DATA SET CATALOG #20

Explorer 30 NRL X-RAY and Ultra Violet monitoring experiment

65-093A-01A	1 tape
65-093A-01B	1 tape
65-093A-01C	1 tape
65-093A-01D	1 tape

Table of Contents

----

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

SOLRAD 8

SOLAR RADIATION 1-MIN. FLUX AVG.

65-093A-01A

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 19 7-TRACK, 556 BPI TAPES, WRITTEN IN BCD. THERE ARE 7 RESTORED TAPES, WIRTTEN IN EBCDIC. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON AN IBM 7094 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR003008	DS003008	D000711	1	11/27/65 - 12/31/65
		D000712	2	01/01/66 - 02/28/66
		D000086	3	03/01/66 - 03/31/66
		D000207	4	03/01/66 - 03/31/66
DR003009	DS003009	D000084	1	04/01/66 - 04/28/66
		D000085	2	04/28/66 - 05/31/66
		D000100	3	05/04/66 - 06/28/66
DR003013	DS003013	D000087	1	06/01/66 - 06/23/66
		D000118	2	07/01/66 - 08/28/66
		D000713	3	08/03/66 - 08/25/66
DR003014	DS003014	D000148	1	09/12/66 - 11/12/66
		D000149	2	11/02/66 - 11/30/66
DR003015	DS003015	D000176	1	12/01/66 - 12/16/66
		D000204	2	01/12/67 - 01/31/67
DR003016	DS003016	D001564	1	02/01/67 - 04/12/67
		D000714	2	05/18/67 - 05/31/67
		D000715	3	06/01/67 - 07/04/67
DR003017	DS003017	D000716	1	08/02/67 - 08/24/67
		D000717	2	08/02/67 - 08/24/67

SOLRAD 8

COMPACT AND EDITED 1 MIN. FLUX AVG.

65-093A-01B

THIS DATA SET HAS BEEN RESTORED. THERE WAS ORIGINALLY ONE 7-TRACK, 556 BPI TAPE, WRITTEN IN BCD. THERE IS ONE RESTORED TAPE, WRITTEN IN ASCII. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 7094 COMPUTER AND THE RESTORED TAPE WAS CREATED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER AND TIME SPAN IS AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004796	DS004796	D001579	1	11/27/65 - 08/24/67

SOLRAD 8

EDIT CARDS

65-093A-01C

THIS DATA SET HAS BEEN RESTORED. THERE WAS ORIGINALLY ONE 7-TRACK, 556 BPI TAPE WRITTEN IN BCD. THERE IS ONE RESTORED TAPE, WRITTEN IN ASCII. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 7094 COMPUTER AND THE RESTORED TAPE WAS CREATED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBER, ALONG WITH THE CORRESPONDING D NUMBER ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004802	DS004802	D000878	1	11/19/65 - 08/24/67

SOLRAD 8

STATION LIST. START/STOP + PASS NO

65-093A-01D

THIS DATA SET HAS BEEN RESTORED. THERE WAS ORIGINALLY ONE 7-TRACK, 556 BPI TAPE, WRITTEN IN BCD. THERE IS ONE RESTORED TAPE, WRITTEN IN ASCII. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 7094 COMPUTER AND THE RESTORED TAPE WAS CREATED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER AND TIME SPAN IS AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004803	DS004803	D000984	1	11/27/65 - 08/23/67

DATA USERS' NOTE
NSSDC 68-

EXPLORER 30 (1965 93A)

NRL X-RAY AND ULTRAVIOLET MONITORING EXPERIMENT

EXPERIMENTERS

R. W. Kreplin
T. A. Chubb
H. Friedman

JULY 1968

FORWORD

This Data Users' Note is specifically designed to help potential data users decide if they can make use of the data obtained in the Explorer 30 (1965 93A) X-ray and ultraviolet monitoring experiment. Once a data user decides that he requires the data, it will serve as the unifying element - the key - in the actual use of the data available at the National Space Science Data Center (NSSDC). To achieve these goals, the Note briefly describes the experiment, including the instrumentation and measurements, the telemetry, and the operational experience. All available details are then provided on the actual reduction techniques and format of recorded data. For those desiring more details, names and addresses of the experimenters are provided to facilitate direct contact. As a further aid, detailed references (and bibliography) are also included. When available, NASA accession numbers* are given. The primary purpose of these references is to identify the sources containing complete information concerning the subject under discussion. Most of these references are physically available at NSSDC - those that are not are readily obtainable.

Inquiries concerning the availability of data should be directed to:

National Space Science Data Center
Goddard Space Flight Center
Code 601
Greenbelt, Maryland 20771

Area Code 301 982-6695

*For example, N64-2243 is an accession number for an article reported in the Scientific and Technical Aerospace Reports (STAR), and A63-5921 refers to an entry in the International Aerospace Abstracts (IAA).

CONTENTS

LIST OF FIGURES

EXPLORER 30 (1965 93A)

NRL X-RAY AND ULTRAVIOLET MONITORING EXPERIMENT

BACKGROUND

The Explorer 30 satellite (NRL SOLRAD 8) was launched on November 18, 1965, by a Scout vehicle from the NASA station at Wallops Island, Virginia. The satellite's major orbital elements were issued by the NASA computing center on January 13, 1966. On that date, the apogee of orbit was 899.61 km, and its perigee was 691.97 km. Its period of revolution in this orbit was 100.79 min and the inclination was 59.71°.[1]

It has been known that the energy output from the sun is very constant in the visible portion of the spectrum, considerably more variable in the far ultraviolet, and extremely variable in the X-ray region. Although solar X-ray emission has been monitored for considerable periods of time since the launching of the first Naval Research Laboratory SOLRAD satellite in 1960, the full range of X-ray variability in all wavelengths has not been determined. There are several reasons for the incompleteness of the data:[2]

1. More or less complete monitoring of solar activity has only been achieved in the past few years, a period of time during which solar activity has been low and large flares rare.
2. The majority of data has been obtained from the SOLRAD series of satellites, which until recently have been limited to real-time telemetry, and hence have provided data limited to those periods of time when the satellite was within range of a tracking station.

3. The X-ray detectors have had limited sensitivity and dynamic range and hence have not always provided on-scale readings even for those periods of time for which the sun has been under observation.

Continuous on-scale readings in the 44-60 A wavelength region have been available for many periods since the launching of the first SOLRAD satellite. On-scale readings of solar background in the 8-20 A region were not made until the launching of SOLRAD 7a (1965 - 16D) in March 1965. Nonflare measurements of emission in the 1-8 A region were made by the present satellite in the series, Explorer 30 (NRL SOLRAD 8) (1965 - 93A). Several months of data below 10 A have also been obtained from an ion-chamber experiment aboard OSO 1 and a proportional counter aboard Ariel.[2]

This experiment differs from the previous NRL solar monitoring experiments in that more photometers are used to extend the sensitivity and range of measurement. An active attitude control system has also been made part of the 1965 93A instrumentation.[1]

EXPERIMENTERS

R. W. Kreplin - Naval Research Laboratory*

T. A. Chubb - Naval Research Laboratory*

H. Friedman - Naval Research Laboratory*

---

* Address: E. O. Hulburt Center for Space Research, U. S. Naval Research Laboratory, Washington, D. C., 20390

EXPERIMENT

Instrumentation and Measurements

Explorer 30 is equipped with a spin-axis orientation system and a spin replenishment system. The spin-axis orientation system acts to position the spin axis of the satellite perpendicular to the satellite-sun line to within $\pm$ 3°. Proper operation of the orientation system requires that the spin rate be held at 60 rpm $\pm$ 10%. The spin replenishment system has therefore been included to preserve the spin rate. Both the spin-axis orientation and the spin replenishment systems are operated by ground command from the NRL telemetry station.[1]

X-ray and UV photometers, and photo aspect sensors, are mounted about the satellite's equatorial band. The photometers monitor solar radiation in the wavelength regions: 0.5-3A, 1-8 A, 8-16 A, 1-20 A, 44-60 A, 1080-1350 A, and 1225-1350 A. Figure 1 lists the number and types of detectors used to monitor each wavelength region. Also listed are the letter designations of the detectors, their angular positions on the equatorial band, the telemetry channel on which they appear, and notes pertinent to data reduction. Complete specifications for the Explorer 30 detectors are given in Figure 2, while the wavelength response curves are shown in Figure 3.

