DATA SET CATALOG #24

Telstar I charged particle

62-029A-01A 5 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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

TELSTAR 1

PROTON & ELECTRON COUNT RATE & EPHEREMIS TAPE

62-029A-01A

This data set has been restored. There were originally five 7-track, 800 BPI tapes written in Binary. There are 2 restored tapes. The DR tapes are 3480 cartridges and the DS tapes are 9-track, 6250 BPI. The original tapes were created on a 7094 computer. The DR, DS, and DD numbers along with the time spans are given as follows:

DR #	DS #	DD #	FILES	TIME SPAN
DR02970	DS02970	D-00067	1 - 748	07/09/62 - 09/09/62
		D-00068	749-1312	09/10/62 - 10/20/62
		D-00069	1313-1813	10/21/62 - 11/25/62
		D-00070	1814-2612	11/26/62 - 12/31/62
DR02971	DS02971	D-00071	1 - 670	01/01/63 - 02/21/63

TELSTAR 1

CHARGED PARTICLE

62-029A-01A

This data set consists of 5 800 BPI, binary, 7-track, multi-filed tapes. These tapes were created on a BESYS computer.

The time spans for the tapes are as follows:

D#	C#	TIME SPAN
D-00067	C-00022	7/09/62 - 9/09/62
D-00068	C-00023	9/10/62 - 10/20/62
D-00069	C-00024	10/21/62 - 11/25/62
D-00070	C-00025	11/26/62 - 12/31/62
D-00071	C-00026	1/01/63 - 2/21/63

July 10, 1962 → Feb. 21, 1963 TELSTAR I

DOCUMENTATION OF THE BTL SATELLITE DATA TAPES

I. TAPE FORMAT

The BTL satellite data tapes were written with Fortran programs on an IBM 7094 under control of the BE-SYS monitor. These Fortran output routines generate tapes where the logical records produced by individual WRITE TAPE or WRITE ØUTPUT TAPE statements do not correspond to the actual physical records. The following description of this tape blocking process is provided to enable a user to decode the tapes.

BE-SYS uses word lengths of 36 bits, which can also be described as 12 octal digits, or as 6 characters, where a character is denoted by 2 octal digits. Character or BCD information is written on tape so as to be directly meaningful to the 1460. Since information is encoded there differently than in the 7094, a translation is necessary between tape and the 7094. Table I-1 contains a list of the character codes for the 7094 and their translation for the 1460 or for tapes.

Most of the data on the Bell Labs satellite output tapes is binary information written with the Fortran "WRITE TAPE" statement. The list of data written by one such statement is called a logical record, and can consist of up to 999 words. For uniformity, BE-SYS writes all tape output in physical records (or blocks) which normally contain up to 167 words. Each block is a single 800 bit per inch binary tape

record and can contain either part of a logical record, or one or more logical records.

Logical records are separated in the blocks (physical records) by control words(of 6 characters). The first character in the control word is always octal 77. The second character is a control character or flag. The third character, the file identification character, is generally blank and can be ignored. The last three characters indicate the length (word count in 1460 BCD code) of the logical record that follows. Records written with a Fortran "WRITE TAPE" statement will have only P and Q flags as control characters. If the logical record fits within the block, it is assigned a Q flag. However, if it overflows the block, it is broken into two or more logical records, the last of which has a Q flag, all others having P flags. Thus on reading, a sequence of logical records flagged P, followed by one flagged Q, should be considered as a single logical record.

Each block is terminated with a control word containing an E flag as the control character. The word count field in this control word is used to indicate the number of logical records within the block. This count includes only records which have been completed.

There is also some information on the tapes, generally identification files or records, which has been generated by Fortran "WRITE ØUTPUT TAPE" statements. This

information has been encoded by means of a specified format into BCD or Hollerith information. BE-SYS blocks this data in the same manner as binary data (i.e. in physical records of up to 167 words which contain logical records separated by control words). This information is distinguished from binary information by the use of different control characters or flags.

The flags which are valid for a Fortran "READ INPUT TAPE" statement are H, L, and M. All indicate that the logical record contains BCD or Hollerith information to be decoded character by character according to some Format. An H flag indicates a BCD card image with a maximum length of 14 words (84 characters). Records written with a Fortran "WRITE OUTPUT TAPE" statement will have L and M flags as control characters. If the logical record is greater than 22 words, it is broken up into two or more records, the last of which has an L flag; all others having M flags. If the logical record contains 22 words or less, it is assigned an L flag. Thus, on reading, a sequence of logical records flagged M, followed by one flagged L should be treated as a single record.

Multireel Tapes: On some occasions, data runs over from one reel to a second. The BE-SYS monitor uses a double end-of-file mark to signify the end of a reel. Thus on reading a

double end of file, the user should proceed to the second tape and continue reading. This should not be interpreted as an end of file.

Examples of Tape Blocking

Example 1: This is an octal dump of the first file of the Relay I electron L-tables tape. This file is an identification file which was generated by a Fortran "WRITE ØUTPUT TAPE" statement. It contains only one physical record (or block). The numbers in the first column of the dump refer to word number within the block.

The first word of the block (octal 774300120102) is a control word, as indicated by the octal 77. The second character in the word is denoted by the octal 43 which represents the character L (see Table I-1). This L indicates that the following logical record contains BCD information, and that the record is completed within the block. The last 6 octal digits (120102) represent the characters 012 and indicate that the logical record contains 12 words. Translating the next 12 words character by character yields: bRELAYbI bbELECTRØNbDATAbTAPEbFØRb12/01/62b(DAYb335)b-b03/31/64b (DAYb091), where b represents a blank.

The final word in the block is another control word. Its second character is an E (octal 65) which indicates that this is the end of the block. The word count (octal 121201) specifies that one logical record was completed within the block.

```
EXAMPLE 1
RECORD NO.  0001
0001  774500120102   005165436130   004100006543   656323514645   006461236100   236147450010
0007  465100010221   120121060200   346431300003   030574004000   120321030121   080400346461
0[illegible]  300012110174   774500121201
[illegible]  OF FILE
```

Example 2: This is an octal dump of the first file of the Explorer XV L-files tape. This is a data.file which was generated by Fortran "WRITE TAPE" statements. It is contained in three physical records (or blocks).

