

#713

Dynamics Explorer 2
Magnetometer Data (MAGB)
81-070B-01C

Dynamcis Explorer 2
LANG Software Tape
81-070B-09C

Dynamics Explorer 2
LANG Data
81-070B-09D

Table of Contents

1. Introduction
 2. Errata/Change Log
 3. **LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC INFORMATION SYSTEM**
 4. Catalog Materials
 - a. Associated Documents
 - b. Core Catalog Materials
-

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

Dynamics Explorer 2

Magnetic Fields

Magnetometer Data (Mag-B)

81-070B-01C **SPMS-00352**

The Mag-B data set is written on 3 Optimem optical disks using SOAR Version 4.2. The documentation is on each disk in the VOLDESC.SFD and FORMAT.SFD files. The directory listings have been included on the following pages. The KV numbers, label names and time spans follow:

KV #	Label	Time Span
KV00026	side 1 deb1_0001a	08/15/81 - 10/12/81
	side 2 deb1_0001b	10/13/81 - 11/17/81
KV00027	side 1 deb1_0002a	11/18/81 - 07/29/82
	side 2 deb1_0002b	07/30/82 - 10/08/82
KV00028	side 1 deb1_0003a	10/09/82 - 02/16/83
	side 2 deb1_0003b	no data on side b

The DE-B magnetometer instrument's archive file contains one day of measured magnetic field vectors in space craft coordinates (x,y,z). The filename contains year and day information and each record is fixed length 4 (32 bit) words long.

(Note: While all files should be in VAX 'fixed length' form, for historical reasons one or two may be encountered as VAX 'variable length' form.)

File Name:

DYYDDD.dat (Ex. D81001.dat)

YY - Last two digits of the year (Ex. 1981 = 81)
 DDD - Day of year three digits (Ex. 001)

Record Format:

TIME, X, Y, Z

s.t.

TIME - Tents of milliseconds of day	I*4
X - X component of the magnetic field vector (nT)	R*4
Y - Y component of the magnetic field vector (nT)	R*4
Z - Z component of the magnetic field vector (nT)	R*4

Sample FORTRAN open and read

```

integer*4 time
real*4 x
real*4 y
real*4 z
c
open (unit=20,file=daily_file,recl=4 status='old',
      access='sequential',recordtype='fixed',
      form='unformatted',iostat=istat,readonly)
c
if (istat.ne.0) then
c
open (unit=20,file=daily_file,recl=4 status='old',
      access='sequential',
      form='unformatted',iostat=istat,readonly)
c
end if
c
do while (istat.eq.0)
  read (unit=20,iostat=istat) time,x,y,z
c
end do
c

```

Exception:

Some files were created with variable length records. Note "if" statement used in the FORTRAN code snapshot above.

Use the following information to convert space craft data vectors into other geophysical coordinate systems. These transforms require the measured space craft vectors as well as data available from the DE O/A data base. These

O/A parameters can be obtained using a program called OAREAD. This program and corresponding data set are expected to be available from the NSSDC archive.

DE MAGNETOMETER DATA PROCESSING

[Matrix]

<Matrix> is the matrix inverse, interchange rows and columns

PI_2 = 1.570796327

GST	-	Greenwich Sidereal Time	O/A Parameter [16]
Pgei	-	GEI position vector	O/A Parameter [23,24,25]
Pgm	-	Geomagnetic Cartesian position vector	[R]*[J]*Pgei
Pgg	-	Geographic Cartesian position vector	[J]*Pgei
THgm	-	Geographic colatitude of the north geomagnetic dipole	0.1954769 radians
PHgm	-	Geographic longitude of the north geomagnetic dipole	5.0483649 radians
LNGgg	-	East Geographic longitude of the satellite	arctan2(Pggy,Pggx)
CLTgg	-	Geographic Colatitude of the satellite	PI_2 - arctan(Pggz/sqrt(Pggx**2+Pggy**2))
LNGgm	-	Geomagnetic longitude of the satellite	arctan2(Pgmy,Pgmx)
CLTgm	-	Geomagnetic Colatitude of the satellite	PI_2 - arctan(Pgmz/sqrt(Pgmx**2+Pgmy**2))
Bspc	-	Magnetic Field in S/C coordinates	[T]*Bspc
Bgei	-	Magnetic Field in GEI coordinates	<Kgg>*[J]*Bgei
Bggs	-	Magnetic Field in GGS coordinates	<Kgm>*[R]*[J]*Bgei
Bgms	-	Magnetic Field in GMS coordinates	O/A Parameter [42,43,44]
Mgei	-	Magnetic Field Model in GEI coordinates	<T>*Mgei
Mspc	-	Magnetic Field Model in S/C coordinates	<Kgg>*[J]*Mgei
Mggs	-	Magnetic Field Model in GGS coordinates	<Kgm>*[R]*[J]*Mgei
Mgms	-	Magnetic Field Model in GMS coordinates	
B	-	Magnitude of the magnetic field	sqrt(Bggsr**2 + Bggsth**2 + Bggspf**2)
D	-	Declination of the magnetic field	arctan2(Bggspf,-Bggsth)
I	-	Inclination of the magnetic field	arctan((-Bggsr)/sqrt(Bggsth**2+Bggspf**2)))
DBgei	-	Delta magnetic field in GEI coordinates	Bgei - Mgei
DBggs	-	Delta Magnetic Field in GGS coordinates	Bggs - Mggs
DBgms	-	Delta Magnetic Field in GMS coordinates	Bgms - Mgms
DBspc	-	Delta Magnetic Field in S/C coordinates	Bspc - Mspc

-[T] matrix transform from SPC to GEI coordinates

[59]	[62]	[65]	O/A parameters
[60]	[63]	[66]	
[61]	[64]	[67]	

[J] matrix transforms from GEI to GG

-
cos(GST) sin(GST) 0
-sin(GST) cos(GST) 0
GST O/A parameter [16]

III

0 0 1

[R] matrix transforms from GG to GM

$$\begin{matrix} \cos(\text{THgm})\times\cos(\text{PHgm}) & \cos(\text{THgm})\times\sin(\text{PHgm}) & -\sin(\text{THgm}) \\ -\sin(\text{PHgm}) & \cos(\text{PHgm}) & 0 \\ \sin(\text{THgm})\times\cos(\text{PHgm}) & \sin(\text{THgm})\times\sin(\text{PHgm}) & \cos(\text{THgm}) \end{matrix}$$

[Ki] matrix Transforms spherical to cartesian coordinates
(GG to GMS or GM to GMS)

$$\begin{matrix} \sin(\text{CLTi})\times\cos(\text{LNGi}) & \cos(\text{CLTi})\times\cos(\text{LNGi}) & -\sin(\text{LNGi}) \\ \sin(\text{CLTi})\times\sin(\text{LNGi}) & \cos(\text{CLTi})\times\sin(\text{LNGi}) & \cos(\text{LNGi}) \\ \cos(\text{CLTi}) & -\sin(\text{CLTi}) & 0 \end{matrix}$$

i = gg, gm

III

CCSDXZLM0001SMRK001CCSDXVN0002SMRK0001
LOG_VOL_IDENT: USANASANSDEB1-0001A
LOG_VOL_INITIATION_DATE: 1989-08-04
LOG_VOL_CLOSING_DATE: 1992-03-12
VOLUME_DIAMETER: 12 INCHES
LOG_VOL_CAPACITY: 1 GB/LOGICAL_VOL
LOG_VOL_FILE_STRUCTURE: FILES-11
VOLUME_DRIVE_MFGR_AND_MODEL: OPTIMUM 1000M WITH 1.6 CONTROLLER
COMPUTER_MFGR: DIGITAL EQUIPMENT CORPORATION
OPERATING_SYSTEM: MICROVMS 4.4
COMPUTER_SYSTEM: MICRO VAX II
TECHNICAL_CONTACT: JAMES B. BYRNES
CODE 694
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
GREENBELT, MD 20771
SPAN LEPVAX::U4JBB
PHONE 301-286-3076
TRANSFER_SOFTWARE: SOAR 4.0
PREV_VOL_IDENT: NONE
CCSDXVN0002EMRK0001CCSDXSNM0002SMRK0003
DATA_SOURCES: DYNAMICS EXPLORER B, MAGNETOMETER INSTRUMENT
SCIENTIFIC_CONTACT: DR. JAMES A. SLAVIN
CODE 696
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
SPAN DE696::U6JAS
PHONE 301-286-5839

DESCRIPTION_OF_SPACECRAFT:

The Dynamics Explorer 2 spacecraft was one of two satellites in the Dynamics Explorer program. The two spacecraft were launched together into coplanar polar orbits for the purpose of studying coupling between the magnetosphere, ionosphere, and the atmosphere. The DE-2 spacecraft was placed in a low altitude orbit whereas the DE-1 orbit was highly elliptical. Instruments aboard the DE-2 spacecraft were: magnetometer(MAG-B), vector electric field instrument(VEFI), neutral atmosphere composition spectrometer (NACS), wind and temperature spectrometer(WATS), Fabry-Perot interferometer (FPI), ion drift meter(IDM), retarding potential analyzer(RPA), low altitude plasma instrument(LAPI), and Langmuir probe(LANG).

ORBIT_INFORMATION:

Because the Delta launch vehicle did not complete a full burn, the DE-2 satellite was placed in a lower than anticipated polar orbit, initially 1012 by 309 km. The orbital period was 98 min. The DE-1 and DE-2 satellites were launched by the same vehicle so that their orbits would be coplanar, allowing two-point measurements along magnetic field lines. The DE-2 spacecraft was normally nadir oriented (i.e. one side always pointing toward the center of the earth). However, the effects of the attitude anomalies and nutation (i.e. period about 30s) are occasionally present in the magnetometer data.

-PERFORMANCE:

The DE-2 spacecraft performed well throughout its lifetime. Available power limited the instrument duty cycle to an average of thirty percent. The lifetime of the spacecraft was shorter than anticipated because of the less than nominal performance of the launch vehicle. DE-2 was launched on Aug. 3, 1981 and reentered the atmosphere on Feb. 19, 1983. (Final data pass on Feb. 18, 1983).

-TIME_SPAN_OF_THE_DATA: 15-AUG-81 TO 16-FEB-83

-INVESTIGATION_OBJECTIVES:

The study of field-aligned currents using the DE-1 and DE-2 magnetic field measurements was the primary objective of the magnetometer investigation

(e.g., Sugiura et al., GRL, 9, 985, 1982). Comparison of the magnetometer data with measurements of precipitating charged particles yielded information on the current carriers (e.g., Marshall et al., JGR, 93, 14542, 1988). Combined with the electric field measurements and ionospheric conductivity distributions deduced from the particle measurements, the magnetometer data allowed the construction of global models for ionospheric and field-aligned currents. The combination of field-aligned current measurements and neutral atmosphere observations provided an opportunity for investigating atmosphere-magnetosphere coupling and assessing the total rate of energy transfer into the upper atmosphere.

INSTRUMENT_ATTRIBUTES:

A. DESCRIPTION_OF_INSTRUMENT:

The DE magnetometers utilize triaxial fluxgate sensors. When a saturable core immersed in an ambient magnetic field is driven into alternating positive and negative saturation, a flux component at the second harmonic of the drive frequency is induced by the ambient field. This signal, which is proportional to the magnitude of the field, is synchronously detected, integrated, and fed back to the sensing coil, wound solenoidally about the core sample. The coil axis defines the direction of sensitivity for that magnetic axis and the field generated by the feedback current nulls the ambient field in that direction. A closed loop system is formed in which the sensitivity and stability are determined primarily by the value and stability of the feedback transfer function, which includes a voltage-to-current transducer and the solenoidal coil constant.

ELECTRONICS:

The dynamic range of each fluxgate sensor is set by the voltage controlled current source to nominally +/- 6000 nT, corresponding to an output voltage of +/- 5V. The dynamic range was extended to the +/- 62000 nT required for the DE-2 mission by a precision 4 bit digitally controlled current source which generates compensation fields in increments of nominally 8000 nT from -56000 to +56000 nT.

THERMAL_CONTROL:

Even with the use of graphite fiber reinforced plastic, the sensors are weakly temperature dependent. A thermostatically controlled heater was incorporated to control the sensor temperature. The heater was driven by the spacecraft unregulated bus so that it could be left on between data acquisition periods on the power limited spacecraft.

B. OPERATIONAL_MODE:

The DE-2 magnetometer possesses only a single operational mode in which the ambient field is sampled 16 times per second with a digital resolution of +/- 1.5 nT.

C. MEASURED_PARAMETERS:

BX, BY, BZ IN SENSOR COORDINATES.

D. PERFORMANCE_OF_THE_INSTRUMENT:

Magnetometer performance was nominal throughout the life of the mission.

E. RESOLUTION:

Each file contains high resolution data (62.5 milliseconds data).

PARAMETERS:

- The daily data files contains four words: universal time, BX, BY, and BZ in spacecraft (SPC) coordinates.

DATA_SET_QUALITY:

Data set quality is excellent (e.g. Langel et al., JGG, 40, 1103, 1988). However, care must be taken to avoid misinterpretation of field direction variations due to spacecraft attitude errors and nutation.

DATA_PROCESSING_OVERVIEW:

A. DATA_PROCESS_CYCLE:

- DE-2 magnetometer data was processed using instrument calibration constants and attitude transfer matrices determined prior to launch.

B. HISTORY:

FINAL DE-2 MAGNETOMETER CALIBRATED DAILY DATA FILES WERE ASSEMBLED IN 1989.

DATA_USAGE:
DE-2 magnetometer data has been used to measure field-aligned current densities (Sugiura et al., GRL, 9, 985, 1982) and model the geomagnetic field (Langel et al., JGG, 40, 1103, 1988).

DATA_ORGANIZATION:
Flat files containing time-tagged (i.e. tenth of milliseconds of day) magnetic field vectors at 62.5 msec resolution.

DATA_SET_NAME: DAILY DATA FILES

CCSDXSNM0002EMRK0003CCSDXKNM0002SMRK0005

LOG_VOL_TIME_COVERAGE: 1981-08-13 TO 1981-10-10

TYPE_OF_FILE_TIME_COVERAGE: Spacecraft coordinates daily files only
1981-08-13T00:00:00 TO 1981-10-10T23:59:59

NAMING_CONVENTION:
Each daily file contains one full day's data. The date of the data is the name of the file. For example, file:D81286.DAT contains all the values for year:1981, day:286.

FILE_NAME_LIST:

D81227.DAT;1	D81228.DAT;1	D81229.DAT;1	D81230.DAT;1
D81231.DAT;1	D81232.DAT;1	D81233.DAT;1	D81234.DAT;1
D81235.DAT;1	D81236.DAT;1	D81237.DAT;1	D81238.DAT;1
D81239.DAT;1	D81240.DAT;1	D81241.DAT;1	D81247.DAT;1
D81248.DAT;1	D81249.DAT;1	D81250.DAT;1	D81251.DAT;1
D81252.DAT;1	D81253.DAT;1	D81254.DAT;1	D81255.DAT;1
D81256.DAT;1	D81257.DAT;1	D81258.DAT;1	D81259.DAT;1
D81260.DAT;1	D81261.DAT;1	D81262.DAT;1	D81263.DAT;1
D81264.DAT;1	D81265.DAT;1	D81266.DAT;1	D81267.DAT;1
D81268.DAT;1	D81269.DAT;1	D81270.DAT;1	D81271.DAT;1
D81272.DAT;1	D81273.DAT;1	D81274.DAT;1	D81275.DAT;1
D81276.DAT;1	D81277.DAT;1	D81278.DAT;1	D81279.DAT;1
D81280.DAT;1	D81281.DAT;1	D81282.DAT;1	D81283.DAT;1
D81284.DAT;1	D81285.DAT;1		

PREV_LOG_VOL_COVERAGE: NONE

CCSDXKNM0002EMRK0005CCSDXRNM0003SMRK0006

NESTING = L

REF = FORMAT.SFD

CCSDXRNM0003EMRK0006CCSDXRLM0003SMRK0007

ADI = NSSD0073

CLASS = I

NESTING = N

SCOPE = EACH

REF = [DATA]DX.DAT;x

CCSDXRLM0003EMRK0007CCSDXRLM0003SMRK0008

ADI = CCSO0002

CLASS = S

NESTING = N

SCOPE = EACH

REF = READ_ME_FIRST.DAT

CCSDXRLM0003EMRK0008CCSDXZLM0001EMARK001

FORMAT.SFD

CCSDYDNM000200NSSD0073SMRK0001

TYPE_OF_FILE_NAME: Spacecraft coordinate daily data file

FILE_ATTRIBUTES: Fixed length, unformatted, sequential file.

TYPE_OF_FILE_DESCRIPTION:

Each file contains all the data for one entire day. Each record of this daily data file contains a time tagged magnetic field vector in spacecraft coordinates.

RECORD_LENGTH: 4 words

FILE_STRUCTURE:

Daily files are written as VAX unformatted sequential with logical records of equal length.

FORMAT_OF_THE_DAILY_DATA_RECORD:

WORD NUMBER	CONTENTS	TYPE I/R	VALUE RANGE	COMMENTS
1	TIME	vI	0 - 864000000	universal time of day in units of tenths of a millisecond
2	BX SPACECRAFT COORDINATES	vR	+/- 62,000	nanoTesla
3	BY SPACECRAFT COORDINATES	vR	+/- 62,000	nanoTesla
4	BZ SPACECRAFT COORDINATES	vR	+/- 62,000	nanoTesla

FORMAT_APPLY_SCOPE: This format applies to all the files under the [DATA] sub-directory.

UTILITY_TO_PRINT_AND_DISPLAY_THE_DATA: The utility is included in the UTILITY.FOR file in the root directory.

UTILITY_APPLY_SCOPE: This utility applies to all the files under the [DATA] subdirectory.

CCSDYDNM000200NSSD0073EMRK0001

CCSDXZLM0001SMARK001CCSDXVNMO002SMRK0001
LOG_VOL_IDENT: USANASANSSDDEB1-0001A
LOG_VOL_INITIATION_DATE: 1989-08-04
LOG_VOL_CLOSING_DATE: 1992-03-12
VOLUME_DIAMETER: 12 INCHES
LOG_VOL_CAPACITY: 1 GB/LOGICAL_VOL
LOG_VOL_FILE_STRUCTURE: FILES-11
VOLUME_DRIVE_MFGR_AND_MODEL: OPTIMUM 1000M WITH 1.6 CONTROLLER
COMPUTER_MFGR: DIGITAL EQUIPMENT CORPORATION
OPERATING_SYSTEM: MICROVMS 4.4
COMPUTER_SYSTEM: MICRO VAX II
TECHNICAL_CONTACT: JAMES B. BYRNES
 CODE 694
 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 GODDARD SPACE FLIGHT CENTER
 GREENBELT, MD 20771
 SPAN LEPVAX::U4JBB
 PHONE 301-286-3076
TRANSFER_SOFTWARE: SOAR 4.0
PREV_VOL_IDENT: NONE
CCSDXVNMO002EMRK0001CCSDXSNM0002SMRK0003
DATA_SOURCES: DYNAMICS EXPLORER B, MAGNETOMETER INSTRUMENT
SCIENTIFIC_CONTACT: DR. JAMES A. SLAVIN
 CODE 696
 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 GODDARD SPACE FLIGHT CENTER
 SPAN DE696::U6JAS
 PHONE 301-286-5839

DESCRIPTION_OF_SPACECRAFT:

The Dynamics Explorer 2 spacecraft was one of two satellites in the Dynamics Explorer program. The two spacecraft were launched together into coplanar polar orbits for the purpose of studying coupling between the magnetosphere, ionosphere, and the atmosphere. The DE-2 spacecraft was placed in a low altitude orbit whereas the DE-1 orbit was highly elliptical. Instruments aboard the DE-2 spacecraft were: magnetometer(MAG-B), vector electric field instrument(VEFI), neutral atmosphere composition spectrometer (NACS), wind and temperature spectrometer(WATS), Fabry-Perot interferometer (FPI), ion drift meter(IDM), retarding potential analyzer(RPA), low altitude plasma instrument(LAPI), and Langmuir probe(LANG).

ORBIT_INFORMATION:

Because the Delta launch vehicle did not complete a full burn, the DE-2 satellite was placed in a lower than anticipated polar orbit, initially 1012 by 309 km. The orbital period was 98 min. The DE-1 and DE-2 satellites were launched by the same vehicle so that their orbits would be coplanar, allowing two-point measurements along magnetic field lines. The DE-2 spacecraft was normally nadir oriented (i.e. one side always pointing toward the center of the earth). However, the effects of the attitude anomalies and nutation (i.e. period about 30s) are occasionally present in the magnetometer data.

PERFORMANCE:

The DE-2 spacecraft performed well throughout its lifetime. Available power limited the instrument duty cycle to an average of thirty percent. The lifetime of the spacecraft was shorter than anticipated because of the less than nominal performance of the launch vehicle. DE-2 was launched on Aug. 3, 1981 and reentered the atmosphere on Feb. 19, 1983. (Final data pass on Feb. 18, 1983).

TIME_SPAN_OF_THE_DATA: 15-AUG-81 TO 16-FEB-83

INVESTIGATION_OBJECTIVES:

The study of field-aligned currents using the DE-1 and DE-2 magnetic field measurements was the primary objective of the magnetometer investigation

DEBI-0001A
VOLDESC.SFD

a JWP

(e.g., Sugiura et al., GRL, 9, 985, 1982). Comparison of the magnetometer data with measurements of precipitating charged particles yielded information on the current carriers (e.g., Marshall et al., JGR, 93, 14542, 1988). Combined with the electric field measurements and ionospheric conductivity distributions deduced from the particle measurements, the magnetometer data allowed the construction of global models for ionospheric and field-aligned currents. The combination of field-aligned current measurements and neutral atmosphere observations provided an opportunity for investigating atmosphere-magnetosphere coupling and assessing the total rate of energy transfer into the upper atmosphere.

INSTRUMENT_ATTRIBUTES:

A. DESCRIPTION_OF_INSTRUMENT:

The DE magnetometers utilize triaxial fluxgate sensors. When a saturable core immersed in an ambient magnetic field is driven into alternating positive and negative saturation, a flux component at the second harmonic of the drive frequency is induced by the ambient field. This signal, which is proportional to the magnitude of the field, is synchronously detected, integrated, and fed back to the sensing coil, wound solenoidally about the core sample. The coil axis defines the direction of sensitivity for that magnetic axis and the field generated by the feedback current nulls the ambient field in that direction. A closed loop system is formed in which the sensitivity and stability are determined primarily by the value and stability of the feedback transfer function, which includes a voltage-to-current transducer and the solenoidal coil constant.

ELECTRONICS:

The dynamic range of each fluxgate sensor is set by the voltage controlled current source to nominally +/- 6000 nT, corresponding to an output voltage of +/- 5V. The dynamic range was extended to the +/- 62000 nT required for the DE-2 mission by a precision 4 bit digitally controlled current source which generates compensation fields in increments of nominally 8000 nT from -56000 to +56000 nT.

THERMAL_CONTROL:

Even with the use of graphite fiber reinforced plastic, the sensors are weakly temperature dependent. A thermostatically controlled heater was incorporated to control the sensor temperature. The heater was driven by the spacecraft unregulated bus so that it could be left on between data acquisition periods on the power limited spacecraft.

B. OPERATIONAL_MODE:

The DE-2 magnetometer possesses only a single operational mode in which the ambient field is sampled 16 times per second with a digital resolution of +/- 1.5 nT.

C. MEASURED_PARAMETERS:

BX, BY, BZ IN SENSOR COORDINATES.

D. PERFORMANCE_OF_THE_INSTRUMENT:

Magnetometer performance was nominal throughout the life of the mission.

E. RESOLUTION:

Each file contains high resolution data (62.5 milliseconds data).

PARAMETERS:

The daily data files contains four words: universal time, BX, BY, and BZ in spacecraft (SPC) coordinates.

DATA_SET_QUALITY:

Data set quality is excellent (e.g. Langel et al., JGG, 40, 1103, 1988). However, care must be taken to avoid misinterpretation of field direction variations due to spacecraft attitude errors and nutation.

DATA_PROCESSING_OVERVIEW:

A. DATA_PROCESS_CYCLE:

DE-2 magnetometer data was processed using instrument calibration constants and attitude transfer matrices determined prior to launch.

B. HISTORY:

FINAL DE-2 MAGNETOMETER CALIBRATED DAILY DATA FILES WERE ASSEMBLED IN 1989.

DATA_USAGE:
DE-2 magnetometer data has been used to measure field-aligned current densities (Sugiura et al., GRL, 9, 985, 1982) and model the geomagnetic field (Langel et al., JGG, 40, 1103, 1988).

DATA_ORGANIZATION:
Flat files containing time-tagged (i.e. tenth of milliseconds of day) magnetic field vectors at 62.5 msec resolution.

DATA_SET_NAME: DAILY DATA FILES

CCSDXSNM0002EMRK0003CCSDXKNM0002SMRK0005

LOG_VOL_TIME_COVERAGE: 1981-08-13 TO 1981-10-10

TYPE_OF_FILE_TIME_COVERAGE: Spacecraft coordinates daily files only
1981-08-13T00:00:00 TO 1981-10-10T23:59:59

NAMING_CONVENTION:
Each daily file contains one full day's data. The date of the data is the name of the file. For example, file:D81286.DAT contains all the values for year:1981, day:286.

FILE_NAME_LIST:

D81227.DAT;1	D81228.DAT;1	D81229.DAT;1	D81230.DAT;1
D81231.DAT;1	D81232.DAT;1	D81233.DAT;1	D81234.DAT;1
D81235.DAT;1	D81236.DAT;1	D81237.DAT;1	D81238.DAT;1
D81239.DAT;1	D81240.DAT;1	D81241.DAT;1	D81247.DAT;1
D81248.DAT;1	D81249.DAT;1	D81250.DAT;1	D81251.DAT;1
D81252.DAT;1	D81253.DAT;1	D81254.DAT;1	D81255.DAT;1
D81256.DAT;1	D81257.DAT;1	D81258.DAT;1	D81259.DAT;1
D81260.DAT;1	D81261.DAT;1	D81262.DAT;1	D81263.DAT;1
D81264.DAT;1	D81265.DAT;1	D81266.DAT;1	D81267.DAT;1
D81268.DAT;1	D81269.DAT;1	D81270.DAT;1	D81271.DAT;1
D81272.DAT;1	D81273.DAT;1	D81274.DAT;1	D81275.DAT;1
D81276.DAT;1	D81277.DAT;1	D81278.DAT;1	D81279.DAT;1
D81280.DAT;1	D81281.DAT;1	D81282.DAT;1	D81283.DAT;1
D81284.DAT;1	D81285.DAT;1		

PREV_LOG_VOL_COVERAGE: NONE

CCSDXKNM0002EMRK0005CCSDXRNM0003SMRK0006

NESTING = L

REF = FORMAT.SFD

CCSDXRNM0003EMRK0006CCSDXRLM0003SMRK0007

ADI = NSSD0073

CLASS = I

NESTING = N

SCOPE = EACH

REF = [DATA]ID*.DAT;*

CCSDXRLM0003EMRK0007CCSDXRLM0003SMRK0008

ADI = CCSD0002

CLASS = S

NESTING = N

SCOPE = EACH

REF = READ_ME_FIRST.DAT

CCSDXRLM0003EMRK0008CCSDXZLM0001EMARK001

DEBI_0001A

Directory \$1\$QSA2:[0000001]

000000.DIR;1	1/8	29-MAY-1992 14:14:18.21
BACKUP.SYS;1	0/0	29-MAY-1992 14:14:18.21
BADBLK.SYS;1	8/24	29-MAY-1992 14:14:18.21
BADLOG.SYS;1	1/8	29-MAY-1992 14:14:18.21
BITMAP.SYS;1	63/64	29-MAY-1992 14:14:18.21
CONFIG.SYS;1	1/8	29-MAY-1992 14:14:22.61
CONTIN.SYS;1	0/0	29-MAY-1992 14:14:18.21
CORIMG.SYS;1	0/0	29-MAY-1992 14:14:18.21
INDEXF.SYS;1	272/272	29-MAY-1992 14:14:18.21
JUNK.DIR;1	1/24	29-MAY-1992 14:14:22.24
MAGE.DIR;1	1/8	29-MAY-1992 14:14:21.43
DSECURE.SYS;1	0/8	29-MAY-1992 14:15:54.97
OTRANSFER.SYS;1	0/1008	1-JUN-1992 12:53:36.50
VOLSET.SYS;1	0/0	29-MAY-1992 14:14:18.21

Total of 14 files, 348/1432 blocks.

Directory \$1\$QSA2:[JUNK]

A.A;1	1/8	29-MAY-1992 10:57:05.79
-------	-----	-------------------------

Total of 1 file, 1/8 blocks.

Directory \$1\$QSA2:[MAGE]

DATA.DIR;1	4/24	29-MAY-1992 14:14:22.03
FORMAT.SFD;1	3/8	12-MAR-1992 10:49:05.19
READ_ME_FIRST.DAT;1	11/16	12-MAR-1992 15:28:07.84
VOLDESC.SFD;1	19/24	12-MAR-1992 15:54:57.45

Total of 4 files, 37/72 blocks.

