

DATA SET CATALOG # 45

MARINER 4, Cosmic Ray Telescope

64-077A-04A

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          { D  
          E

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

MARINER 4

50.4 SECOND AVERAGE VECTOR MAGNETIC FIELD

64-077A-04A-D

THESE DATA SETS HAVE BEEN RESTORED.  ORIGINALLY THEY CONTAINED FOUR 7-TRACK, 800 BPI TAPES WRITTEN IN BCD.  THERE IS ONE RESTORED TAPE WRITTEN IN EBCDIC.  THE DR AND DS TAPES ARE 9-TRACK, 6250 BPI.  THE ORIGINAL TAPES WERE CREATED ON TWO DIFFERENT COMPUTERS, FILE 1 WAS CREATED ON AN IBM 3081 AND FILES 2-4 WERE CREATED ON A 7094 COMPUTER.  THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND THE TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN	ID
DR01675	DS01675	D05886	1	11/28/64 - 10/01/65	04A
		D05887	2	11/28/64 - 10/01/65	04B
		D05888	3	11/28/64 - 10/01/65	04C
		D06365	4	11/28/64 - 10/01/65	04D

March 11, 1971

MARINER 4  
64-077A-04A to 04E

This data set catalog consists of 5 Cosmic Ray Telescope data sets on five 7094 Compatible tapes. These tapes are all 1 file, 800 BPI, 7-track. The first 4 tapes (data sets A thru D) are BCD. The fifth tape (64-077A-04E) is BINARY. The time span for the data is the same for all the tapes. It is 11/28/64 - 10/01/65.

ID	DATA SET NAME	D#	C#
64-077A-04A	RAW COUNT RATE	D-05886	C-04718
64-077A-04B	MIA DATA	D-05887	C-04719
64-077A-04C	D(1)RATE(1.4 HR AVE) + D.S.	D-05888	C-04720
64-077A-04D	D(1)D(2)RATE(4.24 HR. AVE.) + D.S.	<del>D-05889</del>	C-04721
64-077A-04E	MISSION STATUS RECORDS	D-05890	C-04722

*D-05889*

This catalog contains partial listings of the tapes and end-of-file parity checks runs on the tapes.

*Also included in this catalog is a listing of a 30 minute time gap study program and the output from data sets A thru D.*

*8/11/71*

*D-05889 has been released because it had format errors. A new tape was sent back to NSSDC from the U. of Chicago, and a new D# was assigned (D-06365). The C# remained the same (C-04721).*

III. Description of Individual Tape Formats

A. Blocked Pulse Heights Tape. 64-077A-04B

The raw data from all the even numbered frames recorded for the entire mission which meet the JPL criteria for the highest quality level ( $\approx 90\%$  of telemetered data) have been formatted and blocked so as to be recorded on a single tape. Each readout of the 10-bit pulse height register (A-Word) is listed separately. Each logical record contains the following parameters in BCD format.

- IDty      The data given as a four-digit number. The first digit is the last digit of the year and the subsequent 3 digits are the day of the year. That is, Jan. 1st 1965 is given as 5001. (Format I4).\*
- ITIME      The universal time (U. T.) of the receipt by earth tracking stations of the first bit of the frame. The time given is truncated to the preceding minute (Format I4).
- IFC      The spacecraft frame count. Cycles through 0000 to 2047 and then recycles. For pulse height tapes this will always be an even number. (Format I4).
- ICAL      One bit indicator of Calibrate-Normal mode. (Format I1).
- 0 - Normal mode.
- 1 - Calibrate mode.
- Data from frames 0 - 127 is in calibrate mode (except for first calibrate sequence after instruments turn-on) and 128 - 2047 are normal mode.

\* - The form of each parameter on the tape is described by a standard ASA-FORTRAN FORMAT statement.

- IBTR One bit indicating the S/C telemetry bit rate. (Format II)
- 0 - Bit rate =  $33 \frac{1}{3}$  b/sec.
- 1 - Bit rate =  $8 \frac{1}{3}$  b/sec.
- Data from launch until Jan. 3, 1965 are at high bit rate and all subsequent data are at low bit rate ( $8 \frac{1}{3}$  b/sec).
- IPH1 The channel number for the  $D_1$  pulse height analysis for the first readout of the frame (Word 6) (Format I3).
- IB1  $D_3$  indicator bit. A "1" implies  $D_3$  discriminator triggered in coincidence with analyzed event. (Format II).
- IC1  $D_3'$  indicator bit. A "1" implies  $D_3'$  discriminator (high level) triggered in coincidence with analyzed event. (Format II).
- IA1  $D_1 D_2 \overline{D_3}$  rate indicator. A "1" indicates that there has been one or more  $D_1 D_2 \overline{D_3}$  counts since the previous readout of this register (see Figure 5). (Format II).
- IPH2  $D_1$  channel number for the second readout of this frame (word 22). (Format I3).
- IB2 Same as IB1 but for word 22 of frame.
- IC2 Same as IC1 but for word 22 of frame.
- IA2 Same as IA1 but for word 22 of frame.

The above 13 quantities in the order listed are formatted into a logical record with format (4x, 3(1x, I4), 2(1x, I1), 1x, I3, 3(1x, I1), 1x, I3, 3(1x, I1), 5x). This is a total of 48 BCD characters including blank spaces. These 48 character logical records are then blocked at 50 logical records per physical record (2400 characters).

The data frames are all in proper time sequence with no duplicate records. Missing or bad data frames are simply not present on the tape. Therefore, pulse height distributions may be accumulated over any time interval specified up to the duration of the whole mission.

B. Blocked Rates Tape. **64-077A-04A**

This tape is similar in conceptual format to the Blocked Pulse Height Tapes. The raw data from the individual frame-by-frame readouts of the 19-bit rate word (R-Word) are listed in time sequence on a single tape. Each logical record contains the following BCD coded variables:

IDAY	Same as for Pulse Height Tape.
ITIME	Same as for PHA Tape.
IFC	Same as for PHA tape (however here only odd numbers will occur).
ICAL	Same as for PHA tape.
IBTR	Same as for PHA tape.
I6D1	The number of counts of $D_1 \overline{D_2}$ occurring since the previous readout of this register scaled down by a factor of four. The accumulation time for this particular case (Word 6) is 72 seconds and 18 seconds at 8 1/3 bits/sec and 33 1/3 bits/sec respectively (see Figure 5). This corresponds to the time since word 30 was read out in the last odd numbered frame; at that time the 19-bit rate register was destructively read out but the data was not (in interplanetary/cruise mode) telemetered. Only four bits are available for this so this number ranges from 0 to 15. (Format 12).

- I22D1 The number of  $D_1 \overline{D_2}$  counts (divided by 4) occurring between word 6 of the telemetry format and word 22. Accumulation times of .9.2 and 4.8 seconds result at the low and high bit rates respectively (see Figure 5). (Format I2).
- I6D2 The number of  $D_1 D_2 \overline{D_3}$  counts accumulated for word 6 in the telemetry format (see I6D1 above). Here only 3 bits in the register are available so that this ranges from 0 - 7. (Format I4).
- I22D2 The number of counts of  $D_1 D_2 \overline{D_3}$  accumulated between words 6 and 22 of the telemetry format. (Format I4).
- I6D3 The number of  $D_1 D_2 D_3$  counts accumulated for word 6 (see I6D1 above). (Format I4).
- I22D3 The number of  $D_1 D_2 D_3$  counts accumulated between words 6 and 22. (Format I4).

The eleven variables in the order given above are formatted into a logical record with format (1x, 3(1x, I4), 2(1x, I1), 1x, I2, 2(1x, I1), 1x, I2, 2(1x, I1), 2x). 11

This results in a logical record length of 36 BCD characters (including blank spaces) which have been blocked into physical records of 50 logical records each (1800 characters).

