512

PIONEER 10 & 11
15 MIN. AVG JUPITER AND SATURN ENCOUNTER
73-019A-12A,12B
72-012A-12A

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

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1. INTRODUCTION:

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

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

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

2. ERRATA/CHANGE LOG:

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

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

Version	Date	Person	Page	Description of Change
01				
02				

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

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

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

4. CATALOG MATERIALS:

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

b. Core Catalog Materials

PIONEER 10

15 MIN. AVERAGED JUPITER ENCOUUNTER

72-012A-12A PSFP-00221

This data set has been restored. There was originally 1 binary 9-Track, 1600 BPI tape. There is one restored tape. The DR tape is a 3480 cartridge and the DS tape is 9-track, 6250 BPI. The tape was created on an IBM 360 computer. The DR and DS number along with the corresponding D number and the time spans are as follows:

DR#	DS#	D#	FILES	TIME SPAN
DR03224	DS03224	D45492	1-5	11/26/73 - 12/15/73

PIONEER 11

15 MIN. AVERAGED JUPITER ENCOUNTER

73-019A-12A PSFP-00077

THIS DATA SET HAS BEEN RESTORED. THERE WAS ORIGINALLY ONE 9-TRACK, 1600 BPI TAPE, WRITTEN IN BINARY. THERE IS ONE RESTORED TAPE. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE TAPE WAS CREATED ON AN IBM 360 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBER AND TIME SPAN IS AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR003177	DS003177	D45503	5	11/26/74 - 12/09/74

PIONEER 11

15 MIN. AVERAGED SATURN ENCOUNTER

73-019A-12B PSFP-00216

THIS DATA SET HAS BEEN RESTORED. THERE WAS ORIGINALLY ONE BINARY 9-TRACK, 1600 BPI TAPE. THERE IS ONE RESTORED TAPE. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE TAPE WAS CREATED ON AN IBM 3081 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBER AND THE TIME SPAN IS AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR03178	DS03178	D45504	4	08/31/79 - 09/04/79

REQ. AGENT	RAND NO.	ACQ. AGENT
DEW		WSC

PIONEER 10

PIONEER 11

73-019A-12A,12B

72-012A-12A

15 MIN. AVG. JUPITER AND SATURN ENCOUNTER

Each data set consists of one tape. The tapes are 1600 BPI, 9 track, and are multifiled. The tapes were created on an IBM-360 computer.

72-012A-12A

D#	C#	Files	Time Span
D-45492	C-21801	5	11/26/73-12/15/73
73-019A-12A			
D-45503	C-21799	5	11/26/74-12/09/74
73-019A-12B			
D-45504	C-21800	4	08/31/79-09/04/79

Pioneer 10 and 11
Goddard/U. New Hampshire Cosmic Ray Experiment
Jupiter and Saturn Encounter Data

Instrumentation

This experiment consists of a set of three solid-state telescopes, each designed to complement the others and to cover a broad range in energy, intensity and charge spectra. The three telescopes are shown schematically in the attached figure; they are the high-energy telescope (HET) and two low-energy telescopes (LET-I and LET-II). The HET and LET-I are designed primarily for measuring the relatively low fluxes of cosmic rays in interplanetary space. As such, their geometry factors are relatively large, and they cannot tolerate fluxes $\geq 2 \times 10^4/\mathrm{cm}^2$ s sr. Their usefulness is, therefore, limited to the outer regions of the Jovian magnetosphere ($\gtrsim$ 20 R_J). They are, however, high-resolution double dE/dX vs. E instruments that provide unambiguous particle identification and precise energy spectra, so that their contribution to the overall body of data is quite significant.

The LET-II telescope was designed to measure low-energy solar flare particles in interplanetary space and trapped particles in the Jovian magnetosphere. It has a relatively small geometry factor (1.5×10^{-2} cm^2 sr) and can readily measure fluxes up to $\sim 5 \times 10^5/\mathrm{cm}^2$ s sr. It is surrounded by a colimator and shield which will stop electrons up to ~ 4.5 MeV and protons up to ~ 40 MeV. The telescope employs a two-parameter analysis technique to separate electrons and protons. The front element SI has an electronic threshold that is set so that any electron penetrating to SII is below threshold and any proton penetrating to SII is above threshold. Selected counting rates in all three telescopes are divided into eight angular sectors to measure particle anisotropies.

A major effort has been devoted to understanding the response of all detector systems in the presence of intense particle fluxes. The onset of saturation in the LET and HET systems is abrupt and well defined. Negligible corrections are necessary prior to this saturation point.

There is significant overlap in the response functions of the three telecopes, and it was of great value to observe the consistency between flux measurements made with completely different detector systems. For example, the LET-I and LET-II proton data in the 0.5- to 2-MeV region are in excellent agreement. This finding is especially helpful in the outer Jovian magnetosphere where the nuclear component is small (1-10%) in comparison with electrons of the same energy. A complete description of this instrument has been published in the IEEE Transactions on Nuclear Science (Stilwell et al., 1975). The energy and charge ranges of each telescope are summarized in Table 1.

Since the Goddard/University of New Hampshire experiment was primarily designed as an interplanetary experiment, its telemetry assignment was minimal during the Jupiter and Saturn encounters. Consequently, individual pulse heights were sampled infrequently, and most of the results have to be based on rate data. This leaves some ambiguity about the type of particles responsible for the counts. This problem arises primarily in identifying protons vs. alpha particles and heavier ions. LET-I and LET-II respond differently because of the aluminized mylar foil in front of the LET-I detector. On this basis, it has been concluded (McDonald et al., 1979) that the nominal "proton channels" respond primarily to protons at Jupiter; however, some admixture of heavier ions is clearly present and the amount is time dependent. It is hoped that further analysis can narrow down the uncertainty.