Directory \$1\$QSA2:[MAGE,DATA]

D81227.DAT;4	2735/2736	6-JUL-1992 16:39:03.69
D81227.DAT;3	2735/2736	6-JUL-1992 16:39:03.69
D81227.DAT;1	0/2736	29-MAY-1992 14:19:53.17
D81228.DAT;3	4737/4744	6-JUL-1992 16:38:52.80
D81228.DAT;1	0/4744	29-MAY-1992 14:37:30.32
D81229.DAT;4	3537/3544	6-JUL-1992 16:38:45.58
D81229.DAT;1	0/3544	29-MAY-1992 14:50:46.51
D81230.DAT;3	3858/3864	6-JUL-1992 16:38:36.74
D81230.DAT;1	0/3864	29-MAY-1992 15:28:07.21
D81231.DAT;1	9522/9528	18-AUG-1989 11:07:09.30
D81232.DAT;1	9360/9360	18-AUG-1989 11:24:05.02
D81233.DAT;1	6979/6984	18-AUG-1989 11:45:18.89
D81234.DAT;1	8665/8672	18-AUG-1989 13:47:01.48
D81235.DAT;1	10113/10120	18-AUG-1989 14:05:50.45
D81236.DAT;1	8875/8880	18-AUG-1989 14:35:23.79
D81237.DAT;1	5451/5456	18-AUG-1989 14:46:56.58
D81238.DAT;1	5371/5376	18-AUG-1989 14:59:22.18
D81239.DAT;1	9944/9944	18-AUG-1989 15:36:53.10
D81240.DAT;1	9556/9560	18-AUG-1989 16:36:32.36
D81241.DAT;1	735/736	18-AUG-1989 16:48:18.34
D81247.DAT;1	5656/5656	8-SEP-1989 11:41:24.62
D81248.DAT;1	6966/6968	8-SEP-1989 11:47:45.75
D81249.DAT;1	7887/7888	8-SEP-1989 11:55:49.82

DEB1_0001A

D81250.DAT;2	9223/9224	8-SEP-1989 12:05:06.54
D81250.DAT;1	0/9224	29-MAY-1992 17:16:10.38
D81251.DAT;1	9059/9064	8-SEP-1989 12:15:53.66
D81252.DAT;1	9002/9008	6-SEP-1989 11:49:58.03
D81253.DAT;1	6658/6664	6-SEP-1989 12:04:21.40
D81254.DAT;1	6466/6472	6-SEP-1989 12:16:05.78
D81255.DAT;1	8806/8808	6-SEP-1989 12:28:46.34
D81256.DAT;1	7523/7528	6-SEP-1989 12:43:26.72
D81257.DAT;1	7333/7336	6-SEP-1989 12:56:36.97
D81258.DAT;1	5517/5520	6-SEP-1989 13:08:41.17
D81259.DAT;1	8667/8672	6-SEP-1989 13:20:25.48
D81260.DAT;1	4377/4384	6-SEP-1989 13:33:25.27
D81261.DAT;1	7125/7128	6-SEP-1989 13:42:54.61
D81262.DAT;1	8691/8696	8-SEP-1989 16:32:27.18
D81263.DAT;1	11587/11592	18-SEP-1989 16:36:39.42
D81264.DAT;1	8362/8368	18-SEP-1989 17:00:05.97
D81265.DAT;1	9087/9088	15-SEP-1989 17:04:25.03
D81266.DAT;1	8355/8360	15-SEP-1989 17:20:49.02
D81267.DAT;1	9402/9408	15-SEP-1989 17:36:46.60
D81268.DAT;1	12014/12016	15-SEP-1989 17:55:24.43
D81269.DAT;2	8012/8016	15-SEP-1989 18:15:46.18
D81269.DAT;1	0/8016	31-MAY-1992 18:50:42.25
D81270.DAT;1	13596/13600	15-SEP-1989 18:33:33.61
D81271.DAT;1	11769/11776	15-SEP-1989 18:58:15.97
D81272.DAT;1	10350/10352	15-SEP-1989 19:20:00.90
D81273.DAT;1	10642/10648	15-SEP-1989 19:40:07.59
D81274.DAT;1	13235/13240	15-SEP-1989 20:01:58.54
D81275.DAT;1	12161/12168	15-SEP-1989 20:27:28.36
D81276.DAT;1	8686/8688	15-SEP-1989 20:49:51.29
D81277.DAT;1	9303/9304	15-SEP-1989 21:07:28.72
D81278.DAT;2	13304/13304	15-SEP-1989 21:27:56.13
D81278.DAT;1	13304/13304	15-SEP-1989 21:27:56.13
D81279.DAT;1	11412/11416	15-SEP-1989 21:53:44.61
D81280.DAT;1	10616/10616	15-SEP-1989 22:16:27.13
D81281.DAT;1	14109/14112	15-SEP-1989 22:39:42.48
D81282.DAT;1	11211/11216	15-SEP-1989 23:07:12.46
D81283.DAT;1	9413/9416	15-SEP-1989 23:29:38.93
D81284.DAT;1	11507/11512	15-SEP-1989 23:50:23.25
D81285.DAT;1	13471/13472	16-SEP-1989 00:15:22.95

Total of 62 files, 486037/518376 blocks.

Grand total of 4 directories, 81 files, 486423/519888 blocks.

Directory #1\$DUB2:[0000001]	DEB1_0001B
000000.DIR:1	1/8
BACKUP.SYS:1	0/0
BADBLK.SYS:1	8/8
BADLOG.SYS:1	1/8
BITMAP.SYS:1	63/64
CONFIG.SYS:1	1/8
CONTIN.SYS:1	0/0
CORIMG.SYS:1	0/0
INDEXF.SYS:1	272/272
JUNK.DIR:1	1/24
MAGR.DIR:1	1/8
DSECURE.SYS:1	0/8
VOLSET.SYS:1	0/0

Total of 13 files, 348/408 blocks.

Directory #1\$DUB2:[MAGB]	
DATA.DIR:1	2/24
FORMAT.SFD:1	3/8
READ_ME_FIRST.DAT:1	11/16
VOLDESC.SFD:5	20/24

Total of 4 files, 36/72 blocks.

Directory #1\$DUB2:[IMAGE.DATA]	
D81286.DAT:2	11520/11520
D81286.DAT:1	11520/11520
D81287.DAT:1	11960/11960
D81288.DAT:1	10378/10384
D81289.DAT:1	11811/11816
D81290.DAT:1	11533/11536
D81291.DAT:1	10518/10520
D81292.DAT:1	14320/14320
D81293.DAT:1	15212/15216
D81296.DAT:1	15163/15168
D81298.DAT:1	14801/14808
D81300.DAT:1	13612/13616
D81301.DAT:1	12765/12768
D81302.DAT:1	11174/11176
D81303.DAT:1	11967/11968
D81304.DAT:1	12952/12952
D81305.DAT:1	11492/11496
D81307.DAT:1	12985/12992
D81308.DAT:1	13506/13512
D81309.DAT:1	14022/14024
D81310.DAT:1	9314/9320
D81311.DAT:1	11137/11144
D81312.DAT:1	13948/13952
D81313.DAT:1	12419/12424
D81314.DAT:1	9857/9864
D81315.DAT:1	12045/12048
D81316.DAT:1	13861/13864
D81317.DAT:1	12323/12328
D81318.DAT:1	11712/11712
D81319.DAT:1	12198/12200

D81320.DAT:i 15783/15784 17-MAY-1990 09:35:35.81
D81321.DAT:i 13928/13928 17-MAY-1990 10:08:44.03

Total of 32 files, 401736/401840 blocks.

Directory \$1\$DUB3:[0000000] DEB1_0002A

000000.DIR:1	1/8	7-JUN-1990 15:57:32.46
BACKUP.SYS:1	0/0	7-JUN-1990 15:57:32.46
BADBLK.SYS:1	8/8	7-JUN-1990 15:57:32.46
BADLOG.SYS:1	0/0	7-JUN-1990 15:57:32.46
BITMAP.SYS:1	63/64	7-JUN-1990 15:57:32.46
CONFIG.SYS:1	1/8	7-JUN-1990 15:57:37.10
CONTIN.SYS:1	0/0	7-JUN-1990 15:57:32.46
CORIMG.SYS:1	0/0	7-JUN-1990 15:57:32.46
INDEXF.SYS:1	288/288	7-JUN-1990 15:57:32.46
MAGE.DIR:1	1/8	7-JUN-1990 15:57:35.73
VOLSET.SYS:1	0/0	7-JUN-1990 15:57:32.46

Total of 11 files, 362/384 blocks.

Directory \$1\$DUB3:[MAGB]

DATA.DIR:1	10/24	7-JUN-1990 15:57:36.56
FORMAT.SFD:2	3/8	12-MAR-1992 10:49:05.19
READ_ME_FIRST.DAT:1	11/16	17-JUN-1992 14:06:28.92
VOLDESC.SFD:11	27/32	17-JUN-1992 14:36:11.05

Total of 4 files, 51/80 blocks.

Directory \$1\$DUB3:[MAGE.DATA]

D81322.DAT:2	15779/15784	11-JUN-1990 22:23:27.12
D81322.DAT:1	15779/15784	7-JUN-1990 19:36:10.13
D81323.DAT:2	25009/25016	11-JUN-1990 22:47:38.31
D81323.DAT:1	25009/25016	7-JUN-1990 19:58:58.90
D81324.DAT:2	11863/11864	11-JUN-1990 23:09:53.21
D81324.DAT:1	11863/11864	7-JUN-1990 20:18:53.90
D81325.DAT:2	13730/13736	11-JUN-1990 23:24:32.91
D81325.DAT:1	13730/13736	7-JUN-1990 20:32:51.77
D81326.DAT:2	14630/14632	11-JUN-1990 23:41:06.38
D81326.DAT:1	14630/14632	7-JUN-1990 20:48:20.28
D81327.DAT:2	16405/16408	11-JUN-1990 23:58:50.97
D81327.DAT:1	16405/16408	7-JUN-1990 21:05:23.38
D81328.DAT:2	14987/14992	12-JUN-1990 00:17:10.52
D81328.DAT:1	14987/14992	7-JUN-1990 21:22:39.86
D81329.DAT:2	15321/15328	12-JUN-1990 00:34:39.53
D81329.DAT:1	15321/15328	7-JUN-1990 21:39:15.18
D81330.DAT:2	15404/15408	12-JUN-1990 00:52:49.69
D81330.DAT:1	15404/15408	7-JUN-1990 21:56:18.39
D81331.DAT:2	15075/15080	12-JUN-1990 01:10:59.59
D81331.DAT:1	15075/15080	7-JUN-1990 22:13:33.60
D81332.DAT:2	15137/15144	12-JUN-1990 01:28:31.70
D81332.DAT:1	15137/15144	7-JUN-1990 22:30:57.81
D81333.DAT:2	14328/14328	12-JUN-1990 01:45:58.65
D81333.DAT:1	14328/14328	7-JUN-1990 22:48:02.91
D81334.DAT:2	15890/15896	12-JUN-1990 02:03:22.56
D81334.DAT:1	15890/15896	7-JUN-1990 23:05:36.65
D81335.DAT:2	13767/13768	12-JUN-1990 02:21:03.44
D81335.DAT:1	13767/13768	7-JUN-1990 23:23:21.78
D81336.DAT:2	13243/13248	12-JUN-1990 02:36:43.59
D81336.DAT:1	13243/13248	7-JUN-1990 23:39:34.83
D81337.DAT:1	13650/13656	8-JUN-1990 11:48:36.06
D81338.DAT:1	13939/13944	8-JUN-1990 12:05:50.46

D81339.DAT;1	14165/14168	8-JUN-1990 12:22:45.11
D81340.DAT;1	15744/15744	8-JUN-1990 12:40:39.82
D81341.DAT;1	13797/13800	8-JUN-1990 12:58:09.36
D81342.DAT;1	10931/10936	8-JUN-1990 13:13:04.66
D81343.DAT;1	14554/14560	8-JUN-1990 13:28:07.71
D81344.DAT;1	13711/13712	8-JUN-1990 13:45:02.49
D81345.DAT;1	12090/12096	8-JUN-1990 13:59:43.95
D81346.DAT;1	15071/15072	8-JUN-1990 14:14:44.23
D81347.DAT;1	14975/14976	8-JUN-1990 14:31:30.40
D81348.DAT;1	13866/13872	8-JUN-1990 14:48:38.69
D81349.DAT;1	10255/10256	8-JUN-1990 15:02:18.48
D81350.DAT;1	11686/11688	8-JUN-1990 15:14:38.87
D81351.DAT;1	13492/13496	8-JUN-1990 15:28:49.66
D81352.DAT;1	11890/11896	8-JUN-1990 15:43:41.56
D81353.DAT;1	13175/13176	8-JUN-1990 15:58:31.93
D81354.DAT;1	11537/11544	8-JUN-1990 16:13:14.86
D81355.DAT;1	12744/12744	12-JUN-1990 18:39:24.34
D81356.DAT;1	12334/12336	12-JUN-1990 18:52:51.87
D81357.DAT;1	12550/12552	12-JUN-1990 19:06:20.07
D81358.DAT;1	10348/10352	12-JUN-1990 19:18:31.54
D81359.DAT;1	7694/7696	12-JUN-1990 19:28:03.06
D81360.DAT;1	11383/11384	12-JUN-1990 19:38:31.20
D81361.DAT;1	9655/9656	12-JUN-1990 19:49:41.25
D81362.DAT;1	7479/7480	12-JUN-1990 19:58:57.04
D81363.DAT;1	11814/11816	12-JUN-1990 20:09:47.54
D81364.DAT;1	11473/11480	12-JUN-1990 20:22:26.33
D81365.DAT;1	10015/10016	12-JUN-1990 20:34:10.98
D82001.DAT;1	11296/11296	12-JUN-1990 21:12:47.58
D82002.DAT;1	10853/10856	12-JUN-1990 21:24:43.02
D82003.DAT;1	12251/12256	12-JUN-1990 21:37:21.26
D82004.DAT;1	9750/9752	12-JUN-1990 21:49:05.28
D82005.DAT;1	12396/12400	12-JUN-1990 22:01:14.02
D82006.DAT;1	8235/8240	12-JUN-1990 22:12:28.34
D82007.DAT;1	12352/12352	12-JUN-1990 22:23:53.04
D82008.DAT;1	10123/10128	12-JUN-1990 22:36:00.62
D82009.DAT;1	13151/13152	12-JUN-1990 22:48:43.01
D82010.DAT;1	10624/10624	12-JUN-1990 23:01:24.25
D82011.DAT;1	7039/7040	12-JUN-1990 23:10:57.64
D82012.DAT;1	10991/10992	12-JUN-1990 23:20:52.92
D82013.DAT;1	7605/7608	12-JUN-1990 23:30:48.52
D82014.DAT;1	11798/11800	12-JUN-1990 23:41:24.16
D82015.DAT;1	10835/10840	12-JUN-1990 23:53:33.60
D82016.DAT;1	11049/11056	13-JUN-1990 00:05:27.04
D82017.DAT;1	11952/11952	13-JUN-1990 00:17:49.99
D82018.DAT;1	11121/11128	13-JUN-1990 00:30:15.96
D82019.DAT;1	11520/11520	13-JUN-1990 00:42:33.84
D82020.DAT;1	8537/8544	13-JUN-1990 00:53:11.78
D82021.DAT;1	12047/12048	13-JUN-1990 18:10:52.08
D82022.DAT;1	8064/8064	13-JUN-1990 18:21:34.36
D82023.DAT;1	10001/10008	13-JUN-1990 18:31:30.25
D82024.DAT;1	9151/9152	13-JUN-1990 18:41:50.48
D82025.DAT;1	10589/10592	13-JUN-1990 18:52:36.80
D82026.DAT;1	13645/13648	13-JUN-1990 19:05:43.11
D82027.DAT;1	8620/8624	13-JUN-1990 19:17:31.98
D82028.DAT;1	12193/12200	13-JUN-1990 19:28:48.01
D82029.DAT;1	9573/9576	13-JUN-1990 19:40:35.71
D82030.DAT;1	11646/11648	13-JUN-1990 19:52:19.22
D82031.DAT;1	10392/10392	13-JUN-1990 20:04:24.39
D82032.DAT;1	9620/9624	13-JUN-1990 20:15:17.28
D82033.DAT;1	8816/8816	13-JUN-1990 20:25:14.41

D82034.DAT;1	7957/7960	13-JUN-1990	20:33:38.09
D82035.DAT;1	10293/10296	13-JUN-1990	20:42:42.36
D82036.DAT;1	10426/10432	13-JUN-1990	20:52:54.47
D82037.DAT;1	8159/8160	13-JUN-1990	21:02:02.05
D82038.DAT;1	9594/9600	13-JUN-1990	21:11:41.11
D82039.DAT;1	8508/8512	13-JUN-1990	21:21:28.16
D82040.DAT;1	8911/8912	13-JUN-1990	21:31:08.43
D82041.DAT;1	6954/6960	13-JUN-1990	21:39:48.35
D82042.DAT;1	7021/7024	13-JUN-1990	21:47:23.36
D82043.DAT;1	5412/5416	13-JUN-1990	21:54:07.00
D82044.DAT;1	8588/8592	14-JUN-1990	16:59:03.37
D82045.DAT;1	9117/9120	14-JUN-1990	17:07:53.19
D82046.DAT;1	7673/7680	14-JUN-1990	17:16:12.41
D82047.DAT;1	8820/8824	14-JUN-1990	17:24:25.15
D82048.DAT;1	8620/8624	14-JUN-1990	17:33:04.16
D82049.DAT;1	8755/8760	14-JUN-1990	17:41:41.31
D82050.DAT;1	7112/7112	14-JUN-1990	17:49:33.55
D82051.DAT;1	8633/8640	14-JUN-1990	17:57:25.85
D82052.DAT;1	5143/5144	14-JUN-1990	18:04:15.73
D82053.DAT;1	6604/6608	14-JUN-1990	18:10:10.54
D82054.DAT;1	6401/6408	14-JUN-1990	18:16:40.62
D82058.DAT;1	4276/4280	15-JUN-1990	11:39:04.27
D82059.DAT;1	7471/7472	15-JUN-1990	11:45:45.26
D82060.DAT;1	5991/5992	15-JUN-1990	11:53:18.57
D82061.DAT;1	6529/6536	15-JUN-1990	12:00:40.08
D82062.DAT;1	6424/6424	15-JUN-1990	12:08:00.70
D82063.DAT;1	5744/5744	15-JUN-1990	12:14:47.95
D82064.DAT;1	7464/7464	15-JUN-1990	12:22:16.42
D82065.DAT;1	6729/6736	15-JUN-1990	12:30:20.87
D82066.DAT;1	6828/6832	15-JUN-1990	12:38:04.51
D82067.DAT;1	6461/6464	15-JUN-1990	12:45:44.89
D82068.DAT;1	7904/7904	15-JUN-1990	12:54:04.85
D82069.DAT;1	7664/7664	15-JUN-1990	13:03:12.35
D82070.DAT;1	6768/6768	15-JUN-1990	13:11:53.39
D82071.DAT;1	6301/6304	15-JUN-1990	13:19:38.61
D82072.DAT;1	4828/4832	21-JUN-1990	11:25:51.09
D82073.DAT;1	9004/9008	21-JUN-1990	11:36:30.18
D82074.DAT;1	7526/7528	21-JUN-1990	11:47:17.05
D82075.DAT;1	1464/1464	21-JUN-1990	11:53:32.00
D82076.DAT;1	0/0	21-JUN-1990	11:54:48.60
D82077.DAT;1	11195/11200	21-JUN-1990	12:02:43.26
D82078.DAT;1	9958/9960	21-JUN-1990	12:16:38.87
D82079.DAT;1	10434/10440	21-JUN-1990	12:30:01.86
D82080.DAT;1	8068/8072	21-JUN-1990	12:42:18.91
D82081.DAT;1	5490/5496	21-JUN-1990	14:57:47.41
D82082.DAT;1	9831/9832	21-JUN-1990	15:08:36.72
D82083.DAT;1	8364/8368	21-JUN-1990	15:21:25.10
D82084.DAT;1	10384/10384	21-JUN-1990	15:33:13.84
D82085.DAT;1	11043/11048	21-JUN-1990	15:48:14.99
D82086.DAT;1	13246/13248	21-JUN-1990	16:03:38.44
D82087.DAT;1	9882/9888	21-JUN-1990	16:18:07.81
D82088.DAT;1	9988/9992	21-JUN-1990	16:28:30.86
D82089.DAT;1	11498/11504	21-JUN-1990	16:39:10.20
D82090.DAT;1	12436/12440	21-JUN-1990	16:51:08.33
D82091.DAT;1	13038/13040	21-JUN-1990	17:05:54.82
D82092.DAT;1	9562/9568	21-JUN-1990	17:18:53.14
D82093.DAT;1	7704/7704	21-JUN-1990	17:28:32.17
D82094.DAT;1	9489/9496	21-JUN-1990	20:22:38.15
D82095.DAT;1	12224/12224	21-JUN-1990	20:34:33.92
D82096.DAT;1	6589/6592	21-JUN-1990	20:44:08.80

D82097.DAT;1	8025/8032	21-JUN-1990	20:51:27.18
D82098.DAT;1	11415/11416	21-JUN-1990	21:01:06.77
D82099.DAT;1	8327/8328	21-JUN-1990	21:10:48.15
D82100.DAT;1	10769/10776	21-JUN-1990	21:20:16.45
D82101.DAT;1	9676/9680	21-JUN-1990	21:30:20.94
D82102.DAT;1	9943/9944	21-JUN-1990	21:40:02.50
D82103.DAT;1	7101/7104	21-JUN-1990	21:48:25.77
D82104.DAT;1	10836/10840	21-JUN-1990	21:57:21.80
D82105.DAT;1	12652/12656	21-JUN-1990	22:08:57.75
D82106.DAT;1	10058/10064	21-JUN-1990	22:20:06.93
D82107.DAT;1	12249/12256	21-JUN-1990	22:31:08.90
D82108.DAT;1	9773/9776	21-JUN-1990	22:41:57.48
D82109.DAT;1	10887/10888	21-JUN-1990	22:52:10.93
D82110.DAT;1	12975/12976	21-JUN-1990	23:03:57.72

Total of 166 files, 1794174/1794728 blocks.

Grand total of 3 directories, 181 files, 1794587/1795192 blocks.

Directory \$1\$DUB3:[000000] DEB1_0002B

000000.DIR;1	1/8	22-JUN-1990 10:19:18.05
BACKUP.SYS;1	0/0	22-JUN-1990 10:19:18.05
BADBLK.SYS;1	8/8	22-JUN-1990 10:19:18.05
BADLOG.SYS;1	0/0	22-JUN-1990 10:19:18.05
BITMAP.SYS;1	63/64	22-JUN-1990 10:19:18.05
CONFIG.SYS;1	1/8	22-JUN-1990 10:19:22.78
CONTIN.SYS;1	0/0	22-JUN-1990 10:19:18.05
CORIMG.SYS;1	0/0	22-JUN-1990 10:19:18.05
INDEXF.SYS;1	288/288	22-JUN-1990 10:19:18.05
MAGB.DIR;1	1/8	22-JUN-1990 10:19:21.35
VOLSET.SYS;1	0/0	22-JUN-1990 10:19:18.05

Total of 11 files, 362/384 blocks.

Directory \$1\$DUB3:[MAGB]

DATA.DIR;1	11/24	22-JUN-1990 10:19:22.18
FORMAT.SFD;2	3/8	12-MAR-1992 10:49:05.19
READ_ME_FIRST.DAT;1	11/16	17-JUN-1992 14:06:28.92
VOLDESC.SFD;12	34/40	17-JUN-1992 16:05:39.75

Total of 4 files, 59/88 blocks.

Directory \$1\$DUB3:[MAGB.DATA]

D82111.DAT;2	6618/6624	24-JUN-1990 10:29:38.00
D82111.DAT;1	6618/6624	22-JUN-1990 10:32:36.04
D82112.DAT;1	11390/11392	22-JUN-1990 10:42:30.41
D82113.DAT;1	8124/8128	22-JUN-1990 10:53:45.76
D82114.DAT;1	8219/8224	22-JUN-1990 11:03:22.59
D82115.DAT;1	14100/14104	22-JUN-1990 11:32:20.42
D82116.DAT;1	15549/15552	22-JUN-1990 11:49:14.53
D82117.DAT;1	14444/14448	22-JUN-1990 12:07:05.22
D82118.DAT;1	10573/10576	22-JUN-1990 12:21:52.92
D82119.DAT;1	11365/11368	22-JUN-1990 12:34:19.46
D82120.DAT;1	12183/12184	22-JUN-1990 12:48:46.57
D82121.DAT;1	12477/12480	22-JUN-1990 13:03:08.40
D82122.DAT;1	14914/14920	22-JUN-1990 13:19:34.96
D82123.DAT;1	12782/12784	22-JUN-1990 13:37:08.79
D82124.DAT;1	10637/10640	22-JUN-1990 13:54:25.83
D82125.DAT;1	12999/13000	22-JUN-1990 14:08:10.49
D82126.DAT;1	5830/5832	22-JUN-1990 14:20:00.34
D82127.DAT;1	8670/8672	22-JUN-1990 14:29:44.02
D82128.DAT;1	10273/10280	22-JUN-1990 14:42:10.81
D82129.DAT;1	10963/10968	22-JUN-1990 14:54:30.39
D82130.DAT;1	9955/9960	22-JUN-1990 15:06:18.54
D82131.DAT;1	9974/9976	22-JUN-1990 15:17:10.03
D82132.DAT;1	11977/11984	22-JUN-1990 15:29:32.81
D82133.DAT;1	7979/7984	22-JUN-1990 15:41:19.15
D82134.DAT;1	11074/11080	25-JUN-1990 15:58:22.98
D82135.DAT;1	10970/10976	25-JUN-1990 16:11:07.33
D82136.DAT;1	13744/13744	25-JUN-1990 16:25:17.13
D82137.DAT;1	10361/10368	25-JUN-1990 16:39:03.74
D82138.DAT;1	15000/15000	25-JUN-1990 16:54:29.42
D82139.DAT;1	13301/13304	25-JUN-1990 17:11:40.59
D82140.DAT;1	12829/12832	25-JUN-1990 17:27:43.18
D82141.DAT;1	15090/15096	25-JUN-1990 17:44:28.41

D82142.DAT;1	11380/11384	25-JUN-1990	18:00:14.74
D82143.DAT;1	12866/12872	25-JUN-1990	18:14:40.88
D82144.DAT;1	11534/11536	25-JUN-1990	18:29:43.51
D82145.DAT;1	13259/13264	25-JUN-1990	18:44:12.40
D82146.DAT;1	10523/10528	25-JUN-1990	18:59:20.99
D82147.DAT;1	14162/14168	25-JUN-1990	19:14:29.72
D82148.DAT;1	11777/11784	25-JUN-1990	19:31:01.16
D82149.DAT;1	11812/11816	25-JUN-1990	19:45:31.44
D82150.DAT;1	10896/10896	25-JUN-1990	19:58:27.40
D82151.DAT;1	11020/11024	25-JUN-1990	21:08:55.46
D82152.DAT;1	13636/13640	25-JUN-1990	21:22:26.03
D82153.DAT;1	10512/10512	25-JUN-1990	21:36:29.15
D82154.DAT;1	10384/10384	25-JUN-1990	21:49:19.40
D82155.DAT;1	9401/9408	26-JUN-1990	14:44:13.66
D82156.DAT;1	11560/11560	26-JUN-1990	14:56:14.26
D82157.DAT;1	12426/12432	26-JUN-1990	15:09:30.67
D82158.DAT;1	12204/12208	26-JUN-1990	15:23:06.62
D82159.DAT;1	10700/10704	26-JUN-1990	15:33:35.41
D82160.DAT;1	9967/9968	26-JUN-1990	15:43:14.66
D82161.DAT;1	9004/9008	26-JUN-1990	15:52:08.44
D82162.DAT;1	10673/10680	26-JUN-1990	16:02:10.16
D82163.DAT;2	13672/13672	26-JUN-1990	22:44:28.48
D82163.DAT;1	13672/13672	26-JUN-1990	16:16:02.85
D82164.DAT;2	6313/6320	26-JUN-1990	22:54:52.23
D82164.DAT;1	6313/6320	26-JUN-1990	16:25:08.15
D82165.DAT;2	10629/10632	26-JUN-1990	23:04:15.20
D82165.DAT;1	10629/10632	26-JUN-1990	16:33:48.90
D82166.DAT;2	11364/11368	26-JUN-1990	23:16:17.90
D82166.DAT;1	11364/11368	26-JUN-1990	16:44:46.54
D82167.DAT;2	11172/11176	26-JUN-1990	23:28:28.47
D82167.DAT;1	11172/11176	26-JUN-1990	16:57:05.98
D82168.DAT;2	13960/13960	26-JUN-1990	23:41:45.28
D82168.DAT;1	13960/13960	26-JUN-1990	17:09:53.02
D82169.DAT;2	13856/13856	26-JUN-1990	23:56:38.65
D82169.DAT;1	13856/13856	26-JUN-1990	17:22:39.47
D82170.DAT;1	10479/10480	27-JUN-1990	10:55:14.49
D82171.DAT;1	9164/9168	27-JUN-1990	11:05:28.32
D82172.DAT;1	8585/8592	27-JUN-1990	11:15:04.75
D82173.DAT;1	6195/6200	27-JUN-1990	11:23:03.89
D82174.DAT;1	9078/9080	27-JUN-1990	11:31:43.44
D82175.DAT;1	8815/8816	27-JUN-1990	11:41:06.16
D82176.DAT;1	4558/4560	27-JUN-1990	11:48:06.00
D82177.DAT;1	7613/7616	27-JUN-1990	11:54:14.78
D82178.DAT;1	13774/13776	27-JUN-1990	12:05:49.37
D82179.DAT;1	10871/10872	27-JUN-1990	12:17:53.74
D82180.DAT;1	10990/10992	27-JUN-1990	12:28:53.45
D82181.DAT;1	6709/6712	27-JUN-1990	12:37:55.94
D82182.DAT;1	8333/8336	27-JUN-1990	12:46:17.73
D82183.DAT;1	7742/7744	27-JUN-1990	12:55:32.47
D82184.DAT;1	4116/4120	27-JUN-1990	13:02:07.80
D82185.DAT;1	8220/8224	27-JUN-1990	13:09:22.47
D82186.DAT;1	6735/6736	27-JUN-1990	13:17:25.43
D82187.DAT;1	7023/7024	27-JUN-1990	13:24:18.81
D82188.DAT;1	6565/6568	27-JUN-1990	13:31:49.25
D82189.DAT;1	10422/10424	27-JUN-1990	13:40:41.62
D82190.DAT;1	9733/9736	27-JUN-1990	13:51:14.25
D82191.DAT;1	5947/5952	27-JUN-1990	13:58:54.70
D82192.DAT;1	6573/6576	27-JUN-1990	14:05:46.65
D82193.DAT;1	7884/7888	27-JUN-1990	14:12:56.61
D82194.DAT;1	7354/7360	27-JUN-1990	14:21:01.28