The output signal of the ionization chamber photometers is an electric current on the order of several micromicroamperes. This signal is amplified by an electrometer amplifier to a voltage level sufficient to modulate a telemetry subcarrier oscillator. The output signal of each Geiger Mueller counter photometer is applied to a ratemeter, which amplifies the signal to a corresponding analog voltage level for modulation of a subcarrier oscillator.[1]

Designation/ Angular Position	Type	Wavelength Monitored	Telemetry Channel
A/22.5°	Ion Chamber	1-20 A	7
B/45°	Ion Chamber	44-60 A	4
C_T(C)*/67.5°	Ion Chamber	1080-1350 A	6
C_B(C)*/67.5°	Ion Chamber	1080-1350 A	6
D/112.5°	Photocell	Visible Light	8
E/135°	Ion Chamber	8-16 A	5
F_T(F1)*/157.5°	GM Counter	1-8 A	3
F_B(L1)*/157.5°	GM Counter	0.5-3 A	3
G/202.5°	Ion Chamber	1-8 A	7
H/225°	Ion Chamber	1-8 A	4
I_T(I)*/247.5°	Ion Chamber	1225-1350 A	6
I_B(I)*/247.5°	Ion Chamber	1225-1350 A	6
J/292.5°	Photocell	Visible Light	8
K/315°	Ion Chamber	8-16 A	5
L_T(L1)*/337.5°	GM Counter	0.5-3 A	3
L_B(F1)*/337.5°	GM Counter	1-8 A	3

* Designation in parentheses is that appearing in the reduced data.

Figure 1 - Explorer 30 Detectors

Experiment	Position		Serial	Window	Thickness(1)	$\rho x(w)$(2)	Fill Gas	Pressure(3)	Gas Path(4)	$\rho x(Gw)$(2)	Chamber Depth(5)	$\rho x(G)$	ω(6)	Effective Window Area(11)	Misc
1-20 A	A	22.5°	CT3	Mylar Aluminum	6.3×10^{-4} 1500A	8.5×10^{-4} 3.0×10^{-5}	Carbon Tetrachloride	37	0.216	5.37×10^{-5}	2.538	6.19×10^{-4}	2.15×10^{10}	3.10	4.2% trans copper mesh used on outside of magnet.
44-60A	B	45°	1/4 M72	Mylar	6.3×10^{-4}	8.0×10^{-4}	Nitrogen	770	0.216	6.04×10^{-5}	2.538	7.10×10^{-4}	1.80×10^{10}	0.88	
1080-1350A	C_T	67.5°	M1147	LiF	2 mm	-	Nitric Oxide	15	Quantum Efficiency = 34.9%(9)			Av 24.3% at L_α		3.4×10^{-4}	1.9% Attenuator
1080-1350A	C_B	67.5°	M1164	LiF	2 mm	-	Nitric Oxide	15	Quantum Efficiency = 23.6%(9)						
8-16A	E	135°	1/2 A120	Aluminum	8.9×10^{-4}	2.3×10^{-3}	Nitrogen	400	0.216	1.42×10^{-4}	2.538	1.67×10^{-3}	1.80×10^{10}	0.50	20.2% trans. nickle mesh
1-8A GM Counter	F_T	157.5°	914	Mica Beryllium	- 1.27×10^{-2}	1.75×10^{-3}(7) 2.1×10^{-2}	Neon Bromine	597 3	-	-	5.08	3.29×10^{-3} 6.55×10^{-5}	(8)	0.33	
0.5-3A GM Counter	F_B	157.5°	1144	Mica Beryllium	- 0.127	1.75×10^{-3} 0.24	Argon Bromine	597 3	-	-	5.08	6.52×10^{-3} 6.55×10^{-5}	(8)	0.71	
1-8A	G	202.5°	5 Be20	Beryllium	1.27×10^{-2}	2.5×10^{-2}	Argon	700	0.094	1.60×10^{-4}	2.538	4.52×10^{-3}	2.38×10^{10}	2.05	
1-8A	H	225°	5 B-22	Beryllium	1.27×10^{-2}	2.5×10^{-2}	Argon	700	0.094	1.60×10^{-4}	2.538	4.52×10^{-3}	2.38×10^{10}	2.19	
1225-1350A	I_T	247.5°	M799	CaF_2	2 mm	-	Nitric Oxide	15	Quantum Efficiency = 12.7%(10)			Av 12.8% at 1300A		1.11×10^{-2}	9.4% Attenuator
1225-1350A	I_B	247.5°	M1105	CaF_2	2 mm	-	Nitric Oxide	15	Quantum Efficiency = 12.9%(10)						
8-16A	K	315°	1/2 A120	Aluminum	8.9×10^{-4}	2.3×10^{-3}	Nitrogen	400	0.216	1.42×10^{-4}	2.538	1.67×10^{-3}	1.80×10^{10}	1.97	
0.5-3A GM Counter	L_T	337.5°	1047	Mica Beryllium	- 0.127	1.75×10^{-3} 0.24	Argon Bromine	597 3	-	-	5.08	6.52×10^{-3} 6.55×10^{-5}	(8)	0.71	
1-8A GM Counter	L_B	337.5°	916	Mica Beryllium	- 1.27×10^{-2}	1.75×10^{-3}(7) 2.1×10^{-2}	Neon Bromine	597 3	-	-	5.08	3.29×10^{-3} 6.55×10^{-5}	(8)	0.33	

(1) Nominal thickness in cm except where indicated

(2) gm cm^{-2} sec^{-1}

(3) pressure in mm Hg at 0°C

(4) distance between window and internal grid in cm. This path length must be considered as part of the window in efficiency calculations.

(5) cm

(6) ion pair/erg

(7) Muscovite Mica assumed, $K_2O \cdot 3Al_2O_3 \cdot 6SiO_2 \cdot 2H_2O$

(8) Assume that one x-ray photon produces one count in the Geiger tube.

(9) Measured at Lα against CH_3I standard assumed 87% efficient

(10) Quantum efficiency measured at 1300A against Intermediate Standard Cs photocell which in turn is calibrated at Lα against CH_3I standard

(11) cm^2, Attenuation Factor has been included in calculation of effective window area

Figure 2 - Explorer 30 Detector Specifications

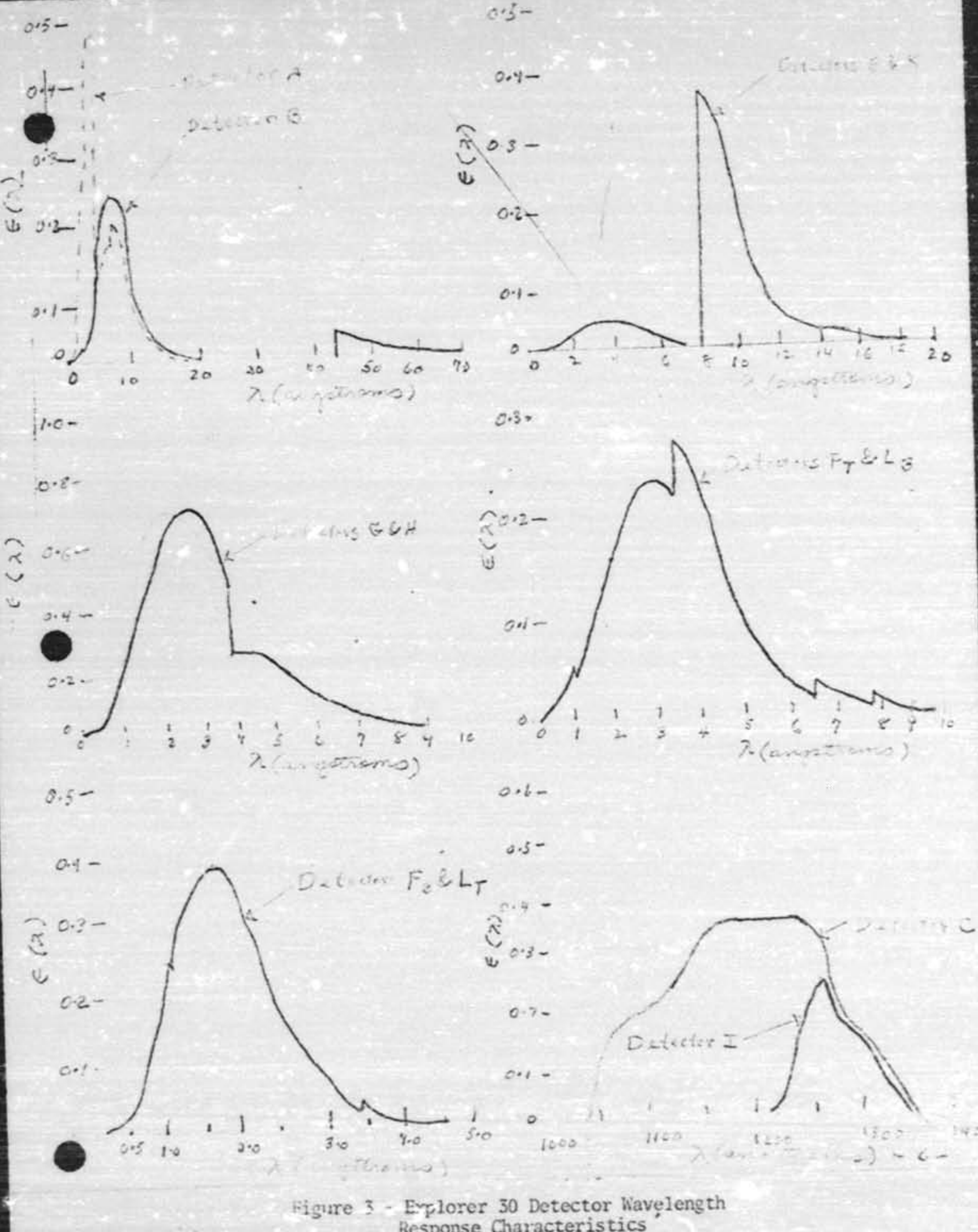
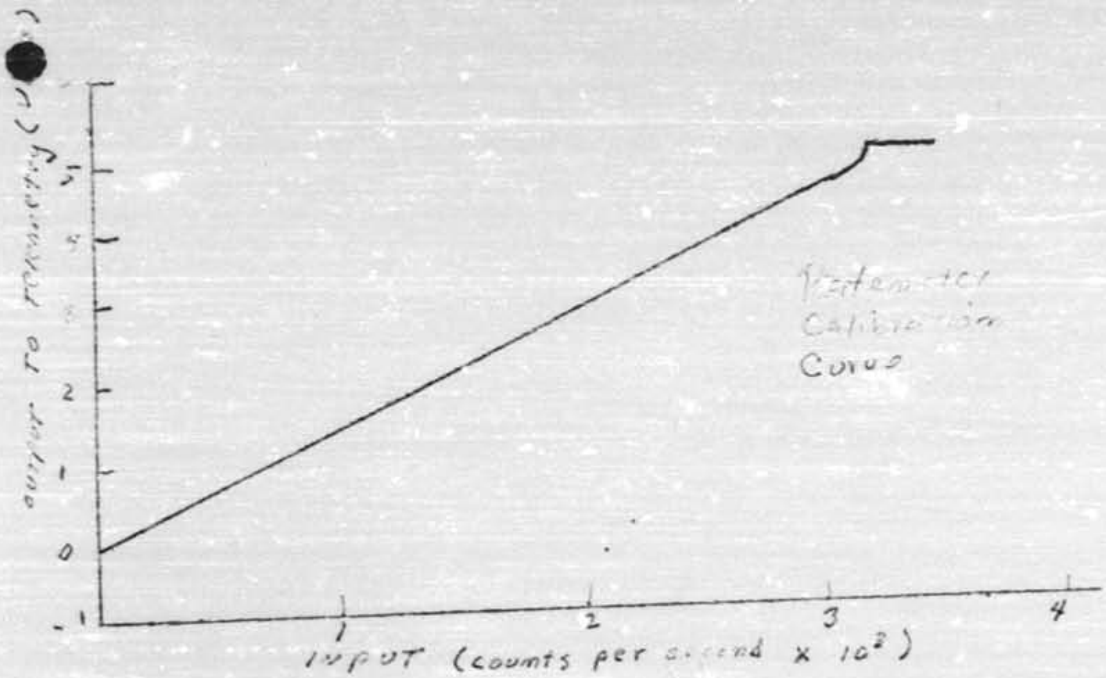


