#382

VIKING LANDER 1 & 2

75-075C-14A, 14B

75-083C-14A, 14B

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

REQ. AGENT
CMP

RAND NO.
RC7653

ACQ. AGENT
RNH

VIKING 1 & 2

EXPER. TRAJECTORY-ATTITUDE DATA

PSPA-00212 75-075C-14A & 75-083C-14A PSPA-00041

RPA ION & ELECTRON DATA

PSPA-00134 75-075C-14B & 75-083C-14B PSPA-00131

These data sets contain 1 tape each. The tapes are 9 track, 1600 BPI, and are multifiled. They are Binary and created on an IBM 360 computer. The physical record size is 24044. The time span is in seconds from deorbit (time of separation), in floating point.

D-29206 contains 4 files of data. #1 Viking Lander 1, Photoelectron Data (logical recs. 884); #2 Viking Lander 2, Photoelectron Data (logical recs. 888); #3 Viking Lander 1 Ion Data (logical recs. 39); #4 Viking Lander 2 Ion Data (logical recs. 40).

D-29207 contains 2 files of data; #1 viking lander 1 OA Data (logical rec 1191); #2 Viking Lander 2 OA Data (logical recs. 1241).

D#	C#	FILES	SATELLITE	TIME SPAN
D-29206	C-18942	4	Viking 1	07/20/76 - 07/20/76
			Viking 2	09/03/76 - 09/03/76
D-29207	C-18943	2	Viking 1	07/20/76 - 07/20/76
			Viking 2	09/03/76 - 09/03/76

VIKING 1 AND VIKING 2 IONOSPHERIC DATA (ENTRY SCIENCE) FROM RETARDING POTENTIAL ANALYZER

DATA SUMMARY FOR WORLD DATA CENTER

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March 1977

DOCUMENTATION OF RPA DATA FROM VIKING 1 AND VIKING 2

Introduction

The geometry of Viking Retarding Potential Analyzer (RPA) sensor head is shown in Fig. 1. The two entrance grids (G_1 and G_2) are grounded to the vehicle. The next two grids (G_3 and G_4) inward are the retarding (sweep) grids, to which a time-varying electric potential is applied. The suppressor grid (G_5) is held at different fixed potentials. G_6 and G_7 are shield grids that protect the collector from capacitively coupled electrical transients.

A complete instrument operation cycle consists of four major frames each of 4 second duration. The retarding grid is stepped through 3 different voltage ramps during a major frame. During the one-second energetic electron flux phase the retarding grid voltage moves from -75 V to 0 V in 100 equal voltage increments of 0.75 V, as shown in Fig. 2(a). During the thermal electron flux phase, also one second long, the retarding grid voltage moves 100 equal steps from 1.5 volts to 0 V. In Phase III, the two-second thermal ion mode, the retarding grid goes from +15 V to 0 volts in 200 equal steps.

While the retarding grid potential cycles as described above, the suppressor grid potential changes as shown in Fig. 2(b). On alternate major frames the suppressor grid is held either at +15 V or -4 V during Phase I. On every major frame, the suppressor grid is held at +15 V for Phase II and -15 V for Phase III. Thus we have two basically different major frames as distinguished by the suppressor grid behavior. Following is a table of retarding grid potential, suppressor grid potential and electrometer sensitivity for different major frames.

The RPA electrometer is a linear automatic range changing device with 8 sensitivity ranges differing successively by a factor of 4. Before each

major frame the electrometer output is set to zero, while the retarding grids are at -75 volts and the suppressor is at +15 volts. On every fourth major frame the electrometer is rezeroed on sensitivity range 5, rather than on range 1 (the most sensitive range). Therefore, a complete operation cycle consists of four major frames, as detailed in Table I, where it can be seen that frames 1 and 3 are identical.

RPA Operation Profile

The RPA recorded data over the altitude range from approximately 16,000 km to 100 km for both landers, but the instrument operated intermittently over this range. The instrument was on for 64 sec, then off for 325 sec until 40 min before "entry" (800,000 ft altitude). During the final 45 minutes or so (below approximately 5000 km) operation was continuous.

Table 1

Major frame	Retarding grid potential	Suppressor grid potential	Electrometer sensitivity
0	Phase I: - 75 V to 0 V Phase II: -1.5 V to 0 V Phase III: +15 V to 0 V	Phase I: +15 V Phase II: +15 V Phase III: -15 V	Rezeroed on Range 5
1	Same as I, II, III above	Phase I: -4 V Phase II: +15 V Phase III: -15 V	Rezeroed on Range 1
2	Same as I, II, III above	Phase I: +15 V Phase II: +15 V Phase III: -15 V	Rezeroed on Range 1
3	Same as I, II, III above	Phase I: -4 V Phase II: +15 V Phase III: -15 V	Rezeroed on Range 1

1. Tape with deranged data vs time

The current vs retarding potential for Phase I of RPA operations is on tape #1. The Read statement is

READ(14) GCSC,SWPNO,MAJFR,NP,(I,V(I),AI(I),I=1,NP)

where GCSC = Time in seconds from deorbit at -75.0 V of retarding grid potential

SWPNO = Sequential frame no.

MAJFR = Major frame no.

NP = No. of pairs of Retarding potential (V(I)) vs current points (AI(I))

Data from Lander 1 is on File 1 of tape #1, and data from Lander 2 is on File 2 of tape #1. Therefore photoelectron data from Phase I is on File 1 and 2 of

DSN = A285.VKPHOTO

Record format, RECFM = VSB (variable size block), binary format

Logical record size, LRECL = 2404

Physical record size, BLKSIZE = 24044

UNIT = 9TRK

BPI = 1600 B.P.I.

LABEL = No Label

File 1 = Lander 1 data from Phase I, the total no. of records are 884.

File 2 = Lander 2 data from Phase I, the total no. of records are 888.

Next on File 3 and 4 of the same tape we have ion data from Phase III of RPA operations. On File 3 we have deranged data from Lander 1, i.e. retarding potential vs current from sweep no. 912 through 951 in the same format as above, i.e.

READ(14)GCSC, SWPNO, MAJFR, NP,(I,V(I),AI(I),I=1,NP)

where GSCS is the time (sec) after deorbit at 0.0V of the retarding grid potential. SWPNO varies from 912 to 951 and MAJFR cycles between 0 & 3, NP in the number of pairs of points with retarding potential V(I) and collector current AI(I).

