#234

EXPLORER 43

COUNT RATE DATA

71-019A-09A, 09B

34 tapes

IMP-I

COUNT RATES & PHA (SST), MAG TAPE

71-019A-09A

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 79 9-TRACK, 1600 BPI TAPES, WRITTEN IN BINARY. THERE ARE 16 RESTORED TAPES. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE FIRST RECORD OF EACH TAPE WAS LOST WITH THE EXCEPTION OF DD006958, DD006959, AND DD006960. THE ORIGINAL TAPES WERE CREATED ON AN XDS-930 COMPUTER AND THEY WERE RESTORED ON AN IBM 9021. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	DD#	FILES	TIME SPAN
DR004743	DS004743	D011912	1-4	03/13/71 - 03/30/71
		D011913	5-8	03/30/71 - 04/15/71
		D011914	9-12	04/15/71 - 05/02/71(a)
		D011915	13-16	05/02/71 - 05/19/71
		D011916	17-20	05/19/71 - 06/04/71(b)
DR004744	DS004744	D011917	1-4	06/04/71 - 06/21/71
		D011918	5-8	06/21/71 - 07/07/71
		D011919	9-12	07/07/71 - 07/24/71
		D011920	13-16	07/24/71 - 08/09/71
		D011921	17-20	08/14/71 - 08/26/71
DR004745	DS004745	D011922	1-4	08/26/71 - 09/12/71(c)
		D011923	5-8	09/12/71 - 09/28/71
		D011924	9-12	09/28/71 - 10/15/71(d)
		D011925	13-16	10/15/71 - 10/31/71
		D011926	17-20	11/01/71 - 11/17/71
DR004746	DS004746	D011927	1-4	11/17/71 - 12/04/71
		D011928	5-8	12/04/71 - 12/20/71(e)
		D011929	9-12	12/20/71 - 01/06/72(f)
		D018368	13-16	01/06/72 - 01/22/72(g)
		D018369	17-20	01/22/72 - 02/06/72
DR004747	DS004747	D018370	1-4	02/08/72 - 02/25/72
		D018371	5-8	02/25/72 - 03/12/72(h)
		D018372	9-12	03/12/72 - 03/29/72
		D018373	13-16	03/29/72 - 04/14/72(i)
		D018374	17-20	04/15/72 - 05/01/72

IMP-I 71-019A-09A CONT.

DR#	DS#	DD#	FILES	TIME SPAN
DR004748	DS004748	D018375	1-4	05/01/72 - 05/18/72(j)
		D018376	5-8	05/18/72 - 06/03/72
		D018377	9-12	06/03/72 - 06/20/72
		D018378	13-16	06/20/72 - 07/06/72
		D018379	17-20	07/07/72 - 07/23/72
DR004749	DS004749	D018380	1-4	07/23/72 - 08/05/72
		D018381	5-8	08/09/72 - 08/25/72(k)
		D023401	9-12	09/11/72 - 09/28/72(l)
		D023402	13-16	09/27/72 - 10/15/72(m)
		D023403	17-20	10/14/72 - 11/01/72
DR004750	DS004750	D023404	1-4	10/31/72 - 11/17/72
		D023405	5-8	11/16/72 - 12/04/72
		D023406	9-12	12/03/72 - 12/20/72
		D023407	13-16	12/20/72 - 01/01/73
		D023408	17-20	01/05/73 - 01/26/73
DR004751	DS004751	D023409	1-4	01/22/73 - 02/05/73
		D023410	5-8	02/07/73 - 02/24/73
		D023411	9-12	02/24/73 - 03/12/73
		D023412	13-16	03/12/73 - 03/29/73
		D023413	17-20	03/29/73 - 04/15/73
DR004752	DS004752	D023414	1-4	04/15/73 - 05/01/73(n)
		D023415	5-8	05/01/73 - 05/18/73(o)
		D023416	9-12	05/18/73 - 06/03/73
		D023417	13-16	06/03/73 - 06/20/73(p)
		D023418	17-20	06/20/73 - 07/07/73(q)
DR004753	DS004753	D023420	1-4	07/24/73 - 08/09/73
		D023421	5-8	08/09/73 - 08/25/73(r)
		D023422	9-12	08/25/73 - 09/11/73
		D023423	13-16	09/11/73 - 09/28/73
		D028904	17-20	09/28/73 - 10/14/73
DR004754	DS004754	D028900	1-4	10/14/73 - 10/31/73(s)
		D028911	5-8	10/31/73 - 11/16/73
		D028897	9-12	11/16/73 - 12/03/73(t)
		D028908	13-16	12/03/73 - 12/20/73
		D028895	17-20	12/19/73 - 01/05/74
DR004755	DS004755	D028913	1-4	01/05/74 - 01/22/74
		D028906	5-8	01/22/74 - 02/07/74
		D028896	9-12	02/07/74 - 02/24/74
		D028910	13-16	02/24/74 - 03/13/74
		D028909	17-20	03/13/74 - 03/29/74(u)
DR004756	DS004756	D028905	1-4	03/29/74 - 04/15/74
		D028898	5-8	04/15/74 - 05/01/74(v)
		D028899	9-12	05/01/74 - 05/18/74

B

D028914	13-16	05/18/74 - 06/04/74
D028912	17-20	06/04/74 - 06/20/74

IMP-I 71-019A-09A

DR#	DS#	DD#	FILES	TIME SPAN
DR004757	DS004757	D028916	1-4	06/20/74 - 07/07/74
		D028917	5-8	07/07/74 - 07/23/74
		D028915	9-12	07/24/74 - 08/09/74
		D028907	13-16	08/09/74 - 08/26/74
		D028901	17-20	08/26/74 - 09/11/74
DR004758	DS004758	D028903	1-4	09/11/74 - 09/28/74
		D028902	5-8	09/28/74 - 10/02/74
		D018382	9-12	08/25/72 - 09/11/72
		D023419	13-16	07/07/73 - 07/23/73

(a) I/O ERROR ON FILE 1, RECORDS 18, 19
(b) I/O ERROR ON FILE 1, RECORDS 261, 315, 377
(c) I/O ERROR ON FILE 2, RECORD 189
(d) I/O ERROR ON FILE 1, RECORDS 41, 57, 80, 394, 395, 398
(e) I/O ERROR ON FILE 3, RECORD 1
(f) I/O ERROR ON FILE 2, RECORD 491; FILE 3, RECORDS 632,672
(g) I/O ERROR ON FILE 1, RECORD 351
(h) I/O ERROR ON FILE 4, RECORD 1286
(i) I/O ERROR ON FILE 1, RECORDS 11, 19, 21, 68, 99, 107, 188, 192, 1351
(j) I/O ERROR ON FILE 1, RECORDS 16, 18, 19, 21, 154, 176; FILE 4, RECORDS 1266, 1335, 1341, 1362, 1367, 1398, 1415, 1420, 1430, 1443, 1446, 1450, 1452 - 1457, 1459, 1461, 1463, 1464, 1465
(k) I/O ERROR ON FILE 1, RECORD 16
(l) I/O ERROR ON FILE 1, RECORDS 253, 255 - 259, 362, 364, 368, 369, 371
(m) I/O ERROR ON FILE 1, RECORDS 15, 631, 685, 700, 769, 787, 878, 901, 906, 909, 924, 939, 951, 954, 981, 1060, 1066, 1075, 1081, 1086, 1096, 1101, 1109, 1115, 1124, 1156
(n) I/O ERROR ON FILE 1, RECORD 13; FILE2, RECORD 231
(o) I/O ERROR ON FILE 2, RECORD 130
(p) I/O ERROR ON FILE 1, RECORD 10; FILE 2, RECORD 812
(q) I/O ERROR ON FILE 1, RECORD 2
(r) I/O ERROR ON FILE 1, RECORDS 138, 199, 240, 250, 261, 287, 297, 298, 459, 1108; FILE 2 RECORDS 437, 440, 601, 665, 831, 838; FILE 3, RECORD 1399; FILE 4, RECORD 241
(s) I/O ERROR ON FILE 1, RECORD 451
(t) I/O ERROR ON FILE 3, RECORD 1412; FILE 4, RECORD 313
(u) I/O ERROR ON FILE 1, RECORD 45
(v) I/O ERROR ON FILE 1, RECORD 891

REQ. AGENT	RAND NO.	ACQ. AGENT
ROP	RB4044	JJB
MAW	RC3474	JHK
CMP	RC5533	
CAW	RC7552	DVR

EXPLORER 43

COUNT RATE DATA

71-019A-09A, 09B

This data set catalog contains Explorer 43 Count Rate and Pluse Height Analysis SOEL Summery data (SST) and Rate Summary data (RATE). The tapes are ~~800~~ 6250, BIN, ~~X~~ 9 track. They were created on a XDS-930 computer.

The record size and number of files on each tape can be found on pages 14 for the SST tapes and page 26 for the Rate tapes in the following supplement form the University of Chicago.

The time spans are as follows:

SOEL Summary Data (SST) 71-019A-09A

D#	C#	TIME SPAN
D-11912	C-09410	3/13/71 - 3/30/71
D-11913	C-09411	3/30/71 - 4/15/71
D-11914	C-09412	4/15/71 - 5/02/71
D-11915	C-09413	5/02/71 - 5/19/71
D-11916	C-09414	5/19/71 - 6/04/71
D-11917	C-09415	6/04/71 - 6/21/71
D-11918	C-09416	6/21/71 - 7/07/71
D-11919	C-09417	7/07/71 - 7/24/71
D-11920	C-09418	7/24/71 - 8/09/71
D-11921	C-09419	8/09/71 - 8/26/71
D-11922	C-09420	8/26/71 - 9/12/71
D-11923	C-09421	9/12/71 - 9/28/71
D-11924	C-09422	9/28/71 - 10/15/71
D-11925	C-09423	10/15/71 - 10/31/71
D-11926	C-09424	10/31/71 - 11/17/71

D#	C#	TIME SPAN
D-11927	C-09425	11/17/71 - 12/04/71
D-11928	C-09426	12/04/71 - 12/20/71
D-11929	C-09427	12/20/71 - 1/06/72
D-18268	C-15282	1/06/72 - 1/22/72
D-18369	C-15283	1/22/72 - 2/06/72
D-18370	C-15284	2/08/72 - 2/25/72
D-18371	C-15285	2/25/72 - 3/12/72
D-18372	C-15286	3/12/72 - 3/29/72
D-18373	C-15287	3/29/72 - 4/14/72
D-18374	C-15288	4/15/72 - 5/01/72
D-18375	C-15289	5/01/72 - 5/18/72
D-18376	C-15290	5/18/72 - 6/03/72
D-18377	C-15291	6/03/72 - 6/20/72
D-18378	C-15292	6/20/72 - 7/06/72
D-18379	C-15293	7/07/72 - 7/23/72
D-18380	C-15294	7/23/72 - 8/05/72
D-18381	C-15295	8/09/72 - 8/25/72
D-18382	C-15296	8/25/72 - 9/11/72
D-23401	C-17645	8/11/72 - 9/28/72
D-23402	C-17464	9/28/72 - 10/15/72
D-23403	C-17647	10/15/72 - 11/01/72
D-23404	C-17648	11/01/72 - 11/17/72
D-23405	C-17649	11/17/72 - 12/04/72
D-23406	C-17650	12/04/72 - 12/20/72
D-23407	C-17651	12/21/72 - 1/01/73
D-23408	C-17652	1/05/73 - 1/26/73
D-23409	C-17653	1/26/73 - 2/05/73
D-23410	C-17654	2/05/73 - 2/24/73
D-23411	C-17655	2/24/73 - 3/12/73

D#	C#	TIME SPAN
D-23412	C-17656	03/12/73 - 03/29/73
D-23413	C-17657	03/29/73 - 04/15/73
D-23414	C-17658	04/15/73 - 05/01/73
D-23415	C-17659	05/01/73 - 05/18/73
D-23416	C-17660	05/18/73 - 06/03/73
D-23417	C-17661	06/03/73 - 06/20/73
D-23418	C-17662	06/20/73 - 07/07/73
D-23419	C-17668	07/07/73 - 07/23/73
D-23420	C-17663	07/23/73 - 08/09/73
D-23421	C-17664	08/09/73 - 08/25/73
D-23422	C-17665	08/25/73 - 09/11/73
D-23423	C-17666	09/11/73 - 09/28/73
D-28904	C-18808	09/28/73 - 10/14/73
D-28900	C-18809	10/14/73 - 10/31/73
D-28911	C-18810	10/31/73 - 11/16/73
D-28897	C-18811	11/16/73 - 12/03/73
D-28908	C-18812	12/03/73 - 12/20/73
D-28895	C-18813	12/20/73 - 01/05/74
D-28913	C-18814	01/05/74 - 01/22/74
D-28906	C-18815	01/22/74 - 02/07/74
D-28896	C-18816	02/07/74 - 02/24/74
D-28910	C-18817	02/24/74 - 03/13/74
D-28909	C-18818	03/13/74 - 03/29/74
D-28905	C-18819	03/29/74 - 04/15/74
D-28898	C-18820	04/15/74 - 05/01/74

