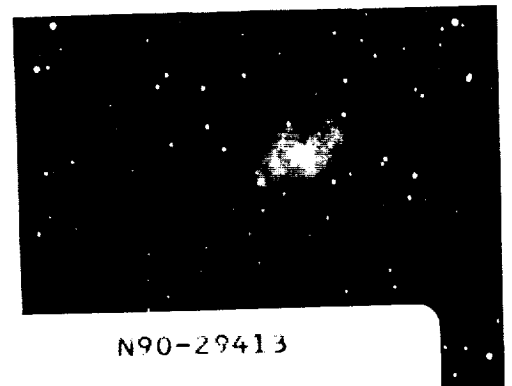
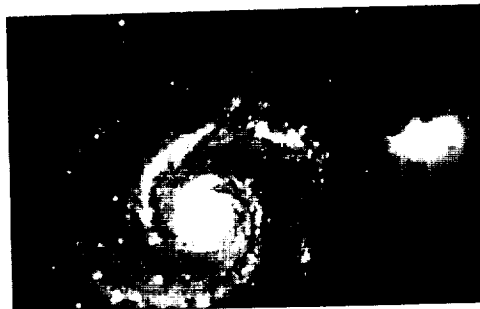
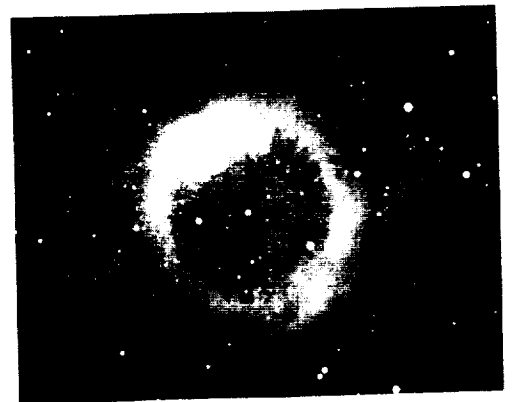


# DATA CATALOG SERIES FOR SPACE SCIENCE AND APPLICATIONS FLIGHT MISSIONS

Volumes 5A & 5B

Descriptions of Astronomy,  
Astrophysics, and Solar Physics  
Spacecraft, Investigations,  
and Data Sets

June 1988



(NASA-TM-101906) DATA CATALOG SERIES FOR  
SPACE SCIENCE AND APPLICATIONS FLIGHT  
MISSIONS. VOLUME 5A: DESCRIPTIONS OF  
ASTRONOMY, ASTROPHYSICS, AND SOLAR PHYSICS  
SPACECRAFT AND INVESTIGATIONS. VOLUME 5B:

N90-29413

63/12 Unclas  
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## CATEGORIES OF SPACECRAFT USED IN THIS SERIES

### PLANETARY AND HELIOCENTRIC

This category includes probes to the various planets of the solar system and probes designed to make measurements of the characteristics of interplanetary space. Also included are the probes that will pass out of the solar system into interstellar space.

### METEOROLOGY AND TERRESTRIAL APPLICATIONS

This category includes geocentric spacecraft whose primary mission is to make remote sensing measurements of the earth and its atmosphere. Spacecraft that carry instrumentation to make geodesy and gravity survey measurements are also included. Technology, engineering, and communications spacecraft or investigations are not included because NSSDC does not archive such data.

### ASTRONOMY, ASTROPHYSICS, AND SOLAR PHYSICS

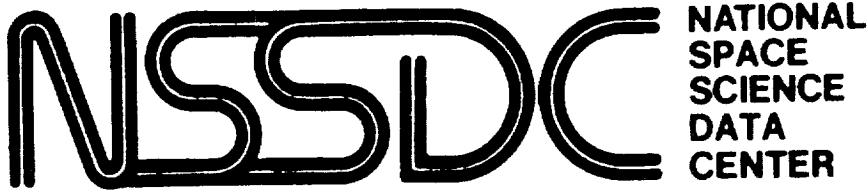
This category consists of scientific satellites designed to conduct investigations of the sun, stellar objects, nonstellar sources, and interstellar phenomena. These satellites are geocentric except for the selenocentric RAE-B.

### GEOSTATIONARY AND HIGH-ALTITUDE SCIENTIFIC

This category includes those satellites designed to conduct investigations of the characteristics of near-earth space from orbits with apogees near geostationary altitude and higher. Three of the spacecraft are selenocentric. Communications satellites are not included because NSSDC does not archive such data.

### LOW- AND MEDIUM-ALTITUDE SCIENTIFIC

This category includes those spacecraft whose apogees are well below geostationary altitude and whose primary purpose is to conduct investigations in the near-earth environment.



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WORLD DATA CENTER A for ROCKETS AND SATELLITES

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# DATA CATALOG SERIES FOR SPACE SCIENCE AND APPLICATIONS FLIGHT MISSIONS

Volume 5A

**Descriptions of Astronomy,  
Astrophysics, and Solar Physics  
Spacecraft and Investigations**

June 1988





DATA CATALOG SERIES FOR SPACE SCIENCE  
AND APPLICATIONS FLIGHT MISSIONS

Volume 5A

DESCRIPTIONS OF ASTRONOMY, ASTROPHYSICS, AND SOLAR PHYSICS  
SPACECRAFT AND INVESTIGATIONS

Edited by

Sang J. Kim

June 1988

National Space Science Data Center (NSSDC)/  
World Data Center A for Rockets and Satellites (WDC-A-R&S)  
National Aeronautics and Space Administration  
Goddard Space Flight Center  
Greenbelt, Maryland 20771



## PREFACE

This volume is part of a series (see inside front cover) that describes data sets and related spacecraft and investigations from space science and applications flight investigations. The series describes the data sets held by the National Space Science Data Center (NSSDC), some of the data sets held by NASA-funded investigators, and some of those held by foreign investigators. The documents in this series will serve as guides to extensive data sets held and serviced by other Government agencies.

We would like to thank the many investigators who have submitted their data for archiving at NSSDC. Their cooperation in supplying current status information is gratefully acknowledged. Thanks are also extended to the other NSSDC personnel, employees of the onsite contractor, Science Applications Research, who have been involved in the information handling necessary to produce this volume. Special acknowledgment is given to Karen Satin for her extensive editorial assistance.

The Data Center is continually striving to increase the usefulness of its data holdings, supporting indexes, and documentation. Scientists are invited to submit their space science data and related documentation to NSSDC. Their comments on the corrections to the present catalog will be greatly appreciated. Catalog recipients are urged to inform potential data users of its availability.

Sang J. Kim

June 1988



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# INTRODUCTION





# 1. INTRODUCTION

## 1.1 PURPOSE

This volume is one of a series of 11 that will describe (1) the holdings from all spacecraft flight investigations for which NSSDC possesses data or can direct people to the data source, (2) all data sets held by NSSDC, (3) some of the data sets held and serviced by NASA-funded investigators, and (4) some of the data sets held and serviced by foreign investigators. The series of documents will also direct readers to extensive data sets held and serviced by other Government agencies, particularly the National Oceanographic and Atmospheric Administration (NOAA). There is one major omission from this series: the extensive set of data obtained from the lunar missions conducted by NASA, supplemented by a few small photographic data sets from Soviet missions. These are described in the *Catalog of Lunar Mission Data* (NSSDC/WDC-A-R&S 77-02) and will not be repeated in this series, except for a few cases. The data from IMP-E, the Apollo 15 subsatellite, and the Apollo 16 subsatellite are included in the series, since these data are important to disciplines other than those connected with lunar studies. Some of the experiments of the Apollo ALSEP missions also yielded useful data for magnetospheric and interplanetary physics, but they are not included in the series because the instruments were confined to the surface of the moon. Readers should consult the *Catalog of Lunar Mission Data* if they are interested in such data sets.

The series consists of (1) five volumes that describe the spacecraft and their associated investigations, separated into various categories; (2) five corresponding volumes that describe the various orbital information and investigation data sets; and (3) a master index volume. The five categories of spacecraft are (i) Planetary and Heliocentric, which includes planetary flybys and probes; (ii) Meteorology and Terrestrial Applications; (iii) Astronomy, Astrophysics, and Solar Physics, which is entirely geocentric except the selenocentric RAE-B; (iv) Geostationary and High-Altitude Scientific; and (v) Low- and Medium-Altitude Scientific. It is impossible to provide an organization of categories that separates the investigations cleanly into scientific disciplines, since many missions were multidisciplinary. With the above organization, which is partly discipline oriented and partly orbit oriented, it was found that in nearly all cases a given spacecraft belonged clearly to only one of the five categories. The few exceptions encountered have resulted in some data sets appearing in more than one data set volume.

Each volume is organized in a way that is believed to be most useful to the user, and the arrangement is described for each volume in Section 1.2, Organization. The standard types of orbital information given in the data set catalogs, i.e., predicted, refined, and definitive, are given in a tabular form to avoid repeating the same brief description an inordinate number of times. The standard description of a data set from an investigation is a free-text brief description, since the wide variety of instruments precludes using a tabular format in most cases.

This catalog series has been prepared following a two-year survey and followup activity by NSSDC personnel to obtain information about the completeness of the NSSDC holdings and to solicit the description of data sets that will be archived by individual investigators; these latter data sets are referred to as directory data sets. This survey was conducted only for NASA missions launched after December 31, 1962, but it includes the majority of NSSDC holdings. Of the 100 investigators surveyed, representing 346 inactive (no longer associated with an active science working team or equivalent) experiments, a small percentage failed to respond in 17 months of concerted solicitation for information. Consequently, there are now 20 investigations, for which NSSDC has no data, that will be

dropped from this catalog series, since it would be irresponsible for NSSDC to send requesters to a possible data source that no longer has data or is nonresponsive. The surveyed investigations were identified for which data no longer exist or for which the instrument failed at launch. These investigations are included in the spacecraft/investigation volumes so that users will know that it is fruitless to try to obtain such data anywhere. Also included in the spacecraft/investigation volumes are descriptions of recent spacecraft and investigations from which NSSDC expects to receive data.

The main purpose of this series is to identify the data and the contact from whom the data can be obtained within the scope previously defined. In addition, attempts have been made to identify the personnel involved with the investigation and to provide their current affiliations, so that a user will know whom to contact for additional information relative to a given data set that NSSDC archives. In some cases people have retired or have gone into different areas of endeavor. This situation is treated by showing the last affiliation of such an individual and printing "NLA" (no longer affiliated) after the person's name. The spacecraft/mission personnel are identified at the institution where they performed their relevant duties, as this is the place where the original project records are most likely to be found. "NLA" is printed with the names of personnel who are no longer associated with the given institution.

It is hoped that this series of documents will serve for many years as the source for data in the disciplines that NSSDC handles. The periodic *NSSDC Data Listing* will be used to update the time intervals for which data are available and to identify, in brief form, the new data sets that become available in the future. The *Report on Active and Planned Spacecraft and Experiments* will be used to describe the new spacecraft and experiments that are placed in orbit.

## 1.2 ORGANIZATION

This volume of the *NSSDC Data Catalog Series for Space Science and Applications Flight Missions* deals with geocentric spacecraft that carried astronomical experiments, with the exception of the selenocentric RAE-B. The principal subject areas are investigations of solar, stellar, interstellar, galactic, and intergalactic phenomena throughout the entire electromagnetic spectrum, from gamma-ray through optical to radio wavelengths. Also included in this volume are the micrometeoroid experiments aboard Pegasus 1, 2, and 3, and S 55B and S 55C. No attempt has been made to reference investigations that are related to the above disciplines but that are described in other volumes of this series.

Section 2, Spacecraft and Investigations Descriptions, contains descriptions of (1) investigations for which NSSDC has data sets, and (2) investigations for which NSSDC expects to receive data, either because the investigations were on recently launched spacecraft or because NSSDC received information during the preparation of this catalog that data would be forthcoming. The organization of spacecraft descriptions in Section 2 is mainly alphabetical by the NSSDC spacecraft common name. Under each spacecraft heading, the appropriate investigation descriptions are arranged alphabetically by name of the original principal investigator.

Each spacecraft description entry in Section 2 includes the spacecraft alternate names, NSSDC ID number (see Appendix A), launch information, orbit parameters, sponsoring country and agency, personnel with their current or latest affiliations, and a brief description of the mission. Each investigation description entry in Section 2 includes the investigation name (as used by NSSDC), NSSDC ID number, discipline(s), experiment personnel with their current or latest affiliations, and a brief description of the investigation.

Section 3, Index of Spacecraft and Investigations, lists the spacecraft and investigations described in this volume. Spacecraft common names and alternate names are in numerical and alphabetical order. Included with each spacecraft common name are the sponsoring country and agency, launch date, orbit type, NSSDC ID number, and page where the spacecraft description may be found in this volume. Grouped under each spacecraft name are the particular investigations for that spacecraft that are dealt with in this volume, arranged alphabetically by principal investigator's last name. Each of these entries also includes the investigation name, NSSDC ID number, and page where the investigation description may be found.

Some definitions and acronyms used in this volume are listed in Appendices A and B.

### 1.3 NSSDC PURPOSE, FACILITIES, AND SERVICES

The National Space Science Data Center was established by the National Aeronautics and Space Administration to provide data and information from space science and applications investigations in support of additional studies beyond those performed by principal investigators. In addition to its main function of providing selected data and supporting information for further analysis of space science flight experiments, NSSDC provides a wide spectrum of online and offline information services. Among these are the *Report on Active and Planned Spacecraft and Experiments* and various user's guides.

Virtually all the data available at or through NSSDC result from individual experiments carried on board individual spacecraft. The Data Center has developed an information system utilizing a spacecraft/investigation/data identification hierarchy. This catalog is based on the information contained in that system. The Data Center is initiating an effort to design a new information base, using a relational data base model, to facilitate easy electronic access by remote users.

NSSDC provides facilities for reproduction of data and for onsite data use. Researchers are invited to study the data while at the Data Center. The Data Center staff will assist users with data searches and with the use of equipment. In addition to spacecraft data, the Data Center maintains some supporting information and data that may be related to the needs of researchers.

The services provided by NSSDC are available to any individual or organization resident in the United States and to researchers outside the United States through WDC-A-R&S. Normally, a charge is made to cover the cost of reproducing and processing the requested data. The researcher is notified of the charge, and payment must be received prior to processing. However, as resources permit, the director of NSSDC may waive charges for modest amounts of data when they are to be used for scientific studies or for specific educational purposes and when they are requested by an individual affiliated with (1) NASA installations, NASA contractors, or NASA grantees; (2) other U.S. Government agencies, their contractors, or their grantees; (3) universities or colleges; (4) state or local governments; or (5) nonprofit organizations.

The Data Center's address for information (for U.S. researchers) follows:

National Space Science Data Center  
Code 633.4  
Goddard Space Flight Center  
Greenbelt, Maryland 20771  
Telephone: (301) 286-6695  
Telex No.: 89675 NASCOM GBLT  
TWX No.: 7108289716  
SPAN Address: NCF::REQUEST

Researchers who reside outside the United States should direct requests for information to the following address:

World Data Center A for Rockets and Satellites  
Code 630.2  
Goddard Space Flight Center  
Greenbelt, Maryland 20771 U.S.A.  
Telephone: (301) 286-6695  
Telex No.: 89675 NASCOM GBLT  
TWX No.: 7108289716  
SPAN Address: NCF::REQUEST

For access to a menu of information, limited data directory, and limited data display, requesters may use SPAN to log onto the NSSDCA node, with NSSDC as Username. No password is required. NSSDC may also be reached by Telenet; current procedures are available from the NSSDC Network Hotline (301-286-7251). The limited data directory is being continually expanded and developed, and allows users to search for useful data sets by several methods.

#### 1.4 DATA ACQUISITION

NSSDC invites members of the scientific community involved in spaceflight investigations to submit data to the Data Center or to provide information about the data sets that they prefer to handle directly. The Data Center assigns a discipline specialist to work with each investigator or science working team to determine the forms of data that are likely to be most useful to the community of users that obtain data from NSSDC. The pamphlet *Guidelines for Submitting Data to the National Space Science Data Center* can be provided on request.

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# SPACECRAFT AND INVESTIGATION DESCRIPTIONS





NSSDC ID- 77-075A-02

PERSONNEL

PI - E.A. BOLDT  
PI - G.P. GARMIRE

NASA-GSFC  
PENNSYLVANIA STATE U

BRIEF DESCRIPTION

This experiment was designed to measure the diffuse X-ray background in the energy range of 0.15 to 60 keV. Objectives were to measure relative diffusion and absorption of diffuse hard and soft X-rays at high galactic latitudes and correlate these measurements with radio and optical studies; to determine discrete source background contribution; to detect large-scale global anisotropies associated with solar system motion with respect to distant emission sources; to make broadband spectral classifications of diffuse and discrete X-ray sources; and to establish temporal variations of multicomponent spectral sources. Three types of multianode, multilayer counters were used for this experiment. Three high-energy detectors (HED) with xenon-filled counters covered the energy range of 3 to 60 keV with an effective area of 900 sq cm. The minimum detectable flux in a 1E3-s observation was 1E-4/sq cm-s-keV for energy bands 3 to 20 keV and 20 to 60 keV. One medium energy detector (MED) with an argon-filled counter covered the energy range 1.5 to 15 keV. The effective area of this counter was 900 sq cm. The minimum detectable flux was the same as for the HEDs. The two low-energy detectors (LED) were thin-window, propane gas flow counters to cover the energy range of 0.15 to 3 keV. The LED used permanent magnets to prevent incident electrons from reaching the detector window and a sunshade whenever direct sunlight was near the field of view. It had a 600-sq cm effective area. The minimum detectable flux for a 1E3-s observation was 1E-3/sq cm-s-keV for the 0.15- to 0.28-keV band and for the 0.5- to 3.0-keV band. The LEDs were shut down in May 1978 because of depletion of gas in the system. For more details, see R. Rothschild et al., Space Science Instr., v. 4, p. 269, 1979.