D82195.DAT;1	5991/5992	27-JUN-1990 14:28:16.15
D82196.DAT;1	9548/9552	27-JUN-1990 14:36:37.32
D82197.DAT;1	8496/8496	27-JUN-1990 15:46:28.37
D82198.DAT;1	9137/9144	27-JUN-1990 15:55:02.18
D82199.DAT;1	7746/7752	27-JUN-1990 16:02:59.52
D82200.DAT;1	10238/10240	27-JUN-1990 16:12:21.61
D82201.DAT;1	9263/9264	27-JUN-1990 16:22:31.57
D82202.DAT;1	10763/10768	27-JUN-1990 16:31:57.17
D82203.DAT;1	9982/9984	27-JUN-1990 16:41:33.30
D82204.DAT;1	10200/10200	27-JUN-1990 16:50:59.52
D82205.DAT;1	10031/10032	27-JUN-1990 17:00:24.53
D82206.DAT;1	7887/7888	27-JUN-1990 17:09:46.44
D82207.DAT;1	9285/9288	27-JUN-1990 17:19:09.26
D82208.DAT;1	9995/10000	27-JUN-1990 17:29:09.63
D82209.DAT;1	9226/9232	27-JUN-1990 17:39:27.93
D82210.DAT;1	8710/8712	27-JUN-1990 17:49:13.82
D82211.DAT;1	10269/10272	27-JUN-1990 18:00:01.80
D82212.DAT;1	9001/9008	2-JUL-1990 15:51:19.25
D82213.DAT;1	8006/8008	2-JUL-1990 16:04:34.42
D82214.DAT;1	9547/9552	2-JUL-1990 16:13:58.36
D82215.DAT;1	8723/8728	2-JUL-1990 16:27:05.87
D82216.DAT;1	10623/10624	2-JUL-1990 16:38:21.22
D82217.DAT;1	4808/4808	2-JUL-1990 16:46:32.65
D82218.DAT;1	6284/6288	2-JUL-1990 16:52:42.76
D82219.DAT;1	6099/6104	2-JUL-1990 16:59:49.37
D82220.DAT;1	6471/6472	2-JUL-1990 17:06:47.03
D82221.DAT;1	7539/7544	2-JUL-1990 17:14:25.72
D82222.DAT;1	9213/9216	2-JUL-1990 22:13:52.75
D82223.DAT;1	9281/9288	2-JUL-1990 22:24:05.06
D82224.DAT;1	7905/7912	2-JUL-1990 22:33:52.64
D82225.DAT;1	8031/8032	2-JUL-1990 22:43:28.86
D82226.DAT;1	6099/6104	2-JUL-1990 22:51:46.91
D82227.DAT;1	7186/7192	2-JUL-1990 22:58:53.45
D82228.DAT;1	5538/5544	2-JUL-1990 23:05:35.85
D82229.DAT;1	5053/5056	2-JUL-1990 23:11:15.30
D82230.DAT;1	5342/5344	2-JUL-1990 23:16:54.47
D82231.DAT;1	6777/6784	2-JUL-1990 23:23:24.03
D82232.DAT;1	2125/2128	2-JUL-1990 23:27:56.64
D82233.DAT;1	2566/2568	2-JUL-1990 23:30:35.58
D82234.DAT;1	6269/6272	2-JUL-1990 23:35:25.89
D82235.DAT;1	4288/4288	2-JUL-1990 23:40:59.91
D82236.DAT;1	5634/5640	2-JUL-1990 23:46:20.24
D82237.DAT;1	7788/7792	2-JUL-1990 23:53:32.53
D82238.DAT;1	8400/8400	3-JUL-1990 00:02:04.94
D82239.DAT;1	6847/6848	3-JUL-1990 00:11:25.41
D82240.DAT;1	4324/4328	3-JUL-1990 00:17:31.91
D82241.DAT;1	5932/5936	3-JUL-1990 00:23:10.53
D82242.DAT;1	5811/5816	3-JUL-1990 00:29:31.23
D82245.DAT;1	6685/6688	3-JUL-1990 15:40:16.11
D82246.DAT;1	8797/8800	3-JUL-1990 15:50:04.95
D82247.DAT;1	8420/8424	3-JUL-1990 16:00:51.15
D82248.DAT;1	8359/8360	3-JUL-1990 16:11:24.69
D82249.DAT;1	8961/8968	3-JUL-1990 16:22:01.59
D82250.DAT;1	8860/8864	3-JUL-1990 16:32:51.38
D82251.DAT;1	7834/7840	3-JUL-1990 16:42:48.72
D82252.DAT;1	8259/8264	3-JUL-1990 16:52:16.72
D82253.DAT;1	7688/7688	3-JUL-1990 17:02:09.44
D82254.DAT;1	8500/8504	3-JUL-1990 17:12:15.41
D82255.DAT;1	7686/7688	3-JUL-1990 17:21:49.09
D82256.DAT;1	6401/6408	5-JUL-1990 08:50:29.44

D82257.DAT;1	7429/7432	5-JUL-1990 08:58:58.10
D82258.DAT;1	6593/6600	5-JUL-1990 09:06:49.09
D82259.DAT;1	5629/5632	5-JUL-1990 09:13:41.93
D82260.DAT;1	8373/8376	5-JUL-1990 09:22:21.30
D82261.DAT;1	8984/8984	5-JUL-1990 09:31:57.12
D82262.DAT;1	7993/8000	5-JUL-1990 09:41:36.62
D82263.DAT;1	7807/7808	5-JUL-1990 09:51:06.01
D82264.DAT;1	8575/8576	5-JUL-1990 10:00:32.25
D82265.DAT;1	6477/6480	5-JUL-1990 10:12:26.60
D82266.DAT;1	9354/9360	5-JUL-1990 10:23:02.53
D82267.DAT;1	8219/8224	5-JUL-1990 10:32:25.49
D82268.DAT;1	9587/9592	5-JUL-1990 10:42:57.60
D82269.DAT;1	10551/10552	5-JUL-1990 10:55:18.45
D82270.DAT;1	6606/6608	5-JUL-1990 11:07:46.22
D82271.DAT;1	8284/8288	5-JUL-1990 11:18:45.55
D82272.DAT;1	9953/9960	5-JUL-1990 11:41:28.19
D82273.DAT;1	8462/8464	5-JUL-1990 11:53:03.79
D82274.DAT;1	7727/7728	5-JUL-1990 12:02:40.67
D82275.DAT;1	8758/8760	5-JUL-1990 12:12:37.20
D82276.DAT;1	5360/5360	5-JUL-1990 12:21:12.97
D82277.DAT;1	8213/8216	5-JUL-1990 12:29:47.92
D82278.DAT;1	8472/8472	5-JUL-1990 12:40:08.49
D82279.DAT;1	8176/8176	5-JUL-1990 12:50:05.72
D82280.DAT;1	7066/7072	5-JUL-1990 12:59:17.89
D82281.DAT;1	9580/9584	5-JUL-1990 13:09:19.71

Total of 177 files, 1629043/1629640 blocks.

Grand total of 3 directories, 192 files, 1629464/1630112 blocks.

DEB1_0003R

Directory \$1\$DUB3:[0000000]

000000.DIR;1	1/8	5-JUL-1990 13:49:24.03
BACKUP.SYS;1	0/0	5-JUL-1990 13:49:24.03
BADBLK.SYS;1	8/8	5-JUL-1990 13:49:24.03
BADLOG.SYS;1	0/0	5-JUL-1990 13:49:24.03
BITMAP.SYS;1	63/64	5-JUL-1990 13:49:24.03
CONFIG.SYS;1	1/8	5-JUL-1990 13:49:34.32
CONTIN.SYS;1	0/0	5-JUL-1990 13:49:24.03
CORIMG.SYS;1	0/0	5-JUL-1990 13:49:24.03
INDEXF.SYS;1	288/288	5-JUL-1990 13:49:24.03
MAGB.DIR;1	1/8	5-JUL-1990 13:49:31.20
VOLSET.SYS;1	0/0	5-JUL-1990 13:49:24.03

Total of 11 files, 362/384 blocks.

Directory \$1\$DUB3:[MAGB]

DATA.DIR;1	8/24	5-JUL-1990 13:49:33.32
FORMAT.SFD;2	3/8	12-MAR-1992 10:49:05.19
READ_ME_FIRST.DAT;1	11/16	17-JUN-1992 14:06:28.92
VOLDESC.SFD;13	39/40	17-JUN-1992 16:29:09.31

Total of 4 files, 61/88 blocks.

Directory \$1\$DUB3:[MAGB.DATA]

D82282.DAT;1	9110/9112	5-JUL-1990 14:08:31.39
D82283.DAT;1	7877/7880	5-JUL-1990 14:20:43.12
D82284.DAT;1	10276/10280	5-JUL-1990 14:31:57.46
D82285.DAT;1	9845/9848	5-JUL-1990 14:44:23.00
D82286.DAT;1	7423/7424	5-JUL-1990 14:59:04.36
D82287.DAT;1	11273/11280	5-JUL-1990 15:11:30.36
D82288.DAT;1	10455/10456	5-JUL-1990 15:30:02.93
D82289.DAT;1	7397/7400	5-JUL-1990 15:43:40.99
D82290.DAT;1	9523/9528	5-JUL-1990 15:58:47.12
D82291.DAT;1	11458/11464	5-JUL-1990 16:17:20.13
D82292.DAT;1	9328/9328	5-JUL-1990 16:31:00.75
D82293.DAT;1	10507/10512	5-JUL-1990 16:44:26.93
D82294.DAT;1	8713/8720	5-JUL-1990 16:56:14.13
D82295.DAT;1	9217/9224	5-JUL-1990 17:07:16.26
D82296.DAT;1	9597/9600	5-JUL-1990 17:18:52.43
D82297.DAT;1	6837/6840	5-JUL-1990 17:28:59.30
D82298.DAT;1	9013/9016	5-JUL-1990 17:39:04.83
D82299.DAT;1	10512/10512	5-JUL-1990 17:51:52.14
D82300.DAT;1	6276/6280	5-JUL-1990 18:03:01.35
D82301.DAT;1	10774/10776	5-JUL-1990 18:13:17.16
D82302.DAT;1	10402/10408	5-JUL-1990 18:26:05.77
D82303.DAT;1	11681/11688	5-JUL-1990 18:39:37.60
D82304.DAT;1	9385/9392	5-JUL-1990 18:51:44.25
D82305.DAT;1	10816/10816	5-JUL-1990 19:46:13.81
D82306.DAT;1	9983/9984	5-JUL-1990 19:58:47.31
D82307.DAT;1	10761/10768	5-JUL-1990 20:12:53.56
D82308.DAT;1	9219/9224	5-JUL-1990 20:25:05.38
D82309.DAT;1	10540/10544	5-JUL-1990 20:37:27.00
D82310.DAT;1	9736/9736	5-JUL-1990 20:49:45.52
D82311.DAT;1	11680/11680	5-JUL-1990 21:03:15.74
D82312.DAT;1	10570/10576	5-JUL-1990 21:17:41.50
D82313.DAT;1	11944/11944	5-JUL-1990 21:31:37.43
D82314.DAT;1	11526/11528	5-JUL-1990 21:44:14.06

DEB1_0003A

D82315.DAT:1	9621/9624	5-JUL-1990 21:55:20.59
D82316.DAT:1	11970/11976	5-JUL-1990 22:07:12.02
D82317.DAT:1	5429/5432	5-JUL-1990 22:16:34.04
D82318.DAT:1	9317/9320	5-JUL-1990 22:24:34.96
D82319.DAT:1	7740/7744	5-JUL-1990 22:33:33.19
D82320.DAT:1	10869/10872	5-JUL-1990 22:43:26.93
D82321.DAT:1	11571/11576	5-JUL-1990 22:55:23.47
D82322.DAT:1	12545/12552	5-JUL-1990 23:08:27.32
D82323.DAT:1	11061/11064	5-JUL-1990 23:20:52.13
D82324.DAT:1	9795/9800	5-JUL-1990 23:31:33.72
D82325.DAT:1	12097/12104	6-JUL-1990 10:02:12.99
D82326.DAT:1	12065/12072	6-JUL-1990 10:15:39.05
D82327.DAT:1	10536/10536	6-JUL-1990 10:27:54.11
D82328.DAT:1	15396/15400	6-JUL-1990 10:42:03.70
D82329.DAT:1	14066/14072	6-JUL-1990 10:58:00.77
D82330.DAT:1	13247/13248	6-JUL-1990 11:13:02.99
D82331.DAT:1	12053/12056	6-JUL-1990 11:26:31.51
D82332.DAT:1	13161/13168	6-JUL-1990 11:39:53.29
D82333.DAT:1	15152/15152	6-JUL-1990 11:54:22.44
D82334.DAT:1	11107/11112	6-JUL-1990 12:07:55.22
D82335.DAT:1	8112/8112	6-JUL-1990 12:18:08.08
D82336.DAT:1	9654/9656	6-JUL-1990 12:27:42.96
D82337.DAT:1	7873/7880	6-JUL-1990 12:37:06.51
D82338.DAT:1	12732/12736	6-JUL-1990 12:47:36.19
D82339.DAT:1	12681/12688	6-JUL-1990 13:00:50.42
D82340.DAT:1	10904/10904	6-JUL-1990 13:13:19.90
D82341.DAT:1	8410/8416	6-JUL-1990 13:23:31.45
D82342.DAT:1	12414/12416	6-JUL-1990 13:34:50.66
D82343.DAT:1	10033/10040	6-JUL-1990 14:28:27.97
D82344.DAT:1	11023/11024	6-JUL-1990 14:45:26.11
D82345.DAT:1	11631/11632	6-JUL-1990 15:01:35.54
D82346.DAT:1	11632/11632	6-JUL-1990 15:15:18.42
D82347.DAT:1	10325/10328	6-JUL-1990 15:27:12.25
D82348.DAT:1	7115/7120	6-JUL-1990 15:36:38.49
D82349.DAT:1	10787/10792	6-JUL-1990 15:46:34.12
D82350.DAT:1	9718/9720	6-JUL-1990 15:57:38.54
D82351.DAT:1	5881/5888	6-JUL-1990 16:05:43.22
D82352.DAT:1	7875/7880	6-JUL-1990 16:13:13.20
D82353.DAT:1	9600/9600	6-JUL-1990 16:22:36.25
D82354.DAT:1	4552/4552	6-JUL-1990 16:29:49.76
D82355.DAT:1	5707/5712	6-JUL-1990 16:35:20.79
D82356.DAT:1	4629/4632	6-JUL-1990 16:40:44.18
D82357.DAT:1	5765/5768	6-JUL-1990 16:46:07.65
D82358.DAT:1	1652/1656	6-JUL-1990 16:50:02.53
D82359.DAT:1	4836/4840	6-JUL-1990 16:53:44.85
D82360.DAT:1	5462/5464	6-JUL-1990 16:59:30.62
D82361.DAT:1	8956/8960	6-JUL-1990 17:07:27.26
D82362.DAT:1	7724/7728	6-JUL-1990 17:16:14.72
D82363.DAT:1	8702/8704	6-JUL-1990 17:24:51.29
D82364.DAT:1	6628/6632	6-JUL-1990 17:32:46.49
D82365.DAT:1	7707/7712	6-JUL-1990 17:40:40.78
D83001.DAT:1	5454/5456	8-JUL-1990 15:05:21.34
D83002.DAT:1	8735/8736	8-JUL-1990 15:14:21.07
D83003.DAT:1	4809/4816	8-JUL-1990 15:22:08.65
D83004.DAT:1	4461/4464	8-JUL-1990 15:27:33.89
D83005.DAT:1	9561/9568	8-JUL-1990 15:36:47.52
D83006.DAT:1	6543/6544	8-JUL-1990 15:45:58.91
D83007.DAT:1	9359/9360	8-JUL-1990 15:55:38.52
D83008.DAT:1	8281/8288	8-JUL-1990 16:05:15.47
D83009.DAT:1	5151/5152	8-JUL-1990 16:13:02.77

DEB1_0003A

D83010.DAT;1	2710/2712	8-JUL-1990 16:18:01.55
D83011.DAT;1	6174/6176	8-JUL-1990 16:23:34.69
D83012.DAT;1	6331/6336	8-JUL-1990 16:30:46.79
D83013.DAT;1	8090/8096	8-JUL-1990 16:40:01.97
D83014.DAT;1	4215/4216	8-JUL-1990 16:46:20.10
D83015.DAT;1	9288/9288	8-JUL-1990 16:53:49.99
D83016.DAT;1	6860/6864	8-JUL-1990 17:02:09.55
D83017.DAT;1	8834/8840	8-JUL-1990 17:11:08.40
D83018.DAT;1	8225/8232	8-JUL-1990 17:21:38.85
D83019.DAT;1	8557/8560	8-JUL-1990 17:31:08.27
D83020.DAT;1	9037/9040	8-JUL-1990 17:42:00.51
D83021.DAT;1	9292/9296	8-JUL-1990 17:50:59.81
D83022.DAT;1	11084/11088	8-JUL-1990 18:01:06.88
D83023.DAT;1	7599/7600	8-JUL-1990 18:11:33.80
D83024.DAT;1	7572/7576	8-JUL-1990 18:20:10.95
D83025.DAT;1	9339/9344	8-JUL-1990 18:29:50.57
D83026.DAT;1	7854/7856	8-JUL-1990 18:39:22.88
D83027.DAT;1	8116/8120	8-JUL-1990 18:48:23.18
D83028.DAT;1	6809/6816	8-JUL-1990 18:56:34.01
D83029.DAT;1	7418/7424	8-JUL-1990 22:03:33.16
D83030.DAT;1	5973/5976	8-JUL-1990 22:09:51.20
D83031.DAT;1	5712/5712	8-JUL-1990 22:15:31.09
D83032.DAT;1	5582/5584	8-JUL-1990 22:20:58.42
D83033.DAT;1	4759/4760	8-JUL-1990 22:25:54.28
D83034.DAT;1	3536/3536	8-JUL-1990 22:29:50.29
D83035.DAT;1	2836/2840	8-JUL-1990 22:32:58.05
D83036.DAT;1	4571/4576	8-JUL-1990 22:36:43.39
D83037.DAT;1	3293/3296	8-JUL-1990 22:40:30.72
D83038.DAT;1	5076/5080	8-JUL-1990 22:44:43.68
D83039.DAT;1	672/672	8-JUL-1990 22:47:16.64
D83040.DAT;1	4074/4080	8-JUL-1990 22:49:57.03
D83041.DAT;1	5671/5672	8-JUL-1990 22:54:45.73
D83042.DAT;1	3658/3664	8-JUL-1990 22:59:17.47
D83043.DAT;1	5919/5920	8-JUL-1990 23:04:06.94
D83044.DAT;1	2663/2664	8-JUL-1990 23:08:11.44
D83045.DAT;1	3644/3648	8-JUL-1990 23:11:21.16
D83046.DAT;1	5817/5824	8-JUL-1990 23:16:05.36
D83047.DAT;1	1654/1656	8-JUL-1990 23:19:31.59

Total of 131 files, 1104040/1104496 blocks.

Grand total of 3 directories, 146 files, 1104463/1104968 blocks.

VMS Dump of file \$1\$DUB62:[MAGB.DATA]D81227.DAT:5 on 14-APR-1994 16:49:11.97
File ID (82,1,0) End of file block 2735 / Allocated 2736

[REDACTED] (00000001), 16 (0010) bytes

C828C71F 654B484C 16484721 0809F364 d6..!GH.LHKe.Ç(E..... 000000

[REDACTED] (00000002), 16 (0010) bytes

70ACC775 73FEC7F4 E2C447FA 0809FD28 (ÿ..üGAA&Ç€suÇ?p..... 000000

[REDACTED] (00000003), 16 (0010) bytes

B9E0C6F3 7698C774 F70847BB 0809FF99»G.etÇ.v6Eà¹..... 000000

Record number [REDACTED] (000155CC), 16 (0010) bytes

6E40C5F5 AD764823 C2E046FD 2B0F739D .s.+ÿF&A#Hv?8A@n..... 000000

Record number [REDACTED] (000155CD), 16 (0010) bytes

6E80C5F5 B0624823 AAE846FD 2B0F760E .v.+ÿFè@#Hb*8A.n..... 000000

Record number [REDACTED] (000155CE), 16 (0010) bytes

6E80C5F5 B0624823 AAE846FD 2B0F787F .x.+ÿFè@#Hb*8A.n..... 000000

Record number [REDACTED] (000155CF), 16 (0010) bytes

6EC2C5F5 B34F4823 92E846FD 2B0F7AF0 Sz.+ÿFè.#HD*8AAn..... 000000

This dump was produced using the commands:

```
$ dump/records=(start:1,count:3) $1$dub62:[magb.data]d81227.dat
$ dump/records=(start:87500,count:4) $1$dub62:[magb.data]d81227.dat
```

To find time span of day:
1) Convert 1st word to decimal
2) Multiply by 10^3 - use result for input to step 3
3) execute program MSEC (at the
prompt, enter msec), to translate
into HH:MM:SS.sss format.

DE-B
81-070B-09C
Software Tape

DYNAMICS EXPLORER 2

LANG SOFTWARE TAPE

81-070B-09C **SPIO-00288**

THIS DATASET CONSIST OF 1 MAGNETIC TAPE. THE TAPE IS 9-TRACK, 6250 BPI, VAX LABELED, WITH A LABEL NAME OF "LANG". THIS SOFTWARE TAPE DESCRIBES THE LANG DATA TAPES(81-070B-09D) AND THE SOFTWARE FOR USING THE DATA. A LIST OF THE TAPES DIRECTORIES HAVE BEEN INCLUDED. THE D AND THE C NUMBER IS LISTED BELOW.

D#	C#	FILES
D- <u>107571</u>	C- <u>031455</u>	<u>10</u>

This is the LANG format file

CCSDYDNM000200NSSD0005SMRK0001

TYPE OF FILE NAME: LANG I-FILES

FILE ATTRIBUTES:

File records are 35 (4-byte) words in length (note, RECL = 35) and cover 8 seconds (16 half-sec. samples) of data. The first word is overhead for the keyed-indexed organization. The second word is universal time in msec. of the first half-second of data in the record. The remaining 33 words are the data, in a packed integer form, covering 16 half-second-resolution samples that begin at that UT (call them DATA(1)-DATA(33)). Thus a typical initial (keyed) READ statement is

```
READ(1,KEYGE=SOME_UT,ERR=label12) ITIME,(IDATA(J),J=1,33)
```

This will read the first record with ITIME>=SOME_UT (both times being in msec). Subsequent READ statements can read sequentially by removing the phrase KEYGE=SOME_UT, possibly adding END=label3.

The 3rd through 35th words of the record comprise the data. The 3rd word (IDATA(1) above) is satellite specific data (IMODE(1-2), IDED, IBIAS, ICMD, IANA, and ION) packed as follows

```
((((IMODE(1)*4+IMODE(2))*4+IDED)*4+IBIAS)*2+ICMD)*4+IANA)*2+ION
```

As implied, these seven data are 1 or 2 bit fields.

IMODE(1:2)	2 bits, mode of each of the two probes
= 0	adapt
= 1	step
= 2	ion hold
= 3	electron hold
IDED	2 bits, which probe is dedicated
IBIAS	2 bits, indicates the extra bias potential applied to the sweep, negative, positive, none.
ICMD	1 bit, command, not used
IANA	2 bits, which probe is analog
ION	1 bit, probe on switch

The 4th through 35th words of the record are paired up (i.e. IDATA(2) and IDATA(3), IDATA(4) and IDATA(5), ..., IDATA(32) and IDATA(33)) so that the 16 pairs cover the 16 half-seconds of data in the 8-second interval. These pairs are packed as follows:

```
IDATA(2i)=((DV(1)*1024)+DV(2))*1024+NI(1)
    +1          {if NI(1) is negative}
    +1024       {if DV(2) is negative}
    +1024**2    {if DV(1) is negative}
```

where i=1,2,3,...,16

```
IDATA(2i+1)=((NI(2)*256)+IV)*1024+N
    +1          {if N=max(NE(1),NE(2)) is negative}
    +1024       {if IV=max(V(1),V(2)) is negative}
    +1024*256   {if NI(2) is negative}
```

where i=1,2,3,...,16

These are 8 or 10 bit data fields

V(1:2)	8 bits,	VA start of sweep potential
DV(1:2)	10 bits,	VA slope for this sweep, Te of last sweep
NI(1:2)	10 bits,	Current detector range used in this sweep, 2 bits for decade range, 8 bits for vernier range
NE(1:2)	10 bits,	decade range (2 bits) and curve amplitude (8 bits) giving electron current

The subroutines INFL_CONVER and INF_VGET are sample algorithms for, respectively, the unpacking and translation of this array (DATA) of packed integers. This software is on the LANG description tape LANGDESC and is also available upon request from the LANG contact person Walter R. Hoegy over SPAN DEIO::HOEGY, DE614::HOEGY.

LOGICAL_RECORD_LENGTH: 35 bytes

TYPE_OF_FILE_DESCRIPTION:

Files are indexed organization using time in milliseconds as the key. A typical OPEN statement is

```
OPEN(UNIT=1,NAME='disk:[directory]Iyyddd.DAT',TYPE='OLD',
      ACCESS='KEYED',KEY=(1:4:INTEGER),RECL=35,READONLY,
      FORM='UNFORMATTED',ORGANIZATION='INDEXED',ERR=label1)
```

File records are 35 (4-byte) words in length (note RECL above) and cover 8 seconds (16 half-sec. samples) of data. The first word is overhead for the keyed-indexed organization. The second word is universal time in msec. of the first half-second of data in the record. The remaining 33 words are the data, in a packed integer form, covering 16 half-second-resolution samples that begin at that UT (call them DATA(1)-DATA(33)).

FILE_STRUCTURE:

I-files are written as VAX unformatted sequential ,keyed-indexed files.

FORMAT_OF_THE_LOGICAL_RECORD:

SEE FILE ATTRIBUTES:

FIELD_RELATIONSHIPS:

SEE FILE ATTRIBUTES:

CCSDYDNM000200NSSD0005EMRK0001

This is the LANG tape description file, TAPEDESC.LANG

This tape, the LANG DESCRIPTION TAPE -- labeled LANG --, is being supplied to the NSSDC well in advance of the delivery of the data tapes. In addition to containing all LANG software, catalogs, FORTRAN source files and com files, this description tape is documented (contains documentation) to insure that the various programs will be compiled and linked appropriately to produce the required geophysical data.

This tape contains the following files:
(size listed is approximate size on VAX disk in blocks)

Catalog files:

ILANG.CAT;2 261

COM files:

PROTAP.COM;14 4

Data files:

BADLANG.DAT;1 2

LANGTAPELIST.DAT;1 98

SPINNERSLANG.DAT;1 17

FORTRAN source files:

LANGSUBROUTINES.FOR;7 23

EXAMLANG.FOR;7 6

Documentation file:

TAPEDESC.LANG;10 10

NSSDC SFD files:

FORMAT.SFD;2 9

VOLDESC.SFD;12 38

Total of 10 files, 468 blocks.

