DATA SET CATALOG #3

Explorer 7 Heavy Primary Cosmic Rays

59-009A-03A 1 Tape

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

EXPLORER 7

ION COUNTS, TAPE

59-009A-03A

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED ONE 7-TRACK 556 BPI TAPE WRITTEN IN BCD. THERE IS ONE RESTORED TAPE WRITTEN IN EBCDIC. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 1401 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER AND THE TIME SPAN IS AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR002859	DS002859	D000001	1	10/13/59 - 05/31/60

59-009A-03A

Explorer 7 (1959 IOTA 1)
Heavy Primary Cosmic Rays

This data set consists of a single magnetic tape (D-00001) which is the BCD image of a set of punch cards.

The Data Set Catalog consists of:

1. A partial listing of the first part of the tape.
2. A Data Users' Note which
   a. Supplies the distribution of data (longitude vs. latitude), p. 6
   b. Describes the format p. 10-11
   c. Gives the dates of availability p. 12.

D-0001

10/13/59 - 5/31/60

HDR NSSDC D00001 65306 004080301 00001 EXPLORER 7 HEAVY COSMIC RADIATION

0	20.59	10	190	6	0	15	0.	14.0	15.8	1589	128	652	10	78	155	1
0	20.61	15	190	5	16	120	480.	13.8	14.9	1589	128	652	10	78	155	2
0	20.63	20	200	5	0	60	0.	13.0	13.0	1589	128	652	10	78	155	3
0	20.65	25	200	5	4	30	480.	12.0	11.3	1589	128	652	10	78	155	4
0	20.95	45	280	6	36	45	2880.	1.1	1.6	1589	128	652	10	78	155	- 5
0	20.97	45	290	5	52	105	1783.	1.0	1.5	1589	128	652	10	78	155	6
0	21.66	-45	40	10	56	90	2240.	2.3	3.4	1589	128	652	10	78	155	- 7
0	21.69	-45	50	10	80	135	2133.	2.0	2.9	1589	128	652	10	78	155	8
0	21.71	-45	60	10	12	15	2880.	1.7	2.5	1589	128	652	10	78	155	9
0	21.63	-40	30	11	52	105	1783.	3.2	5.4	1589	128	652	10	78	155	10
0	22.81	25	300	7	0	15	0.	5.7	6.9	1589	128	652	10	78	155	11
0	22.79	30	290	7	20	45	1600.	3.8	5.2	1589	128	652	10	78	155	12
0	22.75	35	280	7	20	60	1200.	2.8	3.8	1589	128	652	10	78	155	13
0	22.77	35	290	7	20	60	1200.	2.7	3.7	1589	128	652	10	78	155	14
0	22.70	40	270	6	28	60	1680.	2.0	2.7	1589	128	652	10	78	155	15
0	22.72	40	280	7	52	105	1783.	1.8	2.5	1589	128	652	10	78	155	16
0	22.69	45	270	6	28	45	2240.	1.2	1.7	1589	128	652	10	78	155	17
1	2.18	30	240	7	20	75	960.	6.5	6.8	611	120	652	26	102	153	18
1	3.96	15	230	8	0	30	0.	12.2	12.7	611	120	652	26	102	153	19
1	4.69	-40	10	9	16	45	1280.	4.5	6.7	611	120	652	26	102	153	20
1	4.70	-35	10	9	24	60	1440.	5.8	8.4	611	120	652	26	102	153	21
1	4.72	-35	20	8	48	60	2880.	5.4	7.7	611	120	652	26	102	153	- 22
1	4.74	-30	20	8	80	90	3200.	6.9	9.5	611	120	652	26	102	153	- 23
1	4.78	-25	30	8	56	75	2688.	8.1	10.6	611	120	652	26	102	153	- 24
1	4.81	-20	30	7	52	120	1560.	9.3	12.3	611	120	652	26	102	153	- 25
1	4.83	-15	40	7	4	30	480.	10.8	13.3	611	120	652	26	102	153	26
1	5.57	25	190	7	4	60	240.	11.7	12.0	611	120	652	26	102	153	27
1	5.58	25	200	8	4	30	480.	11.0	11.3	611	120	652	26	102	153	28
1	5.55	30	190	7	4	30	480.	10.3	10.2	611	120	652	26	102	153	29
1	12.66	-25	140	10	8	30	960.	6.4	7.4	611	120	652	26	102	153	30
1	12.65	-20	130	10	16	75	768.	8.7	9.0	611	120	652	26	102	153	31
1	12.62	-15	130	10	4	45	320.	11.2	10.8	611	120	652	26	102	153	32
1	21.29	-45	40	10	52	120	1560.	2.3	3.4	611	120	652	26	102	153	33
1	21.33	-45	50	10	76	105	2606.	2.0	2.9	611	120	652	26	102	153	- 34
1	21.26	-40	30	11	4	15	960.	3.2	5.4	611	120	652	26	102	153	35
1	21.27	-40	40	11	32	60	1920.	3.0	4.8	611	120	652	26	102	153	36
1	22.39	35	290	7	28	90	1120.	2.7	3.7	611	120	652	26	102	153	37
1	22.33	40	270	6	20	60	1200.	2.0	2.7	611	120	652	26	102	153	38
1	22.36	40	280	6	60	120	1800.	1.8	2.5	611	120	652	26	102	153	39
1	22.32	45	270	6	24	30	2880.	1.2	1.7	611	120	652	26	102	153	40
1	23.04	-50	30	10	44	60	2640.	1.8	2.7	611	120	652	26	102	153	41
1	23.06	-50	40	10	64	120	1920.	1.5	2.3	611	120	652	26	102	153	42
1	22.96	-45	10	11	24	60	1440.	3.2	5.1	611	120	652	26	102	153	43
1	22.99	-45	20	10	60	120	1800.	3.0	4.5	611	120	652	26	102	153	44
1	23.02	-45	30	10	32	60	1920.	2.6	3.9	611	120	652	26	102	153	45
1	22.92	-40	0	11	0	15	0.	5.0	7.3	611	120	652	26	102	153	46
1	22.95	-40	10	11	24	60	1440.	4.2	6.7	611	120	652	26	102	153	47
2	0.74	-50	10	10	48	105	1646.	2.6	3.7	1646	134	651	30	96	160	48
2	0.78	-50	20	10	60	105	2057.	2.1	3.2	1646	134	651	30	96	160	49
2	0.81	-50	30	10	60	120	1800.	1.8	2.7	1646	134	651	30	96	160	50
2	0.71	-45	0	10	64	105	2194.	3.9	5.6	1646	134	651	30	96	160	- 51
2	0.84	-45	40	10	68	135	1813.	2.3	3.4	1646	134	651	30	96	160	52
2	0.87	-45	50	9	48	90	1920.	2.0	2.9	1646	134	651	30	96	160	53
2	0.68	-45	350	10	40	105	1371.	4.8	6.2	1646	134	651	30	96	160	54
2	2.48	-50	0	10	16	45	1280.	3.1	4.1	1646	134	651	30	96	160	55
2	2.50	-50	10	10	24	45	1920.	2.6	3.7	1646	134	651	30	96	160	56
2	2.52	-45	10	10	20	60	1200.	3.3	5.1	1646	134	651	30	96	160	57
2	2.56	-45	20	9	48	105	1646.	3.0	4.5	1646	134	651	30	96	160	58
2	2.59	-40	30	9	56	120	1680.	3.4	5.4	1646	134	651	30	96	160	59
2	2.62	-40	40	9	12	30	1440.	3.2	4.8	1646	134	651	30	96	160	60
2	2.64	-35	40	9	36	120	1080.	4.3	6.3	1646	134	651	30	96	160	61

MIC RADIATION

10	78	155		1
10	78	155		2
10	78	155		3
10	78	155		4
10	78	155	-	5
10	78	155		6
10	78	155	-	7
10	78	155		8
10	78	155		9
10	78	155		10
10	78	155		11
10	78	155		12
10	78	155		13
10	78	155		14
10	78	155		15
10	78	155		16
10	78	155		17
26	102	153		18
26	102	153		19
26	102	153		20
26	102	153		21
26	102	153	-	22
26	102	153	-	23
26	102	153	-	24
26	102	153	-	25
26	102	153		26
26	102	153		27
26	102	153		28
26	102	153		29
26	102	153		30
26	102	153		31
26	102	153		32
26	102	153		33
26	102	153	-	34
26	102	153		35
26	102	153		36
26	102	153		37
26	102	153		38
26	102	153		39
26	102	153		40
26	102	153		41
26	102	153		42
26	102	153		43
26	102	153		44
26	102	153		45
26	102	153		46
26	102	153		47
30	96	160		48
30	96	160		49
30	96	160		50
30	96	160	-	51
30	96	160		52
30	96	160		53
30	96	160		54
30	96	160		55
30	96	160		56
30	96	160		57
30	96	160		58
30	96	160		59
30	96	160		60
30	96	160		61

BCD list of tape D-00001

Card image formats are described in Data Users' Note.