-----HEAD 1, FRIEDMAN-----

INVESTIGATION NAME- LARGE AREA COSMIC X-RAY SURVEY (A-1)

NSSDC ID- 77-075A-01

PERSONNEL

PI - H.D. FRIEDMAN

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This instrument was a modular assembly of seven large-area, thin-window, proportional counter sensor modules to record incident X-ray fluxes. The objectives were to map the celestial sphere in the energy range from .15 to 20 keV with greater sensitivity than achieved previously, and to measure the spectra, location, and time variations of X-ray sources with a 0.1- to 1-deg angular resolution. Each of the sensor modules consisted of a proportional counter body frame on which was mounted a window support structure, counter back structure with integral control counter, collimator assembly, and electronic subassemblies. A honeycomb cell construction for the basic counter provided X-ray collimation of 80-deg by 4-deg FWHM. A back layer of the three-layered counter provided anticoincidence protection against charged particle events. The front layer was the main X-ray sensor for most of the energy ranges. The collimator for each of the counters viewed the sky. The collimator on sensor modules 1 through 4 provided 1-deg by 4-deg FWHM FOV, on sensor modules 5 and 6 provided 1-deg by 0.5-deg FWHM FOV, and on sensor module 7 provided 8-deg by 2-deg FWHM FOV. Each of the sensors included movable radioactive calibration sources to provide a check on counter operation and channel position. There was also a magnet assembly to deflect low-energy radiation belt electrons. The control counter was a small counter at the back of the assembly that shared the counting gas with the main counter. It was excited by an Fe 55 source and served to generate the proper operating voltage on the main counter to compensate for gas density changes and high-voltage drifts. For more details, see H. Friedman, Proc. Roy. Soc. Lon., v. A 366, p. 423, 1979.

-----HEAD 1, PETERSON-----

INVESTIGATION NAME- LOW-ENERGY GAMMA-RAY AND HARD X-RAY SKY SURVEY (A-4)

NSSDC ID- 77-075A-04

PERSONNEL

PI - L.E. PETERSON  
PI - W.H.G. LEWIN

U OF CALIF, SAN DIEGO  
MASS INST OF TECH

BRIEF DESCRIPTION

This experiment measured point and diffuse sources of X-rays and gamma rays in the 10-keV to 10-MeV range. The instrument consisted of seven NaI(Tl)/CsI(Na) Phoswich scintillators surrounded by eight large CsI(Na) scintillators that provided shielding and defined the fields of view. There were three detector types. The intermediate-energy detectors had an energy range of 10 to 200 keV, an area of 225 sq cm, CsI shielding of 2 in., and a field of view (FWHM) of 1 deg x 20 deg. The slat collimators of the intermediate-energy detectors were positioned at 60 deg relative to the scan direction, allowing point source determination to 1 deg over the approximately 40-deg-wide band scanned during each spacecraft

rotation. The point-mode detectors had an energy range of 0.1 to 5 MeV, an area of 180 sq cm, CsI shielding of about 4 in., and a field of view (FWHM) of 20 deg. Sources detected were identified with low-energy sources by spectral similarity with measurements made by the intermediate-energy detector at about 100 keV. The diffuse-mode detectors had an energy range of 0.2 to 10 MeV, an area of 125 sq cm, CsI shielding of about 6 in., and a field of view (FWHM) of 10 deg. Point sources measured by the diffuse-mode detectors were related to those with similar spectra in the point-mode detectors. Each of the detectors was equipped with a pulse-shape analyzer and discriminator that detected and vetoed CsI(Na) events. The combination of shield upper- and lower-level discriminators (nominal settings of 5 MeV and 0.1 MeV) used for detector anticoincidence was selectable by command. Event time was nominally known to 0.1-s accuracy. This could be improved to 5 ns or 2E-5 s by command. The instrument also contained three particle monitors, which measured proton and electron fluxes in three energy ranges. There was a high-resolution timing system that measured cosmic gamma-ray bursts. For more details, see R. Rothschild, Earth and Extra. Sci., v. 3, pp. 189-196, 1979.

-----HEAD 1, SCHWARTZ-----

INVESTIGATION NAME- X-RAY SCANNING MODULATION COLLIMATOR (A-3)

NSSDC ID- 77-075A-03

PERSONNEL

PI - D. SCHWARTZ  
PI - H.V.D. BRADT

SAO  
MASS INST OF TECH

BRIEF DESCRIPTION

This experiment used a scanning modulation collimator (SMC) instrument to determine, for selected X-ray sources, their position within 5 arc-s and their angular size to a precision of 5-10 arc-s in three energy intervals from 1 to 15 keV, and to study the structure of their X-ray emission to a precision of 10 arc-s in three energy intervals from 1 to 15 keV. The SMC was composed of two parts, each containing four wire grid planes. Each provided a location and angular size measurement in one dimension. An additional collimator located forward to the front grid restricted the overall instantaneous field of view to 4-deg x 4-deg FWHM for each SMC. The outward view direction was perpendicular to the spacecraft spin axis (Z axis) and, hence, the instrument scanned a great circle band on the sky. The two parts of the SMC differed by having their plane of maximum transmission inclined +10 deg and -10 deg to the scan direction. Precise two-dimensional locations were determined by the intersections of the locations obtained from each of the collimators. The angular response of the two SMC components was 30 and 120 arc-s, which extended the dynamic range up to 16 arc-min, over which angular size and structure measurements were made. The SMC instrument was capable of detecting X-ray sources with an intensity of 1E-3 that of the Crab Nebula. This experiment was also equipped with two aspect sensors to provide data on the stellar orientation of the collimator axes to achieve the 5-arc-s position of sources. For more details, see R. E. Griffiths et al., Astroph. J., v. 230, p. L21, 1979.

\*\*\*\*\* HEAD 2 \*\*\*\*\*

SPACECRAFT COMMON NAME- HEAD 2

ALTERNATE NAMES- HIGH ENERGY ASTRON OBS-B, 11101  
HEAD-B, EINSTEIN

NSSDC ID- 78-103A

SPONSORING COUNTRY  
U.S.

LAUNCH DATE- 11/13/78

WEIGHT- 3130. KG

ORBIT PARAMETERS

ORBIT TYPE- GECENTRIC  
ORBIT PERIOD- 94.0 MIN  
PERIAPSIS- 465. KM ALT

EPOCH DATE- 11/14/78  
INCLINATION- 23.5 DEG  
APOAPSIS- 476. KM ALT

PERSONNEL

MC - R.E. HALPERN  
SC - A.C. BPP  
PM - J.F. STONE  
PS - S.S. HOLT

NASA HEADQUARTERS  
NASA HEADQUARTERS  
NASA-MSFC  
NASA-GSFC

BRIEF DESCRIPTION

This was the second of three missions in a program of research in high-energy astronomical phenomena. The specific objectives of this mission were imaging and spectrographic studies of specific X-ray sources and studies of the diffuse X-ray background. The spacecraft was identical to the HEAD 1 vehicle, with the addition of reaction wheels and associated electronics to enable the telescope to be pointed at sources to within 1 min of arc. The instrument payload weighed 1450 kg. A large grazing-incidence X-ray telescope provided images of sources that were then analyzed by four interchangeable instruments mounted on a carousel arrangement that could be rotated into the focal plane of the telescopes. The telescope collected X-rays over an angular range of approximately 1 deg x 1 deg, with the focal plane instruments determining the limiting resolution up to a few arc-s for each measurement. The four instruments were a solid-state spectrometer (SSS), a



focal plan crystal spectrometer (FPCS), an imaging proportional counter (IPC), and a high-resolution imaging detector (HRI). Also included were a monitor proportional counter (MPC), which viewed the sky along the telescope axis, a broadband filter, and objective grating spectrometers that could be used in conjunction with focal plane instruments and an aspect system. The scientific objectives were (1) to locate accurately and examine X-ray sources in the energy range 0.2 to 4.0 keV, with high resolution; (2) to perform high-spectral-sensitivity measurements with both high- and low-dispersion spectrographs; and (3) to perform high-sensitivity measurements of transient X-ray behavior. The spacecraft was a hexagonal prism 5.68 m high and 2.67 m in diameter. Downlink telemetry was at a data rate of 6.5 kb/s for real-time data and 128 kb/s for either of two tape recorder systems. An attitude control and determination subsystem was used to point and maneuver the spacecraft. Gyros, sun sensors, and star trackers were employed as sensing devices. For more details, see R. Giacconi et al., *Astroph. J.*, v. 230, p. 540, 1979.

mode to achieve higher resolution. For more details, see C. R. Canizares and P. F. Winkler, *Astroph. J.*, v. 246, pp. L33-L36, 1981.

-----HEAD 2, GIACCONI-----

INVESTIGATION NAME- IMAGING PROPORTIONAL COUNTER (IPC)

NSSDC ID- 78-103A-04

PERSONNEL		SPACE TELESCOPE SCI IN
PI - R.	GIACCONI	SAO
O1 - H.D.	TANANBAUM	MASS INST OF TECH
O1 - G.W.	CLARK	NASA-GSFC
O1 - S.S.	HOLT	COLUMBIA U
O1 - R.	NOVICK	

BRIEF DESCRIPTION

The IPC was a position-sensitive proportional counter that provided good efficiency and full focal-plane coverage with a 75 x 75-arc-min FOV and an effective area of approximately 100 sq cm. It had a spatial resolution of 1 arc-min, a temporal resolution of 63 microseconds, and 32 energy channels in the range of 0.15 to 4.0 keV. Two identical counters were included for redundancy, plus a background counter for anticoincidence and an inflight calibration system.

-----HEAD 2, GIACCONI-----

INVESTIGATION NAME- MONITOR PROPORTIONAL COUNTER (MPC)

NSSDC ID- 78-103A-01

PERSONNEL		SPACE TELESCOPE SCI IN
PI - R.	GIACCONI	SAO
O1 - H.D.	TANANBAUM	MASS INST OF TECH
O1 - G.W.	CLARK	NASA GSFC
O1 - S.S.	HOLT	COLUMBIA U
O1 - R.	NOVICK	

BRIEF DESCRIPTION

This experiment consisted of a proportional counter that viewed space through a collimator coaligned to the high-resolution telescope. The system had an X-ray collimator, a thermal impedance covering the spacecraft viewing aperture, and an inflight calibration system. The active area was 667 sq cm, the spatial resolution 1.5 x 1.5 deg FWHM, and the temporal resolution 256 s. For more details, see I. L. Cline et al., *Astroph. J.*, v. 255, pp. L45-L48, 1982. This experiment was equipped with three identical HRI detectors. The HRI was a digital X-ray camera that provided high spatial and temporal resolution over the central 25 arc-min of the telescope focal plane. It was composed of two microchannel plates operating in cascade, a cross-grid charge detector, and a set of electronics. It had a spatial resolution of 1 arc-s, a temporal resolution of 7.8125 microseconds, and an energy range of 0.15 to 3.0 keV. Spectral studies could be performed using the interchangeable broadband filter and the objective grating.

-----HEAD 2, GIACCONI-----

INVESTIGATION NAME- SOLID STATE SPECTROMETER (SSS)

NSSDC ID- 78-103A-05

PERSONNEL		SPACE TELESCOPE SCI IN
PI - R.	GIACCONI	SAO
O1 - H.D.	TANANBAUM	MASS INST OF TECH
O1 - G.W.	CLARK	NASA-GSFC
O1 - S.S.	HOLT	COLUMBIA U
O1 - R.	NOVICK	

BRIEF DESCRIPTION

This instrument was a cooled solid-state spectrometer and was used to detect weak sources and weak spectral features over a broad band of energies by employing a nondispersive spectral technique. A lithium-drifted, solid-state detector was operated at a temperature of 120 K. The primary detector was 9 mm in diameter and was surrounded by two veto guard counters. A two-stage solid cryogenic refrigerator was used to cool the detector. Spectral measurements were made between 0.4 and 4 keV, with a resolution from 120 to 150 eV, FWHM. The effective area was 200 sq cm, the FOV 6 arc min in diameter, and the time resolution 2 to 5 microseconds. Observations with the instrument were terminated when the supply of the solid ammonia-methane crystal was expended and operating temperatures could no longer be maintained.

-----HEAD 2, GIACCONI-----

INVESTIGATION NAME- HIGH RESOLUTION IMAGER (HRI)

NSSDC ID- 78-103A-02

PERSONNEL		SPACE TELESCOPE SCI IN
PI - R.	GIACCONI	SAO
O1 - H.D.	TANANBAUM	MASS INST OF TECH
O1 - G.W.	CLARK	NASA GSFC
O1 - S.S.	HOLT	COLUMBIA U
O1 - R.	NOVICK	

BRIEF DESCRIPTION

This experiment was equipped with three identical HRI detectors. The HRI was a digital X-ray camera that provided high spatial and temporal resolution over the central 25 arc-min of the telescope focal plane. It was composed of two microchannel plates operating in cascade, a cross-grid charge detector, and a set of electronics. It had a spatial resolution of 1 arc-s, a temporal resolution of 7.8125 microseconds, and an energy range of 0.15 to 3.0 keV. Spectral studies could be performed using the interchangeable broadband filter and the objective grating.

\*\*\*\*\* HEAD 3 \*\*\*\*\*

SPACECRAFT COMMON NAME- HEAD 3  
ALTERNATE NAMES- HIGH ENERGY ASTRON OBS C, 11532  
HEAD C

NSSDC ID 79-082A

SPONSORING COUNTRY

LAUNCH DATE- 09/20/79

U.S.  
WEIGHT- 2660. KG

ORBIT PARAMETERS

ORBIT TYPE- GEOFENICENTRIC  
ORBIT PERIOD- 94.5 MIN  
PERIAPSIS- 486.4 KM ALT

EPOCH DATE 09/21/79  
INCLINATION- 43.6 DEG  
APOAPSIS- 504.9 KM ALT

PERSONNEL

MC - R.E. HALPERN  
SC - A.G. OPP  
PM - J.F. STONE  
PS - T.A. PARNELL

NASA HEADQUARTERS  
NASA HEADQUARTERS  
NASA MSFC  
NASA MSFC

BRIEF DESCRIPTION

This third High Energy Astronomy Observatory (HEAD) mission performed a sky survey of gamma rays and cosmic rays in a manner similar to HEAD 1. It had a higher orbital inclination than the previous missions in this series, since the payload consisted primarily of cosmic-ray instrumentation; greater cosmic-ray flux occurs near the earth's magnetic poles. The scientific objectives of the mission were (1) to determine the isotopic composition of the most abundant components of the cosmic ray flux with atomic mass between 7 and 56, and the flux of each element with atomic number (Z) between Z = 4 and Z = 50; (2) to search for super-heavy nuclei up to Z = 120 and measure the composition of the nuclei with Z > 20; (3) to study intensity, spectrum, and time behavior of X-ray and gamma-ray sources between 0.06 and 10 MeV; measure isotropy of the diffuse X-ray and gamma-ray background; and perform an exploratory search for X- and gamma-ray line emissions. The normal operating mode was a continuous celestial scan about the Z axis (which nominally pointed to the sun).

-----HEAD 2, GIACCONI-----

INVESTIGATION NAME- FOCAL PLANE CRYSTAL SPECTROMETER (FPCS)

NSSDC ID 78-103A-03

PERSONNEL		SPACE TELESCOPE SCI IN
PI - R.	GIACCONI	SAO
O1 - H.D.	TANANBAUM	MASS INST OF TECH
O1 - G.W.	CLARK	NASA GSFC
O1 - S.S.	HOLT	COLUMBIA U
O1 - R.	NOVICK	

BRIEF DESCRIPTION

The FPCS was a curved crystal Bragg spectrometer with a thin window, gas-filled proportional counter as a position-sensitive detector. There were two identical counters for redundancy, and sufficient gas was carried to compensate for differential leakage through the windows. Six different crystal diffractors were available. The spectrometer and detector had an imaging capability with available apertures of 3 x 30, 2 x 20, and 1 x 20 arc min, and a 6 arc-min diameter. The instrument could be operated as a conventional curved crystal spectrometer or used in a modified defocused

-----HEAD 3, ISRAELI-----

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INVESTIGATION NAME HEAVY NUCLEI

NSSDC ID 79 082A 03

PERSONNEL

PI - M.H. ISRAEL	WASHINGTON U
PI - E.C. STONE	CALIF INST OF TECH
PI - C.J. WADDINGTON	U OF MINNESOTA
OI - W.R. BINNS	MCDONNELL-DOUGLAS CORP
OI - J. KLARMANN	WASHINGTON U
OI - R.E. VOIGT	CALIF INST OF TECH

BRIEF DESCRIPTION

The purpose of this experiment was to measure the charge spectrum of cosmic ray nuclei over the nuclear charge range from 17 to 120 in the energy interval 0.3 to 10 GeV/nucleon to characterize cosmic ray sources, processes of nucleosynthesis, and propagation modes. The detector consisted of a double ended instrument of upper and lower hodoscopes and three dual-gap ion chambers. The two ends were separated by a Cerenkov radiator. The geometrical factor was 4 sq cm sr. The ion chambers could resolve charge to 0.24 charge units at low energy and 0.39 charge units at high energy and high Z. The Cerenkov counter could resolve 0.3 to 0.4 charge units. For more details, see W. R. Binns, et al., Nuc. Instr. and Meth., v. 185, pp. 415-426, 1981.