D#	C#	TIME SPAN
D-28899	C-18821	05/01/74 - 05/18/74
D-28914	C-18822	05/18/74 - 06/04/74
D-28912	C-18823	06/04/74 - 06/20/74
D-28916	C-18824	06/20/74 - 07/07/74
D-28917	C-18825	07/07/74 - 07/23/74
D-28915	C-18826	07/24/74 - 08/09/74
D-28907	C-18827	08/09/74 - 08/26/74
D-28901	C-18828	08/26/74 - 09/11/74
D-28903	C-18829	09/11/74 - 09/28/74
D-28902	C-18830	09/28/74 - 10/02/74 *Has 1 file

RATE Summary Data (RATE) 71-019A-09B

D#	C#	FILES	TIME SPAN
D-11911	C-09594	100	03/13/71 - 05/01/72
D-23424	C-17578	100	05/01/72 - 06/20/73
D-28893	C-18980	100	06/20/73 - 08/09/74
D-28894	C-18981	13	08/09/74 - 10/02/74

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71-019A-09A

CHARACTER		DESCRIPTION
1- 4		Tenths of seconds of day
5- 6	bits 1-3	Year (e.q. 1=1971)
	bits 4-12	Julian day
7- 8		Flags
9-10		Electron current detector temperature
11-12		Electron current detector voltage output
13-14		Large telescope temperature
15-16		Subsystem telescope temperature
17-18		A/D converter calibration 0
19-20		A/D converter calibration 1
21-22		A/D converter calibration 2
23-24		A/D converter calibration 3
25-26		Buss voltage analog
27-28		Command flags
29-30	bits 1-9	Orbit number
	bits 10-12	Mode
31-32		Spares
33-37		Pseudo-sequence count
38-40	bits 1-16	Spacecraft clock
	bits 17-18	Pseudo-sequence count quality flag
41-44		Subsystem digital scan 0
45-48		Subsystem digital scan 1
49-52		Subsystem digital scan 2
53-56		Subsystem digital scan 3
57-58		D1' digital rate
59-60		D2' digital rate
61-62		D5' digital rate
63-64		D6' digital rate

CHARACTER		DESCRIPTION
65-66		D7' digital rate
67-68		Fission chamber digital rate
69-70		D6 (main telescope) digital rate
71-73	bits 1-16	Optical aspect data
	bits 17-18	Spares
74-76		Spares
77-78		Rate quality flags
79-80	bits 1-2	Optical aspect quality
	bits 3-4	On-board computer digital performance parameter
	bits 5-12	digit 1

CHARACTER		DESCRIPTION
1- 4		Tenths of seconds of day
5- 6	bits 1-9	Orbit
7- 8	bits 1-3	Year (e.g. 1=1971)
	bits 4-12	Julian Day
9-10	bits 1-9	Analog Qualities
11	bit 2	Rate flag
12-16		Pseudo-sequence count
17	bits 1-7	Coverage
18	bits 2-8	Quality
19		not used
20-24		D1 total counts
25		Coverage
26		Quality
27		not used
28-32		D2 total counts
33		Coverage
34		Quality
35		not used
36-40		D5 total counts
41		Coverage
42		Quality
43		not used
44-48		D6 total counts
49		Coverage
50		Quality
51		not used
52-56		D7 total
57		Coverage
58		Quality
59		not used

CHARACTOR		DESCRIPTION
60-64		FC total counts
65-68		Radial Distance
69-72		not used
73-76	bits 1-8	ECD volt 0
	bits 15-22	ECD volt 1
	bits 29-36	ECD volt 2
77-80	bits 1-8	ECD volt 3
	bits 15-22	ECD temperature
	bits 29-36	Small telescope temperature
81-84	bits 1-9	A/D convertier calibration 0
	bits 10-18	A/D convertier calibration 2
	bits 18-36	A/D convertier calibration 1
85-86		Converted ECD temperature
87-88		Converted small telescope temperature

Data Formats for Library Magnetic Tapes and Microfilm from The University of Chicago Charged Particle Experiment on the IMP-6 Satellite*

71-019A-09A
-09B

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June, 1973

*This work was supported in part by the National Aeronautics and Space Administration under contract NAS 5-11037.

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FOREWARD

In this document, we assume that the reader is familiar with the IMP-6 encoder, telemetry, and the GSFC data processing system, and the notation used to describe this system. Descriptions are found in the following documents:

IMP I (EYE) Encoding System Interface Document (Feb. 1970) by H. D. White and D. C. Lockerson; Code 711; NASA/GSFC

IMP I (EYE) Encoding System, Preliminary Specification Appendix E (Jan. 1969) by H. D. White and D. C. Lockerson; Code 711; NASA/GSFC

Data Processing Plan for IMP I (EYE); GSFC Preprint X-563-70-337, dated September 1970.

IMP I Optical Aspect System, by E. John Pyle, NASA Technical Note NASA TN D-7008, dated March 1971.

The IMP-6 Small Telescope sensor described in this document is physically identical to the main telescope sensor for the University of Chicago experiments on the Pioneer 10/11 missions, and for the Mariner Venus/Mercury (MVM) mission, with the exception that the anti-coincidence detector (D7 in Figure 1) on the MVM sensor is slightly longer at the back than for the IMP or Pioneer versions of the sensor. However, it is important to note that the electronics for the IMP vs. Pioneer vs. MVM instruments, as well as the data interfaces with the spacecraft encoders, are not identical. For example, the Pioneer and MVM instruments have 3 pulse-height-analyzers, vs. 2 for IMP. There are also important differences in the instrument logic for the different missions. We emphasize, therefore, that the details of the instrument description given here apply only to the IMP-6 experiment.

1. Introduction: We are submitting to the NSSDC the final processed data obtained from the University of Chicago experiment on the eccentric orbiting IMP-6 satellite. Data coverage begins March 14, 1971, and continues through the present time (June 1973). These data are presented on microfilm time-intensity plots for the averaged counting rates with each plot corresponding to a Bartel's Solar Rotation, and on magnetic tape. There are two categories of magnetic tape:

1) Experiment outputs (SST tapes), and,
2) Counting rate accumulator summaries (RATE tapes).

This document describes the instrument, the formats of the data, and the relationship between the data and the physical parameters the instruments were recording.

Not included in this submission are descriptions of or data from: (1) the composition telescope of the University of Chicago IMP-6 experiment, and (2) the IMP-6 on-board computer which was used by our experiment. The Composition Telescope data are not included because this part of the experiment failed after Orbit 2, and thus returned a data set too small to merit processing. The on-board computer (OBC) data are not included because our participation in the OBC experiment was designed to study methods of data compression for future missions, and therefore our experiment was designed in such a way that all the scientific objectives could be achieved without using the OBC.

2. Instrument Description: The data submitted here are obtained from three sensors: (1) the small telescope, (2) the electron current detector and, (3) the fission cell. These sensors are described in sections 2.1, 2.2 and 2.3, respectively.

2.1 Small Telescope: The small telescope is located in the University of Chicago facet (facet 7). The telescope symmetry axis (center line) is perpendicular to the facet face and is displaced approximately 2 mm from the center line of the facet in the direction

of facet 6. Hence, the telescope viewing direction is essentially perpendicular to the spin axis of the spacecraft. A schematic drawing of the telescope is shown in Figure 1. The anti-coincidence detector D7 defines a geometrical factor of 1.3 cm^2 sterad for the 64° opening cone, and a geometrical factor of 0.43 cm^2 sterad for the 48° opening cone. Absorber thicknesses and materials are described in Table 1.

2.1.1 Normal Mode Operation: In the description of the IMP-6 small telescope, we use a notation where each detector is given a number (e.g. D1) and the output from this detector goes to (among other things) a discriminator of the same name (e.g. D1). For the experiment digital logic, particles are characterized by the discriminators they fire. For example, an event described by $D1D2\overline{D7}$ means that discriminators D1 and D2 fired in coincidence and discriminator $\overline{D7}$ did not fire. Coincidence conditions are logical ANDS, and and anti-coincidence conditions are logical ORS -- e.g. $D1D2\overline{D6D7}$ is logically (D1 AND D2 fired), and not (D6 OR D7 fired).

Signals from all the detectors are utilized to give information concerning the flux, charge composition and energy spectra of energetic particles. This information is derived from six counting rates, two pulse-height-analysis (PHA) readings and instrument logic bits. The counting rates are described in Table 2. One of these rates is multiplexed with the fission cell (see section 2.3). Events are counted during a full snapshot (nominally 20.48 sec. at 400 BPS; 5.12 sec at 1600 BPS) and telemetered during the following snapshot.

One (1) PHA event may be telemetered from the telescope each sequence. The period available for analysis (live time) is from the second half of channel 9 frame 11 of one sequence through channel 5 frame 11 of the next. At other times (i.e. during the digital scan inhibit) analysis is forbidden, resulting in a duty cycle of 98.64%.