Data have been included only for periods when the detectors operated in this design range. This excludes the inner magnetosphere. At Jupiter, the detectors were heavily saturated in this region, while at Saturn a very penetrating radiation prevented a clear identification of the type and energy of the particles responsible for our counts. Some of the published results from this experiment required extensive corrections for deadtime, accidental coincidences and anticoincidences (Trainor et al., 1974; McDonald and Trainor, 1976; McDonald et al., 1980). These corrections can be applied only on a case-by-case basis after careful study of the environment and many self-consistency checks. They cannot be applied on a systematic basis and we have no computer programs to do so. A special problem arose during the Pioneer 10 out pass from Jupiter. Radiation damage to the digital logics decreased the margins in these circuits. Although most of the data is good, certain bits failed to reset every now and then. For 15-minute averages, this effect can generally be ignored; but the user should be aware that a few points are off due to this problem. If a user is interested in data not included in this submission or has special questions, the experimenters will be glad to consider requests if the desired information can be extracted from the data.

Description of the Data

In the following rate definitions, individual detectors are identified by the same symbols as in the attched figure. Any subscripts refer to different trigger thresholds on that deector (SIIA is an annular guard detector in LET-II which is not labeled in the figure). Several detectors defining a rate are in coincidence unless a bar over the symbol indicates that the detector is in anticoincidence.

(1) A_2 Rate (Saturn only) gives the counting rate in a 2.5-mm thick Si detector with an area of 3.0 cm^2. Since the threshold is set at 2.01 MeV, it responds primarily to energetic electrons; however, the effective solid angle and detection efficiency are not well known. This rate is given for Saturn because the more desirable coincidence rates suffered from excessive accidentals (note A_2 is identified as A2 on tape).

(2) $A_1 \overline{A_2}\, B\, \overline{\mathrm{CI}}$ Rate (Jupiter only) gives the flux of electrons with a range between 2.5 and 5.0 mm of Si which deposit less than 2 MeV in the front detector. The electron energy falls into the range of about 1.8 to 3.2 MeV (on the tape this rate is identified as A1.¬A2.B.¬C1).

(3) $A_1 \overline{A_2}\, B\, \mathrm{CI}\, \overline{\mathrm{CII}}$ Rate (Jupiter only) gives the electron flux with a range of 5 to 10 mm Si; the approximate energy range of 3.2 to 5.1 MeV (the rate ID is
A1.¬A2.B.C1.¬C2).

(4) $A_1 \overline{A_2}\, B\, \mathrm{CI}\, \mathrm{CII}\, \overline{\mathrm{CIII}}$ Rate (Jupiter only) gives the electron flux with a range of 10 to 15 mm Si; the approximate electron energies are 5.1 to 8 MeV (the rate ID is A1.¬A2.B.C1.C2.¬C3).

(5) $\overline{\mathrm{SI}}\, \mathrm{SII}_5\, \overline{\mathrm{SIIA}}\, \overline{\mathrm{SIII}}$ Rate gives the flux of electrons in LET-II which do not trigger the 0.145 MeV threshold in the 50 γ front detector and trigger the 50 keV threshold in the 2.5-mm thick second detector. The anticoincidence requirement with the annular guard counter SIIA and rear detector SIII insures that the electrons stop in SII. Our calibrations show that the 50% efficiency points occur at 0.16 and 2.0 MeV. If the electron spectrum is hard, this rate will also respond to bremsstrahlung and electrons penetrating the collimator. The latter effect made the

dominant contribution in the inner Saturnian magnetosphere; otherwise, it is believed to be small but is difficult to evaluate (the rate ID is ¬S1.S2(5).¬S2(A).¬S3).

(6) $\overline{\mathrm{SI}}\ \mathrm{SII}_6\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$ Rate is equivalent to rate (5) but with a 0.35-MeV threshold in SII, corresponding to electron energies from 0.43 to 2.0 MeV (the rate ID is ¬S1.S2(6).¬S2(A).¬S3).

(7) $\overline{\mathrm{SI}}\ \mathrm{SII}_7\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$ Rate is equivalent to rate (5) but with a 0.7 MeV threshold in SII corresponding to electron energies from 0.8 to 2.0 MeV (the rate ID is ¬S1.S2(7).¬S2(A).¬S3).

(8) $\overline{\mathrm{SI}}\ \mathrm{SII}_8\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$ Rate is equivalent to rate (5) but with a 1.0-MeV threshold in SII corresponding to electron energies from 1.1 to 2.0 MeV (the rate ID is ¬S1.S2(8).¬S2(A).¬S3).

(9) DI_4 Rate gives the flux of protons and ions which penetrate a 0.53-mg/cm^2 aluminized mylar foil and deposits at least 0.60 (P-10) or 0.63 (P-11) MeV in detector DI of LET-I. (This rate is not given for the Saturn encounter because of substantial electron contamination.) For protons, this corresponds to energies from 0.84 to 15.1 MeV.

(10) DI_5 Rate is eqivalent to rate (9), but with a threshold in DI of 0.95 MeV corresponding to proton energies between 1.11 and 8.1 MeV.

(11) DI_6 Rate is equivalent to rate (9), but with a threshold in DI of 1.45 MeV corresponding to proton energies from 1.6 to 5.1 MeV.

(12) DI_7 Rate is equivalent to rate (9), but with a threshold energy in DI of 2.20 (P-10) or 2.05 (P-11) MeV corresponding to proton energies from 2.3 to 3.6 MeV and 2.1 to 3.8 MeV, respectively, for P-10 and P-11.

(13) $\mathrm{DI}\ \mathrm{DII}\ \mathrm{E}_2\ \overline{\mathrm{F}}$ Rate from LET-I gives the proton flux between 10.3 and 21 MeV for P-10 and between 11 and 21 MeV for P-11. A small correction has

been made for the contribution from alphas and heavier nuclei in the same energy/nucleus range (the rate ID is D1.D2.E2.¬F - D1.D2.∑ D.E4.¬F).