HEAD 3, JACOBSON

INVESTIGATION NAME GAMMA RAY LINE SPECTROMETER

NSSDC ID 79 082A-01

PERSONNEL

PI - A.S. JACOBSON	NASA JPL
OI - J.R. ARNOLD	U OF CALIF, SAN DIEGO
OI - A.E. METZGER	NASA JPL
OI - L.E. PETERSON	U OF CALIF, SAN DIEGO

BRIEF DESCRIPTION

The basic goals of this experiment were to search for gamma ray line emissions arising from a variety of source phenomena. Particular emphasis was placed on finding line emissions from processes of nucleosynthesis in supernovae, and from positron electron annihilation and nuclear reactions in low energy cosmic rays. In addition, careful study was made of the spectral and time variations of known hard X-ray sources. The experiment was capable of measuring gamma ray lines falling within the energy interval from 0.05 to 10 MeV and having an energy resolution better than 2.5 keV at 1.33 MeV at a line sensitivity from 1.E 4 to 1.E 5 photons/sq cm-s, depending on the energy. The experimental package contained four cooled, drifted germanium detectors shielded by cesium iodide. The key experimental parameters were (1) a geometry factor of 11.1 sq cm sr, (2) a field of view of 27-deg FWHM, and (3) a time resolution of less than 0.1 ms for the germanium detector and 10 s for the cesium iodide detector. The primary data base is available at JPL. It consists of all the instrument, orbit, and aspect data plus some spacecraft housekeeping information on 1600-bpi binary tapes. For more detailed information on the data base, contact J. Ling, Mail Stop 169 337, JPL, 4800 Oak Grove Drive, Pasadena, Ca 91109.

HEAD 3, KOCH

INVESTIGATION NAME ISOTOPIC COMPOSITION OF COSMIC RAYS

NSSDC ID 79 082A 04

PERSONNEL

PI - L. KOCH	CENS
PI - B. PETERS	DANISH SPACE RES INST
OI - J.J. ENGLISHMAN	CENS
OI - M. CANTIN	CENS
OI - A. SOUTOU	CENS
OI - P. MASSE	CENS
OI - P. MESTREAU	CENS
OI - N. LUND	DANISH SPACE RES INST
OI - I. RASMUSSEN	DANISH SPACE RES INST
OI - B. BYRNAK	DANISH SPACE RES INST
OI - N.J. WESTERGARRD	DANISH SPACE RES INST
OI - M. ROTHENBERG	DANISH SPACE RES INST
OI - Y. RIO	CENS
OI - N. PETROU	CENS
OI - P. GORED	CENS

BRIEF DESCRIPTION

This experiment measured the relative composition of the isotopes of the primary cosmic rays between beryllium and iron (Z from 4 to 26) and the elemental abundances up to tin (Z=50). Cerenkov counters and hodoscopes, together with the earth's magnetic field, formed a spectrometer. They determined charge and mass of cosmic rays to a precision of 10% for the most abundant elements over the momentum range from 2 to 25 GeV/c (c= speed of light). The primary data base has been archived at the Centre Etudes Nucleaires de Saclay and the Danish Space Research Institute. Information on the data products is given in Engelman et al. Astron & Astrophys., v. 148, pp. 12-20, 1985.

\*\*\*\*\* INTERCOSMOS 4 \*\*\*\*\*

SPACECRAFT COMMON NAME INTERCOSMOS 4  
ALTERNATE NAMES- 04580, IK- 4

NSSDC ID- 70-084A

SPONSORING COUNTRY  
U.S.S.R.  
WEIGHT- 400. KG

LAUNCH DATE- 10/14/70

ORBIT PARAMETERS

ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD- 93.6 MIN  
PERIAPSIS- 263. KM ALT

EPOCH DATE- 10/15/70  
INCLINATION- 48.5 DEG  
APOAPSIS- 668. KM ALT

PERSONNEL

PM -	UNKNOWN	UNKNOWN
PS -	UNKNOWN	UNKNOWN

BRIEF DESCRIPTION

The Intercosmos 4 mission was a joint effort of the German Democratic Republic, the U.S.S.R., and Czechoslovakia. The spacecraft carried a Soviet X-ray polarimeter and X-ray spectroheliograph, an East German UV photometer in the Lyman-alpha range and a real-time telemetry system, and a Czech X-ray photometer with power analyzer and optical photometer. Radioastronomical, ionospheric, and optical observations of the payload were conducted by scientists in Bulgaria, Hungary, Poland, and Rumania. Intercosmos 4 had an eight-channel telemetry system that transmitted both stored and real time data.

\*\*\*\*\* INTERCOSMOS 4, TINDO \*\*\*\*\*

INVESTIGATION NAME SOLAR X RAY POLARIMETER

NSSDC ID- 70-084A-01

PERSONNEL

PI - I.P. TINDO	LEBEDEV PHYS INST
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BRIEF DESCRIPTION

This experiment consisted of a Thomson scattering, block-type polarimeter that measured the polarization of solar X-rays during flares in the spectral region around 0.8 A (15 keV). The Thomson scattering polarimeter was based upon the angular anisotropy of the polarized X-ray intensity, scattered by the angle of about 90 deg. The intensity of the scattered radiation was measured simultaneously by three pairs of photon counters, which were placed around a beryllium scatterer at the angles of 120 deg with respect to each other. To reduce background counting rate, the amplitude discrimination and anticoincidence techniques were used, which rejected pulses having a photon energy above 35 keV or coinciding in two sections of the counter. The rotation of the satellite around the sun pointed axis was very slow. Thus, the orientation of the counters relative to the fiducial plane was practically unchanged during flares. Polarization was measured by rotation of the beryllium scatterer, together with photon counters, around the line of the solar X ray photons' arrival. Polarized X-ray emission in the wavelength range 0.6 to 1.2 A was detected during the initial phase of solar flares. Unfortunately, only two measuring channels had functioned properly. Besides this, the spectral sensitivity of the second measuring channel in the wavelength range  $\lambda < 0.35 \text{ A}$  exceeded that of the first one, because the discrimination circuit of the second channel was switched off. Therefore, the polarization data obtained was in some extent limited. For more details, see I. P. Tindo, S. L. Mandel'stam, and A. I. Shuryghin, Solar Phys., v. 32, p. 469, 1973.

\*\*\*\*\* IRAS \*\*\*\*\*

SPACECRAFT COMMON NAME IRAS  
ALTERNATE NAMES INFRA-RED ASTRONOM SAT, IR ASTRON. SAT.  
13777

NSSDC ID 83-004A

SPONSORING COUNTRY  
NETHERLANDS/U.S./U.K  
WEIGHT 1000. KG

LAUNCH DATE- 01/25/83

ORBIT PARAMETERS

ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD- 103. MIN  
PERIAPSIS- 889. KM ALT

EPOCH DATE- 01/26/83  
INCLINATION- 99.1 DEG  
APOAPSIS- 903. KM ALT

PERSONNEL

MC - D. WRUBLIK	NASA HEADQUARTERS
SC - N.W. BOGGESS	NASA HEADQUARTERS
PM - G.F. SQUIBB	NASA JPL
PS - H.H. AUMANN	NASA JPL

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**BRIEF DESCRIPTION**

The Infrared Astronomical Satellite (IRAS) was a mission with joint execution by the United States (NASA), the Netherlands, and the United Kingdom. The basic goal of this mission was to obtain a full-sky survey over the approximate wavelength range 8 to 120 micrometers with four broadband photometry channels. IRAS contained a 0.6-m Ritchey-Chretien telescope cooled by helium to a temperature of near 10 deg K. An array of 62 detectors was used to detect the infrared flux in bands centered at 12, 25, 60, and 100 micrometers. The noise equivalent flux densities were, respectively, 0.1, 0.1, 0.1, and 0.3 Jy (1 Jansky =  $1E-26$  W/sq m-Hz) in the four survey bands. The positions of galactic and extragalactic sources were determined to an accuracy of 0.5 arc-min. In addition to the focal plane detector array used for the all-sky survey, a low-resolution spectrometer and a 60- and 100-micrometer chopped photometric channel were included on IRAS. To scan the sky for the survey, the satellite was rotated at a constant angular velocity perpendicular to the satellite-sun vector. IRAS could be pointed also at a selected celestial object for up to 12 min. This pointing ability permitted observations of selected objects with up to a factor of 10 increase in sensitivity or spatial resolution compared to that of the survey. IRAS ceased operations on November 21, 1983. Further discussion of the IRAS mission can be found in G. Neugebauer et al., Science, v. 224, pp. 14-21, 1984, and in the entire March 1, 1984 issue of Astrophysical Journal Letters (v. 278, pp. L1-L85).

IRAS, JOINT IRAS SWG

INVESTIGATION NAME - IR TELESCOPE

NSSDC ID 83 004A 01

**PERSONNEL**

PI - JOINT IRAS SWG

**BRIEF DESCRIPTION**

The IRAS telescope system consisted of the optical subsystem (OSS), and the electronic, cryogenic, structural, and thermal subsystem. The OSS consisted of a two-mirror Ritchey-Chretien folded-optics reflector telescope with an aperture of 57 cm and a focal length of 5.5 cm. The FOV was slightly more than 1 deg and was diffraction limited at all wavelengths beyond 8 micrometers. The aperture was 41% obscured by the secondary mirror, with a total effective area of 2024 sq cm. The focal plane assembly was a subassembly of 62 IR and 8 visible detectors mounted at the focal plane of the OSS. The total array consisted of eight IR color band modules and two visible band modules.

IRAS, JOINT IRAS SWG

INVESTIGATION NAME - LOW RESOLUTION SPECTROMETER

NSSDC ID 83 004A 02

**PERSONNEL**

PI - JOINT IRAS SWG

**BRIEF DESCRIPTION**

The additional Dutch experiment consisted of a low-resolution spectrometer (LRS), a chopped photometric channel (CPC) long wavelength photometer, and a short wavelength channel (SWC) ac coupled photometer. The LRS was used in combination with the survey instrument and measured spectra of point sources in the range 7.4 to 23 micrometers, with a spectral resolution of about 20%. The CPC mapped IR sources in two bands, from 41 to 62.5 and from 84 to 114 micrometers, with a spatial resolution of 1.2 arc-min, and could not be used simultaneously with the survey instrument. The SWC scanned with the nominal survey rate over a band of 4.1 to 8 micrometers with a 15 arc s FOV and could be used with the survey instrument.

..... IUE .....

SPACECRAFT COMMON NAME IUE

ALTERNATE NAMES INTI ULTRAVIOLET EXPL, SAS D 10637

NSSDC ID- 7B 012A

LAUNCH DATE- 01/26/78

**ORBIT PARAMETERS**

ORBIT TYPE GEOCENTRIC  
ORBIT PERIOD- 1436.6 MIN  
PERIAPSIS 26643. KM ALT

SPONSORING COUNTRY

INTI / U.S. / U.K.

WEIGHT- 669. KG

EPOCH DATE 01/27/78

INCLINATION 28.8 DEG

APDAPSIS 44951. KM ALT

**PERSONNEL**

MC - J. W. WARNER  
SC - E. J. WILER  
PM - J. P. CORRIGAN  
PS - Y. KONDO

NASA HEADQUARTERS  
NASA HEADQUARTERS  
NASA GSFC  
NASA GSFC

**BRIEF DESCRIPTION**

The International Ultraviolet Explorer (IUE, formerly SAS-D) satellite was a spaceborne ultraviolet astronomical observatory for use as an international facility. The IUE contained a 45-cm telescope solely for spectroscopy in the wavelength range of 1150 to 3250 A. The satellite and optical instrumentation were provided by the Goddard Space Flight Center (GSFC). The television cameras, used as detectors, were provided by the United Kingdom Science Research Council (UKSRC). The European Space Agency (ESA, formerly ESRD) supplied solar paddles for the satellite and a European Control Center. After launch, two-thirds of the observing time was directed from a control center at GSFC, one-third of the time the satellite was operated from the European Control Center near Madrid. The IUE observatory was in a synchronous orbit. The 45-cm Ritchey-Chretien f/15 telescope fed a spectrograph package. The spectrograph package, using secondary electron conduction (SEC) Vidicon cameras as detectors, covered the spectral range from 1150 to 3250 A, operating in either a high- or low-resolution mode with resolutions of approximately 0.1 and 6 A, respectively. The SEC Vidicons could integrate the signal for up to many hours. At high resolution, spectra of stellar sources were obtained as faint as 12th magnitude, while at lower resolution observations had been made of sources fainter than 17th magnitude. The latter observations required 14 h of integration time. Listings of guest observers and their investigations can be obtained from the IUE Newsletter, IUE Observatory, Code 685, Goddard Space Flight Center, Greenbelt, Maryland 20771, U.S.A. For more details, see A. Boggess et al., Nature, v. 275, p. 372, 1978; A. Boggess et al., Nature, v. 275 p. 377, 1978.

IUE, GUEST INVESTIGATORS

INVESTIGATION NAME - LOW /HIGH-RESOLUTION, ULTRAVIOLET SPECTROGRAPH PACKAGE

NSSDC ID- 7B 012A 01

**PERSONNEL**

PI - GUEST INVESTIGATORS SEE EXPR. DESCRIPT.

**BRIEF DESCRIPTION**

This experiment included the ultraviolet spectrograph package carried by the IUE, consisting of two physically distinct echelle-spectrograph/camera units capable of astronomical observations. Each spectrograph was a three-element echelle system composed of an off-axis paraboloidal collimator, an echelle grating, and a spherical first-order grating that was used to separate the echelle orders and focus the spectral display on an image converter plus SEC Vidicon camera. There was a spare camera for each unit. The camera units were able to integrate the signal. The readout/preparation cycle for the cameras took approximately 20 min. Wavelength calibration was provided by the use of a hollow cathode comparison lamp. The photometric calibration was accomplished by observing standard stars whose spectral fluxes had previously been calibrated by other means. Both echelle spectrograph/camera units were capable of high resolution (0.1 A) or low resolution (6 A) performance. The dual high/low resolution capability was implemented by the insertion of a flat mirror in front of the echelle grating, so that the only dispersion was provided by the spherical grating. As the SEC Vidicons could integrate the signal for up to many hours, data with a signal to noise ratio of 50 could be obtained for 80 stars of 9th and 14th magnitudes in the high and low resolution modes, respectively. The distinguishing characteristic of the units was their wavelength coverage. One unit covered the wavelength range from 1192 to 1924 A in the high-resolution mode and 1135 to 2085 A in the low resolution mode. For the other unit, the ranges were from 1893 to 3031 A and 1800 to 3255 A for the high and low resolution modes, respectively. Each unit also had its own choice of entrance apertures - either a 3 arc-s hole or a 10 by 20 arc s slot. The 10 by 20 arc s slots could be blocked by a common shutter, but the 3 arc s aperture was always open. As a result, two aperture configurations were possible: (1) both 3 arc s apertures open and both 10 by 20 arc s slots closed, or (2) all four apertures open. With this instrumentation, the observational options open to an observer were long wavelength and/or short wavelength spectrograph, high or low resolution, and large or small apertures. Exposures could be made with the two spectrographs simultaneously, but the entrance apertures for each were distinct and separated in the sky by about 1 arc-min. An additional restriction was that data could be read out from only one camera at a time. However, one camera could be exposed while the other camera was being read out. The choice of high or low resolution could be made independently for the two spectrographs. Listings of guest observers and their investigations can be obtained from the IUE Newsletter, IUE Observatory, Code 685, Goddard Space Flight Center, Greenbelt, Maryland 20771, U.S.A.

IUE, NONE ASSIGNED

INVESTIGATION NAME PARTICLE FLUX MONITOR (SPACECRAFT)

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NSSDC ID- 78-012A-02

PERSONNEL
PI - NONE ASSIGNED

BRIEF DESCRIPTION

The particle flux monitor experiment was placed in IUE to monitor the trapped electron fluxes that affected the sensitivity of the ultraviolet sensor in the IUE spectrograph package experiment, NSSDC ID 78-012A-01. The particle flux monitor was a lithium drifted silicon detector with a half-angle conical field of view of 16 deg. It had an aluminum absorber of 0.357 g/sq cm in front of the collimator and a brass shield with a minimum thickness of 2.31 g/sq cm. The effective energy threshold for electron measurements was 1.3 MeV. The experiment was also sensitive to protons with energies greater than 15 MeV. The instrument was used as an operational tool to aid in determining background radiation and acceptable camera exposure time. The data were also useful as a monitor of the trapped radiation fluxes. The instrument was provided by Dr. C. Bostrom of the Applied Physics Laboratory.

six-position filter wheel providing passbands from 1930 to 2230 A (effective wavelength 2130 A) to 3050 to 3570 A (effective wavelength 3330 A,) as well as a calibration slide and a dark slide. A pulse counter and dc amplifier similar to those used with the stellar photometers were used with this photometer meter. About 2-1/2 months after launch, a failure left the calibration source permanently in place, and no further data resulted from this detector. Spectrometer 1 covered the wavelength range from 1800 to 3800 A in 100 steps with resolutions of 20 or 200 A (switchable). The slit width of 20 A corresponded to 2 arc-min projected on the sky, and the slit height corresponded to 8 arc-min. Spectrometer 2 covered the wavelength range from 1050 to 2000 A in 100 steps with resolutions of 10 or 100 A. The slit width of 10 A corresponded to 2 arc-min projected onto the sky, and the slit height corresponded to 8 arc-min. Aside from the failures of the nebular photometer, the analog channel of stellar photometer 4, and the degradation of the filters, the instrument operated normally from launch to spacecraft shutoff in February 1973. For more details, see A. D. Code et al., Ap. J., v. 161, p. 377, 1970.