Figure 3 - Explorer 30 Detector Wavelength Response Characteristics

The photo aspect sensors are used to determine the satellite aspect angle. Its measurement is necessary in order to correct the X-ray and UV photometer responses when they do not point directly at the sun. Normally the signal from the aspect sensor located at position J appears on the channel 8 telemetry record. This sensor generates one of two types of pulses, depending on the satellite's aspect angle. For aspect angles less than $\pm$ 6°, the aspect sensor at J generates a series of gray code pulses located between two larger outer pulses. The gray code pulses indicate either "ones" or "zeros", and the aspect angle is determined by the resulting binary code. For aspect angles greater than $\pm$ 6°, a "slot pulse" appears between the two outer pulses. In this case the aspect angle is calculated by comparing the pulse width of the slot pulse to the pulse width of the two outer pulses. The photo sensor located at position D may also appear on channel 8 in place of the sensor at J. This sensor determines the aspect by comparison of pulse width only.[1]

Calibration

Calibration curves for each electrometer amplifier are provided so that the ion chamber photometer currents can be determined from the amplifier output that appears on the telemetry record. To determine the count rate of the GM counter photometers, ratemeter calibration curves are also available.[1] Ratemeter and electrometer amplifier calibration curves are illustrated in Figure 4. The calibration curves for both the electrometer amplifiers and the ratemeters, however, assume a perfect satellite aspect angle. In order to correct for any difference from perfect aspect, the angular response of each photometer was determined by testing either the actual flight unit or a similar unit against a known source of radiation. Angular response curves are provided for both



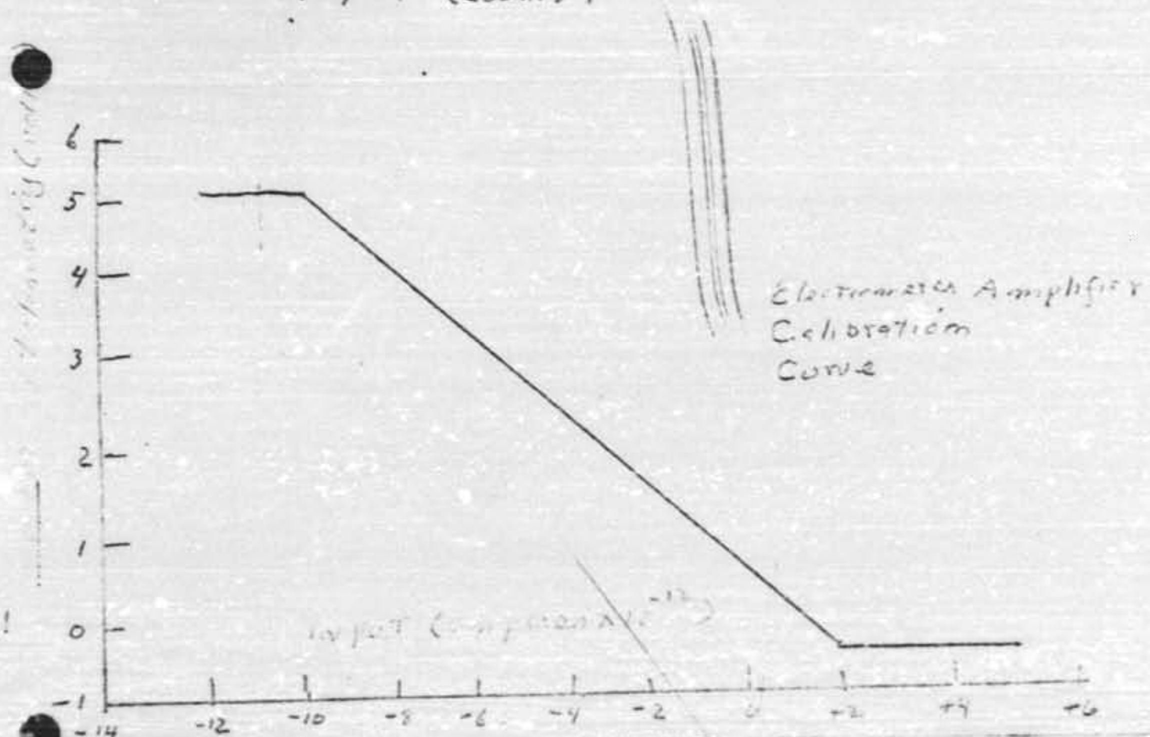


Figure 4 - Ratemeter and Electrometer Amplifier Calibration Curves

positive and negative aspect angles for each photometer; a sample curve for the 1-8 A GM counter photometer is illustrated in Figure 5.

Telemetry

The satellite transmits data in real time by means of an FM/FM telemetry system operating on a main carrier frequency of 136.530 MHz. The standard IRIG subcarrier channels 3 through 8 are used for data transmission. A commutator performs time-division multiplexing to allow each subcarrier channel to carry solar data from more than one detector. The commutator also applies voltage calibration markers to each subcarrier channel. A number of detectors may be substituted by ground command for the detectors normally appearing on the telemetry record. On channel 5 for example, the 8-16 A detector at position E can be substituted for the 8-16 A detector at position K. Although this photometer covers the same wavelength range, it has a lower sensitivity than the one at position K and produces data that are on scale during active solar periods.[1]

Every 5 min the output of a 16-bit counter/shift register is substituted for the channel 5 X-ray signals. The number contained in this shift register is incremented by one unit every 5 min; the shift register is read out nondestructively, providing satellite relative time on the telemetry record.[1]

Operational Experience

All detectors in the satellite operated properly with the exception of the UV units at positions C (1080-1350 A) and I (1225-1350 A). At perfect aspect the signals from these photometers were off-scale and, in the case of the 1225-1350 A photometer, were heavily saturated. The