DESCRIPTION_OF_CATALOG_FILES

The catalog file ILANG.CAT contains a list of the date and the start and stop times in milliseconds of all TM segments that have been processed into LANG I-files. This catalog can be searched using the VAX editor EDT to find whether a given date has data and if it has data, what are the start and stop times of the data.

DESCRIPTION_OF_COM_FILES

The only com file is PROTAP.COM which is used only to promote the data.

To promote data from a tape use PROTAP.COM

(1) To promote all data from the tape answer

'1ST DAY TO BE PROMOTED' with the yyddd of the tape label
and 'LAST DAY TO BE PROMOTED' with the same yyddd+99
(i.e. 82000 and 82099 for tape I82000 and even
82300 and 82399 for tape I82300)

(2) To promote less than the entire tape answer

'1ST DAY...' and 'LAST DAY...' as per required data
(i.e. 82322 and 82345 for days 82322-82345)

Once the data is online, use EXAMLANG.EXE to read inflight data into a formatted file or modify EXAMLANG.FOR for your particular needs.

DESCRIPTION_OF_DATA_FILES

The data file BADLANG.DAT contains a list of dates and start and stop times in HHMMSS format (hour minute second) when the summary plots showed some problem with the LANG data. The data is considered unusable during these times. The cause is unknown, but may be due to anomalous operation of the instrument or an anomaly in the data transmission. These times were used to delete bad data from the unified abstract database. There may not be data segments in ILANG.CAT corresponding to these times; when such data segments exist, do not process those times.

The data file SPINNERSLANG.DAT contains a list of dates and start and stop times in HHMMSS format when the spacecraft was spinning. This data is good for diagnostic purposes by the LANG group only and should therefore be considered in the same category as the data in BADLANG.DAT. Do not use data for the times listed in SPINNERSLANG.DAT.

DESCRIPTION_OF_FORTRAN_SOURCE_FILES

EXAMLANG is the driver which interactively opens and reads the I-files, and then writes the LANG parameters: Te Np (plasma density) and Vs (satellite potential) to a file or to the screen. This file is a prototype for the user's own program for processing the data; it demonstrates how to call the subroutines and functions contained in LANGSUBROUTINES.FOR. EXAMLANG prompts for the date and start and stop time (in seconds) for the data which is written in formatted output to a file of the user's choice or to unit 6, the user's terminal. EXAMLANG.FOR calls the subroutine INFL_READ and the function FNENI.

The subroutines contained in LANGSUBROUTINES.FOR are: INFL_READ, INFL_CONVERT, and INFL_VGET. INFL_READ opens the appropriate data file (I-file with name IYYDDD.dat, where YYDDD is the date) and reads the packed integer data, and places the unpacked (real & integer) data in an array for the calling program (i.e. EXAMLANG). INFL_CONVERT unpacks the integer data and applies INFL_VGET to transform the integer data (as stored in TM) into the geophysical parameters of temperature, density, and satellite potential. The functions FNE and FNI evaluate Ne and Ni from the calculated current and potential.

SUMMARY_OF_HOW_TO_USE_PROGRAMS

The programs needed are: (1) PROTAP.COM and (2) EXAMLANG.EXE or EXAMLANG.FOR, and LANGSUBROUTINES.FOR (to be compiled and linked appropriately). Once linked EXAMLANG.EXE looks for the I-file(s) in SYS\$MAF and tries to write out any saved data file in SYS\$PROC therefore the two following assignments need to be made prior to running EXAMLANG or using ROTAP.COM.

```
ASSIGN <your I-file destination directory> SYS$MAF  
ASSIGN <saved data destination directory> SYS$PROC
```

Now you are ready to run. Good luck.

The LANG volume description file.

This tape, the LANG DESCRIPTION TAPE -- LANGDESC --, will be supplied to the NSSDC well in advance of the delivery of the data tapes. In addition to containing all LANG software, catalogs, FORTRAN source files and com files, this description tape will be documented (contains documentation) to insure that the various programs will be compiled and linked appropriately in producing the required geophysical data.

CCSDXZLM0001SMARK001CCSDXVNM0002SMRK0001

LOG_VOL_IDENT: USANASANSSDDEB9_0001

LOG_VOL_CLOSING_DATE: 1989-10-31

LOG_VOL_FILE_STRUCTURE: FILES-11

TAPE_DENSITY=6250 BPI

TAPE_TRACKS=9

TAPE_LENGTH=2400 INCHES

COMPUTER_MFGR: DIGITAL EQUIPMENT CORPORATION

OPERATING_SYSTEM: MICROVMS 4.7

COMPUTER_SYSTEM: MICRO VAX II

TECHNICAL_CONTACT: DR. W. R. HOEGY

CODE 614

NASA/GSFC

GREENBELT, MD 20771

PHONE: 301-286-3837

SPAN: DE614:::, DEIO::HOEGY, PACF::HOEGY

PREV_VOL_IDENT: NONE

CCSDXVNM0002EMRK0001CCSDXKNM0002SMRK0003

DATA_SET_NAME: LANG ELECTRON DENSITY AND TEMPERATURE

DATA_SOURCES: DYNAMICS EXPLORER B, LANGMUIR PROBE (LANG)

INVESTIGATOR_CONTACT: MR. LARRY H. BRACE

CODE 614

NASA/GSFC

GREENBELT, MD 20771

PHONE: 303-286-8575

SPAN: DE614:::HOEGY

SOURCE_CHARACTERISTICS:

A. DESCRIPTION_OF_SPACECRAFT:

The Dynamics Explorer 2 spacecraft was one of two satellites launched for the Dynamics Explorer program. The two spacecraft were launched together into coplanar polar orbits for the purpose of studying coupling between the magnetosphere, ionosphere, and the atmosphere. The DE-2 spacecraft was placed in a low elliptical orbit whereas the DE-1 orbit was highly elliptical. Instruments aboard the DE-2 spacecraft were: magnetometer, vector electric field instrument, neutral atmosphere composition spectrometer, wind and temperature spectrometer, Fabry-Perot interferometer, ion drift meter, retarding potential analyzer, low altitude plasma instrument, and Langmuir probe.

B. ORBIT_INFORMATION:

Because the Delta launch vehicle did not complete a full burn the DE-2 satellite was placed in a lower than anticipated polar orbit, initially 1012 by 309 km. The orbital period was 98 min. The DE-1 and DE-2 satellites were launched by the same vehicle so that their orbits would be coplanar, all owing occasional two-point measurements along magnetic field lines. The DE-2 spacecraft spun once per orbit and the spin axis was perpendicular to the orbital plane so that one axis of the satellite always was aligned with the center of the earth.

C. PERFORMANCE:

The DE-2 spacecraft performed well through its lifetime. Power limitations forced the duty cycle to be limited to an average which was originally targeted at 30%. The lifetime of the spacecraft was shorter than anticipated because of the less than nominal performance of the launch vehicle.

The launch was on Aug. 3, 1981 and the DE-2 satellite reentered the atmosphere on Feb. 19, 1983, with the last contact the day before.

TIME_SPAN_OF_THE DATA: 8-AUG-81 TO 15-JAN-83

INVESTIGATION OBJECTIVES:

The LANG objective was to provide electron temperature, plasma density, and spacecraft potential at high resolution of 0.5 seconds to study energetics of the thermal plasma and density structure of the ionosphere including large scale structures, traveling ionospheric disturbances, and plasma waves.

INSTRUMENT ATTRIBUTES:

A. DESCRIPTION_OF_INSTRUMENT:

The Dynamics Explorer Langmuir Probe Instrument (LANG) performs in-situ measurements of electron temperature and ion density. Two independent sensors are connected to individual adaptive sweep voltage circuits which continuously track the changing electron temperature and spacecraft potential while autoranging electrometers adjust their gain in response to the changing plasma density. Each voltage sweep takes place in 0.5 seconds. The control signals used to achieve this automatic tracking provide a continuous monitoring of the ionospheric parameters (at 0.5 second resolution) without telemetering each volt-ampere curve. The volt-ampere curves are transmitted twice every 8 seconds (50 samples during one 0.5 second sweep) using digital (10 bit accuracy) stored data. Analog data is digitized by the spacecraft at 8 bit resolution and provides volt-ampere data at 64 samples/second. During much of the mission probe 1 was in the ion hold mode providing 64 samples/second resolution ion density data via the analog data channel. (See Space Science Instrumentation, Vol 5, 493, 1981).

B. OPERATION_MODE:

Inflight electron temperature, ion and electron density, and satellite potential are detected every 0.5 second. Two stored volt-ampere curves are detected every 8 seconds. analog volt-ampere curves every 0.5 second at a rate of 64 samples/second. Normal operating mode is: probe 2 in adaptive mode to give electron temperature and ion density; probe 1 in ion hold mode to give high resolution ion density at 64 samples/second.

C. MEASURED_PARAMETERS:

Electrometer gain and applied voltage (start and slope) settings for every 0.5 second framed volt-ampere sweep are directly sensed. These telemetered engineering parameters are used to derive the inflight values of ion density, electron density, electron temperature, and satellite potential based on calibration with the raw volt-ampere data.

Electrometer gain and applied voltage of volt-ampere curves for stored and analog data channels are telemetered for ground analysis. The geophysical parameters, electron temperature, ion density, satellite potential, and electron density, are derived from this raw volt-ampere data. 64 sample/second ion density is derived from the analog volt-ampere data when probe 1 is in ion hold mode.

D. PERFORMANCE_OF_THE_INSTRUMENT:

The LANG instrument returned usable data from shortly after launch until reentry. During some spinning orbits the instrument was placed in a special stepping mode to calibrate the accelerated electron current. Probe 2 was successfully cleaned and provided accurate electron temperatures throughout the mission. Probe 1 was contaminated and therefore could not provide accurate temperatures; it did provide accurate, high resolution ion densities. Probe 2 was used for the inflight temperature, density, and satellite potential.

E. RESOLUTION:

Each LANG record contains 0.5 second resolution engineering parameters from which the inflight electron temperature, electron and ion density, and satellite potential are derived using simple computer code.

PARAMETERS:

The geophysical parameters derived from the Langmuir probe are electron temperature (Te), plasma density (either ion density Ni from the ion acceleration region of the probe volt-ampere characteristic when the probe is negative with respect to the plasma and measures ion, and electron density Ne from the electron acceleration region when the probe is positive and retards the ions and accelerates the electrons) and satellite potential, Vs which is the potential difference between the probe and the undisturbed ionosphere plasma. These geophysical parameters are derived every 0.5 seconds from a voltage sweep of the probe which generates an internal volt-ampere curve. The curve is framed by adjusting the gain decade and vernier settings so that the accelerated ion current produces an electrometer output voltage of -3.3 volts, the voltage sweep is adjusted so that the electron current produces an electrometer output voltage of 9.5 volts after a voltage difference of 8kTe from the starting voltage. This frames the volt-ampere curve to maximize the resolution of the temperature and density. The inflight engineering parameters from which Te Ni Ne and Vs are derived are telemetered every 0.5 seconds. The detailed engineering parameters described as follows:

IMODE(1:2) 2 bits, mode of each of the two probes

= 0 adapt
= 1 step
= 2 ion hold
= 3 electron hold

IDED 2 bits, which probe is dedicated

IBIAS 2 bits, indicates the extra bias potential applied to the sweep, negative, positive, none.

ICMD 1 bit, command, not used

IANA 2 bits, which probe is analog

ION 1 bit, probe on switch

V(1:2) 8 bits, VA start of sweep potential

DV(1:2) 10 bits, VA slope for this sweep, Te of last sweep

NI(1:2) 10 bits, Current detector range used in this sweep, 2 bits for decade range, 8 bits for vernier range

NE(1:2) 10 bits, decade range (2 bits) and curve amplitude (8 bits) giving electron current

These engineering parameters are converted to the geophysical electron temperature, ion and electron density, and satellite potential using the subroutines contained in the file LANGSUBROUTINES.FOR on tape LANGDESC. Each file contains a functional description clarifying usage.

DATA_SET_QUALITY:

The electron temperature and ion and electron density are accurate to about 10% at all altitudes. The subroutine supplied in LANGSUBROUTINES.FOR which converts the engineering parameters to geophysical Te Ni Ne and Vs, has built in limits which only produces Te when the density is greater than 1.E4, and which returns Ni when density is above 2.E4 and Ne when density is below 2.E4. The range of Te is from about 800 K to about 10,000 K, the range of Ni and Ne is: 1.E3 to 1.E6 for Ne and 1.E4 to 1.E7 for Ni; Vs has a possible range of about -10 volts to +7 volts, but is typically at -1.5 to -0.5 volts.

DATA_PROCESSING_OVERVIEW:

A. DATA_PROCESSING CYCLE:

The raw telemetry data were routinely converted I-files containing the 0.5 second inflight engineering parameters which are converted by the software in LANGSUBROUTINES.FOR into geophysical parameters Te, Ne and Ni. There is one I-file for each day for which data was taken. Each daily I-file contains the telemetry segments listed on the catalog file LANGTAPELIST.DAT. The start and stop times of the telemetry segments are those of the raw telemetry segments. The files

LANGSUBROUTINES.FOR and LANGTAPELIST.DAT are supplied on the LANG document file LANGDESC.

B. HISTORY:

The I-files were produced routinely as telemetry became available. Telemetry was rescanned for missing passes at later times. Duplicate passes or parts of passes should have been eliminated and separate segments joined. The extreme segmentation or length of some telemetry passes resulted in the inability of the Sigma 9 to bring all the data on line within the allotted processing time and results in some passes still being incomplete. All files have been updated to final values and written on VAX formatted tapes.

DATA USAGE: Data are used to obtain the ambient electron temperature, ion density, electron density, and satellite potential. Lists of times when data is bad due to orbit problems or times when the spacecraft was spinning are listed in the files BADLANG.DAT for the bad data and SPINNERSLANG.DAT for the spinning orbits. These files are on the LANG document tape LANGDESC.

DATA ORGANIZATION:

LANGMUIR PROBE INFLIGHT DATA

Stored on 7 tapes labeled Iyyddd where ddd is a multiple of 100 (000,100,200,300) and the tape contains all inflight files from yyddd to yyddd+99. (i.e. 81200-81299)

<<<<<NOTE: ALL LANG SOFTWARE, CATELOGS FORTRAN SOURCE FILES AND COM FILES ARE SUPPLIED ON THE LANG DESCRIPTION TAPE
LANGDESC>>>>>>

Some LANG supplied software:

To promote data from a tape use PROTAP.COM

To promote all data from the tape answer

'1ST DAY TO BE PROMOTED' with the yyddd of the tape label and 'LAST DAY TO BE PROMOTED' with the same yyddd+99
(i.e. 82000 and 82099 for tape I82000 and even
82300 and 82399 for tape I82300)

To promote less than the entire tape answer

'1ST DAY...' and 'LAST DAY...' as per required data
(i.e. 82342 and 82345 for days 82342-82345)

Once online, to read inflight data into a formatted file

use EXAMLANG.EXE which uses subroutines from
LANGSUBROUTINES.OBJ (INFL_READ, INFL_CONVERT, INF_VGET, FNE, FNI, FNENI)
EXAMLANG is the driver which, interactively, gathers the request parameters (date, start time,...) and formats the output (to file or screen).

INFL_READ opens the appropriate data file, reads the packed integer data, and places the unpacked (real & integer) data in an array for the calling program (i.e. EXAMLANG)

INFL_CONVERT unpacks the integer data and applies INF_VGET
INFL_VGET transforms the integer data (as stored in TM) into

the real and integer temperatures, densities, etc.
that it represents using the functions FNE and FNI
for Ne and Ni calculations

Thus programs needed are:

PROTAP.COM and

EXAMLANG.EXE or EXAMLANG.FOR, and LANGSUBROUTINES.FOR
to be compiled and linked appropriately.

Once linked EXAMLANG.EXE looks for the I-file(s) in SYS\$MAF
and tries to write out any saved data file in SYS\$PROC
therefore the two following assignments need to be made
prior to running EXAMLANG or using PROTAP.COM

```
ASSIGN <your I-file destination directory> SYS$MAF
ASSIGN <saved data destination directory> SYS$PROC
```

Now you are ready to run.

```
*****
```

The data files themselves:

File names are of the form Iyyddd where yy is 81, 82, or 83 and 0<ddd<366. The date range is 81215-83049 with almost all days represented.

Files are indexed organization using time in milliseconds as the key. A typical OPEN statement is

```
OPEN(UNIT=1,NAME='disk:[directory]Iyyddd.DAT',TYPE='OLD',
      ACCESS='KEYED',KEY=(1:4:INTEGER),RECL=35,READONLY,
      FORM='UNFORMATTED',ORGANIZATION='INDEXED',ERR=label1)
```

File records are 35 (4-byte) words in length (note RECL above) and cover 8 seconds (16 half-sec. samples) of data. The first word is overhead for the keyed-indexed organization. The second word is universal time in msec. of the first half-second of data in the record. The remaining 33 words are the data, in a packed integer form, covering 16 half-second-resolution samples that begin at that UT (call them DATA(1)-DATA(33)). Thus a typical initial (keyed) READ statement is

```
READ(1,KEYGE=SOME_UT,ERR=label2) ITIME, (IDATA(J),J=1,33)
```

This will read the first record with ITIME>=SOME_UT (both times being in msec). Subsequent READ statements can read sequentially by removing the phrase KEYGE=SOME_UT, possibly adding END=label3. The 3rd through 35th words of the record comprise the data. The 3rd word (IDATA(1) above) is satellite specific data (IMODE(1-2), IDED, IBIAS, ICMD, IANA, and ION) packed as follows
((((IMODE(1)*4+IMODE(2))*4+IDEDED)*4+IBIAS)*2+ICMD)*4+IANA)*2+ION
As implied, these seven data are 1 or 2 bit fields.

IMODE(1:2) 2 bits, mode of each of the two probes

- = 0 adapt
- = 1 step
- = 2 ion hold
- = 3 electron hold

IDED 2 bits, which probe is dedicated

IBIAS 2 bits, indicates the extra bias potential applied to the sweep is not used (SHOULD BE!!!!!!)

ICMD 1 bit, command not used

IANA 2 bits, which probe is analog

ION 1 bit, probe on?

The 4th through 35th words of the record are paired up (i.e. IDATA(2) and IDATA(3), IDATA(4) and IDATA(5), ..., IDATA(32) and IDATA(33)) so that the 16 pairs cover the 16 half-seconds of data in the 8-second interval. These pairs are packed as follows

```
IDATA(2i)=((DV(1)*1024)+DV(2))*1024+NI(1)
          +1           {if NI(1) is negative}
          +1024        {if DV(2) is negative}
          +1024**2     {if DV(1) is negative}
```

where i=1,2,3,...,16

```
IDATA(2i+1)=((NI(2)*256)+IV)*1024+N
          +1           {if N=max(NE(1),NE(2)) is negative}
          +1024        {if IV=max(V(1),V(2)) is negative}
          +1024*256    {if NI(2) is negative}
```

where i=1,2,3,...,16

These are 8 or 10 bit data fields

V(1:2) 8 bits, VA start of sweep potential

DV(1:2) 10 bits, VA slope for this sweep, Te of last sweep
NI(1:2) 10 bits, Current detector range used in this
sweep, 2 bits for decade range, 8 bits
for vernier range
NE(1:2) 10 bits, decade range (2 bits) and curve amplitude
(8 bits) giving electron current

The aforementioned subroutines INFL_CONVER and INF_VGET are
THE algorithms for, respectively, the unpacking and
translation of this array (DATA) of packed integers.

CCSDXKNM0002EMRK0003CCSDXKNM0002SMRK0005

LOG_VOL_TIME_COVERAGE: YYYY-MM-DD TO YYYY-MM-DD

NAMING_CONVENTION:

File names are of the form Iyyddd where yy is 81, 82, or 83 and
0<ddd<366. The date range is 81215-83049 with almost all days
represented.

FILE_TIME_COVERAGE:

The times of the data segments in the I-files are contained in
ILANG.CAT, while the list of the I-files is in LANGTAPELIST.DAT.
These two files are on the LANG description tape LANGDESC.

PREV_LOG_VOL_COVERAGE: NONE

CCSDXKNM0002EMRK0005CCSDXRNM0003SMRK0006

NESTING= L

REF= FORMAT.SFD

CCSDXRNM0003EMRK0006CCSDXRNL0003SMRK0007

ADI= NSSD0005

CLASS= I

NESTING= N

SCOPE= EACH

REF=N*.*

CCSDXRNL0003EMRK0007CCSDXZLM0001EMARK001

DE-B
81-070B-C9D
LANGI Data Tapes

Dynamics Explorer 2

LANG Data Tapes

81-070B-09D **SPIO-00231**

The Lang data set consists of 7 tapes. The D tapes are 9 track 6250 BPI. The C tapes are 3480 cartridges. The tapes are written in Backup format, with keyed-indexed files. The D and C numbers, label name, and time spans follow:

D #	C #	Label Name	Time Span
-----	-----	-----	-----
D-80458	C-29156	I81200	07/19/81 - 10/26/81
D-80459	C-29157	I81300	10/27/81 - 12/31/81
D-80460	C-29158	I82000	01/01/82 - 04/29/82
D-80461	C-29159	I82100	04/10/82 - 07/18/82
D-80462	C-29160	I82200	07/19/82 - 10/26/82
D-80463	C-29161	I82300	10/26/82 - 12/31/82
D-80464	C-29162	I83000	01/01/83 - 02/18/83

TAPELIST.DAT LISTING OF THE 7 6250 LANG I-FILE TAPES
The 7 tapes have the labels: I81200, I81300, I82000, I82100, I82200, I82300,
I8300.
The inclusive dates of the LANG data is: 81215-83049
Listing of save set(s)

Save set: I81200.
Written by: GRAHAM
UIC: [000150,000006]
Date: 22-SEP-1989 10:16:33.90
Command: BACKUP/REW/LOG NADA.DAT,D\$USER:[POSEY.DEBASE]I81***.DAT; MSA0:I81200./LABEL=I81200
Operating system: VAX/VMS version V4.7
BACKUP version: V4.7
CPU ID register: 08000000
Node name: _DEIO::
Written on: _MSA0:
Block size: 8192
Group size: 10
Buffer count: 3

[POSEY.DEBASE]I81215.DAT;1	84	9-JAN-1985	16:07
[POSEY.DEBASE]I81216.DAT;1	1299	26-SEP-1984	10:27
[POSEY.DEBASE]I81217.DAT;1	594	26-SEP-1984	10:31
[POSEY.DEBASE]I81218.DAT;1	1281	26-SEP-1984	10:25
[POSEY.DEBASE]I81219.DAT;1	1794	26-SEP-1984	10:28
[POSEY.DEBASE]I81220.DAT;1	1782	26-SEP-1984	10:21
[POSEY.DEBASE]I81221.DAT;1	852	26-SEP-1984	10:26
[POSEY.DEBASE]I81222.DAT;1	1314	28-SEP-1984	13:35
[POSEY.DEBASE]I81223.DAT;1	2127	15-JAN-1985	10:13
[POSEY.DEBASE]I81224.DAT;1	738	15-JAN-1985	10:15
[POSEY.DEBASE]I81225.DAT;1	1602	26-SEP-1984	10:25
[POSEY.DEBASE]I81226.DAT;1	531	15-JAN-1985	10:14
[POSEY.DEBASE]I81227.DAT;1	918	26-SEP-1984	10:24
[POSEY.DEBASE]I81228.DAT;1	1014	26-SEP-1984	10:24
[POSEY.DEBASE]I81229.DAT;2	927	20-AUG-1984	10:28
[POSEY.DEBASE]I81230.DAT;2	1044	20-AUG-1984	10:29
[POSEY.DEBASE]I81231.DAT;2	1164	20-AUG-1984	10:29
[POSEY.DEBASE]I81232.DAT;1	1338	28-SEP-1984	13:38
[POSEY.DEBASE]I81233.DAT;1	987	28-SEP-1984	13:32
[POSEY.DEBASE]I81234.DAT;1	1830	28-SEP-1984	13:37
[POSEY.DEBASE]I81235.DAT;2	1617	20-AUG-1984	10:31
[POSEY.DEBASE]I81236.DAT;2	1002	20-AUG-1984	10:31
[POSEY.DEBASE]I81237.DAT;2	711	20-AUG-1984	10:32
[POSEY.DEBASE]I81238.DAT;2	513	20-AUG-1984	10:33
[POSEY.DEBASE]I81239.DAT;2	1164	20-AUG-1984	10:34
[POSEY.DEBASE]I81240.DAT;1	1473	28-SEP-1984	13:34
[POSEY.DEBASE]I81241.DAT;1	111	28-SEP-1984	13:31
[POSEY.DEBASE]I81242.DAT;1	309	18-JAN-1985	15:06
[POSEY.DEBASE]I81243.DAT;1	3216	18-JAN-1985	15:03
[POSEY.DEBASE]I81244.DAT;1	1689	18-JAN-1985	15:02
[POSEY.DEBASE]I81245.DAT;1	543	18-JAN-1985	15:09
[POSEY.DEBASE]I81247.DAT;2	1188	20-AUG-1984	10:43
[POSEY.DEBASE]I81248.DAT;1	981	2-OCT-1984	13:43
[POSEY.DEBASE]I81249.DAT;1	1110	2-OCT-1984	13:29
[POSEY.DEBASE]I81250.DAT;1	1494	2-OCT-1984	13:31
[POSEY.DEBASE]I81251.DAT;1	1557	2-OCT-1984	13:24
[POSEY.DEBASE]I81252.DAT;1	1395	2-OCT-1984	13:27
[POSEY.DEBASE]I81253.DAT;1	1014	2-OCT-1984	13:39
[POSEY.DEBASE]I81254.DAT;1	1182	2-OCT-1984	13:35
[POSEY.DEBASE]I81255.DAT;1	1179	2-OCT-1984	13:24
[POSEY.DEBASE]I81256.DAT;1	1161	2-OCT-1984	13:28
[POSEY.DEBASE]I81257.DAT;1	1083	2-OCT-1984	13:40
[POSEY.DEBASE]I81258.DAT;1	828	2-OCT-1984	13:42
[POSEY.DEBASE]I81259.DAT;1	1158	2-OCT-1984	13:36
[POSEY.DEBASE]I81260.DAT;1	1044	2-OCT-1984	13:26
[POSEY.DEBASE]I81261.DAT;1	1095	2-OCT-1984	13:32

[POSEY.DEBASE]I81262.DAT;1	1509	2-OCT-1984	13:22
[POSEY.DEBASE]I81263.DAT;1	1335	2-OCT-1984	13:38
[POSEY.DEBASE]I81264.DAT;1	1530	31-JAN-1985	17:15
[POSEY.DEBASE]I81265.DAT;1	1329	31-JAN-1985	17:08
[POSEY.DEBASE]I81266.DAT;1	1344	31-JAN-1985	17:10
[POSEY.DEBASE]I81267.DAT;1	942	31-JAN-1985	17:14
[POSEY.DEBASE]I81268.DAT;1	1890	31-JAN-1985	14:30
[POSEY.DEBASE]I81269.DAT;1	1728	31-JAN-1985	14:33
[POSEY.DEBASE]I81270.DAT;1	1497	31-JAN-1985	17:09
[POSEY.DEBASE]I81271.DAT;1	1134	31-JAN-1985	17:16
[POSEY.DEBASE]I81272.DAT;1	1281	31-JAN-1985	17:11
[POSEY.DEBASE]I81273.DAT;1	1512	31-JAN-1985	14:35
[POSEY.DEBASE]I81274.DAT;1	1476	31-JAN-1985	17:13
[POSEY.DEBASE]I81275.DAT;1	2148	31-JAN-1985	14:36
[POSEY.DEBASE]I81276.DAT;1	1353	31-JAN-1985	17:11
[POSEY.DEBASE]I81277.DAT;1	1683	31-JAN-1985	14:42
[POSEY.DEBASE]I81278.DAT;1	1455	31-JAN-1985	17:06
[POSEY.DEBASE]I81279.DAT;1	1893	31-JAN-1985	14:43
[POSEY.DEBASE]I81280.DAT;1	1692	11-OCT-1984	10:08
[POSEY.DEBASE]I81281.DAT;2	2007	20-AUG-1984	11:05
[POSEY.DEBASE]I81282.DAT;1	1620	11-OCT-1984	10:09
[POSEY.DEBASE]I81283.DAT;2	1518	20-AUG-1984	11:10
[POSEY.DEBASE]I81284.DAT;2	1272	20-AUG-1984	11:10
[POSEY.DEBASE]I81285.DAT;2	1749	20-AUG-1984	11:11
[POSEY.DEBASE]I81286.DAT;2	1617	20-AUG-1984	11:12
[POSEY.DEBASE]I81287.DAT;2	2271	20-AUG-1984	11:13
[POSEY.DEBASE]I81288.DAT;2	1266	20-AUG-1984	11:16
[POSEY.DEBASE]I81289.DAT;2	2331	20-AUG-1984	11:19
[POSEY.DEBASE]I81290.DAT;2	1284	20-AUG-1984	11:24
[POSEY.DEBASE]I81291.DAT;2	1590	20-AUG-1984	11:25
[POSEY.DEBASE]I81292.DAT;2	2388	20-AUG-1984	11:27
[POSEY.DEBASE]I81293.DAT;2	2976	20-AUG-1984	11:31
[POSEY.DEBASE]I81294.DAT;2	2274	20-AUG-1984	11:32
[POSEY.DEBASE]I81295.DAT;2	1758	20-AUG-1984	11:33
[POSEY.DEBASE]I81296.DAT;2	2610	20-AUG-1984	11:35
[POSEY.DEBASE]I81297.DAT;2	1998	20-AUG-1984	11:38
[POSEY.DEBASE]I81298.DAT;2	2892	20-AUG-1984	11:40
[POSEY.DEBASE]I81299.DAT;2	2391	20-AUG-1984	11:42

