#381

PIONEER 10 & 11

ASTEROID/METEOROID DETECTOR

72-012A-03A & 73-019A-03A

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## 1. INTRODUCTION:

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

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

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

2. ERRATA/CHANGE LOG:

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

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

| Version | Date | Person | Page | Description of Change |
|---|---|---|---|---|
| 01 | | | | |
| 02 | | | | |

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

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

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

4. CATALOG MATERIALS:

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

b. Core Catalog Materials

PIONEER 10

ASTEROID/METEORID/SKY EMISSIONS

72-012A-03A PSSB-00042

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 55, 7-TRACK, 556 BPI TAPES. THE FIRST THREE FILES WERE WRITTEN IN BCD, AND THE FOURTH FILE WAS WRITTEN IN BINARY IN A SET PATTERN THROUGHOUT EACH OF THE INPUT TAPES. THERE ARE 19 RESTORED TAPES WRITTEN IN ASCII AND BINARY, FOLLOWING THE SAME PATTERN AS STATED ABOVE. THE FOLLOWING THREE TAPES D023826, D023850, AND D023852 WERE BAD. SOME OF THE INPUT TAPES HAD ZERO FILES, THESE FILES WERE REMOVED. THERE IS NO RECORD OF THE ZERO FILES THAT WERE REMOVED. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON AN IBM 360 COMPUTER AND WERE RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

| DR# | DS# | DD# | FILES | TIME SPAN | |
|---|---|---|---|---|---|
| DR003031 | DS003031 | D023807 | 1-96 | 03/09/72 - 04/01/72 | |
| | | D023808 | 97-114 | 04/02/72 - 04/29/72 | (a) |
| | | D023809 | 115-134 | 04/30/72 - 05/04/72 | |
| | | D023810 | 135-154 | 05/06/72 - 05/11/72 | (b) |
| | | D023811 | 155-173 | 05/12/72 - 05/16/72 | (c) |
| DR003032 | DS003032 | D023812 | 1-24 | 05/18/72 - 05/23/72 | |
| | | D023813 | 25-48 | 05/24/72 - 05/29/72 | |
| | | D023814 | 49-72 | 05/30/72 - 06/04/72 | |
| | | D023815 | 73-96 | 06/05/72 - 06/10/72 | |
| | | D023816 | 97-120 | 06/11/72 - 06/15/72 | |
| DR003033 | DS003033 | D023817 | 1-28 | 06/17/72 - 06/23/72 | |
| | | D023818 | 29-68 | 06/24/72 - 07/01/72 | (d) |
| | | D023819 | 69-100 | 07/02/72 - 07/06/72 | |
| DR003034 | DS003034 | D023820 | 1-40 | 07/09/72 - 07/17/72 | |
| | | D023821 | 41-78 | 07/18/72 - 07/27/72 | |
| | | D023822 | 79-132 | 07/28/72 - 08/09/72 | |

PIONEER 10

72-012A-03A

| DR# | DS# | DD# | FILES | TIME SPAN | |
|---|---|---|---|---|---|
| DR003035 | DS003035 | D023823 | 1-68 | 08/10/72 - 08/26/72 | |
| | | D023824 | 69-160 | 08/28/72 - 09/16/72 | |
| | | D023825 | 161-247 | 09/17/72 - 10/07/72 | |
| DR004391 | DS004391 | D023827 | 1-164 | 11/19/72 - 12/30/72 | |
| | | D023828 | 165-338 | 12/31/72 - 02/14/73 | |
| DR004392 | DS004392 | D023829 | 1-96 | 03/25/73 - 04/17/73 | |
| | | D023830 | 97-148 | 04/19/73 - 05/07/73 | |
| | | D023831 | 149-236 | 05/07/73 - 05/28/73 | |
| DR004393 | DS004393 | D023832 | 1-68 | 05/29/73 - 06/14/73 | (e) |
| | | D023833 | 69-112 | 06/15/73 - 06/25/73 | |
| | | D023834 | 113-204 | 06/26/73 - 07/18/73 | (f) |
| DR004394 | DS004394 | D023835 | 1-136 | 07/19/73 - 08/21/73 | |
| | | D023836 | 137-212 | 08/22/73 - 09/10/73 | |
| | | D023837 | 213-244 | 09/10/73 - 09/23/73 | |
| DR004395 | DS004395 | D023838 | 1-72 | 09/24/73 - 10/11/73 | |
| | | D023839 | 73-128 | 10/27/73 - 11/10/73 | |
| | | D023840 | 129-182 | 11/10/73 - 11/22/73 | |
| DR004396 | DS004396 | D023841 | 1-52 | 11/23/73 - 12/03/73 | |
| | | D023842 | 53-156 | 11/23/73 - 12/12/73 | |
| | | D023843 | 157-208 | 12/13/73 - 12/25/73 | |
| DR004397 | DS004397 | D023844 | 1-35 | 12/26/73 - 01/03/74 | |
| | | D023845 | 36-107 | 01/28/74 - 03/16/74 | (g) |
| | | D023846 | 108-191 | 03/17/74 - 06/15/74 | |
| DR004398 | DS004398 | D023847 | 1-108 | 05/13/74 - 06/08/74 | |
| | | D023848 | 109-172 | 06/09/74 - 06/24/74 | (h) |

PIONEER 10

72-012A-03A

| DR# | DS# | DD# | FILES | TIME SPAN |
|---|---|---|---|---|
| DR004399 | DS004399 | D023849 | 1-52 | 06/28/74 - * |
| | | D023851 | 53-103 | |
| DR004400 | DS004400 | D023853 | 1-108 | 01/25/75 - 02/20/75 |
| | | D023854 | 109-280 | 04/18/75 - 06/01/75 |
| DR004401 | DS004401 | D023855 | 1-48 | 06/02/75 - 06/13/75 |
| | | D023856 | 49-129 | 07/21/75 - 08/10/75 |
| DR004402 | DS004402 | D023857 | 144 | 09/02/75 - 10/07/75 |
| DR006213 | DS006213 | D023858 | 1-140 | 10/08/75 - 11/11/75 |
| | | D023859 | 141-363 | 11/12/75 - 01/07/76 |
| DR006214 | DS006214 | D023860 | 1-176 | 01/08/76 - 02/26/76 |
| | | D023861 | 177-227 | * |

* TIME SPANS WERE UNABLE TO BE CONFIRMED
(a) D023808 FILES 19-111 DATA IS QUESTIONABLE BUT COPIED
(b) D023810 FILES 21-24 DATA IS QUESTIONABLE BUT COPIED
(c) D023811 FILES 21-24 DATA IS QUESTIONABLE BUT COPIED
(d) D023821 FILES 39-40 DATA IS QUESTIONABLE BUT COPIED
(e) D023832 FILES 63-68 DATA IS QUESTIONABLE BUT COPIED
(f) D023834 FILES 90-92 DATA IS QUESTIONABLE BUT COPIED
(g) D023845 FILES 73-120 DATA IS QUESTIONABLE BUT COPIED
(h) D023848 FILES 65-76 DATA IS QUESTIONABLE BUT COPIED

| REQ. AGENT | RAND NO. | ACQ. AGENT |
|---|---|---|
| VJP | RC6401 | TNK |

PIONEER 10 & 11

ASTEROID/METEOROID DETECTOR

72-012A-03A

73-019A-03A

This data set catalog consists of 55 Pioneer 10 and 39 Pioneer 11 data tapes. The tapes are 556, 7-track, mixed mode, and are multi-filed. The tapes were created on a XDS 930 computer.

In duping these tapes several patrick decks were used per tape. Example of data files: files 1-3 are BCD and file 4 is BIN, files 5-7 are BCD and file 8 is BIN, etc...

Time spans are as follows:

Pioneer 10

| D# | C# | Files | TIME SPAN |
|---|---|---|---|
| D-23807 | C-18730 | 96 | 03/09/72 - 04/01/72 |
| D-23808 | C-18731 | 111 | 04/02/72 - 04/29/72 |
| D-23809 | C-18732 | 20 | 04/30/72 - 05/04/72 |
| D-23810 | C-18733 | 24 | 05/06/72 - 05/11/72 |
| D-23811 | C-18734 | 24 | 05/12/72 - 05/17/72 |
| D-23812 | C-18779 | 24 | 05/18/72 - 05/23/72 |
| D-23813 | C-18780 | 24 | 05/24/72 - 05/29/72 |
| D-23814 | C-18781 | 24 | 05/30/72 - 06/04/72 |
| D-23815 | C-18782 | 24 | 06/05/72 - 06/10/72 |
| D-23816 | C-18783 | 24 | 06/11/72 - 06/16/72 |
| D-23817 | C-18786 | 28 | 06/17/72 - 06/23/72 |
| D-23818 | C-18787 | 40 | 06/24/72 - 07/01/72 |
| D-23819 | C-18788 | 32 | 07/02/72 - 07/08/72 |
| D-23820 | C-18789 | 40 | 07/09/72 - 07/17/72 |
| D-23821 | C-18790 | 40 | 07/18/72 - 07/27/72 |
| D-23822 | C-18933 | 52 | 07/28/72 - 08/09/72 |
| D-23823 | C-18934 | 68 | 08/10/72 - 08/26/72 |
| D-23824 | C-18935 | 92 | 08/27/72 - 09/15/72 |
| D-23825 | C-18936 | 88 | 09/16/72 - 10/07/72 |
| D-23826 | | | |
| D-23827 | C-18937 | 164 | 11/19/72 - 12/29/72 |
| D-23828 | | | |
| D-23829 | | | |
| D-23830 | | | |

Pioneer 10

| D# | C# | Files | TIME SPAN |
|---|---|---|---|
| D-23831 | C-18985 | 88 | 05/07/73 - 05/28/73 |
| D-23832 | C-18986 | 68 | 05/29/73 - 06/14/73 |
| D-23833 | C-18987 | 44 | 06/15/73 - 06/25/73 |
| D-23834 | C-18988 | 92 | 06/26/73 - 07/18/73 |
| D-23835 | C-18989 | 136 | 07/19/73 - 08/21/73 |
| D-23836 | C-18990 | 76 | 08/22/73 - 09/09/73 |
| D-23837 | C-19034 | 56 | 09/10/73 - 09/23/73 |
| D-23838 | C-19035 | 72 | 09/24/73 - 10/11/73 |
| D-23839 | | | |
| D-23840 | C-19036 | 56 | 10/27/73 - 11/09/73 |
| D-23841 | C-19037 | 52 | 11/10/73 - 11/23/73 |
| D-23842 | | | |
| D-23843 | C-19038 | 56 | 12/12/73 - 12/25/73 |
| D-23844 | | | |
| D-23845 | C-19381 | 120 | 01/28/74 - 03/19/74 |
| D-23846 | | | |
| D-23847 | C-19382 | 108 | 05/13/74 - 06/08/74 |
| D-23848 | C-19383 | 76 | 06/09/74 - 06/27/74 |
| D-23849 | | | |
| D-23850 | | | |
| D-23851 | | | |
| D-23852 | C-19384 | 348 | 10/30/74 - 01/24/75 |
| D-23853 | | | |
| D-23854 | C-19385 | 172 | 04/18/75 - 06/01/75 |

Pioneer 10

| D# | C# | Files | TIME SPAN |
|---|---|---|---|
| D-23855 | | | |
| D-23856 | | | |
| D-23857 | C-19386 | 144 | 09/02/75 - 10/07/75 |
| D-23858 | C-19387 | 140 | 10/08/75 - 11/11/75 |
| D-23859 | C-19388 | 224 | 11/12/75 - 01/07/76 |
| D-23860 | | | |
| D-23861 | | | |

Pioneer 11

| D# | C# | FILES | TIME SPAN |
|---|---|---|---|
| D-23862 | C-19461 | 64 | 4/11/73 - 4/26/73 |
| D-23863 | C-19462 | 88 | 4/27/73 - 5/18/73 |
| D-23864 | C-19463 | 24 | 5/19/73 - 5/24/73 |
| D-23865 | | | |
| D-23866 | C-19464 | 24 | 6/04/73 - 6/09/73 |
| D-23867 | C-19465 | 24 | 6/10/73 - 6/15/73 |
| D-23868 | C-19466 | 24 | 6/16/73 - 6/21/73 |
| D-23869 | C-19467 | 24 | 6/22/73 - 6/27/73 |
| D-23870 | C-19468 | 24 | 6/28/73 - 7/03/73 |
| D-23871 | C-19469 | 24 | 7/04/73 - 7/09/73 |
| D-23872 | C-19470 | 24 | 7/10/73 - 7/15/73 |
| D-23873 | C-19499 | 28 | 7/16/73 - 7/22/73 |
| D-23874 | C-19500 | 44 | 7/24/73 - 8/03/73 |
| D-23875 | C-19501 | 48 | 8/04/73 - 8/15/73 |
| D-23876 | C-19502 | 44 | 8/16/73 - 8/26/73 |
| D-23877 | C-19503 | 52 | 8/27/73 - 9/09/73 |
| D-23878 | C-19577 | 52 | 9/09/73 - 9/21/73 |
| D-23879 | C-19578 | 60 | 9/22/73 - 10/06/73 |
| D-23880 | C-19579 | 124 | 10/07/73 - 11/06/73 |
| D-23881 | C-19580 | 224 | 11/07/73 - 1/03/74 |
| D-23882 | | | |
| D-23883 | | | |
| D-23884 | C-19581 | 192 | 5/12/74 - 6/29/74 |
| D-23885 | C-19582 | 84 | 6/30/74 - 7/20/74 |
| D-23886 | | | |
| D-23887 | C-19604 | 96 | 8/23/74 - 9/15/74 |

| D# | C# | FILES | TIME SPAN |
|---|---|---|---|
| D-23888 | C-19605 | 108 | 9/16/74 - 10/15/74 |
| D-23889 | C-19606 | 72 | 10/16/74 - 11/03/74 |
| D-23890 | C-19607 | 40 | 11/04/74 - 11/09/74 |
| D-23891 | C-19608 | 32 | 11/10/74 - 11/15/74 |
| D-23892 | C-19609 | 40 | 11/16/74 - 11/21/74 |
| D-23893 | C-19610 | 56 | 11/22/74 - 11/28/74 |
| D-23894 | C-19611 | 92 | 11/29/74 - 12/08/74 |
| D-23895 | C-19612 | 48 | 12/09/74 - 12/14/74 |
| D-23896 | C-19613 | 40 | 12/15/74 - 12/21/74 |
| D-23897 | C-19614 | 48 | 12/22/74 - 12/29/74 |
| D-23898 | | | |
| D-23899 | | | |
| D-23900 | | | |

GENERAL ELECTRIC

SPACE DIVISION

SPACE SCIENCES LABORATORY

GENERAL ELECTRIC COMPANY . . . . . VALLEY FORGE SPACE CENTER
(MAIL: P. O. BOX 8555, PHILADELPHIA, PENNSYLVANIA 19101), Phone (215) 962-2000

July 2, 1976

Mr. Joseph R. Johns
National Space Science Data Center
Code 601.5
Goddard Space Flight Center
Greenbelt, Maryland 20771

SUBJECT: Pioneer 10 and 11 Data Tapes

Dear Mr. Johns:

Enclosed you will find the documentation necessary for interpreting the data tapes from the Asteroid/Meteoroid Detector on Pioneers 10 and 11. The data tapes (which are labeled according to day of mission) are being shipped under separate cover.

Yours truly,

Sherman L. Neste

Sherman L. Neste
Research Physicist

215-962-2153

/mjb

enc.

Contains all data

Dr. G A Liebling ? willing to aid in developing a use tape reading program

215 - 962 - 2081

Pioneer 10 72-012A-03 55 TAPES (72-012A-03A)

Pioneer 11 73-019A-03 39 TAPES (73-019A-03A)

· During the Detector Working Group meetings the $Al_2O_3$ target was much mentioned, and the W studies supported the idea that the $Al_2O_3$ was a promising slow-scan-mode target. In addition, its use removes one more variable, as the target is its own substrate. What was the reason for dropping this interesting work?