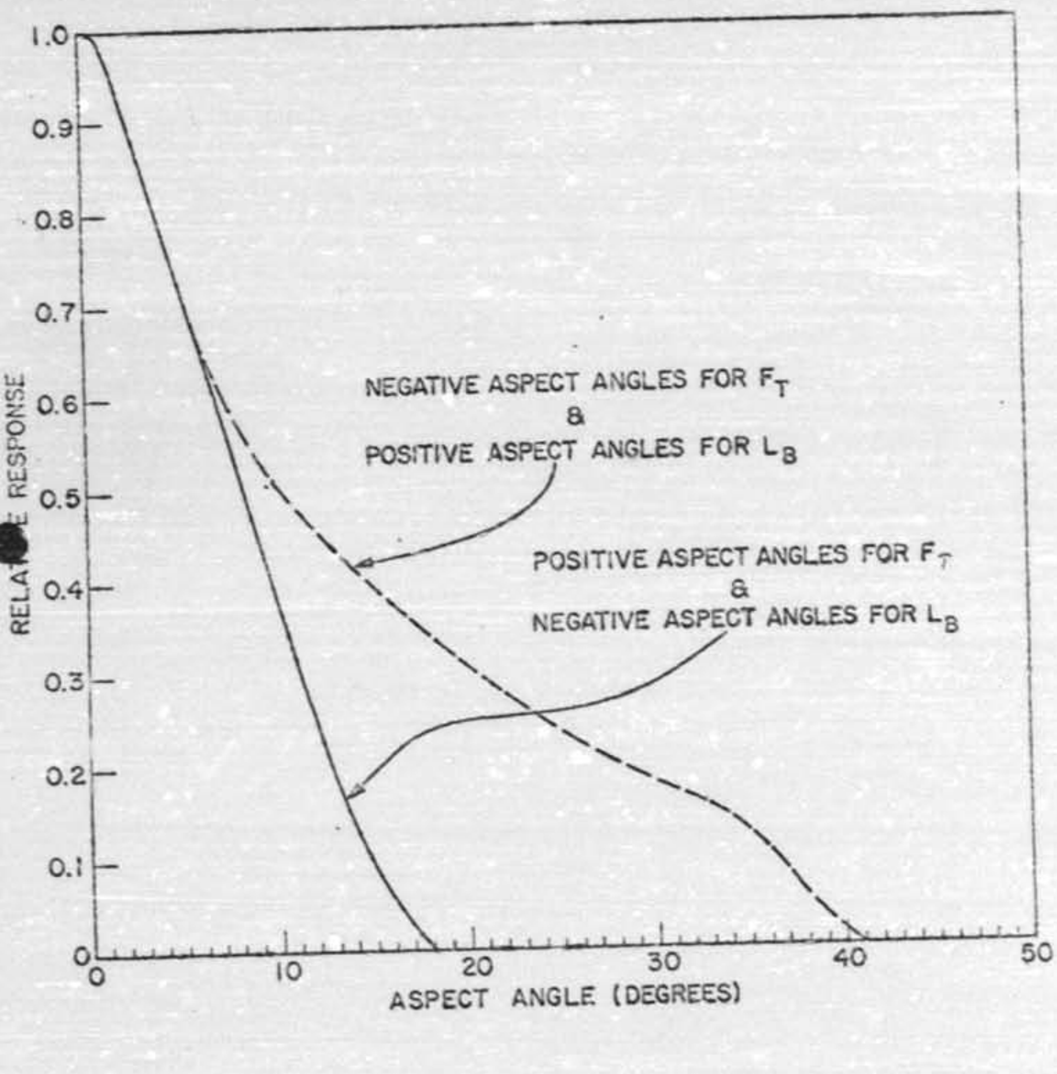


Figure 5 - Angular Response Calibration Curves
for the 1-8 A GM Photometer

attenuator gauze of the 1080-1350 A photometer was to have had a transmission of 1.0%; however, the gauze actually installed was found to have a greater (1.9%) transmission. Thus, the maximum flux measurable at perfect aspect was only 4.7 erg $cm^{-2}sec^{-1}$. The normal solar Lyman-alpha flux has an intensity of between 5 and 6 ergs cm^{-2} sec^{-1} and therefore produced a slightly saturated signal. Whenever the aspect angle increased beyond 12°, the Lyman-alpha signal appeared on scale. Despite the saturation of the Lyman-alpha signal, relative intensities could still be measured as a function of time by measuring the amplitude of the response at a roll position slightly before maximum. Useful data from the 1225-1350 A photometer were not obtained until quite large aspect angles were reached. At that time, it was possible to make measurements of relative intensities as a function of time.[1]

Occasionally the 1-8 A GM counter photometer on channel 3 produced saturated signals. This photometer can experience this saturation in the South Atlantic Anomaly or in the horns of the Van Allen belts. Eventually it appears that this photometer recovered and operated properly in the detection of solar X-ray fluxes. Since laboratory testing indicated this counter tended not to recover when exposed to high intensity beta sources, any saturated signal observed from the 1-8 A GM counter photometers is viewed with suspicion and checked against one of the 1-8 A ion chamber photometers at positions G or H.[1]

The spin replenishment system did not maintain spin at the nominal 60 rpm. Instead, spin rate gradually decreased to 4 rpm on September 12, 1966. (At spin rates below 10 rpm, data reduction becomes difficult.) On September 12, ground commands succeeded in reactivating the gas spin-up system which increased the spin rate to 78 rpm and exhausted the gas supply. From this point, spin rate gradually decreased to 10 rpm in August 1967 when data collection was terminated.

In February 1967, a failure also occurred in the relative time clock. The 16-bit shift register readout still appeared, but the count was no longer being incremented. It has also been determined that the least significant bit of the gray code aspect system did not change from one to a zero. At best, zero was indicated by an amplitude change of not more than 20% of the height of the one pulse. The gray code aspect system was still used but its resolution was less than expected.[1]

DATA

Reduction Techniques

At each ground station, the subcarrier channel signals were transferred unmodified to magnetic tape. At some stations, the subcarrier channel signals were simultaneously demodulated and presented on strip charts. The telemetry tapes were then digitized and decoded. Finally X-ray flux values were obtained by applying appropriate conversion factors to the decoded data.

The conversion of the 44-60 A photometer signal to flux values involves the use of a gray body approximation in which a solar temperature of 0.5×10^{6} °K is assumed to define the wavelength distribution.[3] X-ray flux in the shorter wavelength ranges is calculated assuming higher solar temperatures. Figure 6 lists the conversion factors used to calculate X-ray flux for each photometer.[1]

In the case of the 1080-1350 A UV photometers, it is assumed that almost all measured radiation is concentrated in the Lyman-alpha line.

X-Ray Band & Temp (3) / Photometer	0-3A		0-8A		8-12A	8-20A	0-20A			44-60A
	10×10^6	2×10^6	10×10^6	2×10^6	2×10^6	2×10^6	10×10^6	2×10^6	0.5×10^6	0.5×10^6
0.5-3A GM (1) F_B & L_T	4.61×10^{-9}	2.40×10^{-9}								
1-8A GM (1) F_T & L_D	3.58×10^{-8}	1.87×10^{-12}	1.12×10^{-8}	4.22×10^{-7}						
1-8A (2) G	4.96×10^7	3.27×10^3	1.56×10^9	7.35×10^8						
1-8A (2) H	8.71×10^7	5.75×10^5	2.73×10^9	1.29×10^9						
8-16A (2) E					2.70×10^9	1.03×10^{10}				
8-16A (2) K					7.09×10^8	2.70×10^9				
1-20A (2) A								5.14×10^{10}	1.50×10^{10}	
44-60A (2) B							4.10×10^9	5.57×10^7	6.56×10^7	3.53×10^{10}

(1) Units for GM counter conversion factors are ergs $cm^{-2} sec^{-1}$ per c/s
(2) Units for ion chamber conversion factors are ergs $cm^{-2} sec^{-1} amp^{-1}$
(3) Units are °K

Figure 6 - Summary of Conversion Factors for Explorer 30 Detectors

It is also assumed that one Lyman-alpha photon absorbed in the photometer gas filling will produce one electron-ion pair, and that the electron is collected before recombination can occur. The efficiency of the 1080-1350 A photometers was measured at Lyman-alpha against a CH_3I standard ionization chamber. On the basis of a known efficiency and on the above assumptions, the conversion factor for these two photometers was determined to be 0.84×10^{12} erg $cm^{-2} sec^{-1} amp^{-1}$. The efficiency of the 1225-1350 A photometers was measured against the CH_3I standard by means of an intermediate standard photocell with a CsI surface. A conversion factor for these photometers has not been determined. Sufficient information, however, may be found in Reference 4 to permit rough calculations to be made for continuum and line emission in this region.[1]

Timespan of Data

Data are available for the period of March 1, 1966, through August 27, 1967.

Format of Available Data

The Explorer 30 data are available on one magnetic tape as BCD characters at a density of 556 bpi. Each physical record contains all detector information for a single pass, and is variable in length containing a logical header record and a series of logical detector records. (See Figure 7.) Station identification codes are given in Figure 8.