Total of 84 files, 119580 blocks
End of save set

Listing of save set(s)

Save set:	I81300.
Written by:	GRAHAM
UIC:	[000150,000006]
Date:	20-SEP-1989 09:56:28.26
Command:	BACKUP/REW/LOG NADA.DAT,D\$USER:[POSEY.DEBASE]I813%?.DAT; MSA0:I81300./LABEL=I81300
Operating system:	VAX/VMS version V4.7
BACKUP version:	V4.7
CPU ID register:	08000000
Node name:	_DEIO::
Written on:	_MSA0:
Block size:	8192
Group size:	10
Buffer count:	3

[POSEY.DEBASE]I81300.DAT;2	1839	20-AUG-1984	11:45
[POSEY.DEBASE]I81301.DAT;2	1338	20-AUG-1984	12:53
[POSEY.DEBASE]I81302.DAT;2	1710	20-AUG-1984	12:55
[POSEY.DEBASE]I81303.DAT;2	1371	20-AUG-1984	12:58
[POSEY.DEBASE]I81304.DAT;2	1593	20-AUG-1984	12:59
[POSEY.DEBASE]I81305.DAT;2	1455	20-AUG-1984	13:01
[POSEY.DEBASE]I81306.DAT;2	1590	20-AUG-1984	13:02
[POSEY.DEBASE]I81307.DAT;2	1614	20-AUG-1984	13:04
[POSEY.DEBASE]I81308.DAT;2	1398	20-AUG-1984	13:06

[POSEY.DEBASE]I81309.DAT;2	1596	20-AUG-1984	13:09
[POSEY.DEBASE]I81310.DAT;2	1152	20-AUG-1984	13:11
[POSEY.DEBASE]I81311.DAT;2	1179	20-AUG-1984	13:12
[POSEY.DEBASE]I81312.DAT;2	1548	20-AUG-1984	13:14
[POSEY.DEBASE]I81313.DAT;2	1410	20-AUG-1984	13:15
[POSEY.DEBASE]I81314.DAT;2	1332	20-AUG-1984	13:17
[POSEY.DEBASE]I81315.DAT;2	1443	20-AUG-1984	13:18
[POSEY.DEBASE]I81316.DAT;2	1842	20-AUG-1984	13:22
[POSEY.DEBASE]I81317.DAT;2	1560	20-AUG-1984	13:24
[POSEY.DEBASE]I81318.DAT;2	1695	20-AUG-1984	13:24
[POSEY.DEBASE]I81319.DAT;2	1791	20-AUG-1984	13:27
[POSEY.DEBASE]I81320.DAT;2	1437	20-AUG-1984	13:29
[POSEY.DEBASE]I81321.DAT;2	1485	20-AUG-1984	13:37
[POSEY.DEBASE]I81322.DAT;2	2073	20-AUG-1984	13:41
[POSEY.DEBASE]I81323.DAT;2	2472	20-AUG-1984	13:44
[POSEY.DEBASE]I81324.DAT;2	1419	20-AUG-1984	13:49
[POSEY.DEBASE]I81325.DAT;2	1659	20-AUG-1984	13:53
[POSEY.DEBASE]I81326.DAT;2	1566	20-AUG-1984	13:54
[POSEY.DEBASE]I81327.DAT;2	1629	20-AUG-1984	13:56
[POSEY.DEBASE]I81328.DAT;2	1047	20-AUG-1984	13:58
[POSEY.DEBASE]I81329.DAT;2	1596	20-AUG-1984	13:59
[POSEY.DEBASE]I81330.DAT;2	1953	20-AUG-1984	14:00
[POSEY.DEBASE]I81331.DAT;2	1389	20-AUG-1984	14:02
[POSEY.DEBASE]I81332.DAT;2	2269	20-AUG-1984	14:03
[POSEY.DEBASE]I81333.DAT;2	1404	20-AUG-1984	14:06
[POSEY.DEBASE]I81334.DAT;2	1878	20-AUG-1984	14:08
[POSEY.DEBASE]I81335.DAT;2	1689	20-AUG-1984	14:10
[POSEY.DEBASE]I81336.DAT;2	1281	20-AUG-1984	14:12
[POSEY.DEBASE]I81337.DAT;2	1845	20-AUG-1984	14:14
[POSEY.DEBASE]I81338.DAT;2	1830	20-AUG-1984	14:16
[POSEY.DEBASE]I81339.DAT;2	2325	20-AUG-1984	14:19
[POSEY.DEBASE]I81340.DAT;2	2214	20-AUG-1984	14:22
[POSEY.DEBASE]I81341.DAT;2	2523	20-AUG-1984	15:48
[POSEY.DEBASE]I81342.DAT;2	2199	20-AUG-1984	15:54
[POSEY.DEBASE]I81343.DAT;2	1965	20-AUG-1984	15:59
[POSEY.DEBASE]I81344.DAT;2	1767	20-AUG-1984	16:05
[POSEY.DEBASE]I81345.DAT;2	2145	20-AUG-1984	16:13
[POSEY.DEBASE]I81346.DAT;2	1623	20-AUG-1984	16:18
[POSEY.DEBASE]I81347.DAT;2	2904	20-AUG-1984	16:21
[POSEY.DEBASE]I81348.DAT;2	2388	20-AUG-1984	16:27
[POSEY.DEBASE]I81349.DAT;2	1716	20-AUG-1984	16:31
[POSEY.DEBASE]I81350.DAT;2	1692	20-AUG-1984	16:31
[POSEY.DEBASE]I81351.DAT;2	2142	20-AUG-1984	16:33
[POSEY.DEBASE]I81352.DAT;2	2244	20-AUG-1984	16:35
[POSEY.DEBASE]I81353.DAT;2	1938	20-AUG-1984	16:38
[POSEY.DEBASE]I81354.DAT;2	1722	20-AUG-1984	16:38
[POSEY.DEBASE]I81355.DAT;2	2307	20-AUG-1984	16:40
[POSEY.DEBASE]I81356.DAT;2	2091	20-AUG-1984	16:44
[POSEY.DEBASE]I81357.DAT;2	2631	20-AUG-1984	16:47
[POSEY.DEBASE]I81358.DAT;2	1815	20-AUG-1984	16:52
[POSEY.DEBASE]I81359.DAT;2	1245	20-AUG-1984	16:56
[POSEY.DEBASE]I81360.DAT;2	1581	20-AUG-1984	16:58
[POSEY.DEBASE]I81361.DAT;2	1185	20-AUG-1984	17:12
[POSEY.DEBASE]I81362.DAT;2	1752	20-AUG-1984	17:14
[POSEY.DEBASE]I81363.DAT;2	1341	20-AUG-1984	17:15
[POSEY.DEBASE]I81364.DAT;2	1296	20-AUG-1984	17:17
[POSEY.DEBASE]I81365.DAT;2	1362	20-AUG-1984	17:20

Total of 66 files, 114490 blocks
End of save set

Listing of save set(s)

Save set: I82000.
Written by: GRAHAM
UIC: [000150,000006]
Date: 20-SEP-1989 11:07:02.02

Command: BACKUP/REW/LOG NADA.DAT,D\$USER:[POSEY.DEBASE]I82000.DAT; MSA0:I82000./LABEL=I82000
Operating system: VAX/VMS version V4.7
BACKUP version: V4.7
CPU ID register: 08000000
Node name: _DEIO::
Written on: _MSA0:
Block size: 8192
Group size: 10
Buffer count: 3

[POSEY.DEBASE]I82001.DAT;2	1890	22-AUG-1984	09:55
[POSEY.DEBASE]I82002.DAT;2	1704	22-AUG-1984	09:57
[POSEY.DEBASE]I82003.DAT;2	2049	22-AUG-1984	09:58
[POSEY.DEBASE]I82004.DAT;2	1701	22-AUG-1984	10:02
[POSEY.DEBASE]I82005.DAT;2	1368	22-AUG-1984	10:03
[POSEY.DEBASE]I82006.DAT;2	1773	22-AUG-1984	10:04
[POSEY.DEBASE]I82007.DAT;2	2277	22-AUG-1984	10:06
[POSEY.DEBASE]I82008.DAT;2	1746	22-AUG-1984	10:09
[POSEY.DEBASE]I82009.DAT;2	1623	22-AUG-1984	10:11
[POSEY.DEBASE]I82010.DAT;2	1137	22-AUG-1984	10:13
[POSEY.DEBASE]I82011.DAT;2	876	22-AUG-1984	10:15
[POSEY.DEBASE]I82012.DAT;2	1164	22-AUG-1984	10:17
[POSEY.DEBASE]I82013.DAT;2	1224	22-AUG-1984	10:19
[POSEY.DEBASE]I82014.DAT;2	1473	22-AUG-1984	10:20
[POSEY.DEBASE]I82015.DAT;2	1176	22-AUG-1984	10:22
[POSEY.DEBASE]I82016.DAT;2	1260	22-AUG-1984	10:24
[POSEY.DEBASE]I82017.DAT;2	1128	22-AUG-1984	10:25
[POSEY.DEBASE]I82018.DAT;2	1046	22-AUG-1984	10:27
[POSEY.DEBASE]I82019.DAT;2	1278	22-AUG-1984	10:29
[POSEY.DEBASE]I82020.DAT;2	1758	22-AUG-1984	10:31
[POSEY.DEBASE]I82021.DAT;2	2202	22-AUG-1984	10:46
[POSEY.DEBASE]I82022.DAT;2	1161	22-AUG-1984	10:47
[POSEY.DEBASE]I82023.DAT;1	1716	16-NOV-1984	14:51
[POSEY.DEBASE]I82024.DAT;2	1113	22-AUG-1984	10:48
[POSEY.DEBASE]I82025.DAT;2	2304	22-AUG-1984	10:49
[POSEY.DEBASE]I82026.DAT;2	2166	22-AUG-1984	10:50
[POSEY.DEBASE]I82027.DAT;2	1317	22-AUG-1984	10:51
[POSEY.DEBASE]I82028.DAT;2	3243	22-AUG-1984	10:51
[POSEY.DEBASE]I82029.DAT;2	2517	22-AUG-1984	10:53
[POSEY.DEBASE]I82030.DAT;2	1683	22-AUG-1984	10:55
[POSEY.DEBASE]I82031.DAT;2	1479	22-AUG-1984	10:55
[POSEY.DEBASE]I82032.DAT;1	1560	10-SEP-1984	10:43
[POSEY.DEBASE]I82033.DAT;2	1374	22-AUG-1984	10:57
[POSEY.DEBASE]I82034.DAT;2	1092	22-AUG-1984	10:57
[POSEY.DEBASE]I82035.DAT;2	1263	22-AUG-1984	10:59
[POSEY.DEBASE]I82036.DAT;2	1461	22-AUG-1984	11:00
[POSEY.DEBASE]I82037.DAT;1	1386	21-NOV-1984	14:30
[POSEY.DEBASE]I82038.DAT;1	1641	21-NOV-1984	14:20
[POSEY.DEBASE]I82039.DAT;2	1236	22-AUG-1984	11:02
[POSEY.DEBASE]I82040.DAT;2	1032	22-AUG-1984	11:02
[POSEY.DEBASE]I82041.DAT;2	1155	22-AUG-1984	11:05
[POSEY.DEBASE]I82042.DAT;2	630	22-AUG-1984	11:05
[POSEY.DEBASE]I82043.DAT;1	1152	13-DEC-1984	17:06
[POSEY.DEBASE]I82044.DAT;2	1272	22-AUG-1984	11:06
[POSEY.DEBASE]I82045.DAT;2	1281	22-AUG-1984	11:06
[POSEY.DEBASE]I82046.DAT;1	1389	21-NOV-1984	14:29
[POSEY.DEBASE]I82047.DAT;1	1179	21-NOV-1984	14:22
[POSEY.DEBASE]I82048.DAT;1	1266	21-NOV-1984	14:23
[POSEY.DEBASE]I82049.DAT;1	1326	21-NOV-1984	14:21
[POSEY.DEBASE]I82050.DAT;2	948	22-AUG-1984	11:08
[POSEY.DEBASE]I82051.DAT;2	1212	22-AUG-1984	11:08
[POSEY.DEBASE]I82052.DAT;2	1311	22-AUG-1984	11:09
[POSEY.DEBASE]I82053.DAT;2	1227	22-AUG-1984	11:09
[POSEY.DEBASE]I82054.DAT;1	981	29-NOV-1984	13:56
[POSEY.DEBASE]I82056.DAT;1	771	29-NOV-1984	13:57
[POSEY.DEBASE]I82057.DAT;1	396	2-APR-1985	08:50

[POSEY.DEBASE]I82058.DAT;2	309	22-AUG-1984	11:10
[POSEY.DEBASE]I82059.DAT;2	978	22-AUG-1984	11:11
[POSEY.DEBASE]I82060.DAT;2	813	22-AUG-1984	11:11
[POSEY.DEBASE]I82061.DAT;2	1275	22-AUG-1984	11:32
[POSEY.DEBASE]I82062.DAT;2	1128	22-AUG-1984	11:34
[POSEY.DEBASE]I82063.DAT;2	1173	22-AUG-1984	11:35
[POSEY.DEBASE]I82064.DAT;1	1128	3-DEC-1984	13:57
[POSEY.DEBASE]I82065.DAT;1	984	3-DEC-1984	13:58
[POSEY.DEBASE]I82066.DAT;2	1158	22-AUG-1984	11:36
[POSEY.DEBASE]I82067.DAT;1	867	6-DEC-1984	10:49
[POSEY.DEBASE]I82068.DAT;2	1221	22-AUG-1984	11:38
[POSEY.DEBASE]I82069.DAT;2	1167	22-AUG-1984	11:38
[POSEY.DEBASE]I82070.DAT;1	981	3-DEC-1984	13:56
[POSEY.DEBASE]I82071.DAT;2	1350	22-AUG-1984	11:39
[POSEY.DEBASE]I82072.DAT;1	843	3-DEC-1984	13:59
[POSEY.DEBASE]I82073.DAT;2	1263	22-AUG-1984	11:40
[POSEY.DEBASE]I82074.DAT;1	996	3-DEC-1984	13:56
[POSEY.DEBASE]I82075.DAT;2	1278	22-AUG-1984	11:41
[POSEY.DEBASE]I82076.DAT;2	1455	22-AUG-1984	11:43
[POSEY.DEBASE]I82077.DAT;2	1572	22-AUG-1984	11:43
[POSEY.DEBASE]I82078.DAT;2	1470	22-AUG-1984	11:44
[POSEY.DEBASE]I82079.DAT;2	1425	22-AUG-1984	11:45
[POSEY.DEBASE]I82080.DAT;2	1425	22-AUG-1984	11:46
[POSEY.DEBASE]I82081.DAT;1	945	10-DEC-1984	16:21
[POSEY.DEBASE]I82082.DAT;2	1380	22-AUG-1984	11:52
[POSEY.DEBASE]I82083.DAT;1	1047	10-DEC-1984	16:26
[POSEY.DEBASE]I82084.DAT;1	1656	10-DEC-1984	16:17
[POSEY.DEBASE]I82085.DAT;1	1482	10-DEC-1984	16:18
[POSEY.DEBASE]I82086.DAT;1	1461	10-DEC-1984	16:15
[POSEY.DEBASE]I82087.DAT;1	1455	10-DEC-1984	16:19
[POSEY.DEBASE]I82088.DAT;1	1155	10-DEC-1984	16:22
[POSEY.DEBASE]I82089.DAT;1	1521	10-DEC-1984	16:16
[POSEY.DEBASE]I82090.DAT;2	1557	22-AUG-1984	11:53
[POSEY.DEBASE]I82091.DAT;2	1689	22-AUG-1984	11:54
[POSEY.DEBASE]I82092.DAT;1	996	10-DEC-1984	16:25
[POSEY.DEBASE]I82093.DAT;1	1014	10-DEC-1984	16:24
[POSEY.DEBASE]I82094.DAT;1	1248	10-DEC-1984	16:23
[POSEY.DEBASE]I82095.DAT;1	1632	10-DEC-1984	16:20
[POSEY.DEBASE]I82096.DAT;1	1278	11-DEC-1984	21:22
[POSEY.DEBASE]I82097.DAT;1	1110	1-JUL-1985	13:42
[POSEY.DEBASE]I82098.DAT;1	1503	11-DEC-1984	21:18
[POSEY.DEBASE]I82099.DAT;1	1131	11-DEC-1984	21:22

Total of 98 files, 131552 blocks
End of save set

Listing of save set(s)

Save set:	I82100.
Written by:	GRAHAM
UIC:	[000150,000006]
Date:	20-SEP-1989 14:07:23.49
Command:	BACKUP/REW/LOG NADA.DAT,D\$USER:[POSEY.DEBASE]I821%?.DAT; MSA0:I82100./LABEL=I82100
Operating system:	VAX/VMS version V4.7
BACKUP version:	V4.7
CPU ID register:	08000000
Node name:	_DEIO::
Written on:	_MSA0:
Block size:	8192
Group size:	10
Buffer count:	3

[POSEY.DEBASE]I82100.DAT;1	2460	1-MAY-1986	09:36
[POSEY.DEBASE]I82101.DAT;1	999	11-DEC-1984	21:20
[POSEY.DEBASE]I82102.DAT;1	1263	11-DEC-1984	21:19
[POSEY.DEBASE]I82103.DAT;2	981	22-AUG-1984	12:52
[POSEY.DEBASE]I82104.DAT;2	1551	22-AUG-1984	12:53

[POSEY.DEBASE]I82105.DAT;2	1731	22-AUG-1984	12:53
[POSEY.DEBASE]I82106.DAT;1	1395	12-DEC-1984	14:05
[POSEY.DEBASE]I82107.DAT;1	1791	12-DEC-1984	14:11
[POSEY.DEBASE]I82108.DAT;1	1464	12-DEC-1984	14:11
[POSEY.DEBASE]I82109.DAT;2	1482	22-AUG-1984	12:54
[POSEY.DEBASE]I82110.DAT;2	1590	22-AUG-1984	12:55
[POSEY.DEBASE]I82111.DAT;1	870	12-DEC-1984	14:13
[POSEY.DEBASE]I82112.DAT;1	1551	12-DEC-1984	14:07
[POSEY.DEBASE]I82113.DAT;1	1500	12-DEC-1984	14:05
[POSEY.DEBASE]I82114.DAT;1	1209	12-DEC-1984	14:12
[POSEY.DEBASE]I82115.DAT;1	2040	12-DEC-1984	14:09
[POSEY.DEBASE]I82116.DAT;1	2061	12-DEC-1984	14:06
[POSEY.DEBASE]I82117.DAT;1	1923	13-DEC-1984	17:50
[POSEY.DEBASE]I82118.DAT;1	1557	13-DEC-1984	17:50
[POSEY.DEBASE]I82119.DAT;1	1494	20-MAR-1985	10:06
[POSEY.DEBASE]I82120.DAT;2	1575	22-AUG-1984	12:57
[POSEY.DEBASE]I82121.DAT;2	1770	22-AUG-1984	13:33
[POSEY.DEBASE]I82122.DAT;2	1956	22-AUG-1984	13:34
[POSEY.DEBASE]I82123.DAT;1	1590	20-MAR-1985	14:39
[POSEY.DEBASE]I82124.DAT;1	1695	4-APR-1985	15:17
[POSEY.DEBASE]I82125.DAT;2	2202	22-AUG-1984	13:35
[POSEY.DEBASE]I82126.DAT;2	1563	22-AUG-1984	13:37
[POSEY.DEBASE]I82127.DAT;1	1116	9-APR-1985	09:26
[POSEY.DEBASE]I82128.DAT;1	1503	9-APR-1985	09:26
[POSEY.DEBASE]I82129.DAT;2	1515	22-AUG-1984	13:38
[POSEY.DEBASE]I82130.DAT;2	1284	22-AUG-1984	13:39
[POSEY.DEBASE]I82131.DAT;1	1314	12-APR-1985	09:10
[POSEY.DEBASE]I82132.DAT;1	1536	10-APR-1985	11:00
[POSEY.DEBASE]I82133.DAT;1	1074	10-APR-1985	10:56
[POSEY.DEBASE]I82134.DAT;1	1383	11-APR-1985	09:51
[POSEY.DEBASE]I82135.DAT;1	1515	10-APR-1985	10:59
[POSEY.DEBASE]I82136.DAT;2	1728	22-AUG-1984	13:41
[POSEY.DEBASE]I82137.DAT;2	1563	22-AUG-1984	13:42
[POSEY.DEBASE]I82138.DAT;1	2046	10-APR-1985	10:54
[POSEY.DEBASE]I82139.DAT;2	1866	22-AUG-1984	13:43
[POSEY.DEBASE]I82140.DAT;1	1611	19-APR-1985	10:18
[POSEY.DEBASE]I82141.DAT;1	2013	19-APR-1985	10:17
[POSEY.DEBASE]I82142.DAT;1	1377	23-APR-1985	11:03
[POSEY.DEBASE]I82143.DAT;1	1590	23-APR-1985	11:02
[POSEY.DEBASE]I82144.DAT;2	1173	22-AUG-1984	13:45
[POSEY.DEBASE]I82145.DAT;1	1830	24-APR-1985	13:13
[POSEY.DEBASE]I82146.DAT;1	1938	24-APR-1985	13:12
[POSEY.DEBASE]I82147.DAT;2	1797	22-AUG-1984	13:46
[POSEY.DEBASE]I82148.DAT;1	1479	24-APR-1985	13:14
[POSEY.DEBASE]I82149.DAT;1	1380	25-APR-1985	12:46
[POSEY.DEBASE]I82150.DAT;1	1431	25-APR-1985	12:45
[POSEY.DEBASE]I82151.DAT;1	1503	25-APR-1985	12:47
[POSEY.DEBASE]I82152.DAT;1	1959	25-APR-1985	12:49
[POSEY.DEBASE]I82153.DAT;1	1725	25-APR-1985	12:47
[POSEY.DEBASE]I82154.DAT;1	1401	26-APR-1985	09:48
[POSEY.DEBASE]I82155.DAT;1	1734	26-APR-1985	09:40
[POSEY.DEBASE]I82156.DAT;1	1692	26-APR-1985	09:46
[POSEY.DEBASE]I82157.DAT;1	1632	26-APR-1985	09:41
[POSEY.DEBASE]I82158.DAT;1	1602	26-APR-1985	09:43
[POSEY.DEBASE]I82159.DAT;1	1164	28-APR-1985	13:52
[POSEY.DEBASE]I82160.DAT;1	1599	26-APR-1985	09:47
[POSEY.DEBASE]I82161.DAT;1	1221	26-APR-1985	09:44
[POSEY.DEBASE]I82162.DAT;1	1389	28-APR-1985	14:12
[POSEY.DEBASE]I82163.DAT;1	1926	28-APR-1985	13:51
[POSEY.DEBASE]I82164.DAT;1	1149	28-APR-1985	14:04
[POSEY.DEBASE]I82165.DAT;1	1644	28-APR-1985	14:04
[POSEY.DEBASE]I82166.DAT;1	1581	28-APR-1985	13:54
[POSEY.DEBASE]I82167.DAT;1	1533	28-APR-1985	13:53
[POSEY.DEBASE]I82168.DAT;1	1545	28-APR-1985	13:54
[POSEY.DEBASE]I82169.DAT;1	1968	29-APR-1985	13:54
[POSEY.DEBASE]I82170.DAT;1	1404	1-MAY-1985	10:37

[POSEY.DEBASE]I82171.DAT;1	1203	3-MAY-1985	13:21
[POSEY.DEBASE]I82172.DAT;2	1305	22-AUG-1984	14:03
[POSEY.DEBASE]I82173.DAT;1	960	1-MAY-1985	10:36
[POSEY.DEBASE]I82174.DAT;1	1395	1-MAY-1985	10:35
[POSEY.DEBASE]I82175.DAT;2	1488	22-AUG-1984	14:04
[POSEY.DEBASE]I82176.DAT;1	1227	3-MAY-1985	13:24
[POSEY.DEBASE]I82177.DAT;1	1320	3-MAY-1985	13:23
[POSEY.DEBASE]I82178.DAT;1	1803	3-MAY-1985	13:22
[POSEY.DEBASE]I82179.DAT;1	1644	7-MAY-1985	10:31
[POSEY.DEBASE]I82180.DAT;1	1593	13-MAY-1985	13:24
[POSEY.DEBASE]I82181.DAT;1	1167	14-MAY-1985	14:42
[POSEY.DEBASE]I82182.DAT;1	1533	14-MAY-1985	14:43
[POSEY.DEBASE]I82183.DAT;1	1455	14-MAY-1985	14:40
[POSEY.DEBASE]I82184.DAT;1	825	14-MAY-1985	14:38
[POSEY.DEBASE]I82185.DAT;1	1581	14-MAY-1985	14:41
[POSEY.DEBASE]I82186.DAT;2	1407	22-AUG-1984	14:09
[POSEY.DEBASE]I82187.DAT;2	1728	22-AUG-1984	14:10
[POSEY.DEBASE]I82188.DAT;1	1392	23-MAY-1985	10:44
[POSEY.DEBASE]I82189.DAT;1	1635	23-MAY-1985	10:46
[POSEY.DEBASE]I82190.DAT;2	1509	22-AUG-1984	14:12
[POSEY.DEBASE]I82191.DAT;1	1005	23-MAY-1985	10:42
[POSEY.DEBASE]I82192.DAT;2	1686	22-AUG-1984	14:12
[POSEY.DEBASE]I82193.DAT;1	1365	29-MAY-1985	11:27
[POSEY.DEBASE]I82194.DAT;1	1173	31-AUG-1984	09:17
[POSEY.DEBASE]I82195.DAT;1	837	29-MAY-1985	11:29
[POSEY.DEBASE]I82196.DAT;2	1584	22-AUG-1984	14:13
[POSEY.DEBASE]I82197.DAT;1	1167	29-MAY-1985	11:31
[POSEY.DEBASE]I82198.DAT;2	1128	22-AUG-1984	14:14
[POSEY.DEBASE]I82199.DAT;1	1140	30-MAY-1985	12:57

Total of 100 files, 150951 blocks
End of save set

Listing of save set(s)

Save set:	I82200.
Written by:	CRAHAM
UIC:	[000150,000006]
Date:	20-SEP-1989 15:54:52.68
Command:	BACKUP/REW/LOG NADA.DAT,D\$USER:[POSEY.DEBASE]I82200.DAT; MSA0:I82200./LABEL=I82200
Operating system:	VAX/VMS version V4.7
BACKUP version:	V4.7
CPU ID register:	08000000
Node name:	_DEIO::
Written on:	_MSA0:
Block size:	8192
Group size:	10
Buffer count:	3

[POSEY.DEBASE]I82200.DAT;1	1563	19-AUG-1985	13:51
[POSEY.DEBASE]I82201.DAT;1	1200	30-MAY-1985	12:58
[POSEY.DEBASE]I82202.DAT;1	1473	1-JUN-1985	09:43
[POSEY.DEBASE]I82203.DAT;1	1515	1-JUN-1985	09:43
[POSEY.DEBASE]I82204.DAT;1	1488	4-JUN-1985	13:23
[POSEY.DEBASE]I82205.DAT;1	1731	23-AUG-1984	08:52
[POSEY.DEBASE]I82206.DAT;1	1257	4-JUN-1985	13:23
[POSEY.DEBASE]I82207.DAT;1	1524	23-AUG-1984	08:53
[POSEY.DEBASE]I82208.DAT;1	1104	23-AUG-1984	08:53
[POSEY.DEBASE]I82209.DAT;1	1515	23-AUG-1984	08:53
[POSEY.DEBASE]I82210.DAT;1	1272	7-JUN-1985	14:08
[POSEY.DEBASE]I82211.DAT;1	2022	23-AUG-1984	08:54
[POSEY.DEBASE]I82212.DAT;1	1725	23-AUG-1984	08:54
[POSEY.DEBASE]I82213.DAT;1	1371	23-AUG-1984	08:54
[POSEY.DEBASE]I82214.DAT;1	1776	23-AUG-1984	08:55
[POSEY.DEBASE]I82215.DAT;1	1380	17-MAY-1985	10:25
[POSEY.DEBASE]I82216.DAT;1	1737	23-AUG-1984	08:56
[POSEY.DEBASE]I82217.DAT;1	1032	23-AUG-1984	08:56

