PIONEER 10 & 11

6 HR. AVG INTERPLANETARY DATA

73-019A-12C

72-012A-12B

Table of Contents

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

72-012A-12B SPHE-00709

6 HOUR AVERAGE INTERPLANETARY DATA

THESE DATA SETS CONTAIN 1 TAPE EACH. THE DS TAPE IS 6250 BPI, 9-TRACK, BINARY WITH ONE FILE OF DATA, WHILE THE DR IS 3480, CREATED ON THE ALPHA COMPUTER SYSTEM. THE DS AND DR NUMBERS ALONG WITH THIER TIMESPAN IS AS FOLLOWS:

D#	C#	TIMESPANS
DR-03737	DS-03737	03/06/72-06/30/92(Pioneer 10)

**** This tape replace the tape that were once restored****

PIONEER 11

6-HR AVERAGED INTERPLANETARY DATA

73-019A-12C SPHE-00596

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 the time span is as follows:

DR#	DS#	DD#	FILES	TIME SPAN
DR03738	DS03738	D58152	1	04/02/73 - 12/31/90

PIONEER 10

PIONEER 11

72-012A-12B

73-019A-12C

6 HOUR AVERAGED INTERPLANETARY DATA

These data sets contain 1 tape each. The tapes are 1600 BPI, 9-track, Binary with one file of data. The tapes were created on an IBM 360 computer. The D and C numbers with their corresponding time spans are as follows:

72-012A-12B

D#	C#	TIME SPAN
D-58151	C-22396	03/06/72 - 12/31/90

73-019A-12C

D#	C#	TIME SPAN
D-58152	C-22397	04/02/73 - 12/31/90

The Pioneer 10/11 Cosmic Ray Experiment of Goddard Space Flight Center/University of New Hampshire

The Goddard/University of New Hampshire cosmic-ray experiments on Pioneers 10 and 11 and the Goddard cosmic-ray experiment on Helios-1 and -2 are essentially identical. A schematic drawing of the detector systems is shown in Figure 1 and their parameters are summarized in Table 1. The High-energy Telescope (HET) is used to determine the helium energy spectrum between 20 and 500 MeV per nucleon and the proton spectrum between 20 and 56 MeV and 120 and 300 MeV. The particle trajectory for the HET is defined by the A and B detectors. Stopping particles in this telescope are identified by the additional requirement that there is no signal from the CIII detector. This stopping particle mode covers the range from 20 to 56 MeV per nucleon for both protons and α-particles. For penetrating α-particles and protons with energies greater than 56 MeV per nucleon, the HET becomes a triple dE/dx device. In this case, the energy is determined by the energy loss measured in the 1 cm CI + CII stack of solid-state detectors and the pulse-heights measured in B and CIII are both required to be in an interval that is consistent with a given particle of this energy. This threefold multiparameter analysis reduces the background level of spurious events to a negligible level. It is estimated that the absolute uncertainty in the α flux is $\sim$ 12% at 400 MeV and $\sim$ 7% at energies below 200 MeV. The operation of the LET-I telescope (Fig. 1) is similar to the stopping particle mode of the HET except that the thin 100 μm dE/dx devices (DI and DII; Fig. 1) permit multiparameter measurements to be made from 3.2 to 21.6 MeV per nucleon for protons and helium nuclei. The multiparameter measurements used in this study reduce to a negligible amount any corrections due to the presence of large quantities of radioactive material in the Pioneer 10 and 11 power supplies.

The total radiation damage produced by energetic electrons and protons incident on the Goddard/University of New Hampshire experiment during the passage of Pioneer 10 through the Jovian magnetosphere was sufficiently high that some four electronic failures were induced by radiation damage effects. The most serious of these was the loss of the E detector information from the LET-1 telescope. It was found that the complete 3-21 MeV per nucleon energy range of this detector could be obtained for stopping α-particles by using a two-parameter analysis of DI vs. DII with only a small increase in background ($\leq$ 7%). The other failures occurred at several points in the data system but in such a manner that either redundant information is available or--in one case--a correction factor (which generally was on the order of 3-5%) could be derived from the available data.

ELECTRONICS

Pulses from each detector are amplified and shaped in a preamp/post-amplifier, and applied to one or more pulse-height discriminators which produce logic pulses of uniform amplitude and width for each input pulse exceeding the threshold. These logical pulses are used to form the many coincidence-anticoincidence conditions corresponding to various particle energies and types. Both single detector rates and coincidence rates are counted in 24-bit binary counters. Sixty-one such rates are monitored in the Pioneer instrument and 83 rates are monitored in Helios. The Pioneer rates are shown in Table 2; Helios rate data includes additional LET-II rates and the 2-8-keV X-ray rates. Certain coincidence conditions may initiate pulse-height analysis of selected events. The pulse amplitudes of three selected detector outputs are digitized by three 10-bit analog-to-digital converters (ADC).

Linear Circuits

The pulse-height analyzer and coincidence system electronics for the Pioneer and Helios missions were accomplished using nearly identical designs. The same building blocks contained in Pioneer were used, with only slight modification, in the Helios systems. Each experiment contained three mechanically- and electrically-separate subsystems, one for each telescope. Since Helios contains two identical LET-II's, this subsystem is exactly double its Pioneer counterpart.

The preamps use an FET input in a conventional cascade configuration. After shaping with single integration and differentiation time constants of 0.6 μsec, the pulses are differentially coupled to noise-cancelling linear buffers to eliminate common mode noise pickup. CMRR was measured to be ~ 50 db at the frequencies of interest.

Each of the HET, LET-I and LET-II subsystems operates in a similar fashion. Figure 2 shows the HET system. Each noise-cancelling buffer is followed by another buffer to boost the incoming signal to a level suitable for pulse-height discrimination. The nominal low-level signal to be discriminated corresponds to Channel 1 of the PHA, or 5 millivolts. These low-level discriminators are stable with $\pm$ 0.5% total drift from -20°C to +40°C. A lower power version of discriminator is also used where $\pm$ 2% stability is tolerable. Three of eight discriminators in HET are of this variety.

Two linear summing amplifiers are used in HET. The first linearly adds the CI and CII buffered inputs. This sum is presented to the PHA for analysis under the proper conditions, and, hence, must exceed the linearity requirements of the PHA. The second summing amplifier adds the signals A and B with a weighted output from the first summing amplifier

(A + B + 1.8 [CI+CII]). This signal is fed into two discriminators for use in the coincidence logic to separate protons from electrons and to separate $Z \geq 2$ particles from protons.

In the HET system there are 15 basic coincidence equations, none of which has less than 5 terms. Six additional singles rates are produced. These are multiplexed into the 10 rate outputs. Four of the coincidence conditions are used in the PHA control logic. Inputs to these equations are both pulse and level. The pulse inputs are derived from the discriminators while the levels are derived from the data system to control commutation of the rates.

To insure that coincidence timing is not affected by "discriminator walk" when two pulse inputs are coincident, an active delay has been incorporated. Since the B input appears in all multi-pulse equations, it is delayed 1.5 microseconds using a monostable circuit. The remaining 7 discriminators are followed by 3.0 microsecond monostables. The delayed edge of the B monostable is fed to an edge-coupled high-speed gate, whose other "anding" inputs are 3.0 microsecond-wide pulses or levels. This method insures that if all inputs are coincident with 1.5 microseconds, the proper equation timing will be fulfilled.

The coincidence system also selects events for pulse-height analysis. There are four coincidence conditions which can initiate analysis; two contain the term CIII (penetrating particles) in which case BI, (CI+CII)and CIII are analyzed. The other two conditions contain $\overline{\text{CIII}}$ (stopping particles) for which A, B and (CI+CII) are analyzed. Priority selection of event types allows higher priority events to be analyzed and stored in place of lower priority events. The relative priority of the four event types is rotated so that each type has highest priority for one-fourth the time. This emphasizes the occurrence of relatively rare events in the data.

The PHA system contains four delay lines and linear gates, three height-to-time converters, a gated current source and a gated clock. When an acceptable event has occurred, "open" signals are sent to the proper linear gates (B, [CI+CII] and A or CIII). The input signals are delayed 3.5 microseconds to compensate for delays in the coincidence and priority logic matrices.

The HTC is of the Wilkinson discharge type, the usual choice for nuclear spectrometers because of its excellent differential linearity characteristics. The gated constant current source remains on between events and is turned off slightly after opening of the linear gate. This minimizes the effect of noise spikes associated with opening of the linear gate, and improves the low-channel resolution and linearity significantly. The PHA's are able to resolve Channel 1 (5 millivolts) and produce a total differential non-linearity of $\pm$ 1.5% over the top 99% of full scale (5 volts or Channel 1024). The digitizing clock is 500 kHz, providing a 2-millisecond conversion time for full-scale inputs. The three 1024 channel PHA's used in HET require less than 30 milliwatts of power.

The PHA system outputs three gated pulse trains which are counted in binary counters. Additional tag bits are stored with each three-parameter PHA quantity which identifies the event type, priority, sector ID of spacecraft spin and a CII range indicator to further characterize each event.