It is extremely important to note that the limited number of bits available for rate accumulation severely limits the counting rate dynamic range for the individual rates. In fact some correction to the rates derived directly from the raw register readings listed on this tape is usually necessary

at the low bit rates. Considerable time and effort have been expended to make all the necessary corrections wherever possible. In order for this to be accurate the corrections are possible only on a somewhat extended time base with accumulation times ranging from one to several hours.

These corrected rates and most of the information on which these corrections have been based have been included on two separate rate summary tapes included in this package. It is strongly recommended that all work with counting rates be done with the summary tapes and that the raw rates readings listed on this tape be used only for specific applications requiring time resolutions more precise than those on the summary tapes. In such a case the user should fully understand the procedures used to arrive at accurate corrected rates.

C. The  $D_1$  Rate and Distribution Summary Tape--Hourly.

64-077A-049C

1) General Comments

The 6-bit accumulator (2 bits prescaling plus 4 bits telemetry register) for the  $D_1 D_2$  counting rate provided a very limited dynamic range which could be utilized without producing spuriously low readings due to overflow of the register. In particular, the  $D_1 \overline{D_2}$  rate was just under 3.0 counts/sec which corresponded to the minimum interplanetary background level. The telemetry format shown in Figure 5 illustrates the two basic accumulation times of 72 seconds for word 6 and 19.2 seconds for word 22 at the low ( $8 \frac{1}{3}$  b/sec) bit rate). The corresponding times at the high ( $33 \frac{1}{3}$  b/sec) are 18 and 4.8 seconds respectively. Simple multiplication of these accumulation times by the minimum count rate shows that the total

capacity of 64 counts without overflow is exceeded for word 6 at the low bit rate. Furthermore, the situation is marginal for word 6 at the high bit rate and word 22 at the low bit rate with  $\approx 60$  counts occurring between readouts. Only for word 22 at the high bit rate is there any excess capacity over that required for even the minimum count rates observed.

To handle this problem, several procedures were developed which enabled corrections to be made so as to determine the actual count rate in the marginal configuration and furthermore to follow the count rate up through one or two cycles of overflow at times of a proton intensity increase. The results of these procedures are tabulated for the mission on the third tape of this data package.

The analysis and results are based entirely on the  $D_1 \overline{D_2}$  data from word 22 (I22D1 on Tape 2). This was found to be the simplest approach and yielded sufficient statistical accuracy and time resolution for most studies. The procedures could, of course, be applied to word 6 at the high bit rate if better statistics are required.

The basic procedure consists of accumulating the distribution of the frequency of occurrence of the prescaled count rate register for a given time interval (typically 1 to several hours). Ideally, if interplanetary conditions remain unchanged during the period this frequency distribution will be Poisson and will have a certain mean and characteristic width which must be small compared to the capacity of the register. For the most common case encountered on the  $D_1 \overline{D_2}$  distributions for word 22 at the low bit rate, the mean lies near 13 or 14 (on a zero to 15 scale) and the width is about  $\pm 2$  to 3. This

results in the occasional overflow of the register producing indicated pre-scaled counts of 0 (16), 1 (17), 2 (18) and so on. However, since the width of the distribution is small there are a large number of readings (between, say, 4 and 9) which do not occur. Therefore with an extremely high degree of confidence, the readings of 0, 1, and 2, etc. can be assigned weights of 16, 17, and 18 respectively in order to calculate a "true" counts per readout. For the data taken on word 22 at the high bit rate no correction was necessary except for the very early period of the mission. After the switch to the low bit rate on Jan. 3, 1965 the simple procedure above is adequate  $\approx$  90% of the time and was done by computer. The remainder of the corrections for periods of enhanced particle intensity were made by visual inspection of the distributions and their evolution with time coupled with hand calculations of the "true" counts per readout which were then inserted on the tape at the proper time.

One additional procedure was used in a few places. Here the pattern of calculated counts per readout from the raw data was studied as the "true" counting rate increases through one, two and more overflow cycles. The resulting "observed" versus true counting rates were plotted and if other evidence could be used to determine which overflow cycle was appropriate, the true counting rate was determined graphically.

The procedure just outlined was used only very early in the mission to determine the rate in the first week after launch and help correct for the interference caused by naturally decaying radiation induced in the S/C or instrument during the passage through the earth's radiation belts. Immediately after exiting the radiation belts, the  $D_1 \overline{D_2}$  rate recorded a level more than 25 times the typical interplanetary background levels and yet no solar flare

particles were detected by any of the other Mariner IV particle detectors.

This level decayed away gradually during the early weeks of the mission showing several different dominant time constants. We have corrected the hourly averages given on this tape only for the long term effects due to the longest of these decay rates.

The above procedures have yielded dependable and accurate counting rates for all periods of the mission. Only the period immediately after launch and also during the 5 February 1965 solar event produce counting rates which are in irrecoverable overflow. Finally, note that all calibrate mode data has been excluded from the analysis.

## 2) Detailed Tape Format

As described in the preceding section, frequency distributions were compiled for the readings of the scaled  $D_1 \overline{D_2}$  count rate register to determine the true counts per readout. For this summary tape, these distributions were accumulated for all the available good quality telemetry for each hour (Universal Time) of every day between the launch day and the end of the mission. In addition, the 4-hour averages of the corrected counting rates were computed. For each hour, the following parameters are listed in order on the tape:

IND	Format (It)
1	hourly output*
2	4 hourly output

\*Note: if both IND and IQUAL = 2, ignore the record.

- IDAY**      Format (14)  
 The date of the measurement. The first digit is the last digit of the year of the measurement, the remaining three are the day of the year, i. e. Jan. 1, 1965 is given as 5001.
- ITIME**      Format (14)  
 The time (U. T.) of the beginning of the one-hour (or four-hour) interval of accumulation.
- IQUAL**      Format (11)  
 One digit code describing source and means of arriving at the corrected count rate for this hour.
- 0 - computer corrected
  - 1 - manually calculated and inserted
  - 2 - no data
  - 3 - graphically corrected
  - 4 - irrecoverable overflow
- L**            Format (14)  
 The number of readouts of the rate register that occur during the accumulation interval (here 1 hour).
- I22FRI(I)**    Format (1613)  
 I=1, 16  
 The frequency distribution of the unscaled  $D_1 \overline{D_2}$  counts.
- N**            Format (14)  
 The corrected total number of unscaled counts (multiply by 4 to obtain true  $D_1 \overline{D_2}$  counts) in the accumulation interval (here 1 hour). (Correct if IQUAL = 0 or 1.)

D. Coincidence Rates and Distributions Summary Tape 64-077A-04D

1) General Comments

Although the  $D_1 D_2 \overline{D}_3$  and  $D_1 D_2 D_3$  coincidence counting rates are much lower ( $\approx 0.03$  to  $0.04$  c/sec) than the  $D_1 \overline{D}_2$  counting rate discussed in detail in C) above, the register sizes (3 bits each with no prescaling) still require correction for overflow. No corrections are necessary at all for word 22. However the additional statistical requirements for these low counting rates require that an accurate correction be made for the effect of the overflow problem on data in word 6. The correction is small but necessary.

The procedure is to accumulate frequency distributions of the readings of the  $D_1 D_2 \overline{D}_3$  and  $D_1 D_2 D_3$  register readouts for word 6 on a scale from 0 to 7. The means of these distributions are then calculated. Except during the 5 February flare these means are  $\approx 2$  and 3 counts per readout for  $D_1 D_2 \overline{D}_3$  and  $D_1 D_2 D_3$  respectively. Based on the means calculated from the accumulated distributions the Poisson formulas are used to determine how many times it would have been expected to have accumulated counts of 8 and 9 for the particular time interval of accumulation. The number of 0's and 1's in the observed distribution are then reduced by these numbers and a new mean for the distribution with the calculated number of 3's and 9's included is determined. The new mean is then used to determine the revised number of 8's and 7's that would be expected and these are compared with the numbers found in the fast calculation. Usually two iterations of this process removed any discrepancies between the calculated mean and overflow numbers. The resulting mean number of counts/readout was then used to determine the true

... with the data from word ...