Field Mesh: · Though it does depend upon how one views the mechanisms that govern target operation, one suspects that the voltage applied to the field mesh (and to the target for that matter) should be a function of the operational mode (write, read, prep). Do you hold the voltage on this grid at a constant value?

· Does the performance of the tube depend on the voltage, position, and grid pitch of the field mesh?

Pre-Amp: · The pre-amp is a crucial component in the chain of interfaces. Yet, I have only seen cursory commentary on this device. It would be nice to see data on its:

1/ Electrical "MTF" - i.e., its output upon being externally stimulated at various levels by a controlled and precise signal generator (i.e., operated to give a pure input and also controlled to simulate target similar signals);

2/ Noise characteristics - ambient and under stimulation;

and,

3/ Sensitivity with variations in its "B+" supply.

## II/ FOCUSSING OF THE SECO

· From 1962 (Beyer and Goetze's image tube) until the present, one standard image section sandwich has been ceramic + Kovar. That Kovar could cause troubles when such a unit is immersed in a magnetic field surely should not amaze one as Kovar is a known magnetic material, and, in fact, has been used on occasion as a magnetic shield. It is unfortunate that at the beginning you did not perform a comprehensive study of the electron-optic performance of a pure image section with a phosphor output.

If this had been done you would of found exactly what Vine did - off-axis performance is less than expected. Also, a simple probing of the true magnetic field inside of such an assembly would also have convinced you-as it did Vine-that Kovar strongly perturbs a magnetic field. And yet, when we discussed Vine's results you were still confident that the Kovar perturbations in the SECO's image section would not degrade performance. You also felt that replacement of the Kovar would be an expensive exercise. Clearly the Kovar problem was recognized, as you point out in your recent AAS paper - "Considerable design effort has gone into

DESCRIPTION AND FORMAT OF THE

ASTEROID METEOROID DETECTOR

DATA TAPES FROM PIONEERS 10 AND 11

PREPARED FOR

THE NATIONAL SPACE SCIENCE DATA CENTER

JUNE 1976

Sherman L. Neste
Kurt Lichtenfeld
General Electric Co.
Space Sciences Laboratory
P. O. Box 8555
Philadelphia, Pa. 19101

# DESCRIPTION AND FORMAT OF AMD DATA TAPES

This report summarizes the format of the data tapes transmitted to the NSSDC which contain the data received from the Asteroid Meteoroid Detector (AMD) on Pioneers 10 and 11. A description of the AMD instrument, its operation, and the method of data analysis was presented in detail by Neste (1974). A copy of that report accompanies this document and will be helpful in resolving any questions which may arise.

The AMD data transmitted from the Pioneer 10 and 11 spacecraft was recorded on magnetic tape and forwarded to the General Electric Space Sciences Laboratory for processing and analysis. A data tape referred to as an Experimentor Data Record (EDR) was received for each day of the mission for each of the two spacecraft.

Each EDR for the AMD data consists of four magnetic tape files. The first file is a label defining the period of time covered by the EDR, and giving other miscellaneous descriptive information. The second file contains a list of all commands sent to the spacecraft during the given day. These include commands to orient the spacecraft, turn instruments on or off, etc. A complete listing of the spacecraft and instrument commands is given in Appendix A. The third file contains spacecraft attitude data for the preceding 31 days, including celestial latitude and longitude. These first three files are in BCD format. The fourth file is in binary format and contains the bulk of the AMD instrument data.

In order to facilitate the analysis of the AMD data, the original EDR tapes were reformatted and several days' data were copied onto one magnetic tape. The tedious, time-consuming decoding process is described at length by Liebling (1973). The tape copy contains all data present on the original EDR but in a completely unpacked and decoded form, requiring no additional processing for its use.

In order to achieve maximum flexibility the tape copy was formatted to allow for the possibility of processing on either a 24 or 36 bit computer. Two techniques were used to obtain this goal. First, to avoid potential incompatibility between different floating point word representations, all data are written as 24 bit integers, with fractional values scaled as required to permit representation as an integer. Second, to facilitate reading the tape copy on either 24 or 36 bit machines, 24 bit words of value zero are inserted between each pair of data values, resulting a word triplet of the form: value 1, zero, value 2. When the tape is read on a 24 bit machine, this word division is preserved and the zero word is simply discarded. When read on a 36 bit machine, however, this triplet is divided into only two words. The first word consists of value 1, left adjusted, followed by 12 trailing zero bits. A right shift of 12 places is therefore all that is required to return this word to a normal right adjusted integer form. The second data word consists of value 2,right adjusted, with 12 leading zero bits, and requires no further processing prior to use. In this manner, maximum flexibility in the use of this tape copy is maintained.

The format of the tape copy is as follows: The first three files are BCD data copied directly from the original EDR without any modification. The fourth file contains the AMD data in binary form. This file consists of a series of physical record pairs with format as shown in Figure 1. One such record pair is written each time a completed 264 bit AMD data frame is encountered and decoded. An example of the printed output for a complete AMD data frame is given in Figure 2.

The values shown for the background and peak signals, and for the entry and exit times are in bits and must be converted to millivolts and time, respectively, to obtain physically meaningful quantities. The conversions are as follows:

| | |
|---|---|
| Background and peak values: | 1 bit = 9.75 millivolts |
| Entry and exit values: | 1 bit = 0.4 microseconds (wide bandwidth) |
| | 1 bit = 1.6 microseconds (medium and narrow bandwidths) |

Additional conversions required in the data analysis process, and the analysis process itself, are discussed in detail by Neste (1974). A listing of the computer program used to process the AMD data tapes is given in Appendix B.

RECORD 1

| WORD | DATA ITEM | SCALING |
|---|---|---|
| 1 | Record number | |
| 2 | 0 | |
| 3 | Number of repetitions of words 46-84 | |
| 4 | GMT time of day (seconds) | |
| 5 | 0 | |
| 6 | Milliseconds part of time of day | |
| 7 | Day of year | |
| 8 | 0 | |
| 9 | Time code correction flag | |
| 10 | Reference select status | |
| 11 | 0 | |
| 12 | Signal to noise ratio | 1000 |
| 13 | Deep space tracking station | |
| 14 | 0 | |
| 15 | Bit rate | |
| 16 | Mode | |
| 17 | 0 | |
| 18 | Format | |
| 19 | Round trip light time (seconds) | |
| 20 | 0 | |
| 21 | Milliseconds part of round trip light time | |
| 22 | Extended frame counter | |
| 23 | 0 | |
| 24 | Start delay time | |
| 25 | Preamp temperature (E118) | |
| 26 | 0 | |
| 27 | Supply voltage (E119) | |
| 28 | Star exclusion status | |
| 29 | 0 | |
| 30 | Data readout status | |
| 31 | Threshold status | |
| 32 | 0 | |
| 33 | Bandwidth status | |
| 34-45 | Unused | |

Note zero word between each pair of data items.

Scale factor is 1 unless otherwise indicated.

Figure 1 (Part 1). Format of AMD Tape Copy

RECORD 1

| WORD | DATA ITEM | SCALING |
|---|---|---|
| 46 | Roll pulse phase error data quality flag | |
| 47 | 0 | |
| 48 | Spin average indicator data quality flag | |
| 49 | Spin period data quality flag | |
| 50 | 0 | |
| 51 | Roll attitude timer data quality flag | |
| 52 | Roll attitude timer | 10000 |
| 53 | 0 | |
| 54 | Spin period (seconds) | 10000 |
| 55 | Spin average indicator | |
| 56 | 0 | |
| 57 | Roll pulse phase error | 10000 |
| 58 | GMT time of C112 (seconds) | |
| 59 | 0 | |
| 60 | Milliseconds part of time of C112 | |
| 61 | DC bus voltage | 1000 |
| 62 | 0 | |
| 63 | DC bus current | 1000 |
| 64 | Platform temperature | 1000 |
| 65 | 0 | |
| 66 | GMT time of C124 (seconds) | |
| 67 | Milliseconds part of time of C124 | |
| 68-84 | Unused | |

Words 46-84 are repeated the number of times indicated in word 3.

Scale factor is 1 unless otherwise indicated.

Figure 1 (Part 2). Format of AMD Tape Copy

RECORD 2

| WORD | DATA ITEM | CHANNEL |
|---|---|---|
| 1 | Sector number | |
| 2 | 0 | |
| 3 | Sector status | |
| 4 | Bandwidth bit 1 | |
| 5 | 0 | |
| 6 | Bandwidth bit 2 | |
| 7 | Coincidence indicator bit 1 | |
| 8 | 0 | |
| 9 | Coincidence indicator bit 2 | |
| 10 | Background level | 1 |
| 11 | 0 | |
| 12 | Background level | 2 |
| 13 | Background level | 3 |
| 14 | 0 | |
| 15 | Background level | 4 |
| 16 | Peak signal | 1 |
| 17 | 0 | |
| 18 | Peak signal | 2 |
| 19 | Peak signal | 3 |
| 20 | 0 | |
| 21 | Peak signal | 4 |
| 22 | Entry time | 1 |
| 23 | 0 | |
| 24 | Entry time | 2 |
| 25 | Entry time | 3 |
| 26 | 0 | |
| 27 | Entry time | 4 |
| 28 | Exit time | 1 |
| 29 | 0 | |
| 30 | Exit time | 2 |
| 31 | Exit time | 3 |
| 32 | 0 | |
| 33 | Exit time | 4 |
| 34-45 | Unused | |

Figure 1 (Part 3). Format of AMD Tape Copy

HOUSEKEEPING DATA FOR FILE 4 RECORD 158 (VALUES OF -1.0 OR 1.0E+06 INDICATE MISSING VALUES)

GMT TIME OF DATA RECORD = 86 DAYS, 16:13:51.696 (58431.70 SECONDS) (UNCORRECTED)

CODED INDICATORS DEEP SPACE TRACKING STATION = 42 BIT RATE = 5 MODE = 0 FORMAT = 8

(SIGNAL + NOISE) / NOISE 6.781

ROUND TRIP LIGHT TIME (SECONDS) 122.288

EXTENDED FRAME COUNTER 7569

REFERENCE SELECT STATUS 2

STAR DELAY TIME 0

| ROLL ATTITUDE TIMER | FLAG | SPIN PERIOD | FLAG | SPIN AVG IND | FLAG | ROLL ERROR (MSEC) | FLAG | TIME OF C-112 GMT-SEC | DC BUS VOLTAGE VOLTS | DC BUS CURRENT AMPS | S/C TEMP DEG F | TIME OF C-124 GMT-SEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.11719E 01 | 0 | 12.520 | 0 | 6 | 0 | -13.672 | 0 | 58189.646 | 27.891 | 3.427 | 112.017 | 58194.148 |
| 9.08594E 00 | 0 | 12.520 | 0 | 6 | 0 | -13.672 | 0 | 58237.648 | 27.891 | 3.427 | 112.017 | 58242.150 |
| 7.00781E 00 | 0 | 12.520 | 0 | 6 | 0 | -11.719 | 0 | 58285.650 | 27.891 | 3.427 | 112.017 | 58290.152 |
| 4.92969E 00 | 0 | 12.520 | 0 | 6 | 0 | -13.672 | 0 | 58333.652 | 27.891 | 3.427 | 112.017 | 58338.154 |
| 2.85156E 00 | 0 | 12.520 | 0 | 6 | 0 | -13.672 | 0 | 58381.654 | 27.891 | 3.427 | 112.017 | 58386.156 |
| 7.73437E-01 | 0 | 12.520 | 0 | 6 | 0 | -13.672 | 0 | 58429.655 | 27.891 | 3.427 | 112.017 | 58434.158 |
| 1.12109E 01 | 0 | 12.520 | 0 | 6 | 0 | -11.719 | 0 | 58477.657 | 27.891 | 3.427 | 112.017 | 58482.159 |
| 9.13281E 00 | 0 | 12.520 | 0 | 6 | 0 | -13.672 | 0 | 58525.659 | 27.891 | 3.427 | 112.017 | 58530.161 |

PREAMP TEMPERATURE = 0
SECONDARY VOLTAGE = 59
STAR EXCLUSION STATUS = 1 (1 = ENABLED, 0 = DISABLED)
DATA READOUT STATUS = 1
THRESHOLD LEVEL STATUS = 1 (1 = NORMAL, 0 = HIGH)
BANDWIDTH STATUS = 0 (1 = WIDE, 0 = NOT WIDE)

BANDWIDTH NARROW

SECTOR POSITION 104

SECTOR STATUS 0

| CH | BKGRND | PEAK | CH | BKGRND | PEAK | CH | BKGRND | PEAK | CH | BKGRND | PEAK |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 25 | 103 | 2 | 15 | 100 | 3 | 41 | 120 | 4 | 28 | 82 |

COINCIDENCE BIT ON = EVENT TIMES DECODED

| CH | ENTRY | EXIT | CH | ENTRY | EXIT | CH | ENTRY | EXIT | CH | ENTRY | EXIT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 55 | 2 | 23 | 29612 | 3 | 299 | 22729 | 4 | 591 | 27960 |