10/13/59 - 5/31/60

2	2.66	-35	50	8	8	30	960.	4.0	5.7	1646	134	651	30	96	160		62
2	2.69	-30	50	8	48	150	1152.	5.6	7.4	1646	134	651	30	96	160		63
2	2.72	-25	50	8	8	60	480.	7.2	9.2	1646	134	651	30	96	160		64
2	2.73	-25	60	8	24	60	1440.	6.8	8.5	1646	134	651	30	96	160		65
2	4.30	-40	10	9	4	15	960.	4.5	6.7	1646	134	651	30	96	160		66
2	4.32	-35	10	9	20	60	1200.	5.8	8.4	1646	134	651	30	96	160		67
2	4.34	-35	20	9	56	120	1680.	5.2	7.7	1646	134	651	30	96	160	-	68
2	4.38	-30	20	8	76	75	3648.	6.9	9.5	1646	134	651	30	96	160		69
2	4.41	-25	30	8	44	75	2112.	8.1	10.6	1646	134	651	30	96	160	-	70
2	4.44	-20	30	8	76	120	2280.	9.0	12.3	1646	134	651	30	96	160	-	71
2	4.46	-15	40	7	12	45	960.	10.8	13.3	1646	134	651	30	96	160		72
2	5.00	40	170	6	16	105	549.	7.5	7.9	1646	134	651	30	96	160		73
2	5.02	45	150	6	0	15	0.	5.9	7.1	1646	134	651	30	96	160		74
2	5.04	45	160	6	0	15	0.	5.7	6.7	1646	134	651	30	96	160		75
2	5.06	45	170	6	0	15	0.	5.3	6.2	1646	134	651	30	96	160		76
2	19.17	-40	50	11	36	60	2160.	2.8	4.2	1646	134	651	30	96	160		77
2	19.19	-40	60	11	72	105	2469.	2.6	3.7	1646	134	651	30	96	160	-	78
2	19.15	-35	50	10	28	60	1680.	3.8	5.7	1646	134	651	30	96	160		79
2	19.09	-30	40	10	52	135	1387.	5.6	8.1	1646	134	651	30	96	160		80
2	19.70	-10	170	7	0	45	0.	13.8	14.1	1646	134	651	30	96	160		81
2	19.72	-5	170	7	0	60	0.	14.1	15.3	1646	134	651	30	96	160		82
2	19.73	-5	180	7	4	60	240.	14.0	15.6	1646	134	651	30	96	160		83
2	19.76	0	180	6	8	90	320.	14.6	16.2	1646	134	651	30	96	160		84
2	20.91	-45	40	11	72	105	2469.	2.2	3.4	1646	134	651	30	96	160	-	85
2	20.94	-45	50	10	84	135	2240.	2.0	2.9	1646	134	651	30	96	160	-	86
2	20.86	-40	30	11	52	105	1783.	3.2	5.4	1646	134	651	30	96	160		87
2	20.82	-35	20	10	48	120	1440.	5.1	7.7	1646	134	651	30	96	160		88
2	20.78	-30	20	10	44	75	2112.	6.5	9.5	1646	134	651	30	96	160		89
2	20.77	-25	10	10	32	60	1920.	7.7	12.0	1646	134	651	30	96	160	-	90
2	22.00	35	280	6	32	45	2560.	2.8	3.8	1646	134	651	30	96	160		91
2	22.02	35	290	7	40	105	1371.	2.7	3.7	1646	134	651	30	96	160		92
2	21.97	40	280	6	64	120	1920.	1.9	2.5	1646	134	651	30	96	160		93
2	21.95	45	270	6	32	60	1920.	1.2	1.7	1646	134	651	30	96	160		94
2	22.66	-50	30	10	20	30	2400.	1.8	2.7	1646	134	651	30	96	160		95
2	22.69	-50	40	10	68	150	1632.	1.5	2.3	1646	134	651	30	96	160		96
2	22.72	-50	50	10	48	90	1920.	1.2	1.9	1646	134	651	30	96	160		97
2	22.60	-45	10	11	8	15	1920.	3.2	5.1	1646	134	651	30	96	160		98
2	22.63	-45	20	10	56	105	1920.	3.0	4.5	1646	134	651	30	96	160		99
2	22.65	-45	30	10	0	15	0.	2.6	3.9	1646	134	651	30	96	160		100
2	22.55	-40	0	11	28	60	1680.	5.0	7.3	1646	134	651	30	96	160		101
2	22.57	-40	10	11	32	90	1280.	4.2	6.7	1646	134	651	30	96	160		102
2	22.52	-35	0	10	36	105	1234.	6.2	9.1	1646	134	651	30	96	160		103
2	22.50	-35	350	10	40	60	2400.	6.7	9.7	1646	134	651	30	96	160	-	104
2	22.48	-30	350	10	36	45	2880.	7.8	11.5	1646	134	651	30	96	160	-	105
3	0.43	-50	30	10	64	105	2194.	1.8	2.7	1666	125	652	10	116	167		106
3	0.47	-45	40	10	40	90	1600.	2.3	3.4	1666	125	652	10	116	167		107
3	0.51	-45	50	9	48	105	1646.	2.0	2.9	1666	125	652	10	116	167		108
3	1.42	30	240	7	16	75	768.	6.5	6.8	1666	125	652	10	116	167		109
3	1.38	35	230	7	12	60	720.	5.3	5.7	1666	125	652	10	116	167		110
3	1.37	40	230	6	4	15	960.	4.0	4.2	1666	125	652	10	116	167		111
3	2.11	-50	0	10	20	60	1200.	3.1	4.1	1666	125	652	10	116	167		112
3	2.13	-45	10	10	24	60	1440.	3.3	5.1	1666	125	652	10	116	167		113
3	2.17	-45	20	10	48	105	1646.	3.0	4.5	1666	125	652	10	116	167		114
3	2.20	-45	30	9	16	60	960.	2.7	3.9	1666	125	652	10	116	167		115
3	2.21	-40	30	9	20	60	1200.	3.4	5.4	1666	125	652	10	116	167		116
3	2.25	-40	40	9	24	60	1440.	3.2	4.8	1666	125	652	10	116	167		117
3	2.28	-35	40	9	24	75	1152.	4.3	6.3	1666	125	652	10	116	167		118
3	2.31	-30	50	8	64	120	1920.	5.6	7.4	1666	125	652	10	116	167	-	119
3	2.33	-25	50	8	24	60	1440.	7.2	9.2	1666	125	652	10	116	167		120
3	2.35	-25	60	8	16	60	960.	6.8	8.5	1666	125	652	10	116	167		121
3	2.36	-20	60	8	4	15	960.	9.1	10.4	1666	125	652	10	116	167		122
3	3.08	35	210	7	4	15	960.	6.8	7.0	1666	125	652	10	116	167		123
3	3.88	-45	0	10	20	60	1200.	3.9	5.6	1666	125	652	10	116	167		124
3	3.90	-40	0	9	32	60	1920.	5.3	7.3	1666	125	652	10	116	167	-	125

3	3.91	-40	10	9	8	15	1920.	4.5	6.7	1666	125	652	10	116	167		126
3	3.95	-35	10	9	16	45	1280.	5.8	8.4	1666	125	652	10	116	167		127
3	3.97	-35	20	9	32	60	1920.	5.2	7.7	1666	125	652	10	116	167	-	128
3	3.99	-30	20	9	64	120	1920.	6.7	9.5	1666	125	652	10	116	167	-	129
3	4.01	-30	30	8	28	30	3360.	6.5	8.8	1666	125	652	10	116	167	-	130
3	4.03	-25	30	8	24	45	1920.	8.1	10.6	1666	125	652	10	116	167	-	131
3	4.87	20	200	7	4	45	320.	12.2	13.0	1666	125	652	10	116	167		132
3	4.84	25	200	7	12	120	360.	11.3	11.3	1666	125	652	10	116	167		133
3	4.82	30	190	7	8	75	384.	10.3	10.2	1666	125	652	10	116	167		134
3	11.96	-30	140	10	4	15	960.	4.3	5.7	1666	125	652	10	116	167		135
3	11.94	-25	140	10	20	105	686.	6.4	7.4	1666	125	652	10	116	167		136
3	11.90	-20	130	10	8	60	480.	8.7	9.0	1666	125	652	10	116	167		137
3	11.92	-20	140	10	12	45	960.	9.1	9.3	1666	125	652	10	116	167		138
3	11.87	-15	130	10	8	45	640.	11.2	10.8	1666	125	652	10	116	167		139
3	17.89	30	230	5	8	60	480.	7.8	7.4	1666	125	652	10	116	167		140
3	19.47	10	190	6	4	60	240.	14.0	15.8	1666	125	652	10	116	167		141
3	19.49	15	190	6	8	60	480.	13.4	14.9	1666	125	652	10	116	167		142
3	21.66	30	290	7	12	30	1440.	3.8	5.2	1666	125	652	10	116	167		143
3	21.63	35	280	6	32	60	1920.	2.8	3.8	1666	125	652	10	116	167		144
3	21.65	35	290	7	24	60	1440.	2.7	3.7	1666	125	652	10	116	167		145
3	21.60	40	280	6	48	105	1646.	1.8	2.5	1666	125	652	10	116	167		146
3	21.57	45	270	6	64	105	2194.	1.2	1.7	1666	125	652	10	116	167		147
3	22.30	-50	30	10	48	75	2304.	1.8	2.7	1666	125	652	10	116	167		148
3	22.33	-50	40	10	56	90	2240.	1.8	2.3	1666	125	652	10	116	167		149
3	22.35	-50	50	10	36	60	2160.	1.2	1.9	1666	125	652	10	116	167		150
3	22.25	-45	20	11	16	45	1280.	2.9	4.5	1666	125	652	10	116	167		151
3	22.28	-45	30	10	32	75	1536.	2.6	3.9	1666	125	652	10	116	167		152
3	22.20	-40	10	11	4	15	960.	4.2	6.7	1666	125	652	10	116	167		153
3	22.14	-35	0	10	48	75	2304.	6.2	9.1	1666	125	652	10	116	167	-	154
3	22.12	-30	350	10	16	60	960.	7.8	11.5	1666	125	652	10	116	167		155
3	23.98	-50	10	10	12	30	1440.	2.6	3.7	1666	125	652	10	116	167		156
3	23.96	-45	0	10	40	90	1600.	3.9	5.6	1666	125	652	10	116	167		157
3	23.94	-45	350	11	24	60	1440.	4.6	6.2	1666	125	652	10	116	167		158
4	0.01	-50	10	10	8	15	1920.	2.6	3.7	2633	128	655	30	107	169		159
4	0.02	-50	20	10	24	30	2880.	2.1	3.2	2633	128	655	30	107	169	-	160
4	0.05	-50	30	10	48	60	2880.	1.6	2.7	2633	128	655	30	107	169	-	161
4	0.09	-45	40	10	48	90	1920.	2.3	3.4	2633	128	655	30	107	169		162
4	0.12	-45	50	10	52	120	1560.	2.0	2.9	2633	128	655	30	107	169		163
4	0.15	-40	50	10	12	30	1440.	2.9	4.2	2633	128	655	30	107	169		164
4	0.16	-40	60	9	4	15	960.	2.7	3.7	2633	128	655	30	107	169		165
4	1.05	30	240	7	8	45	640.	6.5	6.8	2633	128	655	30	107	169		166
4	1.01	35	230	6	4	15	960.	5.4	5.7	2633	128	655	30	107	169		167
4	1.04	35	240	7	0	15	0.	4.6	5.1	2633	128	655	30	107	169		168
4	1.00	40	230	6	4	30	480.	4.0	4.2	2633	128	655	30	107	169		169
4	1.73	-50	0	10	24	45	1920.	3.1	4.1	2633	128	655	30	107	169		170
4	1.75	-50	10	10	28	60	1680.	2.6	3.7	2633	128	655	30	107	169		171
4	1.76	-45	10	10	24	45	1920.	3.3	5.1	2633	128	655	30	107	169		172
4	1.81	-45	20	10	32	90	1280.	3.0	4.5	2633	128	655	30	107	169		173
4	1.87	-40	40	9	24	45	1920.	3.2	4.8	2633	128	655	30	107	169		174
4	1.90	-35	40	9	20	45	1600.	4.3	6.3	2633	128	655	30	107	169		175
4	1.92	-35	50	9	8	45	640.	3.9	5.7	2633	128	655	30	107	169		176
4	1.94	-30	50	9	40	120	1200.	5.4	7.4	2633	128	655	30	107	169		177
4	1.97	-25	50	8	24	90	960.	7.2	9.2	2633	128	655	30	107	169		178
4	1.98	-25	60	8	4	60	240.	6.8	8.5	2633	128	655	30	107	169		179
4	3.51	-45	0	10	0	15	0.	3.9	5.6	2633	128	655	30	107	169		180
4	3.54	-40	10	9	8	15	1920.	4.5	6.7	2633	128	655	30	107	169		181
4	3.59	-35	20	9	60	105	2057.	5.2	7.7	2633	128	655	30	107	169	-	182
4	3.63	-30	20	9	64	90	2560.	6.7	9.5	2633	128	655	30	107	169	-	183
4	3.70	-20	30	8	52	60	3120.	9.0	12.3	2633	128	655	30	107	169	-	184
4	3.71	-15	40	8	4	30	480.	10.5	13.3	2633	128	655	30	107	169		185
4	10.87	40	0	5	4	30	480.	6.3	4.6	2633	128	655	30	107	169		186
4	10.86	40	350	5	4	15	960.	5.5	4.1	2633	128	655	30	107	169		187
4	10.88	45	0	5	20	60	1200.	4.4	3.3	2633	128	655	30	107	169		188
4	10.91	45	10	5	32	105	1097.	4.7	3.8	2633	128	655	30	107	169		189