The procedure was applied uniformly throughout the mission at both high and low bit rates, however no change was produced at the high bit rate. At the low bit rate the correction was usually about 3% for word 6.

All calibrate data has been excluded from this summary tape.

It should be noted that the accuracy of the procedure declines as the accumulation interval is reduced. Furthermore, the resulting error is a systematic depression of the counting rate values below the true count. The residual error after application of the described procedure is in general small compared to normal statistical error. However, if an accurate measure of long term average rates is required the full correction procedure should be applied to the accumulated distribution. For the purposes of this summary tape we have provided corrected averages over 4-hour and daily intervals separately. The correction is minimal for the 4-hour averages since the statistics on the distribution are in general poor. The corrected daily averages have a residual error of about -0.2% whereas the standard deviation for this time interval is about  $\pm 1.8\%$ . However for time intervals in excess of about 15 days, the accumulated error for straight average mode from the daily rates given here will approach that due to normal statistical error.

Finally we should note that this procedure is applicable only when the rate remains low and near interplanetary level. Visual inspection and hand calculation have been used to obtain accurate rates during the only significant solar flare increase in these counting rates, resulting from the 5 February 1965 solar flare. These hand calculations exist only in tabular

and graph from and have not been included on this tape. The listed rates during the 5 February flare on this tape are saturated for the time intervals given.

## 2) Detailed Tape Format

The accumulated distributions for words 6 and 22 and the corrections to word 6 are listed on the tape. The data for each accumulation period are put out in six successive 132-character BCD records having the following parameters:

### Record 1

DAY        Format (I3)  
            Day of year of beginning of accumulation period  
            (days  $\geq$  333 are in 1964,  $<$  274 are in 1965).

ITIME      Format (I4)  
            U. T. of beginning of accumulation time.

IFC        Format (I4)  
            Frame count of beginning of accumulation time.

KDAY	(I3)	}                    Day, Time and frame count of end of accumulation period.
KTIME	(I4)	
KFC	(I4)	

FORMAT (9x, I3, 2x, I4, 2x, I4, 3x, 2HTO, 3x, I3, 2x, I4, 2x, I4) #1

### Record 2

I6FR2(I)    Format (8I5)  
I=1, 8       $D_1 D_2 \overline{D_3}$  frequency distribution (word 6 uncorrected).  
            (scale 0 to 7).

CR6 Format (F5.3)

$D_1 D_2 \overline{D_3}$  counts per readout word 6 uncorrected.

RMD6 Format (F4.2)

Root mean squared deviation of the distribution for

$D_1 D_2 \overline{D_3}$  on word 6.

STD6 Format (F4.2)

Calculated uncorrected standard deviation for the

distribution  $D_1 D_2 \overline{D_3}$  for word 6.

ISFR3(I) Format (8I5)

I=1,8

$D_1 D_2 D_3$  frequency distribution for word 6 uncorrected

(scale 0 to 7).

CR36 Format (F5.3)

$D_1 D_2 D_3$  counts per readout word 6 uncorrected.

RMD36 Format (F4.2)

Root mean squared deviation of the  $D_1 D_2 D_3$  word 6

distribution.

STD36 Calculated uncorrected standard deviation  $D_1 D_2 D_3$  word 6.

FORMAT (1x, 8I5, 2x, F5.3, 2(3x, F4.2), 5x, 8I5, 2x, F5.3, 2(3x, F4.2))

Record 3 - same as Record 2 except for word 22 ✓

Variables:

ISFR2(I)

I = 1,8

Word 22 variables

CR22

(see record 2 for word 6 variables)

RMD22

STD22

B21FR3(1)

I=1, 8

(cont.)

CR 322

Word 22 variables

RMD 322

(see record 2 for word 6 variables)

STD 322

FORMAT - Same as Record 2

Record 4

N216 . Format (16)

$D_1 D_2 \overline{D_3}$  accumulated counts (word 6 uncorrected).

CS26 Format (F6, 5)

$D_1 D_2 \overline{D_3}$  counting rate (c/sec) derived from word 6  
(uncorrected).

N222 Format (16)

$D_1 D_2 \overline{D_3}$  accumulated counts word 22.

CS222 Format (F6, 5)

$D_1 D_2 \overline{D_3}$  counting rate derived from word 22.

CS2 Format (F6, 5)

$D_1 D_2 \overline{D_3}$  uncorrected counting rate words 6 and 22 combined.

N36 Format (16)

$D_1 D_2 D_3$  accumulated counts word 6 (uncorrected).

CS36 Format (F6, 5)

$D_1 D_2 D_3$  counting rate (c/sec) derived from word 6  
(uncorrected).

N322 Format (16)

$D_1 D_2 D_3$  accumulated counts word 22.

CS322

Format (F6.5)

$D_1 D_2 D_3$  counting rate (c/sec) derived from word 22.

CS3

Format (F6.5)

$D_1 D_2 D_3$  counting rate (c/sec) uncorrected - derived from words 6 and 22 combined.

FORMAT (7x, I6, 4x, F6.5, 7x, I6, 4x, F6.5, 10x, F6.5, 9x, I6, 4x, F6.5, 7x, I6, 4x, F6.5, 10x, F6.5).

Record 5

I6FR2(I)

Format (I0I5)

I=1, 10

Corrected  $D_1 D_2 \overline{D_3}$ , word 6 frequency distribution.  
(Scale 0 to 9)

CRT26

Format (F5.3)

Corrected  $D_1 D_2 \overline{D_3}$  word 6 counts per readout.

CST26

Format (F6.5)

Corrected  $D_1 D_2 \overline{D_3}$  word 6 counting rate; counts/sec.

I6FR3(I)

Format (I0I5)

I=1, 10

Corrected  $D_1 D_2 D_3$  word 6 frequency distribution (scale 0 to 9).

CRT36

Format (F5.3)

Corrected  $D_1 D_2 D_3$  word 6 counts per readout.

CST36

Format (F6.5)

Corrected  $D_1 D_2 D_3$  word 6 counting rate c/sec.

FORMAT (1x, I0I5, 2x, F5.3, 1x, F6.5, 3x, I0I5, 2x, F5.3, 1x, F6.5)

Record 6

CST?

Format (F6.5)

$D_1 D_2 \overline{D_3}$  corrected rates word 6 (corrected) and word 22 combined.

CST3 Format (F6.5)

$D_1 D_2 D_3$  corrected rates word 6 (corrected) and word 22 combined.

B Format (F6.0)

Total number of readouts in accumulation interval.

FORMAT (4x, 23H CORRECTED RATES D1D2ND3, 3x, F6.5, 10x, 6HD1D2D3, 3x, F6.5, 3x, 18H NUMBER OF READOUTS, 3x, F6.0)

All of the data for a given day of the mission is put out in as many groups of six records in the above formats as required for the 4-hour averages plus one additional group of six records for the daily accumulation and corrected rates. The 4-hour averages are accumulated every four hours starting at 0000 U. T. for a given day and are compiled provided that at least one frame of rate data exists for that 4-hour period.

E. Mariner-IV Mission Status Records *64-077A-04E*

These tapes represent the listing of "comments" concerning the mission events from launch until mission termination. These were prepared by JPL and incorporated as part of the cruise data extract tapes. In analyzing the actual instrument data all of the so-called "status records" and "header records" encountered were simply stripped off the tapes and written on a separate tape.

The format is Fortran compatible standard IBM 7094 magnetic format binary coded characters (255 Fortran words).

Record Type 0 (BHEADR)

Word 1 is a 6 character alphanumeric literal identifying the type of record as "BHEADR".

Word 2 is a 5 character alphanumeric field giving the tape number on the master reel label when originally recorded (actual physical tape number).

Word 3 is a 42 character alphanumeric literal titling the data as "Mariner (b) 64(b) Science (b) Master (b) Cruise (b) Data(b) File."

