

#317

PIONEER 10

CHARGED PARTICLE

PULSE HEIGHT ANALYSIS & 5 MIN. AVG. COUNT RATES

72-012A-02B & 02C

6 TAPES

4 TAPES

Table of Contents

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

1. INTRODUCTION:

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

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

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

2. ERRATA/CHANGE LOG:

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

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

Version	Date	Person	Page	Description of Change
01				
02				

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

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

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

4. CATALOG MATERIALS:

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

- b. Core Catalog Materials

PIONEER 10

PULSE HEIGHT ANALYSIS DATA, TAPES

72-012A-02B

PSFP-00081

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 45 7-TRACK, 800 BPI TAPES, NINE 9-TRACK, 1600 BPI TAPES, AND 12 9-TRACK, 6250 BPI TAPES, ALL WRITTEN IN BINARY. THERE ARE 19 RESTORED TAPES. THE 7-TRACK TAPES WERE REPACKED AND THE 9-TRACK TAPES WERE NOT. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE FOLLOWING TAPES WERE UNABLE TO BE COPIED; D078982, 83, AND D079801. THE TAPES ARE NOT IN TIME SEQUENTIAL ORDER. 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#	D#	FILES	TIME SPAN
DR002839	DS002839	D017169	1	03/03/72 - 03/21/72
		D017170	2	03/22/72 - 04/27/72
		D017289	3	04/28/72 - 05/25/72
		D017171	4	05/28/72 - 06/03/72
		D017172	5	06/05/72 - 06/09/72
		D017173	6	06/10/72 - 06/17/72
DR002840	DS002840	D017174	1	06/17/72 - 06/22/72
		D028776	2	11/05/73 - 11/28/73
		D031865	3	08/16/75 - 10/19/75
DR002841	DS002841	D017175	1	06/23/72 - 07/14/72
		D017285	2	07/15/72 - 07/19/72
		D017286	3	07/20/72 - 07/27/72
		D017176	4	07/28/72 - 08/06/72
		D017177	5	08/07/72 - 08/19/72
DR002877	DS002877	D017284	1	09/04/72 - 09/11/72
		D017288	2	09/12/72 - 10/18/72
		D017179	3	10/19/72 - 12/01/72
		D017287	4	12/02/72 - 12/31/72
		D028769	5	01/01/73 - 02/26/73
		D028768	6	02/28/73 - 04/11/73

72-012A-02B

DR#	DS#	D#	FILES	TIME SPAN
DR002878	DS002878	D028766	1	04/11/73 - 05/04/73
		D028767	2	05/05/73 - 05/17/73
		D028771	3	05/19/73 - 06/13/73
		D028770	4	06/14/73 - 07/22/73
		D028772	5	07/22/73 - 08/21/73
		D028773	6	08/23/72 - 09/17/73
		D028774	7	09/17/73 - 10/04/73
		D028775	8	10/04/73 - 10/18/73
DR002879	DS002879	D028777	1	11/29/73 - 12/19/73
		D028778	2	12/19/73 - 12/31/73
		D031059	3	12/31/73 - 03/09/74
		D031058	4	03/09/74 - 04/28/74
		D031057	5	04/28/74 - 06/05/74
		D031056	6	06/05/74 - 06/18/74
DR002880	DS002880	D031054	1	06/19/74 - 07/28/74
		D031055	2	07/29/74 - 09/23/74
		D017178	3	08/20/72 - 09/03/72
		D031051	4	09/23/72 - 10/10/74
		D031053	5	10/11/74 - 11/22/74
		D031864	6	06/08/75 - 08/16/75
DR002881	DS002881	D031052	1	11/23/74 - 12/30/74
		D031861	2	01/01/75 - 03/26/75
		D031862	3	03/26/75 - 04/26/75
		D031863	4	04/26/75 - 06/07/75
DR002882	DS002882	D031866	1	10/20/75 - 12/31/75
		D047655	2	12/31/75 - 12/31/76
		D053823	3	12/31/76 - 06/18/77
DR002883	DS002883	D053824	1	06/18/77 - 12/31/77
		D053825	2	01/01/78 - 08/03/78
		D053826	3	08/03/78 - 12/30/78
DR002884	DS002884	D053827	1	01/01/79 - 12/31/79
		D058737	2	12/02/80 - 12/31/80
		D073384	3	12/31/80 - 12/31/81
DR002885	DS002885	D058736	1	12/31/79 - 12/02/80
		D073385	2	01/01/82 - 12/30/82
DR002886	DS002886	D073386	1	01/01/83 - 12/31/83
DR002887	DS002887	D074059	1	12/31/83 - 12/31/84
		D076251	2	12/31/84 - 12/31/85
DR003962	DS003962	D082579	1	12/31/88 - 12/31/89
DR005591	DS005591	D086238	1	01/01/90 - 12/31/90
DR005592	DS005592	D100503	1	12/31/90 - 12/31/91

72-012A-02B

DR#	DS#	D#	FILES	TIME SPAN
DR006041	DS006041	D107834	1	01/01/92 - 09/02/92
DR006042	DS006042	D107835	1	02/02/93 - 12/02/93

PIONEER 10

5-MIN AVG COUNT RATE TAPES

72-012A-02C PSFP-00045

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 33 TAPES, 16 WERE 7-TRACK, 800 BPI, SEVEN WERE 9-TRACK, 1600 BPI, AND TEN WERE 9-TRACK , 6250 BPI TAPES, WRITTEN IN BINARY. THERE ARE SEVEN RESTORED TAPES. THE TAPE D079802 IS WAITING ON A RELACEMENT. 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
DR002626	DS002626	D017418	1	03/03/72 - 05/26/72 (a)
		D017420	2	05/28/72 - 07/22/72 (b)
		D017419	3	07/23/72 - 10/18/72 (a)
		D017417	4	10/19/72 - 12/31/72 (a)
		D028793	5	01/01/73 - 04/19/73 (a)
		D028792	6	04/19/73 - 05/09/73 (a)
		D028796	7	05/09/73 - 05/15/73 (a)
		D028795	8	08/22/73 - 12/06/73 (a)
		D028794	9	12/06/73 - 04/20/74 (a)
DR002627	DS002627	D031048	1	12/06/73 - 04/19/74 (a)
		D031050	2	04/20/74 - 07/21/74 (a)
		D031047	3	07/22/74 - 11/01/74
		D031049	4	11/01/74 - 12/31/74 (a)
		D031858	5	01/01/75 - 04/25/75
		D031859	6	04/26/75 - 08/12/75
		D031860	7	08/13/75 - 12/31/75
DR002628	DS002628	D047656	1	01/01/76 - 12/31/76
		D053828	2	01/01/77 - 12/31/77
		D053829	3	01/01/78 - 08/02/78
		D053830	4	08/03/78 - 12/31/78
		D053831	5	01/02/79 - 12/31/79
		D058738	6	01/01/80 - 12/31/81

72-012A-02C

DR#	DS#	DD#	FILES	TIME SPAN
DR002629	DS002629	D073387	1	01/31/81 - 12/31/83
		D074060	2	12/31/83 - 12/31/84
DR002630	DS002630	D076252	1	01/31/85 - 12/31/85
		D078984	2	01/01/86 - 12/31/86
		D078985	3	01/01/87 - 12/31/87
DR003964	DS003964	D082580	1	01/01/89 - 12/30/89
		D086239	2	01/01/90 - 12/31/90
DR006045	DS006045	D100504	1	01/01/90 - 12/31/91
		D107836	2	12/31/91 - 09/01/92
		D107837	3	01/01/93 - 12/11/93

- (a) THE FIRST RECORD WAS REMOVED
(b) THE FIRST TWO RECORDS WERE REMOVED

Not for dist.

REQ. AGENT
CMT
PAR
WKD
DEW
DHG

RAND NO.
RC2742

RC7196

JHK
DVR
NJS

PIONEER 10

CHARGED PARTICLE PULSE HEIGHT ANALYSIS & 5 MIN. AVG. COUNT RATES

72-012A-02B & 72-012A-02C

This data set consists of 57 Pulse Height Analysis (02B) and 24 5 Minute Avg. Count Rate (02C) data tapes. The tapes, unless specified otherwise, are 7 track, 800 bpi, binary, single-filed. They were created at the University of Chicago on an XDS 930 computer.

The Pulse Height tapes contain data records between 150 and 1020 (24 bit) words long and header records of 120 words for every 15 minutes of real data. The header records are made up of 60 XDS double-precision floating point words. This double-precision word is described on page 138 of the format. The data records are written in fixed point format which is described on Page 137.

The Count Rate tapes contain data records of 480 double-precision floating point words. Each physical record consists of 6 logical records. The 'D' and 'C' numbers and time spans for the tapes are as follows:

PULSE HEIGHT DATA 72-012A-02B

<u>D#</u>	<u>C#</u>	<u>TIME SPAN</u>
D-17169	C-16827	03/03/72 - 03/21/72
D-17170	C-16828	03/22/72 - 04/27/72
D-17289	C-16842	04/28/72 - 05/26/72
D-17171	C-16829	05/28/72 - 06/04/72

PULSE HEIGHT DATA 72-012A-02B (cont')

<u>D#</u>	<u>C#</u>	<u>TIME SPAN</u>
D-17172	C-16830	06/05/72 - 06/09/72
D-17173	C-17121	06/10/72 - 06/16/72
D-17174	C-16831	06/17/72 - 06/22/72
D-17175	C-16832	06/23/72 - 07/14/72
D-17177	C-16834	08/07/72 - 08/19/72
D-17285	C-16838	07/15/72 - 07/19/72
D-17286	C-16839	07/20/72 - 07/27/72
D-17176	C-16833	07/28/72 - 08/06/72
D-17177	C-16834	08/07/72 - 08/19/72
D-17178	C-16835	08/20/72 - 09/03/72
D-17284	C-16837	09/04/72 - 09/11/72
D-17288	C-16841	09/12/72 - 10/18/72
D-17179	C-16836	10/19/72 - 12/01/72
D-17287	C-16840	12/02/72 - 12/31/72
D-28769	C-18688	01/01/73 - 02/27/73
D-28768	C-18687	02/28/73 - 04/10/73
D-28766	C-18685	04/11/73 - 05/04/73
D-28767	C-18686	05/05/73 - 05/18/73
D-28771	C-18690	05/19/73 - 06/13/73
D-28770	C-18689	06/14/73 - 07/21/73
D-28772	C-18691	07/22/73 - 08/22/73
D-28773	C-18692	08/23/73 - 09/16/73
D-28774	C-18693	09/17/73 - 10/03/73
D-28775	C-18694	10/04/73 - 11/04/73
D-28776	C-18695	11/05/73 - 11/28/73

PULSE HEIGHT DATA 72-012A-02B (cont')

<u>D#</u>	<u>C#</u>	<u>TIME SPAN</u>
D-28777	C-18696	11/29/73 - 12/18/73
D-28778	C-18697	12/19/73 - 12/31/73
D-31059	C-20553	01/01/74 - 03/09/74
D-31058	C-20552	03/10/74 - 04/27/74
D-31057	C-20551	04/28/74 - 06/05/74
D-31056	C-20550	06/06/74 - 06/18/74
D-31054	C-20548	06/19/74 - 07/28/74
D-31055	C-20549	07/29/74 - 08/14/74
D-31051	C-20545	09/24/74 - 10/11/74
D-31053	C-20547	10/12/74 - 11/22/74
D-31052	C-20546	11/23/74 - 12/31/74
D-31861	C-20498	01/01/75 - 03/26/75
D-31862	C-20499	03/27/75 - 04/25/75
D-31863	C-20500	04/26/75 - 06/08/75
D-31864	C-20501	06/09/75 - 08/15/75
D-31865	C-20502	08/16/75 - 10/19/75
D-31866	C-20503	10/20/75 - 12/31/75
D-47655*	C-22341*	01/01/76 - 12/31/76
D-53823*	C-22856*	01/01/77 - 06/18/77
D-53824*	C-22857*	06/18/77 - 12/31/77
D-53825*	C-22858*	01/01/78 - 08/03/78
D-53826*	C-22859*	08/03/78 - 12/31/78
D-53827*	C-22860*	01/02/79 - 12/31/79
D-58736*	C-23207*	01/01/80 - 12/01/80
D-58737*	C-23208*	12/02/80 - 12/31/80

PULSE HEIGHT DATA 72-012A-02B (cont')

<u>D#</u>	<u>C#</u>	<u>TIME SPAN</u>
D-73384**	C-26765**	01/01/81 - 01/01/82
D-73385**	C-26766**	01/02/82 - 01/01/83
D-73386**	C-26767**	01/02/83 - 01/01/84
D-74059**	C-26768**	01/02/84 - 01/01/85
D-76251**	C-26637**	01/01/85 - 12/31/85

*These tapes are 9-track, 1600 bpi

**These tapes are 9-track, 6250 bpi

COUNT RATE DATA 72-012A-02C

<u>D#</u>	<u>C#</u>	<u>TIME SPAN</u>
D-17418	C-16844	03/03/72 - 05/26/72
D-28792	C-18717	04/20/72 - 05/09/72
D-17420	C-16846	05/28/72 - 07/22/72
D-17419	C-16845	07/23/72 - 10/18/72
D-17417	C-16843	10/19/72 - 12/31/72
D-28793	C-18718	01/01/73 - 04/19/73
D-28796	C-18721	05/09/73 - 05/15/73
D-28795	C-18720	08/23/73 - 12/06/73
D-28794	C-18719	12/06/73 - 04/20/74
D-31048	C-20542	12/06/73 - 04/19/74
D-31050	C-20544	04/20/74 - 07/21/74
D-31047	C-20541	07/22/74 - 11/01/74
D-31049	C-20543	11/01/74 - 12/31/74
D-31858	C-20504	01/01/75 - 04/25/75
D-31859	C-20505	04/26/75 - 08/12/75
D-31860	C-20506	08/13/75 - 12/31/75
D-47656*	C-22342*	01/01/76 - 12/31/76
D-53828*	C-22861*	01/01/77 - 12/31/77
D-53829*	C-22862*	01/01/78 - 08/02/78
D-53830*	C-22863*	08/03/78 - 12/31/78
D-53831*	C-22864*	01/02/79 - 12/31/79
D-58738*	C-23309*	01/01/80 - 12/31/80
D-73387**	C-26769**	01/01/81 - 12/31/83
D-74060**	C-26770**	12/31/83 - 12/31/84
D-76252**	C-26638**	01/01/85 - 12/31/85

*These tapes are 9-track, 1600 bpi

**These tapes are 9-track, 6250 bpi

STATE TAPES: (02C)

YEAR IS THE FIRST FOUR DIGITS OF THE OCTAL DUMP.
SPACECRAFT ID IS SECOND FOUR DIGITS

START TIME WORDS ARE 9 AND 10 TOGETHER (SOMETIMES YOU MUST USE THE SECOND WORD)
A WORD = 8 OCTAL CHARACTERS (24 BITS)

STOP TIME WORDS ARE 11 AND 12 (LAST RECORD) TOGETHER.