File 4 contains similar data from Lander 2 from sweep No. 911 through 951. Hence File 3 = Lander 1 data from Phase III, the total number of records are 39.

File 4 = Lander 2 data from Phase III, the total number of records are 40.

The total number of files on tape #1 with DSN=A285.VKPHOTO are four. The total number of end of file marks are five.

Table 2

A. Number of bad sweeps on File 1 of DSN=A285.VKPHOTO for Lander 1 are:

10, 11, 20, 21, 27, 42, 45, 46, 47, 69, 71, 72, 79, 80, 89, 105, 106, 114, 115, 134, 138, 141, 148, 150, 151, 168, 174, 175, 176, 177, 184, 185, 209, 210, 212, 213, 219, 220, 241, 244, 246, 248, 262, 268, 274, 278, 287, 291, 294, 298, 304, 313, 317, 332, 347, 382, 404, 417, 424, 435, 439, 446, 452, 455, 460, 490, 540, 562, 575, 578, 596, 610, 620, 632, 648, 683, 707, 718, 736, 747, 754, 755, 758, 760, 767, 768, 770, 775, 778, 780, 783, 784, 794, 800, 802, 808, 809, 820, 824, 831, 842, 852, 854, 861, 874, 900, 906, 908, 910.

B. Number of bad sweeps on File 2 of DSN=A285.VKPHOTO for Lander 2 are:

12, 13, 20, 32, 52, 59, 63, 90, 98, 104, 111, 131, 133, 137, 139, 151, 176, 178, 204, 205, 212, 230, 258, 264, 270, 303, 304, 317, 320, 332, 340, 367, 375, 426, 463, 490, 495, 496, 498, 511, 516, 525, 530, 533, 598, 602, 619, 654, 674, 683, 689, 691, 692, 753, 779, 785, 795, 827, 831, 835, 839, 841, 842, 843.

2. Tape of OA data vs time

The following parameters have been listed with time (sec) from separation. The read statement for this tape (DSN=A285.VIKNGOA) is READ(11)(WORD(I),I=1,11).

where WORD(1) = Time in sec from deorbit

WORD(2) = Velocity in km/sec

WORD(3) = Flight angle in deg.

WORD(4) = Heading angle in deg.

WORD(5) = Altitude above Mars mean surface in km.

WORD(6) = Sub-lander latitude in deg.

WORD(7) = Sub-lander longitude in deg.

WORD(8) = R.P.A. angle of attack in deg.

WORD(9) = UMAS angle of attack in deg.

WORD(10) = RPA sun angle in deg.

WORD(11) = Vehicle zenith angle in deg.

The tape characteristics are:

DSN = A285.VIKNGOA

Record Format, RECFM = VSB (variable size block), Binary format

Logical record size, LRECL = 48

Physical record size, BLKSIZE = 24004

UNIT = 9 TRK

BPI = 1600 B.P.I.

LABEL = No label

File 1 = Lander 1 OA, no. of records = 1191

File 2 = Lander 2 OA, no. of records = 1241

There are total of two files on tape #2 (DSN=A285.VIKNGOA), and the total number of file marks are three.

3. Microfilm Plots of

(a) Deranged data from Phase I of RPA operations.

Enclosed are two rolls of microfilm, Roll #1 and Roll #2. Roll #1 contains plots of reduced data from Phase I from deorbit to 315 km of the Lander 1 height. A sample frame is shown in Fig. 3. On this figure frame

number (FRNO) 7 2 means this plot is 7th frame of the data taken under major frame 2 conditions as listed in Table I. The first number monotonically increases and the second number cycles between 0 & 3. Next item after FRNO=, is the vehicle altitude above Mars surface in km; 3rd item is time after deorbit in seconds at the beginning of each frame, i.e. at -75V. Fourth is A.A., which stands for angle of attack for RPA sensor, i.e., the angle between Lander velocity vector and the normal to the RPA sensor. S. A. stands for sun angle, i.e. the angle between the sun and the normal to the RPA sensor. Z. A. is the solar zenith angle (sun-mars-lander angle) at the Lander location. VELOCITY is the lander velocity in km/sec.

Roll #2 has similar information for Lander 2.

Table 2 is list of sweep numbers for which data is bad either because of noisy data or failure to convert to currents properly. These sweeps should be disregarded.

(b) Ion spectra with least square fits

These plots are in roll #3 and roll #4 for Lander 1 and Lander 2, respectively. The plots start from sweep no. 912 for Lander 1 and sweep no. 911 for Lander 2. Each plot is a single sweep plot of Phase III operation of RPA. Observed points are plotted as solid dots on a retarding potential vs collector current axis. A least squares fit to the theoretical equation, to determine the parameters such as ion temperature, vehicle potential, ion drift velocity and concentrations of various ions, is shown as a solid line. On the left-hand top corner of each plot all results obtained from the plot plus the OA data for the plot is printed out. The TIME (GSCS) is in seconds from deorbit at 0.0V of the retarding potential. SIGMA is in

