DATA SET CATALOG #98

Explorer 34 C.R. Proton (RVS DE/DX)

67-051A-03A	6 tapes
67-051A-00F	5 tapes
67-051A-03C	9 tapes
67-051A-03D	2 tapes

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

IMP-F

RATES FOR ALL NONOVERLAP SEQ.

67-051A-03A

This data set has been restored. There were originally 6 Binary 7-Track, 800 BPI tapes. There is one restored tape. The DR tape is a 3480 cartridge and the DS tape is 9-Track, 6250 BPI. The tapes were created on a 930 computer. The DR and DS numbers along with the corresponding D numbers and the time spans are as follows:

DR#	DS#	D#	FILES	TIME SPAN
DR03543	DS03543	D05805	1-30	05/24/67 - 09/30/67
		D05806	31-60	09/30/67 - 02/07/68
		D05807	61-90	02/07/68 - 06/16/68
		D05808	91-120	06/16/68 - 10/24/68
		D05543	121-140	10/24/68 - 03/03/69
		D05544	141-154	03/03/68 - 05/02/69

IMP-F

PHA EVENT SUMMARIES (NONOVERLAP)

67-051A-03C

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 9 9-TRACK, 1600 BPI TAPES, WRITTEN IN BINARY. THERE ARE TWO RESTORED TAPES, WHICH WERE PADDED DURING THE RESTORATION PROCESS. THE TIME SPANS ARE NOT IN SEQUENTIAL ORDER. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE TAPES WERE CREATED ON AN IBM 360 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	DD#	FILES	TIME SPAN
DR003878	DS003878	D005545	1-20	10/24/68 - 01/18/69
		D005546	21-40	01/18/69 - 04/15/69
		D005547	41-44	04/15/69 - 05/02/69
		D005799	45-64	05/24/67 - 08/18/67
		D005800	65-84	08/18/67 - 11/13/67
		D005801	85-104	11/13/67 - 02/07/68
DR003879	DS003879	D005802	1-20	02/07/68 - 05/04/68
		D005803	21-40	05/04/68 - 07/29/68
		D005804	41-60	07/29/68 - 10/24/68

IMP-F

5-MIN AVE COUNT RATES (NONOVERLAP)

67-051A-03D

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 2 7-TRACK, 800 BPI TAPES, WRITTEN IN BCD. THERE IS ONE RESTORED TAPE, WRITTEN IN ASCII. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS A 9-TRACK, 6250 BPI. THE TAPES WERE CREATED ON AN IBM 360 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	DD#	FILES	TIME SPAN
DR03817	DS03817	D05548	1-132	05/24/67 - 12/19/68
		D05549	133-196	07/30/68 - 05/02/69

IMP-F

CHICAGO MULTI-COORD EPHEMERIS TAPES

67-051A-00F

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED FIVE 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 XDS 930 COMPUTER AND THEY WERE RESTORED ON THE MRS SYSTEM. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN	
DR004386	DS004386	D005951	1-33	05/24/67 - 10/14/67	
		D005952	34-66	10/14/67 - 03/05/68	(a)
		D005953	67-99	03/05/68 - 07/25/68	
		D005954	100-132	07/25/68 - 12/15/68	(b)
		D005955	133-164	12/15/68 - 05/03/69	(c)

(a) D005952 - 1 ERROR, REC. 132, FILE 33
(b) D005954 - 4 ERRORS, REC. 95, 96, 136, 141, FILE 1
(c) D005955 - 2 ERRORS, REC. 1, FILE 1; REC. 73, FILE 4

1. Introduction

We are submitting to the NSSDC the final processed data obtained from the University of Chicago instruments on the eccentric polar orbiting satellites IMP-4 and IMP-5. IMP-4 data coverage is from the launch date of May 24, 1967 through April 29, 1969. IMP-5 data coverage is from the launch date of June 21, 1969, and continues until the present time (March, 1971). These data are presented on microfilm and on magnetic tape. On microfilm are time-intensity plots for the averaged counting rates with each plot corresponding to a Bartel's Solar Rotation. There are four categories of magnetic tape:

1) Averaged counting rates,
2) Raw accumulator readouts,
3) Pulse height analysis readouts, and
4) Orbit parameters.