(14) SI_1-$\overline{SII}$-$\overline{SIIA}$-$\overline{SIII}$ Rate gives the flux of protons and heavier ions which stop in the 50γ-thick Si detector SI and deposits an energy between 0.16 and 2.6 MeV. This corresponds to proton energies between 0.20 and 2.15 MeV (P-10) or 2.17 MeV (P-11). Detector SI is shielded by only 0.12 mg/cm^2 of Al and is, therefore, relatively sensitive to low-energy ions. At Saturn, the ion contribution is negligible; however, it may be significant at Jupiter (the rate ID is S1(1).¬S2.¬S2)A).¬S3 - S1(4).¬S2.¬S2(A).¬S3).

(15) SI_6 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$ Rate is equivalent to rate (14) except that the threshold in SI is 0.47 (P-10) or 0.5 (P-11) MeV, this corresponds to proton energies of 0.50 to 2.15 and 0.53-2.17 MeV for P-10 and P-11, respectively (the rate ID is S1(6).¬S2.¬S2(A).¬S3 - S1(4).¬S2.¬S2(A).¬S3).

(16) SI_2 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$ Rate is equivalent to rate (14) except that the threshold is 0.74 (P-10) an 0.72 (P-11), this corresponds to proton energies of 0.76-2.15 MeV (P-10) and 0.74-2.17 MeV (P-11) (the rate ID is S1(2).¬S2.¬S2(A).¬S3 - S1(4).¬S2.¬S2(A).¬S3).

(17) SI_3 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$ Rate is equivalent to rate (14) except that the threshold is 1.2 MeV, corresponding to proton energies of 1.24 to 2.15 MeV (1.24-2.17, P-11) (the rate ID is S1(3).¬S2.¬S2(A).¬S3 - S1(4).¬S2.¬S2(A).¬S3).

(18) SI SII_1 $\overline{SIIA}$ $\overline{SIII}$ Rate gives the flux of protons between 3.13 and 14.8 MeV for Pioneer 10 (3.19-14.9 MeV, P-11) (the rate ID is S1.S2(1).¬S2(A).¬S3 - S1.S2(3).¬S2(A).¬S3).

(19) SI SII_2 $\overline{\text{SIIA}}$ $\overline{\text{SIII}}$ Rate is equivalent to rate (18) except for a higher threshold and covers protons from 5.65 to 14.8 MeV for P-10 (5.68 to 14.9 MeV for P-11) (The rate ID is S1.S2(2).¬S2(A).¬S3 - S1.S2(3).¬S2(A).¬S3).

Data Format

Time history of Pioneer Cosmic Ray Telescope data described above is being submitted on 9-track tapes recorded at 1600 BPI. Tape marked PIOJUF contains Pioneer-10 data, the one marked PIOJUG contains Pioneer-11 data for Jupiter encounter and tape marked PIOSAG contains Pioneer-11 data for the Saturn encounter. Averaging interval for all data is fifteen minutes.

PIOJUF and PIOJUG each have five files and PIOSAG has four files. Contents of PIOJUF, PIOJUG and PIOSAG are described in Tables 2 to 4, respectively. Each file consists of a number of Flux Time History (FTH) records. An FTH record contains a count of the number of data items (NBIN) whose time-history is included in the record, a count of the number of averaging intervals (NINT) included in the record and definitions of data items included and time-history data. Table 5 defines the structure of an FTH record in detail. These tapes were generated on an IBM System 360 computer; thus, a word consists of 32 bits, half-word 1 is the high order 16-bit field of the word and half-word 2 the low order half (bits 16-31, with the left-most or MSB numbered 0). Characters are represented in 8-bit EBCDIC bytes, real numbers are represented in the IBM single precision floating point format. Length (in words) of an FTH record is given by:

$$200 + (3 + 2 * \text{NBIN}) * \text{NINT}.$$

REFERENCES

McDonald, F.B., and J.H. Trainor, Observations of Energetic Jovian Electrons and Protons," in Jupiter, ed. T. Gehrels, Univ. Ariz. Press, 961, 1976.

McDonald, F.B., A.W. Schardt and J.H. Trainor, "Energetic Protons in the Jovian Magnetosphere," J. Geophys. Res. 84, 2579, 1979.

McDonald, F.B., A.W. Schardt and J.H. Trainor, "If You've Seen One Magnetosphere, You Haven't Seen Them All: Energetic Particle Observations in the Saturn Magnetosphere," J. Geophys. Res. 85, 5813, 1980.

Stilwell, D.E., R.M. Joyce, J.H. Trainor, H.P. White, G. Streeter and J. Bernstein, "Pioneer 10/11 and Helios A/B Cosmic Ray Instruments," IEEE Trans. Nucl. Sci. 22, 570, 1975.

Trainor, J.H., F.B. McDonald, B.J. Teegarden, W.R. Webber and E.C. Roelof, "Energetic Particles in the Jovian Magnetosphere," J. Geophys. Res. 79, 3600, 1974.

TABLE 1: Pioneer 10 and 11 Detectors Used during Planetary Encounters

Detector	Shielding	Energy Range (MeV)	Geometric Factor (cm^2 sr)	Comments
PROTONS:				
o LET I	0.53 mg/cm^2 Mylar			Several channels of protons and ions that exceed threshold in DI. The proton flux from rate agrees with pulse-height analyzed data.
DI only		0.84-15.1	1.13	
DI DII E_2 $\overline{F}$		10.3 -21 (P10) 11.0 -21 (P11)	0.155	
o LET II	0.120 Mg/cm^2 Al			
SI $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$		0.2 - 2.15 (P10) 0.2 - 2.17 (P11)	0.015	Several channels of protons and some heavier ion contributions.
SI SII $\overline{SIIA}$ $\overline{SIII}$		3.2 -14.8		Protons.
ELECTRONS:				
o HET				
A_1 $\overline{A_2}$ B $\overline{CI}$	2.5- 5 mm Si	1.8 - 3.2	0.22	Coincidence rates with good background rejection, but accidental coincidence problems at high counting rate.
A_1 $\overline{A_2}$ B CI $\overline{CII}$	5.0-10 mm Si	3.2 - 5.1		
A_1 $\overline{A_2}$ B CI CII $\overline{CIII}$	10 -15 mm Si	5.1 - 8		
o LET II				
SI SII $\overline{SIIA}$ $\overline{SIII}$		0.16- 2	0.015	Several electron channels. Some contamination from collimator penetration and bremsstrahlung.