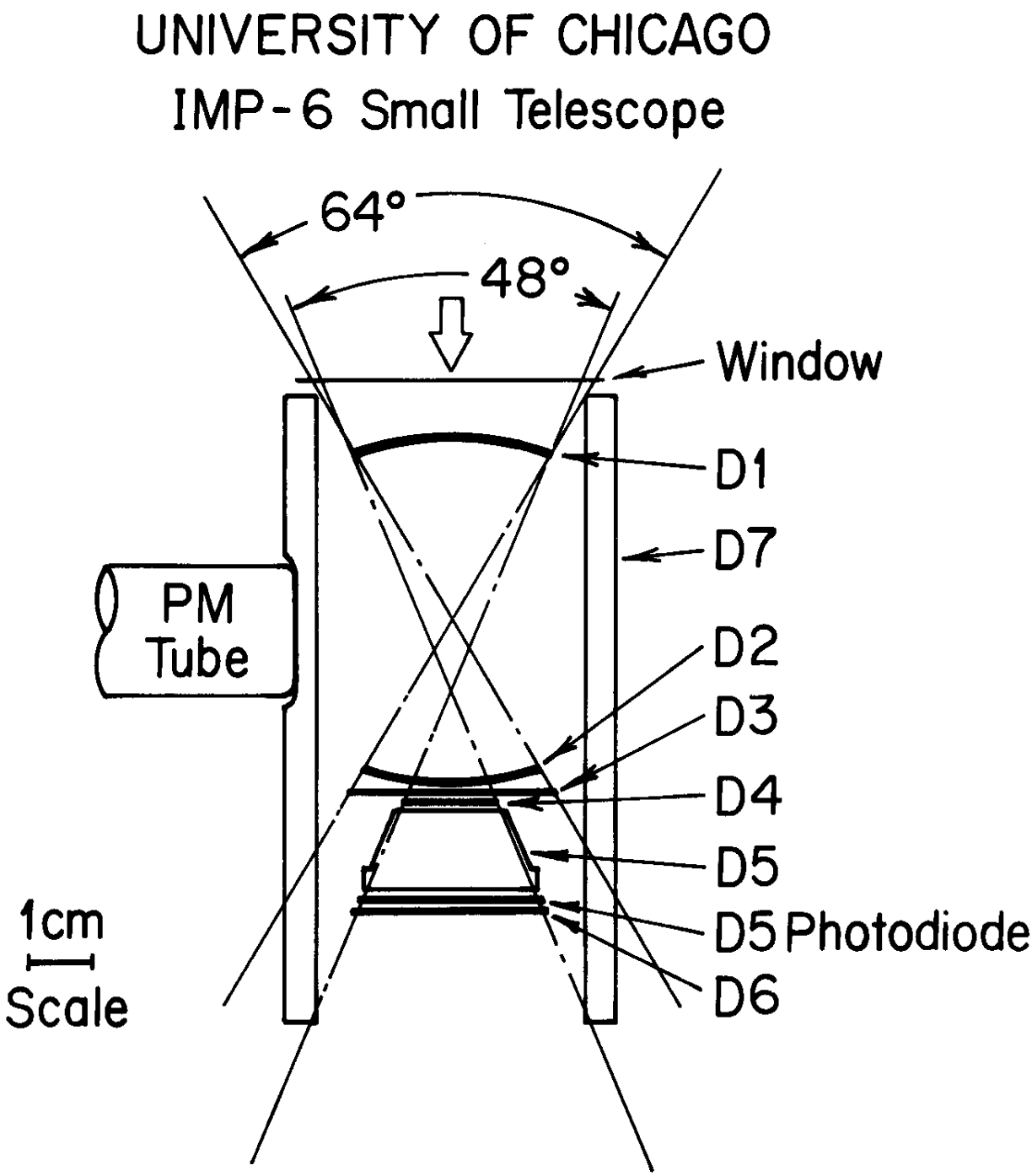

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Figure 1

TABLE 1

IMP-6 Small Telescope Absorbers

Absorber Name	Thickness ($g\ cm^{-2}$)	Material
Ti window	8.7×10^{-4}	Titanium
D1: Sensitive Layer	1.70×10^{-1}	Li drifted Silicon
Dead Layer	1.05×10^{-2}	Li drifted Silicon
D2: Sensitive Layer	3.25×10^{-1}	Li drifted Silicon
Dead Layer	2.33×10^{-2}	Li drifted Silicon
D2-D3 shield	1.27×10^{-3}	mylar
D2-D3 shield	1.37×10^{-3}	aluminum
D3: Sensitive Layer	2.07×10^{-1}	Li drifted Silicon
Dead Layer	1.42×10^{-2}	Li drifted Silicon
D3-D4 shield	1.27×10^{-3}	mylar
D3-D4 shield	1.37×10^{-3}	aluminum
D4: Sensitive Layer	2.41×10^{-1}	Li drifted Silicon
Dead Layer	1.51×10^{-2}	Li drifted Silicon
D5 housing	2.92×10^{-2}	magnesium
D5	5.41	CsI(Tl)
D5 photodiode	1.14×10^{-1}	Li drifted Silicon
D5 photodiode dead layer	7.22×10^{-3}	Li drifted Silicon
D6: Sensitive Layer	2.40×10^{-1}	Li drifted Silicon
Dead Layer	1.63×10^{-2}	Li drifted Silicon

Tab. 2

IMP 6 Small Telescope Digital Rates

Abbrev. name	Logic (1) normal mode, and (2) calibrate mode pages 1, 3	Logic calibrate mode, pages 0, 2	Goddard CHI Rate number	Encoder log compressor	Telemetry location starting SEQ, FRM, CHAN, BIT
D1	$D1\overline{D2}\,\overline{D7}$	D1	R5	$LR12a_2 24$	3, 0, 9, 4
D2	$D1D2\overline{D3}\,\overline{D7}$	D2	R13	$LR10a_2 22$	2, 0, 13, 4
D5	$D1D2D4D5\overline{D6}\,\overline{D7}$	D5	R14	$LR10a_2 23$	2, 0, 14, 6
D6	$D1D2D4D5D6\overline{D7}$	D6	R15	$LR10a_2 25$	2, 8, 12, 2
FC pages 0, 1, 2	Fission cell	FC	R16	$LR10a_2 26$	2, 8, 13, 4
D7 page 3	D7	D7			

Notes:
Fission chamber rate (FC) and D7 share same rate line according to page sequence as shown.
(accumulation is switched according to real time page -- not telemetry page)

LR12 is 24 --> 12 bit log compressor, LR10 is 24 -->10 bit log compressor.

The content of each readout is:

Channel Bit	6		7		8	
	4 5 6 7	0 1 2 3	4 5 6 7	0 1 2 3	4 5 6 7	
	D1 or D5 PHA		D2 PHA		G I I I	Frame 11
	$2^0 2^1 2^2 2^3$	$2^4 2^5 2^6 2^7$	$2^0 2^1 2^2 2^3$	$2^4 2^5 2^6 2^7$	C D D D	Every Sequence
					1 2 3	

where the items are:

D1 or D5 pulse height
If no event, 0.

D1 PHA channel number for events satisfying $D1\overline{D5D7}$

D5 PHA channel number for events satisfying
$D1D2D4D5\overline{D7}$ or $\overline{D1}D2D4D5\overline{D6D7}$

D2 pulse height
D2 PHA channel number for events satisfying
$D1D2\overline{D7}$ or $\overline{D1}D2D4D5\overline{D6D7}$

Otherwise, 0.

ID bit 1
Bit ID1 = 1 for events satisfying
$D1\overline{D2D7}$ or $D1D2D3\overline{D4D7}$ or $D1D2D4D5D6\overline{D7}$ or $\overline{D1}D2D4D5\overline{D6D7}$

Otherwise, 0.

ID bit 2
Bit ID 2 = 1 for events satisfying
$D1D2\overline{D4D7}$ or $D1D2D4D5\overline{D7}$

Otherwise, 0.

ID bit 3
Bit ID3 = 1 for events satisfying
$D1D2D4\overline{D7}$ or $\overline{D1}D2D4D5\overline{D6D7}$

Otherwise, 0.

GC bit
The GC bit is a housekeeping bit from the composition telescope, and has no effect on the small telescope data.

Table 3 shows the relation between ID bits, detectors analyzed and proton energies corresponding to the different ranges of penetration into the detector stack.

Not all events entering the telescope have an equal chance of being analyzed and

TABLE 3

IMP-6 Small Telescope Energy Ranges

Range ID	ID Bits Bit 3	Bit 2	Bit 1	Detectors Triggered	Detectors Analyzed	Proton Energy* (MeV)
0	0	0	0	none	none	--
1	0	0	1	D1	D1	~ 0.5 - 10.6
2	0	1	0	D1D2	D1, D2	10.6 - 19.6
3	0	1	1	D1D2D3	D1, D2	19.6 - 23.9
4	1	0	0	D1D2D3D4	D1, D2	23.9 - 29.3
5	1	0	1	D2D3D4D5	D5, D2	
6	1	1	0	D1D2D3D4D5	D5, D2	29.3 - 66.7
7	1	1	1	D1D2D4D5D6	D5, D2	> 66.7

* for vertically incident particles

read out, due to the presence of a priority system in the telescope. This priority system operates in two modes called MODE 1 and MODE 2, and switching between the modes is done via ground command to the on-board computer. There is no simple way to determine whether the experiment is in MODE 1 or MODE 2 from the experiment telemetry. In practice, switching from one mode to the other has been done rarely (on the order of once per year), and the experiment output tapes have been flagged with an indication added in our data processing program at the University of Chicago.

MODE 1 is the normal operating mode of this experiment. For MODE 1 during pages 0, 1, and 2, an analyzed event satisfying the logic condition $D1D2\overline{D6D7}$ will lock the PHA gates, and no other event will be analyzed until after the event has been telemetered. If this priority condition is not met (low priority event), each succeeding event is analyzed, and the last such event in the accumulation period is telemetered. For MODE 1 during page 3, the first event analyzed is telemetered.

For MODE 2 operation, all events are analyzed, and the last event analyzed during the accumulation period preceeding each digital scan is telemetered.

2.1.2 Calibrate Mode: The experiment is automatically switched into calibrate mode for 21.8 minutes out of every 46.6 hours (when encoder clock $C_{35} \ldots C_{29} = 0000000$). During calibrate mode (1) coincidence requirements for the counting rates are modified as indicated in Table 2, and (2) the pulse height analyzers are pulsed by an on-board pulser with pulses of different fixed amplitudes in order to monitor possible gain-shifts in the system.

2.1.3 Analog Parameter: A thermistor located in the small telescope is sampled in telemetry page 3 and telemetered using the spacecraft analog performance parameter 29, which is measured during channel 15, frame 10, sequence 1, snapshot 2 of each page.

2.2 Electron Current Detector: The electron current detector (ECD) sensor is

a solid state detector connected to a logarithmic amplifier operating in a current mode. The detector is mounted on a short pedestal which protrudes ~ 2" from the facet face. This sensor is a prototype for a similar device included in the University of Chicago experiments for the Pioneer 10/11 missions to measure the expected high fluxes of trapped radiation in the vicinity of Jupiter. Because of this, the ECD on IMP-6 is not optimized for the comparitively low fluxes in the Earth's radiation belts, and will therefore not be described further here.

2.3 Fission Cell: The fission cell sensor consists of a Thorium foil viewed by two solid state detectors which count (proton induced) fission fragments from the foil. The sum of the counting rate of these detectors is telemetered (see Table 2). This sensor is also a prototype for similar sensors on the University of Chicago Pioneer 10/11 experiments, is not optimized for the Earth's radiation belts, and will not be described further here.

2.4 Small Telescope Calibrations: Table 4 shows the thresholds of the small telescope detector discriminators as measured shortly before launch, and Table 5 tabulates a pre-launch electronic pulser calibration of the instrument PHA's.

Table 4
IMP-6 Small Telescope Discriminator Thresholds (in millivolts)

D1	D2	D3	D4	D5	D6	D7
0.75	1.2	0.75	0.85	0.70	0.85	1.13

Threshold is defined as one-half full triggering.
Thresholds are measured at room temperature.
These thresholds were set to include minimum ionizing protons.

A proton calibration of the IMP-6 small telescope at the University of Chicago on 21 July 1970 yielded detector conversion factors which are compared with post launch values in Table 6.

TABLE 5

IMP 6 Small Telescope Pulser Calibrations

Pulser Input (mV)	Channel Number D1	D2	D5	Pulser Input (mV)	Channel Number D1	D2	D5	Pulser Input (mV)	Channel Number D1	D2	D5
1	5.0		4.25	36			115	600	211.75	204.5	
2	11.5	11.66	6.75	38			119	700	220.5	212.25	
3	16.2	16.6	9.25	40	113.75	109.5	121.33	800	229	219.5	
4	22.25	20.75	12.25	42			123.25	900	237.25	227	
5	28.4	25.2	15.5	44			125	1000	246	235	253.75
6	33.8	30.4	18.8	46			126	1100	249.5	241.75	
7	39.5	35.5	22.75	48			127	1200	250.5	246.5	
8	45	41.5		50	119.5	116	128.25	1300	250	248	
9	51	45.8	28.66	55			131	1400	251.5	249	
10	56.8	51.0	31.75	60	125.25	121.25	133.5	1500		249.6	
11	62	55.5		70	131.5	127	138.25	1600		250.5	
12	68.25	61.25	38.25	80	137	132	142.5	1700		250.75	
13	74	66.75		90	143.5	137.5	147				
14	80.25	70.75	44.25	100	149	143	151				
15	84.75	76.5		120	160.25	153					
16	90	80.75	50.5	130	164.25	157.75					
17	92.5	86.25		140	167	162.75					
18	94	90.5	58	150	168.5	165.25					
19	95.5	92.75		160	170	167					
20	97.25	94.5	63.75	170	171.5	168.25					
21	97.6	95.8		180	172.25	169.25					
22	98.75	97.25	70	190	173.75	170					
23	99.75	97.5		200	174.75	171.5	190.75				
24	100.25	99	77	225			200.5				
25	101.25	99.75		250			210.25				
26	102.5	100	83	275			220.25				
27	103	100.75		300	185.5	181	229.5				
28	103.75	101.75	89.25	325			239.75				
29	104.75	102.5		350			247.75				
30	105.25	103.25	95.5	375			250.6				
32			102	400	194.75	189.5	251				
34			108.6	500	203.75	197.25	253.25				
35	109.25	106.25									

Notes: Calibration taken on bench 22 July 1970.
Fractional channel numbers are the average of several readouts.

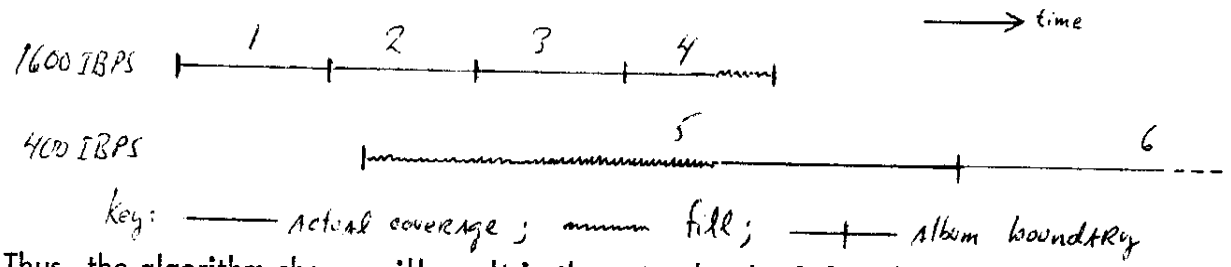
Table 6
IMP-6 Small Telescope Conversion Factors

	D1	D2	D3
Pre Launch	247 ± 12 keV/mV	261 ± 8 keV/mV	7.7 ± 0.1 MeV/mV
Orb 1 - 100 average	253 ± 12 keV/mV	245 ± 8 KeV/mV	7.3 ± 0.1 MeV/mV

In addition to protons, the IMP-6 Small Telescope responds to heavier nucleons and electrons. It is vital to keep this in mind when interpreting the PHA data and especially the counting rates, since, for example, the majority of counts from the instrument is often from electrons.