\*\*\*\*\* DAO 2 \*\*\*\*\*

SPACECRAFT COMMON NAME- DAO 2
ALTERNATE NAMES- DAO-A2, O3597.

NSSDC ID 68-110A SPONSORING COUNTRY U.S.
WEIGHT- 2150. KG
LAUNCH DATE 12/07/68
ORBIT PARAMETERS
ORBIT TYPE- EPOCH DATE-
ORBIT PERIOD 100.1 MIN INCLINATION 35.0 DEG
PERIAPSIS- 759. KM ALT APOAPSIS- 767. KM ALT

PERSONNEL
SC - N.G. ROMAN NASA HEADQUARTERS
PM J. PURCELL NASA-GSFC
PS J.E. KUPPERIAN, JR. (DECEASED) NASA-GSFC

BRIEF DESCRIPTION

This spacecraft was one of a series of automated astronomical observatories that was ground controllable in orientation and was placed in a low-earth orbit. This spacecraft carried two experiment packages, which were located centrally within the spacecraft, each viewing space from opposite ends. One experiment, the Wisconsin experiment package (WEP), consisted of four stellar photometers (1000 to 4250 A), two scanning spectrometers (1000 to 4000 A), and one nebular photometer (2000 to 3300 A). The other package, CeleScope, consisted of four independent telescopic Schwarzschild cameras (1200 to 2900 A). Built in an octahedron shape, 10 ft by 7 ft, the satellite weighed 4400 pounds. The design was dictated by the stringent requirement of the experiments for pointing accuracy, pointing stability, command capability, data handling, and thermal environment, and by the constraints of the orbit for ground-station contacts. Six two-gimbal star trackers were programmed by the onboard memory to acquire and track appropriate guide stars. Error signals were generated that drove the reaction wheels to obtain stellar stabilization. Coarse momentum wheels were used for slewing the spacecraft. Memories permitted storage of 200,000 bits of experimental data. All information was relayed to the central control station in Greenbelt, MD. For more details, see J. Sargent, IEEE Trans. Geosci. Elec., GE-8, p. 215, 1970.

-----DAO 2, WHIPPLE-----

INVESTIGATION NAME- HIGH-RESOLUTION TELESCOPES

NSSDC ID 68 110A-01

PERSONNEL
PI - F.L. WHIPPLE SAD
OI - J.F. MCNALL U OF WISCONSIN

BRIEF DESCRIPTION

This Smithsonian Astrophysical Observatory (SAO) experiment, referred to as the CeleScope experiment, consisted of two major subassemblies: an optical package, containing four 12-in. Schwarzschild telescopes that used Uvicons to produce television pictures of star fields, and an electronics package. The purpose of CeleScope was to measure the UV brightness of a large number of stars. The Uvicons were fitted with filters constructed by combining halves of filter blanks. Redundant data were obtained, thereby, over four different passbands. These passbands were from 1200 to 1500 A, 1375 to 1800 A, 1800 to 2800 A, and 2850 to 3250 A. When struck by UV radiation in the wavelength range to which it was sensitive, the photocathode of a Uvicon emitted electrons in proportion to the intensity of the radiation. The electrons were accelerated and electrostatically focused onto a target, forming a pattern that was half the size of the initial optical image at the focal plane. A time exposure could be made by allowing the electron "picture" to build up on the target. Operated by ground control, time exposures of up to 30-s duration could be made of a field 3 deg square. The optical parts of CeleScope weighed 440 pounds, and its electronics 77. The only significant failure during the 16 months of operation was caused by overexposing one of the Uvicons to sunlight. The sensitivity of the other Uvicons decreased significantly but in a correctable manner, although this decrease was the primary reason that the operation of this experiment ceased in April 1970. Over 8500 2-deg by 2-deg star fields were observed, covering about 10% of the sky and yielding observations of some 5000 objects. For more details, see R. N. Watts, Jr., Sky & Tel., p. 280, May 1969, W. A. Deutschman, Pub. Astron. Soc. Pac., v. 84, p. 123, 1972.

-----DAO 2, CODE-----

INVESTIGATION NAME- WISCONSIN EXPERIMENT PACKAGE

NSSDC ID: 68-110A-02

PERSONNEL
PI - A.D. CODE U OF WISCONSIN
OI - R.J. DAVIS SAD

BRIEF DESCRIPTION

This Wisconsin equipment package contained seven telescopes designed to make spectrophotometric measurements of selected celestial objects in the ultraviolet longward of 1050 A; a set of four stellar photoelectric photometers located behind 8-in. telescopes; a nebular photoelectric photometer located at the prime focus of a 16 in. telescope; and a set of two objective grating spectrometers. The stellar photometers were each located behind a filter wheel containing three filter passbands, a calibration source, and a dark slide. The filter passbands ranged from 1180 to 1370 A with effective wavelength 1330 A, and from 3810 to 4670 A with effective wavelength 4250 A. The filter passbands were arranged to provide redundant coverage so that the telescope responses could be cross correlated. Two field stops were provided with angular diameters of 2 arc-min and 10 arc-min. Photons were detected by photomultipliers. These photomultipliers drove pulse counters and dc amplifiers, thus providing redundant output. Unfortunately, the analog channel of stellar photometer 4 failed shortly after launch and provided no useful data. The filters experienced some degradation in orbit. Corrections to be applied to the stellar photometer data are becoming available. The nebular photometer was located behind a

\*\*\*\*\* DAO 3 \*\*\*\*\*

SPACECRAFT COMMON NAME- DAO 3
ALTERNATE NAMES- PL-701D, DAO-C
COPERNICUS, 06153

NSSDC ID 72-065A SPONSORING COUNTRY U.S.
WEIGHT- 2150. KG
LAUNCH DATE- 08/21/72

ORBIT PARAMETERS
ORBIT TYPE- GEOCENTRIC EPOCH DATE- 08/21/72
ORBIT PERIOD- 99.7 MIN INCLINATION- 35.0 DEG
PERIAPSIS- 739. KM ALT APOAPSIS 751. KM ALT

PERSONNEL
MG - H.B. CHISHOLM NASA HEADQUARTERS
SC - E.J. WEILER NASA HEADQUARTERS
PM - J.P. CORRIGAN NASA-GSFC
PS - J.E. KUPPERIAN, JR. (DECEASED) NASA-GSFC

BRIEF DESCRIPTION

This mission was the third in the DAO program and its second successful spacecraft to observe the celestial sphere from above the earth's atmosphere. A UV telescope with a spectrometer measured high resolution spectra of stars, galaxies, and planets with the main emphasis on the determination of interstellar absorption lines. Three X-ray telescopes and a collimated proportional counter provided measurements of celestial X-ray sources and interstellar absorption between 1 and 100 A. The DAO 3 spacecraft was an octagonally shaped aluminum structure with a 1.21-m hollow central tubular area, which housed the experiment container. Solar panels were mounted on each side of the spacecraft at angles of 34 deg and had an area of 38.2 sq m. A sun baffle

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protected the experiments and increased the length of the spacecraft to 4.9 m. Two inertial balance booms, one forward and one aft, extended approximately 6.8 m. The spacecraft was equipped with an inertial reference unit (a high-precision three-axis gyro inertial system), sun sensors, a magnetometer, and star trackers, which enabled spacecraft pointing to be determined in many different ways. A boresight star tracker, sensitive to sixth magnitude, controlled pitch and yaw to within 5 arc-s. In addition, the high-resolution telescope experiment had a fine pointing control, which could control the pitch and yaw to within one-tenth arc-s on bright stars. Spacecraft attitude was controlled by inertia wheels and thrusters. Redundant tracking beacons facilitated ground tracking of the spacecraft. Two UHF (400.55 MHz) transmitters provided wideband telemetry for transmitting digital data to the ground stations. Two redundant VHF (136.26 MHz) transmitters were used in a narrow-band telemetry link primarily for transmitting spacecraft housekeeping data, although they served as backups for the wideband telemetry system. Two redundant pairs of VHF command receivers were carried as part of command system capable of storing 1280 commands. Data were stored on an onboard tape recorder and in core storage. An onboard processor monitored telemetry data, issued commands, and was programmed via the command receiver uplink. The observational life of the mission was August 1972 to February 1981 (9-1/2 years).

\*\*\*\*\* OSD 1 \*\*\*\*\*

SPACECRAFT COMMON NAME- OSD 1  
ALTERNATE NAMES- 1962 ZETA 1, S 16  
OSO-A, 00255

NSSDC ID- 62-006A  
LAUNCH DATE- 03/07/62

SPONSORING COUNTRY  
U.S.  
WEIGHT- 208. KG

ORBIT PARAMETERS  
ORBIT TYPE-  
ORBIT PERIOD- 95.1 MIN  
PERIAPSIS- 510. KM ALT

EPDCH DATE-  
INCLINATION- 32.8 DEG  
APOAPSIS- 539. KM ALT

PERSONNEL  
SC - UNKNOWN  
PM - J.C. LINDSAY (DECEASED)

UNKNOWN  
NASA-GSFC

**BRIEF DESCRIPTION**  
The objectives of the OSO satellite series were to perform solar physics experiments above the atmosphere during a complete solar cycle and to map the celestial sphere for direction and intensity of UV light, X-rays, and gamma radiation. The OSO 1 was the first satellite to have pointed instruments and onboard tape recorders for data storage. The OSO 1 platform consisted of a sail section, which pointed two experiments continuously toward the sun, supplying power to the experiments from the solar batteries and rechargeable chemical batteries; and a wheel section, which spun about an axis perpendicular to the pointing direction of the sail and carried seven experiments. Attitude adjustment was performed by gas jets. Data were simultaneously recorded on tape and transmitted by FM telemetry. A command system provided for 10 ground-based commands. The spacecraft performed normally until the second onboard tape recorder failed May 15, 1962. The spacecraft provided real-time data until May 1964, when the power cells failed. For more information, see A. W. L. Ball, Spaceflight, v. 12, p. 244, 1970.

-----OAO 3, BOYD-----

INVESTIGATION NAME- STELLAR X RAYS

NSSDC ID- 72-065A-02

PERSONNEL  
PI - R.L.F. BOYD U COLLEGE LONDON  
OI - P.W. SANFORD U COLLEGE LONDON

**BRIEF DESCRIPTION**  
This Mullard experiment used three grazing-incidence paraboloid mirror systems and a collimated proportional counter to observe celestial X-ray sources between 1 and 70 A. Between 1 and 3 A, the collimated proportional counter was used in conjunction with pulse-shape discrimination to reject background counts. The window was 0.51-mm beryllium, and the whole area of 17.8 sq cm collected radiation from a source on the axis of its collimating tube. From 3 to 9 A and 6 to 18 A, proportional counters located at the focus of two grazing-incidence reflecting telescopes, whose photon collect areas were 5.5 sq cm and 12.5 sq cm, respectively, were used with an anticoincidence scintillator also employed to reject background cosmic-ray counts. Their stellar windows were 3 mm in diameter and were of 76-micron beryllium and 5-micron aluminium, respectively. An open-channel multiplier located at the focus of a grazing incidence telescope with a photon collecting area of 23 sq cm was used to observe between 20 and 70 A. A six-channel pulse-height analyzer could be switched to any of the three proportional counters to improve the energy resolution. An image scanning photomultiplier tube behind a three-element lens of 610-mm focal length was an auxiliary system for measuring misalignments of the Mullard experiment from the pointing direction of the spacecraft and the Princeton spectrometer. The 3 to 9 A and 6 to 18 A systems became inoperable in June 1973 when the background shutter stuck in the closed position. Most of the observations after this were made with the 1 to 3 A system. For more details, see J. A. Bowles et al., J. Phy. E Sci. Instru., v. 7, p. 183, 1974.

-----OSO 1, FAZIO-----

INVESTIGATION NAME- HIGH-ENERGY GAMMA-RAY

NSSDC ID- 62-006A-09

PERSONNEL  
PI - G.G. FAZIO SAO

**BRIEF DESCRIPTION**  
This experiment was designed to observe solar flares in the region above 100 MeV of the electromagnetic spectrum. The detector consisted of a lead sheet (to convert gamma rays into electron-positron pairs) that covered a Cerenkov detector (a plastic cylinder coupled to a photomultiplier). An anticoincidence scintillator was placed between the lead sheet and the Cerenkov detector to suppress counts produced by relativistic charged particles. The detector monitored the sun once every revolution of the satellite wheel for an 11-s view every 1.9 s. The experiment performed normally until July 3, 1962. More complete information can be found in "The OSO high-energy gamma-ray experiment," C. G. Fazio and E. M. Hafner, J. Geophys. Res., v. 72, p. 2452, 1967.

-----OAO 3, SPITZER-----

INVESTIGATION NAME- HIGH-RESOLUTION TELESCOPES

NSSDC ID- 72-065A-01

PERSONNEL  
PI - L. SPITZER PRINCETON U  
OI - J. ROGERSON, JR. PRINCETON U

**BRIEF DESCRIPTION**  
The primary objective of this Princeton telescope-spectrometer was to make quantitative observations of interstellar absorption lines with a resolution of about 0.05 A between 950 and 1450 A, and twice in first order between 1650 and 3000 A. The secondary objective was to observe UV spectra of selected brighter stars. The prime optical system was an 80-cm diameter Cassegrain telescope with a 16-m focal length (f/20). This telescope was coupled to a Paschen-Runge spectrometer with a concave grating which focused the spectrum on a 1-m Rowland circle, with a dispersion of 4.2 A per mm in first order. The entrance slit was 3 mm long and 24.2 microns wide, corresponding to 390 arc-s by 0.314 arc-s on the sky. The Bausch and Lomb grating was ruled with 2400 lines per mm, blazed for 2200 A in first order. The photons were detected by four phototubes, each equipped with its own exit slit and movable in pairs along the Rowland circle. A guidance error sensor attached to the prime optics controlled the spacecraft attitude to within 0.1 arc-s. This guidance system locked onto a star as faint as 7th magnitude. The overall system could make useful measurements on O and B-type stars to 7th magnitude. For more details, see J. B. Rogerson et al., Ap. J., v. 181, p. L97, 1973; A. B. Wissinger, Opt. Eng., v. 14, p. 133, 1975.

-----OSO 1, FROST-----

INVESTIGATION NAME- 20- TO 100-KEV SOLAR X-RAY DETECTOR

NSSDC ID- 62-006A-02

PERSONNEL  
PI - K.J. FROST NASA-GSFC

**BRIEF DESCRIPTION**  
This experiment was designed to search for the solar bremsstrahlung bursts in the 20- to 100-keV energy range from the whole solar disk. The detector was a scintillation counter consisting of a cylindrical NaI(11) crystal (0.3 cm thick and 2.24 cm in diameter) and an RCA C-7151 photomultiplier tube. A copper shield collimated the detector to a 0.3-sr FOV. A count-rate meter provided an output signal from 0 to 5 V corresponding to count-rate range from 10 to 104 counts per second. The experiment performed normally during the life of the spacecraft.

-----OSO 1, FROST-----

INVESTIGATION NAME- 0.1- TO 0.7-MEV SOLAR GAMMA-RAY MONITOR

NSSDC ID- 62-006A-03

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PERSONNEL  
PI - K. J. FROST

NASA-CSFC

BRIEF DESCRIPTION

This experiment was designed to measure the solar gamma-ray flux in the 0.1 to 0.7-MeV range, with particular emphasis on the 0.511 MeV positron electron annihilation line and its temporal variation. Three scintillation counter detectors were used. Two NaI(Tl) detectors (3.8 cm in diameter by 3.8 cm high) were placed in the wheel section of the observatory, and a CsI(Tl) crystal (3.8 cm in diameter by 5.08 cm high) was placed in the pointed section. One of the spinning detectors was collimated with a tungsten shield to provide a 20 deg field of view. The other was unshielded to provide nearly isotropic detection and to provide a background control for the shielded detector. The output from each of the three scintillators was sampled sequentially through a 16 level pulse height analyzer. Except for a shift in amplifier gain noted by a corresponding shift in the 0.511-MeV line, the experiment performed normally during the life of the satellite. For more details, see C. E. Fichtel, Sky & Teles., v. 35, p. 85, 1968.

OSD 1, HALLAM

INVESTIGATION NAME 3800- TO 4800-A SOLAR FLUX MONITOR

NSSDC ID 62-006A-06

PERSONNEL  
PI - K. L. HALLAM

NASA-CSFC

BRIEF DESCRIPTION

This experiment was designed to monitor the 3800 to 4800 A band of solar radiant flux with sensitivity sufficient to detect 0.1% variation. The detector was a high-current photodiode with a two-layer filter. An outer filter was an evaporated platinum film on a 2 mm thick fused silica substrate. An inner filter was made of Scotts-Jens blue glass. The detector was mounted on the wheel section of the OSO platform so that it produced a reading once every revolution (approximately every 2 s). Although the data indicated a rapid decrease in the sensitivity of the photodiode, useful data were recorded from March 7 to May 15, 1962.