The Q flag (octal 50) in the first control word (775000120104) indicates that the logical record contains binary information and is complete within the block; the word count (octal 120104) specifies that there are 14 words in the logical record. The next 14 words should be interpreted as explained in the Explorer XV write-up in section II: the first 13 as floating point data, and the fourteenth as an octal flag.

The first word following these 14 data words (word 16 of the block) is another control word. It indicates another 14-word binary logical record which follows.

The last logical record in the block begins with the control word at word 151 of the physical record. It is also 14 words long and is completed within the block. The final control word (word 166) contains an E flag (octal 65), and a word count (octal 120101) which indicates that 11 logical records have been completed within this block.

Example 3: This is an octal dump of the first two physical records of a data file on the Relay I electron L-tables tape.

The Q flag (octal 50) in the first control word (775000121206) indicates that the logical record contains

EXAMPLE 2

RECORD NO. 0001

0001	775000120104	201431463146	176741166710	211455330337	203607653304	000000000000
[illegible]	203431075547	000000000000	202527431503	000000000000	202621276113	000000000000
[illegible]	174746022545	207426172532	022223004440	775000120104	201431463146	177424044026
0019	211465230656	000000000000	000000000000	000000000000	000000000000	000000000000
0025	000000000000	000000000000	000000000000	177563245023	206734465706	032223004440
0031	775000120104	201431463146	177420513447	211502157137	000000000000	000000000000
0037	000000000000	200500677735	000000000001	000000000000	000000000000	000000000000
0043	1775[illegible]60332	207401430153	031330000000	775000120104	201431463146	176765056657
0049	211502123644	200561426500	175702630507	176641564217	177607553334	201675410203
0055	177512214501	177463777430	177516562023	176650572712	207417137766	000003000440
0061	775000120104	201431463146	177403324377	211510104100	200740560420	175631463120
[illegible]67	177412763657	176422361173	201755073227	176407166640	203463002417	175423407377
	177431630653	207434652444	000000000000	775000120104	201431463146	176774611235
	211511141163	000000000000	000000000000	000000000000	000000000000	000000000000
[illegible]	175404422576	000000000000	175402565747	176752707515	206770526034	033113000000
0091	775000120104	201431463146	176760101422	211521066705	000000000000	175764407712
0097	000000000000	2004[illegible]4723	000000000000	177455445532	000000000000	177575507534
0103	176566400575	2074[illegible]161	010000000000	775000120104	201431463146	176777717041
0109	211523046054	0000[illegible]0000	000000000000	000000000000	000000000000	000000000000
0115	175634626322	000000000000	175654266237	177401370133	207431505461	032003004440
0121	775000130104	201431463146	176742337633	211524130303	000000000000	000000000000
0127	000000000000	000000000000	000000000000	000000000000	177400000000	000000000000
0133	175475404054	206622201240	032223000000	775000120104	201431463146	176736605471
0139	211526110531	000000000000	175537604433	000000000000	200434631656	200573222571
0145	177642661503	201432543667	177710220322	000000000000	206655110442	010003000000
[illegible]	775000120104	201431463146	176740710102	211530071000	000000000000	000000000000
	203713230643	000000000000	203556423771	000000000000	202563775760	000000001000
	174562361554	206715354522	032223004440	776500120101		

RECORD NO. 0002

	[illegible]75000120104	201431463146	176741204677	211531145413	203440702723	000000000000
	202414274075	000000000000	202434210746	000000000000	203414637436	1767336537[illegible]
[illegible]13	174751731461	206760545130	022203000000	775000120104	201431463146	1757465512[illegible]
0019	211531051014	000000000000	000000000000	000000000000	000000000000	[illegible]
0025	000000000000	000000000000	000000000000	175761354651	206761126035	0322230[illegible]
0031	775000120104	201431463146	176760054441	211534030642	000000000000	000000000000
0037	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
0043	176560033634	207413137320	032223000000	775000120104	201431463146	1767464526[illegible]
0049	211542032356	000000000000	000000000000	177402453753	000000000000	000000000000
0055	000000000000	200610421046	000000000000	174576053707	206731701523	032223004440
0061	775000120104	201431463146	176740131102	211550053614	202513247131	000000000000
0067	200425401621	000000000000	200707511736	000000000000	222561047000	000000000000
0073	174452067650	206604470321	022223000000	775000120104	201431463146	176737547751
0079	211552033421	203626425247	175624340765	201473471621	176434621050	201566205005
0085	176400137575	223404342550	1[illegible]644154410	173457550261	206646551071	000003004440
0091	775000120104	201431463146	1[illegible]754705425	211555074552	203443467063	000000000000
0097	202447426457	000000000000	[illegible]625774137	000000000000	222501027417	000000000000
[illegible]3	176520762466	206504174237	0[illegible]2223000000	775000120104	201431463146	1767437[illegible]013
	211557054462	000000000000	000000000000	000000000000	176436460031	000000000000
0115	175712751671	000000000000	000000000000	175605661104	206541726370	031133000000
0121	775000120104	201431463146	176743730013	211557054462	000000000000	000000000000
0127	000000000000	176434460051	000000000000	175712751671	000000000000	000000000000
0133	175605661104	206541537544	031133000000	775000120104	201431463146	1767[illegible]1620420
0139	211561034216	000000000000	000000000000	202577317356	000000000000	201724462302
0145	000000000000	222622043000	000000000000	[illegible]73425464071	206575660510	032223000000
0151	775000120104	201431463146	176747061241	211566055271	000000000000	000000000000
0157	202405560742	000000000000	202462475403	000000000000	217777120000	000000000000
0163	175776161466	206527111346	032223000000	776500120101		

RECORD NO. 0003

[illegible]01	775000120104	201431463146	176750741021	211600116702	202702257374	000000000000
[illegible]	200535503412	000000000000	200755407242	000000000000	221615155505	000000000000
[illegible]	176433770550	206600416277	022223000001	775000120104	201431463146	1761416[illegible]
0019	211164356302	000000000000	000000000000	201757650453	000000000000	222433[illegible]
0025	000000000000	221602620266	000004000000	175432526573	206646373401	0322230[illegible]
0031	776500121202					

END OF FILE

binary information and is complete within the block; the word count (octal 121206) specifies six words. These next six words should be interpreted as explained in the Relay I write-up in section V: the first two as floating point, and the last four as decrement integers.