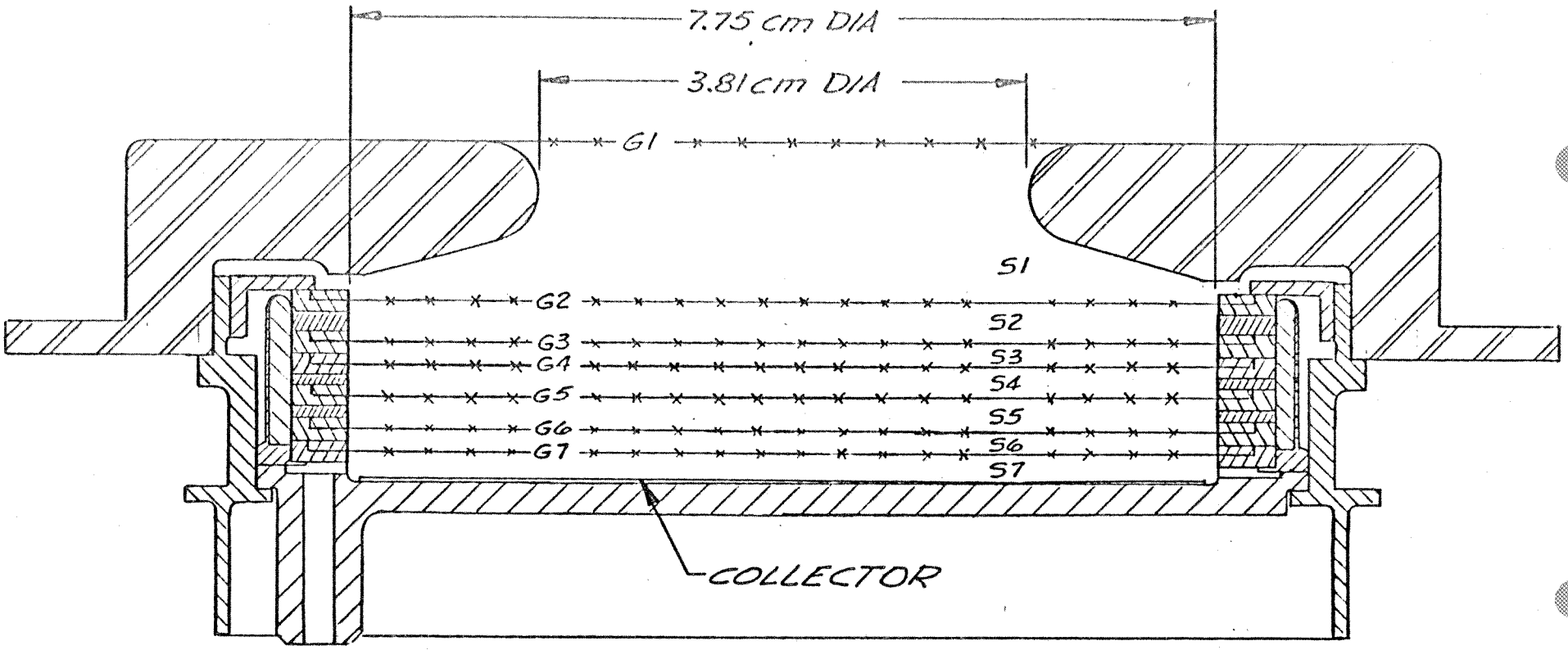
per cent; it is the root of the mean square fractional derivation of the observed points from the theoretical expression and determines the quality of the fit (Hanson, et al., 1970). A sample plot is shown in Fig. 4, where NE is the algebraic sum of different ion concentrations, e.g. NE = N(32) + N(44) + N(76). The concentration of mass 76 ($CO_2 \cdot O_2^+$?) is essentially an artifact of the least squares fitting technique that allows for any current build-up before the onset of the CO_2^+ ion current. The shape of this high energy curve does not, in fact, correspond to that expected for any given ion mass (such as 76). It may arise from suprathermal ions, from secondary emission, or from some other instrumental artifact. D is the ion drift velocity in m/sec; negative D means ion drift velocity away from the RPA. All concentrations are given in particles cm^{-3}. ION-TEMP is in deg°K and VEH-POT, the potential of the RPA sensor with respect to the ionospheric plasma, is in volts.

(c) Orbit-Attitude (OA) data plots

OA data from tape DSN=A285.VIKNGOA has been plotted and stored in roll #5. Each mission has three frames of plots. The first frame is the plot of altitude and velocity with TIME from deorbit. The second frame contains the plot of angle of attack and sun-RPA angle with respect to time from deorbit. Zenith angle and sub-vehicle latitude with respect to time from deorbit are shown in the third plot.

References:

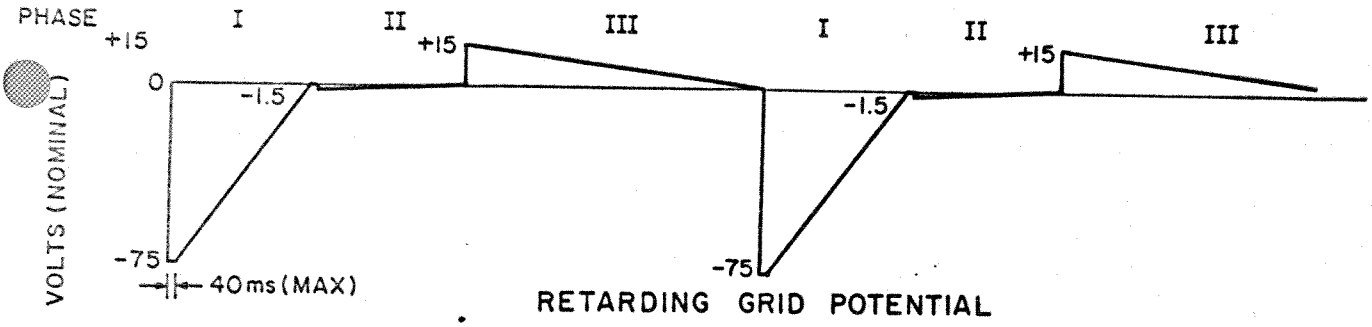
Hanson, W. B., S. Sanatani, D. R. Zuccaro, and T. W. Flowerday, Plasma Measurements with the Retarding Potential Analyzer on Ogo 6, J. Geophys. Res., 75, 5483, 1970



DATA CHART				
GRID NO.	GRID FUNCTION	WIRES/cm	GRID SPACE	DIMENSION (cm)
G1	ENTRANCE	40	S1	1.323
G2	ENTRANCE	20	S2	.320
G3	RETARDING	40	S3	.147
G4	RETARDING	20	S4	.244
G5	SUPPRESSOR	20	S5	.244
G6	SHIELD	20	S6	.147
G7	SHIELD	20	S7	.229