The LET-I and -II systems shown in Figures 3 and 4 operate very similarly to HET. The linear buffers, discriminators and coincidence matrix use the same circuits as in HET. LET-I PHA data contains digitized values of the DI, DII and E detector pulses, and tag bits provide sector ID, priority and event type information. A two-level priority system is used, and both event types are allotted equal time as highest priority events. The coincidence rates detected by LET-I and -II are also listed in Table 2.

Data Systems

All rate data is counted in "Mars bugs," a custom PMOS LSI chip developed at GSFC. A single chip contains a 24-bit binary counter, a quasi-log compressor to convert the 24-bit binary number to a 5-bit characteristic and a 7-bit mantissa and a 12-bit storage buffer to hold the data for readout. PHA data are also counted and stored in PMOS IC's. The Pioneer and Helios PMOS data systems are quite similar in design. All spacecraft interface, command processing logic, control of the accumulation intervals and formatting of Rate and PHA data into the available telemetry space is accomplished in a spacecraft-unique Interface Data System (IDS) using low-power T^2L circuits. Discreet components were used where necessary to comply with spacecraft interface impedances and levels.

The telemetry formatting was designed to keep the rate data cycle time between 3 and 7 minutes for as many bit rates and formats as possible which were most likely to be used during a nominal mission, or not more than one-half of the science telemetry available to each experiment. PHA data is inverleaved with rate data and can process up to 3 events per second on available bit rates. PHA telemetry is always equally divided between HET and LET. Because of the wide variation in bit rate (2048/sec to 16/sec) on Pioneer, a complete data cycle for all rates becomes as long as ~ 1.7 hours.

The experiment acquires spin-sectored data. A sectored rate synchronizer generates suitable control signals to insure that the sectored rate accumulators are live for an exact integral number of spacecraft revolutions. The number of revolutions is determined by the bit rate in use and varies from 1 rev/readout to 31 rev/readouts (spin rate $\simeq$ 5 RPM), and between 53 rev/readouts to 2231 rev/readouts on Helios (spin rate ~ 60 RPM). Sectors are 45^{o} wide on both spacecraft.

Commandable features include (a) disabling the sector synchronizers in the event of failure and (b) turning on internally-generated test pulses to stimulate the electronics for pre-flight and in-flight checkout.

This hardware is an example of an extremely lightweight, low-power electronic design for severe environmental conditions. The experiment qualified in vibration at 50 g's and was subjected to almost 5×10^5 rads in Jovian radiation belts. It has already been operating in flight for 9 years, and we expect to be able to receive data from Pioneer 10 until the telemetry signal is lost. Weight was a major problem, especially on Pioneer. The experiment weighed 2.2 kg for the sensor systems, the electronics system consisting of the charge-sensitive preamplifiers, shaping amplifiers, thresholds and logic circuitry, priority control system, six 10-bit pulse-height analyzers, an extensive data system and the low-voltage and detector bias dc-dc converters. Power consumption was 2.4 watts. The Pioneer experiment includes more than 8,000 discrete electronic components per system and more than 40,000 transistors--largely in medium- and large-scale integrated circuits.

Experiment performance has been excellent. Figure 5 shows the LET PHA data for the August 1972 event. This is a plot of the average dE/dx value ([DI + DII]/2) vs. the E value with a consistency check applied to the DI and DII values. The chemical elements are readily identified, and isotopic separation, even for the Magnesium line, is possible.

TIME PERIOD COVERED

The data for the planetary encounters has been excluded from these tapes. The following time periods were, therefore, excluded from the interplanetary data for the spacecraft/encounter indicated:

Pioneer 10/Jupiter: 11/26/73, 00:00, to 12/16/73, 00:00

Pioneer 11/Jupiter: 11/26/74, 00:00, to 12/10/74, 00:00

Pioneer 11/Saturn: 08/31/79, 00:00, to 09/05/79, 00:00

This data will be supplied on their own tapes complete with similar documentation concerning their content.

The time periods included on these tapes are as follows:

Pioneer 10: 03/06/72, 00:00, to 01/01/81, 00:00

Pioneer 11: 04/02/73, 00:00, to 01/01/81, 00:00

Table 3 lists the particles and their energy range to which the different rates are sensitive.

DATA FORMAT

Time-history of Pioneer Cosmic-ray Telescope data described above is being submitted on 9-track tapes recorded at 1600 BPI. The tape marked PIOEPF contains Pioneer 10 data and the one marked PIOEPG contains Pioneer 11 data.

Each tape contains one file of data. The file consists of a number of frames. A frame covers a period of one month or less and consists of eight Flux Time-history (FTH) records. Data items contained in the FTH records in each frame are described in Table 3. 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, definitions of data items included and time-history data. Table 4 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 byte, 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 * NBIN) * NINT	NBIN $\leq$ 5
233 + (3 + 2 * 6) * NINT	NBIN = 6

Thus, FTH records have a maximum length of 1812 words (7248 bytes).

Table 1

Summary of the Characteristics of Each
of the Telescopes and Their Component Detectors
(One of Each Carried on Board Pioneer)

TELESCOPE	HET	LET-I	LET-II
Geometrical Factor (cm^2-ster)	.22	.155	.015
Detectors (thickness × area)	A,B: 2.5mm×3cm^2	DI,DII: 100μ×1cm^2	SI: 50μ×50mm^2
	C's: 2.5mm×8.5cm^2	E,F: 2.5mm×3cm^2	SII: 2.5mm×50mm^2
			SIIA: 2.5mm×50mm^2
			SIII: 2.5mm×200mm^2

Table 2

RATE	COINCIDENCE	PARTICLE/ENERGY[+]
*R1	$(A_2K_1+A_1CI)B\overline{CIII}$	Protons, Z≥2: 20-56 MeV/nuc
		Electrons: 2-8 MeV
*R2	$A_1\overline{A_2}B$ CIII	Protons: >230 MeV
*	$A_1BK_2\overline{CIII}$	Z≥2: 20-56 MeV/nuc
*R3	A_2B CIII	Protons, 56-220 MeV; Alphas, >56 MeV
	$A_2BK_2\overline{CI}$	Alphas: 20-30 MeV/nuc
R4	$A_2BK_2C\overline{CII}$	Alphas: 30-45 MeV/nuc
	A_1	
R5	$A_2BK_2CCII\overline{CIII}$	Alphas: 45-56 MeV/nuc
	A_2	
R6	$A_1\overline{A_2}B\overline{CI}$	Electrons: 2-4 MeV
	$A_1\overline{A_2}BC\overline{CII}$	Electrons: 4-6 MeV
R7	$A_1\overline{A_2}BCCII\overline{CIII}$	Electrons: 6-8 MeV
	$A_2BK_1\overline{CI}$	Protons, Alphas: 20-30 MeV/nuc
R8	$A_2BK_1C\overline{CII}$	Protons, Alphas: 30-45 MeV/nuc
	$A_2BK_1CCII\overline{CIII}$	Protons, Alphas: 45-65 MeV/nuc
R9	B	
	CI	
	CII	
	CIII	
R10	DI_1	
	.	
	.	
	.	
	DI_8	
*R11	$DIDII\overline{F}$	Protons, Z≥2: 3-21 MeV/nuc
*	$DIDII\Sigma D\overline{F}$	Z≥2: 3-21 MeV/nuc
R12	$DIDIIE_1\overline{F}$	Protons, Z≥2: 6-21 MeV/nuc
	$DIDII\Sigma DE_3\overline{F}$	Z≥2: 6-21 MeV/nuc
R13	$DIDIIE_2\overline{F}$	Protons, Z≥2: 10-21 MeV/nuc
	$DIDII\Sigma DE_4\overline{F}$	Z≥2: 10-21 MeV/nuc

Table 2, Continued:

RATE	COINCIDENCE	PARTICLE/ENERGY+
R14	DI	
	DII	
	E_1	
	F	
	SI	
	SII	
	SIII	
	SIIA	
R15	SI_1 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	Protons: .15-2.1 MeV
	SI_2 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	Protons: .72-2.1 MeV
	SI_3 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	Protons: 1.2-2.1 MeV
	SI_4 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	Alphas: .6-2.1 MeV/nuc
R16	SI SII_1 $\overline{SIIA}$ $\overline{SIII}$	Protons: 2.1-21 MeV
	SI SII_2 $\overline{SIIA}$ $\overline{SIII}$	Protons: 5.7-21 MeV
	SI SII_3 $\overline{SIIA}$ $\overline{SIII}$	Protons: 15.1-21.2 MeV
	SI SII_4 $\overline{SIIA}$ $\overline{SIII}$	Alphas: 6-21.2 MeV/nuc
SR1	$A_1\overline{A_2}B$ CI $\overline{CIII}$	Electrons: 4-8 MeV
	$A_2BK_1\overline{CIII}$	Protons, Z≥2: 20-56 MeV/nuc
	DIDII$\overline{F}$	Protons, Z≥2: 3-21 MeV/nuc
	DIDII$E_1\overline{F}$	Protons, Z≥2: 6-21 MeV/nuc
SR2	SI_5 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	Protons: .12-2.1 MeV
	SI_6 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	Protons: .52-2.1 MeV
	SI_7 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	Protons: 1.5-2.1 MeV
	SI_8 $\overline{SII}$ $\overline{SIIA}$ $\overline{SIII}$	Protons: 1.5-2.1 MeV
	$\overline{SI}$ SII_5 $\overline{SIIA}$ $\overline{SIII}$	Electrons: .12-2 MeV
	$\overline{SI}$ SII_6 $\overline{SIIA}$ $\overline{SIII}$	Electrons: .40-2 MeV
	$\overline{SI}$ SII_7 $\overline{SIIA}$ $\overline{SIII}$	Electrons: .68-2 MeV
	$\overline{SI}$ SII_8 $\overline{SIIA}$ $\overline{SIII}$	Electrons: .97-2 MeV

+Design goals, actual parameters for the submitted rates are listed in Table 3.