In interpreting the remainder of the block one proceeds as in Example 2. At the end of the block an example of the use of the P flag occurs. The control word at word 163 of the block contains a P flag (octal 47) which indicates that only the first part of this logical record is contained in the block. The word count indicates that two words are in this block.

The final word of the block (a control word with an E flag) specifies that four logical records were completed in the block; this count does not include the record with the P flag.

The remaining portion of the incomplete record is found at the beginning of the next block. The first logical record there has a Q flag and contains 14 words. In unblocking, these 14 words should be appended to the two words from the preceding block to form a single 16 word logical record.

EXAMPLE 3

RECORD NO. 0001

0001	775000121206	201531463145	201546111543	000076000000	000133000000	000104000000
0007	000133000000	775000120402	000076000000	000534000000	000003000000	176664247073
0013	176653226712	176423126527	201546111565	201535341217	201546111565	211533076373
0019	211533076105	211533053776	000610002500	000667002577	000323002551	600527642420
0025	600334357656	600576246621	176452504751	176424600662	176452504751	177424631070
0031	176731260524	175447102350	200000000000	200077140016	010000010100	210434000000
0037	621674363517	214464554251	213645400000	621674363517	217545026057	212600000000
0043	621674363517	216817731174	211716666667	621674363517	215772473376	175501636721
0049	604554076566	201762543275	775000121104	000077000000	000033000000	000607000000
0055	175767044152	176421651077	176455220007	176401672150	176431673407	176411032551
0061	176443247737	201535341217	201534324774	201544672274	201534121727	201530152376
0067	201533513615	201541014223	211607075562	211607077666	211607076623	211607075274
0073	211607077400	211607075005	211607077112	001431002550	001376002477	001115002550
0079	001465002550	001365002572	001461002550	001210002550	600722226506	600700012270
0085	600652125462	600714611635	600570765135	600706517400	600661506203	176424600662
0091	176422110320	176447343362	176421371540	176426550466	176420133400	176435647367
0097	167405275000	174415165040	175665225010	171713152200	174664512220	173427017700
0103	175477627240	007000000003	007000000003	005000000003	007000000103	007100000003
0109	007000000003	007000000003	215404266657	215405507514	213757511112	215414733334
0115	214477000000	215420226744	214535733334	217657442223	217673257035	217422131334
0121	217703335556	217635762223	217710454160	217540273334	217462431111	217465022456
0127	216513415556	217473422222	217422751111	217502476654	216672644445	216560411111
0133	216574312742	215601255556	216605762223	216511373334	216604467655	216410051111
0139	202400422773	201770725370	202437243604	202472004717	177546126655	202514076331
0145	203520216457	775000120106	000077000000	000151000000	000001000000	176566561744
0151	201535747331	211725062046	000424002473	600571522535	176426033462	176550365630
0157	004000000001	212532362023	215673474405	214640224744	214421303373	177627173107
0163	774700121202	000077000000	000153000000	776500121204		

RECORD NO. 0002

0001	775000120104	000031000000	176642503326	201536152376	211727071107	000371002770
0007	600541013562	176426550466	176714770320	000010000005	210760451710	214452036420
0013	213401520337	212505056427	175640313200	775000120106	000077000000	000154000000
0019	000001000000	176614374240	201541625402	211730362561	000371002474	600565065500
0025	176437505264	176667647500	005000000004	211616161616	214737252525	213677434343
0031	213437070707	176573324311	775000120106	000077000000	000160000000	000202000000
0037	177413154750	201544467227	211734072603	000302002425	600452562000	176446637534
0043	177552202206	000000000000	000000000000	200707070707	000000003000	000000000000
0049	000000000000	775000120106	000077000000	000163000000	000001000000	176635555554
0055	201534121727	211737074011	000436002475	600543514251	176421371540	176662651164
0061	000000000000	210765252525	214530252525	213512707070	212616525252	175773332625
0067	775000120105	000077000000	000157000000	000031000000	177404165236	201534520041
0073	211743060144	000370002420	600460471010	176422626707	177501347026	000000000001
0079	000000000000	000000000000	000000000000	000000000000	000000000000	775000120106
0085	000077000000	000172000000	000001000000	176154551247	201533513615	211744062524
0091	000466002477	600533527245	176420133400	176110642544	003000000004	210427522162
0097	213601417576	212615075641	211650171227	175443741245	775000120106	000077000000
0103	000174000000	000001000000	176603601041	201541217270	211750070404	000500007420
0109	600562150607	176436361657	176637437750	000000000006	211602525252	214450707070
0115	214452070707	213555070707	177415500534	775000120106	000077000000	000202000000
0121	000001000000	176631630052	201537371656	211756067740	000532002433	600546150454
0127	176431746004	176702075124	000000000000	210732525252	214560434343	213564707070
0133	212605616161	176502124277	775000120106	000077000000	000203000000	000001000000
0139	176605134713	201534121727	211757060222	000534002430	600561174335	176421371540
0145	176574350644	000000000000	211634440767	215516302600	214531147521	213550027552
0151	177502201772	774700120103	000077000000	000211000000	000001000000	176633441652
0157	201535544264	211765054134	000606002427	600544635502	176425316256	176371741770
0163	000000000003	210730707070	214530707070	776500121211		

TABLE I-1

Description or Function	7094 Octal Code	Blocked Tape Code (1460 BCD Code)
Zero	00	12
One	01	01
Two	02	02
Three	03	03
Four	04	04
Five	05	05
Six	06	06
Seven	07	07
Eight	10	10
Nine	11	11
	12	20
Equals	13	13
Quotes	14	14
	15	15
	16	16
Tape Mark	17	17
Plus	20	60
A	21	61
B	22	62
C	23	63
D	24	64
E	25	65
F	26	66
G	27	67
H	30	70
I	31	71
Plus Zero	32	72
Period	33	73
Right Paren	34	74
	35	75
	36	76

TABLE I-1 (cor't.)