Word 4 is a 6 character alphanumeric field designating the sequential position of a given master reel in the MA-64 Master Data Library. Decimal positions are available to maintain sequential labeling if revisions cause overflow from a particular master reel.

Word 5 is a 2 character numeric field indicating the number of times the master reel has been revised.

Word 6 is a 6 character numeric field giving the year and day of the year the master reel was prepared.

Word 7a is a 12 character numeric field giving the least significant digit of the year, the day, the hour, the minute, the second, the tenth of second of time that the first bit of the PN sequence of the first data frame on the master reel was recorded at the DSIF station.

Word 7b is a 4 character numeric field giving the frame count of the first data frame recorded on the master reel.

Word 8 is blank.

Word 9 is a 30 character alphanumeric field providing space for the extract tape ID.

Record Type 1 (Status) - See Figure 2.

Word 1 is a 6 character alphameric literal identifying the type of record as "status".

Word 2 is a 5 character numeric field giving the sequential number of the particular status record. (Status record numbers are unique only between header records.)

Word 3 is a 2 character numeric field giving the Mission Number (S/C) applicable to the data.

Word 4 is a 2 character numeric field identifying the DSIF station that received the data.

Word 5 is an 8 character alphameric field identifying the DSIF analog tape from which the data was extracted. (This is nominal, since each data group identifies the source type for the data.)

Word 6 is a 5 character numeric field giving the S/C transmission bit rate. Nominally, this field will be either 33.33 or 8.33.

Word 7 is a 1 character numeric field identifying the S/C transmission mode. This field should be 2 for science cruise data.

The remainder of the type 1 record is a variable length alphameric field containing appropriate descriptive comments.

When missing science frames are detected, a status record will be inserted which contains, in the descriptive comment portion, the GMT time-frame count of the next received frame. This presumes that short bursts of good frames separated by missing frames will be a rare occurrence. If a missing frame count report

is to be inserted in a status report with a descriptive comment,  
the missing frame count report precedes the descriptive comment.  
Each descriptive comment will be time tagged.

NSSDC MAIN FILE

11-21-73

PAGE 1861

14-0172-04

MARINER 2, COSMIC RAY TELESCOPE

SIMPSON

EXPERIMENT NAME- OTHER NAMES  
NSSDC/COSMIC RAY TELESCOPE

PRINCIPAL INVESTIGATOR

DR. J. A. SIMPSON  
\*U OF CHICAGO  
CHICAGO, ILL.

OTHER INVESTIGATOR

DR. J. J. O'GALLAGHER  
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COLLEGE PARK, MD.

GENERAL CONTACT

DATA PROCESSING  
MR. G. LENTZ  
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CHICAGO, ILL.

EXPERIMENT BRIEF DESCRIPTION

A SET OF THREE SILICON SURFACE BARRIER DETECTORS WAS USED IN THE FORM OF A DE/CX VS RANGE TELESCOPE TO DETERMINE THE FLUX OF PROTONS IN THE ENERGY INTERVALS 10 TO 10 MEV AND 10 TO 110 MEV, ALPHA PARTICLES IN THE ENERGY RANGE 1.1 TO 10 MEV/NUCLEON AND H<sup>16</sup>O<sup>+</sup> TO NEV/NUCLEON, AND PROTONS AND ALPHA PARTICLES IN THE ENERGY INTERVAL 0.01 TO 1.2 MEV/NUCLEON. THE DETECTOR WAS MOUNTED ON THE SPACECRAFT SO AS TO POINT ALWAYS IN THE ANTISCIAR DIRECTION. A 128-CHANNEL PULSE HEIGHT ANALYZER WAS USED TO SAMPLE THE IONIZATION IN THE 701 DETECTOR ELEMENT OF THE TELESCOPE. IT WAS POSSIBLE TO PULSE HEIGHT ANALYZE PROTONS AND ALPHA PARTICLES FROM 1.1 TO 10 MEV/NUCLEON, PROTONS FROM 10 TO 110 MEV, AND ALPHA PARTICLES WITH ENERGIES 0.01 TO 1.2 MEV/NUCLEON. THE COUNTING RATE AND PULSE HEIGHT OUTPUTS WERE EACH SAMPLED FOR TWO DIFFERENT TIME INTERVALS (12 AND 12.7 SEC AT THE 9.1/SEC SPACECRAFT TRANSLATION RATE AND 16 AND 4.8 SEC AT THE 11.1/SEC RATE). THE EXPERIMENT PERFORMED NORMALLY FROM LAUNCH UNTIL OCTOBER 1968 WHEN THE SPACECRAFT WAS TURNED OFF TO CONSERVE POWER. WHEN THE SPACECRAFT WAS TURNED ON AGAIN AT A LATER DATE THE DETECTOR DID NOT RESPOND.

66-077A

MARINER 4 MASS

11/28/64 NASA-JPL

SPACECRAFT COMMON NAME- ALTERNATE NAMES  
 MARINER 4 1964-077A

## SPACECRAFT BRIEF DESCRIPTION

MARINER 4 WAS THE FOURTH IN A SERIES OF SPACECRAFT USED FOR PLANETARY EXPLORATION IN A FLYBY MODE. IT WAS DESIGNED TO CONDUCT CLOSEUP SCIENTIFIC OBSERVATIONS OF THE PLANET MARS AND TO TRANSMIT THESE OBSERVATIONS TO EARTH. OTHER MISSION OBJECTIVES WERE TO PERFORM FIELD AND PARTICLE MEASUREMENTS IN INTERPLANETARY SPACE AND IN THE VICINITY OF MARS AND TO PROVIDE EXPERIENCE IN AND KNOWLEDGE OF THE ENGINEERING CAPABILITIES FOR INTERPLANETARY FLIGHTS OF LONG DURATION. AFTER 1.5 MONTHS OF FLIGHT, THE SPACECRAFT FLEW BY MARS ON JULY 14, 1965, AND RETURNED 21 AND A PORTION PHOTOGRAPHS. THE CLOSEST APPROACH WAS 9848 KM FROM THE MARTIAN SURFACE. THE SPACECRAFT PERFORMED ALL PROGRAMMED ACTIVITIES SUCCESSFULLY AT THE PROPER TIMES AND RETURNED USEFUL DATA FROM LAUNCH UNTIL OCTOBER 1965, WHEN THE DISTANCE FROM EARTH AND ITS ANTENNA ORIENTATION TEMPORARILY HALTED THE SIGNAL INTERPOLATION. DATA ACQUISITION RESUMED IN LATE 1967 AND CONTINUED UNTIL DECEMBER 26, 1967.

## SPACECRAFT AND ORBIT DESCRIPTION

LAUNCH DATE/TIME - 11/28/64----	DATE OF LAST USABLE DATA - 12-20/67
DATE LAST DATA RECORDED- 12/20/67	SPACECRAFT STATUS - OPERATIONAL OFF
DESIGN LIFETIME - MONTHS	INITIAL FUNDING AGENCY - NASA-JPL
PRIMARY LAUNCH VEHICLE ATLAS-AGEN	LAUNCH SITE - LACENT
WEIGHT IN ORBIT - 262 KG.	ANOMALISTIC PERIOD - 567 DAYS
PERIOD - 1.58 AU RAD	PERIGEE - 1.1 AU RAD
ORBIT TYPE - HELIOCENTRIC	EPOCH DATE/TIME - 07/15/65----
SEMI-MAJOR AXIS - KM	ECCENTRICITY -
INCLINATION - 0 DEG	MEAN ANOMALY - DEG
ARGUMENT OF PERIGEE - DEG	PERIGEE ROTATION - DEG
RA OF ASCENDING NODE - DEG	PERCESSION OF NODES - DEG
SPACECRAFT DECAY DATE - / /	