4	10.93	45	20	5	8	30	960.	4.9	4.4	2633	128	655	30	107	169	190
4	17.17	-25	180	8	8	45	640.	8.9	9.7	2633	128	655	30	107	169	191
4	17.19	-20	190	8	24	120	720.	11.3	12.2	2633	128	655	30	107	169	192
4	17.21	-15	190	8	4	15	960.	12.5	13.7	2633	128	655	30	107	169	193
4	19.10	10	190	6	4	15	960.	14.0	15.8	2633	128	655	30	107	169	194
4	19.11	15	190	6	4	60	240.	13.4	14.9	2633	128	655	30	107	169	195
4	19.13	15	200	6	0	60	0.	13.2	14.4	2633	128	655	30	107	169	196
4	19.15	20	200	6	12	60	720.	12.6	13.0	2633	128	655	30	107	169	197
4	19.16	25	200	6	0	30	0.	11.7	11.3	2633	128	655	30	107	169	198
4	20.17	-45	40	11	28	60	1680.	2.2	3.4	2633	128	655	30	107	169	199
4	20.18	-45	50	11	28	45	2240.	1.9	2.9	2633	128	655	30	107	169	200
4	20.12	-40	30	10	48	90	1920.	3.3	5.4	2633	128	655	30	107	169	201
4	20.15	-40	40	11	28	60	1680.	3.0	4.8	2633	128	655	30	107	169	202
4	20.07	-35	20	10	40	120	1200.	5.1	7.7	2633	128	655	30	107	169	203
4	20.10	-35	30	10	16	30	1920.	4.6	7.0	2633	128	655	30	107	169	204
4	20.05	-30	20	10	36	75	1728.	6.5	9.5	2633	128	655	30	107	169	205
4	21.91	-50	30	10	32	60	1920.	1.8	2.7	2633	128	655	30	107	169	206
4	21.94	-50	40	10	68	120	2040.	1.5	2.3	2633	128	655	30	107	169	207
4	21.98	-50	50	10	64	120	1920.	1.2	1.9	2633	128	655	30	107	169	208
4	22.00	-50	60	10	20	30	2400.	1.1	1.6	2633	128	655	30	107	169	209
4	21.88	-45	20	11	20	45	1600.	2.9	4.5	2633	128	655	30	107	169	210
4	21.90	-45	30	11	16	30	1920.	2.6	3.9	2633	128	655	30	107	169	211
4	23.61	-50	10	10	16	30	1920.	2.6	3.7	2633	128	655	30	107	169	212
4	23.64	-50	20	10	52	105	1783.	2.1	3.2	2633	128	655	30	107	169	213
4	23.67	-50	30	10	68	120	2040.	1.8	2.7	2633	128	655	30	107	169	214
4	23.58	-45	0	11	44	90	1760.	3.8	5.6	2633	128	655	30	107	169	215
4	23.60	-45	10	10	16	30	1920.	3.3	5.1	2633	128	655	30	107	169	216
4	23.70	-45	30	10	40	60	2400.	2.6	3.9	2633	128	655	30	107	169	- 217
4	23.72	-45	40	10	68	120	2040.	2.3	3.4	2633	128	655	30	107	169	218
4	23.76	-45	50	10	60	135	1600.	2.0	2.9	2633	128	655	30	107	169	219
4	23.80	-40	60	9	60	120	1800.	2.7	3.7	2633	128	655	30	107	169	220
5	1.36	-50	0	10	28	90	1120.	3.1	4.1	1648	123	657	45	116	171	221
5	1.39	-50	10	10	20	45	1600.	2.6	3.7	1648	123	657	45	116	171	222
5	1.33	-50	350	10	28	60	1680.	3.6	4.6	1648	123	657	45	116	171	223
5	1.40	-45	10	10	32	60	1920.	3.3	5.1	1648	123	657	45	116	171	224
5	1.42	-45	20	10	44	75	2112.	3.0	4.5	1648	123	657	45	116	171	225
5	1.48	-40	30	10	8	15	1920.	3.3	5.4	1648	123	657	45	116	171	226
5	1.50	-40	40	9	8	30	960.	3.2	4.8	1648	123	657	45	116	171	227
5	1.52	-35	40	9	36	120	1080.	4.3	6.3	1648	123	657	45	116	171	228
5	1.55	-35	50	9	8	60	480.	3.9	5.7	1648	123	657	45	116	171	229
5	1.57	-30	50	9	52	135	1387.	5.4	7.4	1648	123	657	45	116	171	230
5	1.61	-25	60	8	28	120	840.	6.8	8.5	1648	123	657	45	116	171	231
5	3.14	-45	0	10	8	30	960.	3.9	5.6	1648	123	657	45	116	171	232
5	3.12	-45	350	10	16	45	1280.	4.8	6.2	1648	123	657	45	116	171	233
5	3.15	-40	0	10	28	60	1680.	5.2	7.3	1648	123	657	45	116	171	234
5	3.16	-40	10	10	16	30	1920.	4.4	6.7	1648	123	657	45	116	171	235
5	3.21	-35	10	9	4	15	960.	5.8	8.4	1648	123	657	45	116	171	236
5	3.22	-35	20	9	36	90	1440.	5.2	7.7	1648	123	657	45	116	171	237
5	3.25	-30	20	9	64	60	3840.	6.7	9.5	1648	123	657	45	116	171	- 238
5	3.27	-30	30	9	28	60	1680.	6.3	8.8	1648	123	657	45	116	171	239
5	3.29	-25	30	8	28	45	2240.	8.1	10.6	1648	123	657	45	116	171	- 240
5	3.32	-20	30	8	20	45	1600.	9.0	12.3	1648	123	657	45	116	171	- 241
5	3.33	-20	40	8	32	60	1920.	9.3	11.7	1648	123	657	45	116	171	- 242
5	3.36	-15	40	8	16	105	549.	10.5	13.3	1648	123	657	45	116	171	243
5	3.38	-10	40	7	4	30	480.	12.0	14.6	1648	123	657	45	116	171	244
5	4.12	20	200	7	8	120	240.	12.2	13.0	1648	123	657	45	116	171	245
5	4.09	25	200	7	8	120	240.	11.3	11.3	1648	123	657	45	116	171	246
5	10.49	40	0	5	4	15	960.	6.3	4.6	1648	123	657	45	116	171	247
5	10.51	45	0	5	40	120	1200.	4.4	3.3	1648	123	657	45	116	171	248
5	10.54	45	10	5	32	75	1536.	4.7	3.8	1648	123	657	45	116	171	249
5	12.28	50	0	5	28	60	1680.	2.9	2.2	1648	123	657	45	116	171	250
5	12.30	50	10	5	16	60	960.	3.2	2.6	1648	123	657	45	116	171	251
5	17.12	25	230	6	8	75	384.	9.6	9.2	1648	123	657	45	116	171	252
5	17.15	30	230	5	20	60	1200.	7.8	7.4	1648	123	657	45	116	171	253