Table 2. Contents of PIOJUF

FILE	RATES	TIME PERIOD
1	$\mathrm{A_1\ \overline{A_2}\ B\ \overline{CI}}$	11/26/73 00:00:00-12/01/73 18:00:00 AND
	$\mathrm{A_1\ \overline{A_2}\ B\ CI\ \overline{CII}}$	12/04/73 22:00:00-12/16/73 00:00:00
	$\mathrm{A_1\ \overline{A_2}\ B\ CI\ CII\ \overline{CIII}}$	
2	$\mathrm{\overline{SI}\ SII_5\ \overline{SIIA}\ \overline{SIII}}$	11/26/73 00:00:00-12/03/73 08:00:00 AND
	$\mathrm{\overline{SI}\ SII_6\ \overline{SIIA}\ \overline{SIII}}$	12/04/73 15:00:00-12/16/73 00:00:00
	$\mathrm{\overline{SI}\ SII_7\ \overline{SIIA}\ \overline{SIII}}$	
	$\mathrm{\overline{SI}\ SII_8\ \overline{SIIA}\ \overline{SIII}}$	
3	$\mathrm{DI_4}$	12/26/73 00:00:00-12/03/73 08:00:00 AND
	$\mathrm{DI_5}$	12/04/73 22:00:00-12/16/73 00:00:00
	$\mathrm{DI_6}$	
	$\mathrm{DI_7}$	
	$\mathrm{DI\ DII\ E_2\ \overline{F}}$	
4	$\mathrm{SI_1\ \overline{SII}\ \overline{SIIA}\ \overline{SIII}}$	11/26/73 00:00:00-12/03/73 08:00:00 AND
	$\mathrm{SI_6\ \overline{SII}\ \overline{SIIA}\ \overline{SIII}}$	12/04/73 15:00:00-12/16/73 00:00:00
	$\mathrm{SI_2\ \overline{SII}\ \overline{SIIA}\ \overline{SIII}}$	
5	$\mathrm{SI_3\ \overline{SII}\ \overline{SIIA}\ \overline{SIII}}$	11/26/73 00:00:00-12/03/73 08:00:00 AND
	$\mathrm{SI\ SII_1\ \overline{SIIA}\ \overline{SIII}}$	12/04/73 15:00:00-12/16/73 00:00:00
	$\mathrm{SI\ SII_2\ \overline{SIIA}\ \overline{SIII}}$	

Table 3. Contents of PIOJUG

FILE	RATES	TIME PERIOD
1	$A_1\ \overline{A}_2\ B\ \overline{\mathrm{CI}}$	11/26/74 00:00:00-12/02/74 16:00:00 AND
	$A_1\ \overline{A}_2\ B\ \mathrm{CI}\ \overline{\mathrm{CII}}$	12/04/74 22:00:00-12/10/74 00:00:00
	$A_1\ \overline{A}_2\ B\ \mathrm{CI}\ \mathrm{CII}\ \overline{\mathrm{CIII}}$	
2	$\overline{\mathrm{SI}}\ \mathrm{SII}_5\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	11/26/74 00:00:00-12/02/74 18:00:00 AND
	$\overline{\mathrm{SI}}\ \mathrm{SII}_6\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	12/03/74 09:00:00-12/10/74 00:00:00
	$\overline{\mathrm{SI}}\ \mathrm{SII}_7\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	
	$\overline{\mathrm{SI}}\ \mathrm{SII}_8\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	
3	DI_4	11/26/74 00:00:00-12/02/74 16:00:00 AND
	DI_5	12/03/74 08:00:00-12/10/74 00:00:00
	DI_6	
	DI_7	
	$\mathrm{DI}\ \mathrm{DII}\ E_2\ \overline{F}$	
4	$\mathrm{SI}_1\ \overline{\mathrm{SII}}\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	11/26/74 00:00:00-12/02/74 18:00:00 AND
	$\mathrm{SI}_6\ \overline{\mathrm{SII}}\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	12/03/74 08:00:00-12/10/74 00:00:00
	$\mathrm{SI}_2\ \overline{\mathrm{SII}}\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	
5	$\mathrm{SI}_3\ \overline{\mathrm{SII}}\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	11/26/74 00:00:00-12/02/74 18:00:00 AND
	$\mathrm{SI}\ \mathrm{SII}_1\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	12/03/74 08:00:00-12/10/74 00:00:00
	$\mathrm{SI}\ \mathrm{SII}_2\ \overline{\mathrm{SIIA}}\ \overline{\mathrm{SIII}}$	

