(2400-9,,DEFER),DISP=SHR,
//    VOL=SER=IMP6TP,DSN=XXXX
//FT26F001  DD  DSN=SEIMP.DEX11CAT.DATA,DISP=SHR
//*0.FT41F001  DD  UNIT=(2400-9),DISP=(NEW,KEEP),DSN=FLUXTAPE,
//*  VOL=SER=E04632,DCB=(DEN=3,RECFM=FB,BLKSIZE=2400,LRECL=240),
//*  LABEL=(2,SL)
//FT05F001 DD *
```

Section 14

User's Guide

for the

IMP-6/7/8 Rates Plot Program

14. General Information

The IMP-6/7/8 Rates Plot Program produces microfilm plotter tapes and rate reports of rates data from the IMP-6, IMP-7, and IMP-8 Cosmic Ray Experiments. The input to the program can be either counts tapes or summary counts tapes. The averaging interval for the data can be specified from every readout up to 12-hour averages. The option is also provided for generating the sums, differences, or ratios of pairs of rates.

14.1 Parameter Cards

For each time period to be plotted, the input deck must consist of five to ten cards in the following sequence:

a) 1 title card

b) 1 tape unit card

c) 1 time-parameter card

d) 1 to 6 rates cards

e) 1 plot card

More than one plot job can be performed in one submittal by stacking the groups of cards shown above in the input deck.

a) Title Card

Column	Format	Description
1-80	20A4	Alphanumeric title to be written on all print logs and plot frames.

b) Tape Unit Card

Column	Format	Description
1-5	I5	Logical unit number for IMP-6 input tapes (as specified in the JCL).
6-10	I5	Same as above, for IMP-7.
11-15	I5	Same as above, for IMP-8.

c) Time-Parameter Card

Column	Format	Description
1	I1	Number of Rate Cards following this card (=1-6).
2-3	I2	IXTYPE - plot x-type (See Table 1.)
4	I1	IYTYPE - plot y-type: 1= counts/sec 2= counts/sec cm^2 ster 3= counts/sec cm^2 ster (Mev/nucleon) 4= no y-axis units (used only for ratio plots)
5	I1	IPERIG - sub-perigee data flag (applies to IMP-6 only) 0= reject IMP-6 sub-perigee data 1= plot all IMP-6 data
6	I1	IPOINT - trend check rejection flag 0= apply trend check 1= do not apply trend check
7	I1	Sectored data fail flag 0= reject failed sectored data 1= accept failed sectored data
8	I1	Sectored data zero suntime flag 0= reject zero suntime sectored data 1= accept zero suntime sectored data
9	I1	IPRINT - rates printout control flag 0= print out rates 1= no line printer rates tabulation
10-11	I2	Start day
12-14	A3	Start month (first 3 letters of month name)
15-16	I2	Start year (last 2 digits of year)
18-19	I2	Start hour
21-22	I2	Start minute
24-25	I2	Start second
30-31	I2	Stop day
32-34	A3	Stop month

Column	Format	Description
35-36	I2	Stop year
38-39	I2	Stop hour
41-42	I2	Stop minute
44-45	I2	Stop second
50-52	I3	IYMIN - y-axis minimum, in power of 10.
53-55	I3	IYMAX - y-axis maximum, in power of 10.
56-58	I3	IXRANG - x-axis range, in units defined by IXTYPE. Optional. (See Table 1. for default values.)
60-69	F10.0	XPERIG - perigee altitude in kilometers, for IMP-6 data only. Optional. (default = 70,000 km.)
80	I1	ITAPE - tape type flag, for testing purposes only. Normally zero. (If =1, forces plotter to use counts tapes for all cases.)

d) Rates Cards (1-6 cards, with the number specified in column 1 of the Time-Parameter Card)

Column	Format	Description
1-2	I2	Event identification number of rate to be accumulated. (See Table 2.)
3	I1	Sector number, if applicable. 0= sum all sectors (or not a sectored rate) 1-8= accumulate designated sector
4	I1	Satellite identification for above rate 6= IMP-6 rate 7= IMP-7 rate 8= IMP-8 rate
5	I1	Defected particle nucleon number. Need only with IYTYPE=3. 1= proton (default) 4= helium 12= carbon 16= oxygen etc.

Column	Format	Description
6-15	F10.0	Energy band for rate, in MeV. Used only with IYTYPE=3.