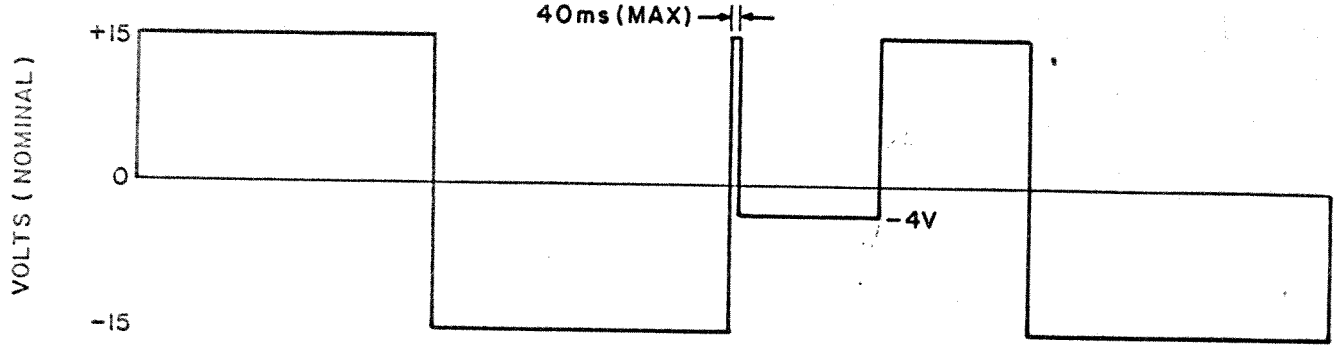
VIKING RPA SENSOR

Fig. 1



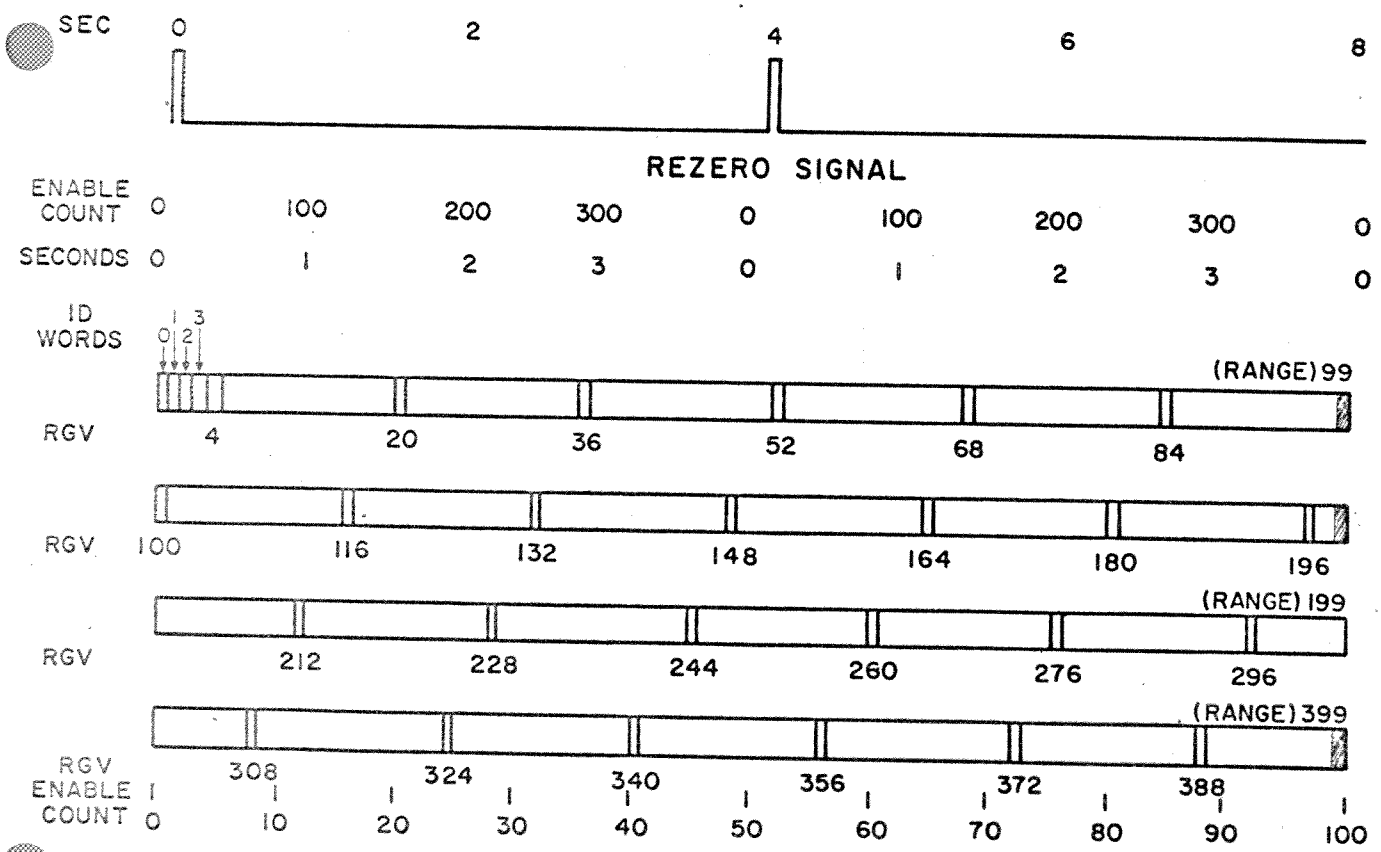
RETARDING GRID POTENTIAL

Fig. 2(a)



SUPPRESSOR GRID POTENTIAL

Fig. 2(b)



RETARDING GRID VOLTAGE (RGV) REGIME AND DATA WORD LOCATION IN ONE FOUR SECOND DATA FRAME.

Fig. 2(c)