5	17.16	30	240	5	16	45	1280.	6.9	6.8	1648	123	657	45	116	171		254
5	17.17	35	240	5	4	15	960.	4.9	5.1	1648	123	657	45	116	171		255
5	18.73	10	190	6	4	60	240.	14.0	15.8	1648	123	657	45	116	171		256
5	18.75	15	190	6	4	60	240.	13.4	14.9	1648	123	657	45	116	171		257
5	18.77	20	200	6	8	90	320.	12.6	13.0	1648	123	657	45	116	171		258
5	18.80	25	200	6	4	90	160.	11.7	11.3	1648	123	657	45	116	171		259
6	0.31	30	240	6	16	105	549.	6.7	6.8	1674	124	656	28	111	173		260
6	0.27	35	230	6	8	30	960.	5.4	5.7	1674	124	656	28	111	173		261
6	0.28	35	240	6	0	15	0.	4.8	5.1	1674	124	656	28	111	173		262
6	0.98	-50	0	10	20	45	1600.	3.1	4.1	1674	124	656	28	111	173		263
6	1.00	-50	10	10	16	45	1280.	2.5	3.7	1674	124	656	28	111	173		264
6	1.02	-45	10	10	36	75	1728.	3.3	5.1	1674	124	656	28	111	173		265
6	1.06	-45	20	10	32	75	1536.	3.0	4.5	1674	124	656	28	111	173		266
6	1.09	-45	30	10	8	30	960.	2.6	3.9	1674	124	656	28	111	173		267
6	1.10	-40	30	10	12	30	1440.	3.3	5.4	1674	124	656	28	111	173		268
6	1.13	-40	40	10	4	30	480.	3.1	4.8	1674	124	656	28	111	173		269
6	1.15	-35	40	9	20	45	1600.	4.3	6.3	1674	124	656	28	111	173		270
6	1.17	-35	50	9	16	60	960.	3.9	5.7	1674	124	656	28	111	173		271
6	1.19	-30	50	9	52	120	1560.	5.4	7.4	1674	124	656	28	111	173	-	272
6	1.22	-25	50	9	16	60	960.	7.0	9.2	1674	124	656	28	111	173		273
6	1.23	-25	60	9	12	60	720.	6.6	8.5	1674	124	656	28	111	173		274
6	2.76	-45	0	10	56	90	2240.	3.9	5.6	1674	124	656	28	111	173	-	275
6	2.74	-45	350	10	4	15	960.	4.8	6.2	1674	124	656	28	111	173		276
6	2.80	-40	10	10	48	165	1047.	4.4	6.7	1674	124	656	28	111	173		277
6	2.84	-35	20	9	40	120	1200.	5.2	7.7	1674	124	656	28	111	173		278
6	2.87	-30	20	9	120	135	3200.	6.7	9.5	1674	124	656	28	111	173	-	279
6	2.90	-30	30	9	44	60	2640.	6.3	8.8	1674	124	656	28	111	173	-	280
6	2.92	-25	30	9	56	90	2240.	7.9	10.6	1674	124	656	28	111	173	-	281
6	2.96	-20	40	8	52	120	1560.	9.3	11.7	1674	124	656	28	111	173	-	282
6	2.99	-15	40	8	20	120	600.	10.5	13.3	1674	124	656	28	111	173		283
6	3.02	-10	40	8	0	60	0.	11.6	14.6	1674	124	656	28	111	173		284
6	3.03	-5	50	7	4	60	240.	13.6	15.3	1674	124	656	28	111	173		285
6	3.73	25	200	7	12	120	360.	11.3	11.3	1674	124	656	28	111	173		286
6	3.70	30	190	7	4	30	480.	10.3	10.2	1674	124	656	28	111	173		287
6	4.36	-50	310	10	84	90	3360.	5.8	5.9	1674	124	656	28	111	173	-	288
6	10.12	40	0	5	8	45	640.	6.3	4.6	1674	124	656	28	111	173		289
6	10.13	45	0	5	8	45	640.	4.4	3.3	1674	124	656	28	111	173		290
6	10.16	45	10	5	16	90	640.	4.7	3.8	1674	124	656	28	111	173		291
6	10.18	45	20	5	24	60	1440.	4.9	4.4	1674	124	656	28	111	173		292
6	10.88	-35	150	10	24	45	1920.	3.3	4.5	1674	124	656	28	111	173		293
6	10.87	-30	150	10	12	45	960.	4.7	6.1	1674	124	656	28	111	173		294
6	10.82	-25	140	10	40	120	1200.	6.4	7.4	1674	124	656	28	111	173		295
6	10.79	-20	140	10	20	105	686.	9.1	9.3	1674	124	656	28	111	173		296
6	10.75	-15	130	9	8	75	384.	11.5	10.8	1674	124	656	28	111	173		297
6	10.74	-10	130	9	4	30	480.	12.8	12.5	1674	124	656	28	111	173		298
6	11.87	45	350	5	16	30	1920.	3.9	2.8	1674	124	656	28	111	173		299
6	11.89	50	0	5	8	30	960.	2.9	2.2	1674	124	656	28	111	173		300
6	11.92	50	10	5	44	120	1320.	3.2	2.6	1674	124	656	28	111	173		301
6	11.95	50	20	5	8	30	960.	3.4	3.1	1674	124	656	28	111	173		302
6	11.88	50	350	5	20	60	1200.	2.6	1.8	1674	124	656	28	111	173		303
6	12.62	-40	130	10	24	45	1920.	1.6	2.6	1674	124	656	28	111	173		304
6	12.64	-40	140	10	32	75	1536.	1.9	2.9	1674	124	656	28	111	173		305
6	12.60	-35	130	10	8	15	1920.	2.8	3.9	1674	124	656	28	111	173		306
6	12.54	-30	120	10	44	105	1509.	3.9	5.2	1674	124	656	28	111	173		307
6	12.52	-25	120	10	8	30	960.	5.8	6.9	1674	124	656	28	111	173		308
6	13.38	25	280	6	12	45	960.	5.8	7.0	1674	124	656	28	111	173		309
6	13.41	30	290	5	48	120	1440.	4.1	5.2	1674	124	656	28	111	173		310
6	13.66	45	0	5	16	30	1920.	4.4	3.3	1674	124	656	28	111	173		311
6	13.68	45	10	6	32	120	960.	4.6	3.8	1674	124	656	28	111	173		312
6	13.65	50	0	5	16	60	960.	2.9	2.2	1674	124	656	28	111	173		313
6	13.64	50	350	5	12	30	1440.	2.6	1.8	1674	124	656	28	111	173		314
6	15.13	35	270	5	32	105	1097.	3.3	4.0	1674	124	656	28	111	173		315
6	15.15	40	270	5	36	60	2160.	2.1	2.7	1674	124	656	28	111	173		316
6	15.18	40	280	5	44	105	1509.	1.9	2.5	1674	124	656	28	111	173		317