[POSEY.DEBASE]I82218.DAT;1	1281 23-AUG-1984 08:56
[POSEY.DEBASE]I82219.DAT;1	1221 3-DEC-1984 14:00
[POSEY.DEBASE]I82220.DAT;1	1260 23-AUG-1984 08:57
[POSEY.DEBASE]I82221.DAT;1	1209 23-AUG-1984 08:58
[POSEY.DEBASE]I82222.DAT;1	1455 23-AUG-1984 08:58
[POSEY.DEBASE]I82223.DAT;1	2043 23-AUG-1984 08:59
[POSEY.DEBASE]I82224.DAT;1	1419 23-AUG-1984 09:00
[POSEY.DEBASE]I82225.DAT;1	1410 23-AUG-1984 09:00
[POSEY.DEBASE]I82226.DAT;1	1641 23-AUG-1984 09:00
[POSEY.DEBASE]I82227.DAT;1	1293 23-AUG-1984 09:01
[POSEY.DEBASE]I82228.DAT;1	993 23-AUG-1984 09:01
[POSEY.DEBASE]I82229.DAT;1	954 23-AUG-1984 09:01
[POSEY.DEBASE]I82230.DAT;1	1032 23-AUG-1984 09:02
[POSEY.DEBASE]I82231.DAT;1	1257 23-AUG-1984 09:02
[POSEY.DEBASE]I82232.DAT;1	345 2-AUG-1985 11:06
[POSEY.DEBASE]I82233.DAT;1	276 14-JUN-1985 13:28
[POSEY.DEBASE]I82234.DAT;1	1029 14-JUN-1985 13:28
[POSEY.DEBASE]I82235.DAT;1	639 16-JUN-1985 13:54
[POSEY.DEBASE]I82236.DAT;1	780 16-JUN-1985 14:00
[POSEY.DEBASE]I82237.DAT;1	1128 16-JUN-1985 13:58
[POSEY.DEBASE]I82238.DAT;1	1134 16-JUN-1985 13:56
[POSEY.DEBASE]I82239.DAT;1	1038 20-JUN-1985 14:47
[POSEY.DEBASE]I82240.DAT;1	984 23-AUG-1984 09:05
[POSEY.DEBASE]I82241.DAT;1	774 20-JUN-1985 14:41
[POSEY.DEBASE]I82242.DAT;1	876 20-JUN-1985 14:41
[POSEY.DEBASE]I82244.DAT;1	432 20-JUN-1985 14:42
[POSEY.DEBASE]I82245.DAT;1	918 15-JAN-1985 10:13
[POSEY.DEBASE]I82246.DAT;1	1506 23-AUG-1984 09:08
[POSEY.DEBASE]I82247.DAT;1	1281 23-AUG-1984 09:08
[POSEY.DEBASE]I82248.DAT;1	1179 20-JUN-1985 14:43
[POSEY.DEBASE]I82249.DAT;1	1233 20-JUN-1985 14:42
[POSEY.DEBASE]I82250.DAT;1	1182 20-JUN-1985 14:43
[POSEY.DEBASE]I82251.DAT;1	1260 6-AUG-1985 14:11
[POSEY.DEBASE]I82252.DAT;1	1230 22-JUN-1985 14:26
[POSEY.DEBASE]I82253.DAT;1	1290 23-AUG-1984 09:10
[POSEY.DEBASE]I82254.DAT;1	1425 23-AUG-1984 09:10
[POSEY.DEBASE]I82255.DAT;1	1047 23-AUG-1984 09:10
[POSEY.DEBASE]I82256.DAT;1	1287 23-AUG-1984 09:11
[POSEY.DEBASE]I82257.DAT;1	1344 26-JUN-1985 14:52
[POSEY.DEBASE]I82258.DAT;1	1080 26-JUN-1985 14:53
[POSEY.DEBASE]I82259.DAT;1	957 23-AUG-1984 09:12
[POSEY.DEBASE]I82260.DAT;2	1344 23-AUG-1984 09:12
[POSEY.DEBASE]I82261.DAT;2	945 23-AUG-1984 09:20
[POSEY.DEBASE]I82262.DAT;2	1092 23-AUG-1984 09:22
[POSEY.DEBASE]I82263.DAT;1	1257 28-JUN-1985 13:23
[POSEY.DEBASE]I82264.DAT;1	1956 23-AUG-1984 09:23
[POSEY.DEBASE]I82265.DAT;1	1383 23-AUG-1984 09:24
[POSEY.DEBASE]I82266.DAT;1	2385 23-AUG-1984 09:25
[POSEY.DEBASE]I82267.DAT;1	1050 23-AUG-1984 09:26
[POSEY.DEBASE]I82268.DAT;1	1101 23-AUG-1984 09:27
[POSEY.DEBASE]I82269.DAT;1	1047 23-AUG-1984 09:29
[POSEY.DEBASE]I82270.DAT;1	849 23-AUG-1984 09:30
[POSEY.DEBASE]I82271.DAT;1	1044 23-AUG-1984 09:31
[POSEY.DEBASE]I82272.DAT;1	1482 23-AUG-1984 09:32
[POSEY.DEBASE]I82273.DAT;1	1266 23-AUG-1984 09:34
[POSEY.DEBASE]I82274.DAT;1	903 23-AUG-1984 09:35
[POSEY.DEBASE]I82275.DAT;1	1335 23-AUG-1984 09:36
[POSEY.DEBASE]I82276.DAT;1	708 23-AUG-1984 09:38
[POSEY.DEBASE]I82277.DAT;1	1026 23-AUG-1984 09:38
[POSEY.DEBASE]I82278.DAT;2	1440 23-AUG-1984 09:40
[POSEY.DEBASE]I82279.DAT;2	1518 16-AUG-1984 10:33
[POSEY.DEBASE]I82280.DAT;1	1512 28-AUG-1984 14:16
[POSEY.DEBASE]I82281.DAT;1	1326 28-AUG-1984 14:16
[POSEY.DEBASE]I82282.DAT;1	1362 28-AUG-1984 14:15
[POSEY.DEBASE]I82283.DAT;1	1740 28-AUG-1984 14:16
[POSEY.DEBASE]I82284.DAT;2	1602 17-AUG-1984 11:02

[POSEY.DEBASE]I82285.DAT;2
[POSEY.DEBASE]I82286.DAT;2
[POSEY.DEBASE]I82287.DAT;2
[POSEY.DEBASE]I82288.DAT;2
[POSEY.DEBASE]I82289.DAT;2
[POSEY.DEBASE]I82290.DAT;2
[POSEY.DEBASE]I82291.DAT;2
[POSEY.DEBASE]I82292.DAT;1
[POSEY.DEBASE]I82293.DAT;1
[POSEY.DEBASE]I82294.DAT;1
[POSEY.DEBASE]I82295.DAT;1
[POSEY.DEBASE]I82296.DAT;1
[POSEY.DEBASE]I82297.DAT;1
[POSEY.DEBASE]I82298.DAT;1
[POSEY.DEBASE]I82299.DAT;1

1668 17-AUG-1984 10:55
1230 17-AUG-1984 11:09
1710 17-AUG-1984 11:07
1824 17-AUG-1984 10:59
1056 27-AUG-1984 09:18
1428 27-AUG-1984 09:18
1737 27-AUG-1984 09:16
1263 28-AUG-1984 14:25
1707 28-AUG-1984 14:26
1389 31-AUG-1984 09:16
1602 28-AUG-1984 14:28
1302 28-AUG-1984 14:26
1314 28-AUG-1984 14:27
1560 28-AUG-1984 14:28
1578 31-AUG-1984 09:19

Total of 99 files, 127848 blocks

End of save set

Listing of save set(s)

Save set: 182300.
Written by: GRAHAM
UIC: [000150,000006]
Date: 21-SEP-1989 14:39:41.08
Command: BACKUP/REW/LOG NADA.DAT,D\$USER:[POSEY.DEBASE]I82300.DAT; MSA0:I82300./LABEL=I82300
Operating system: VAX/VMS version V4.7
BACKUP version: V4.7
CPU ID register: 08000000
Node name: _DEIO::
Written on: _MSA0:
Block size: 8192
Group size: 10
Buffer count: 3

[POSEY.DEBASE]I82300.DAT;1
[POSEY.DEBASE]I82301.DAT;1
[POSEY.DEBASE]I82302.DAT;1
[POSEY.DEBASE]I82303.DAT;1
[POSEY.DEBASE]I82304.DAT;1
[POSEY.DEBASE]I82305.DAT;1
[POSEY.DEBASE]I82306.DAT;1
[POSEY.DEBASE]I82307.DAT;1
[POSEY.DEBASE]I82308.DAT;1
[POSEY.DEBASE]I82309.DAT;1
[POSEY.DEBASE]I82310.DAT;1
[POSEY.DEBASE]I82311.DAT;1
[POSEY.DEBASE]I82312.DAT;1
[POSEY.DEBASE]I82313.DAT;1
[POSEY.DEBASE]I82314.DAT;1
[POSEY.DEBASE]I82315.DAT;1
[POSEY.DEBASE]I82316.DAT;1
[POSEY.DEBASE]I82317.DAT;1
[POSEY.DEBASE]I82318.DAT;1
[POSEY.DEBASE]I82319.DAT;1
[POSEY.DEBASE]I82320.DAT;1
[POSEY.DEBASE]I82321.DAT;1
[POSEY.DEBASE]I82322.DAT;1
[POSEY.DEBASE]I82323.DAT;1
[POSEY.DEBASE]I82324.DAT;2
[POSEY.DEBASE]I82325.DAT;2
[POSEY.DEBASE]I82326.DAT;2
[POSEY.DEBASE]I82327.DAT;2
[POSEY.DEBASE]I82328.DAT;1
[POSEY.DEBASE]I82329.DAT;2
[POSEY.DEBASE]I82330.DAT;2
[POSEY.DEBASE]I82331.DAT;1

1308 31-AUG-1984 09:13
1641 31-AUG-1984 09:14
1593 31-AUG-1984 09:15
1488 23-SEP-1985 16:03
1383 31-AUG-1984 09:13
1647 31-AUG-1984 09:20
1521 31-AUG-1984 09:22
1716 31-AUG-1984 09:21
1389 31-AUG-1984 09:12
1593 31-AUG-1984 09:09
1413 31-AUG-1984 09:11
1677 31-AUG-1984 09:12
1593 31-AUG-1984 09:10
1656 31-AUG-1984 09:10
1797 10-SEP-1984 10:45
1137 10-SEP-1984 10:55
1980 10-SEP-1984 10:46
774 10-SEP-1984 10:54
1380 10-SEP-1984 10:48
1167 10-SEP-1984 10:53
1545 10-SEP-1984 10:47
1908 10-SEP-1984 10:51
1578 19-SEP-1984 11:18
1512 19-SEP-1984 11:17
1041 23-AUG-1984 09:52
1557 23-AUG-1984 09:53
1167 23-AUG-1984 09:55
1440 23-AUG-1984 09:57
2130 19-SEP-1984 11:19
3519 23-AUG-1984 09:58
2661 23-AUG-1984 09:59
1731 19-SEP-1984 11:19

[POSEY.DEBASE]I82332.DAT;1	1920	10-SEP-1984	11:35
[POSEY.DEBASE]I82333.DAT;1	2037	10-SEP-1984	10:48
[POSEY.DEBASE]I82334.DAT;1	1650	20-AUG-1985	14:05
[POSEY.DEBASE]I82335.DAT;1	1215	20-AUG-1985	14:03
[POSEY.DEBASE]I82336.DAT;1	1425	26-SEP-1984	10:30
[POSEY.DEBASE]I82337.DAT;1	1209	26-SEP-1984	10:27
[POSEY.DEBASE]I82338.DAT;1	1785	26-SEP-1984	10:24
[POSEY.DEBASE]I82339.DAT;1	1797	20-AUG-1985	14:03
[POSEY.DEBASE]I82340.DAT;2	1491	23-AUG-1984	10:05
[POSEY.DEBASE]I82341.DAT;1	1035	13-DEC-1984	17:04
[POSEY.DEBASE]I82342.DAT;1	1788	13-DEC-1984	17:03
[POSEY.DEBASE]I82343.DAT;1	1302	13-DEC-1984	17:03
[POSEY.DEBASE]I82344.DAT;1	1539	13-DEC-1984	17:02
[POSEY.DEBASE]I82345.DAT;1	1563	13-DEC-1984	17:02
[POSEY.DEBASE]I82346.DAT;1	1761	17-DEC-1984	14:30
[POSEY.DEBASE]I82347.DAT;1	1500	17-DEC-1984	14:27
[POSEY.DEBASE]I82348.DAT;1	945	17-DEC-1984	14:32
[POSEY.DEBASE]I82349.DAT;1	1614	17-DEC-1984	14:25
[POSEY.DEBASE]I82350.DAT;1	1266	17-DEC-1984	14:24
[POSEY.DEBASE]I82351.DAT;1	837	17-DEC-1984	14:26
[POSEY.DEBASE]I82352.DAT;1	1134	17-DEC-1984	14:31
[POSEY.DEBASE]I82353.DAT;1	1215	17-DEC-1984	14:29
[POSEY.DEBASE]I82354.DAT;1	1320	20-DEC-1984	10:00
[POSEY.DEBASE]I82355.DAT;1	1308	20-DEC-1984	10:05
[POSEY.DEBASE]I82356.DAT;1	759	20-DEC-1984	10:02
[POSEY.DEBASE]I82357.DAT;1	1380	20-DEC-1984	10:02
[POSEY.DEBASE]I82358.DAT;1	234	20-DEC-1984	10:08
[POSEY.DEBASE]I82359.DAT;1	681	20-DEC-1984	10:05
[POSEY.DEBASE]I82360.DAT;1	756	20-DEC-1984	10:06
[POSEY.DEBASE]I82361.DAT;1	1641	20-DEC-1984	10:03
[POSEY.DEBASE]I82362.DAT;1	1008	20-DEC-1984	10:03
[POSEY.DEBASE]I82363.DAT;1	1143	20-DEC-1984	10:06
[POSEY.DEBASE]I82364.DAT;1	948	20-DEC-1984	10:07
[POSEY.DEBASE]I82365.DAT;1	1215	20-DEC-1984	10:06

Total of 66 files, 96063 blocks
End of save set

Listing of save set(s)

Save set:	I83000.
Written by:	GRAHAM
UIC:	[000150,000006]
Date:	22-SEP-1989 09:02:39.39
Command:	BACKUP/REW/LOG NADA.DAT,D\$USER:[POSEY.DEBASE]I83000.DAT; MSA0:I83000./LABEL=I83000
Operating system:	VAX/VMS version V4.7
BACKUP version:	V4.7
CPU ID register:	08000000
Node name:	_DEIO::
Written on:	_MSA0:
Block size:	8192
Group size:	10
Buffer count:	3

[POSEY.DEBASE]I83001.DAT;1	834	20-DEC-1984	10:04
[POSEY.DEBASE]I83002.DAT;1	1110	31-DEC-1984	11:16
[POSEY.DEBASE]I83003.DAT;1	750	31-DEC-1984	11:21
[POSEY.DEBASE]I83004.DAT;1	744	31-DEC-1984	11:13
[POSEY.DEBASE]I83005.DAT;1	1113	31-DEC-1984	11:10
[POSEY.DEBASE]I83006.DAT;1	909	12-NOV-1985	16:23
[POSEY.DEBASE]I83007.DAT;1	1212	31-DEC-1984	11:11
[POSEY.DEBASE]I83008.DAT;1	1092	31-DEC-1984	11:13
[POSEY.DEBASE]I83009.DAT;1	732	31-DEC-1984	11:20
[POSEY.DEBASE]I83010.DAT;1	294	22-AUG-1985	11:36
[POSEY.DEBASE]I83011.DAT;1	792	9-JAN-1985	16:07
[POSEY.DEBASE]I83012.DAT;1	864	31-DEC-1984	11:18
[POSEY.DEBASE]I83013.DAT;1	1212	31-DEC-1984	11:13

[POSEY.DEBASE]I83014.DAT;1	573	31-DEC-1984	11:18
[POSEY.DEBASE]I83015.DAT;1	1326	31-DEC-1984	11:15
[POSEY.DEBASE]I83016.DAT;1	993	9-JAN-1985	16:04
[POSEY.DEBASE]I83017.DAT;1	1446	9-JAN-1985	16:00
[POSEY.DEBASE]I83018.DAT;1	1410	9-JAN-1985	15:58
[POSEY.DEBASE]I83019.DAT;1	1527	9-JAN-1985	16:01
[POSEY.DEBASE]I83020.DAT;1	1359	9-JAN-1985	15:59
[POSEY.DEBASE]I83021.DAT;1	1686	9-JAN-1985	16:05
[POSEY.DEBASE]I83022.DAT;1	1437	9-JAN-1985	16:06
[POSEY.DEBASE]I83023.DAT;1	1062	26-FEB-1985	13:16
[POSEY.DEBASE]I83024.DAT;1	1074	26-FEB-1985	13:14
[POSEY.DEBASE]I83025.DAT;1	1356	26-FEB-1985	13:13
[POSEY.DEBASE]I83026.DAT;1	984	26-FEB-1985	13:17
[POSEY.DEBASE]I83027.DAT;1	1167	26-FEB-1985	13:15
[POSEY.DEBASE]I83028.DAT;1	927	26-FEB-1985	13:16
[POSEY.DEBASE]I83029.DAT;1	1041	27-FEB-1985	15:25
[POSEY.DEBASE]I83030.DAT;1	1023	27-FEB-1985	15:25
[POSEY.DEBASE]I83031.DAT;1	1206	28-FEB-1985	15:56
[POSEY.DEBASE]I83032.DAT;1	765	5-MAR-1985	14:38
[POSEY.DEBASE]I83033.DAT;1	915	7-MAR-1985	11:11
[POSEY.DEBASE]I83034.DAT;1	726	7-MAR-1985	11:11
[POSEY.DEBASE]I83035.DAT;1	693	7-MAR-1985	11:12
[POSEY.DEBASE]I83036.DAT;1	567	7-MAR-1985	11:12
[POSEY.DEBASE]I83037.DAT;1	699	23-AUG-1985	09:51
[POSEY.DEBASE]I83038.DAT;1	663	23-AUG-1985	09:54
[POSEY.DEBASE]I83039.DAT;1	522	23-AUG-1985	09:53
[POSEY.DEBASE]I83040.DAT;1	639	8-MAR-1985	14:39
[POSEY.DEBASE]I83041.DAT;1	996	8-MAR-1985	14:36
[POSEY.DEBASE]I83042.DAT;1	864	8-MAR-1985	14:39
[POSEY.DEBASE]I83043.DAT;1	933	8-MAR-1985	14:38
[POSEY.DEBASE]I83044.DAT;1	426	8-MAR-1985	14:37
[POSEY.DEBASE]I83045.DAT;1	837	8-MAR-1985	14:36
[POSEY.DEBASE]I83046.DAT;1	813	8-MAR-1985	14:36
[POSEY.DEBASE]I83047.DAT;1	690	8-MAR-1985	14:38
[POSEY.DEBASE]I83048.DAT;1	705	27-AUG-1985	09:20
[POSEY.DEBASE]I83049.DAT;1	576	11-MAR-1985	09:10

Total of 49 files, 46284 blocks
End of save set

The LANG volume description file.

This tape, the LANG DESCRIPTION TAPE -- LANGDESC --, will be supplied to the NSSDC well in advance of the delivery of the data tapes. In addition to containing all LANG software, catalogs, FORTRAN source files and com files, this description tape will be documented (contains documentation) to insure that the various programs will be compiled and linked appropriately in producing the required geophysical data.

CCSDXZLM0001SMARK001CCSDXVN0002SMRK0001
LOG_VOL_IDENT: USANASANSSDDEB9_0001
LOG_VOL_CLOSING_DATE: 1989-10-31
LOG_VOL_FILE_STRUCTURE: FILES-11
TAPE_DENSITY=6250 BPI
TAPE_TRACKS=9
TAPE_LENGTH=2400 INCHES
COMPUTER_MFGR: DIGITAL EQUIPMENT CORPORATION
OPERATING_SYSTEM: MICROVMS 4.7
COMPUTER_SYSTEM: MICRO VAX II
TECHNICAL_CONTACT: DR. W. R. HOEGY
CODE 614
NASA/GSFC
GREENBELT, MD 20771
PHONE: 301-286-3837
SPAN: DE614::, DEIO::HOEGY, PACF::HOEGY

PREV_VOL_IDENT: NONE
CCSDXVN0002EMRK0001CCSDXKNM0002SMRK0003
DATA_SET_NAME: LANG ELECTRON DENSITY AND TEMPERATURE
DATA_SOURCES: DYNAMICS EXPLORER B, LANGMUIR PROBE (LANG)
INVESTIGATOR_CONTACT: MR. LARRY H. BRACE
CODE 614
NASA/GSFC
GREENBELT, MD 20771
PHONE: 303-286-8575
SPAN: DE614::HOEGY

SOURCE_CHARACTERISTICS:

A. DESCRIPTION_OF_SPACECRAFT:

The Dynamics Explorer 2 spacecraft was one of two satellites launched for the Dynamics Explorer program. The two spacecraft were launched together into coplanar polar orbits for the purpose of studying coupling between the magnetosphere, ionosphere, and the atmosphere. The DE-2 spacecraft was placed in a low elliptical orbit whereas the DE-1 orbit was highly elliptical. Instruments aboard the DE-2 spacecraft were: magnetometer, vector electric field instrument, neutral atmosphere composition spectrometer, wind and temperature spectrometer, Fabry-Perot interferometer, ion drift meter, retarding potential analyzer, low altitude plasma instrument, and Langmuir probe.

B. ORBIT_INFORMATION:

Because the Delta launch vehicle did not complete a full burn the DE-2 satellite was placed in a lower than anticipated polar orbit, initially 1012 by 309 km. The orbital period was 98 min. The DE-1 and DE-2 satellites were launched by the same vehicle so that their orbits would be coplanar, allowing occasional two-point measurements along magnetic field lines. The DE-2 spacecraft spun once per orbit and the spin axis was perpendicular to the orbital plane so that one axis of the satellite always was aligned with the center of the earth.

C. PERFORMANCE:

The DE-2 spacecraft performed well through its lifetime. Power limitations forced the duty cycle to be limited to an average which was originally targeted at 30%. The lifetime of the spacecraft was shorter than anticipated because of the less than nominal performance of the launch vehicle. The launch was on Aug. 3, 1981 and the DE-2 satellite reentered the atmosphere on Feb. 19, 1983, with the last contact the day before.

TIME_SPAN_OF_THE_DATA: 8-AUG-81 TO 15-JAN-83

INVESTIGATION_OBJECTIVES:

The LANG objective was to provide electron temperature, plasma density, and spacecraft potential at high resolution of 0.5 seconds to study

energetics of the thermal plasma and density structure of the ionosphere including large scale structures, traveling ionospheric disturbances, and plasma waves.

INSTRUMENT_ATTRIBUTES:

A. DESCRIPTION_OF_INSTRUMENT:

The Dynamics Explorer Langmuir Probe Instrument (LANG) performs in-situ measurements of electron temperature and ion density. Two independent sensors are connected to individual adaptive sweep voltage circuits which continuously track the changing electron temperature and spacecraft potential while autoranging electrometers adjust their gain in response to the changing plasma density. Each voltage sweep takes place in 0.5 seconds. The control signals used to achieve this automatic tracking provide a continuous monitoring of the ionospheric parameters (at 0.5 second resolution) without telemetering each volt-ampere curve. The volt-ampere curves are transmitted twice every 8 seconds (50 samples during one 0.5 second sweep) using digital (10 bit accuracy) stored data. Analog data is digitized by the spacecraft at 8 bit resolution and provides volt-ampere data at 64 samples/second.

During much of the mission probe 1 was in the ion hold mode providing 64 samples/second resolution ion density data via the analog data channel. (See Space Science Instrumentation, Vol 5, 493, 1981).

B. OPERATION_MODE:

Inflight electron temperature, ion and electron density, and satellite potential are detected every 0.5 second. Two stored volt-ampere curves are detected every 8 seconds, analog volt-ampere curves every 0.5 second at a rate of 64 samples/second. Normal operating mode is: probe 2 in adaptive mode to give electron temperature and ion density; probe 1 in ion hold mode to give high resolution ion density at 64 samples/second.

C. MEASURED_PARAMETERS:

Electrometer gain and applied voltage (start and slope) settings for every 0.5 second framed volt-ampere sweep are directly sensed. These telemetered engineering parameters are used to derive the inflight values of ion density, electron density, electron temperature, and satellite potential based on calibration with the raw volt-ampere data.

Electrometer gain and applied voltage of volt-ampere curves for stored and analog data channels are telemetered for ground analysis. The geophysical parameters, electron temperature, ion density, satellite potential, and electron density, are derived from this raw volt-ampere data. 64 sample/second ion density is derived from the analog volt-ampere data when probe 1 is in ion hold mode.

D. PERFORMANCE_OF_THE_INSTRUMENT:

The LANG instrument returned usable data from shortly after launch until reentry. During some spinning orbits the instrument was placed in a special stepping mode to calibrate the accelerated electron current. Probe 2 was successfully cleaned and provided accurate electron temperatures throughout the mission. Probe 1 was contaminated and therefore could not provide accurate temperatures; it did provide accurate, high resolution ion densities. Probe 2 was used for the inflight temperature, density, and satellite potential.

E. RESOLUTION:

Each LANG record contains 0.5 second resolution engineering parameters from which the inflight electron temperature, electron and ion density, and satellite potential are derived using simple computer code.

PARAMETERS:

The geophysical parameters derived from the Langmuir probe are electron temperature (T_e), plasma density (either ion density N_i from the ion acceleration region of the probe volt-ampere characteristic when the probe is negative with respect to the plasma and measures ion, and electron density N_e from the electron acceleration region when the probe is positive and retards the ions and accelerates the electrons) and satellite potential, V_s which is the potential difference between the probe and the undisturbed ionosphere plasma. These geophysical parameters are derived every 0.5 seconds from a voltage sweep of the probe which generates an internal volt-ampere curve. The curve is framed by adjusting the gain decade and vernier settings so that the accelerated ion current produces an electrometer output voltage of -3.3 volts, the

voltage sweep is adjusted so that the electron current produces an electrometer output voltage of 9.5 volts after a voltage difference of 8kTe from the starting voltage. This frames the volt-ampere curve to maximize the resolution of the temperature and density. The inflight engineering parameters from which Te Ni Ne and Vs are derived are telemetered every 0.5 seconds. The detailed engineering parameters described as follows:

IMODE(1:2) 2 bits, mode of each of the two probes

- = 0 adapt
- = 1 step
- = 2 ion hold
- = 3 electron hold

IDED 2 bits, which probe is dedicated

IBIAS 2 bits, indicates the extra bias potential applied to the sweep, negative, positive, none.

ICMD 1 bit, command, not used

IANA 2 bits, which probe is analog

ION 1 bit, probe on switch

VI(1:2) 8 bits, VA start of sweep potential

DV(1:2) 10 bits, VA slope for this sweep, Te of last sweep

NI(1:2) 10 bits, Current detector range used in this sweep, 2 bits for decade range, 8 bits for vernier range

NE(1:2) 10 bits, decade range (2 bits) and curve amplitude (8 bits) giving electron current

These engineering parameters are converted to the geophysical electron temperature, ion and electron density, and satellite potential using the subroutines contained in the file LANGSUBROUTINES.FOR on tape LANGDESC. Each file contains a functional description clarifying usage.

DATA_SET_QUALITY:

The electron temperature and ion and electron density are accurate to about 10% at all altitudes. The subroutine supplied in LANGSUBROUTINES.FOR which converts the engineering parameters to geophysical Te Ni Ne and Vs, has built in limits which only produces Te when the density is greater than 1.E4, and which returns Ni when density is above 2.E4 and Ne when density is below 2.E4. The range of Te is from about 800 K to about 10,000 K, the range of Ni and Ne is: 1.E3 to 1.E6 for Ne and 1.E4 to 1.E7 for Ni; Vs has a possible range of about -10 volts to +7 volts, but is typically at -1.5 to -0.5 volts.

DATA_PROCESSING_OVERVIEW:

A. DATA_PROCESSING_CYCLE:

The raw telemetry data were routinely converted I-files containing the 0.5 second inflight engineering parameters which are converted by the software in LANGSUBROUTINES.FOR into geophysical parameters Te, Ne and Ni. There is one I-file for each day for which data was taken. Each daily I-file contains the telemetry segments listed on the catalog file LANGTAPELIST.DAT. The start and stop times of the telemetry segments are those of the raw telemetry segments. The files LANGSUBROUTINES.FOR and LANGTAPELIST.DAT are supplied on the LANG document file LANGDESC.

B. HISTORY:

The I-files were produced routinely as telemetry became available. Telemetry was rescanned for missing passes at later times. Duplicate passes or parts of passes should have been eliminated and separate segments joined. The extreme segmentation or length of some telemetry passes resulted in the inability of the Sigma 9 to bring all the data on line within the allotted processing time and results in some passes still being incomplete. All files have been updated to final values and written on VAX formatted tapes.