## ACQUISITION MANAGEMENT INFORMATION

GROUP C	AGENT CDW	PRIORITY C
TOTAL ACQ. HOURS SPENT	X 24	SPACECRAFT DEC. 4
ACQ. HOURS SPENT LAST MO.	0	CALIBRATION DEC. 4
LAST VISIT	MAY 1968	
LAST CONTACT	MAY 1968	
NEXT CONTACT		
DATE DATA FIRST REC'D	/ /	
DATE ACQUISITION COMPLETE	/ /	
TASK WAIT		
NSSDC CATALOG STATUS: READY FOR PRINTING		

NSSDC AIM FILE

11/26/71

PAGE 1950

64-077A-040 HARINER 7, COSMIC RAY TELESCOPE SIMPSON  
D(13D(2)EVTR(4,24 HR.AVE)0.S. LENTZ

DATA SET NAME- OTHER NAMES

NSSDC/FOUR-HR AND 24-HR AVERAGE COINCIDENCE COUNTING RATES ON  
MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, SUPPLIED BY THE EXPERIMENTER, CONSISTS OF REDUCED  
4-HR AND 24-HR AVERAGE D1D2D3 AND D1D2 NOT D3 COSMIC-RAY  
TELESCOPE COINCIDENCE COUNTING RATES IN A TIME-ORDERED FORMAT.  
THE DATA ARE ON ONE 7-TRACK BCD MAGNETIC TAPE WRITTEN AT 800  
BPI. THE DATA FOR EACH ACCUMULATION PERIOD (4 HR OR 24 HR) ARE  
FORMATTED IN GROUPS OF SEVEN SUCCESSIVE PHYSICAL RECORDS. ALL  
DATA FOR A GIVEN DAY OF THE MISSION ARE CONTAINED IN AS MANY  
GROUPS OF SEVEN PHYSICAL RECORDS AS REQUIRED FOR THE 4-HR  
AVERAGES AND IN ONE ADDITIONAL GROUP OF SEVEN PHYSICAL RECORDS  
FOR THE 24-HR ACCUMULATION AND CORRECTED COUNTING RATES. THE  
4-HR AVERAGES WERE ACCUMULATED EVERY 4 HR STARTING AT 0000 UT  
FOR A GIVEN DAY AND WERE COMPILED PROVIDED THAT AT LEAST ONE  
SATELLITE TELEMETRY FRAME (72 SEC LONG) OF COUNTING RATE DATA  
EXISTED IN THAT TIME INTERVAL. EACH GROUP OF SEVEN PHYSICAL  
RECORDS CONTAINS THE DAY, TIME (UT OF BEGINNING OF ACCUMULATION  
PERIOD), CORRECTED ACCUMULATED COUNTS AND COUNTING RATES, AND  
VARIOUS DATA QUALITY INDICATORS. THE D1D2 NOT D3 COINCIDENCE  
CORRESPONDS TO PROTONS AND ALPHA PARTICLES FROM 1: TO 70  
MEV/NUCLEON, AND THE D1D2D3 COINCIDENCE CORRESPONDS TO PROTONS  
FROM 1: TO 170 MEV AND ALPHA PARTICLES OF ENERGIES GREATER THAN  
70 MEV/NUCLEON.

DATA SET INFORMATION

DATA AT NSSDC BEING PROCESSED  
ALL DATA RECEIVED 07/13/71

PERIOD COVERED FOR DATA SET

NO/DAY/YR TO NO/DAY/YR  
11/28/64 10/01/66

ACCESSION UNITS

DDCI 165

NSDDC AIM FILE

11/26/71

PAGE 1944

04-077A-04A MARINER 4, COSMIC RAY TELESCOPE SIMPSON  
RAW COUNT RATE(CONTAIN OVAFLOW) LENTZ

DATA SET NAME- OTHER NAMES

NSDDC/COSMIC-RAY TELESCOPE RAW COUNT ACCUMULATIONS ON MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, SUPPLIED BY THE EXPERIMENTER, CONSISTS OF EDITED, UNCORRECTED, REAL-TIME COUNTING RATE DATA IN A TIME-ORDERED FORMAT. THE DATA ARE ON ONE 7-TRACK BCD MAGNETIC TAPE WRITTEN AT 800 BPI WITH 36 CHARACTERS PER LOGICAL RECORD, 50 LOGICAL RECORDS PER PHYSICAL RECORD, AND ONE FILE PER TAPE. EACH LOGICAL RECORD CONTAINS (1) TIME OUT OF THE RECEIPT OF DATA BY EARTH TRACKING STATIONS), (2) DATE, (3) SATELLITE TELEMETRY BIT RATE, (4) CALIBRATION INFORMATION, AND (5) ACCUMULATOR OUTPUTS FROM SEVERAL COINCIDENCE MODES OF THE COSMIC-RAY TELESCOPE -- D1 NOT D2 (ELECTRONS E.GT. 200 KEV AND PROTONS AND HEAVIER NUCLEI F.GT. 1.2 MEV/NUCLEON), D1D2 NOT D3 (PROTONS AND HELIUM NUCLEI 15 TO 70 MEV/NUCLEON), AND D1D2D3 (PROTONS FROM 70 TO 170 KEV AND HELIUM NUCLEI F.GT. 70 MEV/NUCLEON). THERE WERE TWO READOUTS PER SPACECRAFT TELEMETRY FRAME, ALLOWING SAMPLING AT INTERVALS OF 19.2 AND 72 SEC AT THE 8-1/3-BPS SPACECRAFT TRANSMISSION RATE AND OF 4.8 AND 18 SEC AT THE 33-1/3-BPS RATE. THE DATA COVER ABOUT 90 PERCENT OF THE PERIOD WHEN THE SPACECRAFT WAS ACTIVE.

DATA SET INFORMATION

DATA AT NSDDC BEING PROCESSED  
ALL DATA RECEIVED 01/26/71

PERIOD COVERED FOR DATA SET

MO/DAYS TO MO/DAYS  
11/28/64 12/01/66

ACCESSION UNITS

0001886

NSSEC AIM FILE

11/26/71

PAGE 1948

A-04C MARINER 4, COSMIC RAY TELESCOPE SIMPSON  
 D(1)RATE(1.4 HR.AVE)+DIS.SUN LEATZ

A SET NAME- OTHER NAMES  
 NSSEC/ONE-HR AND 4-HR AVERAGE COINCIDENCE COUNTING RATES ON  
 MAGNETIC TAPE

A SET BRIEF DESCRIPTION  
 THIS DATA SET, SUPPLIED BY THE EXPERIMENTER, CONSISTS OF REDUCED  
 1-HR AND 4-HR AVERAGE D1 NOT D2 COINCIDENCE RATES IN A  
 TIME-ORDERED FORMAT ON ONE 1-TRACK BCC MAGNETIC TAPE WRITTEN AT  
 800 BPI. THE TAPE FORMAT CONSISTS OF 132-CHARACTER PHYSICAL  
 RECORDS, WHERE EVERY FIFTH RECORD CORRESPONDS TO THE 4-HR  
 AVERAGE DATA. THE 1-HR AVERAGE COUNTING RATE RECORDS CONTAIN THE  
 TIME (UT) OF THE BEGINNING OF THE 1-HR INTERVAL OF ACCUMULATION,  
 THE DATE, THE CORRECTED COUNTING RATE AVERAGE, AND VARIOUS DATA  
 QUALITY INDICATORS. THE 4-HR RECORDS CONTAIN THE CORRESPONDING  
 INFORMATION FOR THE 4-HR AVERAGES. THE D1 NOT D2 COSMIC-RAY  
 TELESCOPE COINCIDENCE CORRESPONDED TO ELECTRONS WITH ENERGIES  
 E.GT. 200 KEV OR PROTONS AND HEAVIER NUCLEI WITH ENERGIES E.GT.  
 1.2 MEV/NUCLEON.