OSD 1, HALLAM

INVESTIGATION NAME SOLAR HYDROGEN LYMAN ALPHA FLUX MONITOR

NSSDC ID 62-006A-07

PERSONNEL  
PI - K. L. HALLAM

NASA-CSFC

BRIEF DESCRIPTION

This experiment, which monitored solar hydrogen Lyman alpha flux, was mounted in the wheel section of the spacecraft so that it scanned the sun once during every 2 s rotation. The detector was a carbon disulfide-filled ion chamber with a lithium fluoride window that provided a bandpass of 1050 to 1230 A. The overall sensitivity of the detector declined by 80% after 230 orbits, but this decline did not affect short-term relative measurements. Except for the degradation of sensitivity, the experiment performed normally during the life of the spacecraft.

OSD 1, HESS

INVESTIGATION NAME- BF 3 PROPORTIONAL COUNTER NEUTRON DETECTOR

NSSDC ID 62-006A-10

PERSONNEL  
PI - W. N. HESS

NOAA-ERL

BRIEF DESCRIPTION

The primary purpose of this neutron detector was to try to detect solar proton. The detector was composed of a pair of moderated BF3 proportional counters with one enriched in boron 10 and one depleted in boron 10. The epoxy moderator was about 3.8 cm thick. The efficiency of the counter for detecting neutrons was roughly 2 counts/sq cm-neutron and was essentially independent of energy in the range 10 keV to 10 MeV. The detector worked well, but the data are not especially useful for producing information about the terrestrial neutron flux because of the significant number of locally produced neutrons. The instrumentation is not very well documented. For more details, see W. N. Hess and R. C. Kaifer, Solar Phy., v. 2, p. 202, 1967.

OSD 1, NEUPERT

INVESTIGATION NAME- SOLAR SPECTROMETER

NSSDC ID 62-006A-01

PERSONNEL  
PI - W. M. NEUPERT  
OI - W. E. BEHRING

NASA-CSFC  
NASA-CSFC

BRIEF DESCRIPTION

The experiment was designed to measure solar EUV radiation in the range of 10 to 400 A by a grating spectrometer. The spectral range was scanned every 8 min when the spacecraft was in sunlight. In operation, the spectrometer was pointed so that the sunlight fell perpendicularly on the front face of the instrument, passed through the entrance slit, and was dispersed by the grating. An aperture defining slit just before the grating allowed light to strike only the 20-mm x 20-mm ruled portion. The edges of this slit were made very sharp to minimize light scattering. With this arrangement the angular aperture was 1.2 x 2.2 deg, which covered the sun and corona. The experiment worked during the period March 7 to May 15, 1962, and over 7000 spectra were obtained. Below 170 A, the data were difficult to interpret because of lower sensitivity and scattered radiation. Above 342 A, the second order images obscured the data. For more details, see W. E. Behring, Applied Optics, v. 9, p. 1006, 1970.

OSD 1, PETERSON

INVESTIGATION NAME- GAMMA RAY SCINTILLATION DETECTOR

NSSDC ID- 62-006A-08

PERSONNEL  
PI - L. E. PETERSON

U OF CALIF, SAN DIEGO

BRIEF DESCRIPTION

This University of Minnesota experiment was designed to monitor the intensity and directional properties of gamma rays between 50 keV and 3 MeV. The detection system consisted of three scintillation counters arranged in various logical and shielding configurations to provide directional properties of gamma rays and a plastic phoswich counter to reject unwanted cosmic rays produced in the background. The phoswich scintillation counter consisted of a 5.1-cm diameter by 5.4-cm long NaI crystal surrounded by a 0.32-cm layer of plastic phosphor. The satellite was launched March 7, 1962, into a nearly circular orbit of 550 km altitude and 33 deg inclination. The instrument was mounted in the wheel section of the spacecraft. All three scintillation counters operated during the sunlit portion of each orbit. During the night portion, only the cosmic-ray counter operated. The various background effects encountered during flight prompted the flight of similar detectors on a balloon to determine the cosmic-ray effects in the materials surrounding the detectors. For more information, see L. E. Peterson, J. Geophys. Res., v. 70, p. 1962, 1965.

OSD 1, SCHRADER

INVESTIGATION NAME- PROTON ELECTRON ANALYZER

NSSDC ID- 62-006A-11

PERSONNEL  
PI - C. D. SCHRADER  
OI - J. A. WAGGONER

LAWRENCE LIVERMORE LAB  
LAWRENCE LIVERMORE LAB

BRIEF DESCRIPTION

This experiment was designed to determine the time and position variations of the directional fluxes of protons with energies above 2 MeV and electrons with energies above 60 keV in the region below the Van Allen belts. The experiment, mounted in the wheel section of the spacecraft, consisted of a Stilbene scintillator crystal mounted on an RCA C-7151 ruggedized photomultiplier tube. In this type scintillator, protons and electrons produce fluorescent pulses of distinctly different decay times, thereby allowing the two particles to be counted separately. The experiment performed well initially and transmitted useful data until July 14, 1963.

OSD 1, WHITE

INVESTIGATION NAME- 1 TO 8 A SOLAR X RAY FLUX

NSSDC ID- 62-006A-04

PERSONNEL  
PI - W. A. WHITE

NASA-CSFC

BRIEF DESCRIPTION

This experiment was designed to study temporal variations in 1- to 8-A solar X-ray flux in support of the 10- to 400 A solar spectrometer experiment (62-006A-01). The detector consisted of a pair of xenon-filled ion chambers with 0.015-cm-thick beryllium windows, of 3.38-sq cm area each. The detectors were connected in parallel and mounted in the pointed portion of the OSO platform so that they monitored the sun. The sampling rate was approximately once every 10 s. Gas pressure was 760 mm Hg, and chamber depth at normal incidence was 2.19 cm. The experiment operated normally from launch through May 15, 1962. Additional data were collected through May 1964 on a real-time basis whenever the spacecraft was

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within range of a receiving station.

..... OSO 2 .....

SPACECRAFT COMMON NAME- OSO 2  
ALTERNATE NAMES- OSO-B2, S 17  
OSO-B, 00987

NSSDC ID- 65-007A  
LAUNCH DATE- 02/03/65

SPONSORING COUNTRY  
U.S.  
WEIGHT- 547. KG

ORBIT PARAMETERS  
ORBIT TYPE-  
ORBIT PERIOD- 93.6 MIN  
PERIAPSIS- 435. KM ALT

EPOCH DATE-  
INCLINATION- 32.9 DEG  
APOAPSIS- 466. KM ALT

PERSONNEL  
SC - UNKNOWN  
PM - L.T. HOGARTH

UNKNOWN  
NASA HEADQUARTERS

BRIEF DESCRIPTION

The objectives of the OSO satellite series were to perform solar physics experiments above the atmosphere during a complete solar cycle and to map the entire celestial sphere for direction and intensity of UV light and X-ray and gamma radiation. The OSO 2 platform consisted of a sail section, which pointed two experiments continuously toward the sun, and a wheel section, which spun about an axis perpendicular to the pointing direction of the sail and carried six experiments. Attitude adjustment was performed by gas jets. A pointing control system permitted the pointed experiments to scan the region of the sun in a 40- by 40 arc-min raster pattern. Data were simultaneously recorded on tape and transmitted by PCM/PM telemetry. A command system provided for 70 ground-based commands. The spacecraft performed normally until the pitch gas supply neared exhaustion on November 6, 1965. The spacecraft was then placed in a stowed condition. The transmitter was commanded on intermittently until March 3, 1966, and then on a weekly schedule until June 1, 1966, when it ceased operation. For more information, see A. W. L. Ball, Spaceflight, v. 12, p. 244, 1970.

..... OSO 2, CHUBB .....

INVESTIGATION NAME SOLAR X RAY BURSTS

NSSDC ID- 65-007A-02

PERSONNEL  
PI - T.A. CHUBB

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This experiment was designed (1) to measure solar X ray bursts in three wavelength bands (2 to 8 A, 8 to 20 A, and 44 to 60 A), the 2 to 8 A background radiation, and X-ray emissions from solar prominences high above the solar limb, and (2) to map X-ray sources on the sun in two wavelength intervals (2 to 8 A and 44 to 60 A). The experiment, located in the sail section of the satellite, had two operational modes - pointed and raster. The pointed mode used five GM tube counters (three were used as burst detectors, one as a background detector, and one as a prominence detector) and was designated the solar X ray telescope. The raster mode, called the X-ray spectroheliograph, used two of the burst detectors. This, however, failed to function. In the pointed mode, the burst detectors were pointed directly at the sun to within plus or minus 1 arc-min of the center of the apparent solar disk and continuously monitored the solar X ray flux except during telemetry readout of the satellite tape recorder and spacecraft night. The background detector was pointed away from the sun and provided a basis for correcting the data for counts caused by particle radiation. The prominence detector looked at the region around the sun by means of an X-ray detector equipped with an occulting disk that artificially eclipsed the sun. The intensity measurements for the burst portion of the experiment were accurate to 7% for short time intervals (8 s) and had better than 7% accuracy for long time intervals (8 min). The experiment produced about 1 month of X-ray data.

..... OSO 3 .....

SPACECRAFT COMMON NAME- OSO 3  
ALTERNATE NAMES- OSO-E, 02703

NSSDC ID- 67-020A  
LAUNCH DATE- 03/08/67

SPONSORING COUNTRY  
U.S.  
WEIGHT- 600. KG

ORBIT PARAMETERS  
ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD- 95.53 MIN  
PERIAPSIS- 534. KM ALT

EPOCH DATE 03/09/67  
INCLINATION 32.87 DEG  
APOAPSIS- 564. KM ALT

PERSONNEL  
SC - H.J. SMITH  
PM - L.T. HOGARTH  
PS - W.E. BEHRING

NASA HEADQUARTERS  
NASA-GSFC  
NASA-GSFC

BRIEF DESCRIPTION

The objectives of the OSO satellite series were to perform solar physics experiments above the atmosphere during a complete solar cycle and to map the celestial sphere for direction and intensity of UV light, X-ray, and gamma radiation. The OSO 3 platform consisted of a sail section, which pointed two experiments continually toward the sun, and a wheel section, which spun about an axis perpendicular to the pointing direction of the sail and carried seven experiments. Attitude adjustment was performed by gas jets and a magnetic torquing coil. Data were simultaneously recorded on tape and transmitted by PCM/PM telemetry. A command system provided for 94 ground based commands. The spacecraft performed normally until the second onboard tape recorder failed in July 1968. The spacecraft was put in standby condition on November 10, 1969, and became inoperable shortly thereafter. For more details, see J. C. Brandt, Solar Phy., v. 6, p. 171, 1969.

..... OSO 3, CLARK .....

INVESTIGATION NAME - HIGH ENERGY GAMMA RAY

NSSDC ID- 67-020A-01

PERSONNEL  
PI - G.W. CLARK  
OI - W.L. KRAUSHAAR  
DI - G.P. GARMIRE

MASS INST OF TECH  
U OF WISCONSIN  
PENNSYLVANIA STATE U

BRIEF DESCRIPTION

This MIT high-energy gamma ray detector was sensitive to gamma rays of energy greater than 50 MeV. The instrument was designed specifically to measure these gamma rays produced by cosmic-ray interactions with the interstellar medium. These devices, particularly spark chambers, were better suited to the study of gamma rays from discrete sources such as radio galaxies. The instrument consisted of a charged particle telescope of three elements, scintillation counters, and a Cerenkov detector. An array of 15 photomultiplier tubes with organic and inorganic crystal scintillators was connected to the appropriate anticoincidence circuitry to detect solar and extrasolar gamma rays with a half-angle spatial resolution of 15 deg (10% efficiency). The detector system performed with no appreciable loss of function from the beginning of the mission to loss of onboard tape recording in July 1968. For more details, see W. L. Kraushaar, G. W. Clark, and G. Garmire, Solar Phy., v. 6, p. 228, 1969.

..... OSO 3, NEUPERT .....

INVESTIGATION NAME SOLAR EUV SPECTROMETER 1 TO 400 A

NSSDC ID- 67-020A 05

PERSONNEL  
PI - W.M. NEUPERT  
OI - W.A. WHITE

NASA GSFC  
NASA GSFC

BRIEF DESCRIPTION

This experiment was designed to observe the whole sun, and was pointed to within 1 arc-min of the sun's center. The instruments consisted of three uncollimated Bragg crystal spectrometers [a lithium fluoride (LiF) crystal spectrometer covering 1.3 to 3.1 A, a potassium acid phthalate (KAP) crystal spectrometer covering 6 to 25 A, and a third crystal spectrometer covering 2 to 6 A that malfunctioned], a grating spectrometer covering the range 20 to 400 A, and a broadband ionization chamber covering 0.5 to 8 A. The LiF spectrometer scanned the spectrum in various modes requiring from 2.73 min to 32.76 min to complete a spectrum. The KAP spectrometer scanned in two modes, requiring either 5.46 min or 21.84 min to complete a spectrum. The grating spectrometer scanned in various modes requiring up to 32.768 min to complete a spectrum. Any spectrometer could be set on a preselected step to monitor a particular wavelength. The ionization chamber apparently worked throughout the life of OSO 3. The LiF spectrometer and the grating spectrometer gave useful data for about 9 months before degrading seriously. The KAP spectrometer lasted about 6 months. Background levels were usually very small compared to the useful signals, although occasional traversals of the radiation belts produced very large backgrounds. For more information, see W. H. Neupert, et al., Solar Phy., v. 6, p. 183, 1969.

..... OSO 3, PETERSON .....

INVESTIGATION NAME - SOLAR AND CELESTIAL GAMMA-RAY TELESCOPE

NSSDC ID 67-020A 07

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PERSONNEL  
PI - L.E. PETERSON U OF CALIF, SAN DIEGO

BRIEF DESCRIPTION  
The experiment was designed to investigate the emission of X-rays in the 7.7 to 200-keV range from cosmic and solar sources with approximately 50% FWHM spectral resolution and 15-s time resolution. The detector, mounted on the wheel section of the spacecraft, consisted of a 0.5-cm-thick NaI crystal surrounded by a 4.8-kg cylindrical cup-shaped CsI(Tl) shield crystal pointed radially outward. The anticoincidence shield had a 5-cm wall and defined a 13 deg half-angle field of view for the inner NaI detector, which had a 0.5-mm beryllium foil window 9.2 sq cm in area with a geometric factor of 1.5 sq cm sr. The output pulse was pulse-height analyzed into six logarithmically spaced channels and two integral channels. The experiment performed normally during the lifetime of the satellite. For more details, see H. S. Hudson, L. E. Peterson, and D. A. Schwartz, Solar Phys., v. 6, p. 205, 1969.

-----OSO 3, TESKE-----

INVESTIGATION NAME 8- TO 12 A SOLAR X-RAY ION CHAMBER

NSSDC ID- 67-020A-06

PERSONNEL  
PI - R.G. TESKE U OF MICHIGAN

BRIEF DESCRIPTION  
This Michigan soft X-ray ion chamber photometer was located in the wheel of the spacecraft. The ion chamber was filled with about one atmosphere of dry nitrogen gas and had a 5-mm thickness aluminum foil window. The detector responded principally to energy in the wavelength range 8-12 A, though there was also a low efficiency of response between 2-5 A. Data generated by the instrument were converted to energy fluxes for the wavelength band 8-12 A under the assumption that the radiation was distributed as in a blackbody curve for 2 x 10<sup>6</sup> K. Reliability of operation was verified by using the sun itself as a standard source. The operation was nominal from launch on March 8, 1967, until tape recorder loss in July 1968. For more details, see R. C. Teske, Solar Phys., v. 6, p. 193, 1969.

\*\*\*\*\*OSO 4\*\*\*\*\*

SPACECRAFT COMMON NAME- OSO 4  
ALTERNATE NAMES OSO D, O3000

NSSDC ID 67 100A

SPONSORING COUNTRY  
U.S.  
WEIGHT 605. KG

LAUNCH DATE 10/18/67

ORBIT PARAMETERS  
ORBIT TYPE GEOCENTRIC  
ORBIT PERIOD- 95.58 MIN  
PERIAPSIS- 546. KM ALT

EPOCH DATE 10/19/67  
INCLINATION 33.04 DEG  
APOAPSIS- 560. KM ALT

PERSONNEL  
SC - H.J. SMITH  
PM - I.I. HOGARTH  
PS - W.L. BEHRING

NASA HEADQUARTERS  
NASA-GSFC  
NASA GSFC

BRIEF DESCRIPTION  
The objectives of this satellite were to perform solar physics experiments above the atmosphere during a complete solar cycle and to map the entire celestial sphere for direction and intensity of UV light, X ray, and gamma radiation. The OSO 4 platform consisted of a sail section, which pointed two experiments continuously toward the sun, and a wheel section, which spun about an axis perpendicular to the pointing direction of the sail and carried seven experiments. Attitude adjustment was performed by gas jets and a magnetic torquing coil. A pointing control system permitted the pointed experiments to scan the region of the sun in a 40 by 40-arc-min raster pattern. Data were simultaneously recorded on tape and transmitted by PCM/PM telemetry. A command system provided for 140 ground-based commands. The spacecraft performed normally until the second tape recorder failed in May 1968. The spacecraft, which was put in standby condition in November 1969, would be turned on only for recording special events in real time. Such an event occurred on March 7, 1970, when OSO 4 recorded data during the solar eclipse. For more information, see A. W. L. Ball, Spaceflight, v. 12, p. 244, 1970.