6	15.19	45	290	5	8	15	1920.	1.0	1.5	1674	12	656	28	111	173		318
6	16.79	30	240	5	28	120	840.	6.9	6.8	1674	124	656	28	111	173		319
6	18.00	-40	140	10	16	45	1280.	1.9	2.9	1674	124	656	28	111	173		320
6	18.02	-35	140	9	12	45	960.	3.0	4.2	1674	124	656	28	111	173		321
6	18.02	-35	150	9	4	15	960.	3.4	4.5	1674	124	656	28	111	173		322
6	18.37	15	190	6	4	60	240.	13.4	14.9	1674	124	656	28	111	173		323
6	18.38	15	200	6	4	60	240.	13.2	14.4	1674	124	656	28	111	173		324
6	18.40	20	200	6	4	90	160.	12.6	13.0	1674	124	656	28	111	173		325
6	19.82	-20	140	8	20	105	686.	9.6	9.3	1674	124	656	28	111	173		326
6	19.87	-15	140	8	4	45	320.	12.0	11.1	1674	124	656	28	111	173		327
6	19.89	-10	150	8	4	90	160.	13.2	13.2	1674	124	656	28	111	173		328
6	20.53	35	290	6	40	120	1200.	2.8	3.7	1674	124	656	28	111	173		329
6	20.49	40	280	6	56	120	1680.	1.8	2.5	1674	124	656	28	111	173		330
6	20.46	45	270	6	48	90	1920.	1.2	1.7	1674	124	656	28	111	173		331
7	2.39	-45	0	10	48	75	2304.	3.9	5.6	1696	129	660	16	108	175	-	332
7	2.37	-45	350	10	16	30	1920.	4.8	6.2	1696	129	660	16	108	175		333
7	2.43	-40	10	10	48	150	1152.	4.4	6.7	1696	129	660	16	108	175		334
7	2.47	-35	20	9	44	120	1320.	5.2	7.7	1696	129	660	16	108	175		335
7	2.50	-30	20	9	68	75	3264.	6.7	9.5	1696	129	660	16	108	175		336
7	2.52	-30	30	9	32	60	1920.	6.3	8.8	1696	129	660	16	108	175	-	337
7	2.54	-25	30	9	52	60	3120.	7.9	10.6	1696	129	660	16	108	175	-	338
7	2.57	-20	30	9	56	60	3360.	8.5	12.3	1696	129	660	16	108	175	-	339
7	2.58	-20	40	8	20	60	1200.	9.3	11.7	1696	129	660	16	108	175		340
7	2.61	-15	40	8	40	135	1067.	10.5	13.3	1696	129	660	16	108	175	-	341
7	2.63	-10	40	8	8	60	480.	11.6	14.6	1696	129	660	16	108	175		342
7	2.65	-10	50	8	4	60	240.	12.2	14.2	1696	129	660	16	108	175		343
7	3.36	25	200	7	8	105	274.	11.3	11.3	1696	129	660	16	108	175		344
7	3.34	30	200	6	0	30	0.	9.6	9.5	1696	129	660	16	108	175		345
7	9.75	40	0	5	4	30	480.	6.3	4.6	1696	129	660	16	108	175		346
7	9.77	45	0	5	12	60	720.	4.4	3.3	1696	129	660	16	108	175		347
7	9.79	45	10	5	32	105	1097.	4.7	3.8	1696	129	660	16	108	175		348
7	9.81	45	20	5	0	30	0.	4.9	4.4	1696	129	660	16	108	175		349
7	10.37	-15	130	9	24	75	1152.	11.5	10.8	1696	129	660	16	108	175		350
7	10.34	-10	130	9	24	120	720.	12.8	12.5	1696	129	660	16	108	175		351
7	10.32	-5	120	9	4	15	960.	13.8	13.9	1696	129	660	16	108	175		352
7	11.51	45	350	5	4	15	960.	3.9	2.8	1696	129	660	16	108	175		353
7	11.53	50	0	5	44	120	1320.	2.9	2.2	1696	129	660	16	108	175		354
7	11.55	50	10	5	20	75	960.	3.2	2.6	1696	129	660	16	108	175		355
7	12.28	-45	140	10	32	45	2560.	1.0	1.8	1696	129	660	16	108	175		356
7	12.24	-40	130	10	20	30	2400.	1.6	2.6	1696	129	660	16	108	175		357
7	12.26	-40	140	10	76	120	2280.	1.9	2.9	1696	129	660	16	108	175		358
7	13.01	25	280	6	28	90	1120.	5.8	7.0	1696	129	660	16	108	175		359
7	13.04	30	290	5	44	105	1509.	4.1	5.2	1696	129	660	16	108	175		360
7	13.30	45	0	5	12	60	720.	4.4	3.3	1696	129	660	16	108	175		361
7	13.32	45	10	5	12	45	960.	4.7	3.8	1696	129	660	16	108	175		362
7	13.29	50	0	5	16	60	960.	2.9	2.2	1696	129	660	16	108	175		363
7	13.27	50	350	5	4	30	480.	2.6	1.8	1696	129	660	16	108	175		364
7	14.76	35	270	5	36	90	1440.	3.3	4.0	1696	129	660	16	108	175		365
7	14.78	40	270	5	28	60	1600.	2.1	2.7	1696	129	660	16	108	175		366
7	14.80	40	280	5	36	45	2880.	1.9	2.5	1696	129	660	16	108	175	-	367
7	14.83	45	290	5	24	45	1920.	1.0	1.5	1696	129	660	16	108	175		368
7	16.38	25	230	6	12	60	720.	9.6	9.2	1696	129	660	16	108	175		369
7	16.40	30	230	6	12	60	720.	7.5	7.4	1696	129	660	16	108	175		370
7	16.42	30	240	5	16	60	960.	6.9	6.8	1696	129	660	16	108	175		371
7	16.44	35	240	5	8	60	480.	4.9	5.1	1696	129	660	16	108	175		372
7	17.54	-45	120	10	52	120	1560.	1.6	1.6	1696	129	660	16	108	175		373
7	17.57	-45	130	10	48	105	1646.	1.0	1.7	1696	129	660	16	108	175		374
7	17.60	-40	130	10	4	30	480.	1.6	2.6	1696	129	660	16	108	175		375
7	17.61	-40	140	10	4	15	960.	1.9	2.9	1696	129	660	16	108	175		376
7	18.00	15	190	6	4	60	240.	13.4	14.9	1696	129	660	16	108	175		377
7	18.01	15	200	6	4	60	240.	13.2	14.4	1696	129	660	16	108	175		378
7	18.04	20	200	6	12	120	360.	12.6	13.0	1696	129	660	16	108	175		379
7	18.07	25	200	6	8	45	640.	11.7	11.3	1696	129	660	16	108	175		380
7	19.42	-25	130	9	8	45	640.	6.3	7.1	1696	129	660	16	108	175		381

7	19.44	-25	140	9	4	30	480.	6.6	7.4	1696	.29	660	16	108	175	382
7	19.45	-20	140	8	12	75	576.	9.6	9.3	1696	129	660	16	108	175	383
7	20.15	35	290	6	32	90	1280.	2.8	3.7	1696	129	660	16	108	175	384
7	20.12	40	280	6	48	105	1646.	1.8	2.5	1696	129	660	16	108	175	385
7	20.09	45	270	6	52	105	1783.	1.2	1.7	1696	129	660	16	108	175	386
7	20.80	-50	30	11	36	60	2160.	1.8	2.7	1696	129	660	16	108	175	387
7	20.82	-50	40	11	32	60	1920.	1.4	2.3	1696	129	660	16	108	175	388
7	20.85	-50	50	10	32	75	1536.	1.2	1.9	1696	129	660	16	108	175	389
7	20.75	-45	20	11	36	60	2160.	2.9	4.5	1696	129	660	16	108	175	390
7	20.78	-45	30	11	44	90	1760.	2.6	3.9	1696	129	660	16	108	175	391
7	20.71	-40	10	10	24	60	1440.	4.4	6.7	1696	129	660	16	108	175	392
7	22.50	-50	10	11	20	45	1600.	2.6	3.7	1696	129	660	16	108	175	393
7	22.53	-50	20	11	60	120	1800.	2.1	3.2	1696	129	660	16	108	175	394
7	22.56	-50	30	10	76	120	2280.	1.8	2.7	1696	129	660	16	108	175	395
7	22.46	-45	0	11	12	15	2880.	3.8	5.6	1696	129	660	16	108	175	396
7	22.59	-45	40	10	44	90	1760.	2.3	3.4	1696	129	660	16	108	175	397
7	22.63	-45	50	10	88	165	1920.	2.0	2.9	1696	129	660	16	108	175	398
7	22.67	-40	60	10	12	30	1440.	2.6	3.7	1696	129	660	16	108	175	399
8	0.23	-50	0	10	32	90	1280.	3.1	4.1	2701	136	662	13	111	175	400
8	0.26	-50	10	10	48	120	1440.	2.6	3.7	2701	136	662	13	111	175	401
8	0.28	-45	10	10	24	45	1920.	3.3	5.1	2701	136	662	13	111	175	402
8	0.30	-45	20	10	45	90	1600.	3.0	4.5	2701	136	662	13	111	175	403
8	0.33	-45	30	10	28	60	1680.	2.6	3.9	2701	136	662	13	111	175	404
8	0.35	-40	30	10	24	60	1440.	3.3	5.4	2701	136	662	13	111	175	405
8	0.37	-40	40	10	48	120	1440.	3.1	4.8	2701	136	662	13	111	175	406
8	0.40	-35	40	10	28	75	1344.	4.2	6.3	2701	136	662	13	111	175	407
8	0.43	-35	50	9	44	120	1320.	3.9	5.7	2701	136	662	13	111	175	408
8	0.46	-30	50	9	44	120	1320.	5.4	7.4	2701	136	662	13	111	175	409
8	0.49	-25	60	9	12	120	360.	6.6	8.5	2701	136	662	13	111	175	410
8	0.51	-20	60	9	0	30	0.	8.9	10.4	2701	136	662	13	111	175	411
8	1.88	-50	320	11	16	105	549.	5.4	5.7	2701	136	662	13	111	175	412
8	1.90	-50	330	11	8	90	320.	4.7	5.4	2701	136	662	13	111	175	413
8	1.79	-45	300	10	80	90	3200.	7.7	7.8	2701	136	662	13	111	175	- 414
8	1.84	-45	310	11	56	105	1920.	7.4	7.7	2701	136	662	13	111	175	- 415
8	1.75	-40	290	10	148	180	2960.	9.0	9.7	2701	136	662	13	111	175	- 416
8	1.71	-35	280	10	40	105	1371.	9.9	11.5	2701	136	662	13	111	175	- 417
8	1.66	-30	270	10	12	30	1440.	10.8	13.0	2701	136	662	13	111	175	418
8	1.69	-30	280	10	4	15	960.	10.4	13.2	2701	136	662	13	111	175	419
8	1.65	-25	270	10	20	75	960.	11.2	14.4	2701	136	662	13	111	175	420
8	2.07	-40	10	10	4	15	960.	4.4	6.7	2701	136	662	13	111	175	421
8	2.10	-35	20	9	68	180	1360.	5.2	7.7	2701	136	662	13	111	175	422
8	2.14	-30	30	9	84	105	2880.	6.3	8.8	2701	136	662	13	111	175	- 423
8	2.17	-25	30	9	60	105	2057.	7.9	10.6	2701	136	662	13	111	175	- 424
8	2.21	-20	40	8	96	120	2880.	9.3	11.7	2701	136	662	13	111	175	- 425
8	2.24	-15	40	8	24	105	823.	10.5	13.3	2701	136	662	13	111	175	426
8	2.27	-10	40	8	8	60	480.	11.6	14.6	2701	136	662	13	111	175	427
8	2.28	-10	50	8	4	60	240.	12.2	14.2	2701	136	662	13	111	175	428
8	2.29	-5	50	8	0	15	0.	13.2	15.3	2701	136	662	13	111	175	429
8	3.00	20	200	7	4	75	192.	12.2	13.0	2701	136	662	13	111	175	430
8	2.97	25	200	6	4	75	192.	11.7	11.3	2701	136	662	13	111	175	431
8	2.95	30	190	6	0	30	0.	10.6	10.2	2701	136	662	13	111	175	432
8	9.37	40	0	5	20	90	800.	6.3	4.6	2701	136	662	13	111	175	433
8	9.42	45	10	5	20	75	960.	4.7	3.8	2701	136	662	13	111	175	434
8	11.14	45	350	5	12	30	1440.	3.9	2.8	2701	136	662	13	111	175	435
8	11.16	50	0	5	20	60	1200.	2.9	2.2	2701	136	662	13	111	175	436
8	11.18	50	10	5	12	15	2880.	3.2	2.6	2701	136	662	13	111	175	437
8	12.62	20	280	6	20	45	1600.	7.6	8.8	2701	136	662	13	111	175	438
8	12.63	25	280	6	16	60	960.	5.8	7.0	2701	136	662	13	111	175	439
8	12.65	30	290	6	8	30	960.	4.0	5.2	2701	136	662	13	111	175	440
8	12.68	35	290	5	56	120	1680.	2.8	3.7	2701	136	662	13	111	175	441
8	12.89	50	350	5	20	45	1600.	2.6	1.8	2701	136	662	13	111	175	442
8	14.40	35	270	5	28	60	1680.	3.3	4.0	2701	136	662	13	111	175	443
8	14.42	40	280	5	72	120	2160.	1.9	2.5	2701	136	662	13	111	175	444
8	14.45	45	280	5	8	45	640.	1.1	1.6	2701	136	662	13	111	175	445

