

IMP-H CPME Archive Tape Format

Listed on the following pages is a description of the data that is contained on the CPME archive tapes. This will be the same for APL and GSFC, except that the GSFC copy will be on seven-track tape recorded at 800 BPI; APL's tapes will be 1600 BPI, nine-track tapes. Each logical record will contain data for two albums, starting with an even album. The physical records will contain two logical records. Hence, for APL:

Logical record size = 14,512* 8-bit bytes

Physical record size = 29,028 8-bit bytes;

for GSFC:

Logical record size = 14,508 8-bit bytes

3,224 36-bit words

Physical record size = 29,016 8-bit bytes

= 6,448 36-bit words.

Identification records separate the data records corresponding to different analog recording tapes and can be identified by all ones in the first 32 bits of the data record.

* The APL records are written with "variable-length" format, so 4 bytes have been added to the logical record size and an additional 4 bytes have been added to the physical record size.



"CPME Archive Identification Record"

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 (YTMDDbbb) 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 10 = low bit rate 21 = high bit rate	32	48
12	master edit tape number 4 EBCDIC characters	32	52

"CPME Archive Identification Record Continued"

Item Number	Item Description	Target Field Size (bits)	8-bit Byte Offset
13	master edit file number 4 EBCDIC characters	32	56
14	average sequence time 6 EBCDIC characters	64	60
15	Perigee counter 3 characters	32	68
16	day of next perigee 4 characters HHMM	32	72
17	time of day of next perigee 4 characters HHMM	32	76
18	fill	115,424	80

CPME Archive Data Record

Item Number	Description	Type
1-8	year of pages 0-7	2 byte integers
9-16	day of pages 0-7	2 byte integers
17-24	milliseconds of day of pages 0-7	4 byte integers
25-32	time quality flags* corresponding to the 8 above times	1 byte integers
33-40	spacecraft clock pages 0-7	4 byte integers
41-48	s/c clock quality** flags corresponding to the 8 above clocks	1 byte integers
49-56	pseudo sequence counter for pages 0-7	4 byte integers

* Quality flags are defined by IPD:

- 0 - analog time unverified (quick look)
- 1 - " " verified by s/c clock
- 2 - " " in error, s/c clock used
- 3 - Time put with fill data - computed

If the year, day, and millisecs. are non-zero, they should be "usable". If they are zero, then the entire page is fill

** These are given by IPD, but not well-defined. If non-zero then they should be OK.

<u>Item Number</u>	<u>Description</u>	<u>Type</u>
57-65	E1 counting rates, sectors 1 to 8, and sector average. SSO of page 0	4 byte real
66-344	repeat of 57-65 for 31 more read-outs	4 byte real
344-632	uncertainties corresponding to items 57-344	4 byte real
633-664	data quality flags for each of the 32 read-outs.*	1 byte integer
665-673	E3 counting rates, sectors 1 to 8, and sector average. SS0 of page 0	4 byte real
674-808	repeat of 665-673 for 15 more read-outs	4 byte real
* One data quality flag corresponds to all eight sectors and the sector average.		
809-952	E3 uncertainties corresponding to items 665-808	4 byte real
953-968	E3 data quality flags for each of the 16 read-outs	1 byte integer
969-977	E2A counting rates, sectors 1-8, and sector average. SSD of page 0.	4 byte real
978-1112	repeat of 969-977 for 15 more read-outs	4 byte real
1113-1226	E2A uncertainties corresponding to items 969-1112	4 byte real
1227-1242	E2A data quality flags for each of the 16 read-outs	4 byte integer
1243-1251	P1 counting rates, sectors 1-8, and sector average SS 1 of page 0	4 byte real
1252-1386	repeat of 1243-1251 for 15 more read-outs	4 byte real
1387-1530	P1 uncertainties corresponding to items 1243-1386	4 byte real

** data quality flags defined by JPD:
0 = excellent - ($PE < 10^{-6}$)
1 = good - ($PE < 10^{-4}$)
2 = FILL

<u>Item Number</u>	<u>Description</u>	<u>Type</u>
1531-1546	P1 data quality flags for each of the 16 read-outs	1 byte integer
1547-1555	E4 counting rates, sectors 1-8, and sector average SS 0 of page 0	4 byte real
1556-1690	repeat of 1547-1555 for 15 more read-outs	4 byte real
1691-1834	E4 uncertainties corresponding to items 1547-1690.	4 byte real
1835-1850	E4 data quality flags for each of the 16 read-outs	4 byte integer
1851-1859	<i>A6 counting rates, sectors 1-8, and sector av.</i> Repeat of 1851-1859	<i>4 byte integer</i>
1860-1851-1922	<i>SS0, page 0</i> Repeat of 1851-1859 for 7 more read-outs	4 byte real
1923-1994	A6 uncertainties corresponding to items 1851-1922	4 byte real
1995-2002	A6 data quality flags for each of the 8 read-outs	1 byte integer
2003-2011	A1 counting rates, sectors 1-8, and sector average, SS 1, page 0	4 byte real
2012-2074	repeat of 2003-2011 for 7 more read-outs	4 byte real
2075-2146	A1 uncertainties corresponding to items 2003-2074	4 byte real
2147-2154	A1 data quality flags for each of the 8 read-outs	1 byte integer
2155-2163	Z1 counting rates, sectors 1-8, and sector average, SS2, page 0	4 byte real
2164-2226	repeat of 2155-2163 for 7 more read-outs	4 byte real
2227-2298	Z1 uncertainties corresponding to items 2164-2226	4 byte real
2299-2306	Z1 data quality flags for each of the 8 read-outs	1 byte integer
2307-2315	P8 counting rates, sectors 1-8, and sector average SS3, page 0	4 byte real