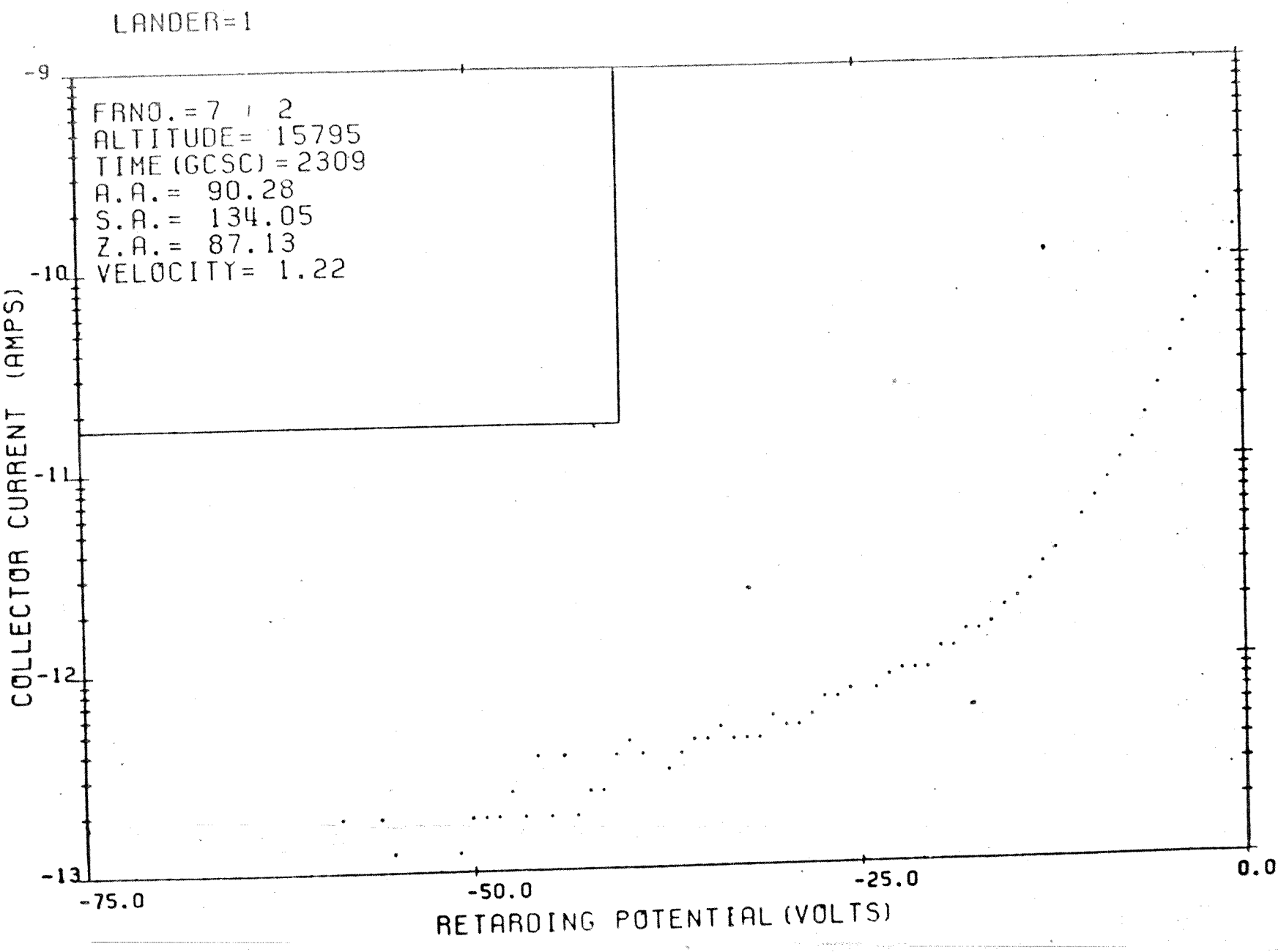

LANDER=1
FRNO.=7 / 2
ALTITUDE= 15795
TIME(GCSC)=2309
A.A.= 90.28
S.A.= 134.05
Z.A.= 87.13
VELOCITY= 1.22
-9
-10
-11
-12
-13
COLLECTOR CURRENT (AMPS)
-75.0
-50.0
-25.0
0.0
RETARDING POTENTIAL (VOLTS)