8	15.54	-40	160	10	16	45	1280.	2.5	3.6	2701	136	662	13	111	175	446
8	15.58	-35	170	10	4	15	960.	4.0	5.6	2701	136	662	13	111	175	447
8	15.61	-35	180	9	4	15	960.	4.6	6.2	2701	136	662	13	111	175	448
8	15.79	-10	200	8	0	30	0.	13.2	15.4	2701	136	662	13	111	175	449
8	15.81	-5	200	8	12	120	360.	13.5	16.1	2701	136	662	13	111	175	450
8	15.85	0	210	7	16	180	320.	13.8	16.4	2701	136	662	13	111	175	451
8	15.88	5	210	7	4	60	240.	13.7	15.9	2701	136	662	13	111	175	452
8	15.90	5	220	7	0	45	0.	13.6	15.7	2701	136	662	13	111	175	453
8	15.91	10	220	7	8	60	480.	13.1	14.6	2701	136	662	13	111	175	454
8	15.94	15	220	6	8	105	274.	13.0	13.3	2701	136	662	13	111	175	455
8	17.22	-45	130	10	20	30	2400.	1.0	1.7	2701	136	662	13	111	175	456
8	17.26	-40	140	10	40	105	1371.	1.9	2.9	2701	136	662	13	111	175	457
8	17.29	-35	150	10	36	105	1234.	3.3	4.5	2701	136	662	13	111	175	458
8	17.32	-30	150	9	12	60	720.	4.8	6.1	2701	136	662	13	111	175	459
8	17.34	-30	160	9	0	15	0.	5.2	6.7	2701	136	662	13	111	175	460
8	17.36	-25	160	9	12	90	480.	7.3	8.4	2701	136	662	13	111	175	461
8	17.38	-20	160	9	28	60	1680.	10.2	10.3	2701	136	662	13	111	175	- 462
8	17.59	5	190	7	4	30	480.	13.9	16.3	2701	136	662	13	111	175	463
8	17.61	10	190	6	8	120	240.	14.0	15.8	2701	136	662	13	111	175	464
8	17.64	15	200	6	12	120	360.	13.2	14.4	2701	136	662	13	111	175	465
8	17.66	20	200	6	0	30	0.	12.6	13.0	2701	136	662	13	111	175	466
8	17.68	25	200	6	8	90	320.	11.7	11.3	2701	136	662	13	111	175	467
8	17.70	25	210	6	12	60	720.	11.1	10.6	2701	136	662	13	111	175	468
8	18.62	-40	30	10	12	30	1440.	3.3	5.4	2701	136	662	13	111	175	469
8	18.58	-35	20	10	12	30	1440.	5.1	7.7	2701	136	662	13	111	175	470
8	18.60	-35	30	10	20	60	1200.	4.6	7.0	2701	136	662	13	111	175	471
8	18.56	-30	20	10	48	90	1920.	6.5	9.5	2701	136	662	13	111	175	- 472
8	18.50	-25	10	10	40	60	2400.	7.7	12.0	2701	136	662	13	111	175	- 473
8	18.92	-40	110	10	16	30	1920.	1.6	2.5	2701	136	662	13	111	175	474
8	18.95	-40	120	10	16	45	1280.	1.6	2.5	2701	136	662	13	111	175	475
8	18.97	-35	120	10	24	60	1440.	2.6	3.8	2701	136	662	13	111	175	476
8	19.01	-30	130	9	16	90	640.	4.1	5.4	2701	136	662	13	111	175	477
8	19.79	35	290	6	28	75	1344.	2.8	3.7	2701	136	662	13	111	175	478
8	19.75	40	280	6	76	180	1520.	1.8	2.5	2701	136	662	13	111	175	479
8	22.12	-50	10	11	8	15	1920.	2.6	3.7	2701	136	662	13	111	175	480
8	22.15	-50	20	11	92	150	2208.	2.1	3.2	2701	136	662	13	111	175	- 481
8	22.19	-50	30	10	44	90	1760.	1.8	2.7	2701	136	662	13	111	175	482
8	22.08	-45	0	11	24	60	1440.	3.8	5.6	2701	136	662	13	111	175	483
8	22.09	-45	10	11	16	30	1920.	3.2	5.1	2701	136	662	13	111	175	484
8	22.23	-45	40	10	20	45	1600.	2.3	3.4	2701	136	662	13	111	175	485

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Data Users' Note

EXPLORER VII
Heavy Primary
Cosmic Ray Experiment

December 1965

NASA Space Science Data Center

National Aeronautics and Space Administration / Goddard Space Flight Center
Greenbelt, Maryland 20771 USA

NASA SPACE SCIENCE DATA CENTER

EXPLORER VII
(1959 Iota)

HEAVY PRIMARY COSMIC RAY EXPERIMENT
DATA USERS' NOTE

DECEMBER 1965

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

FOREWORD

This Data Users' Note, prepared by the NASA Space Science Data Center (NSSDC), describes the final reduced data available through NSSDC for use by the scientific community. The material presented herein was prepared from available literature and from information obtained from the principal investigator.

This Note is intended to provide the potential data user with experiment information and the nature of the reduced data available at NSSDC.

Inquiries concerning the availability of data should be directed to:

NASA Space Science Data Center
Goddard Space Flight Center
Greenbelt, Maryland 20771

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HEAVY PRIMARY COSMIC RAY EXPERIMENT
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INTRODUCTION

The data described in these notes were the results of the Explorer VII Heavy Primary Cosmic Ray Experiment. Brief descriptions of the Explorer VII spacecraft, telemetry, instrumentation, calibration, data reduction, and data continuity are presented. Additional data concerning the experiment may be obtained by contacting Dr. Martin A. Pomerantz, the principal investigator, or by reviewing the referenced literature. The sections on data format and bibliography, however, are intended to be as complete as possible and fully descriptive of the data available at the Space Science Data Center.

PURPOSE OF EXPERIMENT

The late Dr. Gerhart K. Groetzinger of the Research Institute for Advanced Studies (RIAS), Martin Company, and Dr. Martin A. Pomerantz of Bartol Research Foundation, designed this experiment to study temporal variations in the flux and magnetic rigidity spectrum of primary heavy nuclei (atomic number, $Z \geq 6$) during a period when solar modulation effects were most pronounced. The experiment was also designed to provide a basis for comparing the long term (solar cycle) with the short term (cosmic ray storm) modulation effects.

SPACECRAFT DESCRIPTION

Explorer VII (1959 Iota) was launched 13 October 1959 to carry instrumentation for a variety of scientific research. Its active lifetime extended to 24 August 1961, during which time the orbital elements changed only slightly. Initial apogee, perigee, and inclination angle were about 1100 km, 530 km, and 50.3 degrees, respectively. The satellite was spin stabilized about its longitudinal axis. At the time of antenna deployment the spin rate decreased to 360 rpm from the injection rate of 420 rpm. By the 300th day of orbit the rate had decreased to about 312 rpm.

Research was conducted using data obtained from five experiments carried aboard Explorer VII. These experiments are listed in Table 1.

TABLE 1

EXPLORER VII EXPERIMENTS

Experiment Name	Principle Components	Experimenter	Affiliation
Thermal Radiation Balance	Five Bolometers	V. Suomi	University of Wisconsin
Solar X-ray and Lyman-Alpha	Four Ionization Chambers	H. Friedman T. A. Chubb	Naval Research Laboratory
Heavy Primary Cosmic Ray	Pulse Ionization Chamber	G. Groetzinger M. Pomerantz	Martin Company Bartol Research Foundation
Radiation and Solar Proton	Two Geiger-Mueller Counters	J. Van Allen	State University of Iowa
Micrometeorite Penetration	Three Cd-S Cells	H. La Gow L. Secretan	Goddard Space Flight Center

TELEMETRY DESCRIPTION

The 20 Mc telemetry system, which transmitted all Explorer VII scientific experimental data except the micrometeorite information, consisted of a time division multiplexer, four sub-carrier oscillators, and an amplitude-modulated transmitter.

The time division multiplexer was a ten-channel commutation device containing a timing oscillator, pulse amplifier, and a ten-stage counter in the conventional ring counter configuration. The ten commutator segments were divided in the following manner: two used for calibration at 0 and 5.5 volt levels, three used for NRL experiment, one used for battery voltage, one used for solar cell data, and three used for heavy primary cosmic ray data.

EXPERIMENT DESCRIPTION

A complete description of the instrumentation, circuitry, etc.. may be found in Schwed et al 1,2. Pomerantz et al.3 and Pomerantz et al.4 Indiviual features of the experiment are presented below

Instrument

The detector, a pulse ionization chamber, consisted of an extruded cylinder 11 cm in diameter and 11 cm long fabricated from magnesium alloy (principle componets 95% Mg, 3% Al, 1 % Zn by weight) of a 2.5 mm thickness to which were welded end disks, of the same material, of a 3 mm thickness. The center wire was a length of 0.25 mm Kovar wire held in place by a Kovar scal in each end piece.