Description or Function	7094 Octal Code	Blocked Tape Code (1460 BCD Code)
Group Mark	37	77
Minus	40	40
J	41	41
K	42	42
L	43	43
M	44	44
N	45	45
Ø	46	46
P	47	47
Q	50	50
R	51	51
Minus Zero	52	52
Dollar Sign	53	53
Asterisk	54	54
	55	55
	56	56
Mode Change	57	57
Blank	60	00
Slash	61	21
S	62	22
T	63	23
U	64	24
V	65	25
W	66	26
X	67	27
Y	70	30
Z	71	31
Record Mark	72	32
Comma	73	33
Left Paren	74	34
Word Separator	75	35
	76	36
Tape Seg. Mark	77	37

III. TELSTAR I

The Reduced Radiation Information tapes (RRI tapes) are output from the main data reduction program. They are file structured. Each file contains a BCD record identifying the transmitting station and the starting time of the binary information in the one or more records which follow. The files are sequential in time. The first BCD record contains 10 words as follows:

Word 1: Satellite number (1 = Telstar I; 2 = Telstar II).

Word 2: Day number of year at the beginning of this file of data.

Word 3: Year - 1900. (i.e. 62).

Word 4: Starting hour of day in Word 2.

Word 5: Starting minute of hour in Word 4.

Word 6: Minitrack station number. (See Table III-1).

Word 7: Right ascension of spin axis ±2 degrees.

Word 8: Declination of the spin axis ±2 degrees.

Word 9: Orbit number.

Word 10: Number of frames of telemetry in this file.

This record may be read with the following FORTRAN FORMAT statement:

(I3, I5, I6, 3I4, 2I6, I7, I5)

Word 10 of this (BCD) first record in each file specifies the number of 54 word binary records of processed telemetry frames in the file. The words are described below:

Word		
1	decrement integer	Hour of day at beginning of telemetry frame.
2	" "	Minute of hour in Word 1.
3	floating decimal	Second of minute in Word 2.
4	" "	R = distance from the center of the earth to satellite in earth radii. One earth radius (R_e) = 3953. statute miles, 6378.388 km.
5	" "	θ = co-latitude of sub-satellite point in degrees.
6	" "	λ = east longitude of sub-satellite point in degrees.
7-9*	" "	$-B_R$, $-B_\theta$, $-B_\lambda$ where $+B_R$, $+B_\theta$, $+B_\lambda$ components of the earth's magnetic field in gauss. These were calculated using Jensen and Cain 1962 coefficients.
10*	" "	The magnetic induction, B, in gauss.
11*	" "	Magnetic shell parameter, L, in earth radii, calculated by INVAR (1962).
12*	" "	γ, the angle between the spin axis vector and B vector in degrees.
13	" "	Counting rate as measured by the proton log rate meter.
14	" "	Counting rate as measured by the electron log rate meter.
15	" "	Skin temperature °C from the sensor sensitive to the high range. If the reading was out of range Word 15 is set equal to 500.
16	" "	Skin temperature °C from the sensor sensitive to low range. Out of range readings set equal to -500.
17	" "	Fixed bias voltage. (Affects electron detector and PP2 and PP3 detectors.)

*These words correspond to the time at the beginning of the frame.

Word		
18-19	floating decimal	Bias voltages for the low energy proton detector. Word 18, disregard readings between -20 and -100 volts. Word 19, disregard readings between 0 and -20 volts.
20	" "	Temperature of proton rate meter, °C.
21	" "	Temperature of electron rate meter, °C.
22	decrement integer	Number of times that proton rate meter overflowed.
23	" "	Number of times electron rate meter overflowed.
24	" "	Gain-state of electron counters.
		= 1 low gain of amplifier.
		= 2 high gain of amplifier.
		= 3 low gain but previous frame, not high gain.
		= 4 high gain but previous frame, not low gain.
		= 5 low gain as determined by next frame.
		= 6 high gain as determined by next frame.
25	" "	Bias-state of proton counter.
		= 1,2,3 as determined by Words 17 and 18.
		= 4 bias readings out of range.
		= 7,8,9 as determined by Words 17 and 18 but previous reading does not agree with present reading.
		1,7 ~-5 volts
		2,8 ~-15 volts
		3,9 ~-100 volts

Word		
26	octal	Flag 1
		Octal digit
		1-7 0
		8 = 0, this frame contiguous with previous frame
		= 1, time break
		9 = 0, this frame contiguous with succeeding frame
		= 1, time break
		10 = 0, decoder in lock
		= 1, decoder out of lock
		11 = 0, no format correction
		= 1, 1401 made format correction because the number of telemetry channels in the frame was = 118
		12 = 0, traveling wave tube off
		= 1, TWT on
27	"	Flag 2
		Octal digit
		1-7 0
		8 Proton log rate meter temperature.
		9 Electron log rate meter temperature.
		10 Skin temperature panel LC4.
		11 Bias voltage on low energy proton detectors.
		12 Fixed bias voltage.

27 (con't.)		Octal digits = 0 Reading within expected range. = 1 Reading below expected range. = 2 Reading above expected range.
28	octal	Flag 3

Octal Digit		
1-5	0	
6	E1	a 1 in the octal digit indicates that the number of counts in the corresponding radiation detector reading is suspect; a 0, that there is no indication of noisy telemetry.
7	E2	
8	P1	
9	P2	
10	P3	
11	PP3	
12	PP2	

29	floating decimal	Reading of proton rate meter in bits.
30	" "	Reading of electron rate meter in bits.
31	" "	Counting rate for detector E1.
32	" "	B, interpolated to time of reading.
33	" "	L, interpolated to same time.
34	" "	γ, interpolated to same time.
35-38	" "	Counting rate, B, L and γ for E2.
39-42	" "	Counting rate, B, L and γ for P1.
43-46	" "	Counting rate, B, L and γ for P2.
47-50	" "	Counting rate B, L and γ for P3.