3. Data Formats of the Magnetic Tapes:

3.1 SOEL Summary Tapes (SST): Each experimenter tape received from GSFC is processed at the University of Chicago by the IMP-6 Sort/Overlap Eliminate (SOEL) program, which processes one orbit of data per run. The SOEL program input stage reads in the GSFC experimenters tape and performs a number of checks on its contents. Data records on the GSFC experimenter tape may be rejected by SOEL for the following reasons: (1) read (parity) error, (2) empty (all fill data) album, (3) inconsistencies in pseudo-sequence-count or other timing information. The sort phase of SOEL sorts all the albums for an orbit into time order, based on the pseudo-sequence-count of the first non-fill sequence in the album. This is appropriate in cases where there is a change of bit rate, for example:



Thus, the algorithm chosen will result in the natural order 1, 2, 3, 4, 5, 6 whereas a sort based on the start PSC of the album would give 1, 2, 5, 3, 4, 6. Note that there may be a time step-back between the end of the album and the beginning of the next when the bit rate changes. After the sort phase, SOEL examines the data to eliminate duplicate data resulting from more

than one acquisition of the spacecraft. In order to prevent overlap between orbits, SOEL is given parameter cards specifying the pseudo-sequence-count boundaries for each orbit. Table 7 shows the orbit boundaries used in processing the University of Chicago data.

The SOEL output for each orbit is gathered onto SOEL Summary Tapes (SST's). Each SST contains, in four separate files, the data for four orbits. The data for each orbit are followed by an end-of-file mark, and an extra, second end-of-file follows the last orbit on the tape. Tape SST-n thus contains data for orbits 4(n-1)+1 through 4(n-1)+4. If data is lacking for some orbit, that orbit will be represented by an end-of-file on the SST tape. The last tape in the series may contain fewer than four orbits; a double end-of-file will terminate the last orbit present on this tape.

An SST tape is a 7-track, IBM-compatible magnetic tape recorded at 800 BPI density with odd (binary) parity. The file of data for an orbit consists of some number of 2400-character physical records. Each physical record, including the last, contains three 800-character logical records, each of which contains one album of data. The three albums are not necessarily adjacent in time, and individual albums may be empty. Empty albums will often occur in the last one or two logical records in the last physical record of the file; they may also occur in other places if deletions have been made because of anomalies in the data which were discovered after the SOEL processing. An empty album will consist of 799 characters of octal 00 followed by one octal 01 character. An easy test for an empty album can be devised by noting that neither the day nor the year may be 0 in a non-empty album.

The format of the data in a non-empty album is shown in figure 2 and described below. In the descriptions, bits within a character are numbered starting with 1 at the left; the character numbering convention can be gotten from the figure.

Table 7

TIME AND PSC OF THE BEGINNING
OF EACH ORBIT ON IMP-6

ORBIT	MONTH	DAY	YEAR	DAY OF YEAR	HR	MIN	SEC	PSUEDO-SEQUENCE COUNT
1	MAR	13	1971	72	17	11	48	2831600
2	MAR	17	1971	76	20	0	29	3112448
3	MAR	22	1971	81	0	11	0	3391744
4	MAR	26	1971	85	3	37	52	3671808
5	MAR	30	1971	89	7	25	11	3952832
6	APR	3	1971	93	11	12	31	4233857
7	APR	7	1971	97	15	5	17	4515137
8	APR	11	1971	101	19	7	36	4796865
9	APR	15	1971	105	22	26	17	5076545
10	APR	20	1971	110	2	4	3	5357121
11	APR	24	1971	114	6	5	0	5638785
12	APR	28	1971	118	9	12	47	5917953
13	MAY	2	1971	122	12	51	55	6198593
14	MAY	6	1971	126	16	11	57	6478337
15	MAY	10	1971	130	19	47	0	6758785
16	MAY	14	1971	134	23	16	35	7038977
17	MAY	19	1971	139	2	7	59	7317377
18	MAY	23	1971	143	6	21	12	7598817
19	MAY	27	1971	147	10	1	42	7880321
20	MAY	31	1971	151	13	17	39	8159873
21	JUN	4	1971	155	16	32	14	8439361
22	JUN	8	1971	159	19	52	16	8719105
23	JUN	12	1971	163	23	20	29	8999233
24	JUN	17	1971	168	2	44	37	9279169
25	JUN	21	1971	172	6	40	6	9560577

TIME AND PSC OF THE BEGINNING
OF EACH ORBIT ON IMP-6

ORBIT	MONTH	DAY	YEAR	DAY OF YEAR	HR	MIN	SEC	PSUEDO-SEQUENCE COUNT
26	JUN	25	1971	176	10	4	14	9840513
27	JUN	29	1971	180	13	22	54	10120193
28	JUL	3	1971	184	17	3	24	10400897
29	JUL	7	1971	188	20	7	4	10679680
30	JUL	12	1971	193	0	20	17	10962112
31	JUL	16	1971	197	3	37	35	11240896
32	JUL	20	1971	201	7	7	11	11521921
33	JUL	24	1971	205	9	54	30	11800129
34	JUL	28	1971	209	13	39	5	12081025
35	AUG	1	1971	213	18	10	1	12364097
36	AUG	5	1971	217	20	30	4	12641025
37	AUG	9	1971	221	23	25	34	12919617
38	AUG	14	1971	226	3	46	58	13202237
39	AUG	18	1971	230	7	16	33	13482429
40	AUG	22	1971	234	11	22	56	13764349
41	AUG	26	1971	238	15	4	48	14045117
42	AUG	30	1971	242	17	58	55	14323645
43	SEP	3	1971	246	22	10	46	14605821
44	SEP	8	1971	251	1	40	21	14886013
45	SEP	12	1971	255	5	0	23	15165757
46	SEP	16	1971	259	8	38	8	15446333
47	SEP	20	1971	263	11	45	54	15725501
48	SEP	24	1971	267	14	56	23	16004797
49	SEP	28	1971	271	18	47	46	16286013
50	OCT	2	1971	275	21	35	4	16564221

TIME AND PSC OF THE BEGINNING
OF EACH ORBIT ON IMP-6

ORBIT	MONTH	DAY	YEAR	DAY OF YEAR	HR	MIN	SEC	PSUEDO-SEQUENCE COUNT
51	OCT	7	1971	280	2	14	11	16847677
52	OCT	11	1971	284	5	15	7	17126525
53	OCT	15	1971	288	9	13	21	17408062
54	OCT	19	1971	292	12	33	23	17687806
55	OCT	23	1971	296	16	53	24	17970366
56	OCT	27	1971	300	20	1	9	18249539
57	OCT	31	1971	304	23	56	37	18530942
58	NOV	5	1971	309	3	9	49	18810366
59	NOV	9	1971	313	8	23	1	19095422
60	NOV	13	1971	317	12	21	13	19376958
61	NOV	17	1971	321	14	58	57	19654718
62	NOV	21	1971	325	17	57	10	19933438
63	NOV	25	1971	329	21	44	27	20214462
64	NOV	30	1971	334	1	39	55	20495870
65	DEC	4	1971	338	5	23	7	20776702
66	DEC	8	1971	342	9	49	57	21059582
67	DEC	12	1971	346	11	42	42	21335340
68	DEC	16	1971	350	16	14	59	21618366
69	DEC	20	1971	354	19	2	16	21896574
70	DEC	24	1971	358	22	42	44	22177273
71	DEC	29	1971	363	3	8	12	22460094
72	JAN	2	1972	2	6	29	35	22739902
[illegible]	JAN	10	1972	10	9	5	32	23287934
75	JAN	14	1972	14	16	17	22	23578558
76	JAN	18	1972	18	20	6	1	23859646

TIME AND PSC OF THE BEGINNING
OF EACH ORBIT ON IMP-6

ORBIT	MONTH	DAY	YEAR	DAY OF YEAR	HR	MIN	SEC	PSUEDO-SEQUENCE COUNT
77	JAN	22	1972	22	23	23	18	24139262
78	JAN	27	1972	27	3	39	13	24421630
79	JAN	31	1972	31	6	4	42	24698814
80	FEB	4	1972	35	11	16	32	24983806
81	FEB	8	1972	39	13	7	55	25259390
82	FEB	12	1972	43	16	51	7	25540220
83	FEB	16	1972	47	19	17	57	25817470
84	FEB	21	1972	52	0	6	36	26101374
85	FEB	25	1972	56	2	52	31	26379518
86	FEB	29	1972	60	9	0	15	26667134
87	MAR	4	1972	64	10	48	55	26942590
88	MAR	8	1972	68	14	21	13	27222910
89	MAR	12	1972	72	17	52	8	27503166
90	MAR	16	1972	76	22	42	9	27787134
91	MAR	21	1972	81	1	29	26	28065342
92	MAR	25	1972	85	5	22	11	28346622
93	MAR	29	1972	89	9	40	51	28629118
94	APR	2	1972	93	13	0	52	28908862
95	APR	6	1972	97	16	34	31	29189246
96	APR	11	1972	101	20	1	22	29469310
97	APR	15	1972	106	0	35	1	29752510
98	APR	19	1972	110	3	55	3	30032254
[illegible]	APR	23	1972	115	7	30	4	30318334
100	APR	27	1972	118	11	16	0	30593662
101	MAY	1	1972	122	14	30	34	30873150

TIME AND PSC OF THE BEGINNING
OF EACH ORBIT ON IMP-6

ORBIT	MONTH	DAY	YEAR	DAY OF YEAR	HR	MIN	SEC	PSUEDO-SEQUENCE COUNT
102	MAY	5	1972	126	18	47	52	31155582
103	MAY	9	1972	130	21	31	5	31433598
104	MAY	14	1972	135	1	0	39	31713790
105	MAY	18	1972	139	5	7	2	31995710
106	MAY	22	1972	143	8	32	31	32275710
107	MAY	26	1972	147	12	45	44	32557950
108	MAY	30	1972	151	15	50	45	32836990
109	JUN	3	1972	155	19	50	20	33118590
110	JUN	8	1972	160	0	6	16	33400958
111	JUN	12	1972	164	1	23	35	33674942
112	JUN	16	1972	168	5	58	36	33958206
113	JUN	20	1972	172	10	6	22	34240190
114	JUN	24	1972	176	12	35	57	34517566
115	JUN	28	1972	180	17	6	53	34800638
116	JUL	2	1972	184	19	9	11	35076733
117	JUL	7	1972	189	0	44	12	35362813
118	JUL	11	1972	193	2	36	58	35638461
119	JUL	15	1972	197	6	58	22	35921085
120	JUL	19	1972	201	10	12	56	36200573
121	JUL	23	1972	205	14	23	25	36482685
122	JUL	27	1972	209	17	14	49	36761085
123	JUL	31	1972	213	21	10	17	37042493
124	AUG	5	1972	218	1	19	25	37324541
125	AUG	9	1972	222	3	54	27	37602173
126	AUG	13	1972	226	8	6	17	37884349

TIME AND PSC OF THE BEGINNING
OF EACH ORBIT ON IMP-6

ORBIT	MONTH	DAY	YEAR	DAY OF YEAR	HR	MIN	SEC	PSUEDO-SEQUENCE COUNT
127	AUG	17	1972	230	12	5	52	38165949
128	AUG	21	1972	234	15	12	15	38445053
129	AUG	25	1972	238	19	10	27	38726589
130	AUG	29	1972	242	23	0	29	39007741
131	SEP	3	1972	247	1	43	41	39285757
132	SEP	7	1972	251	5	43	15	39567357
133	SEP	11	1972	255	8	48	16	39846397
134	SEP	15	1972	259	12	39	39	40127613
135	SEP	19	1972	263	15	51	30	40406973
136	SEP	23	1972	267	21	0	36	40691837
137	SEP	27	1972	271	23	39	43	40969661
138	OCT	2	1972	276	3	26	46	41250621
139	OCT	6	1972	280	7	45	39	41533181
140	OCT	10	1972	284	11	50	56	41815049
141	OCT	14	1972	288	14	23	14	42092553
142	OCT	18	1972	292	17	45	59	42372425
143	OCT	22	1972	296	22	29	10	42656073
144	OCT	27	1972	301	2	1	28	42936393
145	OCT	31	1972	305	5	55	34	43217737
146	NOV	4	1972	309	8	40	8	43495816
147	NOV	8	1972	313	12	9	42	43776009
148	NOV	12	1972	317	16	5	10	44057417
[illegible]	NOV	16	1972	321	18	42	54	44335177
150	NOV	20	1972	325	23	20	39	44618569
151	NOV	25	1972	330	3	9	18	44899657