Table 4. Contents of PIOSAG

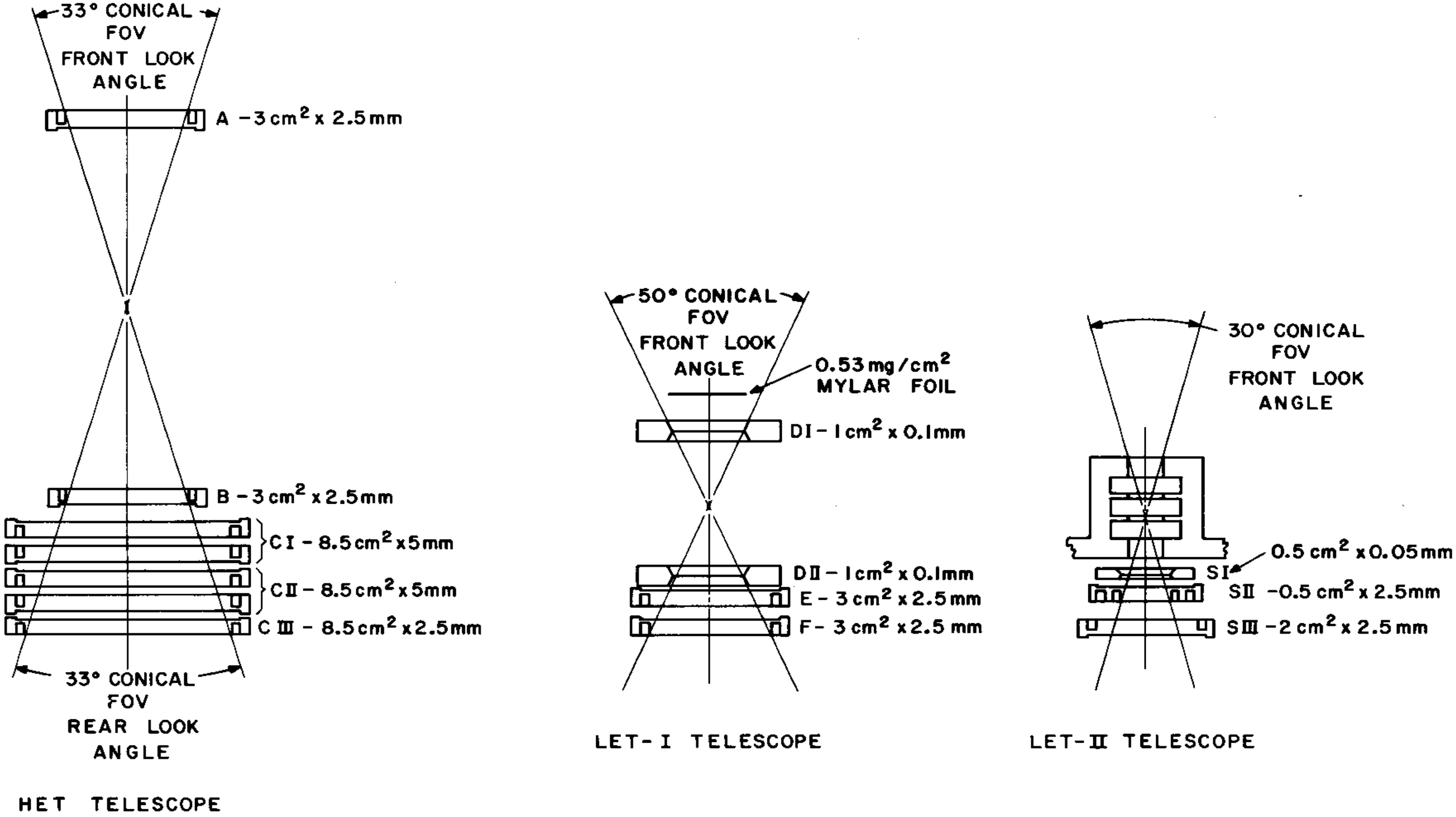
FILE	RATES	TIME PERIOD
1	A_2	8/31/79 00:00:00-9/01/79 13:30:00 AND
	$\overline{SI}$ SII_5 $\overline{SIIA}$ $\overline{SIII}$	9/01/70 19:00:00-9/04/79 12:00:00
	$\overline{SI}$ SII_6 $\overline{SIIA}$ $\overline{SIII}$	
	$\overline{SI}$ SII_7 $\overline{SIIA}$ $\overline{SIII}$	
	$\overline{SI}$ SII_8 $\overline{SIIA}$ $\overline{SIII}$	
2	DI_5	8/31/79 00:00:00-9/01/79 13:30:00 AND
	DI_6	9/01/70 19:00:00-9/04/79 12:00:00
	DI_7	
	DI DII E_2 $\overline{F}$	
3	SI_1 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	8/31/79 00:00:00-9/01/79 13:30:00 AND
	SI_6 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	9/01/79 19:00:00-9/04/79 12:00:00
	SI_2 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	
4	SI_3 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	8/31/79 00:00:00-9/01/79 13:30:00 AND
	SI SII_1 $\overline{SIIA}$ $\overline{SIII}$	9/01/79 19:00:00-9/04/79 12:00:00
	SI SII_2 $\overline{SIIA}$ $\overline{SIII}$	

Table 5. STRUCTURE OF FLUX TIME-HISTORY RECORD

WORD	HALFWORD	TYPE	DESCRIPTION
1	1	Integer	Number of data items contained in the record (NBIN).
3-35	2	Integer	Number of averaging intervals (NINT) contained in the record.
3-35		character	132-character title identifies satellite and gives the start time of first averaging interval and last averaging interval in the record.
36-68		character	132-character description of first data item.
69-101		character	132-character description of second data item, if NBIN $\geq$ 2. Otherwise, not used.
102-134		character	132-character description of third data item, if NBIN $\geq$ 3. Otherwise, not used.
135-167		character	132-character description of fourth data item, if NBIN $\geq$ 4. Otherwise, not used.
168-200		character	132-character description of fifth data item, if NBIN $\geq$ 5. Otherwise, not used.
		NBIN $\leq$ 5	
201-			NINT Averaging Interval Entries (AIE). The structure of an AIE is shown in Table 5.
		NBIN = 6	
201-233		character	132-character description of sixth data item.
234-			NINT Averaging Interval Entries.

Table 6. STRUCTURE OF AVERAGING INTERVAL ENTRY

WORD	HALFWORD	TYPE	DESCRIPTION	
1	1	Integer	2-digit year	
	2	Integer	month of year	
2	1	Integer	day of month	Start time
	2	Integer	hour of day	of averaging interval
3	1	Integer	minute of hour	
	2	Integer	second of minute	
4-(3+2*NBIN)		Real	NBIN FLUX entries. Each FLUX entry is two words long. If the second word of the entry is -1.0, data for this item is not available; otherwise the first word is the value of flux and the second word contains the associated statistical error.	