*Designates PHA conditions.

K = A+B + 1.8(CI+CII)

ΣD = DI+DII +1.6E

Table 3. Data Content of a Frame on PIOEPF and PIOEPG

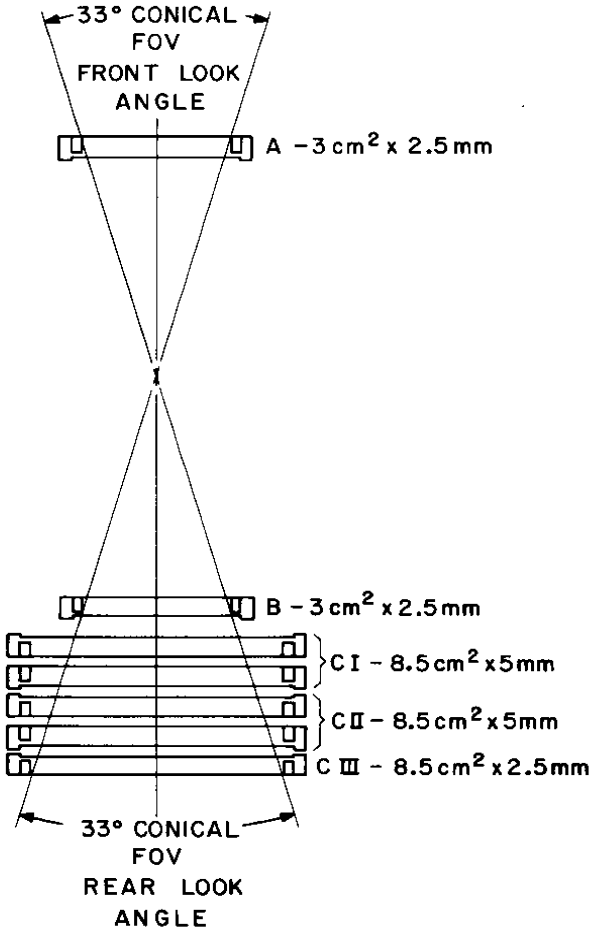
FTH RECORD # WITHIN A FRAME	DATA ITEM
1	112.0 -400.0 MeV Proton
	30.0 - 56.0 MeV Proton
	3.44- 5.2 MeV Proton
	112.7 -400.0 MeV Alpha
	30.0 - 56.0 MeV Alpha
2	10.0 - 21.0 MeV Alpha
	3.44- 5.2 MeV Alpha
	2.0 - 6.0 MeV Electron
	R1 2-8 MeV electrons, 20-56 MeV protons
	R2A >180 (P-10), >220 (P-11) MeV protons, >8 MeV electrons
3	R2B All $Z \geq 2$ ions with a range < 1.5 cm in Si
	R3A 56-180 (P-10)-220 (P-11) MeV protons plus > 56 MeV alphas
	R9A 0.22 MeV threshold on Det. B
	R9B 1.0 MeV threshold on Det. CI
	R9C 1.1 MeV threshold on Det. CII
4	R9D 0.23 MeV threshold on Det. CIII
	R10A 0.13 MeV threshold on Det. DI
	R10B 0.60-33 MeV protons, > 0.39 MeV alphas
	R10C 0.72-20 MeV protons, > 0.42 MeV alphas
	R10D 0.84-14.2 (P-10), 0.82-15.1 (P-11) MeV protons > 0.46 MeV alphas
5	R10E 1.1-8.1 MeV protons, > 0.53 MeV alphas
	R10F 1.60-5.1 (P-10), 1.56-5.1 (P-11) MeV protons, > 0.63 MeV alphas
	R10G 2.29-3.8 (P-10), 2.13-3.8 (P-11) MeV protons, > 0.75 MeV alphas
	R10H > 0.99 MeV alphas with proton contamination
	R11A 3.2-21 MeV protons and alphas
6	R11B 3.2-21 MeV alphas and heavier ions
	R12A 5.6-21 MeV protons and alphas
	R12B 5.6-21 MeV alphas and heavier ions
	R15A 0.20-2.15 (P-10), 0.20-2.17 (P-11) MeV protons, alpha and ion contamination
	R15B 0.74-2.15 (P-10), 0.72-2.17 (P-11) MeV protons, 0.22-2.05 MeV alphas
7	R15C 1.24-2.15 (P-10), -2.17 (P-11) MeV protons, 0.34-2.05 MeV alphas
	R15D 0.69-2.05 (P-10), 0.66-2.05 (P-11) MeV alphas + ions
	R16A 3.2-20.6 MeV protons, plus some alphas
	R16B 5.7-20.6 MeV protons, plus some alphas
	R16C 14.9-20.6 MeV protons, plus some alphas
8	R16D 6.6-20.6 MeV alphas

Table 4. STRUCTURE OF FLUX TIME-HISTORY RECORD

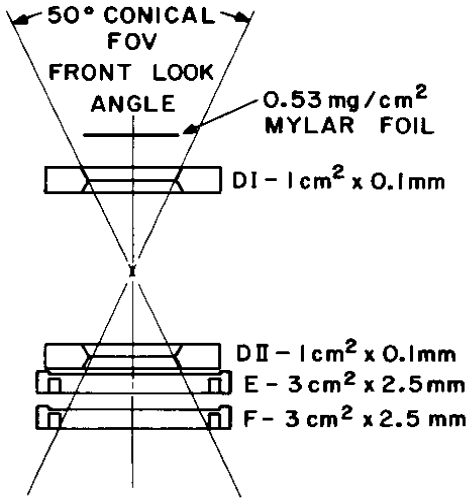
WORD	HALFWORD	TYPE	DESCRIPTION
1	1	Integer	Number of data items contained in the record (NBIN).
3-35	2	Integer	Number of averaging intervals (NINT) contained in the record.
3-35		character	132-character title identifies satellite and gives the start time of first averaging interval and last averaging 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 as defined in Table 5.

Table 5. STRUCTURE OF AVERAGING INTERVAL ENTRY

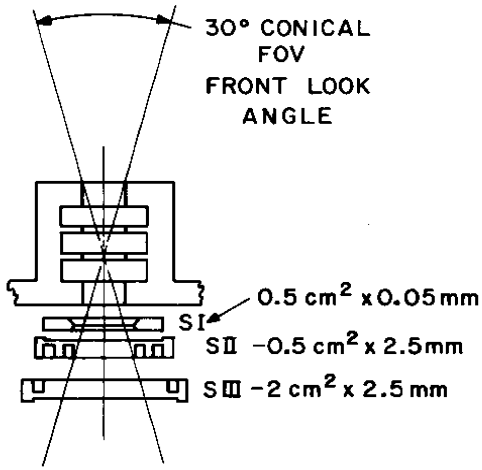
WORD	HALFWORD	TYPE	DESCRIPTION	
1	1	Integer	2-digit year	
	2	Integer	month of year	
2	1	Integer	day of month	Start time of averaging interval
	2	Integer	hour of day	
3	1	Integer	minute of hour	
	2	Integer	second of minute	
4-(3+2*NBIN)		Real	NBIN FLUX entries. Each FLUX entry is two words long. If the 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.	



HET TELESCOPE



LET-I TELESCOPE



LET-II TELESCOPE

PIONEER F & G DETECTOR COMPLEMENT
COSMIC RAY ENERGY SPECTRA

Figure 1. HET, LET-I and LET-II Telescope Assemblies.