TIME AND PSC OF THE BEGINNING
OF EACH ORBIT ON IMP-6

ORBIT	MONTH	DAY	YEAR	DAY OF YEAR	HR	MIN	SEC	PSUEDO-SEQUENCE COUNT
152	NOV	29	1972	334	6	45	40	45180169
153	DEC	3	1972	338	11	0	13	45462473
154	DEC	7	1972	342	13	6	36	45738761
155	DEC	11	1972	346	17	6	10	46020361
156	DEC	15	1972	350	20	39	49	46300745
157	DEC	2[illegible]	1972	355	0	27	6	46581769

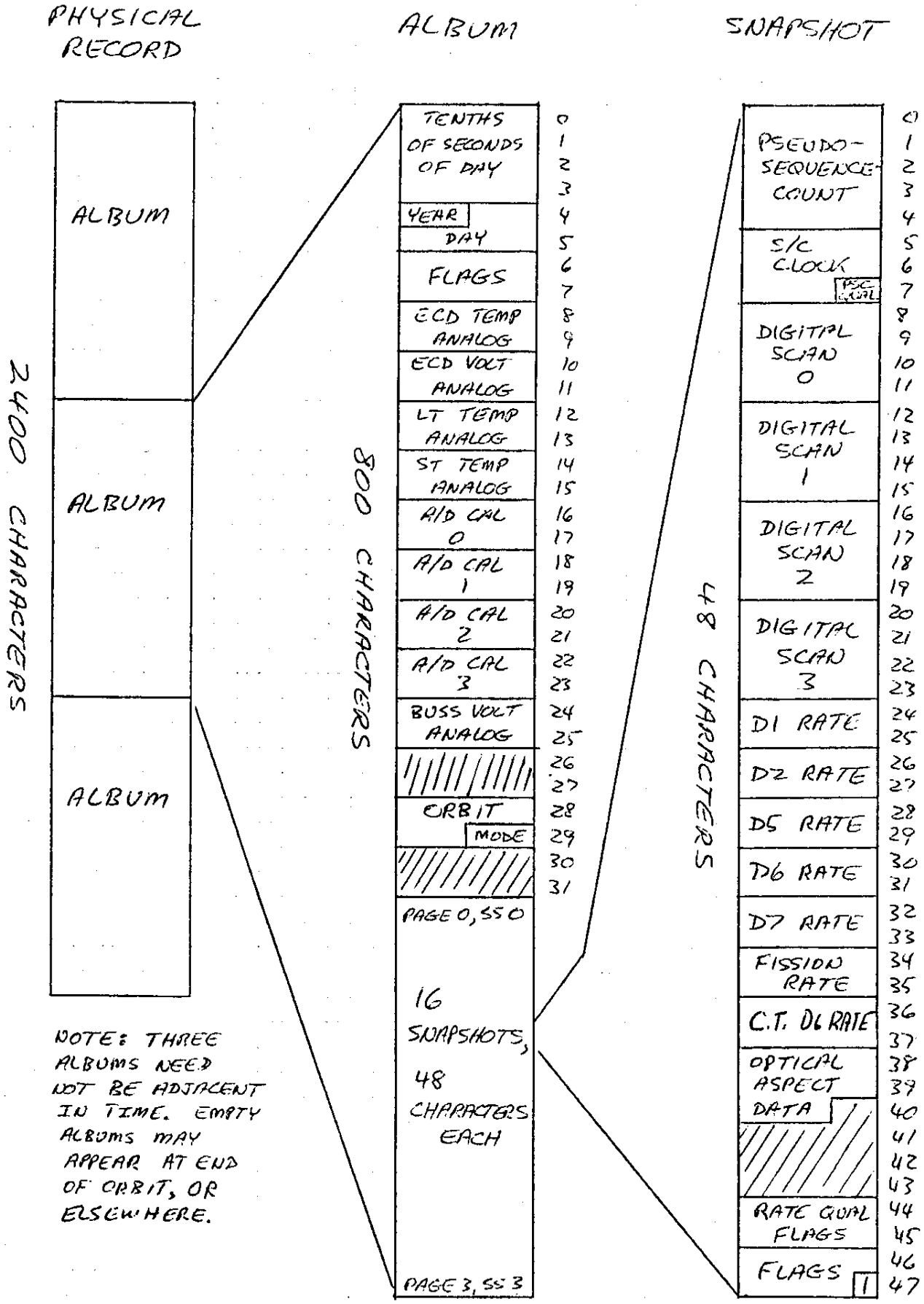
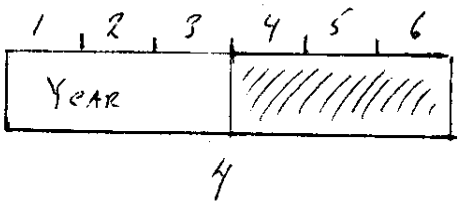

PHYSICAL RECORD
ALBUM
SNAPSHOT
ALBUM
ALBUM
ALBUM
2400 CHARACTERS
TENTHS OF SECONDS OF DAY
YEAR
DAY
FLAGS
ECD TEMP ANALOG
ECD VOLT ANALOG
LT TEMP ANALOG
ST TEMP ANALOG
A/D CAL 0
A/D CAL 1
A/D CAL 2
A/D CAL 3
BUSS VOLT ANALOG
ORBIT
MODE
PAGE 0, SS 0
16 SNAPSHOTS, 48 CHARACTERS EACH
PAGE 3, SS 3
800 CHARACTERS
PSEUDO-SEQUENCE COUNT
S/C CLOCK
PSC QUAL
DIGITAL SCAN 0
DIGITAL SCAN 1
DIGITAL SCAN 2
DIGITAL SCAN 3
D1 RATE
D2 RATE
D5 RATE
D6 RATE
D7 RATE
FISSION RATE
C.T. D6 RATE
OPTICAL ASPECT DATA
RATE QUAL FLAGS
FLAGS
1
48 CHARACTERS
NOTE: THREE ALBUMS NEED NOT BE ADJACENT IN TIME. EMPTY ALBUMS MAY APPEAR AT END OF ORBIT, OR ELSEWHERE.

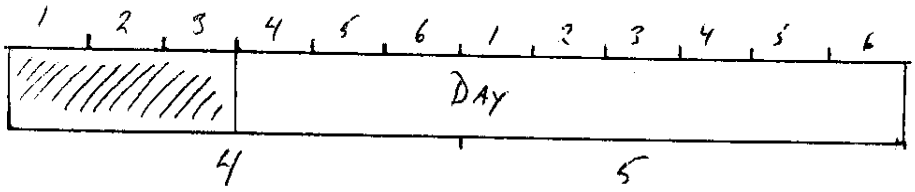
Figure 2

Chars.	Items Present Once Per Album
0 - 3	Tenth of seconds of the day. A 24-bit unsigned integer giving the time in tenths of seconds past midnight (Universal Time). For derivation, see under "day" below.
4(part)	Year. A 3-bit unsigned integer giving



the year modulo 1970 (e.g. 1=1971). For deviation, see under "day" below.

4(part)-5 Day. A 9-bit unsigned integer giving the day of the year.



January 1 = 1. The time given by the above three items is the time of the start of the album. Our data tapes contain the time of the first non-fill sequence in each album. The time put on the SST tape is derived by extrapolating back, if necessary, to the beginning of the album and truncating to tenths of seconds. The extrapolating is done using the nominal value of the sequence duration for the appropriate telemetry rate. This extrapolation is done for each album during the input phase of the SOEL program; if two or more albums are merged to form the final output album, the time used will be from an input album with the smallest time quality flag (see below), interpreted as a 2-bit integer.

The times of the starts of the albums on an SST tape will monotonically increase except, often, when a change from one telemetry rate to the other is made.

Chars.

6 - 7 Flags as follows:

1 2	3 4	5 6	1 2	3	4	5	6
Time Quality	0 0	CAL / NORMAL	0 0	Bit Rate	B.R. WARN.	OFF	OFF WARN.
6			7				

Time quality flag. The 2-bit flag which was associated with that time on our data tape which appears, extrapolated back if necessary, as the time in this album (characters 0 - 5 above). We have so far found no need to examine this flag in our processing. According to the IMP-I Data Processing Plan, values of this flag mean:

00 - (will not occur)
01 - time OK, smoothed
10 - time has been corrected by reference to satellite clock
11 - (will not occur)

Calibrate/normal flag. A 2-bit flag created by the SOEL program from the spacecraft clock and its known relation to our instrument's calibrate period. The four values of this flag are needed because of the time lag between the measurement and the telemetering of our data items. Note also that "first album", as used here, means first album of real time at the spacecraft; the first album may not appear on the SST tapes because of gaps in the data coverage.

01 - this is the first album of a calibrate period
10 - this is an album other than the first, of a calibrate period
11 - this is the first album following a calibrate period
00 - otherwise

Bit rate flag. The telemetry bit rate at which the spacecraft was operating when

Chars.

this album was transmitted. The information is gotten from the file header record on our data tape.

0 - 400 IBPS (information bits per second)
1 - 1600 IBPS

Bit rate warning flag. A flag generated by the SOEL program indicating whether it is known that the preceeding album of time was at the same telemetry rate as the current one. If this is not known, the first non-fill rate readouts in the current album should not be used because the accumulation time is uncertain.

0 - preceeding album known same
1 - otherwise

Off flag. A flag derived by the SOEL program indicating whether the instrument is turned on or not.

0 - power on during entire album
1 - power off during all or part of album

Off warning flag. A flag derived by the SOEL program indicating whether it is known that the instrument power was on during the preceeding album of time. If this is not certain, the first non-fill rate readouts should not be used.

0 - preceeding album known on
1 - otherwise

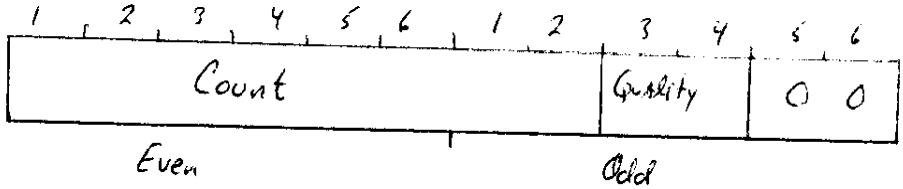
8 - 9 Electron current detector temperature.

10 - 11 Electron current detector voltage output.

12 - 13 Composition telescope temperature.

Chars.

14 - 15 Small telescope temperature.



The count is an 8-bit unsigned integer, 0 if fill, giving the converted value of the analog voltage. The nominal conversion to volts is volts = 0.025 (230 - counts).

The temperature conversions are:

Telescope Temps (C)	Volts	ECD Temp (C)	Volts
40	.92	20	.27
30	1.25	10	.38
20	1.69	0	.56
10	2.23	-10	.82
0	2.85	-20	1.17
-10	3.50	-30	1.75
-20	4.10	-40	2.52
-30	4.61	-50	3.50
-40	4.98	-60	4.62

The 2-bit quality flag gives the data quality of the readout as follows:

00 - excellent

01 - good

10 - fill

11 - (will not occur)

16 - 23 A/D Converter Calibration.

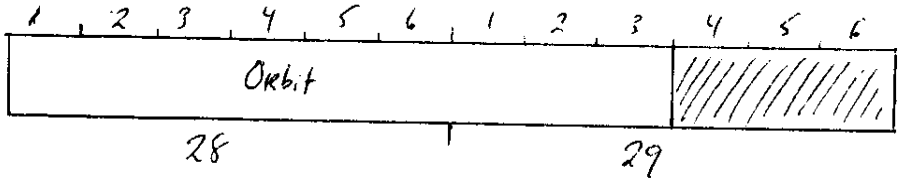
and

24 - 25 Buss Voltage Analog. These S/C housekeeping data were included for completeness on our tapes, but since we have not found any need to use them, they will not be described here.

Chars.