16-25	F10.0	Override geometry factor, in cm^2 ster. If blank, the default factor from Table 2. is used. (Used only with IYTYPE=2 or 3.)

e) Plot Card

Column	Format	Description
1	I1	IFUNCT - first item to be plotted: 1= plot A1 only 2= plot A1 + A2 3= plot A1 - A2 4= plot A1 / A2
2	I1	Rate A1 - the number of the rate card above.
3	I1	Rate A2 - the number of the rate card above. (=0, for IFUNCT=1)
4	I1	MAP-Frame number in which first item is to appear: 0= no plot of first item 1-6= plot first item on this frame
5	A1	Plot symbol for first item.
11-15	(4I1, A1)	Same as columns 1-5 for second item to be plotted.
21-25	(4I1, A1)	Same as columns 1-5 for third item to be plotted.
31-35	(4I1, A1)	Same as columns 1-5 for fourth item to be plotted.
41-45	(4I1, A1)	Same as columns 1-5 for fifth item to be plotted.
51-55	(4I1, A1)	Same as columns 1-5 for sixth item to be plotted.

14.2 Notes on Parameter Cards

This program can plot data from up to three different satellites at the same time. If data from only one or two satellites is desired, however, it obviously makes no sense to allocate all three input tape units in the JCL. The program makes use of only those unit numbers (on the tape unit card) corresponding to satellites for which rates are actually being requested. Thus, if data from only one satellite is being plotted, only that satellite's Tape Unit Number will be used (although all three numbers may be specified on the card); and only one input tape drive need be allocated in the JCL.

The plot x-axis type (IXTYPE) should be chosed from Table 14-1. The plot type determines the interval over which each data point is averaged. Table 14-1 also shows the corresponding allowable values for the plot frame X-range (IXRNGE). If IXRNGE is left blank on the input card, then the maximum value listed will be used.

The plot y-axis type (IYTYPE) is used to pick the plotting units. If IYTYPE=3, then the detected particle nucleon number and the energy bands should be specified on each Rate Card. If it is desired to plot ratios of rates, then only ratios should be specified (i.e., all IFUNCT=4 on the Plot Card); and IYTYPE should be =4.

If IPOINT is left blank, events that fail the trend check and events that occur immediately after bit-rate changes and data time gaps will not be processed. If IPOINT = 1, all events will be processed.

The tape type parameter, ITAPE, should normally be left blank. If left blank, then counts tapes will be used as input for all plot jobs with an averaging interval smaller than 15 minutes; and summary counts tapes will be used with averaging intervals of 15 minutes or more. If ITAPE = 1, then counts tapes will be used with any averaging interval. This option is useful for testing and for processing times for which there exist no summary counts tapes. The use of this option for normal production, however, can be very costly in terms of computer time.

Table 14-1. X-Axis Scaling

PLOT TYPE (= IXTYPE)	INTERVAL AVERAGE	PLOT FRAME X-RANGE (= IXRNGE)[1]	PLOT START TIME ALIGNMENT	
			NORMAL	PRODUCTION
1	EVERY READOUT	5 TO 15 MINUTES	EVEN MINUTE	1/4 HOUR
2	5 MINUTES	3 TO 12 HOURS	HOUR	1/2 DAY
3	10 MINUTES	6 TO 24 HOURS	2 HOURS	DAY
4	15 MINUTES	12 TO 36 HOURS	3 HOURS	1/2 DAY
5	30 MINUTES	1 TO 5 DAYS	DAY	DAY
6	30 MINUTES	24 TO 120 HOURS	6 HOURS	DAY
7	1 HOUR	1 TO 10 DAYS	DAY	DAY
8	1 HOUR	48 TO 240 HOURS	1/2 DAY	DAY
9	6 HOURS	1 MONTH ONLY	MONTH	MONTH
10	12 HOURS	1 TO 3 MONTHS	MONTH	MONTH
11	24 HOURS	1 TO 6 MONTHS	MONTH	MONTH

[1]DEFAULT FOR IXRNGE IS THE MAXIMUM RANGE VALUE SPECIFIED.