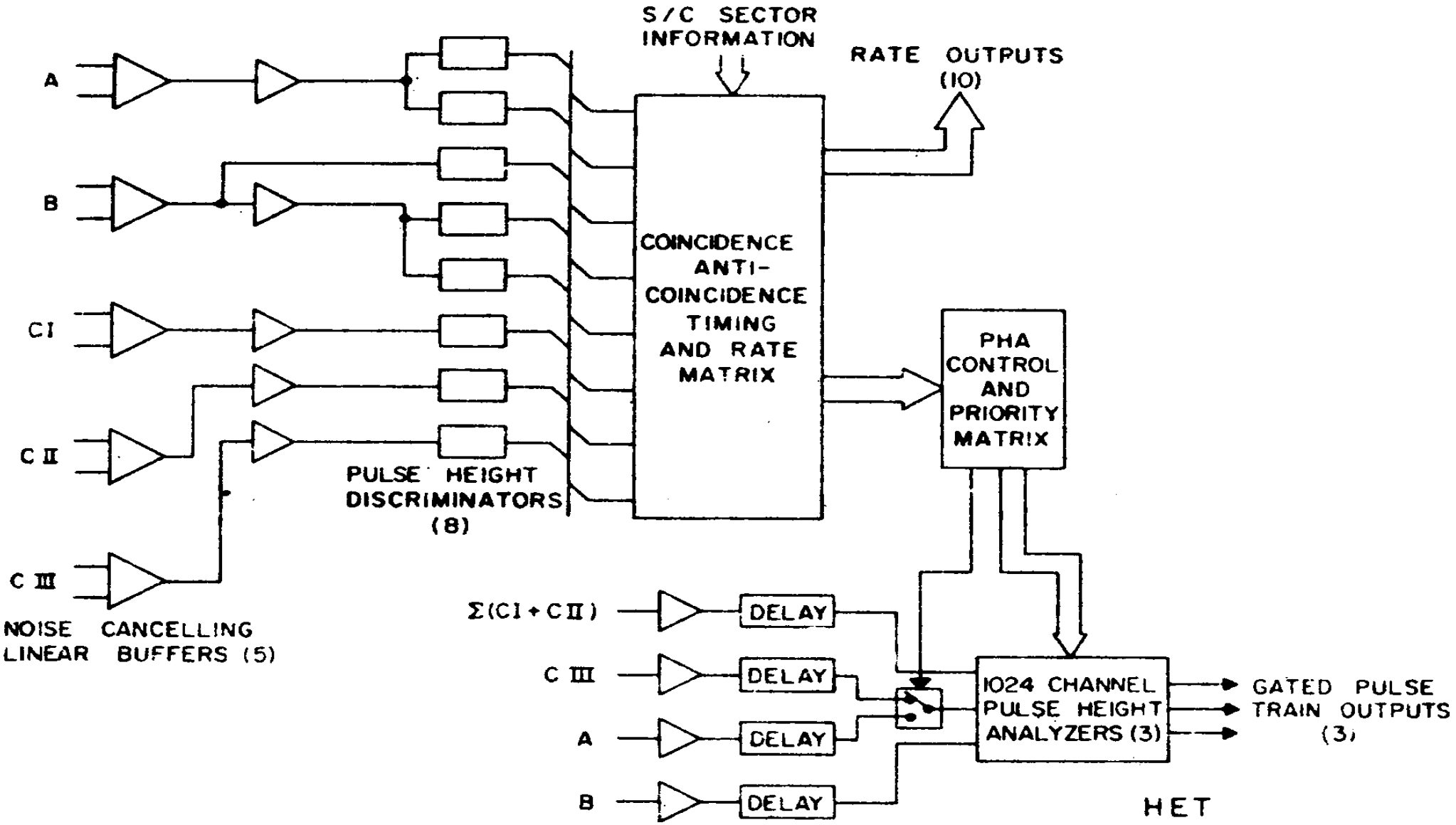


Figure 2. HET Block Diagram.