<u>Item Number</u>	<u>Description</u>	<u>Type</u>
2316-2378	repeat of 2307-2315 for 7 more read-outs	4 byte real
2379-2450	P8 uncertainties corresponding to items 2307-2378	4 byte real
2451-2458	P8 data quality flags for each of the 8 read-outs	1 byte integer

<u>Item Number</u>	<u>Description</u>	<u>Type</u>
2459-2490	M counting rates, 32 read-outs	4 byte real
2491-2522	S counting rates, 32 read-outs	4 byte real
2523-2554	P9 counting rates, 32 read-outs	4 byte real
2555-2586	P7 counting rates, 32 read-outs	4 byte real
2587-2618	Z1 counting rates, 32 read-outs	4 byte real
2619-2650	A6 counting rates, 32 read-outs	4 byte real
2651-2682	A5 counting rates, 32 read-outs	4 byte real
2683-2906	uncertainties corresponding to items 2459-2682	4 byte real
2907-3130	data quality flags corresponding to items 2459-2682	1 byte integer

<u>Item Number</u>	<u>Description</u>	<u>Type</u>
3131-3162	Z3 counting rates, 16 read-outs	4 byte real
3163-3178	A4 counting rates, 16 read-outs	4 byte real
3179-3194	A3 counting rates, 16 read-outs	4 byte real
3195-3210	A2 counting rates, 16 read-outs	4 byte real
3211-3226	P11 counting rates, 16 read-outs	4 byte real
3227-3242	P10 counting rates, 16 read-outs	4 byte real
3243-2358	E4 counting rates, 16 read-outs	4 byte real
3259-3274	E5 counting rates, 16 read-outs	4 byte real
3275-3290	E6 counting rates, 16 read-outs	4 byte real
3291-3306	E2B counting rates, 16 read-outs	4 byte real
3307-3322	E2C counting rates, 16 read-outs	4 byte real
3323-3338	P2 counting rates, 16 read-outs	4 byte real
3339-3354	P3 counting rates, 16 read-outs	4 byte real
3355-3370	P4 counting rates, 16 read-outs	4 byte real
3371-3386	P5 counting rates, 16 read-outs	4 byte real

<u>Item Number</u>	<u>Description</u>	<u>Type</u>
3387-3402	P6 counting rates, 16 read-outs	4 byte real
3403-3418	P8 counting rates, 16 read-outs	4 byte real
3419-3434	Z2 counting rates 16 read-outs	4 byte real
3435-3722	uncertainties corresponding to items 3131-3434	4 byte real
3723-4010	data quality flags corresponding to items 3131-3434	1 byte integer
4011	calibrate flag*	1 byte integer
4012	data quality flag corresponding to 4011	1 byte integer
4013	optical aspect** system failure flag	1 byte integer
4014	data quality flag corresponding to 4013	1 byte integer
4015-4022	analog outputs: APP1, ..., APP8	1 byte integer
4023-4040	data quality flags corresponding to items	1 byte integer
4041-4052	OA data, channels 4-15 directly from telemetry	1 byte integer
4053-4136	repeat 4041-4052 for 7 more read-outs	1 byte integer
4137-4142	data quality flags; one for each 12 channels of OA data	1 byte integer

* calibrate flag = 1 if these two albums contained a calibrate; = 0 if no calibrate.

** optical aspect system in failure mode is indicated by a 1; system is working if flag = 0. When data quality flag indicates fill, OA flag will be set to the last non-fill value.

Item #	Descriptive Name	Comments
538 4/43	Day of ephemeris	integer
539 4/44	milliseconds of day	integer
540 45	Geocentric longitude	Satellite position
541 46	Geocentric latitude	in degrees
542 47	Radial distance from center of the earth	km
543 48	GSE-X	satellite position in Geocentric Solar
544 49	GSE-Y	Ecliptic coordinates
545 4/50	GSE-Z	(km)
546 51	GSM-X	satellite position in Geocentric Solar
547 52	GSM-Y	Magnetospheric coordinates (km.)
548 53	GSM-Z	moon position in Geocentric Solar
549 54	GSE-X	Ecliptic coordinates
550 55	GSE-Y	(km)
551 56	GSE-Z	Satellite position in Geocentric Equatorial
552 4/57	GEI-X	Inertial coordinates
553 58	GEI-Y	(km)
554 59	GEI-Z	sun position in Geocentric Equatorial
555 60	GEI-X	Inertial coordinates
556 61	GEI-Y	(A.U.)
557 62	GEI-Z	satellite position in Celestial Inertial
558 4/63	right ascension	coordinates (degrees)
559 64	declination	velocity vector in Celestial Inertial
560 65	right ascension	coordinates (degrees)
561 66	declination	km/sec.
562 67	magnitude of velocity	satellite-earth-sun angle (degrees)
563 68	LSEP	1 = regular satellite data item
564 69	type of data item	2 = ascending node crossing data item
		3 = north point data item
		4 = descending node data item
		5 = south point data item
		6 = sunlight entrance data item
		7 = sunlight exit data item

ALBUM #1

565 4170	spin period	seconds
566 71	right ascension	spin vector in
567 72	declination	celestial inertial
		coordinates (degrees)
568 4173	sun time	the number of seconds
		between the beginning
		of the telemetry page
		and the first sun pulse.
569 4174	theta SE	spin-axis solar ecliptic
570 4175	phi SE	coordinates (degrees)

~~items 571 - 870 will be listed in the future. They are outputs of subroutine-DETAIL.~~

4176 repeat of all ephemeris
 (items 4143-4175)
 for second album.