

SLP-846-71
December 9, 1971

TO: Distribution

FROM: R. L. McCutcheon

SUBJECT: Final Tape Format for the IMP-H CPME Experimenter's Tape.

The tape format for ID records and data records are given below in tables I and II, respectively. Both types of records have the same length, with "fill" of zeros where it is requested.

Each experimenter tape should contain an end of file mark only at the end of the tape, to indicate just that. Hence, ID records and data records should be found continuously in the input stream, with the first word of the ID records used as an indicator.

Each logical record should be 4581 bytes (8 bits) long and they should be blocked 5 to 1 for a block size of 22,905 bytes. The last block on the tape can contain less than 5 logical records. Seven-track, 800 BPI tapes are requested.



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TABLE I - ID Record Format

Item Number	Item Description	Target Field Size (bits)	8-Bit Byte Offset
1	id record indicator: set to 32 ones	32	0
2	satellite ID number: eight EBCDIC characters	64	4
3	station id - binary integer	32	12
4	analog tape number 4 EBCDIC characters	32	16
5	analog file number 4 EBCDIC characters	32	20
6	record date (YMMDDbbb) 8 EBCDIC characters	64	24
7	analog start time (HHMM) 4 EBCDIC characters	32	32
8	analog stop time (HHMM) 4 EBCDIC characters	32	36
9	data type - binary integer 0 = normal 1 = encoder bypass 2 = encoder failure 3 = uncoded	32	40
10	experimenter ID 4 EBCDIC characters	32	44
11	data rate 0 = low bit rate 1 = high bit rate	32	48
12	master edit tape number 4 EBCDIC characters	32	52

TABLE I - Continued

Item Number	Item Description	Target Field Size (bits)	8-Bit Byte Offset
13	master edit file number 4 EBCDIC characters	32	56
14	fill to data record length	35880	60
			<hr/> 4545

TABLE II - Data Record Format

Item Number	Item Description	Telemetry Sequences	Position Frames	Channel	Target Field Size (bits)	8-Bit Byte Offset
1	year ¹				16	0
2	day				16	2
3	milliseconds				32	4
4	spacecraft clock	same time as above			32	8
5	pseudo-sequence counter	same time as above			32	12
6	Se-1 ①	2	2	8B/0, 2B/1	16	16 ³
	②	2	2	6B/1, 4B/2	16	18
	③	2	2	4B/2, 6B/3	16	20
	④	2	2	2B/3, 8B/4	16	22
	⑤	2	2	8B/11, 2B/12	16	24
	⑥	2	2	6B/12, 4B/13	16	26
	⑦	2	2	4B/13, 6B/14	16	28
	⑧	2	2	2B/14, 8B/15	16	30
	Repeat of above for sequences 6, 10, 14					
7	Se-2 ① - ⑧	2, 6, 10, 14	10	same as item 6	16	80
8	Se-3 ① - ⑧	3, 7, 11, 15	2	same as item 6	16	144
9	Se-4 ① - ⑧	3, 7, 11, 15	10	same as item 6	16	208
10	R1	1, 5, 9, 13	2	4B/6&7	16	272
11	R2	1, 5, 9, 13	10	4B/6&7	16	280
12	R3	2, 6, 10, 14	2	4B/6&7	16	288
13	R4	2, 6, 10, 14	10	4B/6&7	16	296
14	R5	2, 6, 10, 14	10	4B/9&10	16	304