Three features of the chamber deserve mention. First, the choice of magnesium as the structural material was advantageous in reducing the background of pulses due to the disruption of nuclei in the chamber wall. Such pulses, which would be spurious from the point of view of the experiment, could have been produced if the interaction between an energetic primary or secondary particle of the cosmic ray flux and a nucleus within the chamber had lef to a star production. The prongs of such a star include low energy (10-50 Mev) protons and a-particles and also some heavier nuclear fragments. Since particles of this type are highly ionizing, the voltage pulse resulting when they slowed down within the ionization chamber could have been as large as that due to a relativistic heavy nucleus. The probability of this occurrence was diminshed by constructing the ionization chamber of a relatively low Z material which necessarily could not fragment into a large number of multiply charged secondaries when disrupted by an energetic particle.

Second, the chamber was supplied with an a-particle source in the form of a short wire plated with Po210. The a-particles leaving this source could be "turned on or off" by varying the source potential relative to the center wire as can be seen from the following argument. The path length of the 5.3 Mev a-particle within the argon filling the chamber was quite short so that all the electron liberated when it stopped therein were generated in the immediate vicinity of the source wire. If the source wire and center wire were at the same potential (positive, relative to the chamber wall), those electrons were all attracted to the source wire; whereas if the source was at the potential of the chamber wall, the electrons were free to move to the center wire producing the normal pulse. The source wire, via its capacitive coupling to the center wire, also served as a convenient means of introducing electrical pulses into the amplifier.

Third, the ionization chamber also carried a simple, lightweight, pressure gauge in the form of a metal bellows which was extended by the gas pressure within the chamber. At the normal filling pressure the extension of the bellows closed a contact which would have opened if the pressure dropped by more than about ten psi. This provided a simple go, no-go, test of the chamber pressure.

The chamber was filled with argon at nine atmospheres absolute. It was determined, using the internal α-particle source, that its plateau began at 300 volts; and, consequently, 400 volts was selected as the operating voltage with the circuitry used. The electron-collection pulse had a duration of seven seconds to 50% decay.

Prior to filling, the chamber was outgassed 24 hours at a pressure of 10^{-5} mm and a temperature of 120°C. It was then flushed several times with the spectroscopically pure-argon used as the filling gas. The evacuation following each flush was accomplished by means of an ordinary rotary pump in conjunction with a liquid air trap. Immediately subsequent to the last flush, the final filling was accomplished. After the chamber was completed, it was tested for leaks by immersing it in a mineral oil bath at 70°C for five hours and examining the surface of the chamber for gas bubbles.

Lifetime

Data suitable for routine electronic data processing were obtained from the time of launch, 13 October 1959 until 31 May 1960. Some additional data, acquired thereafter, are discussed by Pomerantz and Witten[5].

Details of Measurement

Heavy nuclei with atomic number Z greater than five were detected. The amplified output of the detector was introduced into a three-channel integral pulse height discriminator which was set to pass pulses corresponding to incident nuclei with $Z \geq 6$, $Z \geq 9$, $Z \geq 16$, respectively. Each of these channels operated independently so that any event triggering the last discriminator also triggered the other two. The output of each discriminator in turn was introduced into an associated scaler (the scale factor was four for each of the two lower levels and two for the highest level), stored in its own storage unit, and subsequently sampled by the electronic commutator.

Calibration

Pre-flight calibration was accomplished with the 5.3 Mev α-particles emanating from a Po^{210} coated wire within the chamber. This also served as an in-flight calibration.

Schedule of Measurement

The satellite did not carry a tape recorder; measurements were recorded at ground stations as the satellite passed within radio range. The three storage units of the instrumentation were each sampled for 1-1/2 seconds every 15 seconds. Tables 2 and 3 display the geographic distribution of the data obtained from the carbon and above channel ($Z \geq 6$) only.

Operational Experience

As far as can be ascertained from the results obtained, the entire unit behaved properly during the first eleven days subsequent to launch. Beginning on the twelfth day after launch the analog storage unit associated with the carbon-and-above discriminator underwent a change in mode of operation. This change manifested itself in a failure of the output signal to recycle to zero volts and it proved possible to determine the behavior of the unit by analyzing the telemetry records obtained while the satellite was in the trapped radiation belt. During such intervals the counting rate was considerably above its normal value so that the analog storage unit changed state a number of times during a single 1.5 second sampling period. Observations made during several such periods indicated that the storage unit behaved in quite a consistent fashion in its altered mode. Schematically, if one represents the normal cycle in which the system goes from zero to five volts in one-volt steps, by the progression 0123450, the altered cycle can be represented as 345453. The validity of this representation was also verified by following the behavior of the storage unit during an epoch in which, on the average, it changed state perhaps once a minute. Under these conditions, it was again possible to follow the cycle through which the unit progresses since at this rate the probability of "skipping a step" during the 15 seconds between readings is sufficiently small to be neglected.

A further running check on the validity of assuming the 345453 pattern was performed as follows: For a given period of time (ordinarily 15 or 30 days) the total number of times that each level occurred was determined. If the above pattern held, the numbers of three, four and five volt readings should have been in the ratios 1:2:2, respectively. Over the period from 1 November 1959 through

Table 2

EXPLORER 7 HEAVY PRIMARY COSMIC RAY DATA DISTRIBUTION
LONGITUDE EAST (DEGREES)

		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
	50N	198	185	161	106	85	26	1	0	0	0	10	28	33	47	43	30	10	2	1
L	45N	279	286	230	117	70	29	1	1	1	1	11	44	72	76	62	65	29	12	20
A	40N	142	154	116	53	35	18	0	0	0	1	13	37	54	104	70	47	37	16	29
T	35N	68	66	50	33	26	8	0	0	0	3	5	21	59	60	96	58	25	26	31
I	30N	41	26	22	27	24	1	1	1	0	1	2	10	43	55	84	62	33	34	49
T	25N	17	10	10	28	3	0	0	1	0	1	0	3	14	57	49	35	24	14	33
U	20N	5	3	4	9	1	1	0	1	1	0	0	2	4	28	25	21	18	3	17
D	15N	2	0	6	2	0	1	0	0	1	0	0	0	5	11	10	14	5	2	9
E	10N	0	0	4	1	0	1	0	0	1	0	1	0	4	3	5	8	0	3	5
	5N	0	1	0	0	0	0	1	1	0	0	0	1	4	1	6	3	0	1	1
I	0	0	1	1	6	3	2	1	1	2	0	0	2	0	3	4	0	0	0	4
N	5S	2	1	5	6	2	0	1	0	2	0	1	1	3	6	6	0	0	1	3
	10S	2	0	6	9	8	14	1	0	1	1	2	1	12	15	12	6	2	2	1
D	15S	4	3	17	7	15	7	2	0	0	0	1	4	23	42	53	7	1	0	0
E	20S	4	11	31	28	25	7	5	0	0	1	7	12	41	74	79	27	1	0	0
G	25S	3	16	40	48	26	16	14	0	0	0	6	27	44	95	83	32	4	0	1
R	30S	7	22	49	53	37	31	5	0	0	0	7	35	53	86	66	41	11	0	0
E	35S	17	32	58	49	48	23	3	1	0	1	12	33	64	93	59	32	10	4	1
E	40S	27	40	41	50	32	13	5	2	1	0	5	28	86	99	84	42	9	3	1
S	45S	24	44	60	47	30	17	1	1	0	1	12	30	65	107	74	23	4	2	1
	50S	13	30	24	30	14	7	1	0	0	0	4	18	27	28	18	10	2	0	0

Table 3

EXPLORER 7 HEAVY PRIMARY COSMIC RAY DATA DISTRIBUTION
LONGITUDE WEST (DEGREES)

		180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0
	50N	1	7	13	13	26	24	36	64	60	76	87	40	32	29	19	90	116	178	198
L	45N	20	40	48	46	36	42	61	91	101	165	162	110	71	37	41	62	118	213	279
A	40N	29	57	60	54	35	50	68	67	79	118	132	82	49	27	17	25	46	96	162
T	35N	31	51	64	64	57	74	82	75	88	150	100	85	31	33	8	9	38	62	68
I	30N	49	44	72	62	48	84	90	75	80	127	115	74	52	8	5	12	16	32	41
T	25N	33	53	93	64	55	68	92	59	66	118	148	72	49	15	1	1	5	20	17
U	20N	17	64	90	69	49	39	65	50	41	90	100	64	44	17	3	2	3	7	5
D	15N	9	52	69	48	29	31	33	35	30	60	67	52	44	13	1	1	1	1	2
E	10N	5	28	47	29	27	14	19	24	22	23	35	24	30	6	1	1	1	0	0
	5N	1	17	15	10	25	6	3	5	4	6	40	8	13	2	0	0	3	2	0
I	0	4	13	9	20	14	1	3	1	0	8	42	14	6	1	0	0	0	1	0
N	5S	3	3	7	7	2	1	0	0	1	5	10	3	1	0	0	0	0	1	2
	10S	1	1	3	1	2	1	0	0	0	3	1	4	2	0	0	0	0	0	2
D	15S	0	1	0	3	2	1	0	0	1	2	1	3	1	0	0	0	0	0	4
E	20S	0	1	0	2	1	1	1	0	0	1	7	4	1	0	0	0	0	2	4
G	25S	1	0	0	1	0	0	2	0	0	2	1	6	1	0	0	0	0	0	3
R	30S	0	0	0	0	0	2	1	0	1	1	8	10	1	0	0	0	0	2	7
E	35S	1	0	0	0	1	2	0	1	0	2	11	8	0	0	0	0	0	3	17
E	40S	1	0	0	1	1	0	1	1	0	3	7	2	1	0	0	0	0	4	27
S	45S	1	0	0	0	1	1	0	1	3	3	1	3	1	1	0	0	1	7	28
	50S	0	1	1	1	0	0	0	0	1	0	0	1	0	1	1	1	0	2	13

15 March 1960, and from 18 April 1960 through 31 May 1960, this relationship was maintained satisfactorily (generally to within 5%) giving further credence to the above conclusion about the behavior of the storage unit. It appears that for a very high courting rate (more than seven changes in 1.5 seconds) the storage unit pattern changed to 345453 with a tendency towards a delay in transfer from five to three. During the period from 13 to 19 April 1960, inclusive, the storage unit resumed its normal 0123450 cycle. From approximately 16 March 1960, through 12 April 1960, it operated in some variation of a 3453 cycle in a somewhat irregular pattern. At the present writing it appears impractical to attempt to interpret the data from this period.