TIMES ARE IN "XDS" 48 BIT FLOATING POINT FORMAT
USE "XDS" PROGRAM.

TIMES ARE IN DECIMAL SECONDS OF YEAR.
TO GET DAY OF YEAR, DIVIDE BY 86400

REMEMBER THAT IF THERE IS ANYTHING AFTER THE DECIMAL, ADD 1 DAY.

EXAMPLE: 24.531 = DAY 25

PULSE HEIGHT TAPES (02B)

USE PROGRAM "PULSE_HEIGHT" YOU MUST USE THE HEADER RECORD TO FIND 1ST
ID LAST DATE.

START TIME IS WORD 4 FIRST RECORD (SOMETIMES IT IS WORD 5)
STOP TIME IS WORD 5 LAST RECORD

WORDS ARE 16 OCTAL CHARACTERS (48 BITS)
WORDS ARE IN "XDS" 48 BIT FLOATING POINT FORMAT

TIMES ARE LISTED IN DAY SINCE JAN 1, 1972
(1/1/90 = DAY 6575) WHICH MEANS ADD ONE DAY

USE "XDS" PROGRAM TO TRANSLATE OCTAL WORDS.

II.

PRELIMINARY DOCUMENTATION

University of Chicago Charged Particle Instruments

of

Pioneer 10/11 Spacecraft

Pulse Height Tape Format

72-012A-02B

1 August 1974

GENERAL

This section supplies the minimum format and functional-specifications information to allow the user to read the University of Chicago Pioneer 10/11 Pulse Height tapes. These tapes contain all of the Pulse Height information from the Charged Particle Instrument (CPI) for the mission in a form easily accessible to a FORTRAN-language program. Individual pulse height frames are not time-tagged but are tabulated in blocks corresponding to 15 minutes of real-time at the spacecraft (spacecraft time).. Additional bookkeeping, housekeeping and supporting instrument data are supplied to allow for general use of the pulse height information.

The general tape structure is shown in Figure II-1. All non-zero pulse height frames occurring within the bounds of a 15-minute period of real-time are tabulated as triads of numbers corresponding to the pulse heights measured in the three analyzed detectors of the UC-CPI.⁽¹⁾

The header block supplied at the beginning of each 15-minute block of data contains bookkeeping information (start and stop times of the data, instrument status, seconds of main frame and subcommutated (subcom) data actually received in the 15-minute block), housekeeping data including the initial bit rate, mode and format of the spacecraft during the 15-minute reporting period, and supporting instrument information in the form of selected rate data. The counting rates presented in the data block header records are extracted from the UC-CPI Rate Tapes. See Section IV for a discussion of the design of the logic and of the rate scalers in the instrument, Section III for a description of the basic rate-calculation algorithms and the Appendix, Section V-2 for the method of extracting and averaging the rates for inclusion in the PHA tapes. It is important to note that if a change in spacecraft or instrument mode occurs during a 15-minute recording period, the time block will be prematurely terminated at the time of the mode or status change and one (or more) additional blocks of less than 15 minutes, ending at the predetermined termination point of the original 15 minute block, will be generated with flags set for the changed mode(s).

⁽¹⁾ The detectors D1, D2 and D5 are pulse height analyzed in the UC-CPI. The range of each analysis is 0-128. The triad of pulse heights are accompanied by a range identification flag (ID), a data quality indicator bit and the octant of spacecraft revolution in which the event presented was analyzed. See the UC-CPI Instrument Description and Pioneer 10/11 Spacecraft Description for further details.

One or more data records of variable length containing all of the non-zero pulse height analyzed (PHA) events occurring during the 15 minute period specified in the previous header then follow.⁽²⁾ With the main telescope (main telescope) and subcommutated (low energy telescope-LET) PHA data are extracted and reformatted into the data blocks. Only LET data with channel numbers between zero and twenty-seven are copied. In-flight calibrator data are excluded from the pulse height tape.

PULSE HEIGHT TAPE HEADER CONTENT

This section describes the content of the header record which precedes that data record(s) containing the data for the 15 minute span of real time. This header record is made up of sixty XDS double-precision floating point (double) words. The description of the floating point format is given as Appendix V-1. It is important to note that the quoted 15 minute intervals are nominal. That is, any 15 minute interval in which there was no appreciable quantity of data lost by transmission, or any significant instrument or spacecraft change will be 15 minutes in length starting within two frame times of the even hour, 15 minutes after the hour, 30 minutes after, etc. Clearly, if the spacecraft transmission was lost in the middle of a nominal 15 minute accumulation period and was not reattained until some number of 15 minute intervals later, the interval during which loss of transmission took place would be truncated at the time of the last recoverable pulse height returned to earth and the next 15 minute interval would show a start time after some lapse of time. The "15 minute" period following a data gap will, of course, start at an arbitrary time within some nominal 15 minute interval. The interval will, however, end at an "even" quarter-hour boundary. Similarly, as described earlier, if a spacecraft or instrument status change takes place in the middle of a nominal 15 minute interval that interval will be terminated prematurely as if a data gap had been encountered and a new header/data block would be supplied beginning at the time that the status change was first noted, with the new status in the header record, and would finish out the nominal 15 minute period started earlier (unless another instrument or spacecraft status change occurs in the same interval in which case the interval would be interrupted, etc.).

Table II-1 described the content of each floating-point word in the header record.

⁽²⁾ A "zero pulse height event" is defined to be an event wherein all three detectors, the ID and the sector are transmitted as zero, i.e. no event was seen within that readout time.

DATA RECORD FORMAT

A variable number of physical records of variable length, containing the pulse height data will be found after each header (Fig. II-1). The number of such records to be found in the data block is indicated in the header record for that data block. The total number of words in each record of the data block is indicated in the second 24-bit word of the data record (Figure II-2). If more than one physical record (say, N) occurs in the data block, the first $N-1$ such records will have 1020, 24-bit words in them (a 2 word record header and 509 main or LET work pairs containing data). The last record will be of a variable length with a minimum length of 150, 24-bit words and a maximum of 1020. This last record will be padded out with words containing garbage to the nearest multiple of 3, 24-bit words which gives a total record length greater than or equal to 150, 24-bit words. This is done in order to make the tapes compatible with the Univac 1108, 36-bit word record format. It is therefore necessary to use the event count (word 2 of the record) at all times to determine the end-of-logical-record.

The first word of each physical data record contains the number of the physical data record within the current 15-minute data block. The records are numbered starting with 1 after each header. The second word contains the number of data word pairs in the record and will be a number between 1 and 509.

Each pulse height event in the 15 minute interval is presented sequentially in pairs of 24-bit words beginning with the words 3 and 4 of the record. A main telescope word-pair is differentiated from a LET word-pair by bit 0 of the first word of the pair (which is 0 for LET, 1 for the main telescope). The format of the data within the word pair is given in Figure II-3. Table II-2 gives a description of the abbreviations used in Figure II-3.

FIGURES

- Figure II-1. Pulse Height Tape Structure. Each block represents
a physical record,40
- Figure II-2. Pulse Height Tape Data record format41
- Figure II-3. Pulse Height Tape Data Word Content.42
- Figure II-4. Relation of Spacecraft Z-axis and Start of
Sector Zero to the Sun-Probe Line Projected
on the Ecliptic (Euler Angles)43

FIGURE II-1

Pioneer 10

Pulse Height Tape Structure

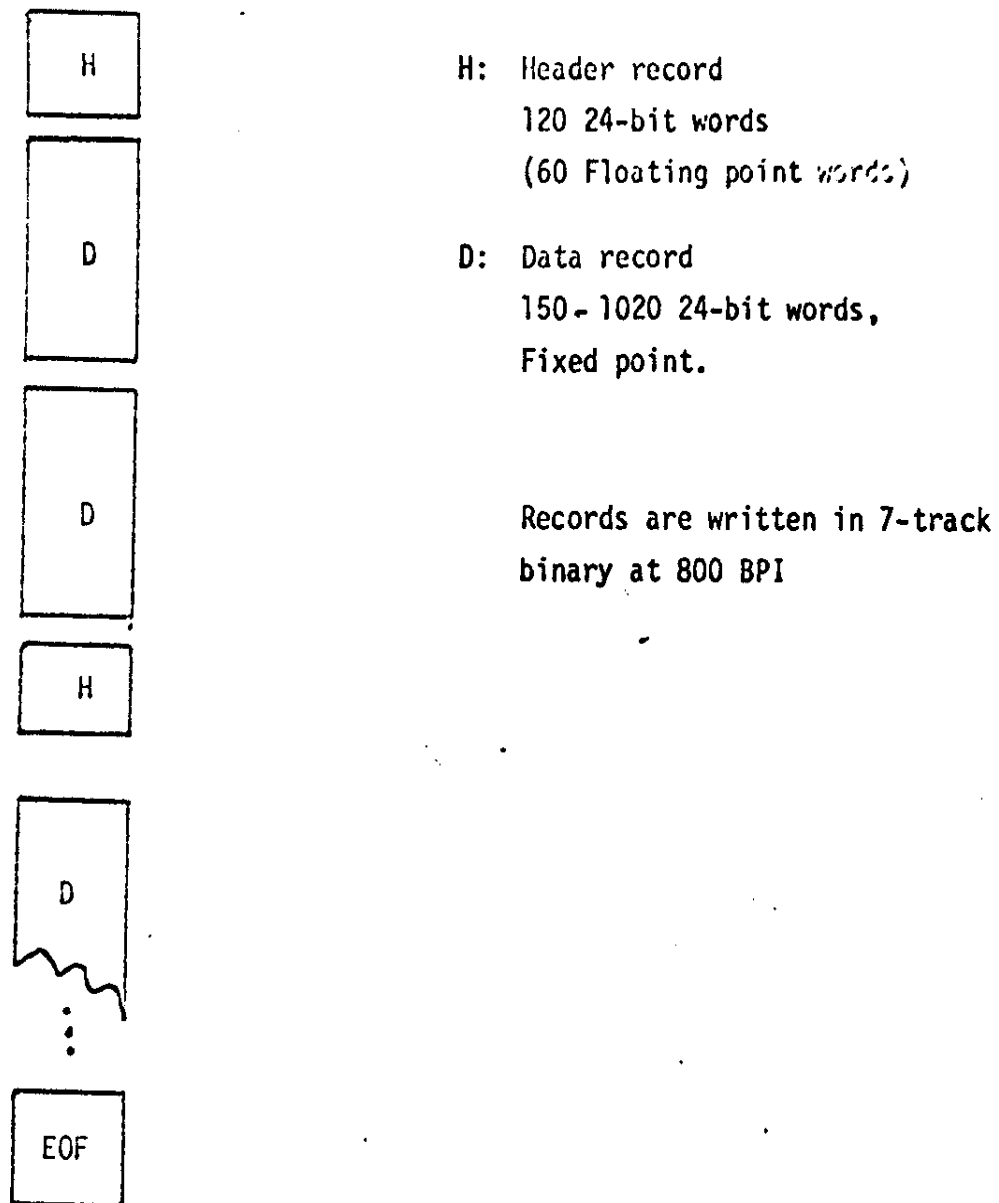
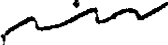


FIGURE 11-2

Pioneer 10/11
Pulse Height Tape
Data Record Format

Word 1
2

⋮

N
N+1

ZEROS
ZEROS

WORD 1 contains the physical record number of the data record in the data block (starting from 1 after the header).

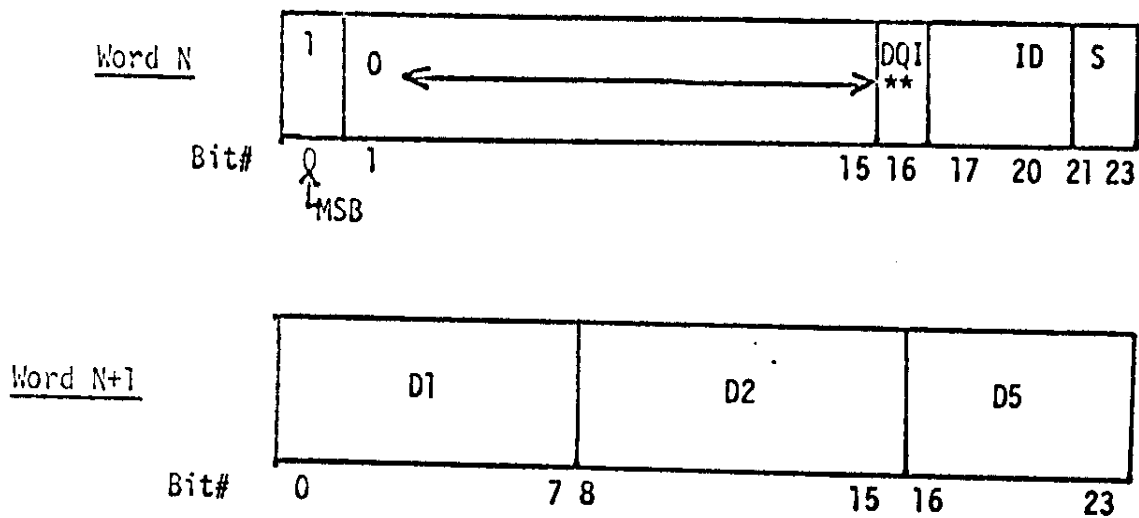
WORD 2 contains the number of word pairs in this record.