TA SET INFORMATION  
 DATA AT NSSEC BEING PROCESSED  
 ALL DATA RECEIVED: 01/26/71

REC: COVERED FOR DATA SET  
 NO/DA/YR TO NO/DA/YR  
 11/23/64 10/01/65

MISSION UNITS  
 000588

MISSION MANAGEMENT INFORMATION

GROUP #	AGENT	JJB	PRIORITY	A
TOTAL ACQ. HOURS SPENT	1		MISSION ARRANGEMENTS	A
ACQ. HOURS SPENT LAST NO.	0		CALIBRATION EDC	A
LAST VISIT	JAN. 1971		DATA SET DCC	A
LAST CONTACT	MAR. 1970		DATA RECEIVED	A
NEXT CONTACT			PROGRAMMING	A
DATE DATA FIRST REC'D	01/71		PROCESSING	A
DATE ACQUISITION COMPLETE	07/71		PUBLICATIONS	5
DATA FORM/QUANTITY	DIGITAL MAG. TAPE	1 REELS	ORIG. DATA TAPES	
TASK WAIT				
ANTICIPATED QUANTITY IN COMPLETE DATA SET				
NSSEC CATALOG STATUS- READY FOR PRINTING				

NSSDC AIM FILE

11/26/71

PAGE 1945

64-077A-04B MARINER 4, COSMIC RAY TELESCOPE SIMPSON  
PHA DATA(MBET JPL HI QUAL LVL) LENTZ

DATA SET NAME- OTHER NAMES  
NSSCC/COSMIC-RAY TELESCOPE PULSE HEIGHT ANALYZER DATA ON  
MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, SUPPLIED BY THE EXPERIMENTER, CONSISTS OF EDITED, REAL-TIME, PULSE HEIGHT DATA IN A TIME-ORDERED FORM. THE DATA ARE ON ONE 7-TRACK BCD MAGNETIC TAPE WRITTEN AT 600 BPI WITH 48 CHARACTERS PER LOGICAL RECORD, 60 LOGICAL RECORDS PER PHYSICAL RECORD, AND ONE FILE PER TAPE. EACH LOGICAL RECORD CONTAINS (1) TIME (OUT OF THE RECEIPT OF DATA BY EARTH TRACKING STATIONS), (2) DATE, (3) SATELLITE TELEMETRY BIT RATE, (4) CALIBRATION INFORMATION, AND (5) PULSE HEIGHT ANALYSIS INFORMATION FOR DETECTOR ELEMENT D1 OF THE COSMIC-RAY TELESCOPE. BY NOTING WHETHER THE D1 ELEMENT OF THE TELESCOPE WAS TRIGGERED AT ONE OF TWO DISCRIMINATION LEVELS, PULSE HEIGHT ANALYSIS OF PROTONS AND ALPHA PARTICLES FROM 10 TO 70 MEV/NUCLEON, PROTONS FROM 10 TO 170 MEV, AND ALPHA PARTICLES WITH ENERGIES 0.01 TO 70 MEV/NUCLEON WAS POSSIBLE. THE LAST EVENT PRIOR TO READOUT WAS PULSE HEIGHT ANALYZED, AND THERE WERE TWO READOUTS PER SPACECRAFT TELEMETRY FRAME ALLOWING SAMPLING AT INTERVALS OF 19.2 AND 7.2 SEC AT THE 8-1/3-BITS SPACECRAFT TRANSMISSION RATE AND OF 4.8 AND 1.6 SEC AT THE 3-1/3-BITS RATE. THE DATA CONSTITUTE ABOUT 90 PERCENT OF THE TELEMETERED DATA.

DATA SET INFORMATION

DATA AT NSSDC BEING PROCESSED  
ALL DATA RECEIVED 01/26/71

PERIOD COVERED FOR DATA SET

NO/DA/YR TO NO/DA/YR  
11/28/64 10/31/66

ACCESSION UNITS

DD00881



0 1 0 0 0 0 0 0 0 0 0  
 47 1 0 0 91 1 1 1 433  
 0 0 0 73 1 0 1 4333 15  
 1 113 0 1 1 4333 1515  
 9 1 1 0 4333 1515 42  
 1 0 4333 1516 46 0 1  
 4333 1517 50 0 1 113  
 4333 1518 54 0 1 80 1 0  
 4333 1519 58 0 1 65 1 0 0 9  
 33 1520 62 0 1 66 0 0 1 104 0  
 520 66 0 1 62 1 0 1 123 0 0 0  
 70 0 1 114 0 1 0 99 0 1 1  
 0 1 71 1 0 0 100 1 0 1  
 72 1 1 1 126 1 0 1 433  
 0 0 0 122 0 1 1 4333 15  
 0 100 1 1 1 4333 1526  
 23 0 0 1 4333 1526 92  
 1 0 4333 1527 96 0 1  
 4333 1528 100 0 1 73  
 4333 1528 104 0 1 113 0 0  
 4333 1529 108 0 1 93 0 1 1 12  
 33 1530 112 0 1 81 0 0 1 82 1  
 531 116 0 1 88 1 1 1 125 1 1 1  
 120 0 1 117 1 0 1 108 0 0 1

REC 1, LENGTH 2400

Mariner 4  
 D-5887  
 64-077A-04B  
 1st 1/2 last recs

11/28/64 - 10/1/65

0 1 90 0 1 0 112 1 1 1 433  
 102 0 1 0 111 1 0 1 4333 15  
 0 0 1 73 1 0 0 4333 1537  
 1 82 0 0 0 4333 1538 148  
 17 0 0 1 4333 1539 152 0 1  
 0 1 4333 1539 156 0 1 126  
 4333 1540 160 0 1 77 0 0  
 4333 1541 164 0 1 102 1 1 0 9  
 33 1542 168 0 1 107 1 0 1 105 0  
 543 172 0 1 83 0 0 0 72 0 0 1  
 176 0 1 69 1 1 1 94 1 0 1  
 0 0 1 109 0 1 1 124 0 0 0  
 77 0 1 0 94 0 0 0 433  
 5 0 1 0 113 0 0 0 4333 15  
 0 1 109 1 0 0 4333 1547  
 119 1 1 1 4333 1548 198  
 0 0 0 4333 1549 202 0 1  
 1 4333 1550 206 0 1 81  
 4333 1551 210 0 1 111 1 1  
 4333 1552 214 0 1 74 1 0 0 12  
 333 1552 218 0 1 112 1 1 1 85 0  
 1553 222 0 1 88 1 1 1 76 1 1 0  
 226 0 1 114 1 1 1 65 0 1 0

REC 2, LENGTH 2400

0 0 1 122 1 1 1 109 1 1 0 433  
 1 117 0 1 0 113 0 1 1 4333 15  
 2 0 0 1 85 0 1 1 4333 1558  
 0 0 124 0 0 0 4333 1559 243  
 69 0 1 0 4333 1600 252 0 1  
 1 0 1 4333 1600 256 0 1 105  
 1 4333 1601 260 0 1 117 1 1  
 4333 1602 264 0 1 89 1 0 1 11  
 333 1603 268 0 1 76 0 1 0 114 1  
 1604 272 0 1 119 1 0 0 105 1 0 1  
 276 0 1 117 0 0 0 92 1 0 0  
 0 0 1 112 0 1 1 114 0 1 0

REC 3, LENGTH 2400

U.S. GOVERNMENT PRINTING OFFICE: 1970-188-411

4333 1604 282 0 1 101 0 0 1 54 0 1 1 4333 1606 294 0 1 122  
3 1607 286 0 1 96 0 0 0 54 1 1 1 4333 1607 288 0 1 100 0 1  
08 290 0 1 39 0 1 0 121 0 0 0 4333 1608 292 0 1 118 0 0 0 11  
294 0 1 0 0 0 0 68 0 1 0 4333 1609 296 0 1 118 0 0 1 69 1  
0 1 96 1 0 0 83 1 1 1 4333 1610 300 0 1 85 1 0 1 93 1 1 1  
103 1 1 0 121 0 1 1 4333 1610 304 0 1 113 0 1 1 71 1 0 0  
1 1 1 123 1 0 0 4333 1611 308 0 1 75 1 1 1 71 0 1 1  
0 109 1 1 1 4333 1612 312 0 1 89 0 1 1 118 0 0 1 433  
6 0 1 0 4333 1613 316 0 1 112 0 0 0 58 0 0 1 4333 16  
1 1 4333 1614 320 0 1 115 0 1 1 119 1 0 1 4333 1614  
4333 1615 324 0 1 113 1 1 1 64 1 0 0 4333 1615 326  
  