DATA_USAGE: Data are used to obtain the ambient electron temperature, ion density, electron density, and satellite potential. Lists of times when data is bad due to orbit problems or times when the spacecraft was spinning are listed in the files BADLANG.DAT for the bad data and SPINNERSLANG.DAT for the spinning orbits. These files are on the LANG document tape LANGDESC.

DATA_ORGANIZATION:

LANGMUIR PROBE INFLIGHT DATA

Stored on 7 tapes labeled Iyyddd where ddd is a multiple of
100 (000,100,200,300) and the tape contains all inflight
files from yyddd to yyddd+99. (i.e. 81200-81299)

<<<<<NOTE: ALL LANG SOFTWARE, CATALOGS FORTRAN SOURCE FILES AND
COM FILES ARE SUPPLIED ON THE LANG DESCRIPTION TAPE
LANGDESC>>>>>

Some LANG supplied software:

To promote data from a tape use PROTAP.COM

To promote all data from the tape answer

'1ST DAY TO BE PROMOTED' with the yyddd of the tape label
and 'LAST DAY TO BE PROMOTED' with the same yyddd+99
(i.e. 82000 and 82099 for tape I82000 and even
82300 and 82399 for tape I82300)

To promote less than the entire tape answer

'1ST DAY...' and 'LAST DAY...' as per required data
(i.e. 82342 and 82345 for days 82342-82345)

Once online, to read inflight data into a formatted file

use EXAMLANG.EXE which uses subroutines from

LANGSUBROUTINES.OBJ (INFL_READ,INFL_CONVERT,INF_VGET,FNE,FNI,FNENI)

EXAMLANG is the driver which, interactively, gathers the
request parameters (date, start time,...) and
formats the output (to file or screen).

INFL_READ opens the appropriate data file, reads the packed
integer data, and places the unpacked (real & integer)
data in an array for the calling program (i.e. EXAMLANG)

INFL_CONVERT unpacks the integer data and applies INF_VGET

INFL_VGET transforms the integer data (as stored in TM) into
the real and integer temperatures, densities, etc.
that it represents using the functions FNE and FNI
for Ne and Ni calculations

Thus programs needed are:

PROTAP.COM and

EXAMLANG.EXE or EXAMLANG.FOR, and LANGSUBROUTINES.FOR
to be compiled and linked appropriately.

Once linked EXAMLANG.EXE looks for the I-file(s) in SYS\$MAF
and tries to write out any saved data file in SYS\$PROC
therefore the two following assignments need to be made
prior to running EXAMLANG or using PROTAP.COM

```
ASSIGN <your I-file destination directory> SYS$MAF
ASSIGN <saved data destination directory> SYS$PROC
```

Now you are ready to run.

The data files themselves:

File names are of the form Iyyddd where yy is 81, 82, or 83 and
0<ddd<366. The date range is 81215-83049 with almost all days
represented.

Files are indexed organization using time in milliseconds as the
key. A typical OPEN statement is

```
OPEN(UNIT=1,NAME='disk:[directory]Iyyddd.DAT',TYPE='OLD',
      ACCESS='KEYED',KEY=(1:4:INTEGER),RECL=35,READONLY,
      FORM='UNFORMATTED',ORGANIZATION='INDEXED',ERR=label1)
```

File records are 35 (4-byte) words in length (note RECL above)
and cover 8 seconds (16 half-sec. samples) of data. The first
word is overhead for the keyed-indexed organization. The second
word is universal time in msec. of the first half-second of data
in the record. The remaining 33 words are the data, in a packed
integer form, covering 16 half-second-resolution samples that
begin at that UT (call them DATA(1)-DATA(33)). Thus a typical
initial (keyed) READ statement is
READ(1,KEYGE=SOME_UT,ERR=label2)ITIME,(IDATA(J),J=1,33)

This will read the first record with ITIME>=SOME_UT (both times being in msec). Subsequent READ statements can read sequentially by removing the phrase KEYGE=SOME_UT, possibly adding END=label3. The 3rd through 35th words of the record comprise the data. The 3rd word (IDATA(1) above) is satellite specific data (IMODE(1-2), IDED, IBIAS, ICMD, IANA, and ION) packed as follows
 $((((IMODE(1)*4+IMODE(2))*4+IDEDED)*4+IBIAS)*2+ICMD)*4+IANA)*2+ION$
As implied, these seven data are 1 or 2 bit fields.

IMODE(1:2) 2 bits, mode of each of the two probes

- = 0 adapt
- = 1 step
- = 2 ion hold
- = 3 electron hold

IDEDED 2 bits, which probe is dedicated

IBIAS 2 bits, indicates the extra bias potential applied to the sweep is not used (SHOULD BE!!!!!!)

ICMD 1 bit, command not used

IANA 2 bits, which probe is analog

ION 1 bit, probe on?

The 4th through 35th words of the record are paired up (i.e. IDATA(2) and IDATA(3), IDATA(4) and IDATA(5), ..., IDATA(32) and IDATA(33)) so that the 16 pairs cover the 16 half-seconds of data in the 8-second interval. These pairs are packed as follows

IDATA(2i)=((DV(1)*1024)+DV(2))*1024+NI(1)
+1 {if NI(1) is negative}
+1024 {if DV(2) is negative}
+1024**2 {if DV(1) is negative}

where i=1,2,3,...,16

IDATA(2i+1)=((NI(2)*256)+IV)*1024+NV
+1 {if NV=max(NE(1),NE(2)) is negative}
+1024 {if IV=max(V(1),V(2)) is negative}
+1024*256 {if NI(2) is negative}

where i=1,2,3,...,16

These are 8 or 10 bit data fields

V(1:2) 8 bits, VA start of sweep potential

DV(1:2) 10 bits, VA slope for this sweep, Te of last sweep

NI(1:2) 10 bits, Current detector range used in this sweep, 2 bits for decade range, 8 bits for vernier range

NE(1:2) 10 bits, decade range (2 bits) and curve amplitude (8 bits) giving electron current

The aforementioned subroutines INFL_CONVER and INF_VGET are THE algorithms for, respectively, the unpacking and translation of this array (DATA) of packed integers.

CCSDXKNM0002EMRK0003CCSDXKNM0002SMRK0005

LOG_VOL_TIME_COVERAGE: YYYY-MM-DD TO YYYY-MM-DD

NAMING_CONVENTION:

File names are of the form Iyyddd where yy is 81, 82, or 83 and 0<ddd<366. The date range is 81215-83049 with almost all days represented.

FILE_TIME_COVERAGE:

The times of the data segments in the I-files are contained in ILANG.CAT, while the list of the I-files is in LANGTAPELIST.DAT.

These two files are on the LANG description tape LANGDESC.

PREV_LOG_VOL_COVERAGE: NONE

CCSDXKNM0002EMRK0005CCSDXRNM0003SMRK0006

NESTING= L

REF= FORMAT.SFD

CCSDXRNM0003EMRK0006CCSDXRLM0003SMRK0007

ADI= NSSD0005

CLASS= I

NESTING= N

SCOPE= EACH

REF=N*.*

CCSDXRLM0003EMRK0007CCSDXZLM0001EMARK001

Printed by user POSEY at 1-MAR-1990 12:21:41
 File: _DUB1:[SYSUSER1.][POSEY.TEMP]TAPEDESC.V/NG;11

This is the LANG tape description file, TAPEDESC.LANG

This tape, the LANG DESCRIPTION TAPE — labeled LANG —, is being supplied to the NSSDC well in advance of the delivery of the data tapes. In addition to containing all LANG software, catalogs, FORTRAN source files and com files, this description tape is documented (contains documentation) to insure that the various programs will be compiled and linked appropriately to produce the required geophysical data.

This tape contains the following files:
 (size listed is approximate size on VAX disk in blocks)

Catalog files:	ILANG.CAT;2	261
COM files:	PROTAP.COM;14	4
Data files:	BADLANG.DAT;1	2
	LANGTAPELIST.DAT;1	98
	SPINNERSLANG.DAT;1	17
FORTRAN source files:	LANGSUBROUTINES.FOR;7	23
	EXAMLANG.FOR;7	6
Documentation file:	TAPEDESC.LANG;10	10
NSSDC SFD files:	FORMAT.SFD;2	9
	VOLDESC.SFD;12	38

Total of 10 files, 468 blocks.

DESCRIPTION_OF_CATALOG_FILES

The catalog file ILANG.CAT contains a list of the date and the start and stop times in milliseconds of all TM segments that have been processed into LANG I-files. This catalog can be searched using the VAX editor EDT to find whether a given date has data and if it has data, what are the start and stop times of the data.

DESCRIPTION_OF_COM_FILES

The only com file is PROTAP.COM which is used only to promote the data.

To promote data from a tape use PROTAP.COM

- (1) To promote all data from the tape answer
 '1ST DAY TO BE PROMOTED' with the yyddd of the tape label
 and 'LAST DAY TO BE PROMOTED' with the same yyddd+99
 (i.e. 82000 and 82099 for tape I82000 and even
 82300 and 82399 for tape I82300)

- (2) To promote less than the entire tape answer
 '1ST DAY...' and 'LAST DAY...' as per required data
 (i.e. 82322 and 82345 for days 82322-82345)

Once the data is online, use EXAMLANG.EXE to read inflight data into a formatted file or modify EXAMLANG.FOR for your particular needs.

DESCRIPTION_OF_DATA_FILES

The data file BADLANG.DAT contains a list of dates and start and stop times in HHMMSS format (hour minute second) when the summary plots showed some problem with the LANG data. The data is considered unusable during these times. The cause is unknown, but may be due to anomalous operation of the instrument or an anomaly in the data transmission. These times were used to delete bad data from the unified abstract database. There may not be data segments in ILANG.CAT corresponding to these times; when such data segments exist, do not process those times.

The data file SPINNERSLANG.DAT contains a list of dates and start and stop times in HHMMSS format when the spacecraft was spinning. This data is good for diagnostic purposes by the LANG group only and should therefore be considered in the same category as the data in BADLANG.DAT. Do not use data for the times listed in SPINNERSLANG.DAT.

DESCRIPTION_OF_FORTRAN_SOURCE_FILES

EXAMLANG is the driver which interactively opens and reads the I-files, and then writes the LANG parameters: Te Np (plasma density) and Vs (satellite potential) to a file or to the screen. This file is a prototype for the user's own program for processing the data; it demonstrates how to call the subroutines and functions contained in LANGSUBROUTINES.FOR. EXAMLANG prompts for the date and start and stop time (in seconds) for the data which is written in formatted output to a file of the user's choice or to unit 6, the user's terminal. EXAMLANG.FOR calls the subroutine INFL_READ and the function FNENI.

The subroutines contained in LANGSUBROUTINES.FOR are: INFL_READ, INFL_CONVERT, and INFL_VGET. INFL_READ opens the appropriate data file (I-file with name IYYDDD.dat, where YYDDD is the date) and reads the packed integer data, and places the unpacked (real & integer) data in an array for the calling program (i.e. EXAMLANG). INFL_CONVERT unpacks the integer data and applies INFL_VGET to transform the integer data (as stored in TM) into the geophysical parameters of temperature, density, and satellite potential. The functions FNE and FNI evaluate Ne and Ni from the calculated current and potential.

SUMMARY_OF_HOW_TO_USE_PROGRAMS

The programs needed are: (1) PROTAP.COM and (2) EXAMLANG.EXE or EXAMLANG.FOR, and LANGSUBROUTINES.FOR (to be compiled and linked appropriately). Once linked EXAMLANG.EXE looks for the I-file(s) in SYS\$MAF and tries to write out any saved data file in SYS\$PROC therefore the two following assignments need to be made prior to running EXAMLANG or using PROTAP.COM.

ASSIGN <your I-file destination directory> SYS\$MAF

ASSIGN <saved data destination directory> SYS\$PROC

Now you are ready to run. Good luck.

From: DEIO::POSEY 27-FEB-1990 11:49:57.48
To: DE614::HOEGY
Cc:
Subj: AS PROMISED MOMENTS AGO

This is the LANG tape description file, TAPEDESC.LANG

This tape, the LANG DESCRIPTION TAPE — labeled LANG —, is being supplied to the NSSDC well in advance of the delivery of the data tapes. In addition to containing all LANG software, catalogs, FORTRAN source files and com files, this description tape is documented (contains documentation) to insure that the various programs will be compiled and linked appropriately to produce the required geophysical data.

This tape contains the following files:
(size listed is approximate size on VAX disk in blocks)

Catalog files:

ILANG.CAT;2 261

COM files:

PROTAP.COM;14 4

Data files:

BADLANG.DAT;1 2

LANGTAPELIST.DAT;1 98

SPINNERSLANG.DAT;1 17

FORTRAN source files:

LANGSUBROUTINES.FOR;7 23

EXAMLANG.FOR;7 6

Documentation file:

TAPEDESC.LANG;10 10

NSSDC SFD files:

FORMAT.SFD;2 9

VOLDESC.SFD;12 38

Total of 10 files, 468 blocks.

DESCRIPTION_OF_CATALOG_FILES

The catalog file ILANG.CAT contains a list of the date and the start and stop times in milliseconds of all TM segments that have been processed into LANG I-files. This catalog can be searched using the VAX editor EDT to find whether a given date has data and if it has data, what are the start and stop times of the data.

DESCRIPTION_OF_COM_FILES

The only com file is PROTAP.COM which is used only to promote the data.

To promote data from a tape use PROTAP.COM

(1) To promote all data from the tape answer

'1ST DAY TO BE PROMOTED' with the yyddd of the tape label and 'LAST DAY TO BE PROMOTED' with the same yyddd+99

(i.e. 82000 and 82099 for tape I82000 and even
82300 and 82399 for tape I82300)

(2) To promote less than the entire tape answer

'1ST DAY...' and 'LAST DAY...' as per required data

(i.e. 82322 and 82345 for days 82322-82345)

Once the data is online, use EXAMLANG.EXE to read inflight data into a formatted file or modify EXAMLANG.FOR for your particular needs.

DESCRIPTION_OF_DATA_FILES

The data file BADLANG.DAT contains a list of dates and start and stop times in HHMMSS format (hour minute second) when the summary plots showed some problem with the LANG data. The data is considered unusable during these times. The cause is unknown, but may be due to anomalous operation of the instrument or an anomaly in the data transmission. These times were used to delete bad data from the unified abstract database. There may not be data segments in ILANG.CAT corresponding to these times; when such data segments exist, do not process those times.

The data file SPINNERSLANG.DAT contains a list of dates and start

and stop times in HHMMSS format when the spacecraft was spinning. This data is good for diagnostic purposes by the LANG group only and should therefore be considered in the same category as the data in BADLANG.DAT. Do not use data for the times listed in SPINNERSLANG.DAT.

DESCRIPTION_OF_FORTRAN_SOURCE_FILES

EXAMLANG is the driver which interactively opens and reads the I-files, and then writes the LANG parameters: Te Np (plasma density) and Vs (satellite potential) to a file or to the screen. This file is a prototype for the user's own program for processing the data; it demonstrates how to call the subroutines and functions contained in LANGSUBROUTINES.FOR. EXAMLANG prompts for the date and start and stop time (in seconds) for the data which is written in formatted output to a file of the user's choice or to unit 6, the user's terminal. EXAMLANG.FOR calls the subroutine INFL_READ and the function FNENI.

The subroutines contained in LANGSUBROUTINES.FOR are: INFL_READ, INFL_CONVERT, and INFL_VGET. INFL_READ opens the appropriate data file (I-file with name IYYDDD.dat, where YYDDD is the date) and reads the packed integer data, and places the unpacked (real & integer) data in an array for the calling program (i.e. EXAMLANG). INFL_CONVERT unpacks the integer data and applies INFL_VGET to transform the integer data (as stored in TM) into the geophysical parameters of temperature, density, and satellite potential. The functions FNE and FNI evaluate Ne and Ni from the calculated current and potential.

SUMMARY_OF_HOW_TO_USE_PROGRAMS

The programs needed are: (1) PROTAP.COM and (2) EXAMLANG.EXE or EXAMLANG.FOR, and LANGSUBROUTINES.FOR (to be compiled and linked appropriately). Once linked EXAMLANG.EXE looks for the I-file(s) in SYS\$MAF and tries to write out any saved data file in SYS\$PROC therefore the two following assignments need to be made prior to running EXAMLANG or using PROTAP.COM.

ASSIGN <your I-file destination directory> SYS\$MAF

ASSIGN <saved data destination directory> SYS\$PROC

Now you are ready to run. Good luck.

81302 121700 134700
81321 063900 081700
J1322 095800 102800
81324 023900 031400
81325 220400 238200
81327 101400 112300
81328 044600 053500
81351 050700 070800
82174 121000 122000
82174 152000 153000
82176 053330 053700
82176 173000 173200
82180 025700 033545
82183 191500 194000
82183 221000 221700
82184 063000 065000
82185 083500 084500
82186 012000 013000
82186 184400 185400
82187 065545 072100
82188 182530 183100
82217 131000 131900
82274 011800 013200
82274 085300 090100
82275 130930 132400
82275 160200 161900
82275 191900 193300
82277 235600 240000
82278 000000 004200
82279 110700 112500
82279 141700 144400
82282 180900 182020
82283 140000 141200
82283 232000 234930

```
$ ON CONTROL_Y THEN GOTO END_PROTAP
$ SET NOON
$ SH DEV MS:
$ INQUIRE MTYP "Which tape drive would you like to use?"
$ ALLOCATE 'MTYP'
$ MNT = "NO"
$ IF .NOT.$STATUS THEN EXIT
$
$ L0:
$   IF MNT .EQS. "YES" THEN $ DISMOUNT/NOUNLOAD 'MTYP'
$   ON CONTROL_Y THEN GOTO END_PROTAP
$   INQUIRE FILE_1 "* Enter the first day to be promoted."
$   INQUIRE FILE_2 "* Enter the last day to be promoted."
$   ON CONTROL_Y THEN GOTO L0
$   IF FILE_1 .GT. FILE_2 THEN GOTO L0
$   TAPE_NUM = (FILE_1/100)*100
$
$ L1:
$
$   FILES = "NADA.DAT"
$   TAPE = "I",TAPE_NUM
$   INQUIRE RET "Please mount tape ''TAPE'' on ''MTYP'' and hit return."
$   MOUNT/FOREIGN/NOWRITE 'MTYP' 'TAPE'
$   MNT = "YES"
$   IF FILE_1 .EQ. TAPE_NUM THEN GOTO L4
$   IF FILE_1 .EQ. ((FILE_1/10)*10) THEN GOTO L3
$
$ L2:
$
$   FILES = FILES + ",I" + F$STRING(FILE_1) + ".DAT"
$   FILE_1 = FILE_1 + 1
$   IF FILE_1 .EQ. ((FILE_1/10)*10) THEN GOTO L3
$   IF FILE_1 .LE. FILE_2 THEN GOTO L2
$   BACKUP/REWI/LOG/INTERCHANGE 'MTYP''TAPE'./SELECT=('FILES') -
    [POSEY.DEBASE]*.* /OWNER=DE_USER
$   GOTO L0
$
$ L3:
$
$   IF (FILE_2-FILE_1) .LE. 10 THEN GOTO L2
$   FILES = FILES + ",I" + F$STRING(FILE_1/10) + "% DAT"
$   FILE_1 = FILE_1 + 10
$   IF FILE_1 .LE. FILE_2 THEN GOTO L3
$
! Be certain to assign SYS$MAF to your destination directory
$   BACKUP/REWI/LOG/INTERCHANGE 'MTYP''TAPE'./SELECT=('FILES') -
    SYS$MAF:.*.* /OWNER=DE_USER
$   GOTO L0
$
$ L4:
$
$   IF FILE_2 .GT. (FILE_1+97) THEN - !promote the whole tape
$     FILES = FILES + ",I" + F$STRING(FILE_1/100) + "% DAT"
$   IF FILE_2 .LT. (FILE_1+98) THEN GOTO L3
$
! Be certain to assign SYS$MAF to your destination directory
$   BACKUP/REWI/LOG 'MTYP''TAPE'./SELECT=('FILES') SYS$MAF:.*.*
$   DISMOUNT 'MTYP'
$   MNT = "NO"
$   GOTO L0
$
$ END_PROTAP:
```

Printed by user POSEY at 1-MAR-1990 12:21:09
File: _DUB1:[SYSUSER1.][POSEY TEMP]SPINNERSLANG.DAT;1

81215 104913 110005
81215 110005 111429
81216 031005 034949
81216 140109 145005
81217 132437 134749
81217 180845 183509
81217 183517 195605
81218 031205 032413
81218 032421 034237
81218 063957 071253
81218 161933 162629
81218 203533 204741
81219 141837 155909
81219 155917 172725
81219 202349 212925
81220 115301 115621
81221 111301 111525
81221 124733 125325
81221 185317 194429
81221 220909 225029
81221 230053 230221
81222 001141 003405
81222 013933 015733
81222 015741 022133
81222 031709 032429
81222 032445 034941
81222 124749 134109
81222 134117 152957
81222 182941 191557
81222 191605 192221
81223 053149 055429
81223 070933 071309
81223 071350 074142
81223 084726 090950
81223 130525 132029
81223 132053 144141
81223 144157 162158
81223 162213 164133
81223 181213 183702
81223 183717 194933
81223 194933 210502
81223 210510 215950
81223 215958 225510
81223 234710 234838
81224 132134 145934
81224 150038 155542
81224 200838 201902
81225 134910 141358
81225 152822 165806
81225 165854 171046
81225 171054 185342
81226 082518 085830
81226 204014 205558
81226 205606 222350
81227 085158 092550
81227 120758 121310
81227 141334 141806
81228 010246 014238
81228 072814 082942
81228 175534 182150
81230 094726 110102
81230 220822 221102
81230 222854 223350
81231 184158 191734
81231 192718 201022
81232 170710 181214

81233 231726 232838
81234 163734 170334
81243 061407 073359
81243 073407 083759
81243 083807 101359
81243 101407 110631
81243 131407 141359
81243 141407 143215
81243 143223 151759
81243 151807 152551
81243 152551 160559
81243 160607 165311
81243 165423 172551
81243 172559 181359
81243 181359 183903
81243 184415 191223
81243 191239 204127
81243 204135 214855
81243 214911 221359
81243 221407 233031
81243 233303 235959
81244 000000 003247
81244 003255 014143
81244 014151 021359
81244 021407 024111
81244 024119 033319
81244 033327 041247
81244 041407 052239
81244 172551 175511
81244 175519 185943
81244 185951 192431
81245 134511 143759
81245 143807 144711
81245 144815 160647
81254 100711 104823
81254 104831 120047
81260 142136 142344
81260 203736 210232
81260 210344 214352
81260 214400 223208
81269 141241 153337
81269 153345 160601
81276 114922 123818
81276 123833 131817
81276 131825 134257
81279 120226 121522
81282 101610 104802
81305 061622 072846
81305 072854 085702
81316 164551 170023
81316 212231 213559
81319 020928 030616
81319 030624 035416
81321 000000 000848
81321 075408 081848
81322 225704 233704
81322 234320 235959
81324 112152 121736
81325 154657 161945
81325 190033 193313
81325 220409 230153
81326 204657 212545
81341 060531 063427
81341 063435 075451
81342 062659 065643
81342 065652 081644

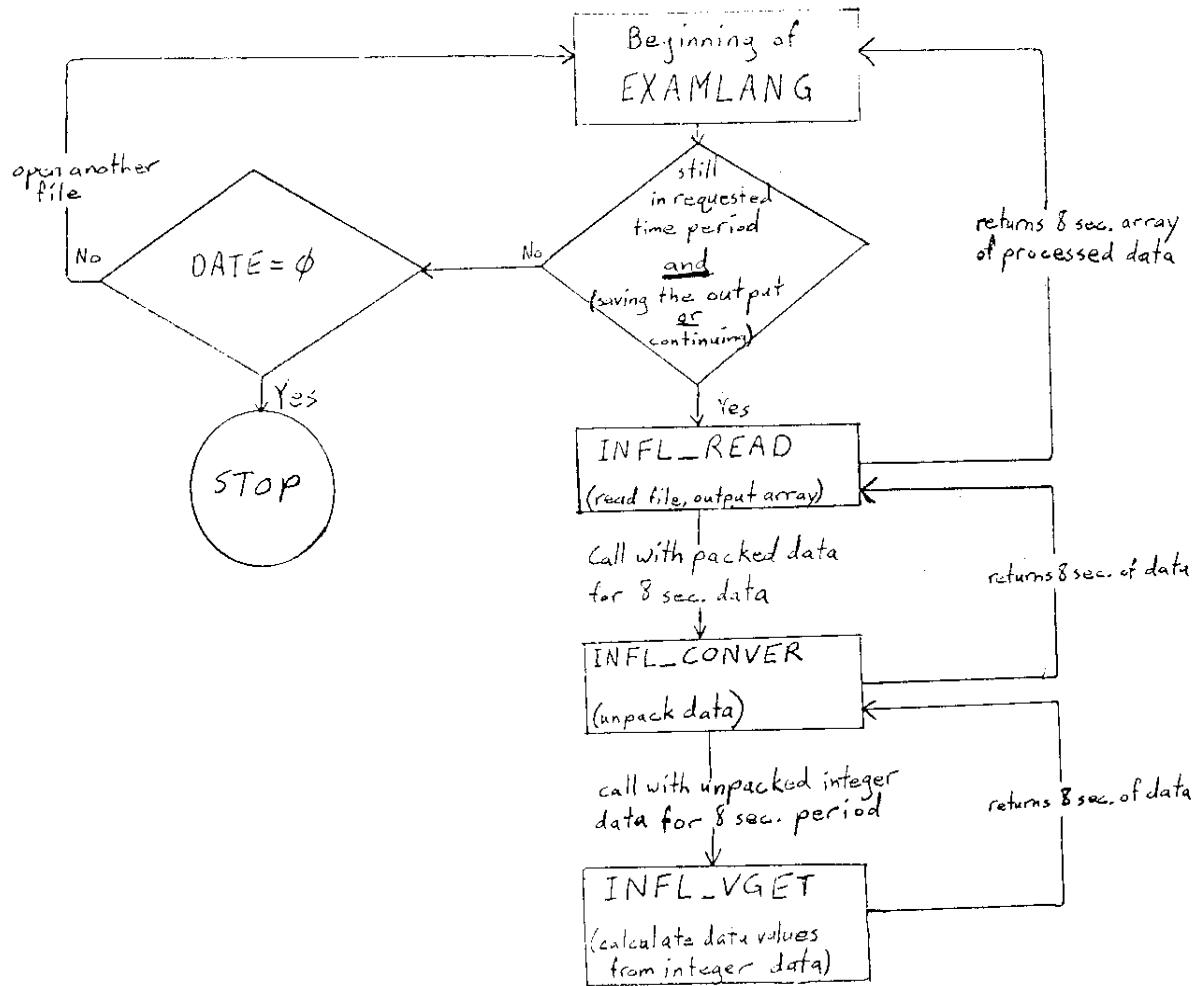
81349 205957 210221
81358 082838 084846
81358 085510 085702
81358 085702 092126
81358 092134 100926
81362 085230 091302
81362 091310 093014
81362 093022 095254
81362 095302 095838
81362 100406 102606
81362 223454 232846
82004 000000 000823
82006 144240 154512
82006 154520 162520
82013 151913 155801
82013 155809 170209
82014 000537 002000
82019 084305 092250
82020 140122 144634
82020 144642 154226
82021 084914 091010
82021 091018 095034
82029 133347 133843
82033 080939 083651
82034 051355 055115
82034 055131 065555
82037 125852 133724
82041 115004 122700
82041 122717 133108
82043 172037 182005
82043 182013 190037
82046 014237 022405
82052 171437 180349
82052 180358 185214
82053 121318 123902
82054 041038 041046
82056 054702 060030
82056 060038 070214
82057 071622 073622
82057 073630 084910
82063 184335 184415
82068 175559 182727
82071 105712 114952
82071 215351 231055
82074 195808 195816
82075 091736 101224
82078 133336 140328
82080 224440 231840
82081 092216 094616
82081 094624 110432
82084 224321 233817
82087 072857 080257
82093 070506 070618
82096 084139 094539
82096 094547 102531
82099 223843 231235
82100 045803 052803
82107 142908 150300
82112 112637 113149
82113 130021 133213
82113 133229 144421
82114 155453 162845
82121 054926 061918
82126 161446 171102
82126 171110 175846
82128 022846 025846