On the Rate Cards, the rate identification number should be taken from the appropriate satellite rate table in Table 2. The sector number only has meaning if a sectored rate is being processed.

The Rate Cards are used to identify and supply input data for all rates that are to be accumulated by the program. Which rates or combination of rates are to be plotted is determined by the contents of the Plot Card. For each item to be plotted, the IFUNCT parameter specifies which combination of rates is to be used. The A1 and A2 parameters refer then to the number of the Rate Card which contains that rate desired.

For example, suppose you wish to plot three IMP-6 MED rates together on the same frames. The Rate and Plot Cards might appear as follows:

```
0106
0206
0306
1101*000001201X00001301$
```

As another example, suppose you wish to plot the IMP-7 electrons and stopping protons, each on separate frames. Since the protons are the difference of two rates, the input might appear as follows:

```
0307
0407
1101*000003212X00000
```

The '3212' on the Plot Card means take the difference ('3') of the rates specified on the second rate card ('2') and the first rate card ('1') and plot it on every second plot frame ('2').

As a final example, suppose you wish to take the ratios of the IMP-7 and IMP-8 stopping particles relative to the IMP-6 stopping particles (i.e., you want $DE\bar{F}\bar{G}$ (IMP-7) divided by $DE\bar{F}\bar{G}$ (IMP-6), etc.). The Rate and Plot Cards might appear as follows:

0106

0107

0108

4211*000004311X

The MAP parameter on the Plot Card is used to determine whether any plots are to be produced and, if so, what the plot organization will be. If all the MAP values are zero or blank, no plots will be generated. If any MAP value is different from zero, plots will be generated. The values of MAP will then determine which rates will be plotted together on the same frame, and which rates will be separated. For example, suppose there are six items, and the MAP values are 0, 0, 0, 1, 1, 1; then the first three items will not be plotted, and the next three will be plotted together on the same frame. For another example, if five items are desired, each on a different frame, the MAP values would be set to 1, 2, 3, 4, 5.

If the plotting symbols on the Plot Card are left blank and plots are requested, a default set of symbols will be employed by the programs (viz: *, 0, x, @, $, #).

When IYTYPE = 2 or 3, geometry factors will be used with all the rates accumulated. If no value is entered on the corresponding Rate Card, the default value from Table 2 will be used. Note that certain rates have defaults of 0.0 degrees, in these cases a geometry factor has been determined to be somewhat meaningless and the user must supply a value if the rate is to be accumulated (with IYTYPE = 2 or 3).

14.3 JCL

Two sample input decks, including JCL, are illustrated in Figure 1.

Figure 1-a shows a typical deck for plotting rates from a single satellite. The case illustrated would generate plots from four IMP-7 non-sectored and sectored rates. Note that although three unit numbers are specified on the Tape Unit Card, only unit 17 has been allocated in the JCL, since only data from IMP-7 is being plotted.

Figure 1-b shows a typical deck for plotting data from three satellites.