Each logical detector record contains a series of quality flags (characters 7 through 36) and corresponding data values (characters 37 through 96). There are three flags for each detector as follows:

```
                                      Header Record
67 E 6P541FV    +19.74 14
1742 ST  C  PA4N  N  O  N  N  FA3FA3    2.38-2                       5.89+03.22+0
1743 4T  C  PA3N  N  O  N  N  FA3FA3    2.32-2                       5.97+03.22+0
1744 40  C  PA4PEOPESPECT  PECFA3FA3    2.32-2       8.70-4          5.55+03.19+0
1745 40  C  PA3FA9PA3PB1T  FA9FA2FA3    2.34-25.41-41.11-31.11-3  1.64+05.88+03.14+0
1746 40  C   C3 A9 B3 A2T   A9 A3 A3    3.32-25.20-41.05-39.53-4  1.79+05.88+03.12+0
1747 40  C   A3 E9 A2 A1T   A9 A2 A3    2.33-25.18-41.17-31.39-3  1.66+05.85+03.13+0
1748 40  C   A3S   A2 A2T   A9 A2 A3    2.47-2       1.32-21.46-3  1.79+05.85+03.11+0
1749 40  C   A3 A9 A3 A1T   A9 A2 A3    2.45-25.92-41.02-31.12-3  1.73+05.83+03.11+0
1750 40  C   A3 A9 A3 A1T   A9 A2 A3    2.35-25.77-41.04-21.10-3  1.69+05.85+03.10+0
1751 40  C   A3 A9 E3 A2T   A9 A3 A3    2.37-25.71-41.20-31.01-3  1.61+05.83+03.11+0
1752 40  C   C3 A9 E4 A2T   A9 A3 A3    3.37-25.86-41.24-31.15-3  1.78+05.96+03.20+0
1753 40  C   A3 E9 F3 A1T   A9 A2 A3    2.29-25.80-45.30-31.10-3  2.02+05.96+03.16+0
1754 40  C   A4S  T   A2T   A9 A3 A3    2.42-2            1.38-3  1.79+05.89+03.22+0
1755 40  C   A3S   A4 A2T   A9 A3 A3    2.46-2       1.28-31.28-3  1.77+05.99+03.21+0
```

Only the "blank" and "P" flags signal data; an "O" flag is generated where no data were recorded.

HEADER RECORD

Variable	Character Position
year	1 - 2
month	3- 4
day	5 - 6
pass number	7 -10
station	11 -12
aspect angle	13 -21
number of samples	22-24

DETECTOR RECORDS

Variable		Character Position
time		1-6
quality flags	B	7-9
	K	10- 12
	E	13- 15
	G	16- 18
	F1	19- 21
	H	22- 24
	L1	25-27
	A	28 -30
	C	31 -33
	T	34 -36
data values	B	37 -42
	K	43 -48
	E	49 -54
	G	55 -60
	F1	61 -66
	H	67 -72
	L1	73 -78
	A	79 -84
	C	85 -90

Figure 7 - Explorer 30 Data Format

Code	Station
HV	Hybla Valley, Virginia
SP	South Point, Hawaii
PM	Point Mugu, California
BP	Blossom Point, Maryland
MO	Mojave, California
FM	Fort Myers, Florida
WK	Winkfield, England
CO	College, Alaska
LI	Lima, Peru
QU	Quito, Ecuador
PA	Point Arguello, California
WO	Woomera, Australia
GF	Grand Forks, Minnesota
ST	Santiago, Chile
RO	Rosman, North Carolina
UL	U. of Alaska, College, Alaska
OR	Orroral, Australia
JO	Johannesburg, Union of S. Africa
KO	Kano, Nigeria
KI	Kauai, Hawaii
MA	Tananarive, Madagascar
NE	St. John's, Newfoundland
CA	Canberra, Australia
KP	Kaena Point, Hawaii

Figure 8 - Station Identification Codes

Character 1 - data quality flag

Character 2 - minute average flag

Character 3 - quiescent level flag

The data values are represented by six characters in the form X.XXSE where X's are significant digits, S the exponent sign, and E the exponent value. Data values for the X-ray detectors and UV detector C are in units of ergs $cm^{-2}sec^{-1}$; data values for the I detector are in amps x 10^{-12}.

The method of coding the quality flags to indicate data quality, minute average, and quiescent level is given in the following paragraphs.

DATA QUALITY FLAG

Character 1 of the quality flag may take on the values S, T, P, N, O or "blank" where:

S	indicates	Saturated Detector
T	indicates	Measurement Below Detector Threshold
P	indicates	Particle Interference
N	indicates	No Data
O	indicates	Inoperative Detector
blank	indicates	Data (no flag given)

MINUTE AVERAGE FLAG

Character 2 of the quality flag is an index, P, of the level of the X-ray or UV flux over a period of 1 min where P=100 x 1σ of detector peak values/1 min average of these values. Character 2 may take on the following values:

A, $0<P \leq 20$ D, $100<P$

B, $20<P \leq 50$ E, $0=P$

C, $50<P \leq 100$

QUIESCENT LEVEL FLAG

Character 3 of the quality flag is an index of the quiescent level of the X-ray or UV flux, expressed as an integer from 1 to 9. The integer multiplied by 0.05 volts corresponds to the level of the detector output appearing on the telemetry record, i.e., a flag of 6 indicates a quiescent level of 0.30 volts. Quiescent levels greater than 9 were set to 9.

REFERENCES

1. Kreplin, R. W., "Final Data and Calibrations for the Explorer 30 (NRL SOLRAD 8) X-Ray Monitoring Experiment (1965-93A)," Jan. 24, 1966.

2. Gregory, Bruce N., and Robert W. Kreplin, "Observations of Solar X-Ray Activity below 20 Angstroms." J. Geophys. Res., 72, 4815-4820, Oct. 1, 1967.

3. Kreplin, R. W., "Solar X-Rays," Ann. Geophys., 17, No. 2, 151-161, 1961.

4. Detweiler, R. C., D. L. Garrett, J. D. Purcell, and R. Tousey, "The Intensity Distribution in the Ultraviolet Solar Spectrum," Extrait des Annales de Geophysique, Tome 17, No. 3, 9-18, July-Sept., 1961.

BIBLIOGRAPHY

Detwiler, R.C., D. L. Garrett, J. D. Purcell, and R. Tousey, "The Intensity Distribution in the Ultraviolet Solar Spectrum," Extrait des Annales de Geophysique, Tome 17, No. 3, 9-18, July-Sept., 1961.

Gregory, Bruce N., and Robert W. Kreplin, "Observations of Solar X-Ray Activity below 20 Angstroms," J. Geophys. Res., 72, 4815-4820, Oct. 1, 1967.

Kreplin, R. W., "Final Data and Calibrations for the Explorer 30 (NRL SOLRAD 8) X-Ray Monitoring Experiment (1965-93A)," Jan. 24, 1966.

Kreplin, R. W., "Solar X-Rays," Ann. Geophys., 17, No. 2, 151-161, 1961.

Kreplin, R. W. "The NRL Solar Monitoring Satellite Program," Report of NRL Progress, 1010, May 1964.

"Monitoring Satellite X-Ray Data Tables," Solar-Geophysical Data, ITSA/ESSA, IER-FB series Bulletins (data tables available from issues of Sept. 30, 1964 to July 1967).

United States Space Science Program Report to COSPAR, Ninth Meeting, Vienna, Austria, May 1966, 18-19, 1966.

FORMAT OF EXPLORER 3[illegible] TAPE

Each physical record contains all detector information for a single pass. The records are of variable length and contain a logical header record and a series of logical detector records.

The logical header record has the following format.

Variable	Character position
year	1-2
month	3-4
day	5-6
orbit number	7-10
station	11-12
aspect angle	13-21
number of samples	22-24

The remainder of the physical record is made up of logical detector records. Each such record consists of 96 characters and contains all flags and detector averages for a one minute period. The number of such logical records is given by characters 22-24 of the logical header record.

The format of a logical detector record is:

Variable		Character position
time		1-6
quality flags,	B	7-9
	K	10-12
	E	13-15
	G	16-18
	F1	19-21
	H	22-24
	L1	25-27
	A	28-30
	C	31-33
	I	34-36
detector response,		
	B	37-42
	K	43-48
	E	49-54
	G	55-60
	F1	61-66

H	67-72
Li	73-78
A	79-84
G	85-90
I	91-96

The quality flags are a 3 character field made up as follows:

Character 1 Data Flag
Character 2 Quality Flag, Minute Average
Character 3 Quality Flag, Quiescent Level

The Data Flag takes on the following values:

S	Saturated
T	Threshold
P	Particle Interference
N	no data
O	Detector off
blank	data, no flag

The Quality Flag, Minute Average, was assigned as follows:

Compute $P = 100X \frac{1\sigma \text{ of minute averages}}{\text{detector minute average}}$

and set the flag as follows;

A $0<P<20$
B $20<P<50$
C $50<P<100$
D $100<P$
E $P=0$

The Quality Flag, Quiescent Level, was reduced to a single digit by multiplying the 3σ quiescent level standard deviation by 20, rounding and converting to an integer. The flag gives an approximation of the 3σ level in .05 volt steps. Values greater than 9 were set to 9. Thus, a flag of 9 would indicate a level of .45 volts or greater.

All data values are represented in 6 characters in the form X.XXSE where X's are significant digits, S the exponent sign and E the exponent value.

65-93A-01B

FORMAT OF EXPLORER 30 TAPE

Each physical record contains all detector information for a single pass. The records are of variable length and contain a logical header record and a series of logical detector records.