-----OSO 4, FRIEDMAN-----

INVESTIGATION NAME- X RAY SPECTROMETER

NSSDC ID- 67 100A 09

PERSONNEL  
PI - H.D. FRIEDMAN US NAVAL RESEARCH LAB  
OI - T.A. CHUBB US NAVAL RESEARCH LAB  
OI - R.W. KREPLIN US NAVAL RESEARCH LAB  
OI - J.F. MEEKINS US NAVAL RESEARCH LAB

BRIEF DESCRIPTION  
This experiment was designed to investigate the X-ray spectra of solar flares using Bragg crystal spectrometers that measured line and continuum emission spectra in the 1- to 8 A region. The measurements permitted a distinction to be made between emissions from a thermally excited coronal plasma (thermal process) and the emissions produced by fast electrons flowing into a relatively cool corona (nonthermal process). This distinction was of great importance in determining the mechanism underlying solar flare X-ray emission phenomena. The instrumentation, mounted in the stable pointed section of the OSO 4 spacecraft, was directed toward the sun and was arranged to scan the wavelength bands 0.63 to 3.83 A and 1.38 to 8.38 A simultaneously, once every 2 min. This instrumentation consisted of two separate Bragg crystal spectrometers that were positioned one above the other on a common axis of rotation and were driven by the same motor. The detectors in each spectrometer had mica windows (1.5 mg/sq cm) and were filled with argon gas (2.6 mg/sq cm). A filter composed of Mylar (0.00062-cm thick) and coated with a thin film of aluminum (1000 A on each side) was placed over the entrance aperture to reduce solar heating inside the instrument enclosure and to reflect any UV radiation to which the detector might respond. The reflecting crystals were made of LiF (lithium fluoride) (0.63- to 3.83 A band) and EDTT (ethylenediamine d-tartrate) (1.38- to 3.38 A band). The experiment produced good quality data until December 7, 1971, when it was placed in an operational off mode. For more information, see J. F. Meekins et al., Science, v. 162, p. 981, 1968.

-----OSO 4, GIACCONI-----

INVESTIGATION NAME- SOLAR X-RAY TELESCOPE

NSSDC ID- 67-100A-08

PERSONNEL  
PI - R. GIACCONI SPACE TELESCOPE SCI IN  
OI - A.S. KRIFGER AS+E, INC  
OI - F.R. PAOLINI AS+E, INC

BRIEF DESCRIPTION  
This experiment was designed to obtain X ray spectroheliograms of good spatial resolution (1 arc min) in four wavelength bands (3 to 13 A, 3 to 21 A, 3 to 20 A, and 44 to 70 A) over periods of solar quiescence and solar activity. The instrument consisted of a two-mirror, image-forming telescope with a two-position aperture wheel and a four-position filter wheel. The detector consisted of a photocathode from which photoelectrons were focused and accelerated by an electrostatic lens onto an anthracene crystal scintillation detector. A complete raster scan, producing a 48 by 40 word array of count-rate values, was performed every 307 s. Except for slight degradation of data caused by internal noise, the experiment performed well during the life of the onboard tape recorders.

-----OSO 4, GOLDBERG-----

INVESTIGATION NAME SOLAR EUV SPECTROMETER

NSSDC ID- 67-100A-07

PERSONNEL  
PI - L. GOLDBERG KITT PEAK NATL OBS  
OI - E.M. REEVES NASA HEADQUARTERS  
OI - W.H. PARKINSON HARVARD COLLEGE OBS

BRIEF DESCRIPTION  
The objective of the experiment was to map solar EUV radiation intensities in the 300 to 1400-A region. A scanning spectrometer was used in two modes of operation. In the wavelength scan mode of operation, the instrument was pointed toward the center of the solar disk, and the spectrum from 300 to 1400 A for an area 1 sq arc-min was obtained. One complete scan required 31.5 min and consisted of approximately 11,000 discrete 0.1-A steps of the ruled grating. A visible-light, zero-order detector was used to indicate one particular position in the wavelength scan. In addition, a mechanical microswitch operating directly off the grating case provided a redundant wavelength reference indicator. Counts were recorded for 80 ms as a function of step number following the optical or mechanical reference position. In the raster mode, the grating was positioned at a selected wavelength to an accuracy of 0.5 A, and the pointed section of the spacecraft was commanded to make repeated raster scans. Each scan required about 5 min, and the count rate from a 1.0-sq arc-min field was recorded in a 40 by 48-element matrix. The complete matrix covered a 36.5 sq arc-min area in the center of the solar disk. The instrument provided a spectral resolution of approximately 1.6 A. The experiment started operating on October 25, 1967, and produced more than 100 wavelength scans and over 4000 spectroheliograms (raster scans) in 52 wavelengths. A failure in the high voltage power supply occurred during orbit 637 on November 29, 1967, and the experiment was turned off during orbit 646 on November 30, 1967. The sensitivity of the



instrument varied with time and was wavelength dependent. Forty-five wavelengths distributed throughout the entire spectral range were used to follow the time-dependent changes. For additional information, see E. M. Reeves and W. H. Parkinson, App. Opt., v. 9, p. 1201, 1970; E. M. Reeves and W. H. Parkinson, Ap. J. Supp., v. 181, p. 1, 1970.

-----OSO 4, WAGGONER-----

INVESTIGATION NAME- PROTON ELECTRON DETECTOR

NSSDC ID- 67-100A-04

PERSONNEL  
PI - J.A. WAGGONER LAWRENCE LIVERMORE LAB

BRIEF DESCRIPTION

This experiment was designed to investigate the energy spectra and angular distributions of protons and electrons in the earth's magnetosphere. The instrument consisted of a single scintillator-photomultiplier assembly having a look direction normal to the satellite spin axis. Particle identification was accomplished by pulse-shape discrimination. Spin-integrated differential proton spectra in eight intervals between 1.73 and 36.7 MeV and differential electron spectra in eight intervals between 80 keV and 5 MeV were obtained by pulse-height discrimination. Energy-integrated angular distributions were obtained in 16 intervals of 22.5 deg each. Eight data registers and subcommutation techniques were used in the transmission of one full set of data every 15.36 s. The instrument provided good data from launch to December 1968. However, only real-time data were obtained after May 12, 1968, when the onboard tape recorder failed.

0.25-mm-thick Mylar window and nitrogen filler gas. Each ion chamber photometer had an electrometer amplifier and analog-to-digital converter. The first three bands had automatic range changing capabilities that enabled them to alter their sensitivity in the event of solar flare. The 0.5- to 3-A and 1- to 8-A photometer amplifiers had three sensitivity ranges, and the 8- to 16-A photometer amplifier had two ranges. The ion chamber photometers continuously monitored the incident radiation while a digital sample was taken. The digitizing operation was controlled by two solar cells mounted 90 deg from each other, with one cell facing in the same direction as the four ion chambers. As the satellite wheel rotated, the cell not aligned with the detectors came into view of the sun first and initiated the taking of a seven-bit digital sample of the X-ray background. When the other cell and the X-ray detectors came into view of the sun, the digital sampling of the solar X-ray flux was initiated. The background X-ray reading was subtracted from the solar X-ray reading before readout. An automatic calibration cycle occurred after every 48 readout cycles and consisted of opening the inputs to the amplifiers and performing a normal digitized operation without subtracting the background reading. The experiment functioned properly for over a year, from January 1969 to July 1970. After this time, however, the experiment failed because of undetermined causes and was placed in an inoperable status on September 8, 1971. The data from this experiment were combined with data from a similar experiment on Solrad 9 to provide observational coverage of a major portion of every X-ray solar event that occurred during the period. For additional information, see R. W. Kreplin and R. G. Taylor, Solar Phys., v. 21, p. 452, 1971.

-----OSO 5, NEUPERT-----

INVESTIGATION NAME- SOLAR SPECTRUM STUDIES

NSSDC ID- 69-006A-03

PERSONNEL  
PI - W.M. NEUPERT NASA-GSFC

BRIEF DESCRIPTION

This experiment was designed to observe the whole sun and to record the spectral and time-resolved radiation between 1 and 400 A for a variety of conditions. The instruments consisted of three single Bragg spectrometers (covering 1 to 3 A, 3 to 10 A, and 6 to 25 A), a grazing incidence grating spectrometer covering the range 25 to 400 A, and a pair of ion chambers covering the range 0.5 to 8 A. Useful data were taken while the experiment was pointed toward the center of the sun. Useful data were also recorded when the experiment pointed to the center of the sun in a raster scan of 40- by 40-arc-min. The grating spectrometer began losing sensitivity after 2 months of operation (the grating spectrometer sensitivity can be monitored by observing the 304 A line at various times). The proportional counters in the 1 to 3 A and 3 to 10 A crystal spectrometers were good for about 1 year (their condition may be monitored by comparing the flux for a particular line against the overall flux monitored by the ion chambers). The ion chambers showed no signs of deterioration for over 1 year. The 6 to 25 A spectrometer began losing sensitivity after 6 months of operation. Background levels were usually very small compared to useful signals. For additional information, see W. M. Neupert, M. Swartz, and S. D. Kastner, Solar Phys., v. 31, p. 171, 1973.

-----OSO 5, NEY-----

INVESTIGATION NAME- ZODIACAL LIGHT MONITOR

NSSDC ID- 69-006A-07

PERSONNEL  
PI - E.P. NEY U OF MINNESOTA

BRIEF DESCRIPTION

This experiment, a modified version of an OSO 2 experiment (65 007A-04), was designed to measure the intensity and degree of polarization of zodiacal light as a function of ecliptic latitude and to search for changes in zodiacal light resulting from solar disturbances. It was also intended to study the intensity of the airglow continuum layer and to study the distribution of nighttime lightning storms. Six photomultiplier/filter photometers were used with various apertures and orientations. These photometers were PM 1, PM 2, PM 3, PM 4, PM 5, and PM 6. PM 1 was oriented parallel to the spin axis with a 9.25- by 57-deg field of view (FOV) and a red/visual passband. PM 2 was oriented antiparallel to the spin axis with a 9.25 by 57-deg FOV and a blue (3500 to 5000 A) passband. PM 3 was oriented parallel to the spin axis with an 11-deg-diameter conical FOV and a blue (3500 to 5000 A) passband. PM 4 was oriented parallel to the spin axis with a 10.5-deg offset, a 9.5-deg-diameter conical FOV, and a blue (3500 to 5000 A) passband. PM 5 was oriented antiparallel to the spin axis with a 9-deg-diameter conical FOV and a red (6000 to 8500 A) passband. PM 6 was oriented antiparallel to the spin axis with a 9-deg offset, a 9.5-deg-diameter FOV, and a visual/red passband. These photometers measured light intensity up to about 1000 times that of a tenth magnitude star, on a scale from 0 to 4096. In addition, two photodiodes, each with a sensitivity about one sixteenth that of the photometers, functioned as monitor eyes and were sampled once every 5 s.

-----OSO 5, CHUBB-----

INVESTIGATION NAME- SOLAR X RAY RADIATION ION CHAMBER PHOTOMETER

NSSDC ID- 69 006A 04

PERSONNEL  
PI - T.A. CHUBB US NAVAL RESEARCH LAB  
O1 - R.W. KREPLIN US NAVAL RESEARCH LAB  
O1 - H.D. FRIEDMAN US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This NRL experiment was designed to monitor the solar X-ray flux in four broad bands between 0.5 and 60 A (0.5 to 3 A, 1 to 8 A, 8 to 16 A, and 44 to 60 A) as part of a long term project to observe solar X-ray activity with sets of standardized X-ray ion chamber photometers over an entire solar cycle. The instrumentation, mounted in the wheel section of the OSO 5 spacecraft, consisted of four X-ray ion chamber photometers. The 0.5- to 3-A ion chamber had a 50 mm thick beryllium window and krypton filler gas, the 1- to 8-A ion chamber had a 5-mm thick beryllium window and argon filler gas, the 8 to 16-A ion chamber had a 0.33-mm-thick aluminum window and nitrogen filler gas, and the 44 to 60-A ion chamber had

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Eye 1 was oriented parallel to the spin axis with a 10.5-deg offset and had a 21-deg-diameter conical FOV. Eye-2 was oriented antiparallel to the spin axis, was offset by 5 deg, and had a 17.5 deg-diameter FOV. For more details, see C. B. Burnett, J. G. Sparrow, and E. P. Ney, *App. Opt.*, v. 11, p. 2075, 1972.

-----OSO 6, ARGO-----

INVESTIGATION NAME X-RAY SPECTROMETER

NSSDC ID- 69-068A-04

PERSONNEL

PI - H.V. ARGO	LOS ALAMOS SCI LAB
O1 - B.L. HENKE	U OF HAWAII
O1 - J.A. BERGEY	LOS ALAMOS SCI LAB
O1 - W.D. EVANS	LOS ALAMOS SCI LAB

BRIEF DESCRIPTION

This experiment monitored photon flux in seven wavelength channels, 16 A, 18 A, 18.1 A, 18.9 A, 21.6 A, 33.7 A, and 40.3 A. The 18.1-A channel was free of line radiation and, thus, provided background continuum and interesting flux measurements during so-called bremsstrahlung flares. This spectrometer was basically similar to that on OSO 4, but there were two important differences: (1) this instrument scanned the spectrum in 8 min compared with 13 min on OSO 4; and (2) its crystal resolution width was 6 arc-min compared with about 20 arc-min for OSO 4. Because of the increased resolution, it was possible to detect weaker emission lines that would be lost against the continuum with the OSO 4 instrument, and blended lines could be separated with more confidence. The instruments consisted of six nonscanning, curved crystal spectrometers that were activated by a sun sensor during the 22 ms when the instrument axis was sweeping the 4 deg of the center of the sun. Crystals used in the spectrometers were of two types: bent mica for wavelengths less than 19 A and a lead stearate crystal formed on mica for wavelengths greater than 19 A. Open window photoelectric counters were used. The Bendix M310 photomultipliers had gradually deteriorated since launch. Good data were received in August and October 1969. No useful data had been obtained since November 1, 1969. The experiment had been in an inoperable status since April 22, 1970. For more information, see C. A. Doschek et al., *Ap. J.*, v. 164, p. 165, 1971.

-----OSO 5, RENSE-----

INVESTIGATION NAME- SOLAR EXTREME ULTRAVIOLET MONITOR

NSSDC ID 69 006A 08

PERSONNEL

PI - W.A. RENSE	U OF COLORADO
O1 - R. PARKER	U OF COLORADO
O1 - E.C. BRUNER, JR.	LOCKHEED PALO ALTO
O1 - F. WILSHOUSEN	U OF COLORADO

BRIEF DESCRIPTION

This experiment was designed to (1) observe temporal variations of solar UV intensity in three broad bands between 280 A and 1030 A (280 to 370 A, 465 to 630 A, and 760 to 1030 A), (2) observe variations in intensity in these bands during solar flares, (3) make estimates for the three UV bands of active and quiet region contributions and limb brightening as a result of measurements made during solar eclipses, and (4) make an approximate determination of the differences in temperature and constituent number densities of the earth's upper atmosphere between sunrise and sunset. The instrumentation, located in the wheel section of the OSO 5 spacecraft, consisted of a single Rowland mounted, concave, grazing incidence, grating spectrophotometer, which dispersed the radiation into the three bands, and three Bendix resistance-strip-type photomultipliers, which detected the radiation in each band. Counts from each band were obtained during every revolution of the satellite (about 2 s) during the daylight portion of the orbit, including sunrise and sunset. The count range was from 100 to 20,000, but variations of more than 5% caused by pitch changes or interference were sometimes present. Inflight calibration, namely a check on the grating reflectivity and photomultiplier response, was made at regular intervals for the first few weeks of operation but was discontinued because of a malfunction of the calibration lamp. A background reading was also taken periodically while the instrument was looking away from the sun. Because of the calibration lamp malfunction, the instrument was deactivated by ground command in May 1969. For more information, see P. T. Kelly and W. A. Rense, *Solar Phys.*, v. 26, p. 431, 1972.

-----OSO 6, BOYD-----

INVESTIGATION NAME- STUDY OF SOLAR HELIUM I, HELIUM II, OXYGEN, AND NITROGEN RADIATION

NSSDC ID 69-068A-06

PERSONNEL

PI - R. L. F. BOYD	U COLLEGE LONDON
O1 - B. E. WOODGATE	NASA-GSFC

BRIEF DESCRIPTION

This experiment simultaneously measured the solar EUV flux in several spectral lines--Fe XI at 180 A, He II at 256 A, He I at 304 A, He I at 537 A, O II, III at 835 A, N III at 991 A, C III at 1175 A, and H I at 1216 A--(1) to determine flux changes and density variations in active regions at various heights above the photosphere, (2) to determine the radiation input heating the earth's atmosphere, and (3) to measure the density of the earth's thermosphere by the absorption of the solar EUV at satellite dusk and dawn. The instrument consisted of a grazing incidence grating spectrometer utilizing channel photomultipliers as detectors. The instrumental field of view was plus or minus 2 deg in pitch and plus or minus 1/2 deg in spin. Inflight X-ray calibration of the detectors was accomplished using an iron 55 radioactive source. Inflight grating calibration was accomplished by simultaneous measurement of the solar Lyman-alpha flux at 1216 A. The background noise of each detector was less than 0.5 counts per second. Counts from each detector were stored in 8-bit scalars with prescalers that divided by four to extend the range to 636 counts. Each detector was read out successively during a rotation of the spacecraft. The three high voltage supplies and the X-ray calibration source could be commanded on or off independently. During the first month of operation (August 1969), the spacecraft pitch angle of minus 2 deg compromised the flux accuracy, but after the first month the pitch angle was kept within plus or minus 1 deg. The experiment was operated only during satellite daytime (60 min of each 96 min orbit). The sensitivity of the experiment was degraded by a factor of three in 9 months, although the experiment was still operable at that time. High-voltage supply problems developed in May to August 1970. The experiment was turned off on January 21, 1972. For more information, see B. E. Woodgate et al., *Proc. Roy. Soc. Lon.*, v. A 332, p. 291, 1973.