Words N, N+1 are the Word Pair.
 $1 \leq N \leq 509$

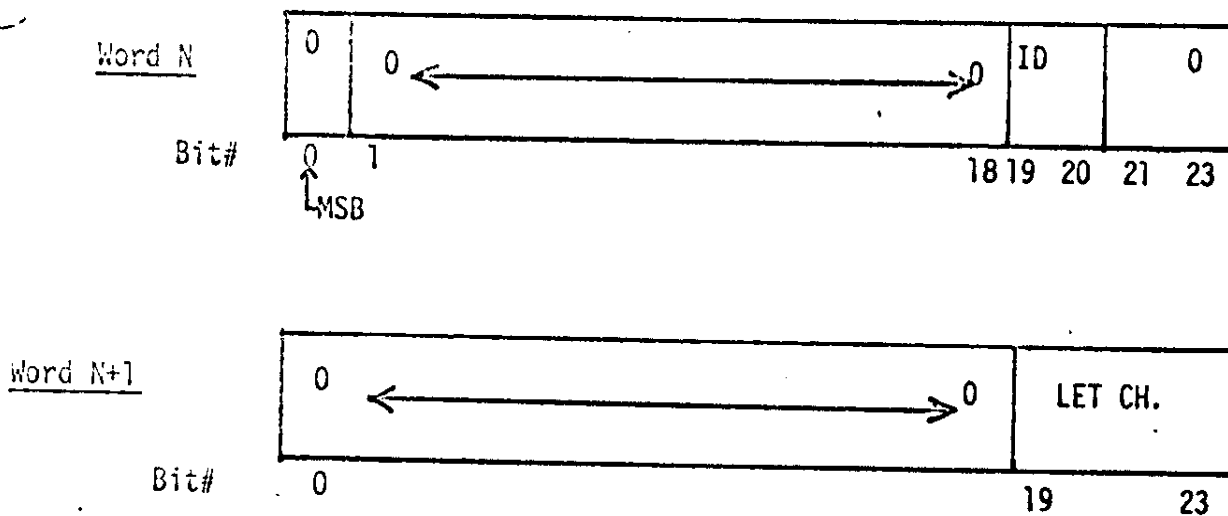
If the record is not filled with word pairs, the remaining words are filled with garbage (see text).

FIGURE 11-3

Pioneer 10/11
Pulse Height Data Word Format*



A. Main Telescope Word Pair



B. LET Word Pair

*See Table II-2 for explanation of terms.

**The DQI (data quality indicator) does not appear (is always zero) on Pioneer 10 pulse height tapes for 1972 through day 172 of 1973. (See Table II-2.) It does appear on all Pioneer 11 tapes and on all subsequent Pioneer 10 tapes.

Figure II-4

Relation of Spacecraft Z-axis and
Start of Sector Zero to the Sun-Probe
Line Projected on the Ecliptic (Euler Angles)

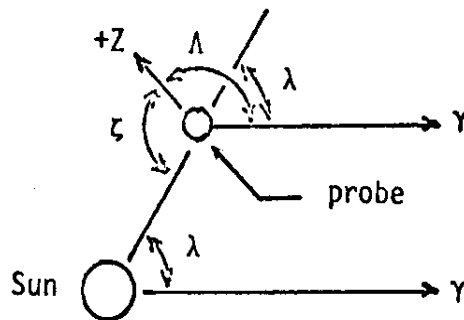
θ Celestial latitude of point on the celestial sphere intersected by +Z axis.

ζ Angle between the +Z axis and the sun-probe line, projected onto an axis parallel to the ecliptic. Computed as follows:

If λ = celestial longitude of probe in heliocentric system (from trajectory tape)

and Λ = celestial longitude of point on the celestial sphere intersected by +Z axis.

then



ω Angle between plane parallel to ecliptic and location of telescope axis at start of sector 0 in spin plane of probe when SPGR = 0° and 180° , respectively, and sun sensor is used. Positive in direction of roll.

$$\omega = \text{MOD}_{360} (\text{CKAH} + \text{SPGR} - 7.1^\circ)$$

When the star sensor is used, to an accuracy of $\pm 1^\circ$, $\omega = -7^\circ$ at all times.

TABLES

TABLE II-1	University of Chicago Charged Particle Instrument Pioneer 10/11 Pulse Height Tape Header-Record Format. . .	45-47
TABLE II-2	University of Chicago Charged Particle Instrument Pioneer 10/11 Description of Data Block Word-Pair Parameters.	48

TABLE II-1

University of Chicago Charged Particle Instrument
Pioneer 10/11
Pulse Height Tape Header-Record Format

HEADER WORD ¹	DESCRIPTION
1	-1
2	Requested (Nominal) interval start time in days and fractions beginning on 1 January 1972 (that is, 0000 on 1 January 1972 = 0.000...).
3	Requested (Nominal) interval end-time in days and fractions of days of 1972.
4	Actual start time in days and fractions of days of 1972.
5	Actual end time in days and fractions of days of 1972.
6	F/T ratio where: F=number of main telescope pulse height main frames with the data quality bit set to 1 (bad data) T=total main frames of pulse height data in the interval.
7	Mode (initial) = 2 for memory readout data = 1 for telemetry store data = 0 for real time data.
8	Initial bit rate. A number from 16-2048 in powers of 2.
9	Bookkeeping bits. This word is constructed as follows: $\text{WORD9} = 512 * S + 256 * \text{SUN} + 128 * \text{STAR} \\ + 64 * E + 32 * D_1 + 16 * D_2 \\ + 8 * D_3 + 4 * P + 2 * U + C$ If any variable in the equation is 0, then the corresponding condition is normal or the associated data is good. If any variable is 1: if S=1, the sectoring data is suspect; if SUN=1, the SUN=A or SUN=B reference source was used; if STAR=1, the STAR reference source was used; if E=1, the select status information was erroneous or missing; if any $D_i=1$ ($i=1,2,3$), then that detector was turned off;

¹Each header word consists of two 24 bit computer words in XDS 930 standard double-precision floating point format. See the Appendix, Section V-1 for a discussion of this word structure.

TABLE II-1, Continued

HEADER WORD	DESCRIPTION
	if P=1, the instrument is in priority override mode; if C=1, the instrument was in calibrate mode; U is not used (is always zero).
10	Format specification. Set to 0 at the beginning of the interval specified for format A/B, 1 for D, 2 for C.
11	Number of seconds of "live time" ⁽²⁾ for the main telescope system during the interval. This includes the total observed time for all PHA's (both zero and non-zero) received through the telemetry but excludes time lost due to telemetry noise.
12	Total number of "valid" main telescope pulse height events in the interval. This includes all non-zero pulse height frames that are not filled. Their DQI's may be 0 or 1.
13	Number of filled main telescope pulse height events.
14	Main telescope counting rate. $D1D2\overline{SD3D7}$ in counts/second. ⁽³⁾
15	Total number of filled low energy pulse height events in the interval.
16	Minimum value of (signal+noise)/noise ratio observed in the interval.
17	Highest value of (signal+noise)/noise ratio observed in the interval.
18-33	Total number of pulse height events in the interval having ID 0, 1, 2, ..., 15 (16 words).
34	Spacecraft identification (10 or 11)
35	$L1\overline{L2}$ ⁽⁴⁾ counting rate (counts/second). ⁽³⁾
36	$D1\overline{SD2D3D7}$ counting rate (average for the interval-cts/sec.) ⁽³⁾
37	$D1D2D4D5\overline{D6}$ counting rate (average for the interval-cts/sec.) ⁽³⁾
38	$D2D4D5D6\overline{D7}$ counting rate (average for the interval-cts/sec.) ⁽³⁾
39	Average spin rate in RPM for the interval.
40	$D1D2\overline{SD3D7}$ counting rate (average for the interval cts/sec.) ⁽³⁾

(2) "live-time" is defined to be the time per frame (at the indicated bit rate) times the number of non-filled PHA frames times 2.

(3) A logic term is negated by a bar over the symbol. If a term (e.g. D4) does not appear, it is a "don't care" term. All times are spacecraft times.

(4) Low energy telescope; detector 1=L1, detector 2=L2.

TABLE II-1, Continued

HEADER WORD	DESCRIPTION
41	Live time in seconds for the low energy telescope pulse height data. The time is incremented when an event is analyzed in channels 0-27.
42	Total number of main telescope events that are non-zero and non-fill. This is the sum of words 18-33.
43	Total number of low energy telescope events that are non-fill and fall in the channel range 0-27 for both L1L2 and L1L2.
44	Total number of low energy telescope pulse height events for the condition L1L2 which are non-fill and fall in channel 1-27.
45	Total number of low energy telescope pulse height events for the condition L1L2 which are non-fill and fall in the channel 0-27.
46-48	Euler angles. (Described in Figure II-4).
49	Counting rate L1L2 (average for the interval-counts/second).
50	Livetime for D12SD3D7 Rate (seconds).
51	Livetime for L1L2 Rate (seconds).
52	Livetime for D1SD2D3D7 Rate (seconds).
53	Livetime for DdD2D4D5D6 Rate (seconds).
54	Livetime for D2D4D5D6D7 Rate (seconds).
55	Livetime for D1D2SD3D7 Rate (seconds).
56	Livetime for L1L2 Rate (seconds).
57	Number of physical data records following this header.
58-60	Date upon which the pulse height tape was generated (year, month, day).

TABLE II-2

University of Chicago Charged Particle Instrument
Pioneer 10/11

Description of Data Block Word-Pair Parameters

Descriptor	Description
ID (main telescope)	Range identification for particle in main telescope; integer 0-15.
ID (LET)	Range identification for a particle in the LET; 1 for L1L2, 2 for L1L2.
DQI*	Data quality indicator; set to 0 for good data, to 1 for suspect data.
S	Sector. This is the octant of spacecraft rotation in which the associated main telescope event was analyzed. The sector is not corrected for spacecraft attitude or location - see description of Euler angles in Figure II-4. Integer, 0-7.
D1	The telemetered pulse height analysis channel reported for the event from the detector 1. Integer, 0-127.
D2	The telemetered pulse height analysis channel reported for the event from the detector 2. Integer, 0-127.
D5	The telemetered pulse height analysis channel reported for the event from the detector 5. Integer, 0-127.
LET CH	Telemetered value of the PHA channel for the L1 detector of the low energy telescope. Integer, 0-127.

* not supplied (always zero) for all 1972 data and for 1973 data through day 172.

Pulse Height Program
Pioneer 10/11

U. of Chicago

PROGRAM:

The PHG program copies pulse height data in 3-dimensional format from the Summary Tape to a Pulse Height Tape and puts a header at the beginning of each 15-minute block of data. The header contains bookkeeping information: start and stop times of the data, instrument status, seconds of mainframe and subcom pulse height data.

The main frame pulse height data (Main Telescope) is reformatted and copied onto the PHT. Data where $PH1 = PH2 = PH5 = 0$, ID0 for non-calibrate data is not copied.

The subcom pulse height data (Low Energy Telescope) is formatted and copied onto the main frame data and copied. Only LET data with channel numbers between 0 and 27 are copied.

Calibrate data is excluded. It does not appear on the Summary Tape.

The header gives the initial bit rate, mode and format of the instrument during the 15-minute time period.

The Main Telescope status (detectors on or off, Priority normal or override) is invariant within the actual start and end time period given in header. If the Priority or Detector status changed, the 15-minute time block is broken.

Zero pulse heights. If a pulse height main frame with $ID = PH1 = PH2 = PH5 = 0$ is encountered, this frame does not increase the seconds of pulse height data or add to the number of events. This is a dummy frame. Only the word giving the number of zero pulse height frames preceding this dummy frame is used. This number increases the number of good frames (word 12) and seconds of pulse height data (word 11).

A 15-minute block is broken on changes in X_1 , X_2 , X_7 and Priority only.

Pioneer 10/11
Pulse Height Program

HEADER FORMAT:

The header is designed to allow for the insertion of rate data during subsequent processing. The program sets rate words to zero.

DATA RECORD FORMAT:

1. The physical records will have a variable length. The minimum number of 24-bit words is 150 (to allow programs to distinguish the 120 word headers from data records by word count) and the maximum number of words is 1020. The number of words in any physical data record must be a multiple of 3 (i.e. $N = 3M$, where $50 < M < 340$) in order for the tape to be compatible with the University of Maryland UNIVAC 1108 system. (The 1108 has 36 bit words and the SDS 930 has 24 bit words; thus $N_{36} = 2/3 N_{24}$. If N_{24} is not a multiple of 3, N_{36} will be a non-integral number of words.

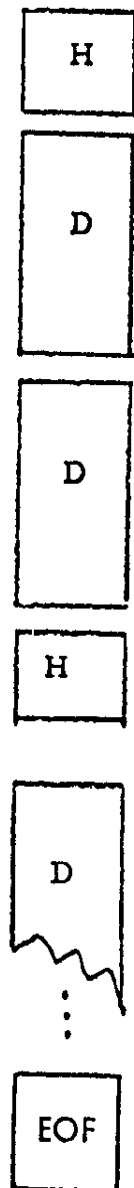
2. Word 1 of each physical data record contains the number of the physical data record. The records are numbered starting with one after each header. For example, if 5 records follow a header, Word 1 can be 1,2,3,4, or 5.

Word 2 contains the number of data word pairs in the record ($1 \leq M \leq 509$, where M is the number of pairs).

3. The pulse height events, starting with words 3 and 4, are word pairs. The Main telescope and Low Energy telescope events are differentiated by word 1, bit 0 of the pair (0 for LET, 1 for MT). The number of counts is always 1 since each word pair is an event.