This document describes the instruments, the formats of the data and the relationship between the data and the physical parameters the instruments were recording. A reference list of scientific publications by the University of Chicago group based on the IMP-4 and IMP-5 data is attached.

2. Instrumentation and Performance

The University of Chicago instruments on the satellites IMP-4 and IMP-5 are sufficiently similar that their characteristics can be described in parallel. The performance of the IMP-5 instrument will be reported when the data are submitted.

2.1 General Description

The University of Chicago instrument occupies one whole facet of the right octagonal cylinder of the IMP-4 (5) main body. Figures

collects in accumulator 7a. The prescaling on the $D1D2\overline{D3}D6$ (7a) rate is such that it collects the 1st count, then the 129th count, etc.

During the 4.8 seconds of each accumulation interval, one PHA event may be registered together with its angular sector (AS) and range identification (ID) information. The PHA comes from three pulse height analyzers: PHA1, 256 channels, assigned to D1 for ID = 0 to 5, and assigned to CK for ID = 6 and 7; PHA2, 512 channels, assigned to D2; PHA4, 256 channels, assigned to D4. The angular sector information comes from the Optical Aspect Sensor on the spacecraft and signifies an octant in the ecliptic* plane in which the PHA occurred (cf. figure 7). The range identification indicates the number of detectors the PHA event has triggered; i.e. a particle that penetrated D1 and D2 and stopped in D3 would be an ID = 3 event, and correspondingly the PHA reading from D4 should be zero. The definition of the IDs and the corresponding proton energies are given in Table 8.

* Actually in a plane perpendicular to the spacecraft spin axis which is approximately normal to the ecliptic plane.

2.5.2 IMP-5:

2.5.2a Pre-launch

The instrument has been carefully calibrated prior to launch on its electronic characteristics and its response to protons and electrons. Table 15 shows the thresholds of the detectors and Table 16 tabulates the pulser calibration of the PHA's.

TABLE 15

IMP-5 Detector Thresholds

D1	D2	D3	D4	$D5_L$	$D5_H$	CK	D6
(mV)	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)
0.685	1.35	0.640	0.275	0.105	1.39	2.08	19.6

Threshold is defined as one-half of full triggering. Thresholds are measured at room temperature.

3.3 RAte Summary Tape--RAST

The RAte Summary Tapes contain counting rates averaged over consecutive time intervals of 15 PSC's (~ 5 minutes) using only data of good quality. The last PSC in the period averaged over is assigned to the rate average. The physical and logical record size are given in Table 17.

Each logical record is generated with the following Fortran II format.

ITEM:	1	2	3	4	5	6 - 12	13	14	15
FORMAT	(1X, I3,	1X, I2,	1X, F4.1,	1X, I8,	1X, F4.1,	7 (1X, E12.5),	1X, F6.2,	1X, I3,	1H/I3)

The item names, units, and other specifications are displayed in Table 19.

3.3.1 Exceptions to the Standard Format

When reading the data from the tape, the above format statement is used except when reading the first logical record of each orbit which logical record is a heading. The second logical record of each orbit, although written in the above data format is not a data line and contains the following substitutions:

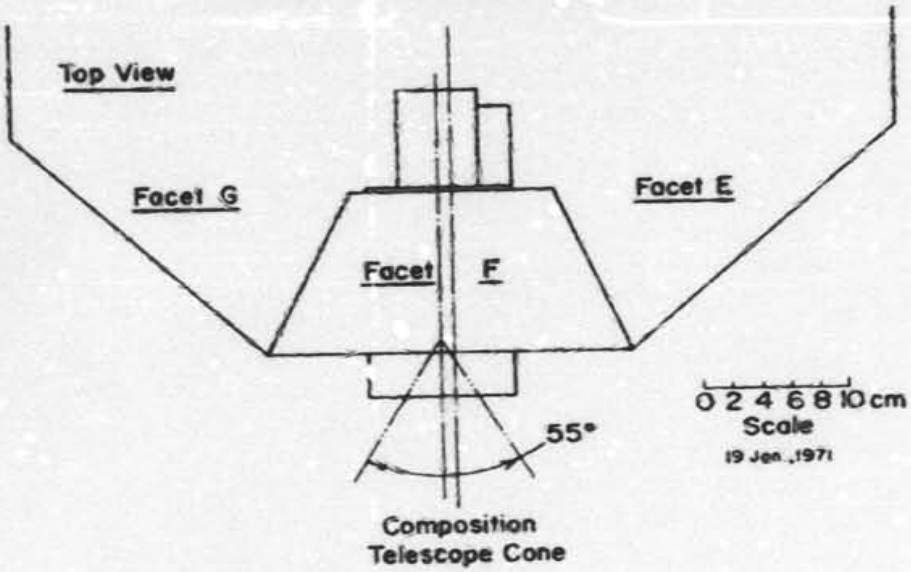
1) ITEMS 1 through 4 contain the Day, Hour, Minute and PSC for the first good data of the orbit.
2) ITEM 5 contains the orbit number.
3) ITEM 6 contains the geocentric distance of the satellite in kilometers.
4) All other ITEMS are filled with zeroes.