51-53	floating decimal	Counting rate, B and L for PP2.
54	" "	Counting rate for PP3. (B and L of this reading correspond to Words 10 and 11).

These tapes have a final file with a BCD record of one word. This word is an integer 99 to be read with Format (I3).

More details on the BTL experiments on this satellite are contained in the articles "Spacecraft Radiation Experiments" and "Results of the Telstar Radiation Experiments" in the Bell System Technical Journal, Vol. 42, pp. 899-941 and 1505-1599 (1963).

TABLE III-1

Minitrack Stations

Number	
3	Fort Myers, Florida
5	Quito, Ecuador
6	Lima, Peru
7	Antofagasto, Chile
8	Santiago, Chile
13	College, Alaska
15	Winkfield, England
16	Johannesburg, Republic of South Africa
17	Mojave, California
18	Woomera, Australia
31	Andover, Maine
32	Cape Canaveral, Florida
50	Antigua
55	South Point, Hawaii

TELSTAR 1 CHARGED PARTICLE EXPERIMENT
PREPARED FOR P.F.STOKER

TAPE 0-00067 INVESTIGATOR
BINARY 800 EFI
BELL LABS SYSTEM W.L.BROWN
UNPACKED BY GETBE 8/2/67

THE TAPE IS DOCUMENTED IN THE UNPUBLISHED MEMO
'DOCUMENTATION OF THE BTL SATELLITE DATA TAPES'

THE DATA ARE FILE STRUCTURED AND ARE OUTPUT FROM THE MAIN DATA REDUCTION PR
THE TRANSMITTING STATION AND THE STARTING TIME OF THE BINARY INFORMATION IN THE
SEQUENTIAL IN TIME. EACH BCD RECORD CONTAINS 10 WORDS AS FOLLOWS

WORD 1 - SATELLITE NUMBER
WORD 2 - DAY NUMBER AT BEGINNING OF FILE
WORD 3 - YEAR - 1900
WORD 4 - STARTING HOUR OF DAY IN WORD 2
WORD 5 - STARTING MINUTE OF HOUR IN WORD 4
WORD 6 - MINITRACK STATION NUMBER AS FOLLOWS

3	FORT MYERS, FLORIDA
5	QUITO, ECUADOR
6	LIMA, PERU
7	ANTOFAGASTO, CHILE
8	SANTIAGO, CHILE
13	COLLEGE, ALASKA
15	WINKFIELD, ENGLAND
16	JOHANNESBURG, R.S.A.
17	MOJAVE, CALIFORNIA
18	WOOMERA, AUSTRALIA
31	ANDOVER, MAINE
32	CAPE CANAVERAL, FLORIDA
50	ANTIGUA
55	SOUTH POINT, HAWAII

WORD 7 - RIGHT ASCENSION OF SPIN AXIS (2 DEG)
WORD 8 - DECLINATION OF THE SPIN AXIS (2 DEG)
WORD 9 - ORBIT NUMBER
WORD 10 - NUMBER OF FRAMES OF TELEMETRY IN THIS FILE

THIS IS FOLLOWED BY BINARY RECORDS OF 54 WORDS.
(ALL NUMBERS OCCUPY 16 CHARACTERS WITH LEADING BLANKS)

HOUR	MINUTE	SECOND	
-B(R)	-B(THETA)	-B(LAMBDA)	
C RATE (P)	C RATE (E)	SKIN TEMP HI	SKIN TEMP L
LOW E BIAS	METER TEMP P	METER TEMP E	P1 OVERFLO
BIAS STATE	FLAG WORD 1	FLAG WORD 2	FLAG WORD
E1 C RATE	E1 B	E1 L	E1 GAMM
E2 L	E2 GAMMA	P1 C RATE	P1
E2 C RATE	E2 B	P2 L	P2 GAMM
P3 L	P3 GAMMA	PP2 C RATE	PP2

TICLE EXPERIMENT
ARED FOR P.F.STOKER

STIGATOR

L.BROWN

O
L SATELLITE DATA TAPES'

THE MAIN DATA REDUCTION PROGRAM. EACH FILE CONTAINS A BCD RECORD IDENTIFYING
E BINARY INFORMATION IN THE ONE OR MORE RECORDS WHICH FOLLOW. THE RECORDS ARE
S AS FOLLOWS

LE

2
RD 4
OLLOWS

DA

(2 DEG)
(2 DEG)

IN THIS FILE

G BLANKS)

SECOND	R	THETA	LAMBDA
-B(LAMBDA)	B	L	GAMMA
SKIN TEMP HI	SKIN TEMP LO	FIXED BIAS	LOW E BIAS
METER TEMP E	P1 OVERFLOW	E1 OVERFLOW	GAIN-STATE E
FLAG WORD 2	FLAG WORD 3	P1	E1
E1 L	E1 GAMMA	E2 C RATE	E2 B
P1 C RATE	P1 B	P1 L	P1 GAMMA
P2 L	P2 GAMMA	P3 C RATE	P3 B
PP2 C RATE	PP2 B	PP2 L	PP3 C RATE