Figure 2. Typical Decoded Data Frame Output

# APPENDIX A

## Pioneer 10 and 11 Spacecraft and Instrument Commands

| OCTAL | DESIGNATOR | COMMAND NAME | COMMAND FUNCTION | VERIFICATION BITS | STATE |
|---|---|---|---|---|---|
| 000 | ZERO | *ZERO TEST CMD | TEST, ALSO INACTIVE REGISTER FILL | NONE | |
| 001 | ANT3 | †*RCVRA TO HG ANTENNA | CONNECTS RCVR A TO HG, RCVR B TO MED GAIN ANT | C316-4 | 1 |
| 002 | HTP9 | +Y Line HTR ON | TURNS POWER ON TO +Y PSA SEC HEATER | NONE | |
| 003 | | | | | |
| 004 | BAT3 | * BATT DISCHG ENAB | ENABLES BATTERY DISCHARGE | C128-2 | 0 |
| 005 | AMD1 | AMD THRESHOLD NORM | SELECTS NORMAL-LEVEL THRESHOLD | | |
| 006 | IPY1 | IPP STEP INHIB | INHIBITS LOOK ANGLE STEPPING | | |
| 007 | CNS3 | CONS ZERO OUTPUT | SELECTS CNS OUTPUT FOR USE WITH PREC PR2 | C313-1 | 0 |
| 010 | ACX3 | SEQUENCE OVERRIDE | OVERRIDES SEQ-INIB, STARTS AT INHIBIT POINT | C432-3 | 1 |
| 011 | ANT1 | *TWTA TO HG ANT | CONNECTS TWTA TO HG, TWTB TO MED GAIN ANT | C316-5 | 0 |
| 012 | CDU1 | MEM.-CMD PROC 1 SELECT | SELECTS STORAGE OUTPUT TO CP1 | C332-4 | 1 ④ |
| 013 | PAW1 | PA TGT SUPPR ON/OFF | TOGGLES-TARGET SUPPR ON/OFF | | |
| 014 | | | | | |
| 015 | BAT9 | + BATT HTR ON | TURNS ON BATTERY HEATER | NONE | |
| 016 | AMD2 | AMD THRESHOLD HIGH | SELECTS HIGH-LEVEL THRESHOLD | | |
| 017 | IPY6 | IPP-START DATA | SYNCS DATA TO THRESHOLD LEVEL | | |
| 020 | | | | | |
| 021 | HTN9 | -Y LINE HTR ON | TURNS POWER ON TO -Y PSA SEC HEATER | ④ NONE | |
| 022 | PUL1 | +PULSE LENGTH 1 | SELECTS 0.0312 SEC PULSE | C403-2,3,4 | 0,0,1 |
| 023 | CDU2 | MEM.-CMD PROC 2 SELECT | SELECTS STORAGE OUTPUT TO CP2 | ④ C332-4 | 0 |
| 024 | PAW2 | PA DET B HV STEP | TOGGLES-DET B CYCLE-32/64 ENERGY LEVELS | | |
| 025 | PSE0 | +PSE OFF | TURNS POWER OFF TO PSE | C421-6 | 0 |
| 026 | CNS9 | + *CONSCAN ON | TURNS POWER ON TO CONSCAN | C316-1 | 1 |
| 027 | AMD4 | AMD MED BANDWIDTH | SELECTS MEDIUM AMPLIFIER BANDWIDTH | | |
| 030 | HVM2 | HVM MAN RG DEC | DECREMENTS MANUAL RANGE BY ONE | | |
| 031 | | | | | |
| 032 | | | | | |
| 033 | | | | | |
| 034 | | | | | |
| 035 | PAY4 | PA DET A HV STEP | STEPS-3 ENERGY RANGE/STEP VALUES | | |
| 036 | SLA9 | + DUR/STR LOGIC A ON | PWR TO DSLA ON, TO DSLB OFF, PSE REG RESET | C421-4,5 | 1,0 |
| 037 | | | | | |
| 040 | IPY2 | IPPS LA RESET | RESETS START LK ANG TO REF POS | | |
| 041 | HVM3 | HVM MAN RG INCRE | INCREMENTS MANUAL RANGE BY ONE | | |
| 042 | ACX5 | + SEQUENCE STEP | ADVANCES SEQUENCE ONE STATE | C431-1,2,3 | CHANGE |
| 043 | BAT1 | + BATT AUTO CHARGE | PLACES BATTERY IN AUTO-CHARGE MODE | C128-1 | 0 |
| 044 | DTA1 | + *DTU REDUNDANCY A | SELECTS DTU REDUNDANT SECTION A | A,B,C-X01-3 | 0 |
| 045 | | | | | |
| 046 | PAY1 | PA FSM S/C REV/HV | STEPS-4 REV/HV IN FSM MODE | | |
| 047 | SLB9 | + DUR/STR LOGIC B ON | PWR TO DSLB ON, TO DSLA OFF, PSE REG RESET | C421-4,5 | 0,1 |
| 050 | | | | | |
| 051 | IPY3 | IPP SLA INCREMENT | | | |
| 052 | HVM4 | HVM DATA INT MODE | TRANSFERS TO DATA INTERCHANGE | | |
| 053 | | | | | |
| 054 | | | | | |
| 055 | PUL5 | + PULSE LENGTH 5 | SELECTS 2.0 SEC PULSE | C403-2,3,4 | 1,0,0 |
| 056 | | | | | |
| 057 | PAY2 | PA DATA SOURCE SEL | STEPS-4 HFM OR 3 FSM MODES | | |
| 060 | PAW3 | PA DET B HV LIMIT | TOGGLES-HV LIMIT ON/OFF | | |
| 061 | SEQ2 | + SEQUENCER INHIBIT | INHIBITS SEQ OUTPUTS, CLOCK CONTINUES | C132-6 | 0 |
| 062 | IPW1 | IPP GAIN INCREMENT | INCREASES GAIN BY ONE | | |
| 063 | HVM1 | HVM MAN RG ON/OFF | TOGGLES -MAN RG/NON DATA INTERCHANGE | | |
| 064 | | | | | |
| 065 | | | | | |
| 066 | | | | | |
| 067 | | | | | |
| 070 | IRR1 | IRR SPOKE WHEEL ADV | ADVANCES START OF DATA TAKING CYCLE | | |
| 071 | PAY3 | PA FLT CALIB | SELECTS CALIB MODE | | |
| 072 | SEQ3 | + SEQUENCER ENABLE | ENABLES SEQUENCER OUTPUTS | C132-6 | 1 |
| 073 | IPW2 | IPP GAIN DECREMENT | DECREASES GAIN BY ONE | | |
| 074 | | | | | |
| 075 | | | | | |
| 076 | | | | | |
| 077 | | | | | |

| OCTAL | DESIGNATOR | COMMAND NAME | COMMAND FUNCTION | VERIFICATION BITS | VERIFICATION STATE |
|---|---|---|---|---|---|
| 100 | | | | | |
| 101 | ACX4 | SEQUENCE RESET | RETURNS SEQUENCE TO INIT RESET STATE | C431-1,2,3 | 0,0,0 |
| 102 | CDS1 | SELECT REG 1-CDU | ENABLES DATA ENTRY TO REG 1 | NONE | |
| 103 | CPD1 | CPI PRIOT MDE OFF | DISABLES PRIORITY MODE | | |
| 104 | IPW3 | IPP MODE 2 ON | SELECTS ZODIACAL LIGHT MODE | | |
| 105 | TRD1 | TRD HV MODE | SELECTS HIGH-VOLTAGE MODE | | |
| 106 | PAY5 | DET A HV/COM BIAS | TOGGLES-HV/COM BIAS | | |
| 107 | | | | | |
| 110 | | | | | |
| 111 | IPW4 | IPP MODE 3 ON | SELECTS PHOTOPOLARIMETRY MODE | | |
| 112 | SEQ1 | START SEQUENCER | START SEQUENCER GROUND BACKUP | NONE | |
| 113 | CDS2 | SELECT REG 2-CDU | ENABLES DATA ENTRY TO REG 2 | NONE | |
| 114 | CPD2 | CPI D2 OFF | DIABLES DETECTOR D2 | | |
| 115 | BAT4 | *BATT DISCHARGE DSAB | DISABLES BATTERY DISCHARGE | C128-2 | 1 |
| 116 | TRD2 | TRD LV MODE | SELECTS LOW-VOLTAGE MODE | | |
| 117 | PAW4 | PA DET B HV ON/OFF | TOGGLES-HV ON/OFF-DET B | | |
| 120 | IPW5 | IPP MODE 4 ON | SELECTS IMAGING MODE | | |
| 121 | PAY6 | LEFT COM BIAS STEP | STEPS-8 COM LEVELS-LEFT BANK | | |
| 122 | ANT2 | *TWTA TO MG ANT | CONNECTS TWTA TO MG, TWTB TO HIGH GAIN ANT | C316-5 | 1 |
| 123 | PSP3 | *OVERLOAD PROT ON | REMOVES ELEC LOAD AUTO WHEN VOLT DROPS | C332-2 | 0 |
| 124 | CDS3 | SELECT REG 3-CDU | ENABLES DATA ENTRY TO REG 3 | NONE | |
| 125 | CPD6 | CPI LOGIC RESET | RETURNS INSTRUMENT TO NORMAL MDE | | |
| 126 | BAT0 | BATT HTR OFF | TURNS OFF BATTERY HEATER | NONE | |
| 127 | AMD6 | AMD STAR EXCLUSION | TOGGLES-STAR EXCLUSION ENABLE/DISABLE | | |
| 130 | CRT1 | CRT CALIB/NORM | TOGGLES-CALIBRATE/NORMAL MODES | | |
| 131 | | | | | |
| 132 | PAY8 | PA INTEG FD | STEPS-4 INTEGRATION PERIODS | | |
| 133 | CNS0 | **CONSCAN OFF | TURNS POWER OFF TO CONSCAN | C316-1 | 0 |
| 134 | ANT5 | **RCVR REVERSE ENABLE | RESETS TIME & ENABLES AUTO REVERSE | C332-3 | 0 |
| 135 | CDS4 | SELECT REG 4-CDU | ENABLES DATA ENTRY TO REG 4 | NONE | |
| 136 | CPD4 | CPI D7 OFF | DISABLES DETECTOR D7 | | |
| 137 | | | | | |
| 140 | PAY7 | PA RT COM BIAS STEP | STEPS-8 COM LEVELS-RT BANK | | |
| 141 | CRT2 | CRT MODE STEP | STEPS-4 POWER MODES | | |
| 142 | IPY7 | IPP SPOKE ADV-FINE | ADVANCES SPOKEWHEEL 1/64 ROLL | | |
| 143 | PUL3 | *PULSE LENGTH 3 | SELECTS 0.5 SEC PULSE | C403-2,3,4 | 1,1,1 |
| 144 | CNS4 | *CONS 180 OUTPUT | SELECTS CONS OUTPUT FOR USE WITH PRECPR1 | C313-1 | 1 |
| 145 | HTP0 | LINE HTRS OFF | TURNS POWER OFF TO PSA SEC HEATERS | NONE | |
| 146 | CDS5 | SELECT REG 5-CDU | ENABLES DATA ENTRY TO REG 5 | NONE | ⚠4 |
| 147 | CPD5 | CPI CALIBRATE | SELECTS CALIBRATE MODE | | |
| 150 | CPD3 | CPI D1 OFF | DISABLES DETECTOR D1 | | |
| 151 | | | | | |
| 152 | | | | | |
| 153 | IPY8 | IPP SPOKE ADV-COARS | ADVANCES SPOKE WHEEL 1/8 ROLL | | |
| 154 | HTN0 | -Y LINE HTR OFF | TURNS POWER OFF TO -Y PSA SEC HEATER | NONE | ⚠4 |
| 155 | DTB1 | **DTU REDUNDANCY B | SELECTS DTU REDUNDANT SECTION B | A,B,C-X01-3 | 1 |
| 156 | | | | | |
| 157 | | | | | |
| 160 | | | | | |
| 161 | AMD3 | AMD NARROW BANDWDTH | SELECTS NARROW AMPLIFIER BANDWIDTH | | |
| 162 | GTT1 | GTT LOGIC A/B | TOGGLES-LOGIC A/B | | |
| 163 | | | | | |
| 164 | BAT2 | *BATT FLOAT CHARGE | PLACES BATTERY IN FLOAT-CHARGE | C128-1 | 1 |
| 165 | IPY4 | IPP LA STEP REV | REVERSES STEP DIRECTION | | |
| 166 | PSE9 | *PSE ON DSL OFF | POWER ON TO PSE, OFF TO DSLA & DSLB | C421-4,5,6 | 0,0,1 |
| 167 | | | | | |
| 170 | | | | | |
| 171 | | | | | |
| 172 | AMD5 | AMD WIDE BANDWIDTH | SELECTS WIDE AMPLIFIER BANDWIDTH | | |
| 173 | | | | | |
| 174 | AMD7 | AMD DATA READOUT | TOGGLES-DATA READOUT ENABLE/DISABLE | | |
| 175 | | | | | |
| 176 | IPY5 | IPP LOW SAMPLE RATE | HALVES SAMPLE RATE | | |
| 177 | | | | | |

| OCTAL | DESIGNATOR | COMMAND NAME | COMMAND FUNCTION | VERIFICATION BITS | VERIFICATION STATE |
|---|---|---|---|---|---|
| 200 | DEP1 | +RTG DEPLOY | RTG DEPLOY (GROUND BACKUP) | C120-2,3 | 0,0 |
| 201 | MFB0 | +*MAIN FEED B NORM | TURNS POWER OFF TO FEED MOVEMENT MTR B | NONE | |
| 202 | ANT6 | +*RCVR REVERSE INHIB | INHIBITS AUTO RCVR-ANT REVERSE | C332-3 | 1 |
| 203 | CPD0 | +CPI PWR OFF | TURNS POWER OFF-CPI | C108-3 | 0 |
| 204 | PSP1 | +RTG RELAY RESET | RESETS 4 RTG RELAYS | NONE | |
| 205 | VEL3 | +RT DV PULSE | SELECTS DV PULSE UPON RECEIPT AT S/C | NONE | |
| 206 | ACR1 | +CLOCK RESET | RESETS CLOCK ENABLE | C410-3,4 | 1,1 |
| 207 | | | | | |
| 210 | MFA9 | +*MAIN FEED A OFFSET | TURNS POWER ON TO FEED MOVEMENT MTR A | NONE | |
| 211 | DEP3 | +BOOM DEPLOY | MAG BOOM DEP, UNCAGE MAIN FEED (GR B/U) | C120-1 | 0 |
| 212 | COB1 | +*RCVR B COHO MODE OFF | INHIBITS COHERENT OUTPUT-RCVR B | C308-4 | 1 |
| 213 | PUL2 | +PULSE LENGTH 2 | SELECTS 0.125 SEC PULSE | C403-2,3,4 | 0,1,1 |
| 214 | HVM0 | +HVM PWR OFF | TURNS PWR OFF-HVM | C108-1 | 0 |
| 215 | | | | | |
| 216 | VEL4 | +SCT DV MODE SELECT | ENABLES DV PULSE PR 90 DEG TO SPIN AXIS | C404-6 | 1 |
| 217 | | | | | |
| 220 | UVP0 | +UVP PWR OFF | TURNS PWR OFF-UVP | C124-2 | 0 |
| 221 | | | | | |
| 222 | ACX1 | +*SEQUENCE EXECUTE | STARTS PROGRAM SEQUENCE | C432-3 | 1 |
| 223 | TRA9 | +*TRANSMITTER A ON | TURNS TWTA & DRIVER A POWER ON | C231 | >0 |
| 224 | SPN3 | +SPIN DIR UP | SELECTS SCT1 TO INCREASE SPIN RATE | C403-6 | 0 |
| 225 | PAY0 | +PA PWR OFF | TURNS PWR OFF-PA | C108-2 | 0 |
| 226 | COB2 | +*RCVR B COHO MDE ON | ALLOWS COHERENT OUTPUT-RCVR B | C308-4 | 0 |
| 227 | SPN2 | +*RT SPIN PULSE | SINGLE SPIN PULSE UPON RECEIPT AT S/C | C308-5,6 | CHANGE |
| 230 | PRE3 | +*ZERO PREC PULSE | SINGLE PREC PULSE AT ZERO DEGREES ROLL | NONE | |
| 231 | GTT0 | +GTT PWR OFF | TURNS POWER OFF-GTT | C108-4 | 0 |
| 232 | TRA0 | +*TRANSMITTER A OFF | TURNS TWTA & DRIVER A POWER OFF | C231 | zero △4 |
| 233 | ACS1 | +ARM REGISTER 1-ACS | ENABLES DATA ENTRY INTO PRECREG 1 | C432-4 | 1 |
| 234 | CNS1 | +*CONSCAN THRESH HIGH | SETS CONSCAN THRESHOLD HIGH | C313-2 | 1 |
| 235 | ANT4 | +*RCVRA TO MG ANTENNA | CONNECTS RCVR A TO MG, RCVR B TO HIGH GAIN ANT | C316-4 | 0 |
| 236 | CRT0 | +CRT PWR OFF | TURNS POWER OFF-CRT | C108-5 | 0 |
| 237 | | | | | |
| 240 | | | | | |
| 241 | PRE4 | +90 DEG PREC PULSE | SINGLE PREC PULSE AT 90 DEGREES ROLL | NONE | |
| 242 | UVP2 | +UVP COVER PWR OFF | REMOVES POWER FROM UVP SENSOR COVER ACTUATOR | | |
| 243 | ORD2 | +ORDNANCE ARM | SETS ORDNANCE CIRCUITS TO ARM | C128-5 | 1 |
| 244 | ACS2 | +ARM REGISTER 2-ACS | ENABLES DATA ENTRY INTO DV REG | C432-5 | 1 |
| 245 | SAS3 | +STAR DELAY UP LSB | ADDS 1 INCREMENT TO STAR DELAY REG-3.91MS | C419 | +1 |
| 246 | PSP2 | +OVERLOAD PROT OFF | PREVENTS OVERLOAD PROTECTION | C332-2 | 1 |
| 247 | AMD0 | +AMD PWR OFF | TURNS POWER OFF-AMD | C124-5 | 0 |
| 250 | | | | | |
| 251 | | | | | |
| 252 | PRE5 | +*180 DEG. PREC PULSE | SINGLE PREC PULSE AT 180 DEGREES ROLL | NONE | |
| 253 | TRD0 | +TRD PWR OFF | TURNS POWER OFF-TRD | C124-1 | 0 |
| 254 | CDX1 | +*EXEC STORED SEQ-CDU | ENABLES STORED DATA TO BE EXECUTED | C324-1 | 0 △4 |
| 255 | ACS3 | +ARM REGISTER 3-ACS | ENABLES DATA ENTRY INTO PRECREG 2 | C432-6 | 1 |
| 256 | SAS1 | +STAR GATE ENAB 45 | BLANKS STAR PULSE FOR 315 DEG ROLL& DISABLES STAR | C410-5 | 1 |
| 257 | MED0 | +MD PWR OFF | TURNS POWER OFF-MD TIME GATE | C124-6 | 0 |
| 260 | | | | | |
| 261 | | | | | |
| 262 | CDU3 | +*SEL CDU5V BUSA | SELECTS DC BUS A | C332-6 | 1 |
| 263 | PRE6 | +*270 DEG PREC PULSE | SINGLE PREC PULSE AT 270 DEGREES ROLL | NONE | |
| 264 | IPY0 | +IPP PWR OFF | TURNS POWER OFF-IPP | C124-3 | 0 |
| 265 | | | | | |
| 266 | PRE1 | +PREC PAIR 1 SELECT | SELECTS VPT 2 & 3 | C403-1 | 0 |
| 267 | CDR2 | RESET SEL REG-CDU | DISABLES ALL REGISTERS FOR MORE DATA | NONE | |
| 270 | | | | | |
| 271 | | | | | |
| 272 | | | | | |
| 273 | | | | | |
| 274 | PRE7 | +*RT PREC PULSE | SINGLE PREC PULSE UPON RECEIPT AT S/C | NONE | |
| 275 | IRR0 | +IRR PWR OFF | TURNS POWER OFF-IRR | C124-4 | 0 |
| 276 | | | | | |
| 277 | VEL1 | +DV PAIR 1 | SELECTS VPT 2 & 4 FOR POS DV | C403-5 | 0 |