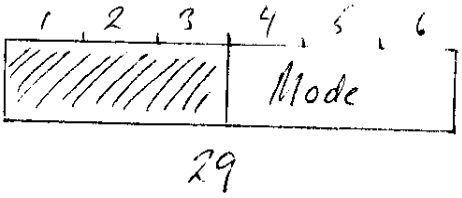
26 - 27 Unused.

28 - 29(part) Orbit. This 9-bit unsigned integer gives the number of the orbit containing this



album. It was given to the SOEL program as an input parameter when the data for this orbit were processed. Orbits extend approximately, but not exactly, from perigee to perigee; see Table 7.

29(part) Mode. This 3-bit flag indicates the priority mode in which the subsystem



telescope was operating during this album. The mode is controlled by the IMP-6 on-board computer experiment, and the mode must be determined from knowledge of commands sent to the OBC or inspection of the telescope data. The SOEL program accepts control cards telling it how to flag albums in various time ranges in the orbit. Additional values of the flag are reserved to indicate possible later updating if more refined transistion times become available.

000 - unknown or varies
100 - flagged by SOEL mode 1
110 - flagged by SOEL mode 2
other - spares

30 - 31 Twelve 0 bits; spares, and to pad the album to a convenient length.

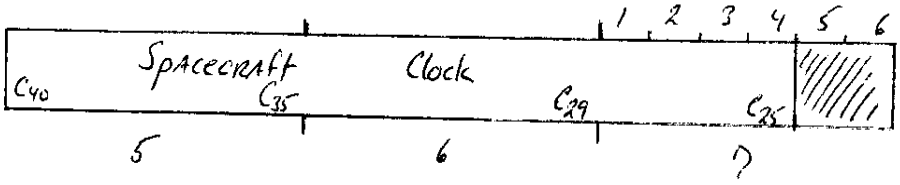
Chars. Items Present Once Per Snapshot

0 - 4 Pseudo-sequence-count. A 30-bit unsigned integer giving the pseudo-sequence-

Chars.

count of the first sequence in the snapshot. The PSC will be present regardless of whether there are any non-fill data in the snapshot. The pseudo-sequence-counts in the album will all be consistent, with each one greater than the preceeding one by 16 in 400 IBPS albums or 4 in 1600 IBPS albums. The PSC on the SST tape is created by extrapolating, if necessary, from the PSC of the first non-fill sequence in the snapshot as given on our data tape. PSCs for snapshots that are entirely fill are then filled out in a consistent manner. Any album whose resulting PSCs are not all consistent among themselves is deleted by the input phase of SOEL. From one album to the next, the pseudo-sequence-count is guaranteed only to increase monotonically, and that only if there is no bit rate change. The PSC may jump backwards when there is a bit rate change.

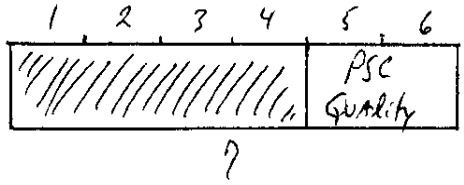
5 - 7(part) Spacecraft clock. A 16-bit unsigned integer giving the value of bits C_{40} - C_{25}



of the spacecraft's encoder clock. This value will be present regardless of whether there are any non-fill data in the snapshot. Missing values of the clock are filled in by the input phase of SOEL. GSFC processing prior to the decom is supposed to have corrected any telemetry errors in this data, even those that got by the convolutional decoder. These clock bits should step by 1 every page in 400 IBPS data and by 1 every album in 1600 IBPS data. No specific check on the consistency of the various clock values within an album is made by the SOEL program.

7(part) PSC quality. A 2-bit pseudo-sequence-count quality flag.

Chars.



00 - (will not occur)

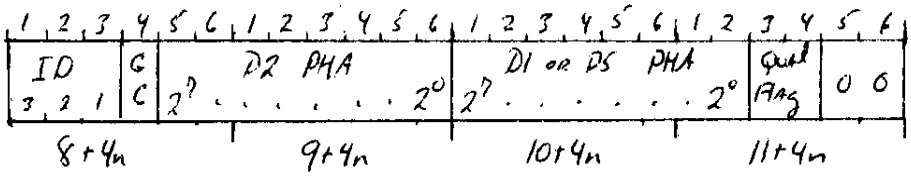
01 - this is, (or was derived from by extrapolating within the snapshot), a PSC flagged by GSFC as "computed from time differences".

10 - this is, (or was derived from by extrapolating within the snapshot), a PSC flagged by GSFC as "computed from satellite clock".

11 - this PSC was created by SOEL by extrapolating from elsewhere in the album since there were no non-fill data and hence no PSC in this snapshot on the data tape.

If two or more albums are merged to create the final output, a bit of the PSC quality flag will be 1 if that bit was 1 in any of the original albums.

(8+4n)-(11+4n)
n=0, 1, 2, 3 Small Telescope Digital Scan, sequence n. The 20-bit digital scan, zeros if fill,



which is telemetered from the subsystem telescope once each sequence. The 2-bit quality flag gives the data quality for the readout as follows:

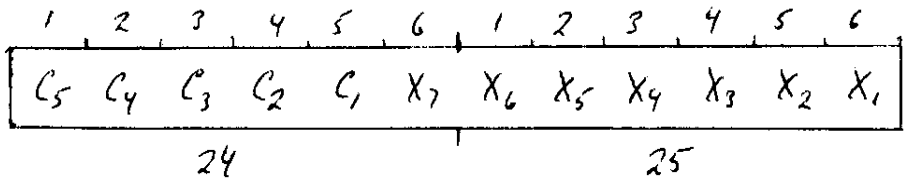
00 - excellent

01 - good

10 - fill

11 - (will not occur)

24 - 25 D1 Digital Rate. The 12-bit log-compressed value of the D1 counting rate



Chars.

readout in this snapshot. The readout will be twelve 0 bits if it is fill; see also "rate quality flags" .

26 - 27 D2 Digital Rate.

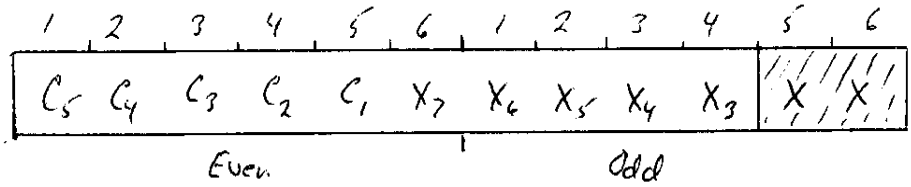
28 - 29 D5 Digital Rate.

30 - 31 D6 Digital Rate.

32 - 33 D7 Digital Rate.

34 - 35 Fission Chamber Digital Rate.

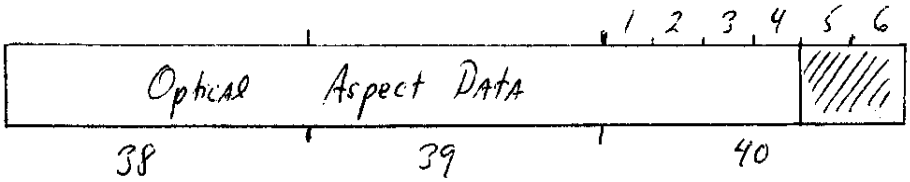
36 - 37 Composition Telescope D6 Rate. The 10-bit log-compressed value of the readout



for the named counting rate. It will be ten 0 bits if the readout is fill. The D7 and fission chamber rates share the same rate accumulator in the spacecraft; the SOEL program puts this readout for the snapshot into the appropriate one of the two rate positions on the SOEL tape and puts 0 bits (fill) in the other. See "rate quality flags" below for the data quality of these rate readouts.

The two remaining bits in the pair of characters, indicated XX in the diagram above, will always be 00 except following the Composition Telescope D6 rate, where a SOEL program bug caused an occasional 01 here.

38 - 40(part) Optical Aspect Data. The 16-bit readout of the optical aspect system for this



snapshot. The meaning of the readouts is described in the NASA/GSFC

Chars.

documents referenced in the Foreword.

40(part)-43 Twenty 0 bits, as spares and to pad the snapshot to a convenient length.

44 - 45 Rate Quality Flags. Seven 1-bit flags, as shown here, each giving the data

1	2	3	4	5	6	1	2	3	4	5	6
D1	D2	D5	D6	D7	FC	C.T. D6	0	0	0	0	0
44						45					

quality of the corresponding rate readout in this snapshot. Code:

0 - excellent or fill (fill can be distinguished by an all-0 readout, which is not a legal log-compressed rate)

1 - good

46 - 47 Flags, as follows.

1	2	3	4	5	6	1	2	3	4	5	6
OA Quality		O.B.C. D.P.P.		0	0	0	0	0	0	0	1
46				47							

Optical Aspect Quality. A 2-bit flag giving the data quality of the optical aspect readout in this snapshot, as follows:

00 - excellent

01 - good

10 - fill

11 - (will not occur)

On-board Computer Digital Performance Parameter. A 2-bit indication of whether power is on to the on-board computer experiment. This is derived from the appropriate DPP, telemetered once per snapshot. Code:

Chars.

00 - unknown (DPP was fill)

01 - OBC on

10 - (will not occur)

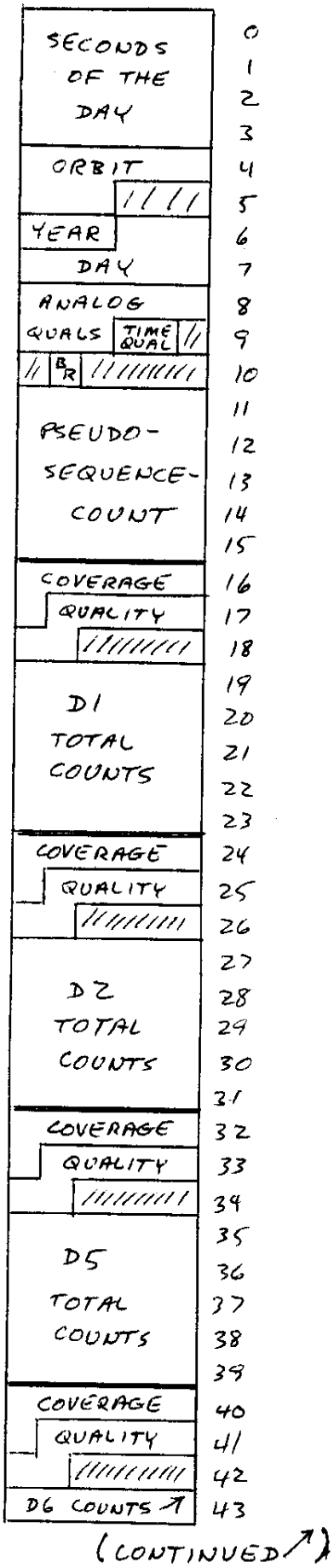
11 - OBC off

3.2 RATE Summary Tapes. These tapes contain the sum of accumulator readouts for each rate during a time interval 1 album long (low bit rate) or 4 albums long (high bit rate); the nominal interval length is thus 327.68 sec (5.46 minutes). In addition, associated time data, quality information and some engineering data are included in the RATE tape.

A RATE summary tape is a 7-track, IBM-compatible magnetic tape recorded at 800 BPI density with odd (binary) parity. Each full RATE summary tape contains data for 100 orbits. Each orbit of data is terminated by an end-of-file mark, with a second, extra end-of-file after the last orbit on the tape. Tape RATE-n contains the data for orbits 100(n-1)+1 through 100(n-1)+100. Each file contains some number of 1760-character physical records, with each physical record consisting of 20 logical records of length 88 characters. If data are lacking for some orbit, that orbit will be represented by an end-of-file mark on the RATE tape. Thus, multiple end-of-files may be encountered within the tapes, and should not be considered to mark the logical end-of-tape; to determine the logical end-of-tape, consult the tape label. Empty (zero) logical records will often occur in the second-to-last physical record of a file; the last physical record of all files is filled with zeros as a logical end-of-file mark.

The format of the data in a non-empty physical record is shown in Figure 3 and described below. In the descriptions, bits within a character are numbered starting with 1 at the left; the character numbering convention can be gotten from the figure.