Pioneer 10
Pulse Height Tape

I. TAPE STRUCTURE



H Header record

120 24-bit words

60 Floating point words

D Data record

150-1020 24-bit words,

Fixed point

Records are written in

binary at 800 BPI

Pioneer 10/11
Pulse Height Tape

II. DATA RECORD

Word 1
2

...

N
N+1


WORD 1 contains the physical
record number of the record
(starting from 1 after the header)

WORD 2 contains the number of
word pairs.

Words N, N+1 are the Word Pair.
 $1 \leq N \leq 509$

Pioneer 10/11
Pulse Height Program

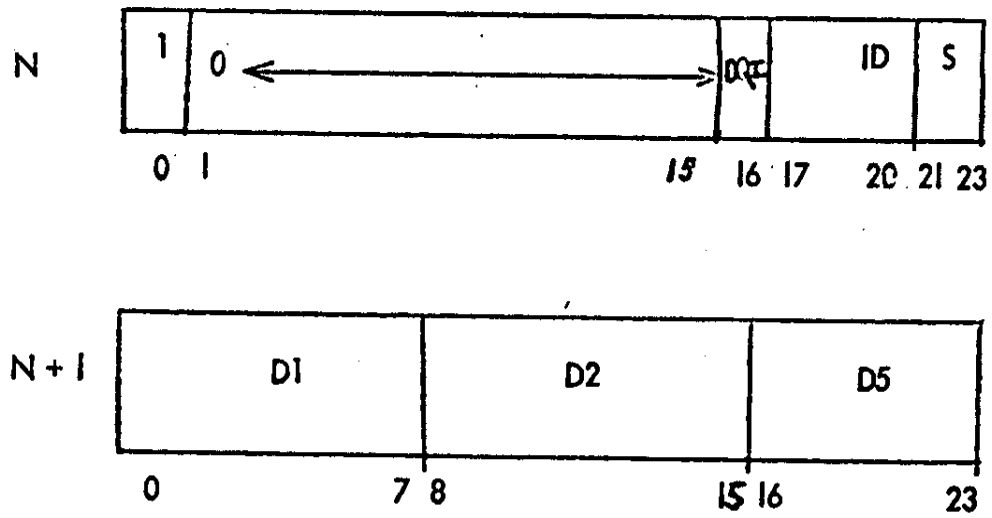


Fig. 1 Main Telescope Word Pair

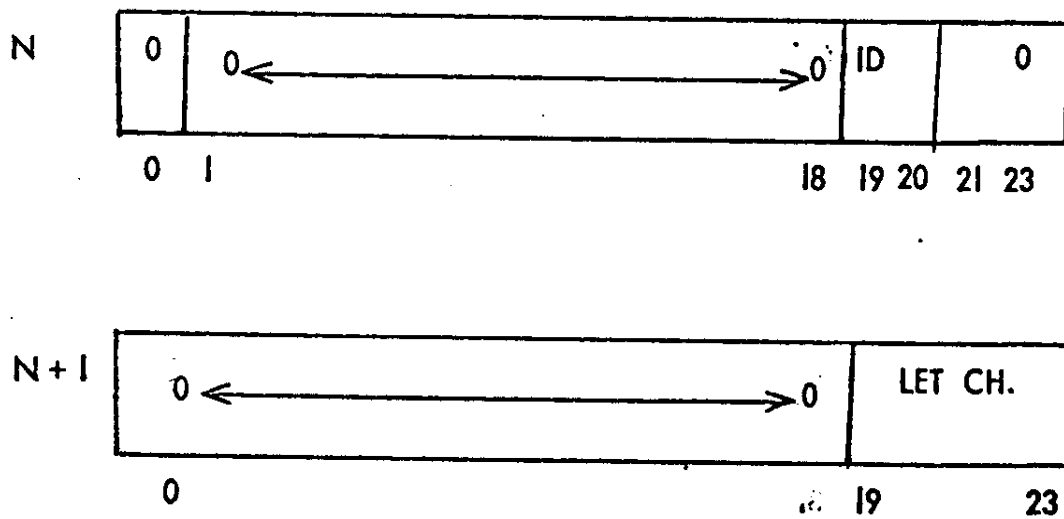


Fig. 2 LET Word Pair

Pioneer - 10/11 Pulse Height Program

Data Word-Pair Format

Bit 0 is the Least Significant Bit
 $1 \leq N \leq 509$

1. Main Telescope (see Fig. 1)

Word N, Bit 0 = 1

Word N:	BITS	INFORMATION
	0	1
	1-15	0
	16	Data Quality Indicator (0 good, 1 bad)
	17-20	ID (range 0 - 15)
	21-23	Sector (range 0 - 7)
Word N+1:	0-7	D1 channel
	8-15	D2 "
	16-23	D5 "

2. Low Energy Telescope (see Fig. 2)

Word N, Bit 0 = 0

Word N:	BITS	
	0	0
	1-18	0
	19-20	ID = 1 L1N1L2
		= 2 L1L2
	21-23	0
Word N+1	0-18	0
	19-23	LET channel

Pioneer 10
Pulse Height Tape

III a.

Header	60 floating point words
Word	
1	-1
2	Requested start time in days of 1972 [†]
3	Requested end time in days of 1972 [†]
4	Actual start time in days of 1972 [†]
5	Actual end time in days of 1972 [†]
6	F/T where F = Number of main Telescope Pulse Height main frames with the data quality bit set to 1 (bad data). T = Total Main frames of Pulse Height data in interval.
7	Mode (initial) = 2 for Memory Read Out data = 1 for Telemetry Store data = 0 for real time data
8	Bit Rate (initial) 16 to 2048 for the corresponding bit rate.

Bookkeeping Bits

$$\begin{aligned}\text{Word 9} &= 512X S + 256 X \text{SUN} \\ &+ 128 X \text{STAR} + 64 X E + 32 X D1 \\ &+ 16 X D2 + 8 X D7 + 2 X U + C \\ &+ 4 * P\end{aligned}$$

S = 0 if sector information is good,
1 if bad (bad if a corrected parameter was used
in the calculation of angles for the main tele-
scope rate words.)

SUN = 1 if SUN A or B reference source used
= 0 if not.

STAR = 1 if STAR reference source used
= 0 if not

E = 1 if erroneous or missing select
status occurred
= 0 if not.

Detector D1 D1 = 0 (on), = 1 (off)

Detector D2 D2 = 0 (on), = 1 (off)

Detector D5 D5 = 0 (on), = 1 (off)

Priority P = 0 (normal), =1 (override)

U (unusual) = 0

Calibrate C = 0 (not calibrate)
=1 (calibrate)

10	Format (=0, A/B) (=2,C) (initial)
11	Main Telescope. Seconds of Pulse Height Data (includes non-zero pulse heights and where PH1 = 0, PH2 = 0, and PH5 = 0)
12	Number of Good Main Frame Pulse Height Events. Includes pulse height frames that are not fill. The DQ1 may be 0 or 1. Includes frames where PH1 = 0, PH2 = 0 and PH5 = 0 .
13	Number of Fill Main Frame Pulse Height Events
14	D125 - 3 - 7 Rate*
15	Number of Fill Low Energy Telescope Pulse Height Events
16	Lowest Value of Signal to Noise Ratio
17	Highest Value of Signal to Noise Ratio
18-33	Number of Pulse Height Events for ID's 0 - 15
34	Satellite number (10 or 11)
35	L1N12 Rate*
36	D15N2 Rate*
37	D1245N6 Rate*
38	D6N7 Rate*
39	Spin Rate*
40	D12NS Rate*
41	Seconds of Low Energy Telescope Pulse Height Data. Time incremented when L1L2 events fall in channels 0 - 27 and L1N12 events fall in channels 0 - 27.

42 Number of Main Telescope events that are not
all zero (PH1 = PH2 = PH5 = 0 doesn't occur)
and not fill. This is the sum of words 18-33.

43 Number of Good Low Energy Telescope events
that are not fill and fall in the channel
ranges 0-27 for both L1L2 and L1NL2.

44 Number of events for L1NL2 which are not fill
and fall in the channel ranges 1-27.

45 Number of events for L1L2 which are not fill
and fall in the channel ranges 0-27.

46-48 Euler angles*

49 RL1L2

50 lifetime for D12S rate

51 " " L1N2 "

52 " " D1SN2 "

53 " " D1245N6 "

54 " " D6N7 "

55 " " D12NS "

56 " " L12 "

57 Number of physical data records following
the header.

58-60 Date Pulse Height Tape generated.

* Pulse Height Program sets this word to zero, merged by another program

↑ Day 1 hour 0 of 1972 is 1.0

Day 1 hour 0 of 1973 is 367.0

Calculation of Rate averages for Pulse Height Tapes.

The Source of rate and time data is the rate tape.

The time interval on the PHT is nominably 15 minutes and that of the rate tape is 5 minutes.

If a change in (X1, X2, X7, or Priority status) occurs, the 5 minute (on the rate tape) rates are not broken, but a flag is set. The PHT interval is broken at the time the status change occurs. The rates on the rate tape that indicate a status change occurred will not be included on the PHT.

Normally, with coverage >0 and with no changes in X1, X2, X7, P, the rate that goes onto the PHT is calculated from the formula:

$$R = \frac{\sum_i R_i t_i}{\sum_i t_i},$$

where

R_i = rate on rate tape for i th summing interval

t_i = livetime from rate tape for i th summing interval

By summing interval, this means that if the PHT interval is 15 minutes and the rate tape interval is 5 minutes, then there are 3 intervals to sum over.

Here, for each rate of the 7 rates, the time word >0 and the rate ≥ 0 .

If there is a status change during a rate interval, the rate for that summing interval is set to zero as well as the time in the above formula.

A rate word and time word can both = -1.

This means:

- 1) There was no coverage, or
- 2) There was a spike on the rate plots and the words were set to -1 for the time period of the spike.

Pioneer 10/11

Pulse Height Tapes

The Pulse Height Tape data records have pulse height events composed of word pairs. The main telescope pulse heights have a data quality bit (DQI) which indicates whether the data was good (=0) or bad (=1).

All Pioneer-11 pulse height data includes this bit.

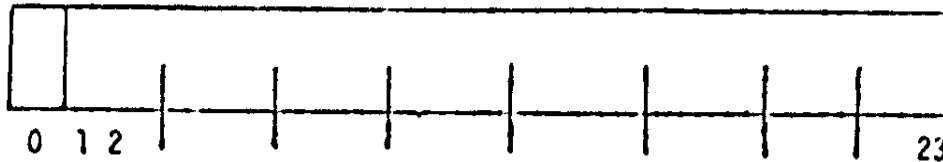
Pioneer-10 1972 data does not include this bit before 1973 day 173, but includes it for 1973 day 173 and later data.

Appendix V-1

Number Representation

FIXED-POINT FORMAT

Fixed-point data words have the format:



Numbers held in this format are 8-digit, octal numbers, with the sign incorporated as the "leading bit" in the most significant octal digit. Bit position 0 is the sign bit, with negative numbers having a "1" in bit position 0 and positive numbers having a "0" in bit position 0.

The memory holds fixed-point numbers as 23-bit fractions with an assumed binary point to the left of bit position one. Numbers held in one word have the equivalent precision of over six decimal digits. The range of values of the fixed-point format is from minus one to slightly less than plus one. Scaling is used in handling numbers during computation.

Programmers sometime consider fixed-point numbers to be integers, with the binary point to the right of bit position 23. The range of integer values is from -2^{23} to $+2^{23}-1$.

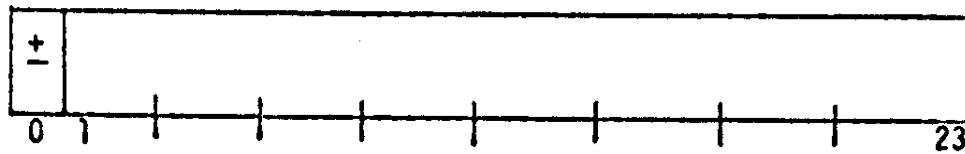
The memory holds negative, fixed-point numbers in two's complement form; the computer operates on these numbers arithmetically in a two's complement number system.

FLOATING-POINT FORMAT

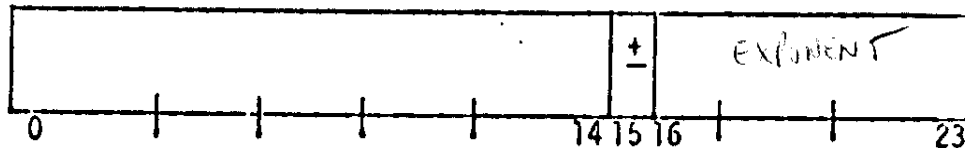
SDS offers standard programmed operator packages for performing double and single-precision floating-point arithmetic. The following paragraphs explain the standard floating-point number formats.

Double-Precision Floating-Point Format

Most Significant Word



Least Significant Word



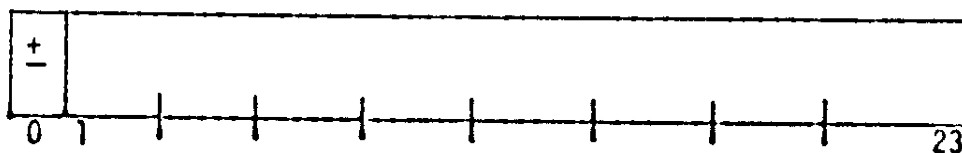
The fractional portion of a double-precision, floating-point number is a 39-bit, proper fraction, with the leading bit being the sign bit and the assumed binary point just to the left of the most significant magnitude bit (bit 1 of the upper word).

The floating-point exponent is a 9-bit integer, with the leading bit being the sign. The standard routines operate on both fraction and exponent in two's complement form. If F represents the contents of the fractional field and E represents the contents of the exponent field, the number has the form $F \times 2^E$.