4333 1616 328 0 1 106 1 1 1 80 0 0 0 4333 1616 330 0 1  
4333 1616 332 0 1 103 1 0 1 57 0 1 1 4333 1617 334 0 1 124  
3 1617 336 0 1 67 1 1 0 125 0 1 1 4333 1618 338 0 1 83 0 0  
18 340 0 1 63 1 0 0 107 1 1 0 4333 1618 342 0 1 98 1 0 0 12  
344 0 1 116 1 0 1 67 0 1 1 4333 1619 346 0 1 110 1 1 1 118 0  
0 1 84 1 1 1 109 0 0 0 4333 1620 350 0 1 74 1 0 1 91 1 1 0  
103 0 1 1 117 1 0 1 4333 1621 354 0 1 107 1 1 1 69 1 1 1  
0 0 0 97 1 0 1 4333 1622 358 0 1 67 0 1 1 104 0 1 0  
0 106 0 1 1 4333 1623 362 0 1 126 0 1 0 72 1 1 0 433  
4 0 0 1 4333 1623 366 0 1 89 1 0 1 125 1 0 1 4333 16  
0 1 4333 1624 370 0 1 107 0 1 1 122 0 0 0 4333 1625  
4333 1625 374 0 1 115 1 0 1 104 0 1 0 4333 1625 376  
4333 1625 378 0 1 119 0 1 1 101 1 1 0 4333 1626 380 0 1  
4333 1627 382 0 1 57 1 1 1 100 1 0 1 4333 1627 384 0 1 107  
3 1628 386 0 1 127 1 1 1 111 0 0 0 4333 1628 388 0 1 98 0 1  
29 390 0 1 118 0 1 1 113 0 1 1 4333 1629 392 0 1 70 1 1 1 10  
394 0 1 100 0 1 1 115 0 0 0 4333 1630 396 0 1 94 1 0 1 92 0  
0 1 101 1 0 0 75 1 0 1 4333 1631 400 0 1 109 0 1 0 122 1 1 1  
120 0 0 1 81 1 0 0 4333 1631 404 0 1 126 1 1 1 105 1 0 0  
1 0 1 123 0 0 0 4333 1632 408 0 1 107 1 1 1 120 0 0 1  
1 100 0 1 1 4333 1633 412 0 1 75 1 0 1 98 1 0 1 43  
8 0 0 0 4333 1634 416 0 1 111 0 0 1 50 0 1 1 4333 16  
0 1 4333 1635 420 0 1 110 0 1 1 107 0 0 1 4333 1635  
4333 1636 424 0 1 105 0 0 1 89 0 0 0 4333 1636 426  
  
4333 1637 428 0 1 121 1 1 0 104 0 1 1 4333 1637 430 0 1  
4333 1637 432 0 1 125 1 1 0 84 1 0 1 4333 1638 434 0 1 122  
3 1638 436 0 1 119 1 0 1 106 0 0 1 4333 1639 438 0 1 94 0 0  
39 440 0 1 116 1 0 1 88 1 1 1 4333 1639 442 0 1 102 1 1 1 1  
444 0 1 69 0 0 0 103 1 1 0 4333 1640 446 0 1 50 1 1 0 105 1  
0 1 104 0 1 1 91 1 1 1 4333 1641 450 0 1 88 1 0 0 98 0 1 1  
83 0 1 0 125 0 0 1 4333 1642 454 0 1 127 1 1 1 50 0 0 1  
1 1 1 96 0 1 1 4333 1643 458 0 1 99 1 0 1 58 0 0 0  
0 84 1 0 0 4333 1644 462 0 1 127 1 1 1 91 1 0 1 43  
7 0 0 0 4333 1645 466 0 1 70 1 1 1 119 0 1 0 4333 1  
1 0 4333 1645 470 0 1 125 1 1 1 122 0 1 0 4333 1646  
4333 1646 474 0 1 123 0 1 0 116 1 0 1 4333 1647 476  
4333 1647 478 0 1 103 0 0 1 91 1 1 1 4333 1647 480 0 1  
4333 1648 482 0 1 120 0 1 1 103 1 1 1 4333 1648 484 0 1 98  
3 1649 486 0 1 86 0 1 1 106 0 1 1 4333 1649 488 0 1 73 0 0  
50 490 0 1 124 1 0 1 69 0 1 0 4333 1650 492 0 1 94 1 1 1  
494 0 1 121 1 1 0 114 1 1 0 4333 1651 496 0 1 104 1 1 1 116 1  
0 1 98 1 0 1 50 0 1 4333 1652 500 0 1 91 1 0 0 126 1 1 1  
118 0 0 0 90 1 0 1 4333 1652 504 0 1 62 0 1 1 126 1 1 0  
0 0 0 84 0 0 1 4333 1653 508 0 1 85 0 1 0 105 1 0 1  
1 78 1 1 1 4333 1654 512 0 1 94 0 0 1 127 0 0 1 43  
6 0 0 0 4333 1655 516 0 1 72 0 1 1 92 1 1 0 4333 1  
1 0 4333 1656 520 0 1 101 1 0 1 86 1 1 0 4333 1656  
4333 1657 524 0 1 82 0 1 0 84 0 0 1 4333 1657 526  
  
4333 1658 530 0 1

1 122 1 1 1 63 0 1 0 433  
0 0 1 1 112 1 1 0 4333 16  
0 0 117 0 0 0 4333 1608  
69 1 1 0 4333 1609 296  
1 1 1 4333 1610 302 0 1  
0 4333 1611 306 0 1 126  
4333 1612 310 0 1 120 1 0  
4333 1613 314 0 1 106 0 0 1 12  
333 1613 313 0 1 112 1 0 1 115 1  
1614 322 0 1 118 1 0 0 120 0 1 1  
326 0 1 82 1 1 0 101 0 0 1

0 0 1 127 0 1 1 59 1 1 0 REC A, LENGTH 2400

1 124 0 0 0 60 0 0 1 433  
7 0 0 1 62 1 1 0 4333 16  
0 0 126 0 1 1 4333 1619  
118 0 1 1 4333 1620 348  
1 1 0 4333 1621 352 0 1  
1 4333 1621 356 0 1 123  
4333 1622 360 0 1 87 0 1  
4333 1623 364 0 1 107 0 1 1 9  
333 1624 368 0 1 126 0 1 1 119 1  
1625 372 0 1 79 0 0 1 86 1 0 0  
376 0 1 116 0 0 1 107 0 1 0  
0 0 1 74 0 0 0 94 0 0 1  
1 107 0 0 1 65 1 1 0 433  
8 0 1 0 70 0 1 0 4333 16  
1 1 103 0 0 0 4333 1629  
92 0 0 1 4333 1630 398  
1 1 1 4333 1631 402 0 1  
0 4333 1632 406 0 1 124  
4333 1633 410 0 1 109 0 0  
4333 1634 414 0 1 123 0 0 1 10  
333 1634 418 0 1 111 1 1 0 87 1  
1635 422 0 1 107 0 0 0 114 0 1 0  
426 0 1 75 0 0 0 88 0 0 1