The logical header record has the following format:

Variable	Character position
year	1-2
month	3-4
day	5-6
orbit number	7-10
station	11-12
aspect angle	13-21
number of samples	22-24

The remainder of the physical record is made up of logical detector records. Each such record consists of 96 characters and contains all flags and detector averages for a one minute period. The number of such logical records is given by characters 22-24 of the logical header record.

The format of a logical detector record is:

Variable	Character position
time	1-6
quality flags, B	7-9
K	10-12
E	13-15
G	16-18
F1	19-21
H	22-24
L1	25-27
A	28-30
C	31-33
I	34-36
detector response,	
B	37-42
K	43-48
E	49-54
G	55-60
F1	61-66

H	67-72
Li	73-78
A	79-84
G	85-90
I	91-96

The quality flags are a 3 character field made up as follows:

Character 1 Data Flag
Character 2 Quality Flag, Minute Average
Character 3 Quality Flag, Quiescent Level

The Data Flag takes on the following values:

S	Saturated
T	Threshold
P	Particle interference
N	no data
O	Detector off
blank	data, no flag

The Quality Flag, Minute Average, was assigned as follows:

$$\text{Compute } P = 100X \frac{1\sigma \text{ of minute averages}}{\text{detector minute average}}$$

and set the flag as follows;

A $0<P<20$
B $20<P<50$
C $50<P<100$
D $100<P$
E $P=0$

The Quality Flag, Quiescent Level, was reduced to a single digit by multiplying the 3σ quiescent level standard deviation by 20, rounding and converting to an integer. The flag gives an approximation of the 3σ level in .05 volt steps. Values greater than 9 were set to 9. Thus, a flag of 9 would indicate a level of .45 volts or greater.

All data values are represented in 6 characters in the form X.XXSE where X's are significant digits, S the exponent sign and E the exponent value.

65-93A-01B

FORMAT OF EXPLORER 30 TAPE

Each physical record contains all detector information for a single pass. The records are of variable length and contain a logical header record and a series of logical detector records.

The logical header record has the following format:

Variable	Character position
year	1-2
month	3-4
day	5-6
orbit number	7-10
station	11-12
aspect angle	13-21
number of samples	22-24

The remainder of the physical record is made up of logical detector records. Each such record consists of 96 characters and contains all flags and detector averages for a one minute period. The number of such logical records is given by characters 22-24 of the logical header record.

The format of a logical detector record is:

Variable	Character position
time	1-6
quality flags, B	7-9
K	10-12
E	13-15
G	16-18
F1	19-21
H	22-24
L1	25-27
A	28-30
C	31-33
I	34-36
detector response,	
B	37-42
K	43-48
E	49-54
G	55-60
F1	61-66

H	67-72
L1	73-78
A	79-84
G	85-90
I	91-96

The quality flags are a 3 character field made up as follows:

Character 1 Data Flag
Character 2 Quality Flag, Minute Average
Character 3 Quality Flag, Quiescent Level

The Data Flag takes on the following values:

S	Saturated
T	Threshold
P	Particle Interference
N	no data
O	Detector off
blank	data, no flag

The Quality Flag, Minute Average, was assigned as follows:

Compute $P = 100X \frac{1\sigma \text{ of minute averages}}{\text{detector minute average}}$

and set the flag as follows;

A $0<P<20$
B $20<P<50$
C $50<P<100$
D $100<P$
E $P=0$

The Quality Flag, Quiescent Level, was reduced to a single digit by multiplying the 3σ quiescent level standard deviation by 20, rounding and converting to an integer. The flag gives an approximation of the 3σ level in .05 volt steps. Values greater than 9 were set to 9. Thus, a flag of 9 would indicate a level of .45 volts or greater.

All data values are represented in 6 characters in the form X.XXSE where X's are significant digits, S the exponent sign and E the exponent value.

65-093A-01A

SPECIFICATIONS FOR A PROGRAM TO [illegible]
THE NRL EXPLORER 30 X-RAY [illegible]
EXPERIMENT DATA SET (65-093A-01A)

Introduction

The data set in question is available as BCD card images on magnetic tapes. Three errors are known to exist in the present [illegible]:

1. For certain passes, various data were [illegible] valid.
2. For certain passes, two fields were [illegible].
3. For certain passes, one field was multiplied by a factor of 100.

Algorithims to correct these conditions are described [illegible]

Because the correction of the data set requires [illegible] through each tape and a regeneration of the data set, it has [illegible] proposed that the output of the processing be in a new format which should:

1. Be more effectively packed with a more [illegible] of the storage media (tape).
2. Be readily processed at both the NRL and [illegible] facilities.
3. Interpret the various one and three [illegible]
4. Consolidate the various flags to a smaller set and [illegible] data whether or not a value is present.
5. Produce an arrangement of values in which identical detectors with different names are indistinguishable.
6. Convert the output of the C detector from current to flux and scale the I detector.
7. Eliminate the summary cards and consolidate all pass and aspect information in a single record.

In what follows we detail the procedures which are to be followed in producing new data set and provide a description of the edited and refined tape.

Corrections Required

In order to understand the procedure for correcting the errors in the existing data set, we must first step through the reduction process. The [illegible] metered data were given a visual quality examination and then processed [illegible] reduction program. The inputs to this program included an edit card [illegible] format and description are given in Figure 1. On the [illegible] information, the appropriate detectors were processed and [illegible] cards produced. It has since come to light, however, that the edit card was not correctly examined by the program and values were output where no value existed. Since the edit cards are available, the most direct way of removing the noise is to scan the edit cards with the resultant data cards and then check to see that all data are valid. The valid edit cards are given in [illegible], where data are supplied with an invalid edit code, the data can be set to blanks and an error message printed.

FORMAT AND DESCRIPTION OF EDIT CARD

FIELD	COLUMNS	COMMENTS
Date	7-12	Year, month, day
Start pass	14-19	hour, min, sec
Stop pass	21-26	hour, min, sec
Station	28-29	
Pass number	30-33	
Channel 3	35-36	see notes 1, 2
Channel 4	38	see note 1
Channel 5	40	see note 1
Channel 6	42-43	see notes 1, 3
Channel 7	45-46	see notes 1, 3
Aspect	48-51	see note 4
Particle start	53-58	hour, min, sec
Particle stop	60-65	hour, min, sec
Comment codes		see note 5

Note 1. 0 - no data 1 - good data
2 - small data 3 - saturated, not reducible
4 - saturated, but reducible
(this appears only with Channel 6, Col. 43)

Note 2. Two fields are used, labeled 3T. The 3 field uses the codes given in Note 1 for both saturated plus:
5 - only 0.5-3 A present
6 - only 1-8 A present
7 - both 0.5-3 and 1-8 A present
The T field parameter specifies the detector name as follows:

T	0.5-3 A	1-8 A
1	L1	F1
2	F2	L2
3	L3	[illegible]
4	F4	[illegible]

Note 3. Two fields are used, the first is for the [illegible] (I or G), the second for the upper signal [illegible].

Note 4. An input of 0.0 forces generation of the average aspect. (Average aspect may be taken from the summary cards.)

Note 5. The following codes are used:

A Change in AA during pass
B [illegible] roll
C Not automatic reduction
D Less than five min. data
E TT change with data
F Flare
I Interface
N Noise
T Tran.

FIGURE 1

DETECTOR NAME	RANGE	EDIT CHANNEL	VALID CODES
B	44-60 A	4	1, 2
K	8-16 A	5	1, 2
E	8-16 A	5	1, 2
G	1-8 A	7 (first)	1, 2
F1	1-8 A	3, T=1	1, 2, 6, 7
L2	same	3, T=2	1, 2, 6, 7
F3	same	3, T=3	1, 2, 6, 7
L4	same	3, T=4	1, 2, 6, 7
H	1-8 A	4	1, 2
L1	0.5-3 A	3, T=1	1, 2, 5, 7
F2	same	3, T=2	1, 2, 5, 7
L3	same	3, T=3	1, 2, 5, 7
F4	same	3, T=4	1, 2, 5, 7
A	1-20 A	7 (last)	1, 2
C	1050-1350 A	6 (last)	1, 2, 4
I	1225-1350 A	6 (first)	1, 2

FIGURE 2

TABLE OF VALID EDIT CARD CODES FOR EACH DETECTOR

The remaining corrections are limited to the March and April data. Where 0.5-3 A detector words have been interchanged, the correct order can be determined by examining the magnitude of the numbers. In all cases the correct word should be the larger of the two. A magnitude check should also pinpoint those 0.5-3 A detector values which are off by a factor of 100.

Modifications Incorporated

1. To make more effective use of the storage medium, we propose the following format which can be easily processed with either the NRL or the NSSDC computer configuration.

a. Each physical record shall contain all detector information for a single pass. The records shall be of variable length and shall contain a logical header record and a series of logical detector records.

b. The logical header record shall have the following format:

Variable	Character position
year	1-2
month	3-4
day	5-6
orbit number	7-[illegible]
station	[illegible]
aspect angle	[illegible]
number of samples	22-[illegible]

These 24 characters comprise the first 3 words of the physical record in a 48-bit word machine and the first 4 words in a 36-bit word machine.

c. The remainder of the physical record shall be made up of logical detector records. Each such record shall consist of 96 characters (12 or 16 words, depending on word size) and will contain all flags and detector averages for a one minute period. The number of such logical records is given by characters 22-24 of the logical header record.