-----OSO 6, GOLDBERG-----

INVESTIGATION NAME- SOLAR UV SCANNING SPECTROMETER, SPECTROHELIO METER (300 TO 1400 A)

NSSDC ID- 69-068A-01

SPACECRAFT COMMON NAME- OSO 6  
ALTERNATE NAMES PL 693A, OSO-G  
04065

NSSDC ID 69 068A

SPONSORING COUNTRY  
U.S.

LAUNCH DATE 08/09/69

WEIGHT 647. KG

ORBIT PARAMETERS

ORBIT TYPE		EPOCH DATE	
ORBIT PERIOD-	94.4 MIN	INCLINATION-	32.9 DEG
PERIAPSIS	465. KM ALT	APOAPSIS-	516. KM ALT

PERSONNEL

SC - UNKNOWN	UNKNOWN
PM - J.M. THOLE	NASA-GSFC
PS - S.P. MARAN	NASA-GSFC

BRIEF DESCRIPTION

OSO 6 was the sixth in a series of satellites designed to conduct solar physics experiments above the earth's atmosphere during a complete solar cycle. The primary objectives of OSO 6 were the acquisition of high spectral resolution data within the 1 to 1300 A range, the observation of solar X rays in the 20 to 200 keV range, and the observation of high-energy neutron flux in the 20 to 130 MeV range. Seven experiments were carried on the spacecraft. Two of these were located in the sail portion and were designed to point toward the sun. The remaining five experiments were mounted in compartments of the nine-sided rotating wheel section and scanned the solar disk every 2 s when the spacecraft was in sunlight. The spacecraft measured approximately 112 cm in diameter and about 96 cm in height. The spacecraft was spin-stabilized after launch, and gas jets mounted on the sail section kept the spacecraft positioned so that its spin axis was normal to the sun vector within plus or minus 3.5 deg. Servomotors drove the sail in a direction opposite to the spinning wheel so that the sail faced the sun during the sunlight portion of the orbit. OSO 6 was the first in the series that could offset point to any one of 16,384 points on a 128 by 128 point grid. With the spacecraft pointing at the sun center, large rasters of 46 by 46 arc-min could be performed. Small rasters, 7.5 by 7 arc-min, could be performed on any offset point but not outside the bounds of the 46 by 46 arc-min. The spacecraft was launched on August 9, 1969. All seven experiments were turned on for continuous operation by orbit 75 on August 14, 1969. The spacecraft was retired on December 31, 1972. For more information, see R. N. Watts, *Sky and Teles.*, v. 38, p. 230, 1969.

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PERSONNEL  
 PI - L. GOLDBERG  
 OI - E.M. REEVES  
 OI - W.H. PARKINSON

KITT PEAK NATL OBS  
 NASA HEADQUARTERS  
 HARVARD COLLEGE OBS

BRIEF DESCRIPTION

The objective of this Harvard experiment was to map solar UV radiation intensities in the 300 to 1400 A region in order to determine spatial and spectral information and the variation with time of a variety of solar phenomena. The instrument consisted of a normal incidence telescope and spectrometer covering the spectral range from 280 to 1380 A. The instrument was used as a spectrometer-spectroheliometer in three operating modes. First, spectral scans were made at fixed positions on or off the solar disk. By moving the spacecraft, the optical axis of the instrument was pointed at one of the positions in a 128 by 128 points reference grid centered in the solar disk. The grating of the instrument was in steps of 0.1 A. The field of view for observations made on the solar disk was 35 arc-s sq. A complete spectral scan required about 16 min. Secondly, the instrument was commanded to a selected wavelength, and the spacecraft was operated in a raster pattern to obtain full disk spectroheliograms. These large rasters contained 64 rows (lines of constant elevation) spaced at 42 arc-s, with 96 points in each row, and required about 8 min to complete. The spatial resolution was about 35 arc-s. Third, the instrument was commanded to a selected wavelength, and the optical axis of the instrument was pointed to one of the reference grid points. The spacecraft was operated in the small raster pattern to obtain spectroheliograms of an area 7 arc-min in azimuth and 7.5 arc-min in elevation. The pattern consisted of 16 rows spaced 28 arc-s apart with 24 points in each row. The time for a small raster was about 31 s. Counts were accumulated for the first 40-ms interval of an 80-ms cycle time and were read into the telemetry record during the last 20 ms of the cycle. The experiment operated from August 12, 1969, until termination, on May 12, 1970, because of low sensitivity. For more details, see P. J. Macar et al., App. Opt., v. 9, p. 581, 1970.

-----OSO 6, KREPLIN-----

INVESTIGATION NAME- NRL X RAY SPECTROHELIOGRAPH

NSSDC ID 69 068A-02

PERSONNEL  
 PI - R.W. KREPLIN  
 OI - T.A. CHUBB  
 OI - J.F. MEEKINS  
 OI - H.D. FRIEDMAN

US NAVAL RESEARCH LAB  
 US NAVAL RESEARCH LAB  
 US NAVAL RESEARCH LAB  
 US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

The NRL X-ray spectroheliograph was designed to study X-ray line spectra of elements in ionized states in the corona from solar flares as compared to spectra during the quiet sun. Basically, the NRL experiment was divided into four parts: (1) three Bragg crystal spectrometers for fine spectral resolution (0.6-25 A), (2) a pulse height spectrometer that used two detectors to monitor fast changes in time of the X ray spectrum (1.4-6.0 A), (3) a raster scanner consisting of three detectors--the first for spectroheliograms in the 8-20 A region, the second for detecting hot spots in the 1-8 A region, and the third (8-20 A) for detecting flares and measuring their lateral velocity, (4) a burst detector that was a Geiger counter designed to detect soft X-rays (18-25 A) of short duration which might have been missed by the Bragg spectrometer. A Geiger counter was also included to detect cosmic background radiation from 2 to 8 A. The detectors all worked well, except for the burst detector (18-25 A) and the third detector of the raster scanner, until January 25, 1972, when the experiment was placed in an operational off mode. For more information, see G. A. Doschek, J. F. Meekins, and R. D. Cowan, Ap. J., v. 177, p. 261, 1972; G. A. Doschek, J. F. Meekins, and R. D. Cowan, Solar Phy., v. 29, p. 125, 1973.

\*\*\*\*\*OSO 7\*\*\*\*\*

SPACECRAFT COMMON NAME OSO 7  
 ALTERNATE NAMES- OSO-H, 05491

NSSDC ID- 71 083A

SPONSORING COUNTRY  
 U.S.  
 WEIGHT- 1400. KG

ORBIT PARAMETERS  
 ORBIT TYPE- GEOCENTRIC  
 ORBIT PERIOD- 93.2 MIN  
 PERIAPSIS 321. KM ALT

EPDCH DATE 09/30/71  
 INCLINATION 33.1 DEG  
 APDAPSIS 572. KM ALT

PERSONNEL  
 MC - M.E. MCDONALD  
 SC - G.K. DERTFJ  
 PM - R.H. PICKARD  
 PS - S.P. MARAN

NASA HEADQUARTERS  
 NASA HEADQUARTERS  
 NASA-GSFC  
 NASA-GSFC

BRIEF DESCRIPTION

The objectives of the OSO satellite series were to perform solar physics experiments above the atmosphere during a complete solar cycle and to map the entire celestial sphere for direction and intensity of UV light and X-ray and gamma radiation. The OSO 7 platform consisted of a sail section, which pointed two experiments continually toward the sun, and a wheel section, which spun about an axis perpendicular to the pointing direction of the sail and carried four experiments. Attitude adjustment was performed by gas jets and a magnetic torquing coil. A pointing control permitted the pointed experiments to scan the region of the solar disk in a 60- by 60-arc-min raster pattern. In addition, the pointed section could be commanded to select and scan any 7.5- by 5-arc-min region near the solar disk. Data were simultaneously recorded on tape and transmitted by PCM/PM telemetry. A command system provided for at least 155 ground based commands. Only real-time data have been received since May 1973, when the second tape recorder failed. The spacecraft reentered the earth's atmosphere July 9, 1974.

-----OSO 7, CHUPP-----

INVESTIGATION NAME- SOLAR GAMMA-RAY MONITOR

NSSDC ID- 71-083A-06

PERSONNEL  
 PI - E.L. CHUPP  
 OI - H.P. GILMAN  
 OI - A.A. SARKADY

U OF NEW HAMPSHIRE  
 U OF NEW HAMPSHIRE  
 U OF NEW HAMPSHIRE

BRIEF DESCRIPTION

This University of New Hampshire experiment monitored the solar high-energy photon (gamma ray) spectrum from 0.3 to 10.0 MeV for intensity, time variation, and possible line emission, particularly during flares. In addition, special attention was paid to lines at 0.51 MeV, 2.22 MeV, 4.43 MeV, and 6.14 MeV, which indicate the production of positrons, neutrons, and excited nuclei in the solar atmosphere. The instrumentation consisted of a high-resolution, gamma ray scintillation spectrometer mounted in the wheel section. The detector was a NaI(Tl) scintillation crystal viewed by a photomultiplier. It was surrounded by a CsI(Na) anticoincidence shield and photomultiplier array, which also provided directional sensitivity. Gamma rays were detected in 377 energy channels from 0.3 to 9.5 MeV by a pulse height analyzer. For correlation purposes in the data analysis, a secondary system made up of a thin NaI(Tl) scintillation crystal and a photomultiplier was used for detecting X rays from 7.5 to 120 keV. X ray pulses were divided by a four-channel pulse-height analyzer. High energy solar neutrons (energies greater than 30 MeV) could be identified from a study of the large energy loss events in the central detector, and their correlation was provided with a gain change attenuator that could be controlled from the ground. For more details, see P. R. Hignie et al., IEEE Trans. Nucl. Sci., v. NS 19, p. 606, 1972.

-----OSO 7, CLARK-----

INVESTIGATION NAME COSMIC X-RAY SOURCES IN THE RANGE  
 1.5 TO 9 A

NSSDC ID 71 083A 04

PERSONNEL  
 PI - C.W. CLARK  
 OI - H.V.D. BRADY  
 OI - W.H.G. LEWIN  
 OI - H.W. SCHNOPPER

MASS INST OF TECH  
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 DANISH SPACE RES INST

BRIEF DESCRIPTION

The purpose of this MIT experiment was to survey the entire sky for cosmic X-ray sources in the energy range 1 to 60 keV with an angular resolution of about 1 deg and perform spectral analysis in five broad bands. Each portion of the sky was viewed several times during each year of operation. Two multicompartimented proportional counters equipped with honeycomb collimators (3.5-sq deg solid angle) were mounted in one segment of the OSO wheel section, with the centers of their fields of view oriented 15 deg above and 15 deg below the spacecraft equator. X-rays were detected in one or another of four compartments depending upon their energy. Low energy photons were stopped in the first compartment, higher-energy photons penetrated to the second compartment, and photons of even higher energies penetrated through the first and second compartments to the third and fourth compartments. The energy bands were logarithmically equispaced. A separate single compartment counter with a thin aluminum window detected photons between 1.0 and 1.5 keV. Counts from each compartment were stored in one of 256 accumulators corresponding to a division of the spacecraft spin into 256 sectors. Inflight calibration was provided by periodic exposure to a radioactive source. For more details, see G. W. Clark et al., Ap. J., v. 179, p. 263, 1973.

-----OSO 7, PETERSON-----

INVESTIGATION NAME COSMIC X RAY EXPERIMENT

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NSSDC ID- 71-083A 03

PERSONNEL

PI - L.E. PETERSON

U OF CALIF, SAN DIEGO

BRIEF DESCRIPTION

The UCSD cosmic X-ray instrument was a sensitive detector mounted in the rotating wheel section of the spacecraft so that it viewed the celestial sphere in 6 months. The objectives of the experiment were (1) to locate accurately known and newly detected X-ray sources, (2) to measure the intensity of the sources, and (3) to analyze the spectrum of the sources over the range of 7 to 500 keV. The experiment capabilities were (1) a full conical look angle of 6.5 deg, (2) a spatial resolution of plus/minus 0.2 deg, (3) a sensitivity of 5.E-4 photons/(sq cm-s), (4) an energy resolution provided by the use of 126 channels for the 7-500 keV range, and (5) a maximum detection rate of 3.12 photons/s. The X-ray detector was a 4-in. diameter by 3/8 in. thick NaI(Tl) scintillation crystal viewed by a 3-in. photomultiplier tube (PMT). The detector was surrounded by a thick CsI(Na) scintillation crystal shield with 10 holes bored through it along the optical axis to define the field of view of the detector. The shield scintillator was viewed by six PM tubes. Light pulses in the NaI crystal caused by X-rays that had passed through the holes in the shield had relatively slow rise times and had intensities proportional to the energy of the photons. The corresponding proportional current pulses out of the PM were recognized as valid events and processed by the data system. X-rays or particles that passed through the CsI shield caused light pulses with fast rise times and corresponding pulses in the shield PM tubes. Pulses from the shield PM tubes were used to electronically reject simultaneous pulses from the detector PM. In this way X rays passed through the collimating holes were processed as useful data. For more information, see M. P. Uimer et al., Ap. J., v. 178, p. 161, 1972.

-----OSD 7, PETERSON-----

INVESTIGATION NAME HARD SOLAR X-RAY MONITORING

NSSDC ID- 71-083A 05

PERSONNEL

PI - L.E. PETERSON

U OF CALIF, SAN DIEGO

BRIEF DESCRIPTION

The UCSD solar X-ray experiment was designed to accomplish two principal objectives: (1) to study, with good temporal and energy resolution, the solar X-ray emission over the energy interval 2-300 keV and (2) to monitor the local radiation environment (cosmic rays, trapped protons and electrons, and cosmic and local X-rays), thereby allowing for a clean interpretation of the primary results. The charged particle data from solid-state detectors were read out each 15-36 s. The instrument was located in the rotating wheel section of the spacecraft. The three detector systems in the instruments were: (1) a collimated proportional counter (2.15 keV), (2) a NaI(Tl) scintillation counter (10-300 keV), and (3) three silicon surface barrier, charged-particle devices. The proportional counter consisted of an aluminum collimator (20 by 90 deg), a 2-mm thick Be window, and an aluminum-lined counter filled to one atm with xenon and carbon dioxide in a nine to one ratio. The detector was provided with a weak Fe(55) source for inflight calibration. The basic element in the hard X-ray detector was a 1-cm thick by 3.5-cm diameter NaI(Tl) scintillator directly coupled to an RCA photomultiplier tube (PMT). A two-segment CsI(Na) anticoincidence shield surrounded the aluminum cylinder subassembly. Each segment of the shield was polished, wrapped in aluminum foil to provide efficient light reflection to an end-mounted PMT, covered by a layer of lead foil, and placed in an aluminum housing. The shield-detector unit had a 90-deg response in the wheel rotation plane and a plus/minus 10-deg response in the perpendicular direction. The detector output was analyzed and loaded into nine energy channel counters. Inflight calibration for the system was provided by monitoring the outputs from a series of suitably placed Am(241) sources. For more details, see I. M. Harrington et al., IEEE Trans. Nucl. Sci., v. NS-19, p. 596, 1972.

-----OSD 7, TOUSEY-----

INVESTIGATION NAME WHITE-LIGHT CORONAGRAPH AND EXTREME ULTRAVIOLET CORONA

NSSDC ID- 71-083A-02

PERSONNEL

PI - R. TOUSEY  
OI - M.J. KOOMEN  
OI - D.J. MICHELS

US NAVAL RESEARCH LAB  
US NAVAL RESEARCH LAB  
US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This experiment was designed (1) to study the morphology of the corona in white light and the extreme UV in relation to active phenomena, such as flares and filaments in the lower solar atmosphere, and (2) to correlate the white light corona with the extreme UV corona and with solar and interplanetary magnetic fields. The instrumentation was located within the pointed section of the spacecraft and consisted of (1) a white light coronagraph for use in the pointed mode to record

the outer corona of the sun from approximately 3 to 10 solar radii in the visible band of 3900 to 6500 A and (2) an extreme UV coronagraph for use in the raster mode to record the upper chromosphere and lower corona fully to two solar radii and partially to five solar radii in the band from 170 to 550 A. The white-light instrument was a modified Lyot coronagraph that artificially eclipsed the sun with a spar-mounted external occulting disk assembly mounted approximately 76 cm in front of the instrument. The faint outer corona could then be observed against the black sky of space. The image was stored in a SEC Vidicon tube with 256 raster lines, each having 256 picture elements. The distance between picture elements was 1.25 arc-min. The extreme UV coronagraph required no occultation device since the solar disk was not an overwhelming source of extreme UV radiation. There were four open to vacuum channel photomultiplier detectors in the image plane behind pinhole apertures in an aperture plate. The assembly was scanned across the solar image in a raster mode. The central aperture detector had a spatial resolution of 20 arc s. The remaining aperture detector combinations were offset, excluding the disk, and had a resolution of 60 arc-s. In a large raster mode, the scanned areas overlapped. The experiment operated normally until March 1972, when it became partially operable. The extreme UV coronagraph degraded until it became useless in September 1973.