LOGICAL RECORD 88 CHARACTERS



(CONTINUED)

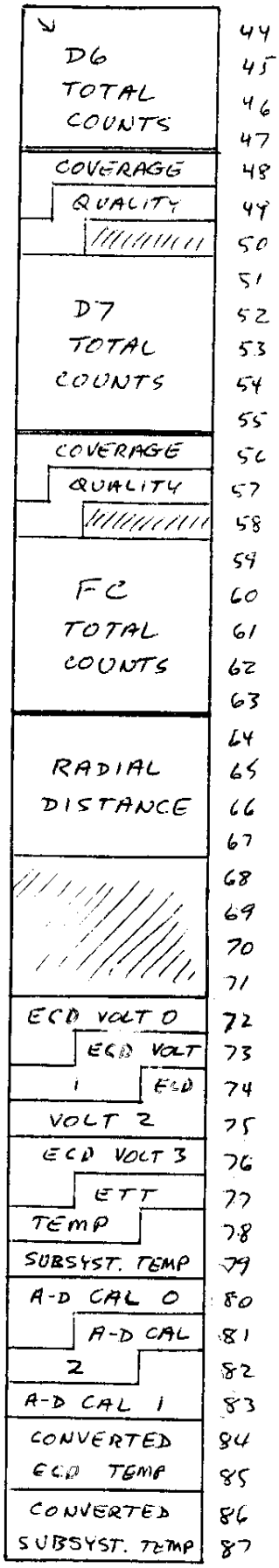
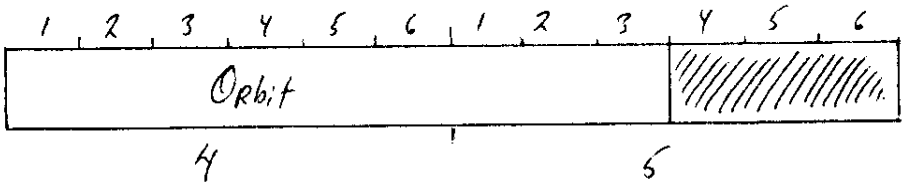


Figure 3

Chars.

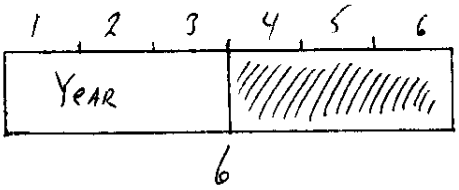
0 - 3 Seconds of the Day. A 24-bit unsigned integer giving the time in seconds past midnight (Universal time). For derivation, see under "pseudo-sequence-count" below.

4 - 5(part) Orbit. This 9-bit unsigned integer gives the number of the orbit from the SOEL



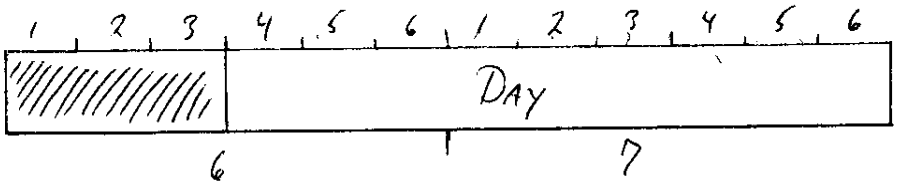
output tape used as input for generation of this file on the RATE tape.

6(part) Year. A 3-bit unsigned integer giving the year modulo 1970 (e.g. 1=1971).



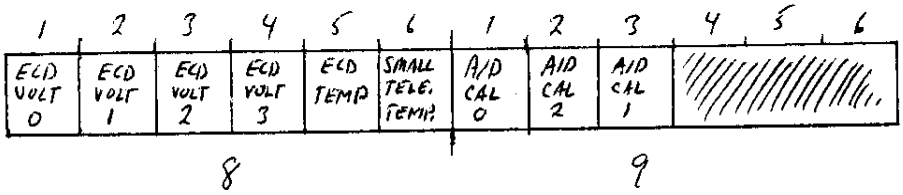
For derivation, see under "pseudo-sequence-count" below.

6(part)-7 Day. A 9-bit unsigned integer giving the day of the year. January 1 = 1.



For derivation, see under "pseudo-sequence-count" below.

8 - 9(part) Analog Qualities. These nine 1-bit flags give the quality of the analog items in



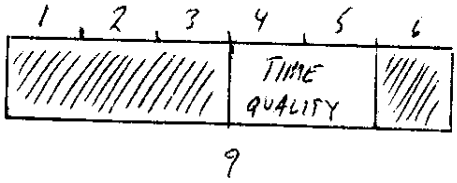
characters 72 - 83. If any analog item in characters 72 - 83 is zero, then no excellent or good quality data existed for that analog. If non-zero, then its quality flag can be inspected. The values of the flag mean:

Chars.

0 - excellent quality

1 - good quality

9(part) Time Quality. This flag has been taken from the SOEL input tape. The



values mean:

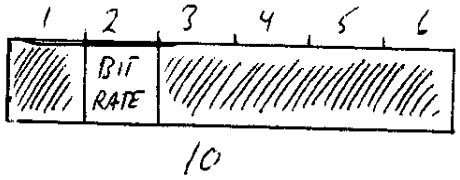
00 - (will not occur)

01 - time OK, smoothed

10 - time has been corrected by reference to satellite clock

11 - (will not occur)

10(part) Bit Rate Flag. The telemetry bit rate at which the spacecraft was operating for



this logical record of data.

0 - 400 IBPS

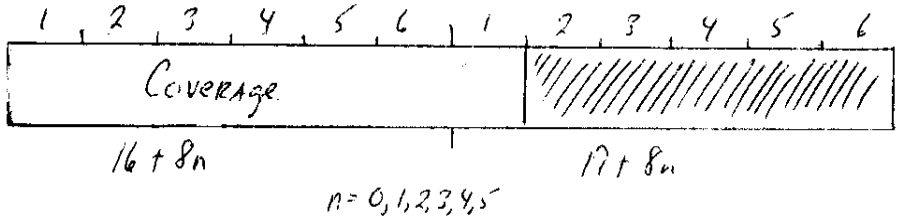
1 - 1600IBPS

(No logical record is included for any collection period during which the bit rate changed.)

11 - 15 Pseudo-Sequence-Count. A 30-bit unsigned integer giving the pseudo-sequence-count 256 PSC's beyond the time and PSC of the first data used in the interval. Similiarly, the time in characters 0 - 3, 6, and 7 is 327.68 seconds after the start of the interval. Note that the extrapolated time and PSC may lie within a data gap or beyond the end of the current orbit.

Chars.

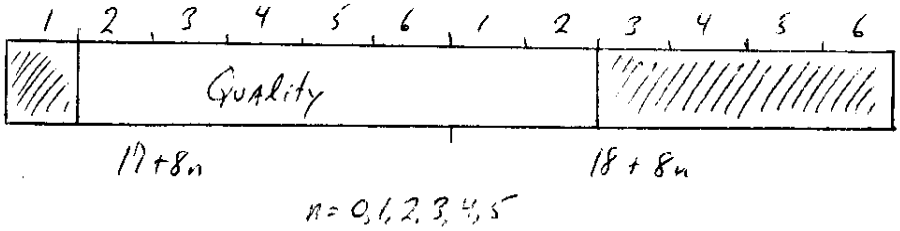
(16+8n)-(17+8n)(part)
n=0, 1, 2, 3, 4, 5 Coverage. A 7-bit unsigned binary integer giving the number of snapshots



containing data which were used in the sum of accumulator counts. (n=0 for D1, 1 for D2, 2 for D5, 3 for D6, 4 for D7, 5 for FC). The maximum value for coverage is 64 at high bit rate; 16 at low bit rate.

(17+8n)(part)-
(18+8n)(part)
n=0, 1, 2, 3, 4, 5

Quality. A 7-bit unsigned integer giving the number of snapshots used in the



sum of accumulator counts which were of excellent quality.

19 - 23 D1 Total Counts.

27 - 31 D2 Total Counts.

35 - 39 D5 Total Counts.

43 - 47 D6 Total Counts.

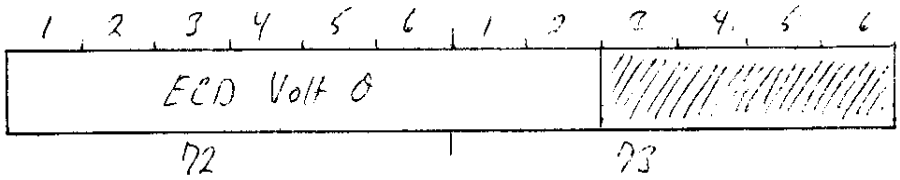
51 - 55 D7 Total Counts.

59 - 63 FC Total Counts. A 30-bit unsigned integer giving the total number of counts recorded during this interval.

Chars.

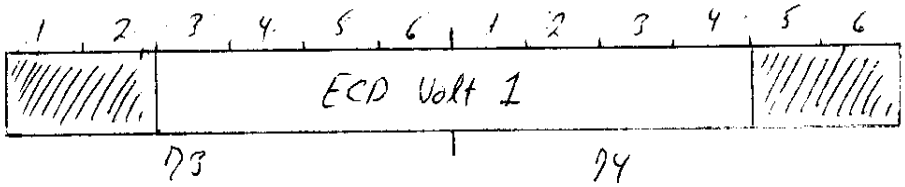
64 - 67 Radial Distance. A 24-bit integer giving the geocentric distance of the satellite in units of tenths of an earth radius. This item is obtained from the IMP-I MCE tape supplied by GSFC, and may be zero if no data for this time was found.

72 - 73 (part) ECD Volt 0. ECD voltage, in counts, for the first album of coverage for this



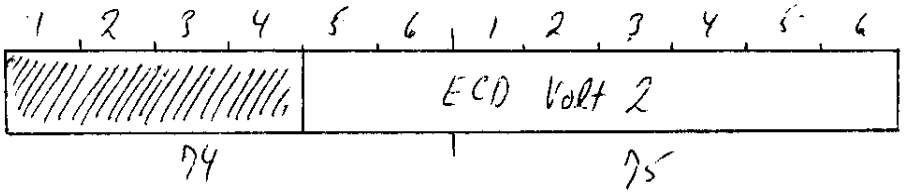
record. The nominal conversion to volts is: volts = 0.025 (230-counts).

73 (part) - 74 (part) ECD Volt 1. ECD voltage, in counts, for the second album of coverage for this



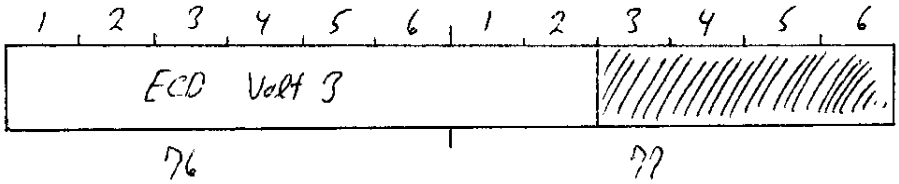
record. At 400 IBPS this item will be zero.

74 (part) - 75 ECD Volt 2. ECD voltage, in counts, for the third album of coverage for this



record. At 400 IBPS this item will be zero.

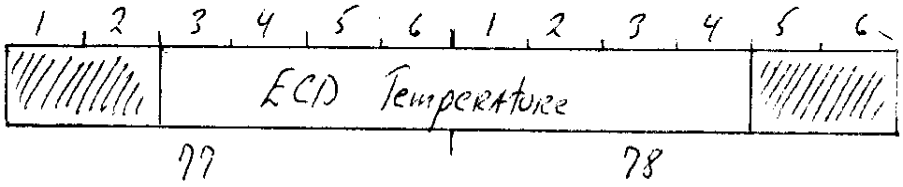
76 - 77 (part) ECD Volt 3. ECD voltage, in counts, for the fourth album of coverage for this



record. At 400 IBPS this item will be zero.

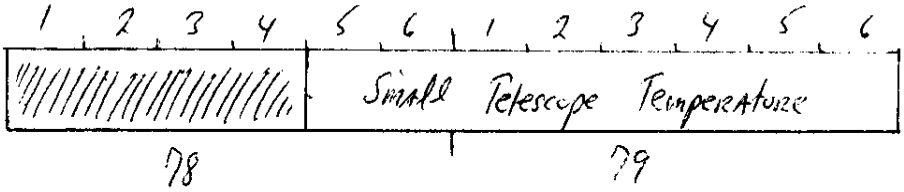
Chars.

77(part) - 78(part) Electron Current Detector Temperature. In counts, for the first readout of this



item for the period covered by this record. For conversion, see SST tape description.

78(part) - 79 Small Telescope Temperature. In counts, for the first readout of this item for the



period covered by this record. For conversion, see SST tape description.

80 - 83 A/D Converter Calibrations. In counts, for A/D Cal readouts on telemetry pages 0, 2, 1. See documents referenced in the foreword.