TELSTAR 1 CHARGED PARTICLE EXPERIMENT
PREPARED FOR F.H.STOKER

```
1  191    62   9   6  16     85    -66        0   38

                             9                 7 0.109999999E 02 0.127338327E 01 0
               -0.114799529E-00 0.892532848E-01 0.345221862E-01 0.169455212E-00 0
                0.              0.              0.316599987E 02 0.500000000E 03-0
               -0.155119993E 02 0.282099992E 02 0.295899995E 02                 0
                             2    000000010011    000000000000    000001111101 0
                0.              0.148912534E-00 0.180347726E 01 0.771694899E 02 0
                0.183324113E 01 0.756897219E 02 0.                0.149183877E-00 0
                0.              0.149002984E-00 0.179603629E 01 0.775394313E 02 0
                0.181091823E 01 0.767995477E 02 0.                0.148641199E-00 0

1  191    62  11   6  17     85    -66        1   20

                            11                 7 0.339999996E 02 0.132806659E 01 0
                0.184451006E-00 0.939422257E-01-0.248760541E-01 0.208485328E-00 0
                0.250000000E 02 0.674999997E 03 0.819999970E 01 0.500000000E 03-0
               -0.930715994E 02 0.288999990E 02 0.255899995E 02                 0
                             3    000000010000    000000000000    000000000000 0
                0.637000001E 03 0.212542891E-00 0.250614144E 01 0.512618773E 02 0
                0.251090385E 01 0.514790282E 02 0.                0.210514106E-00 0
                0.101428563E 02 0.211866632E-00 0.250495091E 01 0.512075901E 02 0
                0.250733204E 01 0.513161644E 02 0.671428561E 01 0.214571670E-00 0

1  191    62  11  17   3     85    -66        1   16

                            11                18 0.409999996E 02 0.119784997E 01 0
                0.251576550E-00 0.142300971E-00-0.322346427E-01 0.290825754E-00 0
                0.              0.307499997E 03 0.819999970E 01 0.500000000E 03-0
               -0.155119993E 02 0.282099992E 02 0.288999990E 02                 0
                             2    000000011000    000000000000    000000000000 0
                0.247999996E 03 0.292091653E-00 0.199646033E 01 0.807876974E 02 0
                0.196487822E 01 0.823029108E 02 0.                0.291458704E-00 0
                0.              0.291880667E-00 0.200435586E 01 0.804088950E 02 0
                0.198856480E 01 0.811665006E 02 0.                0.292724609E-00 0

1  191    62  11  18  32     85    -66        1   15

                            11                19 0.299999997E 02 0.118699998E 01 0
                0.250679240E-00 0.148363337E-00-0.315170661E-01 0.292993322E-00 0
                0.              0.174999997E 02 0.819999970E 01-0.344599999E 02-0
               -0.930715994E 02 0.282099992E 02-0.264999996E 02                 0
                             3    000000010000    000000001100    000000001001 0
                0.166666664E 02 0.293821231E-00 0.191942550E 01 0.845829748E 02 0
                0.183826807E 01 0.861619540E 02 0.                0.293407276E-00 0
                0.              0.293683246E-00 0.192721486E 01 0.841882303E 02 0
                0.191163614E 01 0.849777199E 02 0.                0.294235189E-00 0
```

PERIMENT
P.H.STOKER

```
 02 0.127338327E 01 0.119911663E 03 0.354294993E 03
-01 0.149455212E-00 0.175883152E 01 0.793891415E 02
 02 0.500000000E 03-0.975039981E 02-0.156799994E 02
 02                 0                  0                  2
000    000001111101 0.                 0.
 01 0.771694899E 02 0.                 0.148550749E-00
    0.149183877E-00 0.178115435E 01 0.690909080E 01
 01 0.775394313E 02 0.                 0.148822092E-00
    0.148641159E-00 0.182580017E 01 0.760596633E 02
                              FILE    1 RECORD    40 IS AN EOF.

 02 0.132806659E 01 0.451133326E 02 0.203053325E 03
-01 0.208485328E-00 0.249899790E 01 0.509361513E 02
 01 0.500000000E 03-0.975039981E 02-0.155199997E 02
 02                 0                  0                  2
000    000000000000 0.325999998E 02 0.640000001E 02
 01 0.512618773E 02 0.930000000E 02 0.215247937E-00
    0.210514106E-00 0.250256971E 01 0.
 01 0.513075901E 02 0.187428564E 03 0.213219151E-00
 01 0.214571670E-00 0.250971325E 01 0.514247403E 02
                              FILE    2 RECORD    22 IS AN EOF.

 02 0.119784997E 01 0.565983325E 02 0.244833329E 03
 01 0.290825754E-00 0.204383358E 01 0.785148795E 02
 01 0.500000000E 03-0.975039981E 02-0.156799994E 02
 02                 0                  0                  1
000    000000000000 0.                 0.570000000E 02
 01 0.807876974E 02 0.669999994E 02 0.292935587E-00
    0.291458704E-00 0.202014692E 01 0.
 01 0.804088950E 02 0.                 0.292302638E-00
    0.292724609E-00 0.197277375E 01 0.819241065E 02
                              FILE    3 RECORD    18 IS AN EOF.

 02 0.118699998E 01 0.581999995E 02 0.247499995E 03
-01 0.292993322E-00 0.196616158E 01 0.822145075E 02
 01-0.344599999E 02-0.975039981E 02-0.155199997E 02
 02                 0                  0                  2
 00    000000001001 0.                 0.299999997E 02
 01 0.845829748E 02 0.166666664E 01 0.294373170E-00
    0.293407276E-00 0.194279350E 01 0.
 01 0.841882303E 02 0.                 0.293959215E-00
    0.294235185E-00 0.189605743E 01 0.857672088E 02
```