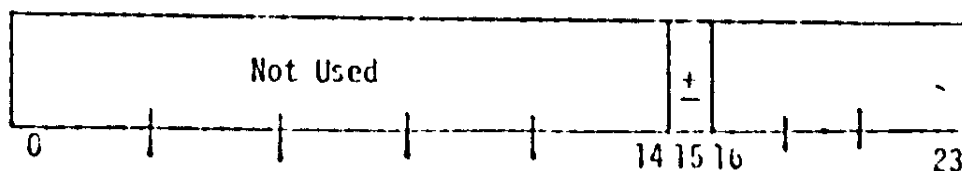
Double-precision, floating-point numbers have over 11 decimal digits of precision and a decimally equivalent exponent range of 10^{-77} to 10^{+77} .

Single-Precision Floating-Point Format

Fractional Word



Exponent Word



The fractional portion of a single-precision, floating-point number is a 24-bit proper fraction, with the leading bit being the sign and the assumed binary point just to the left of the most significant magnitude bit. The floating-point exponent is a 9-bit integer with a leading sign bit. The standard routines operate on both fraction and exponent in two's complement form.

Single-precision, floating-point numbers have over six decimal digits of precision and a decimally equivalent exponent range of 10^{-77} to 10^{+77} .

108.000 7/

Rate Time

Record format

U of Chicago

72-012A-02C

YEAR		SPACECRAFT NUMBER
STATUS		
TWIST ANGLE		
GULLER ANGLE		
ENTER ANGLE		
NUM. BAD FRAMES (DQI=1)	NUM. GOOD FRAMES (DQI=0)	
SPIN RATE		
1	MAIN FRAME START TIME (in sec. of the year)	
10	MAIN FRAME STOP TIME (in sec. of the year)	
SEC. OF DATA (COVERAGE) FOR R1 FRAME RATES		
SEC. OF DATA (COVERAGE) FOR R2 FRAME RATES		
SEC. OF DATA (COVERAGE) FOR SECTORED R1 FRAME RATES - SECTOR 0		
" - SECTOR 1		
" - SECTOR 2		
" - SECTOR 3		
" - SECTOR 4		
" - SECTOR 5		
" - SECTOR 6		
" - SECTOR 7		
SEC. OF DATA (COVERAGE) FOR SECTORED R2 FRAME RATES - SECTOR 0		
" - SECTOR 1		
" - SECTOR 2		
" - SECTOR 3		
" - SECTOR 4		
" - SECTOR 5		
" - SECTOR 6		
" - SECTOR 7		

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
SUBCOM START TIME																							49
(in sec. of the year)																							50
SUBCOM STOP TIME																							51
(in sec. of the year)																							52
SEC. OF DATA (COVERAGE) FOR																							53
SUBCOM RATE - FISSION 2																							54
COVERAGE FOR SUBCOM RATE																							55
FISSION 1																							56
COVERAGE FOR SUBCOM RATE																							57
D2-67																							58
COVERAGE FOR SUBCOM RATE																							59
L1L2																							60
COVERAGE FOR SUBCOM RATE																							61
D125																							62
MAIN FRAME OMNIDIRECTIONAL																							63
RATE - L1L2																							64
MAIN FRAME OMNIDIRECTIONAL																							65
RATE - DIS D237																							66
MAIN FRAME OMNIDIRECTIONAL																							67
RATE - D124567																							68
MAIN FRAME OMNIDIRECTIONAL																							69
RATE - DIS D2																							70
MAIN RATE L1L2 -																							71
SECTOR 0																							72
"																							73
SECTOR 1																							74
"																							75
SECTOR 2																							76
"																							77
SECTOR 3																							78
"																							79
SECTOR 4																							80
"																							81
SECTOR 5																							82
"																							83
SECTOR 6																							84
"																							85
SECTOR 7																							86
MAIN RATE DIS D237 -																							87
SECTOR 0																							88
"																							89
SECTOR 1																							90
"																							91
SECTOR 2																							92
"																							93
SECTOR 3																							94
"																							95
SECTOR 4																							96

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
SUBCOM ANALOG																							145
CR1																							146
SUBCOM ANALOG																							147
CR2																							148
SUBCOM ANALOG																							149
CR3																							150
SUBCOM ANALOG																							151
D7																							152
SUBCOM ANALOG																							153
EGG TEMPERATURE																							154
SUBCOM ANALOG																							155
TELESCOPE TEMPERATURE																							156
MAIN FRAME END OF INTERVAL TIME																							157
(actual 5 min. boundary time in sec. of the year)																							158
SPARE																							159
SPARE																							160

PION 10% RATE...APE FORMAT

U. of (HICAG)

1 LOGICAL RECORD (80 FLOATING PT. WORDS) = 5 MIN. OF DATA
 PHYSICAL RECORD = 6 LOGICAL RECORDS = 480 floating point words
 or 960 words (24 BIT)

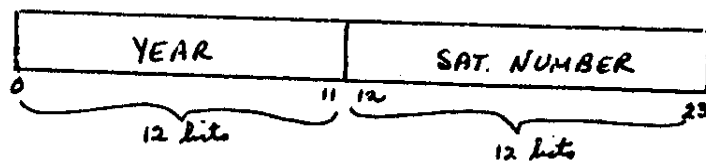
YEAR + SAT. NUMBER (1)
 STATUS (2) - OBUF(1)
~~EMERGENCY~~ (3)
 (4) - (2)
 (5)
 #BAD FRs. + # Good FRs. (6) - (3)

(4) - SPIN RATE
 (5) - M.F. start time (in sec. of the yr.)
 (6) - M.F. stop time (")
 (7) - sec. of data (coverage) for R1 frame rates
 (8) - " R2 "
 (9)
 : - sec. of data (coverage) for sectored R1 frame rates
 (16) sectors 0-7
 (17)
 : - sec. of data (coverage) for sectored R2 frame rates
 (24) sectors 0-7
 (25) - Subcom start time (in sec. of the yr.)
 (26) - Subcom stop time (")
 (27)
 : - sec. of data (coverage) for each Subcom digital rate
 (31)
 (32) - M.F. omni rate $L1\overline{L2}$
 (33) - " $D15\overline{D237}$
 (34) - " $D1245\overline{67}$
 (35) - " $D15\overline{D2}$
 (36)
 : - M.F. sectored rate $L1\overline{L2}$ - sectors 0-7
 (43)
 (44)
 : - M.F. sectored rate $D15\overline{D237}$ - sectors 0-7
 (51)
 (52)
 : - M.F. sectored rate $D1245\overline{67}$ - sectors 0-7
 (59)
 (60)
 : - M.F. sectored rate $D15\overline{D2}$ - sectors 0-7
 (67)

- (68) - Subcom digital - Fission 2
 (69) - " - Fission 1
 (70) - " - D2-67
 (71) - " - L1L2
 (72) - " - D125
 (73) - Subcom analog - CR1
 (74) - " - CR2
 (75) - " - CR3
 (76) - " - D7
 (77) - " - Egg Temp
 (78) - " - Telescope Temp
 - (79) - M.F. end of interval time (actual 5min boundary time)
 (80) - space (IN SECONDS OF YEAR)

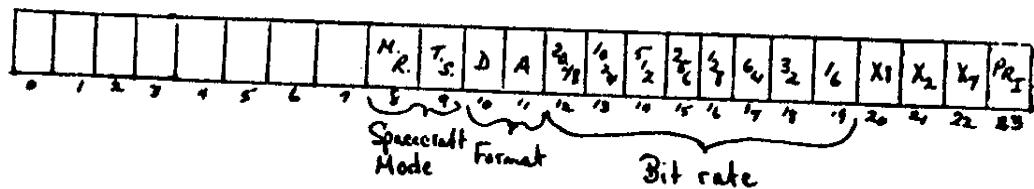
word 1:

Yr + Sat. # :



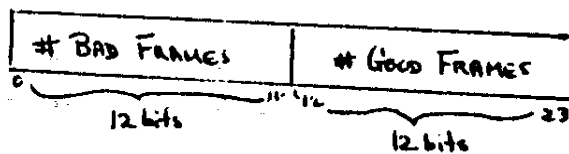
word 2:

STATUS :



word 6:

Bad frames - DQI = 1
 Good frames - DQI = 0



5 Min. Count Rate Tapes

D-28792

Start Time - Words 9+10 of first record

24101 030 21754711

Exponent - $308 = 2410$

sign bit

4 3 7 3 1 6 2 2
0100 0111 1110 1100 1110 0100 1100 1100

8 3 8 8 6 0 8

7 8 6 4 3 2

2 2 9 3 7 6

1 2 2 8 8

5 1 2

3 8 4

1 6

2

9417618

86400 59417618

86400

77761

77600

161

Jan 1 = Day 0 then Day 109 = Day 110
or 4/26/73

Stop Time - Last Record. Words 9+10

27737 030 25056024

521340508 = 1105 719210

86400 1105 7192

Jan. 1 = Day 0 then Day 128 = Day 129

or 5/9/73

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933 EAST 56TH STREET
CHICAGO · ILLINOIS 60637
AREA CODE 312-962-7839

*Laboratory for Astrophysics
and Space Research*

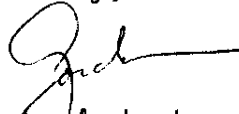
May 6, 1982

Mr. Ralph Post
National Space Sciences Data Center
Goddard Space Flight Center
Code 601
Greenbelt, Maryland 20771

Dear Ralph:

I have been unable to contact you by phone but, assuming that your message implied you wanted a second copy of the modified, 9-track format for the Pioneer data tape submission, I am enclosing a copy of my letter to you of 23 January 1980 which outlines this format. I hope this is what you need.

Sincerely,



Gordon A. Lentz
Manager, Data Systems and Analysis

GAL:rs
Enclosure

2

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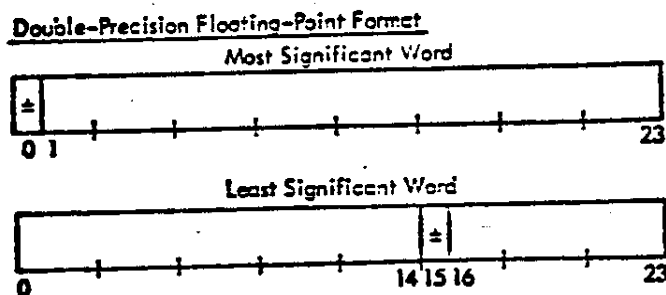
January 23, 1980

Mr. Ralph Post
 National Space Sciences Data Center
 Goddard Space Flight Center
 Code 601
 Greenbelt, Maryland 20771

Dear Mr. Post:

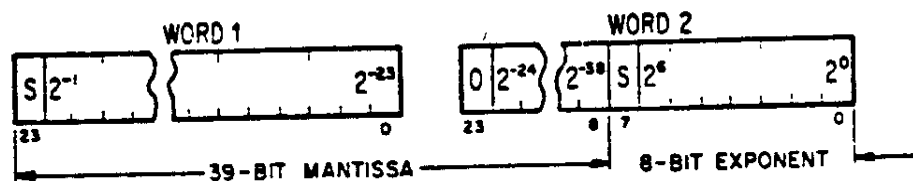
This is to inform you that our next submission of Pioneer 10 and 11 data will be in a different format than the previous submissions have been. The differences are twofold:

1. The tapes will be recorded in 9-track, ⁶²⁵⁰~~1600~~ fci mode and
2. While the form of integer data on the tapes is unchanged, the form of a floating point number is different. Both the new and the old format are 48-bit floating point numbers, however, the old floating point format was as follows:



While the new floating point format is:

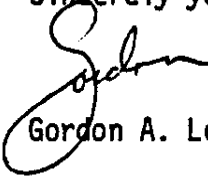
DOUBLE PRECISION - FLOATING POINT



January 23, 1980

You will notice there are three obvious significant differences between the two formats. First of all, the order of the words has been changed so that the word containing the most significant part of the mantissa will appear in memory in the lower-address word while in the older format it occupied the higher-address word, while secondly, bit 23 of the "exponent" word is unused in the new format and is always 0, while finally, the exponent in the new format is 8 bits instead of 9 bits long. Another thing to be aware of is that a floating point 0 in the new format consists of two words with the exponent containing octal 210 with zeros elsewhere. The old format was all 0. The form of both mantissa and exponent are the same as before (2's complement.) In order to refresh your memory as to the general form of the two data-tape types that we send you I have appended a brief verbal description. I hope that this change does not cause you much extra work; it is really a fairly straightforward change.

Sincerely yours,



Gordon A. Lentz

GAL:rs
Attachment

cc: Mr. Bill Valente - NSSDC
Peter Kruley - UC
Bruce McKibben - UC
John Simpson - UC

Pioneer Rate Tape Format:

1 physical record = 960 (24-bit) words = 6 logical records. Each logical record contains 160 24-bit words, of which words 1 → 6 incl. are integer fmt, and words 7 → 160 inc. are floating point (i.e., 77 48-bit words.)

Pulse Height Tape Format:

Each 15-minute interval is represented by 1 header record followed by 1 or more data records.

A header record consists of 60 48-bit words, all in floating point format.

A data record consists of N 24-bit words, $150 \leq N \leq 1020$. All of these are in integer format.

Header records and data records constitute distinct physical records. In addition to the difference in length, header records can be distinguished from data records by examining the most significant bit of the most significant word. In header records, this bit is set; in data records reset.