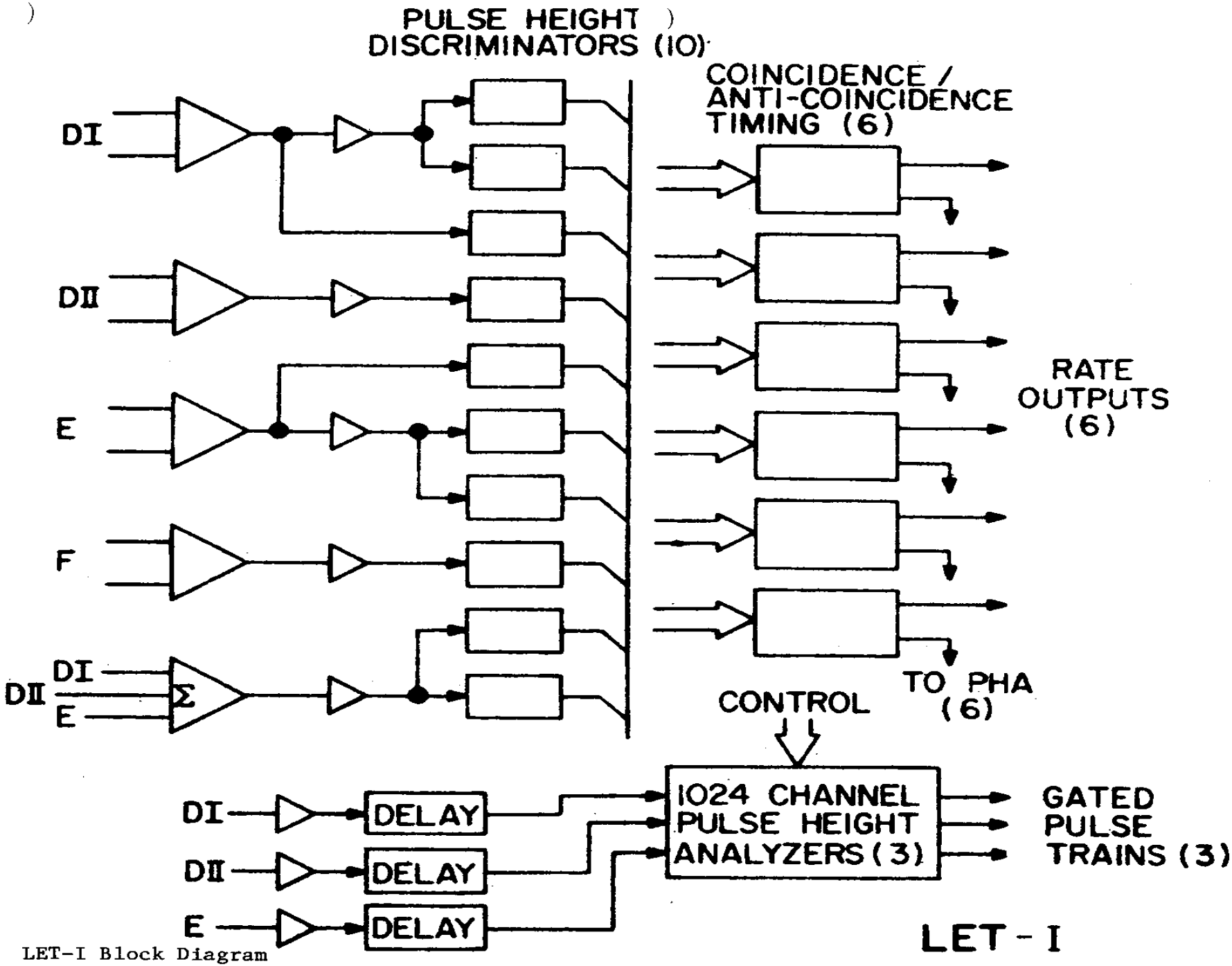


Figure 3. LET-I Block Diagram

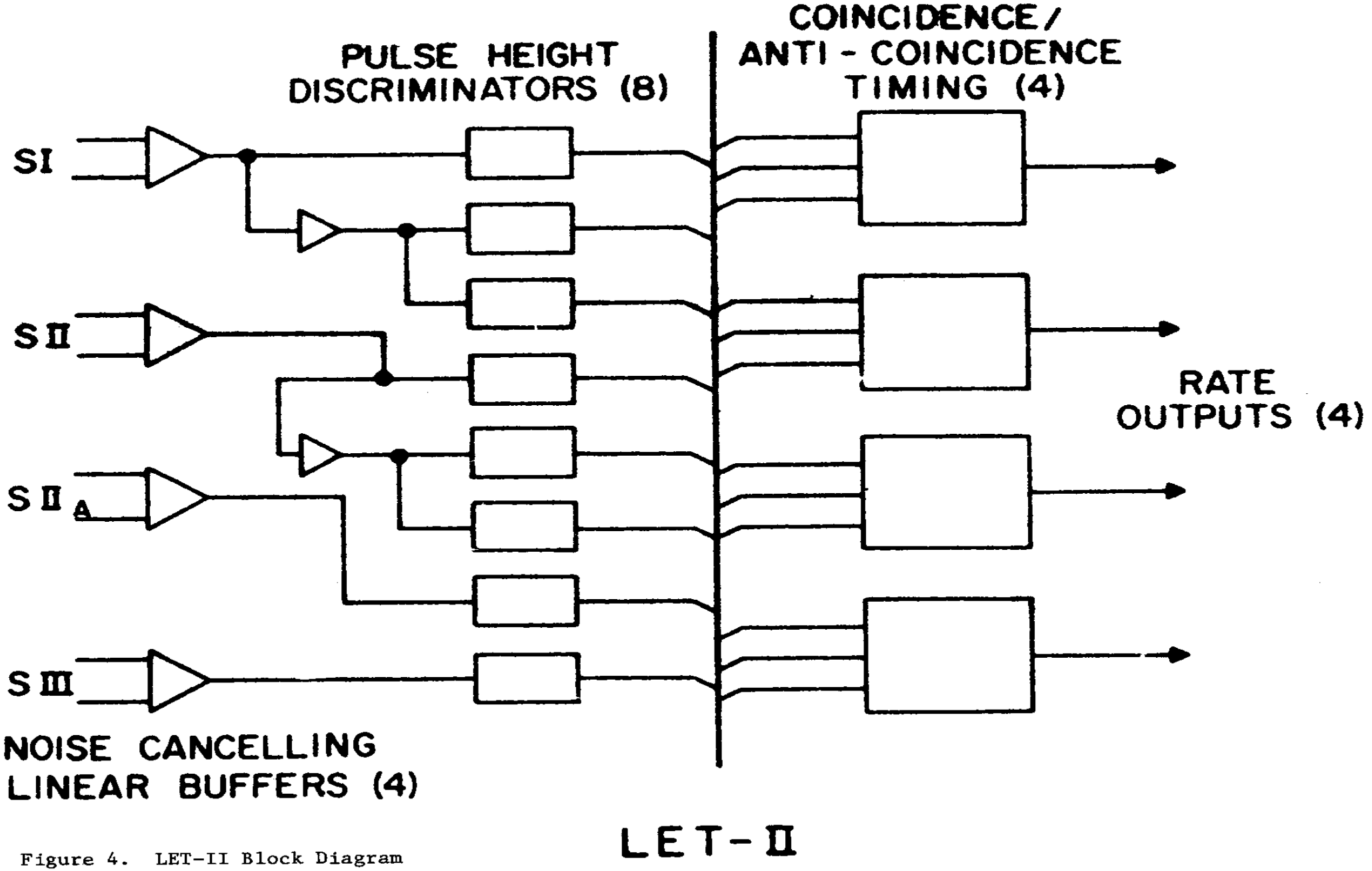


Figure 4. LET-II Block Diagram

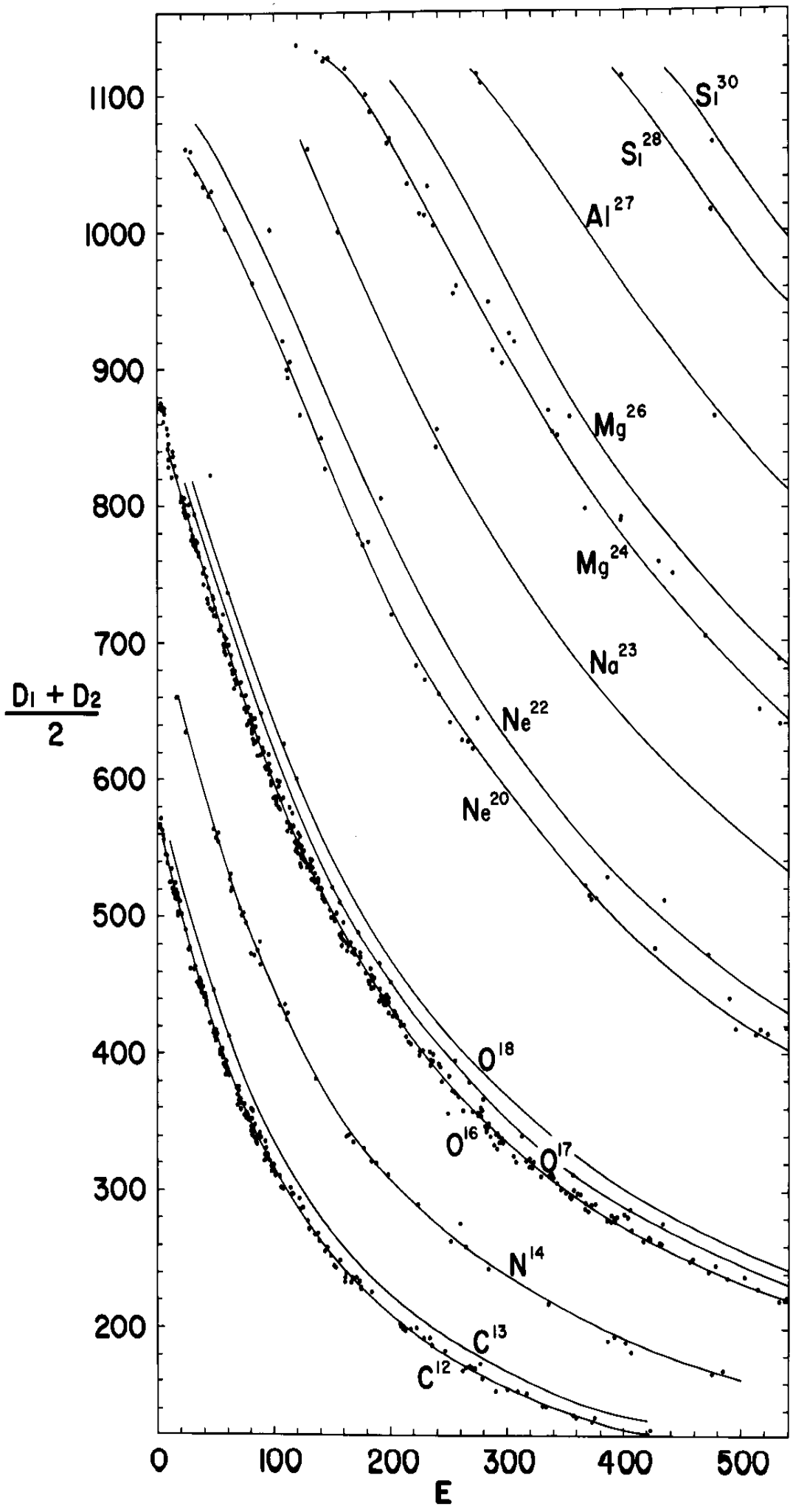


Figure 5.

dE/dx vs. E results from the Pioneer LET-I telescope during the August 1972 solar event. Clear isotopic resolution for elements up to Mg is possible.

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11111111111111111111111111111111111111111  NSSDC Computing Facility --- NASA/GSFC Bldg 28  11111111111111111111111111111111111111111111
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72-012A-12B
03/06/72-06/30/92

DR003737
DS003737

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MMMM    MMMM  YY        YY  EE          RR        RR  SS
MM  MM  MM      YY    YY    EE          RR        RR  SS
MM  MM  MM      YY    YY    EE          RR        RR  SS
MM        MM        YY      EEEEEEEE    RRRRRRRR        SSSSSS
MM        MM        YY      EEEEEEEE    RRRRRRRR        SSSSSS
MM        MM        YY      EE          RR  RR                SS
MM        MM        YY      EE          RR  RR                SS
MM        MM        YY      EE          RR    RR              SS
MM        MM        YY      EE          RR    RR              SS
MM        MM        YY      EEEEEEEEEE  RR        RR  SSSSSSSS
MM        MM        YY      EEEEEEEEEE  RR        RR  SSSSSSSS

PPPP      1              000    U   U   TTTTT
P   P    11             O   O   U   U     T
P   P     1             O   O   U   U     T
PPPP      1     -----   O   O   U   U     T
P         1             O   O   U   U     T
P         1             O   O   U   U     T
P        111             000    UUUUU     T

    J   OOO    BBBB          888    333    55555
    J  O   O   B   B        8   8  3   3   5
    J  O   O   B   B        8   8      3   555
    J  O   O   BBBB          888      3       5
J   J  O   O   B   B        8   8      3       5
J   J  O   O   B   B        8   8  3   3   5   5
 JJJ    OOO    BBBB          888    333     555
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Job P1-OUT (835) queued to LG01 on 23-JAN-1997 08:48 by user MYERS, UIC [NSSDCOPS,MYERS], under account NSSDCOPS at priority 100, started on printer LTA7: on 23-JAN-1997 08:48 from queue LG01.