| OCTAL | DESIGNATOR | COMMAND NAME | COMMAND FUNCTION | VERIFICATION BITS | VERIFICATION STATE |
|---|---|---|---|---|---|
| 300 | DEP2 | - RTG DEPLOY RED | RTG DEPLOY (REDUNDANT GROUND BACKUP) | C120-2,3 | 0,0 |
| 301 | PUL4 | + PULSE LENGTH 4 | SELECTS 1.0 SEC PULSE | C403-2,3,4 | 1,1,0 |
| 302 | HVM9 | + HVM PWR ON | TURNS PWR ON-HVM | C108-1 | 1 |
| 303 | SEN1 | + SENSOR SEL SUN A | SELECTS A OUTPUT OF SUN SENSOR | C431-5,6 | 1,1 |
| 304 | | | | | |
| 305 | | | | | |
| 306 | | | | | |
| 307 | | | | | |
| 310 | TRB9 | - *TRANSMITTER B ON | TURNS TWTB & DRIVER B POWER ON | C214 | >0 |
| 311 | DEP4 | - BOOM DEPLOY RED | MAG BOOM DEP, UNCAGE HG-FEED (REDUNDANT BU) | C120-1 | 0 |
| 312 | SPN4 | - SPIN DIR DOWN | SELECTS SCT2 TO DECREASE SPIN RATE | C403-6 | 1 |
| 313 | PAY9 | + PA PWR ON | TURNS PWR ON-PA | C108-2 | 1 |
| 314 | SEN2 | - SENSOR SEL SUN B | SELECTS B OUTPUT OF SUN SENSOR | C431-5,6 | 1,0/0,1 |
| 315 | CDU4 | - *SEL CDU5V BUS B | SELECTS DC BUS B | C332-6 | 0 |
| 316 | | | | | |
| 317 | | | | | |
| 320 | TRD9 | + TRD PWR ON | TURNS POWER ON-TRD | C124-1 | 1 |
| 321 | CNS2 | + *CONSCAN THRESH MED | SETS CONSCAN THRESHOLD - MED | C313-2 | 0 |
| 322 | PRE2 | - PREC PAIR 2 SELECT | SELECTS VPT 1&4 | C403-1 | 1 |
| 323 | SAS5 | + STAR DELAY DOWN-LSB | SUBTR 1 INCRMNT FR STAR DELAY REG (3.91MS) | C419 | -1 |
| 324 | CRT9 | + CRT PWR ON | TURNS POWER ON-CRT | C108-5 | 1 |
| 325 | SEN3 | + SENSOR SEL STAR | SELECTS STAR SENSOR OUTPUT FOR REF | C431-5,6 | 0,0 |
| 326 | | | | | |
| 327 | | | | | |
| 330 | SPN1 | + DESPIN START | DESPIN GROUND BACKUP | NONE | |
| 331 | TRB0 | - *TRANSMITTER B OFF | TURNS TWTB & DRIVER B POWER OFF | C214 | ZERO |
| 332 | CDX2 | *STOP STORED SEQ-CDU | STOPS EXECUTION OF STORED DATA | NONE | |
| 333 | VEL2 | + DV PAIR 2 | SELECTS VPT 1&3 FOR NEG DV | C403-5 | 1 |
| 334 | SAS2 | + STAR GATE ENAB 360 | ALLOWS 360 DEG STAR SCAN OUTPUT & DISABLES STAR | C410-5 | 0 |
| 335 | CPD9 | + CPI PWR ON | TURNS POWER ON-CPI TIME GATE | C108-3 | 1 |
| 336 | ACA1 | + TIME FREQ SEL A | SELECTS DTU CLOCK OUTPUT A | C410-3,4 | 0,1 |
| 337 | SAS6 | + STAR DELAY DOWN-MSB | SUBTR 64 INCRMNT FR STAR DELAY REG(250MS) | C420 | -64 |
| 340 | SAT1 | + STAR TIME GATE ENAB | ACCEPTS STAR PULSE DURING TIME GATE | C431-4 | 1 |
| 341 | | | | | |
| 342 | IRR9 | + IRR PWR ON | TURNS POWER ON-IRR | C124-4 | 1 |
| 343 | COA2 | + *RCVR A COHO MDE ON | ALLOWS COHERENT OUTPUT-RCVR A | C308-3 | 0 |
| 344 | INS0 | - *INST PWR OFF | TURNS POWER OFF-ALL INSTRUMENTS | C108,124 | ALL "0" |
| 345 | ACX2 | + SEQUENCE INHIBIT-ACS | INHIBITS CONTINUATION OF PROGRAM SEQ | C432-3 | 0 |
| 346 | GTT9 | + GTT PWR ON | TURNS POWER ON-GTT | C108-4 | 1 |
| 347 | ACB1 | + TIME FREQ SEL B | SELECTS DTU CLOCK OUTPUT B | C410-3,4 | 1,0 |
| 350 | | | | | |
| 351 | SAT2 | + STAR TIME GATE INCR | ADDS 250 MSEC TO GATE WIDTH | NONE | |
| 352 | CNS5 | + CONS TO DSL ENAB | ALLOWS CONS PULSES TO ENTER DSL | C410-2 | 1 |
| 353 | AMD9 | + AMD PWR ON | TURNS POWER ON-AMD | C124-5 | 1 |
| 354 | COA1 | - * RCVR A COHO MDE OFF | INHIBITS COHERENT OUTPUT-RCVR A | C308-3 | 1 |
| 355 | CDR1 | RESET STOR REGS-CDU | RESETS ALL STORAGE REGS TO ZERO | C305,306,307 | ZEROS |
| 356 | MFA0 | - * MAIN FEED A NORM | TURNS PWR OFF TO FEED MOVEMENT HTR A | NONE | |
| 357 | UVP1 | - UVP COVER RELEASE | REMOVES SENSOR COVER | NONE | |
| 360 | SEN4 | AUTO STAR MODE | ENABLES AUTO SWITCH TO STAR B (IF STG ENAB) | C410-1 | 1 |
| 361 | UVP9 | + UVP PWR ON | TURNS POWER ON-UVP | C124-2 | 1 |
| 362 | SAT3 | - STAR TIME GATE DECR | SUBTRACTS 250 MSEC FROM GATE WIDTH | NONE | |
| 363 | CNS6 | - CONS TO DSL INHIB | INHIBITS CONS PULSES FROM ENTERING DSL | C410-2 | 0 |
| 364 | MFB9 | + * MAIN FEED B OFFSET | TURNS POWER ON TO FEED MOVEMENT HTR B | NONE | |
| 365 | ORD1 | + ORDNANCE SAFE | SETS ORDNANCE CIRCUITS TO SAFE | C128-5 | 0 |
| 366 | | | | | |
| 367 | | | | | |
| 370 | | | | | |
| 371 | | | | | |
| 372 | IPY9 | + IPP PWR ON | TURNS POWER ON-IPP | C124-3 | 1 |
| 373 | SAS4 | + STAR DELAY UP-MSB | ADDS 64 INCREMENTS TO STAR DEL REG-250MS | C420 | +64 |
| 374 | | | | | |
| 375 | MED9 | + MD PWR ON | TURNS POWER ON-MD | C124-6 | 1 |
| 376 | | | | | |
| 377 | ONE1 | *ONES TEST COMMAND | | NONE | |

| OCTAL | DESIGNATOR | COMMAND NAME | COMMAND FUNCTION | VERIFICATION BITS | VERIFICATION STATE 4 |
|---|---|---|---|---|---|
| 000 | XFB1 | ▽FORMAT B | SELECTS SCIENTIFIC DATA FORMAT B (REDUNDANT CMD) | A,B, & C | 00000 |
| 001 | FMB1 | FORMAT B | SELECTS SCIENTIFIC DATA FORMAT B | FORMATS | 00001 |
| 002 | XFC5 | FORMAT C | SELECTS ENGINEERING DATA FORMAT C (C1-C4) (RED) | BITS | 00010 |
| 003 | XFC6 | FORMAT C | SELECTS ENG DATA FORMAT C (C1-C4) (RED CMD) | 97-101 | 00011 |
| 004 | FMC1 | FORMAT C1 | SELECTS ENG DATA FORMAT C1 (POWER/DH) | | 00100 |
| 005 | FMC2 | FORMAT C2 | SELECTS ENG DATA FORMAT C2 (PT/THERM) | | 00101 |
| 006 | FMC3 | FORMAT C3 | SELECTS ENG DATA FORMAT C3 (CDU/CNS/PROP) | | 00110 |
| 007 | FMC4 | FORMAT C4 | SELECTS ENG DATA FORMAT C4 (ORIENTATION) | | 00111 |
| 010 | FMA1 | FORMAT A | SELECTS SCIENTIFIC DATA FORMAT A | | 01000 |
| 011 | XFA1 | FORMAT A | SELECTS SCIENTIFIC DATA FORMAT A (RED, CMD) | | 01001 |
| 012 | FMC5 | FORMAT C | SELECTS ENG DATA FORMAT C (C1-C4) | | 01010 |
| 013 | XFC7 | FORMAT C | SELECTS ENG DATA FORMAT C (C1-C4) (RED CMD) | | 01011 |
| 014 | XFC1 | FORMAT C1 | SELECTS ENG DATA FORMAT C1 (REDUNDANT CMD) | | 01100 |
| 015 | XFC2 | FORMAT C2 | SELECTS ENG DATA FORMAT C2 (REDUNDANT CMD) | | 01101 |
| 016 | XFC3 | FORMAT C3 | SELECTS ENG DATA FORMAT C3 (REDUNDANT CMD) | | 01110 |
| 017 | XFC4 | FORMAT C4 | SELECTS ENG DATA FORMAT C4 (REDUNDANT CMD) | | 01111 |
| 020 | FBD1 | FORMAT B/D1 | SELECTS SCI DATA FORMAT B/D1 (IPP) | | 10000 |
| 021 | FBD2 | FORMAT B/D2 | SELECTS SCI DATA FORMAT B/D2 (IPP/IRR) | | 10001 |
| 022 | FBD3 | FORMAT B/D3 | SELECTS SCI DATA FORMAT B/D3 (PA) | | 10010 |
| 023 | FBD4 | FORMAT B/D4 | SELECTS SCI DATA FORMAT B/D4 (UNASSIGNED) | | 10011 |
| 024 | FBD5 | FORMAT B/D5 | SELECTS SCI DATA FORMAT B/D5 (UNASSIGNED) | | 10100 |
| 025 | FBD6 | FORMAT B/D6 | SELECTS SCI DATA FORMAT B/D6 (UNASSIGNED) | | 10101 |
| 026 | FBD7 | FORMAT B/D7 | SELECTS SCI DATA FORMAT B/D7 (UNASSIGNED) | | 10110 |
| 027 | FBD8 | FORMAT B/D8 | SELECTS SCI DATA FORMAT B/D8 (UNASSIGNED) | | 10111 |
| 030 | FAD1 | FORMAT A/D1 | SELECTS SCI DATA FORMAT A/D1 (IPP) | | 11000 |
| 031 | FAD2 | FORMAT A/D2 | SELECTS SCI DATA FORMAT A/D2 (IPP/IRR) | | 11001 |
| 032 | FAD3 | FORMAT A/D3 | SELECTS SCI DATA FORMAT A/D3 (PA) | | 11010 |
| 033 | FAD4 | FORMAT A/D4 | SELECTS SCI DATA FORMAT A/D4 (UNASSIGNED) | | 11011 |
| 034 | FAD5 | FORMAT A/D5 | SELECTS SCI DATA FORMAT A/D5 (UNASSIGNED) | | 11100 |
| 035 | FAD6 | FORMAT A/D6 | SELECTS SCI DATA FORMAT A/D6 (UNASSIGNED) | | 11101 |
| 036 | FAD7 | FORMAT A/D7 | SELECTS SCI DATA FORMAT A/D7 (UNASSIGNED) | | 11110 |
| 037 | FAD8 | FORMAT A/D8 | SELECTS SCI DATA FORMAT A/D8 (UNASSIGNED) | | 11111 |
| 040 | BIT1 | 16 BPS | SELECTS 16 BPS DATA RATE | A, B, & C | 000 |
| 041 | BIT2 | 32 BPS | SELECTS 32 BPS DATA RATE | FORMATS | 001 |
| 042 | BIT3 | 64 BPS | SELECTS 64 BPS DATA RATE | BITS | 010 |
| 043 | BIT4 | 128 BPS | SELECTS 128 BPS DATA RATE | 4,5, & 6 | 011 |
| 044 | BIT5 | 256 BPS | SELECTS 256 BPS DATA RATE | | 100 |
| 045 | BIT6 | 512 BPS | SELECTS 512 BPS DATA RATE | | 101 |
| 046 | BIT7 | 1024 BPS | SELECTS 1024 BPS DATA RATE | | 110 |
| 047 | BIT8 | 2048 BPS | SELECTS 2048 BPS DATA RATE | | 111 |
| 050 | XBR1 | 16 BPS | SELECTS 16 BPS DATA RATE (REDUNDANT COMMAND) | | 000 |
| 051 | XBR2 | 32 BPS | SELECTS 32 BPS DATA RATE (REDUNDANT COMMAND) | | 001 |
| 052 | XBR3 | 64 BPS | SELECTS 64 BPS DATA RATE (REDUNDANT COMMAND) | | 010 |
| 053 | XBR4 | 128 BPS | SELECTS 128 BPS DATA RATE (REDUNDANT COMMAND) | | 011 |
| 054 | XBR5 | 256 BPS | SELECTS 256 BPS DATA RATE (REDUNDANT COMMAND) | | 100 |
| 055 | XBR6 | 512 BPS | SELECTS 512 BPS DATA RATE (REDUNDANT CMD) | | 101 |
| 056 | XBR7 | 1024 BPS | SELECTS 1024 BPS DATA RATE (REDUNDANT CMD) | | 110 |
| 057 | XBR8 | 2048 BPS | SELECTS 2048 BPS DATA RATE (REDUNDANT CMD) | | 111 |
| 060 | RTM1 | REAL TIME MODE | SELECTS REAL TIME DATA MODE | FORMATS | 00 |
| 061 | MRM1 | MEMORY READOUT MODE | SELECTS MEMORY READOUT DATA MODE | A, B, & C 4 | 01 |
| 062 | TSM1 | ▽TELEMETRY STORE MDE | SELECTS TELEMETRY STORE DATA MODE | BITS | 11 |
| 063 | | | | | |
| 064 | MHM1 | ▽MEMORY HALT MODE | SELECTS MEMORY HALT DATA MODE (REAL TIME DATA) | NONE | |
| 065 | MCM1 | ▽MEMORY CONTINUE MDE | SELECTS MEMORY DATA MODE AT POINT OF HALT | NONE | |
| 066 | RIP1 | ROLL REF ZERO DEG | SELECTS ROLL PULSE COINCIDENT WITH +Y AXIS | C417-1 | 0 |
| 067 | RIP2 | ROLL REF 180 DEG | SELECTS ROLL PULSE COINCIDENT WITH -Y AXIS | C417-1 | 1 |
| 070 | CCM1 | ▽CODED DATA MODE | SELECTS CODED DATA OUTPUT | C132-1 | 1 |
| 071 | UCM1 | ▽UNCODED DATA MODE | SELECTS UNCODED DATA OUTPUT | C132-1 | 0 |
| 072 | | | | | |
| 073 | | | | | |
| 074 | RIP5 | +ACS MODE SPSG | SELECTS ACS MODE FOR SPSG | C417-2,3 | 0,1 |
| 075 | | | | | |
| 076 | RIP4 | +NON-AVERAGING MODE | SELECTS NON-AVERAGING MODE FOR SPSG | C417-2,3 | 0,0 |
| 077 | RIP3 | +SPIN AVERAGING MODE | SELECTS SPIN AVERAGING MODE FOR SPSG | C417-2,3 | 1,0 |