One other difficulty was encountered in the operation of the telemetry system. The signal associated with the NRL solar emission experiment appeared in the form of a sinusoidal signal, of approximately 5 cps, superimposed on the normal signal. This sometimes made it difficult or impossible to determine the levels of the storage unit which represented the output of the cosmic ray experiment. It addition, a similar difficulty was encountered in fixing the 0 to 5.5 volt reference levels incorporated into the sequence of time commutated signals on the 960 cps channel. This introduced a further ambiguity into the measurement. It may be remarked that the interference seemed to be most serious at lower voltages and it was frequently possible to identify four-volt levels in a sequence of the records in which signals of less than three volts were completely undecipherable.

As a consequence of increased noise level, intermittent commutator malfunction, erratic storage unit behavior, and the intermixing of the NRL signal on other commutator channels, it became increasingly difficult to acquire data after May 1960.

Conclusions

A discussion related to the solar disturbed and quiet periods during the experiment's lifetime is presented by Pomerantz et al.[6] Other results are given by Pomerantz and Witten[7], Duggal et al.[8], and Nagashima et al.[9]

DATA DESCRIPTION

Preparation of Reduced Data

The information was initially recorded in the form of magnetic tapes containing the audio signal modulation of the 20 Mc transmitter within the satellite. These tapes were recorded at 1-7/8 ips at the NASA stations monitoring the

Explorer VII satellite. For the first step in the data reduction the tapes were played back at 15 inches per second (8 × 1-7/8) into a 7680 cps (8 × 960) discriminator. The output of this discriminator was recorded on a Sanborn chart run at the rate of 25 mm/sec. On the same record were the timing signal which was included on the magnetic tape and the output of this discriminator as modified by an 80 cps low pass filter. The extra filtration on the record of the 960 cps channel served to damp out high frequency noise and was designed to take advantage of (1) the relatively long (1.5 second) time during which each storage unit was sampled and (2) the relatively slow rate (much smaller than once a second) at which the level of any of these units changed when the satellite was outside the trapped radiation belt. (It should be remarked that the procedure described was employed only when the counting rate was "normal".) For data corresponding to times when the satellite was well within the belt of trapped radiation, the tape was played back at its original speed which had the effect of producing the Sanborn record at a chart speed of eight times that usually employed.

The manually read Sanborn records were punched onto IBM cards. A three-digit decimal number served to specify the information contained in a basic 15-second commutator interval or frame. Each one of the three digits represented the level of some one of the storage units during the frame. If this level could be read and was "normal" the number was an integer from zero through five inclusive. If any level changed once during the 1.5-second sampling period, the value at the beginning of the period was recorded. If the level changed twice during this time the rate was considered "abnormally" high and the reading was represented by a seven. If the record at some point was too noisy to permit a given segment to be read in a given frame, the number assigned to the segment was eight. As a practical matter most of the reading was done with the aid of Benson-Lehner Oscar J readers. This permitted the charts to be advanced electrically and increased the efficiency of the process. These machines were also equipped with card punches which permitted direct and rapid entry of the results on punched cards without the extra step of making a handwritten record. The identification of the individual levels was facilitated by the use of a transparent overlay carrying six equi-spaced horizontal lines ranging from zero to five. A series of these overlays had been prepared and the particular one employed was selected in terms of the positions of the 0 and 5.5 volt standards present in each frame. In practice it was usually found that a single overlay would serve for the entire record of a single pass at a single station. As indicated earlier, perhaps the greatest source of difficulty in making the readings resulted from the commutator malfunction which allowed the signals from the NRL experiment to be mixed with those of the heavy primary cosmic ray experiment and with the voltage reference.

The task of the IBM 709 computer in handling the data as obtained above was to convert from the readings into counts for the carbon and above channel ($Z \geq 6$) only. With the storage units operating as designed, this function was quite straightforward. Providing the time interval between readings was not excessive, the number of counts which had occurred between a pair of readings was simply equal to the appropriate scale factor times the change in reading Δ, if the latter was non-negative. Otherwise, for Δ negative, the number of counts equaled the scale factor times the quantity (six $+\Delta$). (There is an inherent ambiguity since six impulses entering a storage unit will apparently leave its state unchanged; this occurrence was sufficiently improbable for the counting rates associated with the fluxes of heavy primary cosmic rays as to be neglected.)

The procedure followed when the storage unit operated in the 345453 mode was more difficult to select—at least in the case in which the counting rate was high enough to admit a possibility of eight counts between a pair of successive samplings. There were essentially two procedures available. Using the first procedure, any of the following was considered to correspond to no counts: 33, 44, or 55. Any of the following was considered to correspond to four counts (taking into account the scale factor): 34, 45, 54, or 53. Finally, either of the following was considered to correspond to 18 counts: 35 or 43. It should be noted that, considered by itself, either of the last two sequences could have corresponded to eight counts. However, it was possible for the level to go from four to four when the unit received eight counts, therefore, concluding that no change had occurred. On the average the sequences 35 and 43, representative of 18 counts, compensated for this error. The possible occurrence of 12 counts between readings demanded a further refinement which is described below. The above procedure was used in the machine treatment of data. The second procedure (which is also easily adaptable to machine computation) consisted essentially of comparing a span of actual record with the 345453 sequence and of associating with this span the smallest counting rate consistent with the 345453 sequence. Thus, 343 was taken as representing 20 counts since it was a skeleton representation of the complete cycle. This procedure was investigated in a "hand computation" treatment of the data.

Counting rates were all corrected for the possibility of missed counts because the storage unit could no longer indicate the occurrence of 12 counts in a single frame. For this purpose a Poisson distribution for the number of counts in a 15-second interval was assumed. (This correction was in addition to that employed in setting the equivalence between the change in level of the storage unit and the associated number of counts.)

The next stage in the data reduction process was the merging of two magnetic tapes, one of which contained the count rate and the corresponding Universal

Time as obtained from the first program, and the other contained the satellite ephemeris. The program produced a tape on which were recorded the total number of counts registered within the box-like volume defined by latitude, longitude, and altitude; the time in seconds that the satellite was within the volume; the hourly count rate computed from the first two values; the mid-point latitude and longitude, and the altitude at the top of the box; and the time at which the last useful data within the box were recorded. The dimensions of these boxes were: five degrees of latitude, 10 degrees of longitude, and 100 km altitude. These summary data were then punched onto cards to which were added the following information: geomagnetic threshold rigidity computed on the basis of the centered-dipole approximation; geomagnetic threshold rigidity computed in accordance with the Quenby-Wenk[10] formulation; neutron monitor data from Climax, Mt. Norikura, and Thule; solar flare importance; Zurich Sunspot number, R_Z; solar radio emission at 2800 Mc recorded at Ottawa; and K_p.

The dependence of the cutoff rigidity, R_h upon altitude, h, was taken into account by means of the relationship:

$$R_h = R_o \frac{r_e^2}{(r_e + h)^2}$$

where R_o is the threshold rigidity at the earth's surface and r_e is the radius of the earth.

Format

The 17238 data cards have been transcribed to magnetic tape, one card per record preceded by a NASA Space Science Data Center (NSSDC) header card and followed by a card containing all nines. The tape was prepared on an IBM 1401 System, BCD Mode, 556 bits per inch density. The card formats are indicated below.

NSSDC Header Card Format

Columns	Content
1 - 4	= 1 HDR
6 - 10	= NSSDC
13 - 18	Accession number - D00001
20 - 21	Year tape made (tens and units) = 65

NSSDC Header Card Format (Continued)

Columns	Content
22 - 24	Day of year = 306
26 - 34	File Identification, SSSSSEEDD where
	SSSSS = NSSDC Satellite no. = 00408
	EE = NSSDC Experiment no. = 03
	DD = Data Set no. = 01
36 - 40	Sequential Reel number of Data Set = 00001
42 - 80	Descriptive Information

Explorer VII Data Card Format

Columns	Content
2, 3, 4	Day after launching (October 13, 1959 = 0 day)
6, 7, 8, 9, 10	Universal time in Hours, e.g., 20.78 (column 8 is always punched as decimal)
12, 13, 14	Geographic mean Latitude of the box (e.g., 10°N = 10, 60°S = -60)
17, 18, 19	Geographic mean Longitude of the box (0 to 360° measured Eastward)
21, 22	Altitude in 100 Km units
24, 25, 26	Counts for $Z \geq 6$ particles (recorded in the box)
28, 29, 30	Time in seconds in which these particles were recorded
32, 33, 34, 35, 36	Hourly counting rate (36 column, always decimal point)
39, 40, 41, 42	Cut-off rigidity (corrected for altitude) on Quenby-Wenk model (Decimal 41)
45, 46, 47, 48	Cut-off rigidity from Dipole model (Decimal 47) (not corrected for altitude)
50	Solar Flare Importance
51, 52, 53	Climax Neutron Monitor Data
55, 56, 57	Mt. Norikura Neutron Monitor Data
59, 60, 61	Thule Neutron Monitor Data
63, 64	K_p (Planetary Magnetic index)
66, 67, 68	R_Z (Zurich Sunspot number)
70, 71, 72	Solar flux at 2800 MC recorded at Ottawa
76, 77, 78, 79, 80	Serial Number of the card

Availability

The table below gives the days for which data are available:

Explorer VII Day	Dates
9 - 11	13 October 1959 - 24 October 1959
19 - 154	01 November 1959 - 15 March 1960
182 - 231	12 April 1960 - 31 May 1960

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