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1111111111111111111111111111111111111111  Digital Equipment Corporation - VAX/VMS Version V6.1  1111111111111111111111111111111111111111
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HEX DUMP OF p10in

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(5400)	C1100000	3DC4EFC4	3DC4EFC4	3D1C8698	3C389C67	3C939AC7	3C939AC7	00480003	001C0006	00000000
(5440)	3DAB1443	3CF9E13B	000000FF	C1100000	403CE36E	3F2C6B9B	3D1E81C6	3C3F03CC	3D120327	3CCBC93F
(5480)	00480003	001C000C	00000000	3D9D5533	3CE63AE1	00000091	C1100000	40ECFB20	3F5245D5	3D1C661A
(5520)	3C385BEB	3D267505	3D133A82	00480003	001C0012	00000000	3D94B0BE	3CE4EC8B	00000033	C1100000
(5560)	4112FC96	3F5073F6	3D1B66BF	3C3A9628	3D34F538	3D17AEF9	00480003	001D0000	00000000	3DB37047
(5600)	3CF4A9CC	00000012	C1100000	408F0CD2	3F2F08DA	3D16FD68	3C33028B	3CA381F9	3CA381F9	00480003
(5640)	001D0006	00000000	3D9F988B	3CED388D	00000010	C1100000	405D6921	3F241F13	3D1C32FA	3C3C4AD2
(5680)	3D122679	3CCD58D9	00480003	001D000C	00000000	3DAEC933	3CF482BC	00000008	C1100000	4035AECE
(5720)	3F1A71B2	3D1A0118	3C371C0E	3CAB6FB5	3CAB6FB5	00480003	001D0012	00000000	3D9F50C5	3CF019F4
(5760)	00000004	C1100000	40196AB0	3F11800D	3D18B7FC	3C36D889	3D13A9AC	3CDE7582	00480003	001E0000
(5800)	00000000	3DB5B6F7	3CF961CF	00000006	C1100000	3FFA6010	3EE0FFE9	3D224812	3C3FC328	3C9A9BCD
(5840)	3C9A9BCD	00480003	001E0006	00000000	3D88D931	3CD83B60	00000006	C1100000	3F9DC469	3EAA2FC7
(5880)	3D1DC37B	3C39BFF6	3D11F5E3	3CCB332A	00480003	001E000C	00000000	3D909040	3CD939D5	00000004
(5920)	C1100000	3F73F9F1	3E9604A1	3D19E0C1	3C350367	3C9BCD9F	3C9BCD9F	00480003	001E0012	00000000
(5960)	3D9EB18D	3CF172B0	00000005	C1100000	3F3C9E7F	3E6FFEBE	3D18C436	3C36F3AA	3C9E9FE7	3C9E9FE7
(6000)	00480003	001F0000	00000000	3DB3A8B8	3CF23EF1	00000006	C1100000	3F23E758	3E52EA7F	3D19561D
(6040)	3C353AB1	3D2B4E17	3D135DD9	00480003	001F0006	00000000	3DB56924	3CFAED88	00000005	C1100000
(6080)	3F2AFB5C	3E5CBB14	3D2551CF	3C42588C	3D1DDACC	3D113C92	00480003	001F000C	00000000	3DA613C1
(6120)	3CEAF1F6	00000006	C1100000	3F201649	3E512CAE	3D1D98D0	3C3A4A42	3CA349E5	3CA349E5	00480003
(6160)	001F0012	00000000	3DACA4AD	3D1114F9	00000001	C1100000	3F22C81A	3E591CC1	3D1B33B0	3C3E2D00
(6200)	3D25C552	3D15CE95	00480004	00010000	00000000	3DB5BBF8	3CF981B2	00000002	C1100000	3F19E072
(6240)	3E4812AF	3D1AE487	3C3804A0	3CA37DE9	3CA37DE9	00480004	00010006	00000000	3DAB87E1	3CF6CA22
(6280)	00000002	C1100000	3ED84250	3E347354	3D1CE053	3C3AAD37	3CBB78F3	3CBB78F3	00480004	0001000C
(6320)	00000000	3DA21115	3CE93027	00000005	C1100000	3E9D617B	3E2F73BC	3D1AF31E	3C36C305	3D1D3C19
(6360)	3D10E0F2	00480004	00010012	00000000	3D6974C6	3CD362A1	00000003	C1100000	3E55A8C8	3E22F863
(6400)	3D199724	3C3BB950	3CC3076C	3CC3076C	00480004	00020000	00000000	3DB82079	3CF9E710	00000005
(6440)	C1100000	3E25DA30	3E15DAA1	3D1A778C	3C381717	3C8CC89A	3C8CC89A	00480004	00020006	00000000
(6480)	3DA9A3D3	3CF10275	00000002	C1100000	3E78D56D	3E2AB89D	3D177ED2	3C34A3E4	3CAFA404	3CAFA404
(6520)	00480004	00020000	00000000	3DAE7632	3CF5DB0C	00000007	C1100000	3E6149A1	3E1C15A2	3D1ED856
(6560)	3C3CBF8C	3C9F7383	3C9F7383	00480004	00020012	00000000	3D96AE76	3CE3DD6E	00000002	C1100000
(6600)	3EA1EF65	3E2CE9A8	3D1D656C	3C3B41D3	3CB4246B	3CB4246B	00480004	00030000	00000000	3DAE7447
(6640)	3CF4DF5B	00000006	C1100000	3E99714D	3E2A8EAB	3D18840D	3C35E14F	3D1DA12F	3D111B4E	00480004
(6680)	00030006	00000000	3D8F853C	3CDC5CB8	00000003	C1100000	3E49FB0E	3E1E33D6	3D1E40BC	3C3A45B4
(6720)	3D201388	3D1284ED	00480004	00030000	00000000	3D8DACC8	3CF0E08E	00000003	C1100000	3E409A0F
(6760)	3E204D07	3D196D10	3C3A1DDB	3D21F867	3D139CDE	00480004	00030012	00000000	3D9D84D5	3CEF475B
(6800)	00000005	C1100000	3E3A7138	3E1A22DC	3D1E8003	3C3DF9E5	3D13F3D4	3CE1BC7E	00480004	00040000
(6840)	00000000	3D8C77AB	3CD87306	00000004	C1100000	3E1C2EB8	3E13ED93	3D22E7D5	3C3ED5C1	3D1C6FCC
(6880)	3D106AFE	00480004	00040006	00000000	3DACCD08	3D1055FF	00000001	C1100000	3DC47E0C	3DC47E0C
(6920)	3D1F5125	3C3EA24A	3D2A84E6	3D154273	00480004	0004000C	00000000	3D78AB94	3CD34BDD	00000004
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( 7000)   3DA57409  3CF9C6A1  00000007  C1100000  00000000  00000000  3D1E30AE  3C3CDB8D  00000000  00000000
( 7040)   00480004  00050000  00000000  3DE36C8B  3CF57121  00000004  C1100000  00000000  00000000  3D1ADD79
( 7080)   3C377E0B  3C9BB9F3  3C9BB9F3  0C480004  00050006  00000000  3DC59C5E  3D107F31  00000005  C1100000
( 7120)   00000000  00000000  3D1B9A0B  3C39038E  00000000  00000000  00480004  0005000C  00000000  3DBC9535
( 7160)   3D100DA5  00000004  C1100000  00000000  00000000  3D19C73D  3C38A799  3D11C228  3CC8E9E6  00480004
( 7200)   00050012  00000000  3DB63D63  3D1082CD  00000009  C1100000  3E1A4D43  3E129922  3D208C02  3C411804
( 7240)   3CAAED68  3CAAED68
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HEX DUMP OF p10in