FILE		DAY	YR	HR	MIN	STA	ASC	DEC	ORB	FRAMES	REC	FIRST B	LAST B	
592	1	31	63	20	42	13	97	-59	1968	21	31	0.05274	0.16471	
593	1	41	63	21	34	8	97	-59	1968	16	16	0.19461	0.18433	
594	1	41	63	21	56	16	97	-59	1968	26	26	0.15940	0.07484	
595	1	42	63	0	22	8	97	-59	1969	19	19	0.25591	0.12212	
596	1	42	63	2	47	16	97	-59	1969	45	45	0.05681	0.05850	
597	1	42	63	3	7	8	97	-59	1970	33	33	0.23201	0.08294	
598	1	42	63	5	21	18	97	-59	1971	15	15	0.22147	0.36505	
599	1	42	63	6	6	5	97	-59	1971	27	27	0.08343	0.04542	
600	1	42	63	6	15	31	97	-59	1972	61	61	0.07153	0.08095	
601	1	42	63	9	0	31	97	-59	1973	65	65	0.06675	0.10276	
602	1	42	63	11	55	31	97	-59	1974	62	62	0.06592	0.12790	
603	1	42	63	14	53	32	97	-59	1975	44	44	0.07195	0.15148	
604	1	42	63	17	55	32	97	-59	1976	30	30	0.10081	0.16497	
605	1	43	63	6	24	31	97	-59	1981	17	17	0.06634	0.07437	
606	1	43	63	8	38	31	97	-59	1982	69	69	0.06506	0.10011	
607	1	43	63	11	32	31	97	-59	1983	50	50	0.06551	0.10782	
608	1	43	63	14	29	31	97	-59	1984	47	47	0.07253	0.14473	
609	1	43	63	17	26	32	97	-60	1985	31	31	0.10411	0.16118	
610	1	44	63	6	48	32	99	-59	1991	14	14	0.07375	0.09219	
611	1	44	63	10	12	16	99	-59	1991	21	21	0.38286	0.18093	
612	1	44	63	10	49	17	99	-59	1991	23	23	0.07529	0.06673	
613	1	44	63	11	2	32	99	-59	1992	58	58	0.06551	0.11737	
614	1	44	63	12	37	16	99	-59	1992	13	13	0.18346	0.27415	
615	1	44	63	12	57	18	99	-59	1992	36	36	0.23357	0.07240	
616	1	44	63	13	42	17	99	-59	1993	47	47	0.06140	0.09615	
617	1	44	63	14	4	32	99	-59	1993	53	53	0.06381	0.13963	
618	1	44	63	15	43	16	99	-59	1993	43	43	0.24367	0.06011	
619	1	44	63	16	43	17	99	-59	1994	44	44	0.06481	0.13565	
620	1	44	63	17	7	32	99	-59	1994	41	41	0.09067	0.15618	
621	1	44	63	18	10	16	99	-59	1994	24	24	0.20742	0.13084	
622	1	44	63	19	31	13	99	-59	1995	27	27	0.06441	0.09898	
623	1	44	63	20	33	8	99	-59	1995	14	14	0.18433	0.19072	
624	1	44	63	22	54	16	99	-59	1995	39	39	0.17605	0.06398	
625	1	44	63	22	10	13	99	-59	1996	39	39	0.07434	0.12110	
626	1	45	63	4	15	16	99	-59	1998	17	17	0.18410	0.35653	
627	1	45	63	4	52	6	99	-59	1998	49	48	0.17098	0.06620	
628	1	45	63	5	12	31	99	-59	1999	43	43	0.07458	0.06849	
629	1	45	63	7	55	31	99	-59	2000	53	53	0.07335	0.08132	
630	1	45	63	10	47	31	99	-59	2001	60	60	0.06709	0.10712	
631	1	45	63	13	48	31	99	-59	2002	56	56	0.06920	0.13655	
632	1	45	63	13	50	32	99	-59	2002	46	46	0.07353	0.13567	
633	1	45	63	16	46	32	99	-59	2003	35	35	0.08875	0.15318	
634	1	45	63	19	26	31	99	-59	2004	9	9	0.06672	0.06836	
635	1	46	63	7	34	31	99	-59	2009	45	45	0.07479	0.07697	
636	1	46	63	10	25	31	99	-59	2010	64	64	0.06876	0.10771	
637	1	46	63	13	21	31	99	-59	2011	56	56	0.07017	0.13185	
638	1	46	63	16	42	32	99	-59	2012	17	17	0.11954	0.14933	
639	1	47	63	5	8	31	101	-58	2017	7	7	0.06696	0.06817	
640	1	47	63	7	15	31	101	-58	2018	43	43	0.07046	0.07585	
641	1	47	63	10	3	31	101	-58	2019	63	63	0.07021	0.10491	
642	1	47	63	13	0	32	101	-58	2020	46	46	0.06696	0.12568	
643	1	47	63	15	25	32	101	-58	2021	15	15	0.12471	0.10570	
644	1	48	63	7	25	32	101	-58	2027	19	19	0.07410	0.08210	
645	1	48	63	9	23	17	101	-58	2027	60	60	0.08708	0.09130	

NSSDC TAPE L-00371

MENT ST B	LAST B	FIRST L	LAST L	HR	MIN	SEC
5774	0.16471	2.6684	1.2685	21	28	6.00
9461	0.18433	1.2239	1.7352	21	49	48.00
594C	C.07484	2.1151	1.7017	22	22	23.00
5591	0.12212	1.5800	1.7278	0	40	38.00
5681	C.05850	1.7216	2.2676	1	31	55.00
3201	0.06264	1.7939	1.7433	3	40	21.00
2147	C.36505	1.2350	2.2216	5	35	53.00
8343	0.06542	1.5547	2.4432	6	34	8.00
7153	C.08095	1.6886	3.6448	7	14	37.00
6675	0.10275	1.9427	3.1028	10	7	25.00
6592	C.12790	2.5453	1.5804	12	55	7.00
7195	0.15146	3.1972	1.7809	15	43	2.00
0081	C.16487	3.4525	1.4274	16	26	25.00
6634	0.07437	3.1225	3.7905	6	46	49.00
6506	C.10011	1.8110	3.0644	9	46	38.00
6651	0.10752	2.3569	4.5801	12	22	27.00
7253	C.14473	3.3068	2.2038	15	16	7.00
0411	0.16116	3.4917	1.4144	18	6	40.00
7375	C.09219	4.0885	3.7375	9	20	20.00
8886	0.18093	3.5812	1.8837	10	34	1.00
7525	C.06673	1.6057	2.3797	11	13	17.00
6551	0.11737	1.8669	2.3579	12	14	5.00
8346	C.27415	1.4146	2.5422	12	45	25.00
3357	0.07240	4.0704	1.6328	13	32	41.00
6140	C.09615	1.8304	5.0373	14	31	22.00
3881	0.13963	2.9735	1.5492	15	4	55.00
4367	C.06011	2.8421	1.8467	16	25	28.00
5481	0.13545	2.5338	2.5715	17	30	15.00
5067	C.15618	3.6211	1.3355	17	48	55.00
7742	0.13084	2.4285	1.8004	18	34	4.00
5441	C.09898	2.3187	2.6523	19	56	32.00
9433	0.19072	1.2337	1.6549	20	46	36.00
9605	C.06398	2.1340	1.7046	21	31	45.00
7434	0.12110	2.6745	1.6150	22	50	18.00
6410	C.35653	1.2365	2.0657	4	33	53.00
0098	0.06620	1.6108	2.8724	5	40	38.00
7458	C.06849	1.7002	3.5465	6	55	21.00
1335	0.08132	1.7379	4.9569	8	47	8.00
7059	C.10712	2.1479	3.4726	11	45	48.00
9920	0.13659	3.0032	1.9096	14	39	33.00
3353	C.13567	3.5112	1.6035	14	43	25.00
8756	0.15318	3.7118	1.6447	17	21	30.00
6672	C.06836	3.2170	3.5183	5	35	1.00
7479	0.07697	1.7624	4.9553	8	19	14.00
8876	C.10771	2.1981	2.7273	11	25	22.00
0017	0.13185	3.1129	1.8912	14	19	3.00
5554	C.14933	3.1067	1.6653	17	0	55.00
6996	0.06817	3.2886	3.4873	5	14	59.00
6546	C.07585	1.7810	4.8662	7	54	55.00
0221	0.10451	2.1546	2.5959	11	9	18.00
5996	C.12568	3.0258	2.2924	13	54	20.00
8471	0.14570	2.8175	1.6631	16	40	40.00
6410	C.08210	4.3083	3.8595	7	53	C.
7098	0.09130	1.5315	4.9204	10	33	59.00