Similarly the last logical record of an orbit does not contain experiment data, but has the following substitutions:

1) ITEMS 1 through 3 contain the time of the last good data of the orbit.
2) ITEM 4= -1, thus acting as a sentinnel flag for the orbit.

IMP-5

Location and Orientation of University of Chicago Experiment



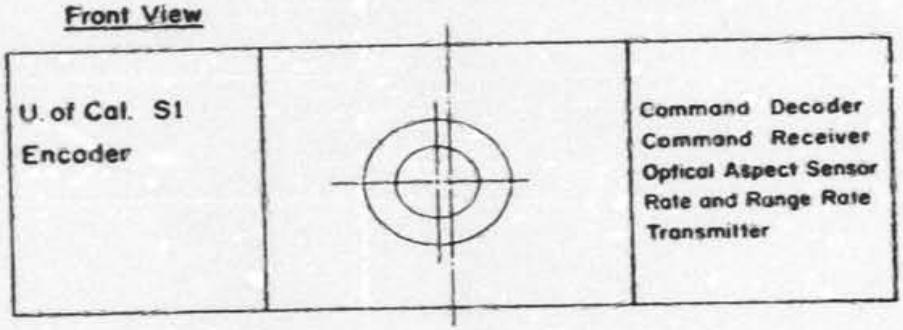


Figure 2

FILE 0001 REC 0001 CH 3264

EXP ... 54 ... 5805 ... BINARY

3/24/67

3/30/67

0001	601271567237	722172257410	000001350363	323475255401	405776120755	7607
0049	030614127551	751551123603	571041036012	716070547153	746375067760	0135
0097	601271617511	751175117511	776001350367	355573661560	573701415715	6150
0145	036756147566	352454577713	524737036012	716474577467	754475405016	0145
0193	601271657531	737377777347	134201450367	545077743432	233456547775	1644
0241	036734157564	334514071635	077436256012	716773317376	744775145360	0145
0289	601271707523	752575267526	776001450367	114675645127	024360760212	4067
0337	036707757564	671401662062	007560546012	717275277527	753075305240	0155
0385	601271737530	753075307527	524001550366	453075710435	001336540030	3646
0433	036643707565	235600217515	002436726012	717574757467	745174525240	0155
0481	601271767450	745174557470	524001550365	612175654103	002264110003	1370
0529	036540657061	604000051243	002311676012	720075267527	752775275240	0155
0577	601272037523	752175157507	524001650353	400475462002	001701560016	0146
0625	033660017530	000000112102	000161006012	720574337417	740073635240	0165
0673	601272067346	733073117265	524001650276	200274342002	002626240025	7333
0721	016520027340	400300107541	000576215012	721071007041	701175155720	0165
0769	601272116765	751575147513	652001750300	402367206034	004153020056	2420
0817	023300556665	011000502537	012226366012	721375067506	750374762520	0175
0865	601272147501	750074777476	252001750345	016667112212	017130410132	7055
0913	035022226621	220001677071	023330706012	721674657461	746074532520	0175
0961	601272177450	745274527452	252002050345	213754456133	011070600137	7055
1009	034301326341	610201675055	011430576012	722174667466	747474772520	0205
1057	601272227500	751175147176	256002050346	205352527066	016051120121	5125
1105	035020566462	205301331143	011211666012	722473237340	735473647760	0205
1153	601272267373	740174077412	776002150354	002670200026	013372650113	1273
1201	035560457104	203000565275	008432736012	722774327433	743674407760	0215
1249	601272307443	744374467451	776102150396	203371144030	011352560115	6250
1297	035300437161	003400505212	007331706012	723374627463	745574657760	0225
1345	601272347467	746774707471	776002250345	205271252055	010570650061	1016
1393	034340567265	404700442745	004226776012	723674717472	747174717760	0225
1441	601272377470	747074707471	776002250335	405373416062	005545210064	4453
1489	033340467372	004700440420	005503656012	724174747474	747574747750	0235
1537	601272447467	747174577465	776002350314	605574200062	004201600025	6142
1585	032060747420	205100304126	003301076012	724674557455	743374535640	0235