FILE 1 RECORD 1936 2960 BYTES

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(   40)   4040F661  40F461F9  F24040F0  7A40F07A  40F040E3  D64040F6  61F3F061  F9F240F1  F87A40F0  7A40F040
(   80)   40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040
(  120)   40404040  40404040  40404040  40404040  40404040  C1407E40  4DD9F1F6  C4406140  F14BF0F0  F0C540F0
(  160)   F05D4040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040
(  200)   D9F1F6C4  407E40E2  F14BE2F2  4DF45D4B  5FE2F24D  C15D4B5F  E2F34040  40404040  40404040  40404040
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(  280)   C4406140  F14BF0F0  F0C540F0  F05D4040  40404040  40404040  40404040  40404040  40404040  40404040
(  320)   40404040  40404040  40404040  D9F1F5C4  407E40E2  F14DF45D  4B5FE2F2  4B5FE2F2  4DC15D4B  5FE2F340
(  360)   40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040
(  400)   40404040  C3407E40  4DD9F1F6  C1406140  F14BF0F0  F0C540F0  F05D4040  40404040  40404040  40404040
(  440)   40404040  40404040  40404040  40404040  40404040  40404040  D9F1F6C1  407E40E2  F14BE2F2  4DF15D4B
(  480)   5FE2F24D  C15D4B5F  E2F34040  40404040  40404040  40404040  40404040  40404040  40404040  40404040
(  520)   40404040  40404040  40404040  40404040  C4407E40  4DD9F1F6  C2406140  F14BF0F0  F0C540F0  F05D4040
(  560)   40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  D9F1F6C2
(  600)   407E40E2  F14BE2F2  4DF25D4B  5FE2F24D  C15D4B5F  E2F34040  40404040  40404040  40404040  40404040
(  640)   40404040  40404040  40404040  40404040  40404040  40404040  40404040  C5407E40  4DD9F1F6  C3406140
(  680)   F14BF0F0  F0C540F0  F05D4040  40404040  40404040  40404040  40404040  40404040  40404040  40404040
(  720)   40404040  40404040  D9F1F6C3  407E40E2  F14BE2F2  4DF35D4B  5FE2F24D  C15D4B5F  E2F34040  40404040
(  760)   40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040
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(  840)   005C0006  0004000C  00000000  00000000  C1100000  005C0006  00040012  00000000  00000000  C1100000
(  880)   005C0006  00050000  00000000  00000000  C1100000  005C0006  00050006  00000000  00000000  00000000
(  920)   005C0006  0005000C  00000000  00000000  C1100000  005C0006  00050012  00000000  00000000  C1100000
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( 1000)   005C0006  0006000C  00000000  00000000  00000000  005C0006  00060012  00000000  00000000  00000000
( 1040)   005C0006  00070000  00000000  00000000  00000000  005C0006  00070006  00000000  00000000  00000000
( 1080)   005C0006  0007000C  00000000  00000000  00000000  005C0006  00070012  00000000  00000000  00000000
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( 1200)   005C0006  00090000  00000000  00000000  C1100000  005C0006  00090006  00000000  00000000  C1100000
( 1240)   005C0006  0009000C  00000000  00000000  00000000  005C0006  00090012  00000000  00000000  C1100000
( 1280)   005C0006  000A0000  00000000  00000000  00000000  005C0006  000A0006  00000000  00000000  00000000
( 1320)   005C0006  000A000C  00000000  00000000  C1100000  005C0006  000A0012  00000000  00000000  C1100000
( 1360)   005C0006  000B0000  00000000  00000000  C1100000  005C0006  000B0006  00000000  00000000  C1100000
( 1400)   005C0006  000B000C  00000000  00000000  C1100000  005C0006  000B0012  00000000  00000000  00000000
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( 1560)   005C0006  000D000C  00000000  00000000  00000000  005C0006  000D0012  00000000  00000000  C1100000
( 1600)   005C0006  000E0000  00000000  00000000  C1100000  005C0006  000E0006  00000000  00000000  00000000
( 1640)   005C0006  000E000C  00000000  00000000  00000000  005C0006  000E0012  00000000  00000000  C1100000
( 1680)   005C0006  000F0000  00000000  00000000  C1100000  005C0006  000F0006  00000000  00000000  C1100000
( 1720)   005C0006  000F000C  00000000  00000000  00000000  005C0006  000F0012  00000000  00000000  00000000
( 1760)   005C0006  00100000  00000000  00000000  C1100000  005C0006  00100006  00000000  00000000  00000000
( 1800)   005C0006  0010000C  00000000  00000000  C1100000  005C0006  00100012  00000000  00000000  C1100000
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( 1880)   005C0006  0011000C  00000000  00000000  C1100000  005C0006  00110012  00000000  00000000  C1100000
( 1920)   005C0006  00120000  00000000  00000000  00000000  005C0006  00120006  00000000  00000000  C1100000
( 1960)   005C0006  0012000C  00000000  00000000  C1100000  005C0006  00120012  00000000  00000000  C1100000
( 2000)   005C0006  00130000  00000000  00000000  C1100000  005C0006  00130006  00000000  00000000  00000000
( 2040)   005C0006  0013000C  00000000  00000000  00000000  005C0006  00130012  00000000  00000000  00000000
( 2080)   005C0006  00140000  00000000  00000000  00000000  005C0006  00140006  00000000  00000000  C1100000
( 2120)   005C0006  0014000C  00000000  00000000  00000000  005C0006  00140012  00000000  00000000  00000000
( 2160)   005C0006  00150000  00000000  00000000  C1100000  005C0006  00150006  00000000  00000000  C1100000
( 2200)   005C0006  0015000C  00000000  00000000  00000000  005C0006  00150012  00000000  00000000  00000000
( 2240)   005C0006  00160000  00000000  00000000  C1100000  005C0006  00160006  00000000  00000000  00000000
( 2280)   005C0006  0016000C  00000000  00000000  C1100000  005C0006  00160012  00000000  00000000  00000000
( 2320)   005C0006  00170000  00000000  00000000  C1100000  005C0006  00170006  00000000  00000000  C1100000
( 2360)   005C0006  0017000C  00000000  00000000  C1100000  005C0006  00170012  00000000  00000000  00000000
( 2400)   005C0006  00180000  00000000  00000000  00000000  005C0006  00180006  00000000  00000000  C1100000
( 2440)   005C0006  0018000C  00000000  00000000  C1100000  005C0006  00180012  00000000  00000000  C1100000
( 2480)   005C0006  00190000  00000000  00000000  C1100000  005C0006  00190006  00000000  00000000  00000000
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( 2880)   005C0006  001E0000  00000000  00000000  C1100000  005C0006  001E0006  00000000  00000000  C1100000
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92 06 30

HEX DUMP OF p101n

FILE 2 RECORD 1 0 BYTES

D58152 73-019A-12C 4/2/73 -12/31/90

DUMP OF TAPE ~~LIZD~~

PIONEER 11

D-58152 C-22397

INPUT TAPE LIZD ON HT1
DATA INPUT H9 NF=1 FL=1=1=1

FILE 1 RECORD 1 LENGTH 7248BYTES

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(40)	404 F461	40F261F7	F34040F0	7A40F07A	40F040E3	D64040F5	6140F261	F7F340F1	F87A40F0	7A40F040
(80)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(120)	4040 4040	40404040	40404040	40404040	40404040	C1407E40	F14BF2F5	F6C540F0	F2406040	F24BF3F3
(160)	F0C540F0	F240D485	E540D7D9	D6E3D6D5	40404 0C6	D3E4E740	40404040	40404040	40404040	40404040
(200)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(240)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	C2407E40	F34BF0F5	
(280)	F8C54 F0	F1406040	F54BF6F4	F7C540F0	F140D485	E540D7D9	D6E3D6D5	40404 0C6	D3E4E740	40404040
(320)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(360)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(400)	404 4040	C3407E40	F34BF4F4	F4C54 0F0	F0406040	F54BF1F9	F5C540F0	F940D485	E540D7D9	D6E3D6D5
(440)	4040 40C6	D3E4E740	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(480)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(520)	4040 4040	40404040	40404040	40404040	C4407E40	F14BF1F1	F0C540F0	F2406040	F44BF2F8	F0C540F0
(560)	F24 D485	E540C1D3	D7C8C140	40404 0C6	D3E4E740	40404040	40404040	40404040	40404040	40404040
(600)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(640)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	C5407E40	F34BF0F6	F7C540F0
(680)	F140 6040	F54BF6F7	F6C54 0F0	F140D485	E540C1D3	D7C8C140	40404 0C6	D3E4E740	40404040	40404040
(720)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(760)	4040 4040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(800)	73 00490004	0002 0000	00000000	00000000	C1100000	00000000	C1100000	00000000	C1100000	00000000
(840)	C11 0000	00000000	C11 0000	00490004	0002 0006	00000000	00000000	C1100000	00000000	C1100000
(880)	0000 0000	C1100000	00 0000 0	C1100000	00000000	C1100000	00490004	0002000C	00000000	00000000
(920)	C1100000	00000000	C1100000	00000000	C1100000	00000000	C1100000	00000000	C1100000	00490004
(960)	0002 0012	00000000	00000000	C1100000	00000000	C1100000	00000000	C1100000	00000000	C1100000
(1000)	0000 0000	C1100000	0049 0004	0003 0000	00000000	00000000	C1100000	00000000	C1100000	00000000
(1040)	C11 0000	00000000	C1100000	00000000	C1100000	00490004	00030006	00000000	00000000	C1100000
(1080)	0000 0000	C1100000	00000000	C1100000	00000000	C1100000	00000000	C1100000	00490004	0003000C
(1120)	0000 0000	0000 0000	C11 0000	00000000	C1100000	00000000	C1100000	00000000	C1100000	00000000
(1160)	C11 0000	00490004	0003 0012	00000000	00000000	C1100000	00000000	C1100000	00000000	C1100000
(1200)	0000 0000	C1100000	00000000	C1100000	00490004	00040000	00000000	00000000	C1100000	00000000
(1240)	C11 0000	00000000	C1100000	00000000	C1100000	00000000	C1100000	00490004	00040006	00000000
(1280)	0000 0000	C1100000	00 0000 0	C1100000	00000000	C1100000	00000000	C1100000	00000000	C1100000
(1320)	00490004	0004000C	00 0000 0	00000000	C1100000	00000000	C1100000	00000000	C1100000	00000000
(1360)	C11 0000	00000000	C1100000	00490004	00040012	00000000	00000000	C1100000	00000000	C1100000
(1400)	0000 0000	C1100000	00 0000 0	C1100000	00000000	C1100000	00490004	00050000	00000000	00000000
(1440)	C11 0000	00000000	C11 0000	00000000	C1100000	00000000	C1100000	00000000	C1100000	00490004
(1480)	00050006	00000000	00 0000 0	C1100000	00000000	C1100000	00000000	C1100000	00000000	C1100000
(1520)	0000 0000	C1100000	00490004	0005000C	00000000	00000000	C1100000	00000000	C1100000	00000000
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(  7120)   4046C264  3F21BD3B  3D17551E  3C370B02  3D178392  3D10A07A  00490005  0002000C  00000000  3DF6681D
(  7160)   3D122FD8  3EDAA8BB  3DBEDC7C  402DBFE2  3F18B083  3D1D6E75  3C37E2CF  3CAA5362  3CAA5362  00490005
(  7200)   00020012  00000000  3DB1DB63  3CF7F547  3EBCD6C7  3CADCF61  40306016  3F1992E8  3D1896B4  3C3492A4
(  7240)   3D2 FDBB  3D1 7EDD