62-025A-01A TELSTAR 1 CHARGED PARTICLE EXPERIMENT

FILE		DAY	YR	HR	MIN	SYA	ASC	DEC	CRR FRAMES	REC		FIRST E	LAS
646	1	48	63	9	34	32	101	-58	2028	60	60	0.07391	0.1
647	1	48	63	11	5	16	101	-58	2028	14	14	0.14481	0.2
648	1	48	63	11	34	16	101	-58	2028	29	29	0.36316	0.0
649	1	48	63	12	34	32	101	-58	2029	56	56	0.06868	0.1
650	1	48	63	13	5	16	101	-58	2029	13	13	0.17645	0.2
651	1	49	63	15	37	32	101	-58	2030	46	46	0.07966	0.1
652	1	49	63	7	0	31	101	-58	2036	13	13	0.07405	0.0
653	1	49	63	9	19	31	101	-58	2037	59	59	0.07389	0.1
654	1	49	63	12	14	31	101	-58	2038	64	64	0.06974	0.1
655	1	49	63	15	14	32	101	-58	2039	61	61	0.07725	0.1
656	1	49	63	18	17	32	101	-58	2040	19	19	0.10357	0.1
657	1	50	63	14	49	31	102	-57	2048	34	34	0.08124	0.1
658	1	50	63	17	54	32	102	-57	2049	30	30	0.09903	0.1
659	1	51	63	3	2	32	102	-57	2053	40	40	0.05188	0.0
660	1	51	63	5	40	32	102	-57	2054	50	50	0.09631	0.0
661	1	51	63	8	29	32	102	-57	2055	51	51	0.08186	0.0
662	1	51	63	8	35	31	102	-57	2055	54	54	0.07831	0.0
663	1	51	63	11	27	32	102	-57	2056	60	60	0.07145	0.1
664	1	51	63	14	28	32	102	-57	2057	56	56	0.07474	0.1
665	1	51	63	17	30	32	102	-57	2059	34	34	0.05190	0.1
666	1	52	63	5	28	31	102	-57	2063	44	44	0.08840	0.0
667	1	52	63	8	7	32	102	-57	2064	53	53	0.08435	0.0
668	1	52	63	11	4	32	102	-57	2065	26	26	0.08883	0.1
669	1	52	63	11	7	31	102	-57	2065	25	25	0.07283	0.0
670	35	[illegible]								0		0.07283	0.0

****** END OF TAPE ******

ICLE EXPERIMENT NSSDC TAPE D-00071

S REC	FIRST B	LAST B	FIRST L	LAST L	HR	MIN	SEC
60	0.07391	0.10134	1.7355	2.6712	10	47	40.00
14	0.14481	0.26024	1.3438	2.1593	11	25	1.00
29	0.36316	0.09748	4.1077	1.5497	12	3	17.00
56	0.06868	0.12283	2.7065	1.6678	13	40	25.00
13	0.17645	0.26556	1.5063	3.0459	14	10	52.00
46	0.07566	0.14223	3.7778	1.5114	15	23	20.00
13	0.07405	0.07548	4.3321	4.7098	7	18	56.00
55	0.07389	0.10048	2.0106	2.2555	10	30	17.00
64	0.06974	0.11863	2.7360	1.8561	13	17	8.00
51	0.07725	0.13741	3.7291	1.4020	16	5	55.00
19	0.10357	0.13496	2.5945	1.5453	18	37	5.00
34	0.08124	0.13403	4.0956	1.5720	15	41	24.00
30	0.09903	0.14644	2.7483	1.2983	18	25	15.00
40	0.05188	0.06710	1.5126	2.5523	3	42	40.00
50	0.09631	0.07356	1.4821	4.5029	6	31	30.00
51	0.08186	0.09100	1.6438	2.5806	5	41	50.00
54	0.07831	0.09377	1.9318	2.4110	9	46	45.00
60	0.07145	0.11077	2.5361	1.7843	12	36	30.00
56	0.07474	0.12953	3.6781	1.4327	15	24	20.00
34	0.05190	0.14428	3.0155	1.3021	18	5	15.00
44	0.08840	0.07314	1.6654	4.4426	6	12	25.00
53	0.08435	0.08803	1.6293	3.1005	9	19	40.00
26	0.08983	0.12387	2.9014	1.3735	9	46	45.00
25	0.07283	0.07984	2.4902	5.1451	11	31	13.00
0	0.07283	0.07984	2.4902	5.145166121	0	13.00	