1633	601272477452	745374547454	524002460276	605674044045	002576510035	3657
1681	027000567374	605600343645	002716406012	725174547455	745674555240	0245
1729	601272527455	745474557456	524002450247	406773650063	002556250031	5525
1777	024540677331	205500241617	001736105012	725474547455	745474535240	0245
1825	601272557452	745274517451	524002550225	405172314046	004535570022	3556
1873	021426707271	407000337551	003755356012	725774477450	744674465240	0255
1921	601272607446	744674467446	524002550202	005673460051	002515100017	3506
1969	017140537416	006500277464	001454726012	726274477447	745074505240	0255
2017	601272637446	744274457444	524002650157	205774100056	002456740043	7442
2065	015000557400	007000433441	002514476012	726574437442	744374415240	0265
2113	601272667437	743674377436	524002650157	006274104060	001454070030	7363
2161	014660547400	406500331357	003264046012	727074337433	743374335240	0265
2209	601272717435	743774377436	524002750135	607073610076	001033220032	3353
2257	014300607321	005700431322	001053366012	727374377444	744474456240	0275
2305	601272747447	744674467446	524002750133	606174254047	001432700004	3320
2353	013701047311	405700327315	002612646012	727674457445	744474445240	0275
2401	601272777442	744474467445	524003050127	207574520056	003412520016	3257
2449	013340537456	006100327260	005032466012	730174417441	744074425240	0305
2497	601273027437	743674357433	524003050136	206774364061	003412370024	5160
2545	013620617440	005000163174	002612166012	730474307431	743074265240	0305
2593	601273057427	742774257424	524003150121	007274202064	006332270026	3205
2641	012220457420	407200463155	002071726012	730774207416	741574175240	0315
2689	601273107412	741274107407	524003150125	404773506061	004352150011	7111
2737	012366607355	010000221174	003351725012	731274067405	740374025240	0315
2785	601273137406	740474067410	524003250122	606073212066	002751560010	5147
2833	013220567337	405300421174	002271346012	731574077405	740474055240	0325
2881	601273167403	740374027402	524003250133	007273316074	002331150017	7157
2929	013040677372	006600161141	002531216012	732173757376	737673755240	0335

EXPLORER 34

C. R. Proton (R vs DE/DX)

67-051A-03A (KATE PACKED TAPE)

800 BPI, 7-track, Binary, XDS 930 Computer

D#	C#	FILES	Start	Stop
D-05805	C-04738	30	5/24/67	9/30/67
D-05806	C-04739	30	9/30/67	2/7/68
D-05807	C-04740	30	2/7/68	6/16/68
D-05808	C-04741	30	6/16/68	10/24/68
D-05543	C-04522	30	10/24/68	3/3/69
D-05544	C-04523	14	3/3/69	5/2/69

67-051A-00F (Orbit Parameter Tape) Ephemeris Data
800 BPI, 7-track, Binary, XDS 930 Computer

D#	C#	Files	Start	Stop
D-05951	C-04845	33	5/24/67	10/14/67
D-05952	C-04846	33	10/14/67	3/5/68
D-05953	C-04847	33	3/5/68	7/25/68
D-05954	C-04848	33	7/25/68	12/15/68
D-05955	C-04849	32	12/15/68	5/3/69

Note: The only means of dtermining a time span for these data sets are by using the sequence count formula. The sequence count in data set A is in bits 2-23 of the 1st word of each logical record. The sequence count for data set B is in bits 0-23 of the 1st word of each logical record.