PIONEER F & G DETECTOR COMPLEMENT
COSMIC RAY ENERGY SPECTRA

Pioneer 11 D45504

8/31/79- 9/4/79

DUMP OF TAPE DO-6

INPUT TAPE DO-6 ON MT2

DATA INPUT H9 NF 4 FL 1 1 1 SR 4 1 1 SR 4 LAST 1

FILE 1 RECORD 1 LENGTH 5792 BYTES

PIONEERS FLUX FOR THE PERIOD

8/31/79 00:00:00

9/4/79 05:30:00

(0)	00050060	77777777	D7C9D6D5	C5C5D960	E2404040	40C6D3E4	E740C6D6	D940E3C8	C540D7C5	D9C9D6C4
(40)	4040F861	F3F161F7	F94040F0	7A40F07A	40F040E3	D64040F8	61F3F161	F7F940F2	F37AF4F5	7A40F040
(80)	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(120)	40404040	40404040	40404040	40404040	40404040	C1407E40	4DD9F5C2	406140F1	4BF0F0F0	C540F0F0
(160)	5D404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(200)	D9F5C240	7E40C1F2	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(240)	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	C2407E40	4DE2D9F2
(280)	C54DF95D	406140F1	4BF5F0F0	C560F0F2	5D404040	40404040	40404040	40404040	40404040	40404040
(320)	40404040	40404040	40404040	E2D9F2C5	4DF95D40	7E405FE2	F14BE2F2	4DF55D4B	5FE2F24D	C15D4B5F
(360)	E2F34DF9	5D404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(400)	40404040	C3407E40	4DE2D9F2	C64DF95D	406140F1	4BF5F0F0	C560F0F2	5D404040	40404040	40404040
(440)	40404040	40404040	40404040	40404040	40404040	40404040	E2D9F2C6	4DF95D40	7E405FE2	F14BE2F2
(480)	4DF65D4B	5FE2F24D	C15D4B5F	E2F34DF9	5D404040	40404040	40404040	40404040	40404040	40404040
(520)	40404040	40404040	40404040	40404040	C4407E40	4DE2D9F2	C74DF95D	406140F1	4BF5F0F0	C560F0F2
(560)	5D404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	E2D9F2C7
(600)	4DF95D40	7E405FE2	F14BE2F2	4DF75D4B	5FE2F24D	C15D4B5F	E2F34DF9	5D404040	40404040	40404040
(640)	40404040	40404040	40404040	40404040	40404040	40404040	40404040	C5407E40	4DE2D9F2	C84DF95D
(680)	406140F1	4BF5F0F0	C560F0F2	5D404040	40404040	40404040	40404040	40404040	40404040	40404040
(720)	40404040	40404040	E2D9F2C8	4DF95D40	7E405FE2	F14BE2F2	4DF85D4B	5FE2F24D	C15D4B5F	E2F34DF9
(760)	5D404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(800)	004F0008	001F0000	00000000	41AFB425	4028D0DA	42D4512B	421182F9	4245541D	41A01B86	42268410
(840)	417B4034	42190902	414E8E91	004F0008	001F0000	000F0000	41B30505	402A64C2	42F6FBAA	4212E324
(880)	424F7061	41AB6285	421FC68D	416C64AF	421BB842	41801614	004F0008	001F0000	001E0000	41AA9249
(920)	40407CE8	4310BDC6	421D0DB8	42506BE0	41EEF12B	42262179	41B7F31F	42160F23	418566B0	004F0008
(960)	001F0000	002D0000	41B12492	402E784E	42F4793C	42151E8A	425A206A	4211ACDF	422998C9	419CDF17
(1000)	421DB64C	417ABF01	004F0008	001F0001	00000000	41A971C7	4031172B	42C61404	422C4AA8	4251EEBE
(1040)	4210117C	4224F97F	41D128EE	42196B91	417AA1B1	004F0008	001F0001	000F0000	41A7364D	4032EF3A
(1080)	42FF406E	421C5C7E	424B1AEC	41C06C5C	42258D6F	41A6A49A	41FC19B5	4170BE25	004F0008	001F0001
(1120)	001E0000	41AB2492	4040988A	431765E2	422998AF	42326B8A	41C9AE2B	424553CE	421882CB	421081AE
(1160)	41761C83	004F0008	001F0001	002D0000	41A9DDDD	404C2535	43103FAB	4226C164	425E1687	421595D3
(1200)	4210BC04	4165334C	42147BC1	415AE5B2	004F0008	001F0002	00000000	41B1097B	4028F86C	42F07BCC
(1240)	41D2DACD	424DFEA3	418AA83F	42249710	415EF89E	421215F1	4144349D	004F0008	001F0002	000F0000
(1280)	41A40E38	40304DB6	42F2A65F	421A79AB	4256A925	41B30172	421FC68D	416C64AF	42191E7A	41506186
(1320)	004F0008	001F0002	001E0000	41A19E79	403EC5D7	4313B552	421A8E49	424B1ACF	41EBAB00	4219FF6F
(1360)	418AA7A5	4217B7A6	41693F8F	004F0008	001F0002	002D0000	41B4BDA1	403A8B38	42CFFBA1	4222A9F0
(1400)	422E37DF	4212DE57	423B6C82	4218427B	00000000	C1100000	004F0008	001F0003	00000000	41B7C71C
(1440)	403B089D	43135AAC	4225D4F4	423C15AD	4210AA1C	4224B40D	41C3C048	42171C09	4196F366	004F0008
(1480)	001F0003	000F0000	41C22D82	402F00D9	43124059	4218C4DB	424A47E7	41D8FD08	42247D1E	41B89EBC
(1520)	4211550D	415C7047	004F0008	001F0003	001E0000	41BDAAAA	4059F53F	43115505	423E025F	424AA951
(1560)	4213F43F	42279DC3	4213CEE1	4222AA0B	42115505	004F0008	001F0003	002D0000	41C18787	402C1402
(1600)	4312988F	421D5126	4242B65F	41957735	421E54CD	4169E6B2	421DB656	41610A31	004F0008	001F0004
(1640)	00000000	41BE4BDA	402A7A19	431360D8	42114750	424F7061	41AB6285	421ED00D	415726C7	4219090B
(1680)	414E8EAA	004F0008	001F0004	000F0000	41BE6666	40284EE3	43120DE7	42146D16	42598CA5	419492CE
(1720)	421FC68E	415880B5	41B8E048	415C7021	004F0008	001F0004	001E0000	41C271C7	402AEFFA	4313C4FC
(1760)	42155FD5	4256A925	41B30172	42258D8E	41A6A524	42124B88	4143279A	004F0008	001F0004	002D0000
(1800)	41C0D097	402AC1D2	4310BAF7	42100E01	4252CF24	418EDF65	4226FF50	417814A5	4219FF8B	41620BA1
(1840)	004F0008	001F0005	00000000	41C44444	4028ECA7	43129890	4214BAF2	4263A8E9	41BFF64F	42277A91
(1880)	4162A617	41A1C443	413D245E	004F0008	001F0005	000F0000	41C22AAA	402D826C	42FFA630	4213373C
(1920)	424857C7	4188693B	422CC653	418DAB1E	41C84857	41378C64	004F0008	001F0005	001E0000	41BD5555
(1960)	402CF081	4311833F	42141E0E	42455419	41E26D11	42268410	417B4034	421E54CD	4169E6B2	004F0008
(2000)	001F0005	002D0000	00000000	C1100000	00000000	C1100000	00000000	C1100000	00000000	C1100000
(2040)	00000000	C1100000	004F0008	001F0006	00000000	00000000	C1100000	00000000	C1100000	00000000
(2080)	C1100000	00000000	C1100000	00000000	C1100000	004F0008	001F0006	000F0000	41A9C30C	402D7DD4
(2120)	43102D3A	4213F80A	42464A9D	4183A1C6	42311B93	41BE90DF	42171C09	4182BA27	004F0008	001F0006
(2160)	001E0000	41AAB425	40283B1B	4311DFAF	421452E0	424DFE9B	41F0293A	422A3334	41682F89	4212C6C8
(2200)	41535296	004F0008	001F0006	002D0000	41AA25ED	40282A55	4311A20F	42107B6D	424EF523	418B82B0
(2240)	4213BDCA	415F4873	421CE30C	41675954	004F0008	001F0007	00000000	41AA5555	40261FFC	42FCC2AB
(2280)	42131B5D	424C8CE1	41A83D68	421CE30C	41675954	4219FF8B	41500DC5	004F0008	001F0007	000F0000