82129 102751 110143
82135 193743 200735
82137 063711 071111
82143 172616 175608
82144 012552 015856
82146 025856 033000
82146 033016 040224
82146 040240 045840
82146 045856 053056
82150 115441 120649
82150 121353 121537
82150 121649 122353
82150 201137 204129
82152 003521 010913
82153 013337 013409
82156 155114 165450
82156 165458 173506
82157 021914 024914
82161 172034 172042
82165 012450 012658
82165 012658 015442
82165 024331 031723
82167 154210 163842
82171 013739 020147
82171 020155 024939
82171 024947 032131
82173 140659 144051
82174 035532 042532
82185 001124 001228
82185 171756 173940
82185 221340 224716
82186 012228 015612
82187 011732 012916
82187 012924 020932
82193 205029 205533
82200 095318 102645
82201 031438 034430
82212 090415 093743
82212 170751 173743
82214 220719 222951
82214 222951 232552
82219 133616 140944
82219 215512 220632
82219 220640 222456
82223 180113 180209
82227 162857 165129
82227 165137 165857
82229 005401 012729
82229 041209 041705
82229 231305 235959
82230 000000 001705
82234 161138 164058
82240 094426 105826
82244 034323 042043
82244 042043 050011
82244 050019 054747
82246 013411 015219
82246 015243 020323
82246 131803 134803
82248 051259 051307
82250 233811 233843
82250 234043 234147
82250 234619 234659
82250 234811 234907
82258 124020 125212
82258 192116 195004

82259 024916 033204
82259 031956 033204
82259 033212 034716
82259 175004 175316
82259 175316 185724
82260 030700 031756
82260 031805 034037
82262 105236 112236
82263 104157 111141
82267 014405 014517
82267 205053 212029
82272 190302 193246
82274 113926 114230
82279 052639 052807
82279 223439 223551
82280 144911 145223
82283 103727 111103
82285 093256 101336
82285 101344 105328
82286 035424 043016
82287 140520 140552
82288 053816 061152
82290 085248 092848
82294 224857 225001
82294 232841 232849
82297 205754 212722
82300 165050 165626
82300 165634 180850
82303 100714 101530
82303 101538 104026
82305 024147 031123
82306 052235 055347
82306 054339 055347
82309 041331 044339
82309 235851 235959
82310 000000 002115
82310 002123 003003
82315 060132 062036
82315 204317 205405
82316 202813 203045
82318 124621 125053
82320 110805 114005
82320 200846 201302
82322 010526 010710
82323 144206 144214
82323 204158 205014
82323 215102 215518
82325 135358 135806
82326 013630 023710
82326 023718 031414
82327 000000 000207
82327 133055 140431
82330 110831 111335
82332 025511 032727
82335 131328 134312
82336 082616 085952
82343 024442 031426
82344 025250 025338
82354 223635 224907
82354 224907 231011
82357 070748 071116
82359 002516 002828
82361 091244 094228
82362 052740 054444
82364 122405 124021
82364 124029 133229

82364 133237 140149
83001 235333 235845
83001 235853 235959
83002 000000 002341
83002 045734 052918
83004 121614 122158
83004 122206 124550
83008 234246 235959
83009 000000 001222
83009 185951 190135
83012 071151 074855
83013 030407 031215
83013 031223 033351
83016 002735 011055
83018 011103 014303
83018 145752 152336
83018 152352 152728
83021 004648 012256
83021 012304 020720
83024 030345 033321
83025 204817 211753
83031 001618 004026
83031 004034 011706
83031 221626 221954
83032 110426 110842
83032 110850 113018
83032 145506 145738
83034 040322 040802
83034 183202 183522
83037 160915 161115
83040 233147 235115
83040 235115 235459
83042 153411 160347
83043 103147 103339
83043 112059 112307
83045 134212 134740
83045 134748 141156
83045 195212 195332
83045 195340 200308
83045 200308 204708
83047 142156 143708
83047 154228 160540
83047 170916 172332
83047 172332 175004
83047 175004 181748
83047 232052 234116
83048 024148 030500
83048 050452 052012
83048 104100 105148
83048 105156 113204
83048 152228 154540
83048 164908 171724
83048 185844 191100
83048 191100 195452
83049 003644 003748
83049 003748 011956
83049 012004 012828
83049 042700 042948
83049 043100 045508
83049 045516 045644
83049 122404 130652
83049 130652 131548
83049 162652 164436

Once online, to read inflight data into a formatted file
use EXAMLANG.EXE which uses subroutines from
LANGSUBROUTINES.OBJ (INFL_READ, INFL_CONVERT, INF_VGET, FNE, FNI, FNENI)
EXAMLANG is the driver which, interactively, gathers the
request parameters (date, start time,...) and
formats the output (to file or screen).
INFL_READ opens the appropriate data file, reads the packed
integer data, and places the unpacked (real & integer)
data in an array for the calling program (i.e. EXAMLANG)
INFL_CONVERT unpacks the integer data and applies INF_VGET
INFL_VGET transforms the integer data (as stored in TM) into
the real and integer temperatures, densities, etc.
that it represents using the functions FNE and FNI
for Ne and Ni calculations



```
PROGRAM EXAMLANG
CHARACTER CONT*1,BUF*80,OUT*1,OUT_FILE*45
REAL*4 DATA(16,6), NP
INTEGER*4 MAP(7)
DATA      MAP/6, 1, 2, 3, 4, 5, 6/
DATA      IPROBE/2/
COMMON/ERRCOM$/BUF
1 CLOSE(UNIT=7)
WRITE(6,100)
READ(5,*,END=1000,ERR=1)IDATE
IF(IDATE.LE.0) GOTO 1000
WRITE(6,101)
READ(5,*,END=1000,ERR=1)ITIME
ITIME = ITIME * 1000
WRITE(6,102)
READ(5,*,END=1000,ERR=1)IDEND
WRITE(6,103)
READ(5,*,END=1000,ERR=1)ITEND
ITEND = ITEND * 1000
WRITE(6,110)
READ(5,'(A1)',END=1000,ERR=1)OUT
IF(OUT .EQ. 'Y' .OR. OUT .EQ. 'y') THEN
  IDIT = (IDATE - 80000)*1.E5 + ITIME*.001
  WRITE(OUT_FILE,'(9HSYS$PROC:,I9,3H.P2)') IDIT
  WRITE(6,109)IDIT
  OPEN(UNIT=7,STATUS='NEW',NAME=OUT_FILE)
  IUNIT = 7
ELSE
  IUNIT = 6
ENDIF
IF(IDATE .GT. IDEND) IDEND=IDATE
IF(IUNIT .EQ. 6) WRITE(6,107)
10 CALL INFL_READ(IDATE,ITIME,MAP,KEYRD,DATA,IERR)
DO J=1,16
  IP = IFIX(DATA(J,2))
  NP = FNENI(DATA(J,4),DATA(J,5))
  IF(NP .LT. 1.E-2) NP=0.
  IF(DATA(J,5) .LT. 2.E4) DATA(J,3)=0.
  IF(IP .EQ. IPROBE .OR. IPROBE .EQ. 0) THEN
    WRITE(IUNIT,105)IDATE,ifix(DATA(J,1)),DATA(J,3),
  &           NP,DATA(J,6),IP
  ENDIF
ENDDO
ITIME=ITIME+10
IF(IDATE .GT. IDEND .OR. IERR .NE. 0) GOTO 1
IF(IDATE .GE. IDEND .AND. ITIME .GE. ITEND+1) GOTO 1
```

Printed by user POSEY at 1-MAR-1990 12:19:33
File: _DUB1:[SYSUSER1.][POSEY TEMP]EXAMLANG.FOR;7

```
IF(IUNIT .EQ. 6) THEN
  WRITE(6,106)
  READ(5,'(A1)',END=1,ERR=1)CONT
  IF(CONT .EQ. 'N' .OR. CONT .EQ. 'n') GOTO 1
  WRITE(6,107)
ENDIF

GOTO 10

1000 CLOSE(UNIT=7)

100 FORMAT(1X,'* Enter the start date(YYDDD), (type 0 to stop): ',,$)
101 FORMAT(1X,'* Enter the start time (SECS): ',,$)
102 FORMAT(1X,'* Enter the stop date (YYDDD): ',,$)
103 FORMAT(1X,'* Enter the stop time (SECS): ',,$)
104 FORMAT(1X,'*** No data available within the given window ***')
105 FORMAT(1X,I5,5X,I8,5X,F6.0,5X,1PE9.3,4X,0PF6.2,4X,I2)
106 FORMAT(1X,'** Do you wish to continue?(y/n): ',,$)
107 FORMAT(1X,'Date ',4X,' Time ',4X,' Temp. ',4X,
      &           ' Np ',4X,'Potential',2X,'Probe',
      &           '/,1X,'_____),',
      &           '_____)')
108 FORMAT(1X,'The data for orbit ',I5,' date',I5,' and times',
      &           2(I8,1X),'are currently offline.',/,/)
109 FORMAT(1X,'The name of your file is ',I9,'.P2')
110 FORMAT(1X,'* Would you like to save the output? (Y/N): ',,$)

STOP
END
```

This is the LANG format file

CCSDYDNM000200NSSD0005SMRK0001
TYPE_OF_FILE_NAME: LANG I-FILES

FILE_ATTRIBUTES:

File records are 35 (4-byte) words in length (note, RECL = 35)
and cover 8 seconds (16 half-sec. samples) of data. The first
word is overhead for the keyed-indexed organization. The second
word is universal time in msec. of the first half-second of data
in the record. The remaining 33 words are the data, in a packed
integer form, covering 16 half-second-resolution samples that
begin at that UT (call them DATA(1)-DATA(33)). Thus a typical
initial (keyed) READ statement is

```
READ(1,KEYGE=SOME_UT,ERR=label2)ITIME,(IDATA(J),J=1,33)
```

This will read the first record with ITIME>=SOME_UT (both times
being in msec). Subsequent READ statements can read sequentially
by removing the phrase KEYGE=SOME_UT, possibly adding END=label3.

The 3rd through 35th words of the record comprise the data. The
3rd word (IDATA(1) above) is satellite specific data (IMODE(1-2),
IDED, IBIAS, ICMD, IANA, and ION) packed as follows

```
((((IMODE(1)*4+IMODE(2))*4+IDED)*4+IBIAS)*2+ICMD)*4+IANA)*2+ION
```

As implied, these seven data are 1 or 2 bit fields.

IMODE(1:2) 2 bits, mode of each of the two probes

= 0 adapt

= 1 step

= 2 ion hold

= 3 electron hold

IDED 2 bits, which probe is dedicated

IBIAS 2 bits, indicates the extra bias potential applied
to the sweep, negative, positive, none.

ICMD 1 bit, command, not used

IANA 2 bits, which probe is analog

ION 1 bit, probe on switch

The 4th through 35th words of the record are paired up (i.e.
IDATA(2) and IDATA(3), IDATA(4) and IDATA(5), ..., IDATA(32)
and IDATA(33)) so that the 16 pairs cover the 16 half-seconds
of data in the 8-second interval. These pairs are packed as
follows:

```
IDATA(2i)=((DV(1)*1024)+DV(2))*1024+NI(1)
    +1      {if NI(1) is negative}
    +1024   {if DV(2) is negative}
    +1024**2 {if DV(1) is negative}
where i=1,2,3,...,16
```

```
IDATA(2i+1)=((NI(2)*256)+IV)*1024+N
    +1      {if N=max(NE(1),NE(2)) is negative}
    +1024   {if IV=max(V(1),V(2)) is negative}
    +1024*256 {if NI(2) is negative}
where i=1,2,3,...,16
```

These are 8 or 10 bit data fields

V(1:2) 8 bits, VA start of sweep potential
DV(1:2) 10 bits, VA slope for this sweep, Te of last sweep

NI(1:2) 10 bits, Current detector range used in this
sweep, 2 bits for decade range, 8 bits
for vernier range

NE(1:2) 10 bits, decade range (2 bits) and curve amplitude

(8 bits) giving electron current

The subroutines INFL_CONVERT and INF_VGET are sample algorithms for, respectively, the unpacking and translation of this array (DATA) of packed integers. This software is on the LANG description tape LANGDESC and is also available upon request from the LANG contact person Walter R. Hoegy over SPAN DEIO::HOEGY, DE614::HOEGY.

LOGICAL_RECORD_LENGTH: 35 bytes

TYPE_OF_FILE_DESCRIPTION:

Files are indexed organization using time in milliseconds as the key. A typical OPEN statement is

```
OPEN(UNIT=1,NAME='disk:[directory]Iyyddd.DAT',TYPE='OLD',
      ACCESS='KEYED',KEY=(1:4:INTEGER),RECL=35,READONLY,
      FORM='UNFORMATTED',ORGANIZATION='INDEXED',ERR=label1)
```

File records are 35 (4-byte) words in length (note RECL above) and cover 8 seconds (16 half-sec. samples) of data. The first word is overhead for the keyed-indexed organization. The second word is universal time in msec. of the first half-second of data in the record. The remaining 33 words are the data, in a packed integer form, covering 16 half-second-resolution samples that begin at that UT (call them DATA(1)-DATA(33)).

FILE_STRUCTURE:

I-files are written as VAX unformatted sequential ,keyed-indexed files.

FORMAT_OF_THE_LOGICAL_RECORD:

SEE FILE_ATTRIBUTES:

FIELD_RELATIONSHIPS:

SEE FILE_ATTRIBUTES:

CCSDYDNM000200NSSD0005EMRK0001

```
*****
C File : LANGSUBROUTINES.FOR (LANG INFLIGHT Subroutines)
C Contains: Subroutines INFL_READ, INFL_CONVER, INFL_VGET
C           Functions FNE, FNI, FNENI
*****
SUBROUTINE INFL_READ(IDATE,ITIME0,MAP,KEYRD,DATA,IERR)

C This subroutine gets 16 data points
C ITIME0 is requested time on call, on return is time of next data in MSEC

INTEGER*4 INFL(33), MAP(*), IPVEC(16)
REAL*4 DATA(16,*), TNNV(4,16), LIMLO(4), LIMHI(4)
CHARACTER INPUT_FILE*45, BUF*80, ON_OFF*3
LOGICAL*1 EIGHTSEC

COMMON/ERRCOM$/BUF
COMMON/STATCOM$/IMODE(2), IDED, IBIAS, ICMD, IANA, ION
COMMON/NICEPLOT/NICEPLOT ! To not zero Te at low Ni

DATA      LIMLO/100., 100., 100., -4./
DATA      LIMHI/2.0E4, 1.E8, 1.E8, 4./
DATA      IDAOLD/0/
DATA      LASTIME/0/
DATA      EIGHTSEC/.FALSE./

ITIME=ITIME0
IF(IDATE.NE.IDAOLD)THEN

C Set Keyed read and Open new I* file, remember to assign SYS$MAF

      KEYRD = 1
      IDAOLD = IDATE
      WRITE(INPUT_FILE,'(9HSYS$MAF:I,I5,4H.DAT)')IDATE
      CLOSE(UNIT=98)
      OPEN(UNIT=98,NAME=INPUT_FILE,TYPE='OLD',ERR=30,READONLY,
      1          ACCESS='KEYED',KEY=(1:4:INTEGER),RECL=35,
      2          FORM='UNFORMATTED',ORGANIZATION='INDEXED')
      ENDIF

2 IF(KEYRD .GE. 1) THEN
      ITREAD=ITIME0-7500 ! should it be -7500 ??
      READ(98,KEYGT=ITREAD,ERR=60)ITIME,(INFL(K),K=1,33)
      KEYRD=0
      EIGHTSEC=.FALSE.

      ELSE
      READ(98,ERR=60,END=40)ITIME,(INFL(K),K=1,33) ! sequential read
      ENDIF

C Check for 8 second interval. LASTIME LE 0 means last read was first in
C I* file. EIGHTSEC=.TRUE. is key to do check.

      IF( LASTIME .GE. 0 .AND. EIGHTSEC .AND.
      & ITIME-LASTIME .LT. 7600 ) GOTO 2

      EIGHTSEC=.TRUE.
      LASTIME = ITIME

      CALL INFL_CONVER(IPVEC,INFL,TNNV)
```

C Check MODE

```
IF(IBIAS .EQ. 3) GOTO 70

IF( IMODE(2) .NE. 0 ) GOTO 2

INCREM=1
7 IND_DATA=0

DO 33 I33=1,16,INCREM
  IPROBE=IPVEC(I33)
  IND_DATA=IND_DATA+1
  ITIM33=ITIME+500*I33-8000

  DO IND_MAP = 1, MAP(1)
    NUM_MAP = MAP(IND_MAP + 1)
    IF(NUM_MAP .EQ. 1)DATA(IND_DATA,IND_MAP) = FLOAT(ITIM33)
    IF(NUM_MAP .EQ. 2)DATA(IND_DATA,IND_MAP) = FLOAT(IPROBE)

    IF(NUM_MAP .GE. 3 .AND. NUM_MAP .LE. 6)THEN
      NUM_MAP = NUM_MAP - 2
      IF(TNNV(NUM_MAP,I33) .LT. LIMLO(NUM_MAP) .OR.
        TNNV(NUM_MAP,I33) .GT. LIMHI(NUM_MAP))THEN
        DATA(IND_DATA,IND_MAP) = 0.
      ELSE
        DATA(IND_DATA,IND_MAP) = TNNV(NUM_MAP,I33)
      ENDIF
    ENDIF
  ENDDO
```

33 CONTINUE

```
IERR=0                      !Return error code of '0':
ITIME0=ITIME
BUF=% INFL- Operation has successfully completed'
RETURN
```

```
30 IERR=3                  !Return error code of '3':
BUF=% INFL- The relevant data is currently offline, promote.'
RETURN
```

```
40 IERR=4                  !Return error code of '4':
BUF=% INFL- Time requested is after last data segment of day.'
RETURN
```

```
60 IERR=6                  !Return error code of '6':
ITIME0=ITREAD
BUF=% INFL- Error reading INFLIGHT data file (Could be EOF?).'
RETURN
```

```
70 IERR=7                  !Return error code of '7':
BUF=% INFL- IBIAS equals 3 is bad data.'
RETURN
```

END

SUBROUTINE INFL_CONVERT(IPVEC,INFL,TNNV)

C This subroutine changed to return all 16 values of the 8 sec period.
C Change made 1-9-1985 WRH.

REAL*4 TNNV(4,16)

```
INTEGER*4 INFL(33),IPVEC(16)

COMMON/GETCOM$/VION,VE,VP,DVDT,VEE,VIONW,
& DVDTW,CI,CE,IP,FLTE,RTE,NIFLT,NEFLT,IEVGET
COMMON/BITCOM$/IDATA(128,9),ANA(32),ADV(8,2),DV(2),
& V(2),NI(2),NE(2)
COMMON/STATCOM$/IMODE(2),IDED,IBIAS,ICMD,IANA,ION
COMMON/NICEPLOT/NICEPLOT ! To not zero Te at low Ni

DATA RLEVEL/99999./

DO 33 I33=1,16
  IC=I33

  IF(IC.EQ.1)THEN
    ION=MOD(INFL(1),2)
    IANA=MOD((INFL(1)/2),4)
    ICMD=MOD((INFL(1)/8),2)
    IBIAS=MOD((INFL(1)/16),4)
    IDED=MOD((INFL(1)/64),4)
    IMODE(2)=MOD((INFL(1)/256),4)
    IMODE(1)=INFL(1)/1024
  ENDIF

  I=2*IC
  DV(2)=MOD((INFL(I)/1024),1024)
  DV(1)=INFL(I)/1048576

  IF(INFL(I+1).LT.0)THEN
    IF(INFL(I+1) .LE. -2147483648)THEN
      IPVEC(IC)=-1
      GOTO 33
    ELSE
      IP=2
      INFL_IPLUS_1 = -INFL(I+1)
    ENDIF
  ELSE
    IP=1
    INFL_IPLUS_1=INFL(I+1) !This had not been assigned,messing 1
  ENDIF

  IPVEC(IC)=IP
  NI(1)=MOD(INFL(I),1024)
  NI(2)=INFL_IPLUS_1 /262144
  N=MOD(INFL_IPLUS_1 ,1024)
  IV=MOD((INFL_IPLUS_1 /1024),256)
  NE(IP)=N
  V(IP)=FLOAT(IV)

  NI(3-IP)=0
  NE(3-IP)=0
  V(3-IP)=0.

  CALL INFL_VGET

  TNNV(1,IC)=FLTE
  TNNV(2,IC)=FNE(CE,VEE+VP,RTE)*.6666667

C Ion density is invalid when the gain of probe two is saturated.
C 1023 is the saturation limit of electrometer two. 31 May 1985. WRH

  IF( IP.EQ.2 .AND. NI(2).LT.1022)
```

& TNNV(3,IC)=FNI(CI,VIONW+VP,.75)
IF(IP.EQ.2 .AND. NI(2).GE.1022)TNNV(3,IC)=999.

C This added 6-5-85

```
IF( IP.EQ.2 .AND. NI(2).GE.990)THEN ! 990 IS ABOUT N=2.E4 ?
  IF (NICEPLOT.NE.1)TNNV(1,IC)=0 !change made 1-2-85, IF added 9-20-85
  IF(RTESAVE.LE.0)RTESAVE=RTE ! IF FIRST TIME
  TNNV(2,IC)=FNE(CE,VEE+VP,RTESAVE)*.6666667
ELSE
  IF(IP.EQ.2)RTESAVE=RTE
ENDIF
```

C Added 12-24-85 Interpolation function for Ni
C TNNV(3,IC)=FNENI(TNNV(2,IC),TNNV(3,IC))
C IF(TNNV(3,IC) .LE. 0.) TNNV(3,IC) = -999.

TNNV(4,IC)=VP

C under Larry Brace's instructions to not return Te when Ni
C from probe 2 is less than 2.e4 W.R.H.
C confirmed 6-5-85

33 CONTINUE

```
RETURN
END
```

SUBROUTINE INFL_VGET

C Subroutine changed 5-25-85 to allow simple use of probe 1 Te
C in calculation of probe 1 Ne. Purpose is to eliminate artificial
C structure from probe 2 Te at low densities (Ni<2.E4).

```
REAL*4 DIMUL(2),DEMUL(2),TECON(2),TEMUL(2),
& DINORM(2),FNECOF(3)

COMMON/GETCOM$/VION,VE,VP,DVDT,VEE,VIONW,
& DVDTW,CI,CE,IP,FLTE,RTE,NIFLT,NEFLT,IEVGET
COMMON/BITCOM$/IDATA(128,9),ANA(32),ADV(8,2),DV(2),
& V(2),NI(2),NE(2)
COMMON/STATCOM$/IMODE(2),IDED,IBIAS,ICMD,IANA,ION

DATA DIMUL,DEMUL,TECON,TEMUL/2.4E6,2.4E6,1.176E4,1.176E4
& ,-6802.87,-6802.87,22.995,22.995/
DATA DINORM/1.7,1.7/
DATA NFNE,FNECOF/3,-1.6639,1.0471,-8.7978E-2/

VION=10.134+.0559564*V(IP)
```

C IMODE=0 FOR ADAP,1 FOR STEP,2 NIHOLD,3 NEHOLD

```
IF(IMODE(IP) .EQ. 1) THEN
  DVDT=27.195
  IF(VION .GT. -4.5) DVDT=6.799
ELSE
  DVDT=-16.2462+.055133*D(V(IP))
ENDIF
```

VADD2=0.

VADD=0.

IF(IMODE(IP) .EQ. 0) VADD=2.

IF(IMODE(IP) .EQ. 1 .AND. VION .GT. -4.5) THEN

```
VADD=4.  
VADD2=5.  
ENDIF  
  
IF(IP .EQ. 2) THEN  
  VE=VION+DVDT*.43248  
ELSE  
  VION=VION-.039*DVT  
  VE=VION+.484375*DVT  
ENDIF  
  
DVDTW=DVDT/113.3  
VP=VION-DVDTW*43.027761  
VEE=VE+VADD  
VIONW=VION+VADD2  
CE=0.  
CI=0.  
NIFLT=0  
NEFLT=0  
  
IF(NI(IP) .GT. 0) THEN  
  NIFLT=1  
  IVNI=MOD(NI(IP),256)  
  IDNI=NI(IP)/256  
  SAVE=.988842977-.003553719*IVNI  
  CI=3.3*SAVE*10.**(IP-1-IDNI)  
ENDIF  
  
IF(NE(IP) .GT. 0) THEN  
  NEFLT=1  
  IVNE=MOD(NE(IP),256)  
  
  IF(IVNE .GE. 255) THEN  
    NEFLT=0  
    IDNE=0  
  ELSE  
    IDNE=NE(IP)/256  
    CE=SAVE*(-4.135+.0557*IVNE)*10.**(IP-1-IDNE)  
  ENDIF  
  
ENDIF  
  
FLTE=TECON(IP)+TEMUL(IP)*DV(IP)  
RTE=FLTE*.001  
  
RETURN  
END  
  
*****  
  
FUNCTION FNE(CE,V,RTE)  
  
C INVERSE OF ELCUR CONST 5.476E-6 IS 1.8262E5  
C CE=ACC EL CURRENT (MAMPS),V=ACTUAL PROBE TO PLASMA VOLTAGE,  
C RTE=ELECTRON TEMPERATURE (1000 DEG K)  
  
REAL*4 DIMUL(2),DEMUL(2),TECON(2),TEMUL(2),  
& DINORM(2),FNECOF(3)  
  
DATA CON/1.8262E5/  
DATA DIMUL,DEMUL,TECON,TEMUL/2.4E6,2.4E6,1.176E4,1.176E4  
& , -6802.87,-6802.87,22.995,22.995/  
DATA DINORM/1.7,1.7/  
DATA NFNE,FNECOF/3,-1.6639,1.0471,-8.7978E-2/  
VOLT=1.+11.605*V/RTE
```

Printed by user POSEY at 1-MAR-1990 12:36:58
 File: _DUB1:[SYSUSER1.][POSEY.TEMP]LANGSUBROUTINES.FOR;7

```
IF(VOLT .LE. 1 .OR. RTE .LE. 0.) THEN
  FNE=1.
  RETURN
ENDIF
```

```
X=SQRT(VOLT)
Y=1.
FNE=0.
```

```
DO 11 I=1,NFNE
  Y=Y*X
  FNE=FNE+Y*FNECOF(I)
11 ENDDO
```

```
FNE=CON*CE/(SQRT(RTE)*FNE)
```

```
RETURN
END
```

```
FUNCTION FNI(CI,V,VEL)
```

C INVERSE OF ONCUR CONST 3.55E-7 IS 2.8169E6
C CI=ION CURRENT M-AMPS,V=ACUTAL PROBE TO PLASMA POT(VOLTS)(NEG)
C VEL NET PLASMA DRIFT NORMAL TO PROBE (10KM/SEC)

```
DATA CON/2.8169E6/
```

```
DUM=VEL*VEL-.1206*V
```

```
IF(DUM .LE. 0) THEN
  FNI=1.
  RETURN
ENDIF
```

```
FNI=CON*CI/SQRT(DUM)
```

```
RETURN
END
```

C Filename: SYS\$USR1:[LANGMUIR]FNENI.FOR
C
C function neni (NE, NI) Ne, Ni are electron, ion densities
C neni is the continuous returned density
C
C "Good" refers to greater than 1.e2 for the Ni and Ne values
C The transition region is from 1.e4 to 3.e4
C
C The weighted average is Fneni = [log(Ni) * (A - log(1.e4)) +
C log(Ne) * (log(3.e4) - A)] /
C [log(3.e4) - log(1.e4)]
C
C where A = log(Ni)
C
C It is used for Ni in the transition region and Ne good, but not
C above the transition region. In other cases Ni, Ne, or 0. is
C returned as appropriate.

```
FUNCTION FNENI( NE, NI )
```

```
implicit none .
```

```
real*4 fneni, NE, NI, xhi, xlo, rdel, x0, x1, x2, xne, xni, y, d
c
          ln(3.e4)  ln(1.e4)  1./diff
data xhi, xlo, rdel / 4.47712, 4.0 , 2.0959 /
data x0, x1, x2 / 1.e2, 3.e4, 1.e4/
if( NI .ge. x1 ) then           ! Above transition
  fneni = NI
elseif( NI .le. x2 .and. NE .gt. x0 ) then   ! Below transition
  fneni = NE
elseif( NE .le. x0 ) then       ! NE bad and NI too low
  fneni = 0.
elseif( NE .gt. x1 ) then      ! NE greater than NI ??
  fneni = 0.
else
  xne = alog10(NE)
  xni = alog10(NI)
  y = xni
  d = ( y - xlo ) * rdel
  fneni = d * xni + (1.-d) * xne
  fneni = 10.**fneni
endif

return
end
```

DUMP OF TAFF DB1114

INPUT TAPE BR1 14 ON HTL
DATA INPUT H9 NF=2 FL=2=1=1

```

FILE    1 RECORD      3 LENGTH     8C BYTES
(   )  46445232  46303831  39323138  71393220  20262021  20242020  20202026  20242020  20202021  40212021
(   4)  222221  21222121  21222121  20202026  20242020  20202021  21222121  21222121  21222121  21222121

```

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY	INPUT # RECS.	PTRIES TOTAL#
J	3	4	80	PERM ZERO 8 SHORT UNDEF.	0	0

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY	INPUT RETRIEVE
2	8776	8777	8192	PERM ZERO B SHORT UNDEF.	#RECS. TOTAL

6 IOJ DUMP STOPPED AFTER FILE 2 # OF PERMANENT READ ERRORS 1
6
7 START TIME 06/04/92 10:21:22 STOP TIME 06/04/92 10:25:00

3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62