NOTES: DSN AFFECTED

Δ SDA: ▽ DDA: *OTHER: + S/C CRITICAL

# APPENDIX B

## Computer Program For Processing

## AMD Data Tapes

```
C     PROGRAM TO COPY AND/OR DUMP UNPACKED VERSION OF SISYPHUS DATA TAPE
C     WRITTEN BY G. LIEBLING, GENERAL ELECTRIC CO., JUNE 1973
C
C     WRITTEN FOR SDS-930 COMPUTER USING 24 BIT WORDS
C     DATA INPUT IS NUMBER OF DAYS OF DATA ON ONE TAPE TO BE
C     DUMPED OR COPIED
C
C     BREAKPOINTS -
C        2 RESET(UP)    - DO NOT PRINT ALL DATA FRAMES
C          SET  (DOWN)  - PRINT ALL DATA FRAMES
C        3 RESET(UP)    - DO NOT PRINT ONLY DATA FRAMES WITH EVENTS
C          SET  (DOWN)  - PRINT ONLY DATA FRAMES WITH EVENTS
C        4 RESET(UP)    - DO NOT WRITE DECODED DATA ON NEW TAPE
C          SET  (DOWN)  - WRITE DECODED DATA ON NEW MAG TAPE
C
      DIMENSION  IREC(820), JREC(50), ISYS(4,4)
      DIMENSION  RAT(20), IRAT(20), ASP(20), IASP(20), ISPN(20),
     1           ISPF(20), ARI(20), IARI(20), T112(20), DCV(20), DFC(20),
     2           PTF(20), T124(20), TCBIN(50)
C
      EQUIVALENCE  (NREC, IREC( 1)), (IW  , IREC( 3)), (IDAY, IREC( 7)),
     1             (ITCF, IREC(9)) , (IRSS, IREC(10)), (IDSS, IREC(13)),
     2             (IBIT, IREC(15)), (IMODE, IREC(16)), (IFMT, IREC(18)),
     3             (IESC, IREC(22)), (ISDC, IREC(24)), (IPAT, IREC(25)),
     4             (ISPV, IREC(27)), (ISES, IREC(28)), (IDRB, IREC(30)),
     5             (ITRS, IREC(31)), (IBON, IREC(33)),
     6             (IPOS, JREC( 1)), (ISCT, JREC( 3)), (IB1 , JREC( 4)),
     7             (IB2 , JREC( 6)), (IC1 , JREC( 7)), (IC2 , JREC( 9))
C
      IBBIN =  1
      IBBCD = 11
      ITBIN =  2
      ITBCD = 12
      IWD = 900
C
C     SET PARAMETERS FOR RECORD READ ROUTINE
      CALL IBSET (IPAR, LDPT, IEBF, LENGTH)
C     READ DATA CARD FOR NUMBER OF TAPES TO PROCESS
C     DEFAULT VALUE IS 7
      READ 5000, NIN
      IF (NIN .EQ. 0)  NIN = 7
      DO 800  NTIN = 1, NIN
C
      PRINT 6000
C
C     READ FIRST RECORD (BCD)
      KREC = 1
      NFIL = 1
      CALL READ (ITBCD, IWD, IREC)
```

```
      IF (IEOF .NE. 0)  PRINT 6010, KREC, NFIL
      IF (LENGTH .NE. 120)  PRINT 6020, KREC, NFIL, LENGTH
      PRINT FIRST RECORD
      PRINT 6030, (IREC(I), I = 1, 120)
C     COPY FIRST FILE
      IF (BPT4)  CALL WRITE (I9BCD, LENGTH, IREC)
C     READ END OF FILE (BINARY)
      CALL READ (ITBIN, IWD, IREC)
      IF (IEOF .NE. 1)  PRINT 6040, NREC, NFIL
      IF (BPT4)  CALL WEOF (I9BIN)
C
C     READ SECOND FILE (BCD)
      NFIL = 2
      KREC = 1
170   CALL READ (ITBCD, IWD, IREC)
      IF (IEOF .NE. 0)  PRINT 6010, KREC, NFIL
      IF (LENGTH .NE. 300)  PRINT 6020, KREC, NFIL, LENGTH
      IF (KREC .GT. 1)  GO TO 173
C
C     GET NO. OF FRAMES IN SECOND FILE
C     IF MORE THAN 50 FRAMES, FILE HAS MORE THAN ONE RECORD
C     NO. OF FRAMES IN SECOND WORD OF FIRST RECORD IN BCD
C     CONVERT WORD FROM BCD TO BINARY (ASSUME MAXIMUM OF 3 DIGITS)
      IN0 = IREC(2)
      IHUN = (IAND (IN0, 0770000)) / 4096
      IF (IHUN .EQ. 48)  IHUN = 0
      ITEN = (IAND (IN0, 07700)) / 64
      IF (ITEN .EQ. 48)  ITEN = 0
      IUN = IAND (IN0, 077)
      NFR = IHUN * 100 + ITEN * 10 + IUN
173   CONTINUE
C     PRINT HEADER
175   PRINT 6100
C     PRINT RECORD
180   PRINT 6110, (IREC(I), I = 3,300)
185   IF (BPT4)  CALL WRITE (I0BCD, LENGTH, IREC)
      NFR = NFR - 50
C     MAX 50 FRAMES / PHYS RECORD
      IF (NFR .LE. 0)  GO TO 200
      KREC = KREC + 1
      GO TO 170
C     READ FILE 2 EOF
200   CALL READ (ITBIN, IWD, IREC)
      IF (IEOF .NE. 1)  PRINT 6040, NREC, NFIL
      IF (BPT4)  CALL WEOF (I9BIN)
C
C     READ THIRD FILE (BCD)
      NFIL = 3
      KREC = 1
      CALL READ  (ITBCD, IWD, IREC)
```

```
      IF (IEOF .NE. 0) PRINT 6010, KREC, NFIL
      IF (LENGTH .NE. 465)  PRINT 6020, KREC, NFIL, LENGTH
      PRINT THIRD FILE
      PRINT HEADER
220   PRINT 6150
      DO 230 I = 1, 451, 15
230   PRINT 6160,IREC(I), IREC(I+1), IREC(I+1), IREC(I+2), IREC(I+2),
     1            IREC(I+5), IREC(I+6), IREC(I+7), IREC(I+7), IREC(I+8),
     2            IREC(I+9), IREC(I+10), IREC(I+10), IREC(I+11)
240   IF (BPT4)  CALL WRITE (IOBCD, LENGTH, IREC)
C     READ FILE 3 EOF
      CALL READ (ITBIN, IWD, IREC)
      IF (IEOF .NE. 1)  PRINT 6040, KREC, NFIL
      IF (BPT4)  CALL WEOF (IOBIN)
C
C     READ FOURTH FILE (BINARY)
      ICNO = 0
      TCBIN(1) = 0.0
      NFIL = 4
300   CALL READ  (ITBIN, IWD, IREC)
      IF (IEOF .EQ. 0)  GO TO 310
      PRINT 6010, NTREC, NFIL
      IF (BPT4)  CALL WEOF (IOBIN)
      GO TO 790
310   CONTINUE
      NTREC = NREC
C
      COPY RECORD IF DESIRED
      IF (BPT4)  CALL WRITE (IOBIN, LENGTH, IREC)
C     READ SECOND RECORD IN DATA FILE, COPY IF DESIRED
      CALL READ (ITBIN, IWD, JREC)
      IF (BPT4)  CALL WRITE (IOBIN, LENGTH, JREC)
C
C     PRINT DATA FRAME IF DESIRED, ELSE READ NEXT FRAME
C     PRINT DATA FRAME IF BREAKPOINT 2 SET OR
C     BREAKPOINT 3 SET AND EVENT OCCURS IN DATA FRAME
      ICOIN = 1
      IF (IC1 .EQ. 1  .OR.  IC2 .EQ. 1)  ICOIN = 2
      IF (BPT2)  GO TO 340
      IF (BPT3)  GO TO (300, 340) ICOIN
      GO TO (300, 760) ICOIN
340   CONTINUE
C
C     FRAME IS TO BE PRINTED, SCALE AND CONVERT DATA ITEMS AS REQUIRED
C
C     TIME OF DAY - CONVERT TO HRS, MIN, SECONDS
      TODAY = FLOAT(IREC(4)) + (FLOAT(IREC(6))) / 1000.0
      ITEMP = IREC(4)
C     SECONDS PART OF TIME
      ISEC = MOD (ITEMP, 60)
```

```
      SECS = ISEC
      SECS = SECS + (FLOAT(IREC(6))) / 1000.0
      MINUTES
      IMIN = ITEMP / 60
      MINS = MOD (IMIN, 60)
C     HOURS
      IHRS = IMIN / 60
C
      SBYN = (FLOAT (IREC(12))) / 1000.0
      RTLT = FLOAT (IREC(19)) + (FLOAT (IREC(21))) / 1000.0
C
C     SCALE AND CONVERT THOSE DATA ITEMS WHICH APPEAR MORE THAN
C     ONCE PER DATA FRAME
      DO 360  I = 1, IM
      IX = 7 + 39 * I
      IARI(I) = IREC(IX)
      ISPF(I) = IREC(IX+ 2)
      IASP(I) = IREC(IX+ 3)
      IRAT(I) = IREC(IX+ 5)
      RAT (I) = (FLOAT (IREC(IX+ 6))) / 10000.0
      ASP (I) = (FLOAT (IREC(IX+ 8))) / 10000.0
      ARI (I) = (FLOAT (IREC(IX+11))) / 10000.0
      DCV (I) = (FLOAT (IREC(IX+15))) / 1000.0
      DCC (I) = (FLOAT (IREC(IX+17))) / 1000.0
      PTF (I) = (FLOAT (IREC(IX+18))) / 1000.0
      ISPN(I) = IREC(IX+ 9)
      T112(I) =  FLOAT (IREC(IX+12)) + (FLOAT (IREC(IX+14))) / 1000.0
      T124(I) =  FLOAT (IREC(IX+20)) + (FLOAT (IREC(IX+21))) / 1000.0
360   CONTINUE
C
C     EXTRACT ENTRY, EXIT TIMES, BACKGROUND, PEAK SIGNALS FROM
C     SECOND DATA RECORD
C
      DO 380  I = 1, 4
      IX = 4 + 6 * I
      ISYS(I,1) = JREC(IX)
      ISYS(I,2) = JREC(IX+2)
      ISYS(I,3) = JREC(IX+3)
      ISYS(I,4) = JREC(IX+5)
380   CONTINUE
C
C     PRINT DATA FRAME
C
C     PRINT HOUSEKEEPING DATA
553   PRINT 6200, NFIL, NREC
      IF (ITCF .EQ. 0)  GO TO 555
      PRINT 6205, IDAY, IHRS, MINS, SECS, TODAY
      GO TO 560
555   PRINT 6210, IDAY, IHRS, MINS, SECS, TODAY
560   PRINT 6220, IDSS, IBIT, MODE, IFMT
```

```
      PRINT 6230, SBYN, RTLT, IESC
      PRINT 6240, IRSS
      PRINT 6250, ISDC
      PRINT 6260
C
      PRINT 6280, (RAT(I), IRAT(I), ASP(I), IASP(I), ISPN(I), ISPF(I),
     1             ARI(I), IARI(I),  T112(I), DCV(I), DCC(I),
     2             PTF(I), T124(I),  I= 1, IW)
      PRINT 6300, IPAT, ISPV, ISES, IDRO, ITRS, IBDW
C
C     BANDWIDTH FLAG
      IF (IB1 .EQ. 1  .AND.  IB2 .EQ. 1)  GO TO 630
      IF (IB1 .EQ. 0  .AND.  IB2 .EQ. 0)  GO TO 620
      PRINT 6430, IB1, IB2
      GO TO 650
620   PRINT 6440
      GO TO 650
630   PRINT 6460
C     PRINT BACKGROUND AND PEAK DATA
650   PRINT 6470, IPBS, ISCT, ((I, ISYS(1,I), ISYS(2,I)), I = 1,4)
C
C     COINCIDENCE FLAG
      IF (IC1 .EQ. 1  .AND.  IC2 .EQ. 1)  GO TO 730
      IF (IC1 .EQ. 1  .OR.   IC2 .EQ. 1)  GO TO 720
      PRINT 6480
      GO TO 770
720   PRINT 6500, IC1, IC2
      GO TO 750
730   PRINT 6520
750   PRINT 6540, ((I, ISYS(3,I), ISYS(4,I)), I = 1,4)
C     UPDATE EVENT COUNTER
760   ICNO = ICNO + 1
      TODAY = FLOAT(IREC(4)) + (FLOAT(IREC(6))) / 1000.0
      TCOIN(ICNO) = TODAY
      IF (ICNO .LT. 50)  GO TO 770
      PRINT 6320,  ICNO, (TCOIN(I), I= 1, ICNO)
      ICNO = 0
770   CONTINUE
C
C     READ NEXT DATA FRAME
      GO TO 300
C
C     PRINT DIRECTORY OF EVENTS
790   PRINT 6320,  ICNO, (TCOIN(I), I= 1, ICNO)
C     END OF DATA FOR ONE DAY - LOOP BACK FOR NEXT DAY
800   CONTINUE
C
      STOP
C
5000  FORMAT ( I2 )
```

```
6000  FORMAT ( 1H1 )
6010  FORMAT ( //, 5X, 34HEND OF FILE ENCOUNTERED IN RECORD , I3,
     1                 9H OF FILE , I3 / )
6020  FORMAT ( //, 5X,  7HRECORD , I3, 9H OF FILE , I3,
     1              22H HAS LENGTH ERROR, LENGTH = , I4)
6030  FORMAT ( / , 10 ( 5X, 30A4, /))
6040  FORMAT ( //, 5X, 35HEND OF FILE NOT FOUND AFTER RECORD , I3,
     1                 9H OF FILE , I3 / )
6100  FORMAT (///, 5X, 22HFILE 2 COMMAND DATA    ,
     1              2( 22HDAY HR MN SE COMD  S  ) / )
6110  FORMAT (  2(27X, 11A4, /), 27X, 8A4, / )
6150  FORMAT (1H1, //, 5X, 40HFILE 3 ATTITUDE DATA   DAY  HR  MIN  SEC,
     1         52H  FLAG  C LANG   C LAT  CLK ANG-SUN  CLK ANG-CANOPUS;/)
6160  FORMAT ( / 28X, R1, A2, 2X, R2, 3X, A2, 3X, R2, 4X, R2, 2X, A4,
     1                A2, 2X, R2, A4, 5X, A4, A2, 9X, R2, A4)
6200  FORMAT (1H1, 29H   HOUSEKEEPING DATA FOR FILE, I3, 7H RECORD, I4,
     1         53H  (VALUES OF -1.0 OR 1.0E+06 INDICATE MISSING VALUES) )
6205  FORMAT ( / 5X, 25HGMT TIME OF DATA RECORD - , I4, 6H DAYS, ,
     1            I4, 1H:, I2, 1H:, OPF6.3, 3H  (,  F8.2,  9H SECONDS),
     2            23H (CORRECTED OR SUSPECT) )
6210  FORMAT ( / 5X, 25HGMT TIME OF DATA RECORD - , I4, 6H DAYS, ,
     1            I4, 1H:, I2, 1H:, OPF6.3, 3H  (,  F8.2,  9H SECONDS),
     2            14H (UNCORRECTED) )
6220  FORMAT ( / 5X, 49HCODED INDICATORS   DEEP SPACE TRACKING STATION -
     1            I4, 12H  BIT RATE -, I3, 8H  MODE -, I3, 10H  FORMAT -,
     2            I4 )
6230  FORMAT ( / 5X, 24H(SIGNAL + NOISE) / NOISE, 12X, F12.3, // 5X,
     1            31HROUND TRIP LIGHT TIME (SECONDS), 5X, F12.3, // 5X,
     2            22HEXTENDED FRAME COUNTER, 14X, I8 )
6240  FORMAT ( / 5X, 23HREFERENCE SELECT STATUS , 18X, I3 )
6250  FORMAT ( / 5X, 15HSTAR DELAY TIME, 25X, I4 )
6260  FORMAT ( / 5X, 43HROLL      FLAG       SPIN   FLAG    SPIN FLAG, 6X,
     1            47HROLL   FLAG       TIME OF       DC BUS      DC BUS, 4X,
     2            21HS/C TEMP       TIME OF, / , 3X, RHATTITUDE, 12X,
     3             6HPERIOD, 11X, 3HAVG, 10X, 5HERROR, 14X, 5HC-112, 6X,
     4            42HVOLTAGE    CURRENT       DEG F         C-124, /   4X,
     5             5HTIMER, 31X, 3HIND, 10X, 6H(MSEC), 12X, 7HGMT-SEC,7X,
     6            15HVOLTS       AMPS, 19X, 7HGMT-SEC      )
6280  FORMAT ( / 1X, 1PE12.5, I5, OPF12.3, I5, I8, I5, F12.3, I5, F14.3,
     1          2F11.3, F12.3, F14.3 )
6300  FORMAT  ( // 5X, 27HPREAMP TEMPERATURE        - I3,  /
     2             5X, 27HSECONDARY VOLTAGE         - I3,  /
     3             5X, 27HSTAR EXCLUSION STATUS     - I3,
     4             5X, 28H(1 = ENABLED,  0 = DISABLED) ,  /
     5             5X, 27HDATA READOUT STATUS       - I3,  /
     6             5X, 27HTHRESHOLD LEVEL STATUS    - I3,
     7             5X, 24H(1 = NORMAL,   0 = HIGH) ,      /
     8             5X, 27HBANDWIDTH STATUS          - I3,
     9             5X, 29H(1 = WIDE,     0 = NOT WIDE)  )
6320  FORMAT (1H1, 5X, 11HTHERE WERE , I3, 17H EVENTS AT TIMES ,
```

```
     1          50 (F9.3, /, 37X) )
6340  FORMAT ( // 12H MOUNT TAPE , I2, 8H ON MT7 //)

6430  FORMAT  ( /  5X, 39HBANDWIDTH BITS DO NOT AGREE - BIT 37 = , I2,
     1                 10H BIT 43 = , I2     )
6440  FORMAT ( / 5X, 29HBANDWIDTH          NOT MEDIUM )
6460  FORMAT ( / 5X, 25HBANDWIDTH          MEDIUM )
6470  FORMAT ( / 5X, 18HSECTOR POSITION    , I3, //
     1           5X, 18HSECTOR STATUS      , I3,
     1          //  4( 25H      CH  BKGRND     PEAK   ) /
     2              4( 5X, I2,2I8, 2X )     )
6480  FORMAT  ( /  5X, 42HCOINCIDENCE BIT OFF - NO FURTHER DECODING    )
6500  FORMAT  ( /  5X, 40HCOINCIDENCE BITS DO NOT MATCH - BIT 38 = , I2,
     1              10H BIT 44 = , I2 / 5X, 23HTREAT AS COINCIDENCE AN  )
6520  FORMAT  ( /  5X, 41HCOINCIDENCE BIT ON - EVENT TIMES DECODED     )
6540  FORMAT  ( / 4( 25H      CH    ENTRY     EXIT   ), /
     1              4( 5X, I2, I8, I8, 2X )     )
      END
```