0 0 1 98 1 0 1 113 1 0 1 REC 5, LENGTH 2400

1 122 0 0 0 98 0 1 1 433  
94 0 0 0 97 0 1 1 4333 16  
1 1 113 1 1 1 4333 1640  
105 1 0 1 4333 1641 448  
0 1 1 4333 1642 452 0 1  
1 4333 1642 456 0 1 79  
4333 1643 460 0 1 122 1 0  
4333 1644 464 0 1 87 0 1 0 9  
333 1645 468 0 1 101 0 0 0 107 0  
1646 472 0 1 89 1 0 0 115 0 0 0  
476 0 1 122 0 0 1 101 0 1 1  
0 0 1 119 1 1 1 117 1 0 0  
1 98 1 0 1 125 1 1 1 433  
73 0 0 1 105 1 0 1 4333 16  
1 1 59 1 1 0 4333 1650  
116 1 1 1 4333 1651 498  
1 1 1 4333 1652 502 0 1  
0 4333 1653 506 0 1 64  
4333 1654 510 0 1 67 0 1  
4333 1655 514 0 1 95 0 1 1 7  
333 1655 518 0 1 104 0 1 1 83 0  
1656 522 0 1 81 1 1 1 101 1 0 0  
526 0 1 70 0 0 0 95 0 0 1

0 0 1 111 0 0 1 90 1 1 0 REC 6, LENGTH 2400

WU 8. IMPROVED PANTHER REVISION 1274-100-411

START DATE YYDD	START TIME HHMM	STOP DATE YYDD	STOP TIME HHMM	TOTAL GAP MINUTES
65266	1600	65266	1700	60
65266	1700	65266	1800	60
65266	1800	65266	1900	60
65266	1900	65266	2000	240
65266	2000	65266	2100	60
65266	2100	65266	2200	60
65266	2200	65266	2300	60
65266	2000	65267	-0	240
65267	-0	65267	100	60
65267	100	65267	200	60
65267	200	65267	300	60
65267	-0	65267	400	240
65267	400	65267	500	60
65267	500	65267	600	60
65267	600	65267	700	60
65267	400	65267	800	240
65267	800	65267	900	60
65267	900	65267	1000	60
65267	1000	65267	1100	60
65267	800	65267	1200	240
65267	1200	65267	1300	60
65267	1300	65267	1400	60
65267	1400	65267	1500	60
65267	1200	65267	1600	240
65267	1600	65267	1700	60
65267	1700	65267	1800	60
65267	1800	65267	1900	60
65267	1500	65267	2000	240
65267	2000	65267	2100	60
65267	2100	65267	2200	60
65267	2200	65267	2300	60
65267	2000	65268	100	300
65268	100	65268	200	60
65268	200	65268	300	60
65268	-0	65268	400	240
65268	400	65268	500	60
65268	500	65268	600	60
65268	600	65268	700	60
65268	400	65268	800	240
65268	800	65268	900	60
65268	900	65268	1000	60
65268	1000	65268	1100	60
65268	800	65268	1200	240
65268	1200	65268	1300	60
65268	1300	65268	1400	60
65268	1400	65268	1500	60
65268	1200	65268	1600	240
65268	1600	65268	1700	60
65268	1700	65268	1800	60
65268	1800	65268	1900	60
65268	1600	65268	2000	240
65268	2000	65268	2100	60
65268	2100	65268	2200	60

START DATE YYDD	START TIME HHMM	STOP DATE YYDD	STOP TIME HHMM	TOTAL GAP MINUTES
65259	2200	65268	2300	60
65258	2000	65269	-0	240
65269	-0	65269	100	60
65269	100	65269	200	60
65269	200	65269	300	60
65269	-0	65269	400	240
65269	400	65269	500	60
65269	500	65269	600	60
65269	600	65269	700	60
65269	400	65269	800	240
65269	800	65269	900	60
65269	900	65269	1000	60
65269	1000	65269	1100	60
65269	800	65269	1200	240
65269	1200	65269	1300	60
65269	1300	65269	1400	60
65269	1400	65269	1500	60
65269	1200	65269	1600	240
65269	1600	65269	1700	60
65269	1700	65269	1800	60
65269	1800	65269	1900	60
65269	1600	65269	2000	240
65269	2000	65269	2100	60
65269	2100	65269	2200	60
65269	2200	65269	2300	60
65269	2000	65270	-0	240
65270	-0	65270	100	60
65270	100	65270	200	60
65270	200	65270	300	60
65270	-0	65270	400	240
65270	400	65270	500	60
65270	500	65270	600	60
65270	600	65270	700	60
65270	400	65270	800	240
65270	800	65270	900	60
65270	900	65270	1000	60
65270	1000	65270	1100	60
65270	800	65270	1200	240
65270	1200	65270	1300	60
65270	1300	65270	1400	60
65270	1400	65270	1500	60
65270	1200	65270	1600	240
65270	1600	65270	1700	60
65270	1700	65270	1800	60
65270	1600	65270	1900	60
65270	1600	65270	2000	240
65270	2000	65270	2100	60
65270	2100	65270	2200	60
65270	2200	65270	2300	60
65270	2000	65271	-0	240
65271	-0	65271	100	60
65271	100	65271	200	60
65271	200	65271	300	60

START DATE YY000	START TIME HHMM	STOP DATE YY000	STOP TIME HHMM	TOTAL GAP MINUTES
65271	-0	65271	400	240
65271	400	65271	500	60
65271	500	65271	600	60
65271	600	65271	700	60
65271	400	65271	800	240
65271	800	65271	900	60
65271	900	65271	1000	60
65271	1000	65271	1100	60
65271	800	65271	1200	240
65271	1200	65271	1700	300
65271	1700	65271	1800	60
65271	1800	65271	1900	60
65271	1600	65271	2000	240
65271	2000	65271	2100	60
65271	2100	65271	2200	60
65271	2200	65271	2300	60
65271	2000	65272	-0	240
65272	-0	65272	100	60
65272	100	65272	200	60
65272	200	65272	300	60
65272	-0	65272	400	240
65272	400	65272	500	60
65272	500	65272	600	60
65272	600	65272	700	60
65272	400	65272	800	240
65272	800	65272	900	60
65272	900	65272	1000	60
65272	1000	65272	1100	60
65272	800	65272	1200	240
65272	1200	65272	1300	60
65272	1300	65272	1400	60
65272	1400	65272	1500	60
65272	1200	65272	1600	240
65272	1600	65272	1700	60
65272	1700	65272	1800	60
65272	1800	65272	1900	60
65272	1600	65272	2000	240
65272	2000	65272	2100	60
65272	2100	65272	2200	60
65272	2200	65272	2300	60
65272	2000	65273	-0	240
65273	-0	65273	100	60
65273	100	65273	200	60
65273	200	65273	300	60
65273	-0	65273	400	240
65273	400	65273	500	60
65273	500	65273	600	60
65273	600	65273	700	60
65273	400	65273	800	240
65273	800	65273	900	60
65273	900	65273	1000	60
65273	1000	65273	1100	60
65273	800	65273	1200	240

START DATE YYDDJ	START TIME HHMM	STOP DATE YYDDJ	STOP TIME HHMM	TOTAL GAP MINUTES
65273	1200	65273	1300	60
65273	1300	65273	1400	60
65273	1400	65273	1500	60
65273	1200	65273	1600	240
65273	1600	65273	1700	60
65273	1700	65273	1800	60
65273	1800	65273	1900	60
65273	1600	65273	2000	240
65273	2000	65273	2100	60
65273	2100	65273	2200	60
65273	2200	65273	2300	60
65273	2000	65274	-0	240
65274	-0	65274	100	60
65274	100	65274	200	60
65274	200	65274	300	60
65274	-0	65274	400	240
65274	400	65274	500	60
65274	500	65274	600	60
65274	600	65274	700	60
65274	400	65274	800	240
65274	800	65274	900	60
65274	900	65274	1000	60
65274	1000	65274	1100	60
65274	800	65274	1200	240
65274	1200	65274	1300	60
65274	1300	65274	1400	60
65274	1400	65274	1500	60
65274	1200	65274	1600	240
65274	1500	65274	1700	60
65274	1700	65274	1800	60
65274	1800	65274	1900	60
65274	1600	65274	2000	240
65274	2000	65274	2100	60
65274	2100	65274	2200	60

PHYSICAL RECORDS READ= 9220  
 LOGICAL RECORDS READ= 9220