The format of a logical detector record is:

Variable		Character position
time		1-6
quality flags,	B	7-9
	K	[illegible]-12
	E	[illegible]
	G	[illegible]
	F1	[illegible]
	H	[illegible]
	L1	[illegible]
	A	[illegible]
	C	[illegible]
	I	[illegible]
detector response,	B	37-42
	K	43-48
	E	49-54
	G	55-60
	F1	61-66

[illegible]	[illegible]7-72
L	[illegible]-78
[illegible]	79-[illegible]
C	85-90
I	91-96

d. The quality flags shall be a 3 character field made up as follows:

Character 1 Data Flag
Character 2 Quality Flag, Minute Average
Character 3 Qaulity Flag, Quiescent Level

e. The Data Flag will take on the following values:

S	Saturated
T	Threshold
P	Particle interference
N	no data
Ø	Detector off
blank	data, no flag

Only the blank and P flag will signal data. For all other flags, the data field and quality flags will be left blank. The modifying program will convert the NC, NT, [illegible], [illegible], NO flags to N and the PI, WS and ST flags to P, T, and S respectively. An Ø flag will be generated where no flag is given, but the data field is blank, or if there is no card for that time.

f. The Quality Flag, Minute Average, will be assigned as follows:

Compute $P = 100X \frac{1\sigma \text{ of minute averages}}{\text{detector minute average}}$

and set the flag as follows:

A	$0 < P < 20$
B	$20 < P < 50$
C	$50 < P \leq 100$
D	$100 < P$
E	$P = 0$

g. The Quality Flag, Quiescent Level, will be reduced [illegible] single digit by multiplying the 3σ quiesc[illegible] level standard deviation by 20, rounding and converting [illegible]. The flag will then give an approximation o[illegible] .05 volt steps. Values greater than 9 shall [illegible]. Thus, a flag of 9 would indicate a level o[illegible] .4[illegible] volts or greater.

h. All data values shall be represented in 6 characters in the form X.XXSE where X's are significant digits, S the exponent sign and E the exponent value.

2. The C detector is to be converted from current to [illegible]. [illegible] values are required. If the aspect angle is less than [illegible]°, then word 3 is multiplied by 3×10^{12}; if the aspect angle is greater [illegible] equal to [illegible] word 3 is multiplied by $.96 \times 10^{12}$. This conversion assume[illegible] the flux is Lyman Alpha. In either case the output should be in the [illegible] of [illegible] to [illegible]. The I detector will be scaled by a factor of 10^{12}. This is done to avoid large exponents.

3. All summary cards will be ignored. Only the aspect angle will be saved. This will appear in the header record.

4. The March and April 1966 data from the 0.5-3 A detector (L1, F2, L3, F4) should not exceed 2×10^{-4}. If it does, this indicates it was scaled by a factor of 100. The value should be divided by 100. During March and April all 1-8 A detectors (G, H, F1, L2, F3, L4) should be tested and the larger of word 3 and 4 should be saved as the correct value.

5. Whenever errors are detected as defined in 3 and 4, the erroneous card image and the corrected record should be printed out. This listing should be done on a separate tape so that error messages will not interfere with normal output.

<u>The Processing Plan</u>

The current data consists of 14 magnetic tapes with additional tapes to follow. In this discussion, we limit ourselves to the 14 tapes at the NSSDC. At present, each pass is contained on punch cards with every minute average in 10 cards (one for each detector) and an additional 10 summary cards. If we assume each pass contains only 6 minutes of data (and this is a low estimate), then each pass requires 70 cards or 980 (70x14) 36-bit words. As the data are currently recorded on magnetic tape, 70 records are required, each using .15 inches of tape for data and .75 inches of tape for a record gap. Thus 6.3 inches of tape are required per pass. In the refined format, the same information would be contained in 100 36-bit words with only a single record gap. This should require under 2 inches of tape per pass. Longer passes will produce greater savings. Hence, the entire data set should easily fit on a single reel of tape.

To edit and refine the data set, we propose the following program:

1. Write a program to incorporate all the modifications outlined and correct the errors in the March and April data. The output of this program shall be an edited and refined data set with the channel 3 errors presented.

2. Run the existing 14 tapes through this program and produce a single refined tape.

3. Sort this pass tape to get it in sequential order.

4. Get the edit cards in chronological order.

5. Write a program using the sorted refined tape and stored edit cards to remove the erroneous channel 3 data.

The output of this final step shall be the edited and refined data set. As additional data are received, they may be stepped through the same process.

In order to expedite the processing of the data set, we suggest the following sequence of events.

1. NSSDC documents the proposed changes as per our joint meeting.

2. NRL verifies that the documentation is correct and supplies the missing details.

3. Once the program is approved, NSSDC begins processing the refined tape. A sample is sent to NRL for NRL's checkout.

4. After NRL accepts the tape, the [illegible] is generated and sorted. Once the edit cards are [illegible], they are sorted and a refined and edited tape is made.

5. The final tape is sent to NRL and also entered into the NSSDC system.

6. As more data are received, they are processed in a similar way. When the data set is complete, it may be desirable to merge and sort the entire set.

5() 9991965-93A 021110660100000000000000000000000000000000000000000000000000000

66	428	2286	OR	F2	52944	WS	8.25E-02					
66	428	2286	OR	F2	53044	NT						
66	428	2286	OR	E	52245	NC						
66	428	2286	OR	E	52344	NC						
66	428	2286	OR	E	52444	NC						
66	428	2285	OR	K	52544		1.46E-01	3.34E-04	4.64E-03			
66	428	2286	OR	K	52644		1.21E-01	6.99E-05	4.49E-03			
66	428	2286	OR	K	52744		1.19E-01	1.22E-04	4.49E-03			
66	428	2286	OR	K	52844		1.22E-01	1.54E-04	4.48E-03			
66	428	2286	OR	K	52944		1.59E-01	1.13E-03	5.00E-03			
66	428	2286	OR	K	53044	NT						
66	428	2285	OR	K	53044		4.52E-03	2.09E-04	1.27E-01	-	3.25	SUMMA
66	428	2286	OR	C	52245		2.68E-01	4.42E-13	2.01E-12			
66	428	2285	OR	C	52344		1.82E-01	1.48E-13	2.10E-12			
66	428	2285	OR	C	52444		1.84E-01	1.92E-13	2.17E-12			
66	428	2285	OR	C	52544		1.62E-01	1.50E-13	2.05E-12			
66	428	2285	OR	C	52644		1.49E-01	9.98E-14	2.10E-12			
66	428	2285	OR	C	52744		1.50E-01	1.36E-13	2.04E-12			
66	428	2285	OR	C	52844		1.49E-01	8.34E-14	2.07E-12			
66	428	2285	OR	C	52944		1.80E-01	2.79E-14	2.08E-12			
66	428	2285	OR	C	53044	NT						
66	428	2286	OR	C	53044		2.08E-12	1.36E-13	1.65E-01	-	3.25	SUMM
66	428	2285	OR	G	52245	NC						
66	428	2286	OR	G	52344	NC						
66	428	2286	OR	G	52444	NC						
66	428	2286	OR	G	52544	NC						
66	428	2286	OR	G	52644	NC						
66	428	2285	OR	G	52744	NC						
66	428	2286	OR	G	52844	NC						
66	428	2286	OR	G	52944	NC						
66	428	2286	OR	G	53044	NC						

C-00035
D-00085

0000000000000000000000000000000000000000		REC	1. LENGTH	84
-	0000	REC	2. LENGTH	84
	0000	REC	3. LENGTH	84
	0000	REC	4. LENGTH	84
	0000	REC	5. LENGTH	84
	0000	REC	6. LENGTH	84
03	0000	REC	7. LENGTH	84
03	0000	REC	8. LENGTH	84
03	0000	REC	9. LENGTH	84
03	0000	REC	10. LENGTH	84
03	0000	REC	11. LENGTH	84
	0000	REC	12. LENGTH	84
01 - 3.25	SUMMARY0000	REC	13. LENGTH	84
12	0000	REC	14. LENGTH	84
12	0000	REC	15. LENGTH	84
12	0000	REC	16. LENGTH	84
12	0000	REC	17. LENGTH	84
12	0000	REC	18. LENGTH	84
12	0000	REC	19. LENGTH	84
12	0000	REC	20. LENGTH	84
12	0000	REC	21. LENGTH	84
	0000	REC	22. LENGTH	84
-01 - 3.25	SUMMARY0000	REC	23. LENGTH	84
	0000	REC	24. LENGTH	84
	0000	REC	25. LENGTH	84
	0000	REC	26. LENGTH	84
	0000	REC	27. LENGTH	84
	0000	REC	28. LENGTH	84
	0000	REC	29. LENGTH	84
	0000	REC	30. LENGTH	84
	0000	REC	31. LENGTH	84
	0000	REC	32. LENGTH	84