D-23807
3/09/72 - 4/01/72

```
$JOB  17:27:13
$NOP*************** OCTAL DUMP OF FILES 4 & 96 OF X-398 ***************
$ASS IN MS5 SI TY
$NOTE BOJ    17:27:43
$AVF IN 3
$EXEC DPOCT7 BS
 INPUT TAPE ON MS5
 DATA INPUT    1 2 2
  FILE  4        RECORD   1        LENGTH    1116 BYTES
  (    0)  000001250000  000000000004  000460670000  000000000074  000001050000  000000000000  000000020000  000000017046
  (   48)  000000630000  000000000006  000000000000  000000000010  000000400000  000000000753  000074210000  000000000727
  (   96)  000000000000  000000000073  000000000000  000000000001  000000010000  000000000000  000000000000  000000000000
  (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  192)  000000000000  000000000000  000625210000  000000361535  000000040000  000000000000  000461460000  000000000051
  (  240)  000663620000  000000006542  003723110000  000000046150  000004440000  000000000000  000000000000  000000000000
  (  288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  336)  000000000000  000000000000  000000000000  000000000000  000440050000  000000361533  000000040000  000000000000
  (  384)  000461760000  000000000052  000663620000  000000006542  003723110000  000000046200  000004450000  000000000000
  (  432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000252710000  000000361535
  (  528)  000000040000  000000000000  000462260000  000000000053  000663620000  000000006542  003723110000  000000046230
  (  576)  000004460000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  672)  000065550000  000000361540  000000040000  000000000000  000462560000  000000000054  000663620000  000000006542
  (  720)  003723110000  000000046260  000004470000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  816)  000000000000  000000000000  003517250000  000000361535  000000040000  000000000000  000463060000  000000000055
  (  864)  000663620000  000000006542  003723110000  000000046310  000004500000  000000000000  000000000000  000000000000
  (  912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  960)  000000000000  000000000000  000000000000  000000000000  003332110000  000000361532  000000040000  000000000000
  ( 1008)  000463360000  000000000056  000663620000  000000006542  003723110000  000000046340  000004510000  000000000000
  ( 1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  ( 1104)  000000000000  000000000000
  FILE  1        RECORD   2        LENGTH     180  BYTES
  (    0)  000001760000  000000000000  000000010000  000000000001  000000010000  000000000001  000000350000  000000000033
  (   48)  000000320000  000000000030  000002300000  000000000162  000002360000  000000000226  000000010000  000000005624
  (   96)  000022440000  000000000000  005442400000  000000005624  000022520000  000000610406  000000000000  000000000000
  (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1        RECORD 925        LENGTH    1116 BYTES
  (    0)  000007070000  000000000006  002473610000  000000000417  000001050000  000000000000  000000020000  000000022473
  (   48)  000000520000  000000000005  000000000000  000000000007  000000440000  000000001032  000126210000  000000000000
  (   96)  000000000000  000000000073  000000010000  000000000001  000000010000  000000000001  000000000000  000000000000
  (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  192)  000000000000  000000000000  002512760000  000000361515  000000040000  000075655572  002472770000  000000000345
  (  240)  000663620000  000000006542  003522720000  000000247303  000013330000  000000000000  000000000000  000000000000
  (  288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  336)  000000000000  000000000000  000000000000  000000000000  002143020000  000000361515  000000040000  000075655572
  (  384)  002473570000  000000000347  000663620000  000000006542  003522720000  000000247363  000013350000  000000000000
  (  432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  001571710000  000000361515
  (  528)  000000040000  000075655572  002474370000  000000000351  000663620000  000000006542  003522720000  000000247443
  (  576)  000013370000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  672)  001220570000  000000361515  000000040000  000075655572  002475170000  000000000353  000663620000  000000006542
  (  720)  003522720000  000000247523  000013410000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  816)  000000000000  000000000000  000647450000  000000361515  000000040000  000075655572  002475770000  000000000355
  (  864)  000663620000  000000006542  003522720000  000000247603  000013430000  000000000000  000000000000  000000000000
  (  912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  960)  000000000000  000000000000  000000000000  000000000000  000277510000  000000361515  000000040000  000075655572
  ( 1008)  002476570000  000000000357  000663620000  000000006542  003522720000  000000247663  000013450000  000000000000
  ( 1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  ( 1104)  000000000000  000000000000
  FILE  1        RECORD 926        LENGTH     180  BYTES
```

```
$EXE DP3CT7 BS
 INPUT TAPE ON MS5
 DATA INPUT     1 2 2
  FILE  1      RECORD    1       LENGTH    1116 BYTES
  (     0)  000000030000  000000000006  000007530000  000000000135  000001340000  000000000000  000000020000  000000012201
  (    48)  000000630000  000000000005  000000000000  000000000010  000002250000  000000000177  000135250000  000000000000
  (    96)  000000000000  000000000073  000000010000  000000000001  000000010000  000000000001  000000000000  000000000000
  (   144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   192)  000000000000  000000000000  000165140000  000000364371  000000060000  000077663552  000002500000  000000000637
  (   240)  000663620000  000000006542  003231360000  000000000261  000006420000  000000000000  000000000000  000000000000
  (   288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   336)  000000000000  000000000000  000000000000  000000000000  002621620000  000000364371  000000060000  000077663552
  (   384)  000004100000  000000000643  000663620000  000000006542  003231360000  000000000000  777777770000  000000000000
  (   432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  001411450000  000000364371
  (   528)  000000060000  000077663552  000005500000  000000000647  000663620000  000000006542  003231360000  000000000561
  (   576)  000006510000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   672)  000202470000  000000364371  000000060000  000077663552  000007100000  000000000652  000663620000  000000006410
  (   720)  465450000000  000000000721  000006550000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   816)  000000000000  000000000000  000202470000  000000364371  000000060000  000077663552  000007100000  000000000652
  (   864)  000663620000  000000006410  465450000000  000000000721  000006550000  000000000000  000000000000  000000000000
  (   912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   960)  000000000000  000000000000  000000000000  000000000000  001630320000  000000364371  000000060000  000077663552
  (  1008)  000007770000  000000001051  000663620000  000000006542  003231360000  000000001004  000000670000  000000000000
  (  1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  1104)  000000000000  000000000000
  FILE  1      RECORD    2       LENGTH     180  BYTES
  (     0)  000000740000  000000000000  000000000000  000000000000  000000000000  000000000000  000002120000  000000000072
  (    48)  000002460000  000000000205  000002110000  000000000075  000002440000  000000000212  000000000000  000000000000
  (    96)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1      RECORD  595       LENGTH    1116 BYTES
  (     0)  000003440000  000000000006  002503520000  000000001657  000001340000  000000000000  000000020000  000000012731
  (    48)  000000630000  000000000005  000000000000  000000000010  000002320000  000000000132  000016210000  000000000000
  (    96)  000000000000  000000000073  000000010000  000000000001  000000010000  000000000001  000000000000  000000000000
  (   144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   192)  000000000000  000000000000  000516360000  000000364365  000000060000  000076635514  002500500000  000000001577
  (   240)  000663620000  000000006542  003231360000  000000250055  000006150000  000000000000  000000000000  000000000000
  (   288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   336)  000000000000  000000000000  000000000000  000000000000  000012770000  000000364365  000000060000  000076635514
  (   384)  002501300000  000000001601  000663620000  000000006542  003231360000  000000250135  000006170000  000000000000
  (   432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  003153040000  000000364365
  (   528)  000000060000  000076635514  002502100000  000000001603  000663620000  000000006542  003231360000  000000250215
  (   576)  000006210000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   672)  002447450000  000000364365  000000060000  000076635514  002502700000  000000001605  000663620000  000000006542
  (   720)  003231360000  000000250275  000006230000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   816)  000000000000  000000000000  001744350000  000000364365  000000060000  000076635514  002503500000  000000001607
  (   864)  000663620000  000000006542  003231360000  000000250355  000006250000  000000000000  000000000000  000000000000
  (   912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   960)  000000000000  000000000000  000000000000  000000000000  001240460000  000000364365  000000060000  000076567401
  (  1008)  002504300000  000000001610  000664620000  000000006542  003231360000  000000250435  000006270000  000000000000
  (  1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  1104)  000000000000  000000000000
  FILE  1      RECORD  596       LENGTH     180  BYTES
  (     0)  000000470000  000000000000  000000000000  000000000000  000000000000  000000000000  000002320000  000000000110
  (    48)  000002300000  000000000214  000002300000  000000000115  000002340000  000000000222  000000000000  000000000000
  (    96)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 FILE    1      # OF DATA RECORDS    596      # SUCCESSFUL READS  598
        # PERMANENT READ ERRORS    0        # ZERO BYTE ERRORS   0        # SHORT RECORDS    0        # UNDEFINED ERRORS   0
          # OF RECORDS RETRIED    0        TOTAL # OF RETRIES   0
```