Fig. 3

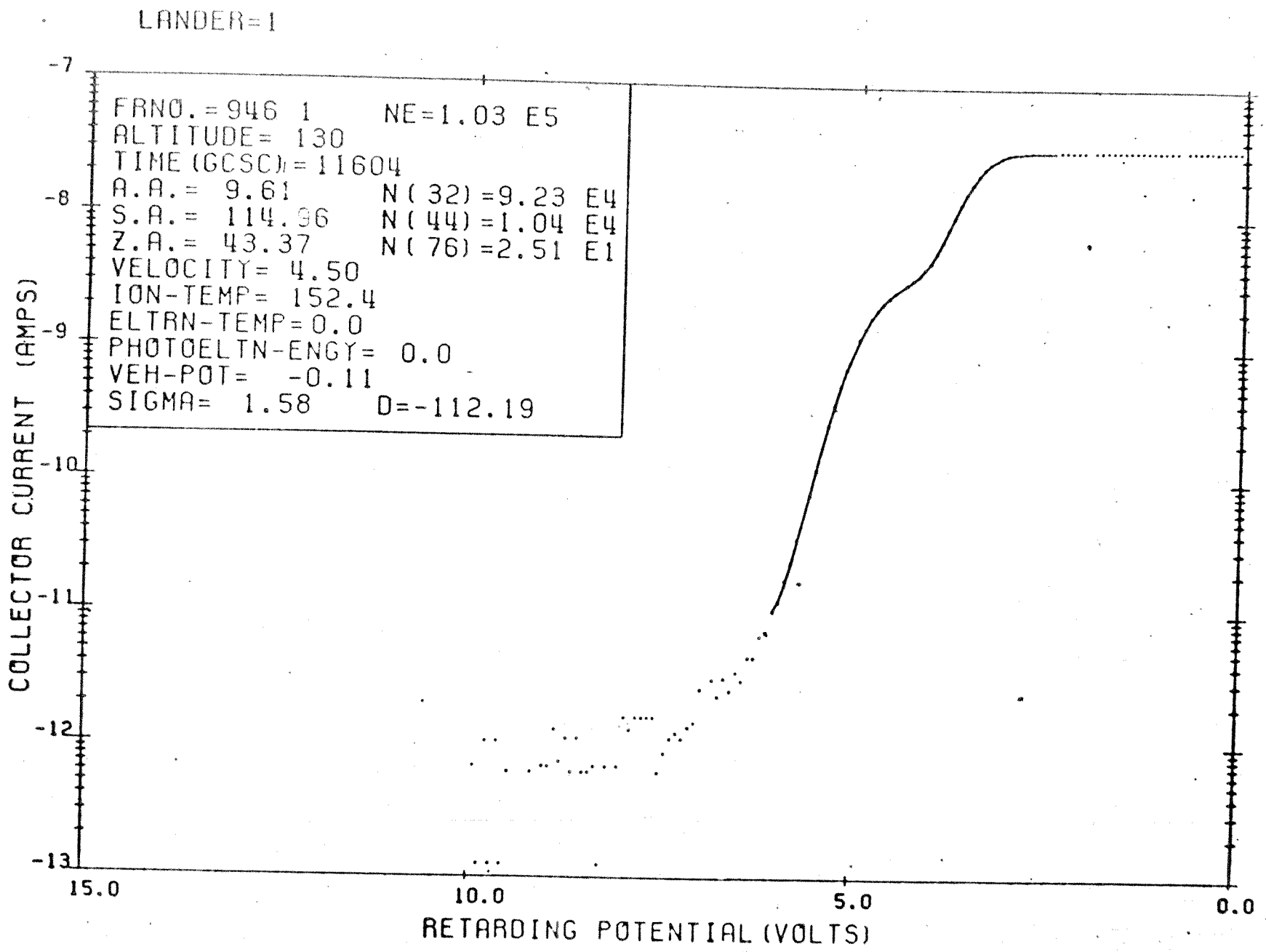

LANDER=1
FRNO.=946 1 NE=1.03 E5
ALTITUDE= 130
TIME(GCSC)=11604
A.A.= 9.61 N(32)=9.23 E4
S.A.= 114.96 N(44)=1.04 E4
Z.A.= 43.37 N(76)=2.51 E1
VELOCITY= 4.50
ION-TEMP= 152.4
ELTRN-TEMP=0.0
PHOTOELTN-ENGY= 0.0
VEH-POT= -0.11
SIGMA= 1.58 D=-112.19
COLLECTOR CURRENT (AMPS)
-7
-8
-9
-10
-11
-12
-13
15.0
10.0
5.0
0.0
RETARDING POTENTIAL (VOLTS)

Fig. 4

VL-2 TIMELINE OF MAJOR EVENTS THRU SOL 1 RELAY PLAYBACK

EVENT	TIME, PDT	
PRESEP C/O	THURSDAY	6:40 AM - 11:30 AM
XMIT SEP - 9.5 HR UPDATE	FRIDAY	3:00 AM
XMIT SEP - 3.5 HR UPDATE	FRIDAY	8:45 AM
GO/NO-GO MEETING 9/3/76	FRIDAY	9:00 AM - 9:30 AM
XMIT SEP CMD	FRIDAY	11:45 AM
SEPARATION	FRIDAY	12:40 PM
DEORBIT BURN	FRIDAY	12:47 AM - 1:09 PM
ENTRY	FRIDAY	3:52 PM
TOUCHDOWN	FRIDAY	3:58 PM
FIRST PICTURE ON TV (FOOTPAD)	FRIDAY	4:45 PM - 5:05 PM
SECOND PICTURE ON TV (PANORAMA)	FRIDAY	5:10 PM - 6:10 PM
SOL 1 RELAY PLAYBACK	SATURDAY	9:00 PM - 12:21 AM
FIRST COLOR PICTURE ON TV	SATURDAY	11:00 PM