66	531	2768	HV	G	215654	ST							
66	531	2768	HV	G	215754	PI							
66	531	2768	HV	G	215854	PI	5.11E-01	8.20E-06	1.49E-04	3.15E-05			
66	531	2768	HV	G	215954		5.34E-01	1.16E-05	1.55E-04	3.28E-05			
66	531	2768	HV	G	22 054		5.39E-01	1.68E-05	1.59E-04	3.38E-05			
66	531	2768	HV	G	22 154		5.11E-01	1.66E-05	1.59E-04	3.38E-05			
66	531	2768	HV	G	22 254		5.16E-01	1.40E-05	1.68E-04	3.56E-05			
66	531	2768	HV	G	22 354		5.18E-01	2.99E-05	1.62E-04	3.44E-05			
66	531	2768	HV	G	22 454		5.71E-01	2.05E-05	1.57E-04	3.33E-05			
66	531	2768	HV	G	22 554		5.82E-01	9.09E-06	1.57E-04	3.33E-05			
66	531	2768	HV	G	22 653		5.14E-01	1.71E-05	1.54E-04	3.27E-05			
66	531	2768	HV	G	22 653		1.58E-04	1.58E-05	6.07E-01	5	3.25		SUMMARY
66	531	2768	HV	A	215155		6.04E-01	1.78E-01	9.97E-01	1.85E-03	9.84E-03		
66	531	2768	HV	A	215254		5.74E-01	1.07E-01	8.77E-01	1.63E-03	8.66E-03		
66	531	2768	HV	A	215354	NT							
66	531	2768	HV	A	215454	ST							
66	531	2768	HV	A	215554	ST							
66	531	2768	HV	A	215654	ST							
66	531	2768	HV	A	215754	ST							
66	531	2768	HV	A	215854	PI	5.00E-01	5.95E-02	9.37E-01	1.74E-03	9.25E-03		
66	531	2768	HV	A	215954		5.58E-01	4.13E-01	1.10E 00	2.04E-03	1.09E-02		
66	531	2768	HV	A	22 054		5.16E-01	1.19E-01	9.51E-01	1.76E-03	9.39E-03		
66	531	2768	HV	A	22 154		5.98E-01	9.29E-02	8.61E-01	1.60E-03	8.50E-03		
66	531	2768	HV	A	22 254		5.21E-01	3.77E-02	8.72E-01	1.62E-03	8.51E-03		
66	531	2768	HV	A	22 354		5.06E-01	7.78E-02	8.93E-01	1.65E-03	8.81E-03		
66	531	2768	HV	A	22 454		5.00E-01	1.17E-01	9.21E-01	1.71E-03	9.09E-03		
66	531	2768	HV	A	22 554		5.04E-01	1.42E-01	8.82E-01	1.63E-03	8.70E-03		
66	531	2768	HV	A	22 653		5.15E-01	1.63E-01	9.24E-01	1.71E-03	9.12E-03		
66	531	2768	HV	A	22 653		9.10E-01	1.15E-01	6.09E-01	5	3.25		SUMMAR

	0000	REC	1. LENGTH	84
	0000	REC	2. LENGTH	84
9E-04 3.15E-05	0000	REC	3. LENGTH	84
5E-04 3.28E-05	0000	REC	4. LENGTH	84
9E-04 3.38E-05	0000	REC	5. LENGTH	84
0E-04 3.38E-05	0000	REC	6. LENGTH	84
8E-04 3.56E-05	0000	REC	7. LENGTH	84
2E-04 3.44E-05	0000	REC	8. LENGTH	84
7E-04 3.33E-05	0000	REC	9. LENGTH	84
7E-04 3.33E-05	0000	REC	10. LENGTH	84
4E-04 3.27E-05	0000	REC	11. LENGTH	84
7E-01 & 3.25	SUMMARY0000	REC	12. LENGTH	84
97E-01 1.85E-03 9.84E-03	0000	REC	13. LENGTH	84
77E-01 1.63E-03 8.56E-03	0000	REC	14. LENGTH	84
	0000	REC	15. LENGTH	84
	0000	REC	16. LENGTH	84
	0000	REC	17. LENGTH	84
	0000	REC	18. LENGTH	84
	0000	REC	19. LENGTH	84
37E-01 1.74E-03 9.25E-03	0000	REC	20. LENGTH	84
10E 00 2.04E-03 1.09E-02	0000	REC	21. LENGTH	84
51E-01 1.76E-03 9.39E-03	0000	REC	22. LENGTH	84
61E-01 1.60E-03 8.50E-03	0000	REC	23. LENGTH	84
72E-01 1.62E-03 8.61E-03	0000	REC	24. LENGTH	84
93E-01 1.65E-03 8.81E-03	0000	REC	25. LENGTH	84
21E-01 1.71E-03 9.09E-03	0000	REC	26. LENGTH	84
82E-01 1.63E-03 8.70E-03	0000	REC	27. LENGTH	84
24E-01 1.71E-03 9.12E-03	0000	REC	28. LENGTH	84
09E-01 & 3.25	SUMMARY0000	REC	29. LENGTH	84
	0000	REC	30. LENGTH	84

HEADER RECORDS AND TIMES OF EXPLORER 30 SOLAR XRAY DAT

67 8149050NE	- 1.75	12	827 6	838 5
67 8149052HV	- 1.25	6	115455	115954
67 8149052NE	- 1.25	15	115655	121054
67 8149053HV	- 2.75	13	1339 0	135059
67 8149055FM	- 3.25	14	171024	172323
67 8149057KI	- 5.75	15	202856	204254
67 8149058KI	- 7.81	12	2213 6	2224 4
67 8159071KI	-17.76	14	195852	201150
67 8159072KI	-18.97	16	214223	215721
67 8169076OR	-23.28	7	45343	45942
67 8169080HV	-23.63	8	1055 2	11 2 1
67 8169081HV	-23.62	12	123940	125039
67 8169081NE	-23.61	13	124147	125346
67 8169083HV	-24.63	11	16 8 3	1618 2
67 3179088OR	-29.31	7	05411	1 010
67 8179092NE	-30.04	12	656 3	7 7 2
67 8179093HV	-29.71	8	83640	84339
67 8179094HV	-29.16	8	102415	103114
67 8179094NE	-29.16	14	102553	103852
67 8179095HV	-28.84	13	12 815	122014
67 8179095NE	-28.81	14	121037	122336
67 8179096RO	-28.71	9	135822	14 621
67 8179096HV	-28.75	9	135832	14 631
67 8179097RO	-28.97	14	153728	155027
67 8179097HV	-28.98	9	153730	154529
67 8179100KI	-30.72	15	204231	205629
67 8189103OR	-32.06	14	2 322	21621
67 8189104OR	-31.93	12	349 8	4 0 7
67 8189106NE	-31.34	11	62625	63624
67 8189106HV	-31.29	4	62645	62944
67 8189107HV	-30.68	8	8 710	814 9
67 8189108HV	-29.75	8	95250	95949
67 8189109NE	-28.95	14	113951	115250
67 8189114KI	-28.83	14	201258	202556
67 8199117OR	-29.25	14	133 6	146 5
67 8199118OR	-29.00	13	318 4	330 3
67 8199119WK	-28.47	10	42045	43044
67 8199121HV	-27.08	6	738 0	74259
67 8199121NE	-26.84	11	74132	75131
67 8199122HV	-26.11	8	92230	92929
67 8199123NE	-25.12	14	11 941	112240
67 8199124HV	-24.37	9	1258 5	13 6 4
67 8199125HV	-24.06	14	143625	144924
67 8199125FM	-24.06	16	143756	145254
67 8199128KI	-24.11	13	194331	195529
67 8199129KI	-24.14	7	212854	213453
67 8209131OR	-24.22	13	1 3 2	115 1
67 8209137NE	-19.49	15	1039 0	105259
67 8209142KI	-18.40	14	191121	192419
67 8219153RO	-14.15	15	133556	134955
67 8229160WK	-15.87	9	1 655	11454
67 8229163WK	-14.49	16	61521	63019
67 8229166NE	-13.12	13	112314	113513
67 8229171KI	-15.27	7	195447	20 046
67 8239174WK	-16.75	8	03710	044 9

67 8239177HV	-16.46	4	53930	54229
67 8239177WK	-16.34	16	545 1	55959
67 8239178HV	-16.24	7	72055	72654
67 8239178NE	-16.17	13	72357	73556
67 8239178OR	-15.68	7	82359	82958
67 8239179HV	-15.87	8	9 720	91419
67 8239179NE	-15.85	14	9 814	92113
67 8239180HV	-15.81	7	105740	11 339
67 8239182LI	-17.08	16	143113	144611
67 8249189WK	-22.26	11	14820	15819
67 8249193OR	-22.32	6	93828	94327
67 8249195FM	-23.30	15	12 644	122043

*** END TAPE ***

HEADER RECORDS AND TIMES OF EXPLORER 30 SOLAR XRAY DATA

53930	54229
545 1	55959
72055	72654
72357	73556
82359	82958
9 720	91419
9 814	92113
105740	11 339
143113	144611
14820	15819
93828	94327
12 644	122043