RECORD COUNT OF D-100504 ON MKA100:

```

FILE      RECORDS      MAX SIZE      MIN SIZE      ERRORS
-----
1          3209         2880         2880         0
END OF TAPE

```

TOTAL RECORDS ON TAPE = 3209
TOTAL BYTES ON TAPE = 9241920
TOTAL ERRORS ON TAPE = 0

START TIME: 29-JUN-1993 14:16:53.94
END TIME: 29-JUN-1993 14:17:32.20
ELAPSED TIME: 00:00:39

REGULAR OCTAL DUMP OF D-100504
Pinned 10
- 5 minute count rate
12/29/90 - 12/31/91 - D-100504

FILE 1	RECORD 1	3840 BYTES	6	5	4	3	2	1
(0)	1370000120001	002000000000	000000000000	000000000016	223146312314	606336044536	112334313604	464611247431
(48)	300001421156	1441022000142	115644100000	000000000201	000000000000	020100000000	000000000000	000000000201
(96)	000000000000	020100000000	000000000201	000000000201	000000000000	020100000000	000000000000	000000000201
(144)	000000000000	020100000000	000000000201	000000000201	000000000000	020100000000	000000000000	000000000201
(192)	360442711123	343136044571	112474310000	000000000201	000000000000	020100000000	000000000000	000000000201
(240)	000000000000	020125252375	324037720000	000000000201	000000000000	020100000000	000000000000	000000000201
(288)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000000000000	000000000201
(336)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000000000000	000000000201
(384)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000000000000	000000000201
(432)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000000000000	000000000201
(480)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000000000000	000000000201
(528)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000000000000	000000000201
(576)	365152232044	374223316747	033217462374	521400067755	303555230170	141142001125	22474065376	367632112005
(624)	360446470000	003100000000	000002013706	001200010020	000000000000	000000000000	000000142231	463123146003
(672)	360446461124	743136044756	112474312200	000000000011	220000000000	001100000000	000002010000	000000000201
(720)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000002010000	000000000201
(768)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000002010000	000000000201
(816)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000002010000	000000000201
(864)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000002010000	000000000201
(912)	000000000000	020100000000	000000000000	000000000201	216161613070	737300000000	000002010000	000000000201
(960)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000002010000	000000000201
(1008)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000002010000	000000000201
(1056)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000002010000	000000000201
(1104)	000000000000	020100000000	000000000000	000000000201	000000000000	020100000000	000002010000	000000000201
(1152)	000000000000	020100000000	000000000000	000000000201	000000000000	02010		

(1296)	000000000000	001522314631	231460033604	475611247431	360450741124	743125000000	000000112200	000000000011
(1344)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1392)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1440)	000000000000	020100000000	000002010000	000000000201	000000000000	020136044571	112474313604	507111247431
(1488)	300000000000	001230000000	000000123000	000000000012	300000000000	001230000000	000000123030	303010141773
(1536)	303030301014	177200000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1584)	000000000000	000002010000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1632)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1680)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1728)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1776)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1824)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1872)	337452140006	037320000000	000003722325	252512525374	205252522125	277500000000	000002012000	674703321746
(1920)	200000000000	775521443327	234534124200	112522474406	537636763211	600536045075	000000310000	000000000201
(1968)	370600120001	002000000000	000000000000	000000000014	237146312314	200536045074	112474313604	520411247431
(2016)	220000000000	001122000000	000000110000	000000000201	000000000000	020100000000	000002010000	000000000201
(2064)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(2112)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(2160)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(2208)	000000000000	020125252525	125253720000	000000000201	343434341216	177000000000	000002010000	000000000201
(2256)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(2304)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(2352)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(2400)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(2448)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(2496)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(2544)	360452100000	003100000000	000002013706	001200010020	000000000000	020100000000	000002010000	463123146003
(2592)	36							

REGULAR OCTAL DUMP OF D-100504

90/365 12/28/90 7
12/31/91

FILE 1	RECORD 2	3840 BYTES	5	6	7	8	9	10
(0)	370600120001	002000000000	000000000015	223146312314	600336045432	112600313604	555011260031	
(48)	250000000000	001122000000	000000000201	000000000000	020100000000	000002010000	000002010000	
(96)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(144)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(192)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(240)	000000000000	020125252525	000000000201	000000000000	020100000000	000002010000	000000000201	
(288)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(336)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(384)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(432)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(480)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(528)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(576)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(624)	360455510000	003100000000	001200010020	000000000000	020100000000	000002010000	000000000201	
(672)	360455501126	003136045660	00000000010	000000000000	020100000000	000002010000	000000000201	463123146003
(720)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(768)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(816)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(864)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(912)	252525251252	537100000000	000000000201	000000000000	020100000000	000002010000	000000000201	252512525371
(960)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1008)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1056)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1104)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1152)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1200)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1248)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1296)	000000000000	001422314631	566400000031	000000000000	020137060012	000100200000	000000000000	
(1344)	000000000000	020100000000	000000000201	000000000000	003136000000	000000103600	000000000010	
(1392)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1440)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1488)	300000000000	001200000000	000000000201	000000000000	020136045371	112600313604	56711260031	
(1536)	210421041042	137321042104	000000000201	000000000000	001230000000	000000123146	314610631772	
(1584)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1632)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1680)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1728)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1776)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1824)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(1872)	237452140006	020100000000	000000000201	000000000000	037436515223	204437422331	525221252772	
(1920)	370600120001	002000000000	000000000201	000000000000	200536045777	000000310000	674703321746	
(1968)	360000000000	001030000000	000000000201	000000000000	600336045776	112600313604	610611260031	
(2016)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(2064)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(2112)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(2160)	000000000000	020125252525	000000000201	000000000000	020100000000	000002010000	000000000201	
(2208)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(2256)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(2304)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	
(2352)	000000000000	020100000000	000000000201	000000000000	020100000000	000002010000	000000000201	

(2400)	000000000000	020100000000	500002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(2448)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(2496)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(2544)	360461120000	003100000000	000002013706	001200010020	000000000000	000000000000	000000152231	463123146003
(2592)	360461061126	003136046224	113410312500	030423351011	220003042335	101100000000	000002010000	000000000000
(2640)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(2688)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(2736)	000000000000	020100000000	000002013604	567111260031	360461711134	103130000142	115644120000	000000000000
(2784)	300001421156	441230000142	115644123000	014211564412	303024640005	377230302464	000537723434	274530452370
(2832)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(2880)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(2928)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(2976)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3024)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3072)	000000000000	020100000000	000002010000	000000000201	352523350174	577200000000	000002013452	506503775774
(3120)	272523653027	477430525105	20214743651	522320443742	233167470332	174623745214	000677553035	552301701411
(3168)	420011252247	440653763674	321120053604	622500000031	000000000000	020137070012	000100200000	000000000000
(3216)	000000000000	001422314631	231460033604	633411341031	224456050365	601136000000	000000103600	000000000000
(3264)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3312)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3360)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3408)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3456)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002012104	210410421371
(3504)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3552)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3600)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3648)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000000
(3696)	000							

REGULAR OCTAL DUMP OF D-100504

FILE 1	RECORD 3208	3840 BYTES	9	10	11	12
(0)	370760120001	002000000000	000000000000	000000000000	016414313602	046501641431
(48)	220000000000	001122000000	000000112220	000000112220	130650062222	335113065006
(96)	215402030223	340621345300	203044062171	203044062171	203044062173	310520162406
(144)	222233511306	500622223351	130650062174	130650062174	004060621250	753401075006
(192)	000000000000	020100000000	000002010000	000002010000	000002010000	000000000201
(240)	000000000000	020125252525	125253730000	125253730000	000002012457	520110664773
(288)	242721350272	137324303233	117607732556	117607732556	302303732530	774610042773
(336)	244653712336	037300000000	000020100000	000020100000	000002010000	000000000201
(384)	000000000000	020100000000	000020100000	000020100000	000002010000	000000000201
(432)	000000000000	020100000000	000020100000	000020100000	000002010000	000000000201
(480)	000000000000	020100000000	000020100000	000020100000	000002010000	000000000201
(528)	000000000000	020100000000	000020100000	000020100000	000002010000	000000000201
(576)	000000000000	020100000000	000020100000	000020100000	000002010000	000000000201

(624)	360204710000	003100000000	000002013707	001200010020	000000000000	000000000000	000000152231	463123146000
(672)	360204650164	143136020603	016414310000	000000000201	000000000000	001100000000	000002010000	000000000201
(720)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(768)	254162540101	400625402030	223350062511	156423432406	245544262071	240624554426	207124062455	442620712406
(816)	245706513337	140625014223	124570063602	022601641431	360205260164	143130000000	000000123000	000000000012
(864)	300000000000	001230000000	000000123000	000000000012	000000000000	020100000000	000002010000	000000000201
(912)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(960)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1008)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1056)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1104)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1152)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1200)	30525222125	277435252525	000002010000	000000000201	352525251252	537325252525	125253743000	000000000373
(1248)	420011252247	440653763676	321120053602	060400000031	233167470332	174623745214	000677553035	552301701411
(1296)	000000000000	001422314631	231460033602	060301641431	000000000000	020137070012	000100200000	000000000000
(1344)	217473310264	140621442641	312600062142	641612601006	221422332057	040622254020	102230062174	733102641406
(1392)	221564570324	740622237574	315440062174	733102641406	214426413126	000621426416	126010062214	223320570406
(1440)	225402010222	300621747331	026414062215	645703247406	222375743154	400600000000	000002010000	000000000201
(1488)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002012161	616130707373
(1536)	343434341216	177233434343	121617700000	000000000201	233115443311	577322762005	230367732170	740030570773
(1584)	214027322376	677322315407	230263732037	017403701773	201757270233	477321326403	312053732721	350532135372
(1632)	326377420100	677237600774	007743723647	572521362772	363026252130	737237017407	301743723645	120531220772
(1680)	272063342140	137227213505	321353702762	005430366370	334312512334	577036475725	213627703630	262521307370
(1728)	370174073017	437036451205	312207703576	210321501770	000000000000	020100000000	000002010000	000000000201
(1776)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1824)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1872)	000000000000	020100000000	000002010000	000000000201	000000000000	020136020717	000000310000	000000000201
(1920)	370700120001	002000000000	00000					

(3504) 345244470023 337334002541 304327733407 603700760373 344416010205 537334514637 127367732731 354533135772
(3552) 350700661264 337327273213 115017723640 007111141372 364000711114 317237017407 301747323473 425631537772
(3600) 267000530171 077200000000 000002010000 000000000201 000000000000 020100000000 000002010000 000000000201
(3648) 000000000000 020100000000 000002010000 000000000201 000000000000 020100000000 000002010000 000000000201
(3696) 000000000000 000002010000 000002010000 000000000201 000000000000 020100000000 000002010000 000000000201
(3744) 000000000000 020100000000 000002010000 000000000201 000000000000 020100000000 000002010000 000000000201
(3792) 000000000000 020100000000 000002010000 000000000201 000000000000 020100000000 000002010000 000000000201
(3840) 000000000000 020100000000 000002010000 000000000201 000000000000 020100000000 000002010000 000000000201

REGULAR OCTAL DUMP OF D-100504

FILE 1 RECORD 3209 3840 BYTES

(0)	370700120001	002000000000	000000000000	000000000014	223146312314	600336021257	016760313602	136701676031
(48)	220000000000	001122000000	000000112144	264131260006	221564570324	740622432574	315440062174	733102641406
(96)	222071260040	600622172700	217270062174	733102641406	214264161260	100621442641	312600062215	645703247406
(144)	222375743154	400621747331	026414062220	712600406006	221727022172	700621747331	026414062142	641612601006
(192)	360210260167	603136021326	016760313000	000000000012	300000000000	001230000000	000000123000	000000000012
(240)	300000000000	001234343434	121617730000	000000000201	343434341216	177000000000	000002013562	174730045373
(288)	354777612337	43733371571	130357733311	544631154773	333252153257	237334263514	131647733407	603700760373
(336)	351360551130	377300000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(384)	000000000000	020100000000	000002010000	000000000201	375526210051	037036451205	312207702720	633421401370
(432)	272135053213	537031624631	325353703642	452123541770	370174073017	437037600774	007743700000	000000000201
(480)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(528)	000000000000	020120000000	000003733525	252512525373	210000000000	037530000000	000003743000	000000000372
(576)	244440743134	574223316747	033217462374	521400067755	303555230170	141142001125	224744065376	367632112005
(624)	360213730000	003100000000	000002013707	001200010020	000000000000	000000000000	000000152231	463123146003
(672)	360213670167	603136021505	016760312500	000000000011	220000000000	001125477371	333104062527	024332702406
(720)	246213203053	000624651767	316660062444	264131260006	246355441320	700624635544	132070062523	757431544006
(768)	222702433270	240622061115	322740062203	044631136006	223044671136	140622044672	136150062142	641612601006
(816)	214264161260	100622030446	311360060000	000000000201	000000000000	020100000000	000002010000	000000000201
(864)	000000000000	020100000000	000002010000	000000000201	222222221111	137330303030	101417730000	000000000201
(912)	343434341216	177021362512	231643732131	574622002373	211123750131	677321773217	315077732341	020711302773
(960)	240501201202	437322577664	111073732176	047731663373	316055050334	477332050516	116047733263	255010050773
(1008)	325730531015	277330144274	31173732512	236510545373	250400540300	077327202541	202153730000	000000000201
(1056)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1104)	000000000000	020130771053	016473702705	464211254370	300350311130	777036232133	313327703664	601211501370
(1152)	376007740077	437037600774	007743703667	300320145770	000000000000	020100000000	000002010000	000000000201
(1200)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1248)	000000000000	020100000000	000002013602	150600000031	000000000000	020137070012	000100200000	000000000000
(1296)	000000000000	001422314631	231460033602	150501676031	360216150167	603122000000	000000112200	000000000000
(1344)	214733102241	600621361523	327634062174	733102641406	222233511306	500622207126	004606062174	733102641406
(1392)	222071260040	600622233351	130650062174	733102641406	222233511306	5006222172702	217270062145	706503737006
(1440)	213757471144	240621747331	026414062220	712600406006	222233511306	500600000000	000002010000	000000000201
(1488)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002012161	616130707373
(1536)	000000000000	020134343434	121617700000	000000000201	217543573246	577337645764	237227723701	740730174372
(1584)	206651423367	037322746520	331057732331	154433115773	230400433017	477322364447	204477730000	000000000201
(1632)	000000000000	020100000000	000002010000	000000000201	000000000000	020100000000	000002010000	000000000201
(1680)	000000000000	020137017407	301743703635	347422222370	364245212354	177034130364	002253702770	214533312770