84 - 85 Converted ECD Temperature. A 12-bit signed (two's complement) integer giving the converted value of ECD Volt 0 (see above) in units of 0.03125 degrees centigrade.

86 - 87 Converted Small Telescope Temperature. A 12-bit signed (two's complement) integer giving the converted value of the Small Telescope temperature (see above) in units of 0.03125 degrees centigrade.

4. Format for the Counting Rate Plots on Microfilm. The plots were computer generated on a Cal/Comp 563 plotter with the vertical axis representing the rate in counts per second, and the horizontal axis representing a time period of 30 days beginning on the first day

of a Bartels Solar Rotation and ending three days into the following Solar Rotation. The horizontal scale is one day per division, and the vertical logarithmic scale varies for each range interval. Every horizontal fiducial is labelled with the Month and day-of-month as well as the day of year (January 1 = day 1). The year of the first day is printed at the origin. The heading of each plot contains the experiment name, the counting rate range interval expressed in terms of the relevant detector coincidence, the Bartels Solar Rotation number, and the date of generation of the plot at the University of Chicago.

Each plotted point represents a rate averaged from 3 logical records of the RATE tape. The rates are obtained from the rate accumulator readouts, and are therefore a measure of all particle types triggering the telescope -- i.e., electrons + protons + heavier nuclei.

Acknowledgements. The IMP-6 experiment was designed and constructed under the direction of Professor J. A. Simpson with important contributions being made by Drs. J. J. O'Gallagher and M. G. Munoz. The instrument was constructed by the staff of the Laboratory for Astrophysics and Space Research under the direction of J. Lamport. R. Jacquet was the project engineer, with R. Tjonoman and E. Drag performing most of the instrument electronics fabrication and check-outs. The post-launch data submitted here was processed by the data group under the direction of G. Lentz, with programming contributions and data processing assistance from T. Keck, E. Murphy, M. Lewis and D. Gunter.

DR\DS004743

RECORD 1 OF FILE 1
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72

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41(241)	000000000000	000001770174	017401740000	017401741413	640000000000	140100126341	205316050000	000000000000
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169(1009)	000001740174	777774000000	000014010012	634500531625	000000000000	000000000000	000000000177	017401740174
177(1057)	000001740174	157670000000	000014010012	634520531625	000000000000	000000000000	000000000177	017401740174
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257(1537)	017400000174	777774000000	000014010012	634760531635	000000000000	000000000000	000000000177	017401740174
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385(2305)	001263534053	165500000000	000000000000	000000000000	017701740174	017401740000	017477777400	000000001401
393(2353)	001263536053	165500000000	000000000000	000000000000	017701740174	017401740000	017477777400	000000001401

RECORD 1 OF FILE 5
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153(	913)	000001740174	214274000000	000014010017	050710742435	000000000000	000000000000	000000000177	017401740174
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177(	1057)	000001740174	065510000000	000014010017	050724742435	000000000000	000000000000	000000000177	017401740174
185(	1105)	000001740174	214274000000	000014010017	050730742435	000000000000	000000000000	000000000177	017401740174
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313(	1873)	001705102474	244100000000	000000000000	000000000000	017701740174	017400000174	017421427400	000000001401
321(	1921)	001705103074	244100000000	000000000000	000000000000	017701740174	017400000174	017477777400	000000001401
329(	1969)	001705103474	244100000000	000000000000	000000000000	017701740174	017400000174	017477777400	000000001401
337(	2017)	001705104074	244100000000	000000000000	000000000000	017701740174	017400000174	017401421000	000000001401
345(	2065)	001705104474	244100000000	000000000000	000000000000	017701740174	017400000174	017421427400	000000001401
353(	2113)	001705105074	244100000000	000000000000	000000000000	017701740174	017400000174	017477777400	000000001401
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369(	2209)	001705106074	244100000000	000000000000	000000000000	017701740174	017400000174	017415721000	000000001401
377(	2257)	001705106474	244100000000	000000000000	000000000000	017701740174	017401740000	017421427400	000000001401
385(	2305)	001705107074	244100000000	000000000000	000000000000	017701740174	017401740000	017477777400	000000001401
393(	2353)	001705107474	244100000000	000000000000	000000000000	017701740174	017401740000	017477777400	000000001401

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RECORD 1 OF FILE 9
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17(97)	000000000000	000001770174	017401740000	017401741501	600000000000	140100232731	116741050000	000000000000
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41(241)	000000000000	000001770174	017401740000	017401741570	200000000000	140100232731	256741050000	000000000000
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73(433)	000000000000	000001770174	017401740000	017401741570	200000000000	140100232731	456741050000	000000000000
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89(529)	000000000000	000001770174	017401740000	017401742133	040000000000	140100232731	556741050000	000000000000
97(577)	000000000000	000001770174	017401740000	017401740125	540000000000	140100232731	616741050000	000000000000
105(625)	000000000000	000001770174	017401740000	017401740712	740000000000	140100232731	656741050000	000000000000
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169(1009)	000001740174	777774000000	000014010023	273221674111	000000000000	000000000000	000000000177	017401740174
177(1057)	000001740174	071274000000	000014010023	273225674111	000000000000	000000000000	000000000177	017401740174
185(1105)	000001740174	220310000000	000014010023	273231674111	000000000000	000000000000	000000000177	017401740174
193(1153)	000001740174	777774000000	000014010023	273235674111	000000000000	000000000000	000000000177	017401740174
201(1201)	000001740174	777774000000	000014010023	273241674111	000000000000	000000000000	000000000177	017401740174
209(1249)	000001740174	071274000000	000014010023	273245674111	000000000000	000000000000	000000000177	017401740174
217(1297)	000001740174	220310000000	000014010023	273251674111	000000000000	000000000000	000000000177	017401740174
225(1345)	000001740174	777774000000	000014010023	273255674111	000000000000	000000000000	000000000177	017401740174
233(1393)	000001740174	777774000000	000014010023	273261674111	000000000000	000000000000	000000000177	017401740174
241(1441)	000001740174	054300000000	000014010023	273265674111	000000000000	000000000000	000000000177	017401740174
249(1489)	017400000174	220044000000	000014010023	273271674111	000000000000	000000000000	000000000177	017401740174
257(1537)	017400000174	777774000000	000014010023	273275674111	000000000000	000000000000	000000000177	017401740174
265(1585)	017400000174	777774000000	000014010305	470211512013	716071607160	716072000740	406040601420	000001140000
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297(1777)	002327331567	411500000000	000000000000	000000000000	017701740174	017400000174	017477777400	000000001401
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329(1969)	002327333567	411500000000	000000000000	000000000000	017701740174	017400000174	017477777400	000000001401
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361(2161)	002327335567	411500000000	000000000000	000000000000	017701740174	017400000174	017477777400	000000001401
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377(2257)	002327336567	411500000000	000000000000	000000000000	017701740174	017401740000	017422042000	000000001401
385(2305)	002327337167	411500000000	000000000000	000000000000	017701740174	017401740000	017477777400	000000001401
393(2353)	002327337567	411500000000	000000000000	000000000000	017701740174	017401740000	017477777400	000000001401

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17(97)	000000100000	001000000000	000000000000	000000000000	000000000000	400100275125	111050670000	001000000010
25(145)	000000100000	001000000000	000000000000	000000000000	000000000000	400100275125	151050650000	000000000000
33(193)	000000000000	000001770174	017401740000	017401747777	740000000000	040100275125	211050650000	000000000000
41(241)	000000000000	000001770174	017401740000	017401741542	040000000000	140100275125	251050650000	000000000000
49(289)	000000000000	000001770174	017401740000	017401742132	300000000000	140100275125	311050650000	000000000000
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137(817)	720007404060	406015000000	015400000027	512601105071	000000000000	000000000000	000000000177	017401740174
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321(1921)	002751273110	507520240000	201301202053	000020232240	133336700174	017400000174	145077777400	000000000401
329(1969)	002751273510	507520220020	300600202011	002030020140	135037200174	017400000174	150477777400	000000000401
337(2017)	002751274110	507530000020	400400200000	000030020120	134637507600	760100000174	150001247000	000000000401
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4 files

FILE 0001 REC 0001 CH 2400

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1729	001704661074	233100000000	000000000000	000000000000	017701740174	017400000174	017477777400	00000000 1401
1777	001704661474	233100000000	000000000000	000000000000	017701740174	017400000174	017477777400	00000000 1401
1825	001704662074	233100000000	000000000000	000000000000	017701740174	017400000174	017410053000	00000000 1401
1873	001704662474	233100000000	000000000000	000000000000	017701740174	017400000174	017421412400	00000000 1401
1921	001704663074	233100000000	000000000000	000000000000	017701740174	017400000174	017477777400	00000000 1401
1969	001704663474	233100000000	000000000000	000000000000	017701740174	017400000174	017477777400	00000000 1401
2017	001704664074	233100000000	000000000000	000000000000	017701740174	017400000174	017410053000	00000000 1401
2065	001704664474	233100000000	000000000000	000000000000	017701740174	017400000174	017421412400	00000000 1401
2113	001704665074	233100000000	000000000000	000000000000	017701740174	017400000174	017477777400	00000000 1401
2161	001704665474	233100000000	000000000000	000000000000	017701740174	017400000174	017477777400	00000000 1401
2209	001704666074	233100000000	000000000000	000000000000	017701740174	017400000174	017402564000	00000000 1401
2257	001704666474	233100000000	000000000000	000000000000	017701740174	017401740000	017421412000	00000000 1401
2305	001704667074	233100000000	000000000000	000000000000	017701740174	017401740000	017477777400	00000000 1401
2353	001704667474	233100000000	000000000000	000000000000	017701740174	017401740000	017477777400	00000000 1401

FILE 0001 REC 0017 CH 2400

0001	007664201131	201371607160	716000107160	074040400010	132000000044	000000170467	007423350000	000000000000
0049	000000000000	000001770174	017401740174	000001740256	400000000000	140100170467	047423350000	000000000000
0097	000000000000	000001770174	017401740000	017401742141	200000000000	140100170467	107423350000	000000000000
0145	000000000000	000001770174	017401740000	017401747777	740000000000	140100170467	147423350000	000000000000
0193	000000000000	000001770174	017401740000	017401747777	740000000000	140100170467	207423350000	000000000000
0241	000000000000	000001770174	017401740000	017401740256	400000000000	140100170467	247423350000	000000000000
0289	000000000000	000001770174	017401740000	017401742141	200000000000	140100170467	307423350000	000000000000
0337	000000000000	000001770174	017401740000	017401747777	740000000000	140100170467	347423350000	000000000000
0385	000000000000	000001770174	017401740000	017401747777	740000000000	140100170467	407423350000	000000000000
0433	000000000000	000001770174	017401740000	017401740256	400000000000	140100170467	447423350000	000000000000
0481	000000000000	000001770174	017401740000	017401742141	200000000000	140100170467	507423350000	000000000000
0529	000000000000	000001770174	017401740000	017401747777	740000000000	140100170467	547423350000	000000000000
0577	000000000000	000001770174	017401740000	017401747777	740000000000	140100170467	607423350000	000000000000
0625	000000000000	000001770174	017401740000	017401741670	700000000000	140100170467	647423350000	000000000010
0673	000000100000	001000000000	000000000000	000001740000	000000000000	500100170467	707423370000	001000000010
0721	000000100000	001000000000	000000000000	000000000000	000000000000	400100170467	747423370000	001000000010
0769	000000100000	001000000000	000000000000	000000000000	000000000000	400100000000	000000000000	000000000000

0817	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0865	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
0913	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
0961	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1009	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1057	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1105	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1153	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1201	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1249	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1297	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1345	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1393	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1441	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1489	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1537	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1585	000000000000	000000000000	000000010000	000000000000	000000000000	000000000000	000000000000	000000000000
1633	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
1681	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
1729	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
1777	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
1825	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
1873	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
1921	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
1969	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
2017	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
2065	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
2113	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
2161	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
2209	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
2257	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
2305	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001
2353	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000001

IMP-I

5-MIN AVG COUNT RATES, MAG. TAPE

71-019A-09B

This data set has been restored. There were originally four 7-track, 800 BPI tapes 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 original tapes were created on a 360 computer. The DR and DS numbers along with the corresponding D number are as follows:

DR#	DS#	D#	FILES	TIME SPAN
DR004031	DS004031	D011911	1 - 100	03/13/71 - 05/01/72
		D023424	101 - 200	04/22/72 - 06/20/73
		D028893	201 - 300	06/20/73 - 08/09/74
		D028894	301 - 313	08/09/74 - 10/02/74

o Read error occured in record 42 of File 103.

See 71-019A-09A