VIKING 1 LANDER DEORBIT 7/20/76

```
$JOB  20:30:12
$ASS IN MS2
$NOP********************* HEX DUMP OF X-416 **********************
$NOTE 30J   20:30:37
$EXE DPHEX 8S
 INPUT TAPE ON MS2                    VIKING 1   start  38 MINS 13 SEC   files 1+3
 DATA INPUT    1 2 2                  VIKING 1   stop  3 HRS 9 MINS 28 SEC
  FILE  1      RECORD   1       LENGTH  24044 BYTES
(    0)  5DEC0000 02D50000 438F50CC 00000003 03000002 00000038 00000001 C238DA25 36232E39 00000002
(   40)  C23653E9 3634C56C 00000003 C2321ED9 3634C56C 00000004 C2314770 3634C56C 00000005 C2307006
(   80)  3634C56C 00000006 C22EC134 3634C56C 00000007 C22DE9CA 36465C6A 00000008 C22D1261 3634C56C
(  120)  00000009 C22C3AF7 3634C56C 0000000A C22B638E 3634C56C 0000000B C22A8C24 36465C6A 0000000C
(  160)  C229B4BB 36465C6A 0000000D C228DD51 3634C56C 0000000E C22805E8 3657F38B 0000000F C2272E7E
(  200)  3634C56C 00000010 C2257FAB 36698ACE 00000011 C224A842 367B21BD 00000012 C223D0D8 367B21BD
(  240)  00000013 C222F96F 36698ACE 00000014 C2222206 367B21BD 00000015 C2214A9C 367B21BD 00000016
(  280)  C2207333 367B21BD 00000017 C21F9BC9 367B21BD 00000018 C21EC460 367B21BD 00000019 C21DECF6
(  320)  369E4FDC 0000001A C21D158D 367B21BD 0000001B C21C3E23 368C88C8 0000001C C21B66BA 367B21BD
(  360)  0000001D C21A8F50 369E4FDC 0000001E C219B7E7 36C17DEF 0000001F C2180914 36D31588 00000020
(  400)  C21731AA 36D31588 00000021 C2165A41 36F64362 00000022 C21582D8 36F64362 00000023 C214AB6E
(  440)  37107DB0 00000024 C213D405 37107DB0 00000025 C212FC9B 3712B087 00000026 C2122532 3714E379
(  480)  00000027 C2114DC8 37182FBC 00000028 C210765F 371A62AF 00000029 C1F9EF50 371EC869 0000002A
(  520)  C1EC78C0 372214D1 0000002B C1DF0220 3729C6ED 0000002C C1D18B90 373178EF 0000002D C1C414F0
(  560)  373B5E02 0000002E C1A927D0 3756DA18 0000002F C19BB130 376DF04B 00000030 C18E3AA0 3788532C
(  600)  00000031 C180C400 37AECDED 00000032 C1734D70 37DBE082 00000033 C165D6D0 38122CAD 00000034
(  640)  C1586040 38197F93 00000035 C14AE9A0 38245957 00000036 C13D7310 3832FF21 00000037 C12FFC70
(  680)  38421F5D 00000038 C12285E0 3857D1A4 00000039 C1150F40 3873B6E4 0000003A C0798B00 389D0ACF
(  720)  0000003B 405DDF00 38B7E75D 04400000 438F90CC 00000003 00000059 00000001 C24DE371
(  760)  3715FCDF 00000002 C24D0C07 3714E379 00000003 C24C349E 3714E379 00000004 C24B5D34 3714E379
(  800)  00000005 C24A85CB 3714E379 00000006 C249AE61 37182FBC 00000007 C248D6F8 3715FCDF 00000008
(  840)  C247FF8F 37182FBC 00000009 C2472825 37182FBC 0000000A C24650BC 37182FBC 0000000B C2457952
(  880)  37194941 0000000C C244A1E9 37194941 0000000D C243CA7F 37182FBC 0000000E C242F316 37194941
(  920)  0000000F C2421BAD 37194941 00000010 C2406CDA 37182FBC 00000011 C23F9571 371A62AF 00000012
(  960)  C23EBE07 37182FBC 00000013 C23DE69E 371A62AF 00000014 C23D0F34 37194941 00000015 C23C37CB
( 1000)  371A62AF 00000016 C23B6061 371A62AF 00000017 C23A88F8 371A62AF 00000018 C239B18F 371A62AF
( 1040)  00000019 C238DA25 37194941 0000001A C23802BC 371A62AF 0000001B C2372B52 371B7C18 0000001C
( 1080)  C23653E9 371A62AF 0000001D C2357C7F 371B7C18 0000001E C234A516 371A62AF 0000001F C232F643
( 1120)  371A62AF 00000020 C2321ED9 371DAF04 00000021 C2314770 371DAF04 00000022 C2307006 371A62AF
( 1160)  00000023 C22F989D 371B7C18 00000024 C22EC134 371DAF04 00000025 C22DE9CA 371DAF04 00000026
( 1200)  C22D1261 371EC869 00000027 C22C3AF7 371EC869 00000028 C22B638E 371EC869 00000029 C22A8C24
( 1240)  371C959C 0000002A C229B4BB 3720FB5C 0000002B C228DD51 371EC869 0000002C C22805E8 3720FB5C
( 1280)  0000002D C2272E7E 3720FB5C 0000002E C2257FAB 3720FB5C 0000002F C224A842 372214D1 00000030
( 1320)  C223D0D8 372214D1 00000031 C222F96F 37232E2B 00000032 C2222206 372214D1 00000033 C2214A9C
( 1360)  37232E2B 00000034 C2207333 372214D1 00000035 C21F9BC9 372447A9 00000036 C21EC460 37232E2B
( 1400)  00000037 C21DECF6 372447A9 00000038 C21D158D 37267A86 00000039 C21C3E23 37267A86 0000003A
( 1440)  C21B66BA 37267A86 0000003B C21A8F50 37267A86 0000003C C219B7E7 372793F0 0000003D C2180914
( 1480)  372AE051 0000003E C21731AA 372AE051 0000003F C2165A41 372BF9B9 00000040 C21582D8 372F4620
( 1520)  00000041 C214AB6E 372D134C 00000042 C213D405 373178EF 00000043 C212FC9B 37305FA3 00000044
( 1560)  C2122532 3734C558 00000045 C2114DC8 37392B32 00000046 C210765F 373D90CD 00000047 C1F9EF50
( 1600)  3741F6B3 00000048 C1EC78C0 37465C97 00000049 C1DF0220 374E0E96 0000004A C1D18B90 3757F36A
( 1640)  0000004B C1C414F0 376524F2 0000004C C1A927D0 3787398C 0000004D C19BB130 37A19C65 0000004E
( 1680)  C18E3AA0 37C06488 0000004F C180C400 37E91215 00000050 C1734D70 38115C4B 00000051 C165D6D0
( 1720)  3816C92F 00000052 C1586040 381F31EC 00000053 C14AE9A0 3823216F 00000054 C13D7310 3838B178
( 1760)  00000055 C12FFC70 383A978F 00000056 C12285E0 383A978F 00000057 C1150F40 383A978F 00000058
( 1800)  C0798B00 383A978F 00000059 405DDF00 383ADD11 00800000 438F90CC 00000005 00000000 00000009
( 1840)  00000001 C165D6D0 38115140 00000002 C1586040 38115140 00000003 C14AE9A0 3833F3D3 00000004
( 1880)  C13D7310 3833F3D3 00000005 C12FFC70 384544F5 00000006 C12285E0 3867E79D 00000007 C1150F40
( 1920)  387938AF 00000008 C0798B00 389BDB14 00000009 405DDF00 38BE7E2B 04400000 439010CC 00000006
( 1960)  00000001 00000059 00000001 C24DE371 3714E379 00000002 C24D0C07 371A62AF 00000003 C24C349E
( 2000)  371A62AF 00000004 C24B5D34 371A62AF 00000005 C24A85CB 3715FCDF 00000006 C249AE61 37119717
( 2040)  00000007 C248D6F8 37119717 00000008 C247FF8F 371A62AF 00000009 C2472825 3713C9FA 0000000A
( 2080)  C24650BC 3715FCDF 0000000B C2457952 3712B087 0000000C C244A1E9 3712B087 0000000D C243CA7F
( 2120)  3712B087 0000000E C242F316 371A62AF 0000000F C2421BAD 3714E379 00000010 C2406CDA 3714E379