TABLE II - Continued

Item Number	Item Description	Telemetry Sequences	Position Frame	Channel	Target Field Size (bits)	8-Bit Byte Offset
15	R6	3,7,11,15	2	4B/6&7	16	312
16	R7	3,7,11,15	10	4B/6&7	16	320
17	R8	1,9	4	4B/6&7	16	328
18	R9	4,12	8	4B/6&7	16	332
19	R10	0,8	8	4B/6&7	16	336
20	R11	5,13	4	4B/6&7	16	340
21	R12	0,8	4	11&2B/12	16	344
22	R13	0,8	4	6B/12&4B/13	16	348
23	R14	1,9	4	11&2B/12	16	352
24	R15	1,9	4	6B/12&4B/13	16	356
25	R16	4,12	8	11&2B/12	16	360
26	R17	4,12	8	6B/12&4B/13	16	364
27	R18	0,8	8	11&2B/12	16	368
28	R19	0,8	8	6B/12&4B/13	16	372
29	R20	5,13	4	11&2B/12	16	376
30	R21	5,13	4	6B/12&4B/13	16	380
31	R22	0,8	12	11&2B/12	16	384
32	R23	0,8	12	6B/12&4B/13	16	388
33	R24	4,12	12	11&2B/12	16	392
34	R25	4,12	12	6B/12&4B/13	16	396
35	data quality flags - 16 sequences ⁴				8	400
36	time quality flag - sequence 0				8	416

TABLE II - Continued

Item Number	Item Description	Telemetry Sequences	Position Frame	Channel	Target Field Size (Bits)	8-Bit Byte Offset
37	spacecraft clock quality flag - sequence 0				8	417
38	DPP-a3,1-4	0	4	4	8	418
39	DPP-a3,13-16	0	8	4	8	419
40	DPP-a3,21-24	0	12	4	8	420
41	DPP-a3,5-8	1	4	4	8	421
42	DPP-a2,5-8	1	8	4	8	422
43	DPP-a2,9-12	1	12	4	8	423
44	DPP-a2,13-16	2	4	4	8	424
45	DPP-a2,17-20	2	8	4	8	425
46	DPP-a2,21-24	2	12	4	8	426
47	DPP-a2,25-28	3	4	4	8	427
48	DPP-a2,29-32	3	8	4	8	428
49	DPP-a2,33-36	3	12	4	8	429
50	DPP-a3,9-12	4	8	4	8	430
51	DPP-a3,17-20	5	4	4	8	431
52	AP16, &1-15 ⁵	ALL	0	4	8	432
53	AP32, &17-31	ALL	0	5	8	448
or	AP48, &33-47	ALL	0	5	8	
54	OA data	4,12	4	4-15	8/chan	464
55	repeat of items 1 thru 54 for page 1 of an "even" album					488
56	repeat of items 1 thru 54 for page 2 of an "even" album					976
57	repeat of items 1 thru 54 for page 3 of an "even" album					1464

TABLE II - Continued

em Number	Item Description	Telemetry Sequences	Position Frame	Channel	Target Field Size (bits)	8-Bit Byte Offset
58	items 1 thru 66 of attitude/orbit/ephemeris table-see attachment 1 of reference 1				32	1952
59	item 67 (see above) YRMODAbb (EBCDIC)				8/char	2216
60	items 68 thru 79 from above table				32	2224
61	repeat of items 1 thru 60 for the next album, an "odd" one					2272 <u>2272</u> 4544
62	one 8-bit byte to pad to a multiple of 36 bits					1 <u>4545</u>

*logical record size = 4545 bytes = 1010 36-bit words

Notes

- 1 All items are binary integers except for the attitude/orbit/ephemeris data, which is in IBM 360 floating point format.
- 2 An even album is one in which satellite clock lines \bar{a}_5 , \bar{a}_6 , and \bar{a}_7 are all ones. Note that $\bar{a}_7 = \bar{C}_{25}$ at 1600 BPS and $\bar{a}_7 = \bar{C}_{27}$ at 400 BPS.
- 3 Items 6 through 34 are telemetry data and should appear in the 16 bit target field as a 10 or 12 bit integer as they are specified. This should be the floating point compressed form as described in Appendix C, sheets 7-11 of the IMP H&J Encoder document.
- 4 Each quality flag should be a 2 bit integer right-justified in the 8 bit target field with the left-most 6 bits as zeros.
- 5 The DPP's should remain four to a channel as they appear in the telemetry read-out: $D_1D_2D_3D_4D_1D_2D_3D_4$; i.e., each one repeats.
- 6 The AP's should be placed in 8 bit fields so that the conversion to volts is as follows:

$$\text{VOLTS} = 5.75 - .025*(8 \text{ bit count});$$

i.e., 230 counts = 0. volts and
30 counts = 5. volts.