D-23808
4/2/72 - 4/29/72

```
$JOB    9:28:02
$ASS IN MS5 SI TY
$EXEC DPOCT7 BS
 INPUT TAPE ON MS5
 DATA INPUT     1 1 1
  FILE  1       RECORD    1       LENGTH    1116 BYTES
  (      0)   000000030000  000000000006  000006520000  000000001704  000001350000  000000000000  000000020000  000000012201
  (     48)   000000630000  000000000005  000000000000  000000000010  000002320000  000000000173  000046210000  000000000000
  (     96)   000000000000  000000000073  000000010000  000000000001  000000010000  000000000001  000000000000  000000000000
  (    144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    192)   000000000000  000000000000  001260360000  000000364365  000000060000  000076635514  000002700000  000000001623
  (    240)   000663620000  000000006542  003231360000  000000000275  000006410000  000000000000  000000000000  000000000000
  (    288)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    336)   000000000000  000000000000  000000000000  000000000000  000554770000  000000364365  000000060000  000076635514
  (    384)   000003500000  000000001625  000663620000  000000006542  003231360000  000000000355  000006430000  000000000000
  (    432)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    480)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000051400000  000000364365
  (    528)   000000060000  000076567401  000004300000  000000001627  000663620000  000000006542  003231360000  000000000435
  (    576)   000006450000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    624)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    672)   003211450000  000000364365  000000060000  000076635514  000005100000  000000001631  000663620000  000000006542
  (    720)   003231360000  000000000515  000006470000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    768)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    816)   000000000000  000000000000  002506060000  000000364365  000000060000  000076635514  000005700000  000000001633
  (    864)   000663620000  000000006542  003231360000  000000000575  000006510000  000000000000  000000000000  000000000000
  (    912)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    960)   000000000000  000000000000  000000000000  000000000000  002002470000  000000364365  000000060000  000076567401
  (   1008)   000006500000  000000001634  000663620000  000000006542  003231360000  000000000655  000006530000  000000000000
  (   1056)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   1104)   000000000000  000000000000
  FILE  1       RECORD    608     LENGTH    180  BYTES
  (      0)   000000130000  000000000000  000000000000  000000000000  000000000000  000000000000  000002300000  000000000120
  (     48)   000002060000  000000000210  000002300000  000000000124  000002100000  000000000222  000000000000  000000000000
  (     96)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 FILE    1       # OF DATA RECORDS    608      # SUCCESSFUL READS   609
        # PERMANENT READ ERRORS    0        # ZERO BYTE ERRORS   0        # SHORT RECORDS    0        # UNDEFINED ERRORS   0
           # OF RECORDS RETRIED    0        TOTAL # OF RETRIES   0

$$
$AVF IN 110
$EXEC DPOCT7 BS
```

```
INPUT TAPE ON MS5
DATA INPUT     1 1 1
 FILE   1      RECORD    1       LENGTH    1116 BYTES
 (      0)   000000040000  000000000006  000017410000  000000001050  000001700000  000000000000  000000030000  000000006614
 (     48)   000000630000  000000000004  000000000000  000000000007  000004570000  000000000340  000120210000  000000000005
 (     96)   000000160000  000000000073  000000010000  000000000001  000000010000  000000000001  000000000000  000000000000
 (    144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 (    192)   000000000000  000000000000  003523000000  000000364153  000000060000  000077134305  000007750000  000000000702
 (    240)   000663620000  000000006410  003043240000  000000001006  000007070000  000000000000  000000000000  000000000000
 (    288)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 (    336)   000000000000  000000000000  000000000000  000000000000  002335070000  000000364153  000000060000  000077202420
 (    384)   000011350000  000000000707  000663620000  000000006410  003043240000  000000001146  000007130000  000000000000
 (    432)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 (    480)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  001150350000  000000364153
 (    528)   000000060000  000077202420  000012750000  000000000713  000663620000  000000006410  003043240000  000000001306
 (    576)   000007200000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 (    624)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 (    672)   003624720000  000000364153  000000060000  000077134305  000014350000  000000000720  000663620000  000000006410
 (    720)   003043240000  000000001446  000007240000  000000000000  000000000000  000000000000  000000000000  000000000000
 (    768)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 (    816)   000000000000  000000000000  002437020000  000000364154  000000050000  000000000000  000015750000  000000000724
 (    864)   000663620000  000000006410  003043240000  000000001606  000007310000  000000000000  000000000000  000000000000
 (    912)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 (    960)   000000000000  000000000000  000000000000  000000000000  001254640000  000000364153  000000050000  000000000000
 (   1008)   000017350000  000000000731  000663620000  000000006410  003043240000  000000001746  000007350000  000000000000
 (   1056)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 (   1104)   000000000000  000000000000
 FILE   1      RECORD    548     LENGTH    180  BYTES
 (      0)   000001760000  000000000000  000000000000  000000000000  000000000000  000000000000  000000250000  000000000023
 (     48)   000000640000  000000000043  000000420000  000000000030  000001040000  000000000061  000000000000  000000000000
 (     96)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 (    144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
FILE    1       # OF DATA RECORDS    548      # SUCCESSFUL READS   549
        # PERMANENT READ ERRORS    0       # ZERO BYTE ERRORS   0       # SHORT RECORDS    0       # UNDEFINED ERRORS   0
          # OF RECORDS RETRIED    0       TOTAL # OF RETRIES   0

$$
$EOJ    9:32:58
```

D-23809
4/30/72 - 5/04/72

```
$JOB    9:2[illegible]:25
$NOP DUMP OF X-393
$ASS IN MS5 SI TY
$AVF IN 3
$EXEC DPOCT7 BS
 INPUT TAPE ON MS5
 DATA INPUT     1 2 2
  FILE  1       RECORD    1       LENGTH    960  BYTES
  (     0)   000000010000  000000000005  000010010000  000000000301  000001710000  000000000000  000000030000  000000037767
  (    48)   000000630000  000000000007  000000000000  000000000030  000004650000  000000001342  000050210000  000000000000
  (    96)   000000170000  000000000072  000000010000  000000000001  000000010000  000000000001  000000000000  000000000000
  (   144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   192)   000000000000  000000000000  000244620000  000000364011  000000060000  000077202420  000010600000  000000000172
  (   240)   000663620000  000000006410  003043240000  000000001062  000005650000  000000000000  000000000000  000000000000
  (   288)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   336)   000000000000  000000000000  000000000000  000000000000  000012770000  000000364011  000000060000  000077134305
  (   384)   000011100000  000000000173  000663620000  000000006410  003043240000  000000001112  000005670000  000000000000
  (   432)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   480)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  003417670000  000000364011
  (   528)   000000060000  000077202420  000011400000  000000000175  000663620000  000000006410  003043240000  000000001142
  (   576)   000005670000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   624)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   672)   003166030000  000000364011  000000060000  000077202420  000011700000  000000000175  000663620000  000000006410
  (   720)   003043240000  000000001172  000005700000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   768)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   816)   000000000000  000000000000  002734170000  000000364011  000000060000  000077134305  000012200000  000000000176
  (   864)   000663620000  000000006410  003043240000  000000001222  000005710000  000000000000  000000000000  000000000000
  (   912)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1       RECORD    2       LENGTH    180  BYTES
  (     0)   000001430000  000000000000  000000000000  000000000000  000000000000  000000000000  000000240000  000000000014
  (    48)   000000370000  000000000026  000000360000  000000000023  000000500000  000000000041  000000000000  000000000000
  (    96)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1       RECORD    2259    LENGTH    180  BYTES
  (     0)   000001050000  000000000000  000000000000  000000000000  000000000000  000000000000  000000330000  000000000022
  (    48)   000000570000  000000000041  000000500000  000000000026  000000770000  000000000054  000000000000  000000000000
  (    96)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
FILE    1       # OF DATA RECORDS    2259     # SUCCESSFUL READS   2261
        # PERMANENT READ ERRORS    0        # ZERO BYTE ERRORS   0        # SHORT RECORDS    0        # UNDEFINED ERRORS   0
          # OF RECORDS RETRIED    0        TOTAL # OF RETRIES   0

$$
$AVF IN 5
$AVF IN 5
```

```
$AVF IN 5
$AVF IN 4
$EXEC DPOCT/ BS
 INPUT TAPE ON MS5
 DATA INPUT     1 2 2
  FILE  1      RECORD    1      LENGTH    1116 BYTES
  (     0)  000000030000  000000000006  000001520000  000000000424  000001750000  000000000000  000000030000  000000030560
  (    48)  000000750000  000000000007  000000000000  000000000010  000005210000  000000000153  000020210000  000000000000
  (    96)  000000170000  000000000072  000000010000  000000000001  000000010000  000000000001  000000000000  000000000000
  (   144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   192)  000000000000  000000000000  001750760000  000000363764  000000060000  000077547324  000000550000  000000001373
  (   240)  000663620000  000000006410  003043240000  000000000056  000015710000  000000000000  000000000000  000000000000
  (   288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   336)  000000000000  000000000000  000000000000  000000000000  001635220000  000000363764  000000060000  000077547324
  (   384)  000000710000  000000001373  000663620000  000000006410  003043240000  000000000072  000015710000  000000000000
  (   432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  001520300000  000000363764
  (   528)  000000060000  000077547324  000001050000  000000001374  000663620000  000000006410  003043240000  000000000106
  (   576)  000015720000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   672)  001403360000  000000363764  000000060000  000077547324  000001210000  000000001375  000663620000  000000006410
  (   720)  003043240000  000000000122  000015730000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   816)  000000000000  000000000000  001266450000  000000363764  000000060000  000077547324  000001350000  000000001375
  (   864)  000663620000  000000006410  003043240000  000000000136  000015730000  000000000000  000000000000  000000000000
  (   912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   960)  000000000000  000000000000  000000000000  000000000000  001151530000  000000363764  000000060000  000077547324
  (  1008)  000001510000  000000001376  000663620000  000000006410  003043240000  000000000152  000015740000  000000000000
  (  1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  1104)  000000000000  000000000000
  FILE  1      RECORD    2      LENGTH     180  BYTES
  (     0)  000000260000  000000000000  000000000000  000000000000  000000000000  000000000000  000000400000  000000000027
  (    48)  000000650000  000000000047  000000520000  000000000032  000001000000  000000000056  000000000000  000000000000
  (    96)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1      RECORD 2129    LENGTH    1116 BYTES
  (     0)  000015750000  000000000006  002503320000  000000001100  000001750000  000000000000  000000030000  000000026610
  (    48)  000000750000  000000000007  000000000000  000000000010  000005300000  000000000271  000050210000  000000000000
  (    96)  000000170000  000000000073  000000010000  000000000001  000000010000  000000000001  000000000000  000000000000
  (   144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   192)  000000000000  000000000000  003240610000  000000363756  000000060000  000077501210  002503620000  000000000102
  (   240)  000663620000  000000006410  003043240000  000000250363  000003000000  000000000000  000000000000  000000000000
  (   288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   336)  000000000000  000000000000  000000000000  000000000000  003123670000  000000363756  000000060000  000077501210
  (   384)  002503760000  000000000103  000664620000  000000006410  003043240000  000000250377  000003010000  000000000000
  (   432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  003006760000  000000363756
  (   528)  000000060000  000077433075  002504120000  000000000103  000663620000  000000006410  003043240000  000000250413
  (   576)  000003010000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   672)  002672040000  000000363756  000000060000  000077501210  002504260000  000000000105  000663620000  000000006410
  (   720)  003043240000  000000250427  000003020000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   816)  000000000000  000000000000  002555120000  000000363756  000000060000  000077433075  002504420000  000000000104
  (   864)  000663620000  000000006410  003043240000  000000250443  000003020000  000000000000  000000000000  000000000000
  (   912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   960)  000000000000  000000000000  000000000000  000000000000  002440200000  000000363756  000000060000  000077501210
  (  1008)  002504560000  000000000105  000663620000  000000006410  003043240000  000000250457  000003030000  000000000000
  (  1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  1104)  000000000000  000000000000
  FILE  1      RECORD 2130    LENGTH     180  BYTES
  (     0)  000000220000  000000000000  000000000000  000000000000  000000010000  000000000001  000000360000  000000000034
  (    48)  000000730000  000000000067  000001370000  000000000072  000001550000  000000000140  002045720000  000000613722
  (    96)  001372670000  000000000000  002046060000  000000613722  001374520000  000000553101  000000000000  000000000000
  (   144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 FILE    1        # OF DATA RECORDS   2130     # SUCCESSFUL READS   2132
```

PIONEER 11

ASTEROID/METEORID/SKY EMISSIONS

73-019A-03A PSSB-00018

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 39 TAPES, 32 WERE 7-TRACK, 556 BPI, AND SEVEN WERE 9-TRACK, 6250 BPI. THE FIRST THREE FILES WERE WRITTEN IN BCD, AND THE FOURTH FILE WAS WRITTEN IN BINARY IN A SET PATTERN THROUGHOUT THE INPUT TAPES. A LISTING OF ANY ZERO FILES THAT OCCURRED ON THE ORIGINAL TAPES WILL FOLLOW THE COVER SHEET SHOWING WHERE THEY OCCURR ON THE RESTORED TAPES. THERE ARE 11 RESTORED TAPES WRITTEN IN ASCII AND BINARY. THE FOLLOWING TWO TAPES D023900, AND 023886 WERE BAD. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON AN IBM 360 COMPUTER AND WERE RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

| DR# | DS# | DD# | FILES | TIME SPAN | |
|---|---|---|---|---|---|
| DR004702 | DS004702 | D023862 | 1-64 | 04/11/73 - 04/26/73 | |
| | | D023863 | 65-88 | 04/19/73 - 05/24/73 | (a) |
| | | D023864 | 89-112 | 05/19/73 - 05/24/73 | |
| | | D023865 | 113-140 | 05/25/73 - 06/04/73 | |
| | | D023866 | 141-164 | 06/04/73 - 06/09/73 | |
| DR004703 | DS004703 | D023867 | 1-24 | 06/10/73 - 06/15/73 | |
| DR004704 | DS004704 | D023868 | 1-24 | 06/16/73 - 06/21/73 | |
| | | D023869 | 25-48 | 06/22/73 - 06/27/73 | |
| | | D023870 | 49-72 | 06/28/73 - 07/04/73 | |
| | | D023871 | 73-96 | 07/04/73 - 07/10/73 | |
| | | D023872 | 97-119 | 07/10/73 - 07/15/73 | |
| DR004705 | DS004705 | D023873 | 1-28 | 07/16/73 - 07/24/73 | |
| | | D023874 | 29-72 | 07/24/73 - 08/04/73 | |
| | | D023875 | 73-120 | 08/04/73 - 08/16/73 | |
| | | D023876 | 121-164 | 08/16/73 - 08/26/73 | |

Refer to 72-012A-03A

73-019A-03A

| DR# | DS# | DD# | FILES | TIME SPAN | |
|---|---|---|---|---|---|
| DR004706 | DS004706 | D023877 | 1-52 | 08/27/73 - 09/08/73 | |
| | | D023878 | 53-104 | 09/09/73 - 09/21/73 | |
| | | D023879 | 105-164 | 09/22/73 - 10/06/73 | |
| DR004707 | DS004707 | D023880 | 1-120 | 10/07/73 - 11/03/73 | (b) |
| | | D023881 | 121-284 | 11/04/73 - 12/15/74 | (c) |
| | | D023882 | 285-439 | 12/15/74 - 02/07/74 | |
| DR004708 | DS004708 | D023883 | 1-68 | 03/24/74 - 04/09/74 | |
| | | D023884 | 69-213 | 05/12/74 - 06/30/74 | (d) |
| | | D023885 | 214-297 | 07/01/74 - 07/21/74 | |
| DR004709 | DS004709 | D023887 | 1-48 | 08/23/74 - 09/03/74 | (e) |
| | | D023888 | 49-144 | 09/16/74 - 10/12/74 | (f) |
| | | D023889 | 145-216 | 10/16/74 - 11/03/74 | |
| | | D023890 | 217-256 | 10/16/74 - 11/09/74 | |
| DR004710 | DS004710 | D023891 | 1-32 | 11/10/74 - 11/15/74 | |
| | | D023892 | 33-72 | 11/16/74 - 11/21/74 | |
| | | D023893 | 73-128 | 11/22/74 - 11/28/74 | |
| | | D023894 | 129-220 | 11/29/74 - 12/08/74 | |
| DR004711 | DS004711 | D023895 | 1-44 | 12/09/74 - 12/14/74 | (g) |
| | | D023896 | 45-84 | 12/15/74 - 12/21/74 | |
| | | D023897 | 85-132 | 12/22/74 - 12/29/74 | |
| DR006111 | DS006111 | D023899 | 1-40 | 12/30/74 - 02/03/75 | |
| | | D023898 | 41-138 | 02/03/75 - 02/27/75 | |

(a) D023863 FILES 25-88 WERE BAD
(b) D023880 FILES 121-124 WERE BAD
(c) D023881 FILES 165-224 WERE BAD
(d) D023884 FILES 145-192 WERE BAD
(e) D023887 FILES 49-96 WERE BAD
(f) D023888 FILES 97-108 WERE BAD
(g) D023895 FILES 45-48 WERE BAD

PIONEER 11

ASTEROID/METEOROID/SKY EMISSION

73-019A-03A

THE FOLLOWING DR/DS TAPES HAVE ZERO FILES. THE POSITION OF EACH FILE AND THE TAPE THAT THEY ARE ON FOLLOW:

DR/DS 004702, FILES 120, 124, 128

004705, FILE 116

004707, FILE 122

004708, FILES 24, 85, 210, 212, 213

D-23862
4/12/73 - 4/20/73

```
$JOB  13:26:56
$ASS IN MS5
$NOP ************* DUMP OF X-405 *****************
$AVF IN 3
$EXEC DPOCT7 BS
 INPUT TAPE ON MS5
 DATA INPUT    1 2 2
  FILE  4      RECORD   1      LENGTH   1116 BYTES
  (    0)  000005620000  000000000006  001664400000  000000001724  000001450000  000000000000  000000030000  000000014346
  (   48)  000000520000  000000000006  000000000000  000000000010  000000360000  000000000623  000036210000  000000000705
  (   96)  000000000000  000000000073  000000000000  000000000001  000000010000  000000000000  000000000000  000000000000
  (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  192)  000000000000  000000000000  001312070000  000000361734  000000060000  000000413016  001662770000  000000001673
  (  240)  000664620000  000000006410  003622500000  000000166302  000003170000  000000000000  000000000000  000000000000
  (  288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  336)  000000000000  000000000000  000000000000  000000000000  001121200000  000000361734  000000060000  000000461132
  (  384)  001663270000  000000001674  000664620000  000000006256  003622500000  000000166332  000003170000  000000000000
  (  432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000730320000  000000361734
  (  528)  000000060000  000000413016  001663570000  000000001675  000663620000  000000006410  003622500000  000000166362
  (  576)  000003200000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  672)  000537440000  000000361734  000000060000  000000413016  001664070000  000000001676  000664620000  000000006410
  (  720)  003622500000  000000166412  000003220000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  816)  000000000000  000000000000  000346550000  000000361734  000000060000  000000413016  001664370000  000000001677
  (  864)  000664620000  000000006410  003622500000  000000166442  000003230000  000000000000  000000000000  000000000000
  (  912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  960)  000000000000  000000000000  000000000000  000000000000  000155670000  000000361734  000000060000  000000413016
  ( 1008)  001664670000  000000001700  000663620000  000000006410  003622500000  000000166472  000003230000  000000000000
  ( 1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  ( 1104)  000000000000  000000000000
  FILE  1      RECORD   2      LENGTH    180  BYTES
  (    0)  000000060000  000000000000  000000010000  000000000001  000000000000  000000000000  000000700000  000000000074
  (   48)  000001130000  000000000061  000000750000  000000000120  000001210000  000000000067  000000000000  000000000000
  (   96)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1      RECORD 213      LENGTH   1116 BYTES
  (    0)  000006730000  000000000006  002475320000  000000001331  000001450000  000000000000  000000030000  000000014603
  (   48)  000000630000  000000000006  000000000000  000000000030  000000370000  000000001736  000044210000  000000000705
  (   96)  000000000000  000000000073  000000010000  000000000001  000000010000  000000000000  000000000000  000000000000
  (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  192)  000000000000  000000000000  002504700000  000000361736  000000060000  000000461132  002476700000  000000001114
  (  240)  000664620000  000000006410  003522720000  000000247675  000001310000  000000000000  000000000000  000000000000
  (  288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  336)  000000000000  000000000000  000000000000  000000000000  002123130000  000000361736  000000060000  000000461132
  (  384)  002477500000  000000001116  000663620000  000000006410  003522720000  000000247755  000001330000  000000000000
  (  432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  001540200000  000000361736
  (  528)  000000060000  000000461132  002500300000  000000001120  000663620000  000000006410  003522720000  000000250035
  (  576)  000001350000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  672)  001156430000  000000361736  000000060000  000000461132  002501100000  000000001122  000663620000  000000006410
  (  720)  003522720000  000000250115  000001370000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  816)  000000000000  000000000000  000574670000  000000361736  000000060000  000000461132  002501700000  000000001124
  (  864)  000663620000  000000006410  003522720000  000000250175  000001410000  000000000000  000000000000  000000000000
  (  912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  960)  000000000000  000000000000  000000000000  000000000000  000213120000  000000361737  000000060000  000000461132
  ( 1008)  002502500000  000000001126  000663620000  000000006410  003522720000  000000250255  000001430000  000000000000
  ( 1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  ( 1104)  000000000000  000000000000
  FILE  1      RECORD 214      LENGTH    180  BYTES
  (    0)  000001020000  000000000000  000000000000  000000000000  000000000000  000000000000  000000700000  000000000027
```

```
$JOB  13:49:37
$ASS IN MS5
$NOP ***************** FILE 63 OF X-405 ********
$AVF IN 63
$EXEC DPOCT7 BS
 INPUT TAPE ON MS5
 DATA INPUT    1 2 2
  FILE  1      RECORD   1      LENGTH   960  BYTES
   (    0)  000000020000  000000000005  000000130000  000000000045  000001640000  000000000000  000000030000  000000012103
   (   48)  000000630000  000000000006  000000000000  000000000010  000002030000  000000001476  000034210000  000000000705
   (   96)  000000000000  000000000073  000000010000  000000000001  000000010000  000000000000  000000000000  000000000000
   (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  192)  000000000000  000000000000  002707370000  000000361537  000000060000  000077501210  000000420000  000000000021
   (  240)  000663620000  000000006410  003522720000  000000000044  000004140000  000000000000  000000000000  000000000000
   (  288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  336)  000000000000  000000000000  000000000000  000000000000  002522230000  000000361537  000000060000  000077501210
   (  384)  000000720000  000000000022  000663620000  000000006410  003522720000  000000000074  000004150000  000000000000
   (  432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  002335070000  000000361537
   (  528)  000000060000  000077501210  000001220000  000000000023  000665610000  000000006410  003522720000  000000000124
   (  576)  000004160000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  672)  002151110000  000000361537  000000060000  000077501210  000001520000  000000000024  000664620000  000000006410
   (  720)  003522720000  000000000154  000004170000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  816)  000000000000  000000000000  001763750000  000000361537  000000060000  000077547324  000002020000  000000000025
   (  864)  000663620000  000000006410  003522720000  000000000204  000004200000  000000000000  000000000000  000000000000
   (  912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1      RECORD   2      LENGTH   180  BYTES
   (    0)  000000270000  000000000000  000000000000  000000000000  000000000000  000000000000  000001440000  000000000060
   (   48)  000001560000  000000000042  000001450000  000000000060  000001600000  000000000045  000000000000  000000000000
   (   96)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1      RECORD  1101    LENGTH  1116 BYTES
   (    0)  000006160000  000000000006  002503300000  000000000355  000001640000  000000000000  000000030000  000000007736
   (   48)  000000630000  000000000006  000000000000  000000000010  000002100000  000000001574  000114210000  000000000705
   (   96)  000000000000  000000000073  000000010000  000000000001  000000010000  000000000000  000000000000  000000000000
   (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  192)  000000000000  000000000000  002303360000  000000364330  000000060000  000077663552  002502170000  000000000325
   (  240)  000664620000  000000006410  003424060000  000000250221  000007200000  000000000000  000000000000  000000000000
   (  288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  336)  000000000000  000000000000  000000000000  000000000000  002043440000  000000364330  000000060000  000077663552
   (  384)  002502470000  000000000326  000663620000  000000006410  003424060000  000000250251  000007210000  000000000000
   (  432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  001602330000  000000364330
   (  528)  000000060000  000077663552  002502770000  000000000327  000663620000  000000006410  003424060000  000000250301
   (  576)  000007220000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  672)  001341230000  000000364330  000000060000  000077663552  002503270000  000000000330  000663620000  000000006410
   (  720)  003424060000  000000250331  000007230000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  816)  000000000000  000000000000  001100130000  000000364330  000000060000  000077663552  002503570000  000000000331
   (  864)  000664620000  000000006410  003424060000  000000250361  000007240000  000000000000  000000000000  000000000000
   (  912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  960)  000000000000  000000000000  000000000000  000000000000  000640200000  000000364330  000000060000  000077731665
   ( 1008)  002504070000  000000000331  000663620000  000000006410  003424060000  000000250411  000007250000  000000000000
   ( 1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   ( 1104)  000000000000  000000000000
  FILE  1      RECORD  1102    LENGTH   180  BYTES
   (    0)  000001640000  000000000000  000000000000  000000000000  000000000000  000000000000  000000650000  000000000051
   (   48)  000000720000  000000000032  000000670000  000000000050  000001040000  000000000036  000000000000  000000000000
   (   96)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
   (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
 FILE    1      # OF DATA RECORDS    1102     # SUCCESSFUL READS   1104
```

D-23863
4/27/73 - 5/18/73

```
$JOB  13:59:19
$ASS IN MS6
$NOP ******************** OCTAL DUMP OF  X-407 ************************
$AVF IN 3
$EXE DPOCT7 BS
 INPUT TAPE ON MS6
 DATA INPUT    1 2 2
  FILE  1      RECORD   1      LENGTH   1272 BYTES
  (    0)  000000020000  000000000007  000000300000  000000000364  000001650000  000000000000  000000030000  000000010761
  (   48)  000000630000  000000000006  000000000000  000000000010  000001570000  000000000523  000134210000  000000000705
  (   96)  000000000000  000000000073  000000010000  000000000001  000000010000  000000000000  000000000000  000000000000
  (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  192)  000000770000  000000000077  777543600000  000077754360  777777770000  000077754360  000000000000  000077777777
  (  240)  777760300000  000077776030  777760300000  000000000000  777777770000  000000000000  000000000000  000000000000
  (  288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  336)  000000000000  000000000000  000000000000  000000000000  002576200000  000000364330  000000060000  000077731665
  (  384)  000000270000  000000000337  000664620000  000000006410  003424060000  000000000031  000007320000  000000000000
  (  432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  002336250000  000000364330
  (  528)  000000060000  000077731665  000000570000  000000000340  000663620000  000000006410  003424060000  000000000061
  (  576)  000007330000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  672)  002075150000  000000364330  000000060000  000077663552  000001070000  000000000341  000663620000  000000006410
  (  720)  003424060000  000000000111  000007340000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  816)  000000000000  000000000000  001634040000  000000364330  000000060000  000077663552  000001370000  000000000342
  (  864)  000663620000  000000006410  003424060000  000000000141  000007350000  000000000000  000000000000  000000000000
  (  912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  960)  000000000000  000000000000  000000000000  000000000000  001372740000  000000364330  000000060000  000077663552
  ( 1008)  000001670000  000000000343  000663620000  000000006410  003424060000  000000000171  000007360000  000000000000
  (1056)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (1104)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  001133010000  000000364330
  (1152)  000000060000  000077663552  000002170000  000000000344  000663620000  000000006410  003424060000  000000000221
  (1200)  000007370000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (1248)  000000000000  000000000000  000000000000  000000000000
  FILE  1      RECORD   2      LENGTH   180  BYTES
  (    0)  000000660000  000000000000  000000000000  000000000000  000000000000  000000000000  000000700000  000000000033
  (   48)  000001450000  000000000030  000000700000  000000000034  000001460000  000000000034  000000000000  000000000000
  (   96)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1      RECORD  1083    LENGTH   960  BYTES
  (    0)  000006240000  000000000005  002502330000  000000001267  000001650000  000000000000  000000030000  000000006417
  (   48)  000000520000  000000000006  000000000000  000000000010  000001640000  000000000701  000126210000  000000000705
  (   96)  000000000000  000000000073  000000010000  000000000001  000000010000  000000000000  000000000000  000000000000
  (  144)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  192)  000000000000  000000000000  000032660000  000000364333  000000060000  000000114226  002503120000  000000001244
  (  240)  000663620000  000000006410  003424060000  000000250314  000016370000  000000000000  000000000000  000000000000
  (  288)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  336)  000000000000  000000000000  000000000000  000000000000  003435220000  000000364333  000000060000  000000114226
  (  384)  002503420000  000000001245  000663620000  000000006410  003424060000  000000250344  000016400000  000000000000
  (  432)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  480)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  003175300000  000000364333
  (  528)  000000060000  000000114226  002503720000  000000001246  000664620000  000000006410  003424060000  000000250374
  (  576)  000016410000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  624)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  672)  002734170000  000000364333  000000060000  000000114226  002504220000  000000001247  000664620000  000000006410
  (  720)  003424060000  000000250424  000016420000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  768)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (  816)  000000000000  000000000000  002473070000  000000364333  000000060000  000000114226  002504520000  000000001250
  (  864)  000663620000  000000006410  003424060000  000000250454  000016430000  000000000000  000000000000  000000000000
  (  912)  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE  1      RECORD  1084    LENGTH   180  BYTES
  (    0)  000000600000  000000000000  000000000000  000000000000  000000000000  000000000000  000000720000  000000000041
  (   48)  000001440000  000000000027  000000720000  000000000042  000001440000  000000000033  000000000000  000000000000
```

```
INPUT TAPE ON MS6
DATA INPUT     1 2 2
  FILE   1      RECORD    1       LENGTH    1116 BYTES
  (      0)   000000020000  000000000006  000001500000  000000000776  000002120000  000000000000  000000030000  000000013461
  (     48)   000000630000  000000000004  000000000000  000000000010  000003320000  000000000313  000124210000  000000000705
  (     96)   000000000000  000000000072  000000010000  000000000001  000000010000  000000000000  000000000000  000000000000
  (    144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    192)   000000000000  000000000000  000027140000  000000364222  000000060000  000077501210  000004440000  000000000666
  (    240)   000664620000  000000006410  003135640000  000000000455  000006720000  000000000000  000000000000  000000000000
  (    288)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000

01305160000  000000364222
  (    528)   000000060000  000077501210  000007440000  000000000675  000663620000  000000006410  003135640000  000000000755
  (    576)   000007020000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    624)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    672)   000112350000  000000364222  000000060000  000077501210  000011040000  000000000701  000663620000  000000006410
  (    720)   003135640000  000000001115  000007050000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    768)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    816)   000000000000  000000000000  002562020000  000000364222  000000060000  000077547324  000012440000  000000000705
  (    864)   000663620000  000000006410  003135640000  000000001255  000007110000  000000000000  000000000000  000000000000
  (    912)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    960)   000000000000  000000000000  000000000000  000000000000  001370370000  000000364222  000000060000  000077501210
  (   1008)   000014040000  000000000710  000664620000  000000006410  003135640000  000000001415  000007150000  000000000000
  (   1056)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (   1104)   000000000000  000000000000
  FILE   1      RECORD    2       LENGTH    180  BYTES
  (      0)   000001070000  000000000000  000000000000  000000000000  000000000000  000000000000  000001160000  000000000000
  (     48)   000001140000  000000000033  000001210000  000000000003  000001160000  000000000042  000000000000  000000000000
  (     96)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE   1      RECORD    411     LENGTH    960  BYTES
  (      0)   000002510000  000000000005  002501550000  000000000367  000002120000  000000000000  000000030000  000000035170
  (     48)   000000630000  000000000006  000000000000  000000000010  000003370000  000000000523  000172210000  000000000705
  (     96)   000000000000  000000000072  000000010000  000000000001  000000010000  000000000000  000000000000  000000000000
  (    144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    192)   000000000000  000000000000  001416360000  000000364175  000000060000  000000000000  002501540000  000000000342
  (    240)   000663620000  000000006410  003135640000  000000250156  000007350000  000000000000  000000000000  000000000000
  (    288)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    336)   000000000000  000000000000  000000000000  000000000000  001160770000  000000364175  000000060000  000077663552
  (    384)   002502040000  000000000343  000663620000  000000006410  003135640000  000000250206  000007360000  000000000000
  (    432)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    480)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000722230000  000000364175
  (    528)   000000060000  000077731665  002502340000  000000000343  000664620000  000000006410  003135640000  000000250236
  (    576)   000007370000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    624)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    672)   000464650000  000000364175  000000060000  000000000000  002502640000  000000000344  000664620000  000000006410
  (    720)   003135640000  000000250266  000007370000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    768)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    816)   000000000000  000000000000  000226110000  000000364175  000000060000  000077731665  002503140000  000000000345
  (    864)   000663620000  000000006410  003135640000  000000250316  000007400000  000000000000  000000000000  000000000000
  (    912)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  FILE   1      RECORD    412     LENGTH    180  BYTES
  (      0)   000000260000  000000000001  000000000000  000000000000  000000000000  000000000000  000001120000  000000000000
  (     48)   000001100000  000000000073  000001140000  000000000003  000001150000  000000000076  000000000000  000000000000
  (     96)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
  (    144)   000000000000  000000000000  000000000000  000000000000  000000000000  000000000000
FILE    1       # OF DATA RECORDS    412      # SUCCESSFUL READS   414
        # PERMANENT READ ERRORS    0        # ZERO BYTE ERRORS   0        # SHORT RECORDS    0        # UNDEFINED ERRORS   0
           # OF RECORDS RETRIED    0        TOTAL # OF RETRIES   0


$$
$NOTE EOJ    14:06:58
```