FILE	RECORDS	MAX SIZE	MIN SIZE	ERRORS
(1728)	272135053213	537035301773	020737703635	34742222370
(1776)	000000000000	020100000000	000002010000	000000000201
(1824)	000000000000	020100000000	000002010000	000000000201
(1872)	000000000000	020100000000	000002010000	000000000201
(1920)	000000000000	002000000000	000000000000	000000000000
(1968)	370700120001	002000000000	000000000000	000000000000
(2016)	220001421156	441125000142	115644112162	132030530000
(2064)	222071260040	600622207126	004060062163	554413207006
(2112)	24584262071	240625061115	322740062541	625401014006
(2160)	360213260167	603136021626	017270313000	006100672012
(2208)	300000610067	201221616020	220377743434	320103230772
(2256)	22056511167	177421776517	015627742174	076013407774
(2304)	221334333214	137435554105	030417723640	007111141372
(2352)	334533122031	477227353772	132647722774	327132301202
(2400)	236336401311	177027457361	020353703170	323371142260
(2448)	000000000000	020100000000	000002010000	000000000000
(2496)	265842370134	020125252451	204473723125	365551533345
(2544)	360217340000	674223316747	033217462374	30355230170
(2592)	360217330172	003100000000	000002013707	000000000000
(2640)	221727022172	703136022043	017270312200	000000000000
(2688)	214570650373	500622223351	130650062174	222233511306
(2736)	000000000000	7006221747331	026414062222	335113065006
(2784)	000000000000	020100000000	000002010000	000000000201
(2832)	000000000000	020127265344	007413733017	407601740773
(2880)	321037102377	637332557322	037443733157	004012101773
(2928)	363534742222	237237017407	301743723765	267173751161
(2976)	370174073017	437036353474	222223702666	375245050107
(3024)	364000711114	137000000000	000002010000	273135053213
(3072)	000000000000	020100000000	000002010000	000000000000
(3120)	000000000000	020100000000	000002010000	000000000000
(3168)	000000000000	020100000000	000002010000	000000000000
(3216)	000000000000	001422314631	231460033602	204700000031
(3264)	220611153227	400622270243	327024062201	204301727031
(3312)	223044671136	140622044672	136150062206	422312457006
(3360)	214264161260	100622030446	311360062230	111532274006
(3408)	000000000000	020100000000	000002010000	446711361406
(3456)	343434341216	177200000000	000002010000	000000000201
(3504)	200510561257	177321651473	113027732322	000000000201
(3552)	362563530040	177236720031	133623723760	470210477773
(3600)	270744073216	077200000000	000002010000	077400774372
(3648)	000000000000	020100000000	000002010000	000000000000
(3696)	000000000000	020100000000	000002010000	000000000000
(3744)	000000000000	020100000000	000002010000	000000000000
(3792)	000000000000	020100000000	000002010000	000000000000
(3840)	000000000000	020100000000	000002010000	000000000000

RECORD COUNT OF D-100505 ON MKA100:

FILE	1	RECORD	2918	LENGTH	384 BYTES
(2784)	22	0000000000	001122000000	000000000000	000000000000
(2832)	352	350063234	777124044735	21637742646	266215054773
(2832)	31	073770343	37752374104	04527753146	37433314374
(2828)	336	236671307	33732602355	343423742165	163403343375
(2976)	25	324622775	17710000000	00000000000	00000000000
(3024)	355	37113272	23735537171	32722372221	264737503772
(3120)	346	132067	63735537171	327223713107	037737503772
(3120)	325	52522525	237455252525	125245763651	522324435342
(3163)	420	011252250	00652747062	026003012212	490000000000
(3216)	00	000000000	013522617270	121730032212	353024365021
(3264)	206	136151176	740621433105	241624062143	310524162406
(3312)	246	424362702	400620602436	27824062143	310524162406
(3363)	214	45300203	040621765176	371664362143	310524162406
(3408)	220	00403040	01122000040	304000013600	004030000000
(3456)	355	45111711	237355031240	073523703503	124007352370
(3594)	367	106573503	137437273166	24332747357	175723144774
(3552)	000	000000000	020100000000	000000000000	000000000000
(3690)	202	434130531	777500000000	000002010000	000000000000
(3648)	362	15613453	677137022166	04253712252	602102761764
(3696)	000	000000000	020100000000	000002010000	000000000000
(3744)	252	2456200	377431252462	273113762652	521326472775
(3792)	237	5214006	23552505272	063114124200	112322500006
FILE 1 RECORD 2918 LENGTH 384 BYTES					
(46)	367	200120601	010000000000	000000000000	000000000206
(46)	360	000000000	006300000000	000000000000	000000000201
(95)	000	000000000	020100000000	000002010000	000000000201
(144)	000	000000000	020100000000	000002010000	000000000201
(192)	000	000000000	020100000000	000002010000	000000000201
(240)	000	000000000	020100000000	000002010000	000000000201
(288)	000	000000000	020100000000	000002010000	000000000201
(336)	000	000000000	020100000000	000002010000	000000000201
(384)	000	000000000	020100000000	000002010000	000000000201
(432)	000	000000000	020100000000	000002010000	000000000201
(480)	000	000000000	020100000000	000002010000	000000000201
(528)	000	000000000	020100000000	000002010000	000000000201
(576)	000	000000000	020100000000	000002010000	000000000201
(624)	214	561160000	063100000000	000002010000	000000000000
(672)	000	000000000	000000000000	000000000000	000000000000
(720)	000	000000000	000000000000	000000000000	000000000000
(768)	000	000000000	000000000000	000000000000	000000000000
(816)	000	000000000	000000000000	000000000000	000000000000
(864)	000	000000000	000000000000	000000000000	000000000000
(912)	000	000000000	000000000000	000000000000	000000000000
(960)	000	000000000	000000000000	000000000000	000000000000
(1008)	000	000000000	000000000000	000000000000	000000000000
(1056)	000	000000000	000000000000	000000000000	000000000000

[illegible]

FILE		INPUT	DATA RECORDS		MAX.	READ ERROR SUMMARY				INPUT RETRIES		
	RECS.	INPUT	FILE #	RECORD #	SIZE	PERM	ZERO	B	SHORT	UNDEF.	#RECS.	TOTAL#
1	2918	2918	1	1	2880	1	23	0	0	0	29	40
READ ERROR #			FILE #	RECORD #								
	1		1	2521								

EOJ	DUMP STOPPED AFTER FILE	1	# OF PERMANENT READ ERRORS	1
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START TIME	12/13/82	11:25:57	STOP TIME	12/13/82	11:27:34
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SEW LO

(384) 400001510000 400740000154 004034034000 015100005411 400000243732 640040000151 002050104000 007401404406
 (432) 400001570001 10140000153 000100030000 000000000000 000000000000 000000000000 000000000000 000000000000
 (480) 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
 (528) 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
 (576) 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY			INPUT RETRIES		
				PERM	ZERO	B SHORT	UNDEF.	#RECS.	TOTAL#
1	9432	9435	1836	0	14	0	0	19	19

EOJ DUMP STOPPED AFTER FILE 1 # OF PERMANENT READ ERRORS 0

START TIME 11/24/82 14:03:12 STOP TIME 11/24/82 14:05:49

D-17169

72-012A-02B

PIONEER 10

PULSE HEIGHT DATA

FILE 0001 REC 0002 CH 3468

0001	000000004000	000025252006	374325252252	500037435252	154000000000	37254116000	374346652162	277123352557
0049	000000000000	000000000000	000000000000	000120000000	000000000000	000000000000	235100000000	001132140000
0057	000000063340	000000000000	000000000000	000120000000	000000000000	000000000000	000000000000	001121040000
0145	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0193	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0241	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0289	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0337	000000004000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0385	000000004320	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0433	000000004000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0481	000000004000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0529	000000071341	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0577	400000011521	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0625	400000040000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0673	400000070642	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0721	400000042060	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0769	400000061320	700000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0817	400000012040	500000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0865	400000041540	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0913	400000071561	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0961	4000000321640	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1009	400000062121	100000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1057	400000011300	500000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1105	400000032261	200000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1153	4000000261400	600000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1201	400000011320	600000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1249	400000062000	200000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1297	4000000212660	700000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1345	400000051420	140000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1393	4000000202560	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1441	400000030420	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1489	4000000260562	340000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1537	400000011200	300000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1585	400000030200	240000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1633	4000000470121	500000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1681	4000000021600	600000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1729	4000000352061	200000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1777	400000001340	700000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1825	4000000031461	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1873	400000072140	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1921	4000000020140	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
1969	4000000050600	240000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2017	4000000201740	700000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2065	400000031761	340000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2113	4000000260662	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2161	400000011022	200000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2209	4000000041060	600000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2257	4000000001200	500000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2305	4000000431020	200000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2353	4000000061641	240000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2401	4000000010440	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2449	4000000041361	200000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
2497	4000000001660	540000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000

4/11

2

3/3/72 - 3/24

0673	400000750500	340540000167	010500254000	015000105206	000000200000	000000000020	000000044000	003106233400
0721	400000720200	441040000123	012114104000	007401204405	400000770221	601340000150	001044604000	007102011407
0759	400001630101	400740000034	060344004000	007501207005	400001560000	500540000157	000210304000	015300212407
0817	400001660100	417640000077	062304344000	003107441000	400000720502	703040000073	012074064000	012404631424
0865	400000760140	7005400000150	000064006400	016401420445	400001570005	707740000151	000044074000	003412045000
0913	400001260646	402140000033	170650064000	012407433005	400001550000	500540000167	030524214000	015000004012
0961	400000710100	500540000164	044064044000	007402415017	000000100000	000200000010	000000004000	015100073144
1009	400000720342	141540000152	000050104000	007401204400	400000761064	545240000076	014064144000	015000000505
1057	400001610631	177340000163	016655704000	007401004404	400001550000	640640000076	054260434000	007101074100
1105	400000320664	100040000163	011232234000	016602050036	400000700100	500640000074	014064114000	015600017006
1153	400001570000	501040000070	012070114000	015200026431	400000700060	640540000154	000044044000	015600005005
1201	400000700121	201140000070	014050054000	007105626427	400000730201	202240000154	000070104000	016515575066
1245	400000700157	701040000157	000264664000	016003124672	400001610542	605640000072	024074114000	015300005410
1297	400000740140	640740000165	010550704000	007601204453	400000770141	440440000077	012044064000	007001606412
1345	400000730140	741340000164	011274360000	002000000000	400000100000	000040000156	000050114000	015700011010
1393	400000711366	050440000071	012074074000	003237725400	40000070563	304040000163	016635014000	007401005006
1441	400001550000	441740000160	351061774000	007101010004	400000720140	741540000153	004050064000	015500017422
1485	400000760261	341040000151	000244264000	007006050005	400001650201	101140000126	012114054000	0150000217020
1537	400000720120	640640000154	000060064000	015500007004	400001160010	015540000150	000040054000	015300005005
1585	400000740120	440340000075	036204214000	007101204404	400000720120	400540000150	000060054000	015100007413
1633	400001540000	441040000074	012044064000	016501227445	400001670210	116040000070	011054374000	015100010407
1681	400000730100	441040000074	012044064000	016501227445	400001670210	116040000070	011054374000	015100010407
1725	400001550020	500640000162	263222064000	015000204416	400000331126	740640000075	010060074000	007701606410
1777	400000300020	740640000036	353060004000	016702015575	400001200060	600540000071	010050064000	007300604011
1825	400001540000	701040000151	000040050000	001000000002	000000200000	002340000153	004204174000	012300101403
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1921	400001540001	001040000065	010240164000	007601407414	400001520001	141540000072	052214304000	007301003412
1969	400000740141	200740000165	010635014000	007701210007	400000705634	437340000075	010054064000	003611046000
2017	400001550000	500640000113	000070134000	015300004407	400001240300	500340000076	010060074000	015700005406
2065	400001550000	400440000156	000150034000	006001005010	400000700644	146040000002	000520514000	007301205006
2113	400001510000	741040000072	010044074000	007306033433	400000750723	704040000157	000054070000	002000000002
2161	400001610121	240740000156	000054064000	007701412405	400000700161	740640000074	010054074000	007701406003
2209	400000740120	501040000030	012744004000	007302404405	400000750201	201040000046	030064004000	007701406003
2257	400001600221	402540000152	000054074000	015300005010	400000740120	500640000075	042224214000	007601004407
2305	400000710121	001140000074	102364514000	007401204405	400001250230	442140000167	012104264000	007101005405
2353	400000710221	501540000072	010050044000	007101206012	400001550000	640400000020	230644004000	016532701601
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2449	400001560000	540440000167	110065664000	000100005401	400001520000	640540000122	160144614000	007500605405
2497	400000750100	640640000156	000070104000	016001024413	400000701100	500440000157	042314004000	007401604006
2545	400001560000	600740000151	006404064000	016401621064	400000760140	400044004000	015100011414	015100011414
2593	400000730200	700740000155	000054074000	016101206411	400001630120	540740000166	028232154000	015700010410
2641	400000100000	300140000074	012060074000	007701207007	400000701124	604540000153	000050164000	007500606017
2689	400000270667	200040000152	000034074000	000500004005	400000050000	400540000126	010050030000	001000000001
2737	400001500000	400740000073	012064064000	007400606010	400001560000	400040000077	006044054000	007201207407
2785	400000750400	540440000156	000060114000	015700014420	400000720542	543340000071		
FILE 0001 REC 0006 CH 0480								
0001	000000004000	000025252007	243765250000	000724440000	57365007437	652401201607	243776660000	000000000000
0049	000000000000	000000000011	200000000000	001120000000	000000000000	000000000012	274500000000	001137340000
0097	000000123166	000000000000	000000000000	000430000000	000000023000	000000000003	240000000000	000230000000
0145	000000032400	000000000000	000000000000	000420000000	000000023000	000000000003	300000000000	000000000000
0193	000000073040	000000000000	000000000000	000324000000	000000042600	000000000000	000000000000	000000000000
0241	000000073120	000000000006	314000000000	000000000000	000000042400	000043600773	240500602330	577330554331
0289	046337722247	434770020000	202524764631	400323314631	434467753525	243700000012	314000000000	001122140000
0337	000000052100	000000000003	200000000000	000424000000	000000000011	241000000000	003200000000	003200000000
0385	330007742060	60266114012	245000406111	401224560040	611140122456	00406114012	245000406000	001030000041
0433	000000112200	004100000011	250000410000	000120000000	000000262400	074200000024	203610700000	002431212120
* FILE 0001 REC 0007 CF 2472								
0001	000000100000	046400000020	000000154000	015600004406	400000700221	401240000164	012045754000	015500606005
0045	400001630200	552040000154	000124124000	000500006005	400001500160	541240000034	072444004000	007402616024
0097	400001650127	250540000073	036274414000	015400004404	400000770422	301540000110	000110100000	002000600002
0145	000000200000	000040000155	000040224000	016712222032	400001500000	340640000156	000043044000	012604256047
0193	400000770140	400440000156	000050074000	015700005007	400001601426	460440000152	000130104000	007301004005
0241	400001560002	001740000050	012050044000	015100004414	400001610533	526640000163	010104244000	015300005410
0289	400000540623	505140000075	014044064000	007732070470	400000700121	200540000071	146645144000	007301003404