FILE      1  RECORD     1696  LENGTH     2720BYTES
(     0)   00010061  00000000  D7C9D6D5  C5C5D960  C7404040  40C6D3E4  E740C6D6  D940E3C8  C540D7C5  D9C9D6C4
(    40)   40F1F261  40F861F9  F0404 0F0  7A40F07A  40F040E3  D640F1F2  61F3F161  F9F040F1  F87A40F0  7A40F040
(    80)   40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040
(   120)   40404040  40404040  40404040  40404040  40404040  C1407E40  4DD9F1F6  C4406140  F14BF0F0  F0C540F0
(   160)   F05D4040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040  40404040
(   200)   D9F1F6C4  407E40E2  F14BE2F2  4DF45D4B  5FE2F24D  C15D4B5F  E2F340C0  40404040  40404040  40404040
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(240)	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	C2407E40	4DD9F1F5
(280)	C4406140	F14BF0F0	F0C540F0	F05D4040	40404040	40404040	40404040	40404040	40404040	40404040
(320)	40404040	40404040	40404040	D9F1F5C4	407E40E2	F14DF45D	4B5FE2F2	4B5FE2F2	4DC15D4B	5FE2F340
(360)	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(400)	40404040	C3407E40	4DD9F1F6	C1406140	F14BF0F0	F0C540F0	F05D4040	40404040	40404040	40404040
(440)	40404040	40404040	40404040	40404040	40404040	40404040	D9F1F6C1	407E40E2	F14BE2F2	4DF15D4B
(480)	5FE2F24D	C15D4B5F	E2F34040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(520)	40404040	40404040	40404040	40404040	C4407E40	4DD9F1F6	C2406140	F14BF0F0	F0C540F0	F05D4040
(560)	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	D9F1F6C2
(600)	407E40E2	F14BE2F2	4DF25D4B	5FE2F24D	C15D4B5F	E2F34040	40404040	40404040	40404040	40404040
(640)	40404040	40404040	40404040	40404040	40404040	40404040	40404040	C5407E40	4DD9F1F6	C3406140
(680)	F14BF0F0	F0C540F0	F05D4040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(720)	40404040	40404040	D9F1F6C3	407E40E2	F14BE2F2	4DF35D4B	5FE2F24D	C15D4B5F	E2F34040	40404040
(760)	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040
(800)	C005A00C	C0080000	00000000	00000000	C1100000	005A000C	00080006	00000000	00000000	C1100000
(840)	C005A00C	00080000	00000000	00000000	C1100000	005A000C	00080012	00000000	00000000	C1100000
(880)	C005A00C	00090000	00000000	00000000	C1100000	005A000C	00090006	00000000	00000000	C1100000
(920)	C005A00C	00090000	00000000	00000000	C1100000	005A000C	00090012	00000000	00000000	C1100000
(960)	005A000C	000A0000	00000000	00000000	C1100000	005A000C	000A0006	00000000	00000000	C1100000
(1000)	005A000C	000A000C	00000000	00000000	C1100000	005A000C	000A0012	00000000	00000000	C1100000
(1040)	C05A00CC	000B0000	00000000	00000000	C1100000	005A000C	000B0006	00000000	00000000	C1100000
(1080)	005A000C	000B000C	00000000	00000000	C1100000	005A000C	000B0012	00000000	00000000	C1100000
(1120)	C05A000C	000C0000	00000000	00000000	C1100000	005A000C	000C0006	00000000	00000000	C1100000
(1160)	005A000C	000C000C	00000000	00000000	C1100000	005A000C	000C0012	00000000	00000000	C1100000
(1200)	C05A00CC	000D0000	00000000	00000000	C1100000	005A000C	000D0006	00000000	00000000	C1100000
(1240)	005A000C	000D000C	00000000	00000000	C1100000	005A000C	000D0012	00000000	00000000	C1100000
(1280)	005A000C	000E0000	00000000	00000000	C1100000	005A000C	000E0006	00000000	00000000	C1100000
(1320)	C05A00CC	000E000C	00000000	00000000	C1100000	005A000C	000E0012	00000000	00000000	C1100000
(1360)	C05A00CC	000F0000	00000000	00000000	C1100000	005A000C	000F0006	00000000	00000000	C1100000
(1400)	005A000C	000F000C	00000000	00000000	C1100000	005A000C	000F0012	00000000	00000000	C1100000
(1440)	C05A00CC	00100000	00000000	00000000	C1100000	005A000C	00100006	00000000	00000000	C1100000
(1480)	C05A00CC	00100000	00000000	00000000	C1100000	005A000C	00100012	00000000	00000000	C1100000
(1520)	C05A00CC	00110000	00000000	00000000	C1100000	005A000C	00110006	00000000	00000000	C1100000
(1560)	005A000C	00110000	00000000	00000000	C1100000	005A000C	00110012	00000000	00000000	C1100000
(1600)	005A000C	00120000	00000000	00000000	C1100000	005A000C	00120006	00000000	00000000	C1100000
(1640)	C05A00CC	00120000	00000000	00000000	C1100000	005A000C	00120012	00000000	00000000	C1100000
(1680)	C05A00CC	00130000	00000000	00000000	C1100000	005A000C	00130006	00000000	00000000	C1100000
(1720)	005A000C	00130000	00000000	00000000	C1100000	005A000C	00130012	00000000	00000000	C1100000
(1760)	C05A00CC	00140000	00000000	00000000	C1100000	005A000C	00140006	00000000	00000000	C1100000
(1800)	C05A00CC	00140000	00000000	00000000	C1100000	005A000C	00140012	00000000	00000000	C1100000
(1840)	005A000C	00150000	00000000	00000000	C1100000	005A000C	00150006	00000000	00000000	C1100000
(1880)	C05A00CC	00150000	00000000	00000000	C1100000	005A000C	00150012	00000000	00000000	C1100000
(1920)	C05A00CC	00160000	00000000	00000000	C1100000	005A000C	00160006	00000000	00000000	C1100000
(1960)	C05A00CC	00160000	00000000	00000000	C1100000	005A000C	00160012	00000000	00000000	C1100000
(2000)	C05A000C	00170000	00000000	00000000	C1100000	005A000C	00170006	00000000	00000000	C1100000
(2040)	C05A00CC	00170000	00000000	00000000	C1100000	005A000C	00170012	00000000	00000000	C1100000
(2080)	C05A00CC	00180000	00000000	00000000	C1100000	005A000C	00180006	00000000	00000000	C1100000
(2120)	C05A000C	00180000	00000000	00000000	C1100000	005A000C	00180012	00000000	00000000	C1100000
(2160)	C05A00CC	00190000	00000000	00000000	C1100000	005A000C	00190006	00000000	00000000	C1100000
(2200)	C05A00CC	00190000	00000000	00000000	C1100000	005A000C	00190012	00000000	00000000	C1100000
(2240)	C05A00CC	001A0000	00000000	00000000	C1100000	005A000C	001A0006	00000000	00000000	C1100000
(2280)	C05A000C	001A000C	00000000	00000000	C1100000	005A000C	001A0012	00000000	00000000	C1100000
(2320)	C05A000C	001B0000	00000000	00000000	C1100000	005A000C	001B0006	00000000	00000000	C1100000
(2360)	C05A00CC	001B000C	00000000	00000000	C1100000	005A000C	001B0012	00000000	00000000	C1100000
(2400)	C05A00CC	001C0000	00000000	00000000	C1100000	005A000C	001C0006	00000000	00000000	C1100000
(2440)	C05A000C	001C000C	00000000	00000000	C1100000	005A000C	001C0012	00000000	00000000	C1100000
(2480)	C05A00CC	001D0000	00000000	00000000	C1100000	005A000C	001D0006	00000000	00000000	C1100000
(2520)	C05A00CC	001D000C	00000000	00000000	C1100000	005A000C	001D0012	00000000	00000000	C1100000
(2560)	C05A000C	001E0000	00000000	00000000	C1100000	005A000C	001E0006	00000000	00000000	C1100000
(2600)	C05A000C	001E000C	00000000	00000000	C1100000	005A000C	001E0012	00000000	00000000	C1100000
(2640)	C05A00CC	001F0000	00000000	00000000	C1100000	005A000C	001F0006	00000000	00000000	C1100000
(2680)	C05A00CC	C01F000C	00000000	00000000	C1100000	005A000C	001F0012	00000000	00000000	C1100000

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
1	1696	1697	7248	0	0	0	0	0	0

```
EOJ        DUMP STOPPED AFTER FILE   1          # OF PERMANENT READ ERRORS  0
 START TIME 04/04/91  19:37:27        STOP TIME 04/04/91  19:38:18
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