(3720)	001F0014	000F0000	41AA5ED0	412049C3	41BBA783	411E7109	415E71C5	4116E7F8	004F0008	001F0014
(3760)	001E0000	41B92F6A	4125097B	418FEA53	41216E06	413D6029	41185C92	004F0008	001F0014	002D0000
(3800)	417A38E3	411F190E	41A8E38E	4126BEEA	41971C72	4124A65A	004F0008	001F0015	00000000	41855555
(3840)	411C53F0	416225ED	411C446D	414484BC	411812F6	004F0008	001F0015	000F0000	4158E38C	411791F9
(3880)	41698E3B	411B5468	412B5556	4115B022	004F0008	001F0015	001E0000	41780001	41198809	416BC71D
(3920)	411A3921	4139C71C	41143ED3	004F0008	001F0015	002D0000	4177FFFD	4118BEE0	416638E2	41155097
(3960)	4139C71D	41100651	004F0008	001F0016	00000000	417FC71E	411BC71C	415D5554	41193D55	4130E38F
(4000)	4114F6E3	004F0008	001F0016	000F0000	41471C70	4119EA53	4176E38C	411B5FF6	41238E38	4110EC87
(4040)	004F0008	001F0016	001E0000	413EF682	41174704	417FC71F	411EEE99	411DA130	4116875C	004F0008
(4080)	001F0016	002D0000	4158E38F	4118D85F	4180E38C	4117EF1E	413E38E4	4110A12D	004F0008	001F0017
(4120)	00000000	415D5554	4118BEE0	4139C71C	41143ED3	411DFFFF	40FFC717	004F0008	001F0017	000F0000
(4160)	4161C71B	411857DD	416F1C6F	41171810	4127FFFF	40EBD951	004F0008	001F0017	001E0000	4158E38F
(4200)	4118D85F	4157C71B	41151C71	4138AAAB	41118875	004F0008	001F0017	002D0000	4130E38E	4112532D
(4240)	414B8E38	41135F75	412C71C6	40F6560D						