047655

11/01/76 - 12/31/76

Pioneer 16

Pulse Height

DUMP OF TAPE D01

INPUT TAPE D01 ON MT4
DATA INPUT 09 FL 1 1 1

FILE	1	RECORD	1	LENGTH	480BYTES	005225252413	266500013232	541326660052	252524130000	000000000201
(3)	400000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(48)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(96)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(144)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(192)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(240)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(288)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(336)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(384)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(432)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000

FILE	1	RECORD	21852	LENGTH	1704BYTES	015200030433	400001640000	6407400000047	0120400004000	012102464502
(3)	000000010000	0323000000020	000000034000	000000034000	000000034000	015200030433	400001640000	6407400000047	0120400004000	012102464502
(48)	000001520041	601040000123	026454064000	000064034000	000064034000	015200005405	400001550020	4405400000075	0120302640000	0157002040005
(96)	000001510000	501340000153	004034044000	004034044000	004034044000	015500403404	400000761166	3502400000071	0362203140000	015200010414
(144)	00000340463	200040000156	004050064000	004050064000	004050064000	016000140404	400000730060	3404400000164	0363221040000	0036860430000
(192)	00000700221	341100000020	000000000000	000000000000	000000000000	003000000000	4000001510000	5004400000164	0140400340000	015500024062
(240)	00000770100	640740000161	016124254000	016124254000	016124254000	007503224447	4000001570005	0037400000032	0624340040000	0073001611014
(288)	00000550100	500240000156	000064034000	000064034000	000064034000	016003020537	400000124500	0000400000075	0060300640000	016600712262
(336)	000001670121	442240000071	010054074000	010054074000	007401004404	007401004404	400000750201	3421400000151	0000540740000	007304024032
(384)	0000070161	300740000157	000130164000	000130164000	015100003603	015100003603	400001520040	3014400000154	0040401040000	015100004413
(432)	000001520020	500640000154	000400064000	000400064000	007602412017	007602412017	400000760140	7606400000152	0000440540000	015500012410
(480)	000001570000	300540000167	252657614000	252657614000	015100060600	015100060600	400000730060	3403400000075	0221341640000	016703631175
(528)	00000710321	441740000152	000114154000	000114154000	015400001142	015400001142	400000760141	5015340000160	0663646400000	015200007411
(576)	000001540000	500440000156	000040104000	000040104000	007002003406	007002003406	400001520000	4406400000154	0001342140000	0155000411010
(624)	000001570000	440540000072	034124264000	034124264000	003413065400	003413065400	400001550000	4003400000127	0465012540000	0151006054005
(672)	00000730120	741340000155	002040054000	002040054000	012701051411	012701051411	400001510040	5003000000020	0000000500000	0020000000002
(720)	000001530020	500540000154	002040064000	002040064000	016601204400	016601204400	400001600100	3404400000151	0041440540000	0154002034005
(768)	000001550000	400740000161	036104064000	036104064000	015200010007	015200010007	400001630161	1414400000155	0040400340000	007703213421
(816)	000001510040	341040000153	000034034000	000034034000	007600605006	007600605006	400000700100	3007400000010	4260000040000	007201004406
(864)	00000740100	440740000071	014050044000	014050044000	007201003405	007201003405	400001540040	3007400000075	0342141140000	015000003407
(912)	000000710343	603640000044	347134014000	347134014000	015500003004	015500003004	400001570001	4016400000161	0161041340000	016301010014
(960)	000001550020	300440000157	004034044000	004034044000	003106035400	003106035400	400001520001	0406400000164	0242142340000	015600604403
(1008)	00000305514	000040000151	000034044000	000034044000	003510663000	003510663000	400001200470	2503400000072	0100400540000	0163010054005
(1056)	000001510002	405340000153	000034064000	000034064000	015500022423	015500022423	400000760121	3004400000020	4110000040000	0154000406425
(1104)	000001560000	500640000031	331010004000	331010004000	003211261400	003211261400	400000740100	4404400000076	0100601040000	0047022034000
(1152)	000001520060	400540000074	042260304000	042260304000	012602662443	012602662443	400000470120	4001400000151	0020441000000	0020000000002
(1200)	000002000000	000440000073	030170254000	030170254000	015500011405	015500011405	400000700060	5003400000073	0060400640000	0155000076445
(1248)	00000370624	000040000150	000434054000	000434054000	015200031422	015200031422	400000450121	0402400000077	0221101540000	0152000204004
(1296)	000001530000	640540000167	016461774000	016461774000	016100614577	016100614577	400000730140	7414400000035	1506700040000	007607042471
(1344)	00000102260	000040000163	006040064000	006040064000	011400205012	011400205012	400001560000	6402400000152	0060401140000	0074020060007
(1392)	000001560001	000740000150	006034204000	006034204000	002136730000	002136730000	400001550040	4006400000152	0002042640000	0153000034004
(1440)	00000750042	643240000077	016124104000	016124104000	016101614422	016101614422	400001540040	5005400000075	0201000540000	007601205410
(1488)	000001500040	240440000122	0704000274000	0704000274000	015400403404	015400403404	400001570000	5404400000070	0342643440000	0032110474000
(1536)	000001530001	541140000006	0001300254000	0001300254000	007701011006	007701011006	400001630120	702040000155	0060540440000	015700006003
(1584)	000001500001	241340000152	002634454000	002634454000	015500003405	015500003405	400001570000	5004400000152	0020440640000	007501010011
(1632)	000001560000	400340000070	014074064000	014074064000	015200043452	015200043452	400000731066	2122400000150	0040340640000	0151000011406
(1680)	000001230524	604740000155	002044034000	002044034000	0153000004406	0153000004406				

FILE	INPUT RECS.	DATA RECORDS	MAX. SIZE	READ ERROR	SUMMARY	PERM ZERO B	SHORT	UNDEF.	INPUT RETRIES	#RECS. TOTAL#
1	21852	21853	3060	0	30	0	0	0	30	31

DUMP STOPPED AFTER FILE 1

OF PERMANENT READ ERRORS 0

EOJ

0-17417

Pioneer 10

RATE DATA

72-617A-02C

292-365

10/19/72 - 12/31/72

FILE 0001 REC 0001 CH 3240	0001 366400120001	100000000000	000000000000	000000000000	172700032275	341270611003	10036604663	103130036712
	0045 611150112134	004061115011	213400401727	000621273412	641620062131	544272702006	213341215034	506521273105
	0097 513610062134	223374733006	21312375203C	400621502540	426410062132	355417270006	212734126416	200621315442
	0145 727C0062133	412150345006	212731055136	100621342233	747330062131	237520304006	215026404264	100621323554
	0193 62611C313003	660462631031	300367060000	001120400040	000000112040	004000000011	204000400000	001120400040
	0241 000000112040	004004556776	337704356515	377235271172	700000000000	000000000000	000000002724	377623645411
	0285 546017772310	352055504777	236325563304	777634150716	750607763661	631315426776	311434736233	477620231160
	0337 737C27763165	460500000000	000000000000	000000000000	000000000000	000000000000	000000004265	477526370445
	0385 662237733343	113700000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
	0433 000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
	0481 000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
	0529 000000000000	000044775770	370173131027	577333115362	251660002076	032766535774	350563363203	577531154405
	0577 00737372047	164316640746	233167470014	275523745214	313000112070	073445200006	420011253554	000324634107
	0625 000000313003	671300000000	000000003664	001200011000	000000000000	000000000000	000006201727	00032753412
	0673 64631C313003	671264662031	300370251156	401122600061	115640112260	006175341006	227360502274	306623024467
	0721 432470062274	722761115006	227500406763	500622406517	473310062210	375727024006	223212176662	100621777371
	0769 75341C062273	605027433006	230244674324	700622747227	611150062275	004067635006	224065174733	100622103757
	0817 70240C062232	121766621006	227773716263	103130036706	626620313003	702400050011	234000620000	001123400062
	0865 000000112340	006200000011	234000620000	001123400062	313627762560	500417516772	332346771751	677033234677
	0913 175167703323	467707266776	333130311457	777637660475	700237763227	415103066776	257563155030	577521071376
	0961 364577762236	234623242776	204744056162	577626167125	341247743073	531113217774	347716200000	000000000000
	1005 000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
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	1105 667017732777	001300000000	000000000000	000000000000	000000000000	000000000000	000000006434	777032021341
	1153 000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	2245326220430	777327110752
	1201 504067742525	243610330775	362675110007	373720471643	166407462331	674700141755	237452140401	101121353603
	1249 452000064200	112535540003	246341070000	003130037026	003130037026	000036640012	000110000000	000000000000
	1297 000000000000	062017270003	227534126466	2031300	647020313003	714061115011	226000406111	501122600000
	1345 111560062276	040630460006	227140207635	500622125176	121720062214	753401422006	226126014324	700622747227
	1393 560500062300	243621727006	227553411115	600622760406	304460062271	402076355006	221251761217	200622147534
	1441 014220062261	260143247006	227472275605	000623002436	217270062275	534162662031	300370246270	203130037134
	1485 000000112200	004000000011	220000400000	001122000000	000000112200	004000000011	220000401570	677627711234
	1537 065647733323	472706564771	332347270000	000000000000	024007762222	053574166776	351775117412	477625571144
	1585 716257772032	577646712776	3054032C4720	677625773311	514227763015	307221353776	223446660000	000000000000
	1633 547047752651	42217373773	223721020000	000000000000	000000000000	000054232775	330101330000	000000000000
	1681 000000000000	000000000000	000000005744	077333057116	000000000000	000000000000	000000000000	000000000000
	1725 716377723334	537457563772	324045640000	000000000000	000000000000	000000000000	000000000000	000000000000
	1777 000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000003205	677225252457
	1825 510667733070	701437501777	361615302047	177432525173	014627752707	063600073737	204716431664	074623316747
	1873 001427552374	521431300011	207007344520	000642001125	355400032463	410700000031	300371410000	000000000000
	1921 366400120001	100000000000	000000000000	000000000620	172700032275	341264702031	300371406472	203130037253
	1965 611150112260	004061115011	226000402601	000622172071	355440062217	767670651006	227556455605	000623002436
	2017 365600062276	702473716006	230032472601	000622772071	7270240062240	121726010006	221720713554	400622177676
	2065 706510062275	564556050006	230024363656	000622767024	737160062300	324726010006	227720712702	400622401217
	2113 627020313003	713462722031	300372520000	001123400040	000000112340	004000000011	234000400000	001123400040
	2161 000000112340	004065757777	221041500656	47733234727	000000000000	000000000000	000000002351	577626414500
	2205 465347763302	525750325777	340123277427	077735746654	010317773234	012571443776	323126062105	57763157404
	2257 636507762265	126000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
	2305 050767732331	236656053775	260703360000	000000000000	000000000000	000000000000	000000000000	000000000000
	2353 000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
	2401 000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
	2445 000000000000	000024532771	322031457740	477323542313	71707773745	566164671775	22762302453	277532603145
	2497 000737372047	164316640746	233167470014	175523745214	221520112217	214145200006	420011253554	000324634107
	2545 000000313003	725400000000	000000003664	001200011000	000000000000	000000000000	000006201727	000322753412
	2593 647220313003	725364743031	300373666111	501122600040	611150112260	004057065006	227715646010	100622760712
	2641 676350062276	651757065006	227715643656	000622767024	463140062217	463144264006	221363556010	100622460712
	2685 570650062277	156460101006	227607126763	500622766517	570650062277	156436500006	227670244631	400622174631
	2737 442640062213	635560101006	224607126272	203130037252	627430313003	736200000011	220000420000	001122000042
	2785 000000112200	004200000011	220000420000	001122000042	556177763744	534025027774	243655410656	477133234727
	2833 000000000000	000000102775	314221720422	777627262571	325667773100	03406243777	324757332662	677730743346
	2881 720017763434	275136674776	263523131664	377527036304	750277742120	363643614775	222466100000	000000000000
	2929 000000000000	000021402775	271264603227	477237335201	055117712144	335157326775	323533040000	000000000000
	2977 626177703455	671024122773	273054270000	000000000000	000000000000	000031312773	273543553472	077122360605
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1393	335130062266	142230446006	230540207432	400622416722	517670062210	570677371006	223343244223	3006222730101
1441	753410062301	605005075006	227736563351	300622661422	304460062305	402061146031	361161026117	603136116215
1485	000000112260	006000000011	226000600000	001122600060	000000112260	006000000011	226000606461	600123711221
1537	175167743323	467733573772	243655170000	000000000000	126020032222	015135127001	210547336617	500122701531
1585	733150012370	431677446001	337166726535	300133531302	272220036006	154647057001	231231553057	577427210256
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