```
 100 //PLOT EXEC LINKGO,REGION.GO=300K
 200 //LINK.SYSLIB DD DSN=K3.ZBJDC.OIMPMOD,DISP=SHR
 300 //             DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
 400 //             DD
 500 //             DD
 600 //             DD DSN=SYS2.SC4060,DISP=SHR
 700 //LINK.SYSLIN DD *
 800  INCLUDE SYSLIB(IMPLOT,IMPDAT)
1100 //GO.FT17F001 DD UNIT=(2400-9,,DEFER),DISP=SHR,
1200 //  LABEL=(,SL,,IN),VOL=SER=IMP7TP,DSN=IMP7
1500 //GO.SC4060ZZ DD DSN=ZBJDCIMP,UNIT=(2400-2,,DEFER),
1600 //  LABEL=(1,NL),DISP=(NEW,KEEP),VOL=SER=TEMSAV,
1700 //  DCB=(DEN=1,TRTCH=C,RECFM=F,BLKSIZE=1024)
1900 //GO.FT27F001 DD DSN=K3.AIJTD.SB016.DEX32CAT,DISP=SHR
2100 //GO.SYSUDUMP DD SYSOUT=A
2200 //GO.DATA5 DD *
2300 SECTORED AND NON-SECTORED PLOT TEST FOR IMP-7
2400    16   17   18
2500 4041      1JUN74 00 00 00    30JUN74 00 00 00     -4  3
2600 0307
2700 5207
2800 1507
2900 5307
3200 1101*     12010     13020     1402&
```

Figure 1-a. Sample JCL for IMP Plot Program

```
  100 //PLOT EXEC LINKGO,REGION.GO=300K
  200 //LINK.SYSLIB DD DSN=K3.ZBJDC.OIMPMOD,DISP=SHR
  300 //             DD DSN=K3.SBJPH.OIMPILIB,DISP=SHR
  400 //             DD
  500 //             DD
  600 //             DD DSN=SYS2.SC4060,DISP=SHR
  700 //LINK.SYSLIN DD *
  800   INCLUDE SYSLIB(IMPLOT,IMPDAT)
  900 //GO.FT16F001 DD UNIT=(2400-9,,DEFER),DISP=SHR,
 1000 //   LABEL=(,SL,,IN),VOL=SER=IMP6TP,DSN=IMP6
 1100 //GO.FT17F001 DD UNIT=(2400-9,,DEFER),DISP=SHR,
 1200 //   LABEL=(,SL,,IN),VOL=SER=IMP7TP,DSN=IMP7
 1300 //GO.FT18F001 DD UNIT=(2400-9,,DEFER),DISP=SHR,
 1400 //   LABEL=(,SL,,IN),VOL=SER=IMP8TP,DSN=IMP8
 1500 //GO.SC4060ZZ DD DSN=ZBJDCIMP,UNIT=(2400-2,,DEFER),
 1600 //   LABEL=(1,NL),DISP=(NEW,KEEP),VOL=SER=TEMSAV,
 1700 //   DCB=(DEN=1,TRTCH=C,RECFM=F,BLKSIZE=1024)
 1800 //GO.FT26F001 DD DSN=K3.SBJPH.DEX11CAT,DISP=SHR
 1900 //GO.FT27F001 DD DSN=K3.AIJTD.SB016.DEX32CAT,DISP=SHR
 2000 //GO.FT28F001 DD DSN=K3.SBJPH.SB016.DEX52CAT,DISP=SHR
 2100 //GO.SYSUDUMP DD SYSOUT=A
 2200 //GO.DATA5 DD *
12300 IMP-6, -7, AND -8 MED AND LED RATES.
12400    16   17   18
12500 6041      1JUN74 00 00 00    29JUN74 00 00 00     -4  3
12600 0106
12700 1806
12800 0107
12900 1807
12940 0108
12980 1808
13000 1101*     12020     1301X     14020     1501#     1602?
```

Figure 1-b. Sample JCL for IMP Plot Program

The case illustrated will plot the stopping MED and LED events for IMP-6, IMP-7, and IMP-8, putting the MED on the odd frames and the LED on the even frames.

The data tape GO steps shown will handle either counts or summary counts input tapes.

The examples shown will gnerate 7-track, 556 bpi tapes. You can obtain 9-track plot tapes by changing the unit parameters to UNIT = (2400-9, ,DEFER) and by deleting the DCB parameters.

Note: The IMP Plot Program expects the IMP-6 tape catalog to be unit 26, the IMP-7 catalog to be unit 27, and the IMP-8 catalog to be unit 28.

14.4 Output

The plot tapes generated are either 7 or 9-track tapes (as specified in the JCL) which are used as input for the SD-4060 microfilm plotter using the META processor.

A sample line printer report is shown in Figure 2. A "0.0" for a rate value means that there were one or more reads of the rate, but that there were no counts recorded in those reads. A "-1.0" on the other hand indicates that there were no reads of a rate for that interval. Sample plot frames are shown in Figure 3.

14.5 Timing and Core

Using summary counts tapes as input, the IMP Plot Program may take up to 1.5 minutes CPU and 2 minutes IO to plot a month's worth of data. Using counts tapes, a month of data might take up to 2 minutes CPU and 10 minutes IO to run, depending on how many tapes will have to be read through.

Plotting from one satellite, the core required is about 265k. Plotting from all three satellites, the core requirement is about 295k. Specifying 300k will suffice for all cases.