FILE 4 RECORD 5 LENGTH 2348BYTES

(0)	0003002B)	77777777	D7C9D6D5	C5C5D960	E2404040	40C6D3E4	E740C6D6	D940E3C8	C540D7C5	D9C9D6C4
(40)	4040F961	40F361F7	F940F1F9	7A40F07A	40F040E3	D64040F9	6140F461	F7F94040	F57AF3F0	7A40F040
(80)	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(120)	40404040	40404040	40404040	40404040	40404040	C1407E40	4DD9F1F5	C3406140	F14BF5F0	F0C560F0
(160)	F25D4060	404DD9F1	F5C44061	40F14BF5	F0F0C560	F0F25D40	40404040	40404040	40404040	40404040
(200)	D9F1F5C3	407E40E2	F14DF35D	4B5FE2F2	4B5FE2F2	4DC15D4B	5FE2F340	5040D9F1	F5C440E2	F14DF45D
(240)	4B5FE2F2	4B5FE2F2	4DC15D4B	5FE2F340	40404040	40404040	40404040	40404040	C2407E40	4DD9F1F6
(280)	C1406140	F14BF5F0	F0C560F0	F25D4060	404DD9F1	F6C34061	40F14BF5	F0F0C560	F0F25D40	40404040
(320)	40404040	40404040	40404040	D9F1F6C1	407E40E2	F14BE2F2	4DF15D4B	5FE2F24D	C15D4B5F	E2F34050
(360)	40D9F1F6	C340E2F1	4BE2F24D	F35D4B5F	E2F24DC1	5D4B5FE2	F3404040	40404040	40404040	40404040
(400)	40404040	C3407E40	4DD9F1F6	C2406140	F14BF5F0	F0C560F0	F25D4060	404DD9F1	F6C34061	40F14BF5
(440)	F0F0C560	F0F25D40	40404040	40404040	40404040	40404040	D9F1F6C2	407E40E2	F14BE2F2	4DF25D4B
(480)	5FE2F24D	C15D4B5F	E2F34050	40D9F1F6	C340E2F1	4BE2F24D	F35D4B5F	E2F24DC1	5D4B5FE2	F3404040
(520)	40404040	40404040	40404040	40404040	77777777	77777777	77777777	77777777	77777777	77777777
(560)	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777
(600)	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777
(640)	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777
(680)	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777
(720)	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777
(760)	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777
(800)	004F0009	00030013	00000000	4130E38D	41100651	411CE38D	40E50CF8	411CE38D	40E50CF8	004F0009
(840)	00030013	000F0000	4142AAAB	41113698	41238E38	40E0DF82	411F1C71	40D55555	004F0009	00030013
(880)	001E0000	413D1C70	4116E7F8	4126E38E	40F1CDCF	41151C71	40C38E39	004F0009	00030013	002D0000
(920)	412C71C6	40F6560D	413E38E3	4116A98D	412D8E38	41113FC4	004F0009	00030014	00000000	413438E4
(960)	4110F5DB	411638E2	40BC246F	4111C71B	40AE2F9B	004F0009	00030014	000F0000	412C71C7	41119176
(1000)	413E38E4	4110A12D	411AAAAA	40AE2F9A	004F0009	00030014	001E0000	4130E38E	40EBD951	41238E38
(1040)	40E0DF82	408E38E5	408E38E3	004F0009	00030014	002D0000	4139C71C	41135F75	4143C71B	4114849A
(1080)	4111C71B	40D93F7E	004F0009	00030015	00000000	412C71C7	41119176	41280000	40D55555	408E38E4
(1120)	406490F8	004F0009	00030015	000F0000	4127FFFF	41100651	412C71C7	40FB6A70	4126E38E	40EB2D8C
(1160)	004F0009	00030015	001E0000	41320000	4110AAAB	4110AAAB	4110AAAA	40B1C720	40FB6A6E	004F0009
(1200)	00030015	002D0000	4126E38E	40EB2D8C	411E0000	40DBE622	40C38E32	40A7B716	004F0009	00030016
(1240)	00000000	4127FFFF	40EBD951	412C71C7	40E0DF84	40D55557	407B2B06	004F0009	00030016	000F0000
(1280)	40ED097D	40A79C4A	41378E39	4118D85F	411638E3	40FB6A70	004F0009	00030016	001E0000	00000000
(1320)	40B1C71C	41215555	41133EB9	411DA12F	40ED097D	004F0009	00030016	002D0000	00000000	C1100000
(1360)	00000000	C1100000	00000000	C1100000	004F0009	00030017	00000000	00000000	C1100000	411638E3
(1400)	411638E4	00000000	C1100000	004F0009	00030017	000F0000	4110AAAA	40C6C2F7	41215555	40FB6A6F
(1440)	411638E3	40D9BB80	004F0009	00030017	001E0000	4125097B	40CD47B5	4058E384	40B90976	4058E384
(1480)	40B90976	004F0009	00030017	002D0000	412C71C7	40FB6A70	41215555	40B1C71C	40B1C71C	4066A3D9
(1520)	004F0009	00040000	00000000	411BC71C	40C6C2F9	4110AAAA	40C6C2F7	41215555	40FB6A6F	004F0009
(1560)	00040000	000F0000	4125097B	40BB64EB	412C71C7	40FB6A70	4058E38E	4058E38D	004F0009	00040000
(1600)	001E0000	412C71C7	41133EB8	412C71C7	41105AE9	403B4261	40ACC4DA	004F0009	00040000	002D0000
(1640)	414838E3	411407E5	411BC71C	40C6C2F9	411BC71C	40C6C2F9	004F0009	00040001	00000000	4142AAAA
(1680)	4110903F	41320000	4110AAAB	411638E3	40FB6A70	004F0009	00040001	000F0000	4110AAAB	4110AAAA
(1720)	413B425F	40ED097D	40B1C71C	4066A3D9	004F0009	00040001	001E0000	41378E39	4114C978	41378E39
(1760)	41133EB8	41215555	40FB6A6F	004F0009	00040001	002D0000	41465ECD	411284BC	4125097B	4110903F
(1800)	403B425E	40971501	004F0009	00040002	00000000	414838E3	411407E5	412C71C7	40FB6A70	4110AAAA
(1840)	4099F5C6	004F0009	00040002	000F0000	4163FFFD	4115E951	4128BDA1	411024E2	411284BD	40BB64EC
(1880)	004F0009	00040002	001E0000	419071C9	411D65B1	4158E38E	411638E3	411BC71C	40C6C2F9	004F0009
(1920)	00040002	002D0000	41855555	411C53F0	41535555	4112F9D0	411812F6	40BDB8E2	004F0009	00040003
(1960)	00000000	417A38E4	4117B71C	41535556	4115843E	412C71C7	40FB6A70	004F0009	00040003	000F0000