67-051A-03C (PHA Event Summarys)

800 BPI, 7-track Binary, XDS 930 Computer

D#	C#	Files	Start	Stop
D-05799	C-04743	20	5/24/67	8/18/67
D-05800	C-04744	20	8/18/67	11/13/67
D-05801	C-04745	20	11/13/67	2/7/68
D-05802	C-04746	20	2/7/68	5/4/68
D-05803	C-04747	20	5/4/68	7/29/68
D-05804	C-04748	20	7/29/68	10/24/68
D-05545	C-04524	20	10/24/68	1/18/69
D-05546	C-04525	20	1/18/69	4/15/69
D-05547	C-04526	4	4/15/69	5/2/69

Note: The only means of determining a time span for this data set is by using sequence count formula. The sequence count is in bits 0-23 of the first word in each logical record.

67-051A-03D (Rate Summary Tapes)

800 BPI, 7-track, BCD, XDS 930 Computer

D#	C#	Files	Start	Stop
D-05548	C-04527	~~134~~ 133	5/24/67	12/19/68
D-05549	C-04528	64	7/30/68	5/2/69

Note: Data starts in Record 2. Time span is in item 1. The time span can also be determined by using sequence count formula with the indicated sequence count in item 4.

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Laboratory for Astrophysics and Space Research

30 March 1972

Mr. Julius Brecht
Code 601.4
National Space Sciences Data Center
Goddard Space Flight Center
Greenbelt, Maryland 20441

Dear Julius:

The following equation renders the Time (T) corresponding to any Pseudo Sequence Count (PSC) on the University of Chicago data tapes for satellites IMP A, B, C, F, and G:

$$T = T_{BASE} + (PSC - PSC_{BASE}) R_{TIME/SEQ}$$

The enclosed table specifies T_{BASE}, PSC_{BASE}, and $T_{TIME/SEQ}$ for each satellite.

The error in T for IMP A, B, C will not be greater than $\pm$ 2.5 minutes, and for IMP F and G will not exceed $\pm$ .5 minutes.

Sincerely,

Eugene M. Murphy

EMM:am

Satellite	T_{BASE}				PSC_{BASE}	$R_{TIME/SEQ}$ (seconds)
	Day	Hr.	Min.	Year		
IMP-A	331	4	10.2	1963	96	81.91697
IMP-B (Orbits 1 to 50)	278	3	59.7	1964	39	81.84857
IMP-B (Orbits 51 to 12[illegible])	62	13	40.2	1965	158807	81.84356
IMP-C	149	12	44.5	1965	50	81.91690
IMP-F	144	14	26.1	1967	44651	20.45437
IMP-G	172	9	28.1	1969	28464	20.454764

SEQUENCE COUNT FORMULA

Use Sequence Count in data format to obtain data and time of measurement (start time of first orbit corresponds to sequence count 44, 651, L.E., Day 144 (May 24, 1967) at 14:26.1 U.). Each sequence was 20.45439 Sec. Long. experimenter says time span of data is 5/3/69.

Total number of intervals on sequence count minus intervals at launch on sequence count equals intervals since launch on sequence count.

Intervals since launch on sequence count times 20.45439 Sec/intervals equals sec. from launch.

Sec. from launch divided by NO. OF SEC. in a day equals days from launch.

EXAMPLE

2238356	Sequence Count
- 44651	Sequence Count at launch (base)
2193705	Sequence Interval since launch
2193705	Sequence Interval since launch
x20.45439	Sec. long per internal
44870897.61495	Sec From launch
44870897.61495 ÷ 86400 sec. in day = 519.33909 Days since launch	

Formula Used to Determine Day and
Year for Explorer 34.

A data card that was read in by the program(s) contain the start day of the orbit (144) for the year 1967.

In the program when the PSC* is calculated the following check was used.

1. When the PSC* is 0 to 221 the calculation was:

   PSC* + 144 which had the day count of 144 to 365 for the year 1967.

2. When the PSC* is 222 to 587 the calculation was:

   PSC* + 144 - 365 which had the day count of 1 to 366 for the year 1968.

3. When the PSC* is 588 and greater the calculation was:

   PSC* + 144 - 731 which had the day count of 1 and up to the final day on the input tapes for the year 1968.

*PSC = PSEUDO SEQUENCE COUNT

Data Formats for Library Magnetic Tapes and Microfilm from The University of Chicago Charged Particle Experiments on the Satellites IMP-4 and IMP-5*

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