( 2160)  00000011 C23F9571 3714E379 00000012 C23EBE07 3717165B 00000013 C23DE69E 37194941 00000014
( 2200)  C23D0F34 37194941 00000015 C23C37CB 37194941 00000016 C23B6061 37194941 00000017 C23A88F8
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Launch VIKING 1 ~~9/10~~ 9/9/75

Launch VIKING 2 ~~8/20/76~~ 8/20/75 VIKING 2 start 38 MINS 13 SEC

stop 3 HRS 8 MINS 28 SEC

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$JOB  20:19:21
$ASS IN MS2
$NOP ********** DUMP OF X-430 **************
$NOTE BOJ   20:19:42                    from deorbit
$EXEC DPHEX BS
 INPUT TAPE ON MS2  VIKING 1 START   1HR, 38MINS, 10 SEC   STOP 3HRS, 3MINS, 35SEC
 DATA INPUT   2 2 2 VIKING 2 STOP    38MINS. 9 SEC         STOP 2 HRS, 58MINS, 15SEC
  FILE  1      RECORD  1      LENGTH  24004BYTES
(    0) 5DC40000 00300000 436F4614 411390B5 C24E88B3 4311202D 443DC6B6 C225A55B C281604F 425A4B55
(   40) 425928F2 42B5D37E 42572A69 00300000 438F7614 41139163 C24E8D5A 4311209A 443DC31C C225A551
(   80) C2816100 425A49E8 42592FEC 4285DCFB 425728D1 00300000 438FA614 41139211 C24E9201 43112106
(  120) 443DBF85 C225A547 C28161B1 425A49C0 42593890 4285E752 42572739 00300000 438FD614 411392BF
(  160) C24E96A8 43112173 443D8BEC C225A53D C2816268 425A48D9 42594060 4285F261 425725A2 00300000
(  200) 43900614 4113936D C24E984F 431121E0 443DB852 C225A533 C2816319 425A48B7 425948D7 4285FCA5
(  240) 4257240A 00300000 43906614 411394CB C24EA49C 431122BC 443DB11F C225A51E C2816479 425A472E
(  280) 42595877 428611F2 425720DA 00300000 43909614 4113957A C24EA943 4311232B 443DAD85 C225A514
(  320) C2816532 425A4703 425960E0 42861CC0 42571F41 00300000 4390C614 41139629 C24EADE9 4311239A
(  360) 443DA9EC C225A50A C28165E3 425A4600 42596869 428627F6 42571DA9 00300000 4390F614 411396D9
(  400) C24EB288 43112409 443DA652 C225A4FF C2816694 425A45BF 425970A6 42863296 42571C10 00300000
(  440) 43912614 4113978A C24EB726 43112479 443DA2B8 C225A4F5 C2816745 425A4510 42597874 42863D84
(  480) 42571A77 00300000 43915614 4113983A C24EBBC3 431124E9 443D9F1F C225A4EA C28167F6 425A8D0C
(  520) 4259C8EF 42862993 425718DE 00300000 4391E614 41139A4B C24EC9AF 4311263C 443D944D C225A4CA
(  560) C2816A09 42536AB5 425ABFF3 4285F183 42571413 00300000 43921614 41139AFC C24ECE54 431126AD
(  600) 443D90B3 C225A4C0 C2816ABA 425BB4F2 425B129F 4285E03B 42571279 00300000 43924614 41139BAC
(  640) C24ED2FA 43112720 443D8D17 C225A4B5 C2816B6B 425BFEFC 425B6508 4285CF3B 425710DF 00300000
(  680) 43927614 41139C5D C24ED79F 43112792 443D897B C225A4AA C2816C1C 425C49A6 425BB80F 4285BE22
(  720) 42570F45 00300000 4392A614 41139D0E C24EDC44 43112805 443D85E1 C225A49F C2816CC6 425C914E
(  760) 425C07B6 4285ADA5 42570DAB 00300000 43930614 41139E71 C24EE58D 431128EC 443D7EA9 C225A489
(  800) C2816E28 425D2514 425CAC20 42859354 42570A7C 00300000 43933614 41139F22 C24EEA32 43112960
(  840) 443D7B0D C225A47E C2816ED9 425CC14E 425D702D 4286CBF5 425708DC 00300000 43A77614 4113EE9E
(  880) C250DA84 431165EE 443BF0DC C2259E85 C281B326 425D5641 425D2F23 42883FDF 4256580A 00300000
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(  960) 4256565E 00300000 43A83614 4113F1BB C250EC81 431168B5 443BE217 C2259E3F C281B57A 425DB9F7
( 1000) 425D81CD 42876DFA 42565159 00300000 43A86614 4113F283 C250F13B 43116968 443BDE66 C2259E2D
( 1040) C281B60B 425DD46F 425D9381 42872FB1 42564FAD 00300000 43A89614 4113F34B C250F5C5 43116A1D
( 1080) 443BDAB3 C2259E1C C281B6A1 425DEE69 425DA53E 4286F106 42564E00 00300000 43A8C614 4113F414
( 1120) C250FA4E 43116AD2 443BD7D3 C2259ECA C281B732 425E07E1 425DB66C 4286B15B 42564C53 00300000
( 1160) 43A8F614 4113F4DC C250FED8 43116B88 443BD34F C2259DF8 C281B7C8 425E20B7 425DC713 42867247
( 1200) 42564AA6 00300000 43A92614 4113F5A5 C2510360 43116C3F 443BCF9F C2259DE7 C281B858 425E39B7
( 1240) 425DD7F0 42863333 425648F8 00300000 43A95614 4113F66D C25107E9 43116CF6 443BCBEC C2259DD4
( 1280) C281B8E9 425E3E6C 425DD3D4 42860D01 4256474A 00300000 43A98614 4113F737 C2510C71 43116DAE
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( 1480) 425CDA7C 4286593E 42563EE5 00300000 43AA7614 4113FB28 C2512314 43117154 443BB5B8 C2259D67
( 1520) C281BC57 425D51A7 425CA892 42866545 42563D36 00300000 43AAA614 4113FBF3 C251279A 43117210
( 1560) 443BB205 C2259D55 C281BCE7 425D2A97 425C7747 42867780 42563B88 00300000 43AAD614 4113FCBD
( 1600) C2512C20 431172CE 443BAE52 C2259D43 C281BD77 425D02ED 425C456B 42868717 42563D9D 00300000
( 1640) 43ABC614 4113FD83 C25130A5 4311738D 443BAA9F C2259D30 C281BE07 425CDC23 425C1468 42869704
( 1680) 42563829 00300000 43AB3614 4113FE53 C2513523 4311744C 443BA6E9 C2259D1E C281BE9B 425CB4B2
( 1720) 425BE2B9 4286A660 4256367B 00300000 43AB6614 4113FF2D C251399F 4311750C 443BA333 C2259D0B
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( 1800) 443B9F80 C2259CF9 C281BFB1 425C8F85 425BA946 4286B41F 4256331C 00300000 43BFC333 41145A4C
( 1840) C25317C2 4311DE88 443A0C45 C22593A1 C281F5F7 425F5E2E 425EE886 428734C3 425579BC 00300000
( 1880) 43BFF614 41145E3C C2531C47 4311DFDB 443A0843 C2259386 C281F66D 425F4E3C 425ED2A3 4287580A
( 1920) 425577DE 00300000 43C02614 41145C1E C253208A 4311E11C 443A0478 C225936C C281F6E3 425F3DFC
( 1960) 425EBC80 42877B16 42557618 00300000 43C05614 41145D02 C25324CB 4311E25F 443A00AE C2259352
( 2000) C281F752 425F2E37 425EA6DA 42879DA5 42557457 00300000 43C08614 41145DE5 C253290B 4311E3A3
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( 2080) C2532D4B 4311E4E9 4439F917 C225931E C281F838 425FCF1A 425E7BFC 4287E2A3 425570D1 00300000
( 2120) 43C0E614 41145FAC C2533189 4311E631 4439F54D C2259303 C281F8A7 425EFF83 425E6691 428804CA
( 2160) 42556F0D 00300000 43C11614 41146091 C25335C1 4311E77A 4439F183 C22592E9 C281F917 425EF027
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