\*\*\*\*\* OSD 8 \*\*\*\*\*

SPACECRAFT COMMON NAME OSD 8  
ALTERNATE NAMES OSD I, OSD-EYE  
731D

NSSDC ID- 75-057A

SPONSORING COUNTRY  
U.S.

LAUNCH DATE- 06/21/75

WEIGHT- 4280. KG

ORBIT PARAMETERS

ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD 95.7 MIN  
PERIAPSIS- 544. KM ALT

EPOCH DATE- 06/22/75  
INCLINATION- 32.9 DEG  
APDAPSIS- 559. KM ALT

PERSONNEL

MC - M.E. MCDONALD  
SC - J.D. BOHLIN  
PM - J.P. CORRIGAN  
PS - R. THOMAS

NASA HEADQUARTERS  
NASA HEADQUARTERS  
NASA GSFC  
NASA GSFC

BRIEF DESCRIPTION

The objectives of the OSD satellite series were to perform solar physics experiments above the atmosphere during a complete solar cycle and to map the entire celestial sphere for direction and intensity of UV light, X-ray radiation, and gamma-ray radiation. The OSD 8 platform consisted of a sail section, which pointed two experiments continually toward the sun, and a wheel section, which spun about an axis perpendicular to the pointing direction of the sail and carried five experiments. Gas jets and a magnetic torquing coil performed attitude adjustment. Pointing control permitted the pointed experiments to scan the region of the solar disk in a 40- by 40-arc-min to 60- by 60-arc-min raster pattern. In addition, the pointed section was capable of being commanded to select and scan a 1- by 1-arc-min or 5- by 5-arc-min region anywhere on the solar disk. Data were simultaneously recorded on tape and transmitted by PCM/PM telemetry. A command system provided for at least 512 ground-based commands. For more information, see S. P. Maran and R. J. Thomas, Sky & Teles., v. 49, p. 355, 1975.

-----OSD 8, ACTON-----

INVESTIGATION NAME- MAPPING X-RAY HELIOMETER

NSSDC ID 75-057A-04

PERSONNEL

PI - L.W. ACTON  
OI - J.L. CULHANE  
OI - R.C. CATURA

LOCKHEED PALO ALTO  
U COLLEGE LONDON  
LOCKHEED PALO ALTO

BRIEF DESCRIPTION

This Lockheed Mapping X-ray Heliometer experiment was designed to measure the location, spectrum, and intensity of moderate-energy X-rays (2 to 30 keV) from individual solar active regions (including flaring regions) and from extrasolar X-ray sources. The instrument consisted of three X-ray collimator-detector systems, a power supply, and a data accumulation/readout system. The collimators were identical but oriented differently and had fields of view of 2.1 arc-min by 10-deg FWHM. One collimator was oriented so that the 2.1 arc-min field of view was parallel to the spacecraft spin axis; the other two collimators were inclined plus and minus 60 deg relative to the spin axis. The detectors were proportional counters of various areas and window thicknesses allowing a wide dynamic range of activity to be observed. The experiment was operated from June 1975 through September 1978 in a period of mainly moderate to low solar activity. For more information, see J. M. Mosher, Solar Phys., v. 64, p. 109, 1979; C. J. Wolfson et al., Solar Phys., v. 55, p. 181, 1977.

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-----DSO 8, BARTH-----

INVESTIGATION NAME- HIGH-RESOLUTION ULTRAVIOLET SPECTROMETER MEASUREMENTS

NSSDC ID- 75-057A-01

PERSONNEL

PI - C.A. BARTH  
OI - E.C. BRUNER, JR.  
OI - R.C. ATHAY

U OF COLORADO  
LOCKHEED PALO ALTO  
HIGH ALTITUDE OBS

BRIEF DESCRIPTION

This University of Colorado experiment measured solar ultraviolet lines between 1050 and 2300 A and their variation with time and position on the disk. Spectroheliograms were also generated at selected wavelengths. The instrument consisted of an extended-focal-length Cassegrain telescope, an Ebert monochromator, and a small computer. The telescope focused sunlight on the entrance slit (variable from 1- by 5-arcs to 1-arc-s by 15-arc-min) of the monochromator. The 3600 lines/mm grating in the monochromator was used in second order. The grating drive mechanism was capable of being programmed to scan: (1) the entire spectrum, (2) selected portions of the spectrum, or (3) selected single wavelengths. Two photomultiplier tubes, one covering the range from 1400 to 2300 A and the other covering wavelengths less than 1400 A, detected the radiation. The small computer controlled the experiment and allowed flexible observing programs through automated, data-dependent observing sequences. For more information, see E. C. Bruner et al., Ap. J., v. 210, p. L97, 1976.

NSSDC ID- 75-057A-03

PERSONNEL

PI - R. NOVICK  
OI - J.R. ANGEL  
OI - P.A. VANDENBOUT  
OI - M. WEISSKOPF  
OI - R.S. WOLFF

COLUMBIA U  
U OF ARIZONA  
NATL RADIO ASTRON OBS  
NASA-MSFC  
COLUMBIA U

BRIEF DESCRIPTION

This Columbia experiment was designed to monitor continuously the sun's emission in the 2-8 keV range, to obtain high-resolution spectra of many celestial X-ray objects, and to measure the polarization of X-ray emission from stellar sources. This instrument package was mounted in the wheel section and made use of the wheel rotation to obtain complete Bragg energy spectra of the sun every 10 s during flares. The spectrometer was oriented perpendicular to the spin axis and used large area panels of crystals (1100 sq cm of graphite, 194 sq cm of PET) to reflect, via Bragg reflection, monochromatic solar X-rays into proportional counter detectors. The detectors were double-sided proportional counters with 0.025-mm beryllium windows on each side and contained an argon-xenon gas mixture chosen for its high efficiency over the 2-8 keV range. A ground wire-grid plane through the center of the bank of counters effectively divided the instrument into two isolated spectrometers. The polarimeter was oriented parallel to the spin axis and utilized Bragg angle reflection to measure polarization in X-rays from celestial sources. For more details, see H. L. Kestenbaum et al., Ap. J., v. 210, p. 805, 1976.

-----DSO 8, FROST-----

INVESTIGATION NAME- HIGH-ENERGY CELESTIAL X RAYS

NSSDC ID- 75-057A-07

PERSONNEL

PI - K.J. FROST  
OI - B.R. DENNIS

NASA-CSFC  
NASA-CSFC

BRIEF DESCRIPTION

The purpose of this GSFC hard X-ray telescope was to measure the energy spectra of all known X-ray sources above the intensity threshold of 1.E-6 photons/sq cm-s-keV in the energy region .02 to 3 MeV and to search for time variations, both periodic and irregular, in the intensity of the sources detected. The detector consisted of two optically isolated CsI(Na) central crystals shielded by a large, active collimator also made of CsI(Na). The sensitive area was 27.5 sq cm and the FOV was 5-deg FWHM. One of the two central crystals was completely shielded and served as a monitor of the total internal detector background spectrum. The instrument was mounted in the wheel section of the satellite with the axis of its FOV offset by 5 deg from the negative spin axis of the wheel. The minimum detectable intensity of a point source that was brought to within 5 deg of the negative spin axis for greater than 1 day was about 10E-5 photons/sq cm-s-keV at 100 keV. This was determined from the background spectrum measured in orbit. For more information, see B. R. Dennis et al., Space Sci. Inst., v. 3, p. 325, 1977.

-----DSO 8, SERLEMITOS-----

INVESTIGATION NAME- COSMIC X-RAY SPECTROSCOPY

NSSDC ID- 75-057A-06

PERSONNEL

PI - P.J. SERLEMITOS  
OI - E.A. BOLDT  
OI - S.S. HOLT  
OI - D. SCHWARTZ

NASA-CSFC  
NASA-CSFC  
NASA-CSFC  
SAG

BRIEF DESCRIPTION

This GSFC experiment was designed to determine the spectra of sources and the diffuse cosmic X-ray background in the energy range 2 to 60 keV, and to measure intensity variations and possible emission lines of discrete X-ray sources. Proportional chambers (multianode proportional counters) were used as detectors. One detector complement, consisting of a propane neon filled chamber and a xenon-methane-filled chamber (240 sq cm), was located behind a 5 deg collimator and oriented parallel to the spacecraft spin axis. A single-volume, argon-methane filled chamber (75 sq cm) was located behind a 3-deg collimator and was offset slightly from antiparallel to the spin axis. A xenon-methane filled chamber (270 sq cm) was located behind a 5 deg collimator and was oriented antiparallel to the spin axis. Data were accumulated in a buffer memory for 1-min intervals and the data from the offset detector were sectorized in azimuth. For more information, see R. H. Becker et al., Ap. J., v. 209, p. L65, 1976.

-----DSO 8, KRAUSHAAR-----

INVESTIGATION NAME- SOFT X RAY BACKGROUND RADIATION INVESTIGATION

NSSDC ID- 75-057A-05

PERSONNEL

PI - W.L. KRAUSHAAR  
OI - A.N. BUNNER

U OF WISCONSIN  
PERKIN ELMER

BRIEF DESCRIPTION

This Wisconsin experiment was designed to measure galactic latitude dependence of the X-ray background radiation in the 0.150 to 45 keV region, emphasizing the soft X-ray portion. Two sets of three proportional counters mounted on the DSO wheel viewed parallel and antiparallel to the wheel spin direction. All detectors used collimators that were of hexagonal honeycomb construction with 3.5 by 3.5 deg FWHM. Sensitivity was expected to be about 1% statistical accuracy near the galactic poles, and energy resolution was provided by selected filters. Since two of the counters had thin polycarbonate windows through which methane diffused, a high-pressure methane reservoir carried on the spacecraft replenished those counters through a gas flow system. The remaining detectors were permanently sealed. The sealed counters had an additional thin film thermal barrier in the X-ray path of 551 micro g sq cm aluminum. For more details, see A. N. Bunner, Ap. J., v. 220, p. 261, 1978.

-----DSO 8, WELLER, JR.-----

INVESTIGATION NAME- EUV FROM EARTH AND SPACE

NSSDC ID- 75-057A-08

PERSONNEL

PI - C.S. WELLER, JR.

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This NRL experiment, mounted in the wheel section, obtained spatial and temporal measurements of extreme ultraviolet (EUV) emissions of hydrogen, helium, and oxygen in the earth's atmosphere and in interplanetary and galactic space. Three photometers were designed to measure EUV resonance radiation in various wavelengths from 170 to 1080 A and in portions of the 1125 to 1230 A band. Each photometer consisted of a continuous-channel electron multiplier used as a photon detector, together with a thin metal film or a magnesium fluoride-oxygen cell to serve as optical bandpass filters. There were four such bandpass filters: (1) a thin film of 1000 A thick aluminum and 500 A thick carbon (bandwidth of 170 to 440 A), (2) a thin film of 1000 A-thick aluminum (bandwidth of 170 to 800 A), (3) a thin film of 1500 A thick indium (bandwidth of 730 to 1080 A), and (4) a cell with a magnesium fluoride window (bandwidth of 1130 to 1500 A). These bandpass filters were mounted on a wheel in front of the photon detectors and were rotated at regular intervals to change the filters. This made three of the indicated wavelength ranges operational at any given time. The instrument was mounted with the photometer axes at a small angle to the satellite-sun line and with sufficient baffling that the photometers would never see the sun. For more information, see S. P. Maran and R. J. Thomas, Sky & Teles., v. 3, p. 355, 1977.

-----DSO 8, NOVICK-----

INVESTIGATION NAME- HIGH-SENSITIVITY CRYSTAL SPECTROSCOPY OF STELLAR AND SOLAR X RAYS

\*\*\*\*\* PEGASUS 1 \*\*\*\*\*

SPACECRAFT COMMON NAME PEGASUS 1  
ALTERNATE NAMES 01085

NSSDC ID 65 009A

SPONSORING COUNTRY

U.S.

LAUNCH DATE 02/16/65

WEIGHT- 1455. KG

ORBIT PARAMETERS

ORBIT TYPE  
ORBIT PERIOD 94.1 MIN  
PERIAPSIS- 430 KM ALT

EPOCH DATE-  
INCLINATION 31.7 DEG  
APOAPSIS 523. KM ALT

PERSONNEL

PM - L.C. GARVIN  
PS - J.B. DOZIER, JR.

WORLD METEOR. ORGAN  
NASA-MSFC

BRIEF DESCRIPTION

The mission of this spacecraft was to measure meteoroid abundances over the mass range 1.E-7 to 1.E-4 g in the region near the earth. In its stored position with panels folded inside the Apollo service module, the spacecraft was 5.3 m high, 2.1 m wide, and 28 cm deep. It was divided into two major parts, the central section and the wing assemblies. The satellites' framework was made of riveted aluminum alloy extrusions. The central section was attached to the launch vehicle's second stage. It provided a mounting for the deployment mechanism, electronics canister, solar power panels, and sensors. The spacecraft was equipped with winglike appendages that extended to form a plane 29.3 m long by 4.3 m wide. These wings carried sensitive penetration surfaces for the meteoroid experiments. Total weight in orbit was 10,500 kg. The Goddard Space Flight Center's Space Tracking and Data Acquisition Network tracked the satellite using the signal of the telemetry transmitter that transmitted continuously on 136.89 megacycles. Optical tracking coverage was provided by the Smithsonian Astrophysical Observatory's Optical Tracking Network and the Minitrack Optical Tracking System. Errors were found in the spacecraft attitude system, but the data were still usable. Otherwise, the operation was normal.

PEGASUS 1, NAUMANN

INVESTIGATION NAME- METEOROID PENETRATION DETECTORS

NSSDC ID 65 009A 01

PERSONNEL

PI R.J. NAUMANN  
OI K.S. CLIFTON

NASA MSFC  
NASA MSFC

BRIEF DESCRIPTION

The meteoroid detectors on this experiment were parallel plate capacitors that temporarily discharged when penetrated by meteoroids. A total of 416 capacitors formed 208 detector assemblies, which were located on the wings of the spacecraft. Arrays of panels, each panel measuring 51 by 102 cm, were mounted on the frames. On each wing, six frames provided mountings for 16 panels and one provided for eight panels, making a total of 208 panels on the satellite. The total area of the detectors was approximately 188 sq m. The outside plates of the capacitors were either 0.4, 0.2, or 0.04 mm thick aluminum. Under the aluminum was a sheet of Mylar plastic. The back surface of the Mylar was coated with a thin layer of copper. The "sandwich" of aluminum, Mylar, and copper was mounted to a soft foam, and, in turn, the larger "sandwich" was mounted to a rigid foam center core. The thickness penetrated provided information about the size of the penetrating meteoroids. Penetration times were recorded with an accuracy of 1 min. A higher than expected permanent electrical short rate occurred in the 0.4 and 0.2 mm thick detectors, and some spurious discharges occurred.

\*\*\*\*\* PEGASUS 2 \*\*\*\*\*

SPACECRAFT COMMON NAME PEGASUS 2  
ALTERNATE NAMES- 01381

NSSDC ID 65 039A

SPONSORING COUNTRY

U.S.

LAUNCH DATE 05/25/65

WEIGHT 1455. KG

ORBIT PARAMETERS

ORBIT TYPE  
ORBIT PERIOD 95.2 MIN  
PERIAPSIS 467. KM ALT

EPOCH DATE-  
INCLINATION 31.7 DEG  
APOAPSIS 594. KM ALT

PERSONNEL

PM UNKNOWN  
PS - J.B. DOZIER, JR.

UNKNOWN  
NASA-MSFC

BRIEF DESCRIPTION

The mission of this spacecraft was to measure meteoroid abundances over the mass range 1.E-7 to 1.E-4 g in the region near the earth. In its stored position with panels folded inside the Apollo service module, the spacecraft was 5.3 m high, 2.1 m wide, and 28 cm deep. It was divided into two major parts, the center section and the wing assemblies. The satellites' framework was made of riveted aluminum alloy extrusions. The central section was attached to the launch vehicle's second stage. It provided a mounting for the deployment mechanism, electronics canister, solar power panels, and sensors. The spacecraft was equipped with winglike appendages that extended to form a plane 29.3 m long by 4.3 m wide. These wings carried sensitive penetration surfaces for the experiments. Total weight in orbit was 10,500 kg. The NASA Space Tracking and Data Acquisition Network tracked the satellite using the signal of the telemetry transmitter that transmitted continuously on 136.89 megacycles. Optical tracking coverage was provided by the Smithsonian Astrophysical Observatory's Optical Tracking Network and the Minitrack Optical Tracking System. Intermittent failures occurred in the PAM and PCM telemetry channels, but stable PCM communications were reestablished.

PEGASUS 2, NAUMANN

INVESTIGATION NAME- METEOROID PENETRATION DETECTORS

NSSDC ID 65-039A 01

PERSONNEL

PI R.J. NAUMANN  
OI K.S. CLIFTON

NASA MSFC  
NASA MSFC

BRIEF DESCRIPTION

The meteoroid detectors on this experiment were parallel-plate capacitors that temporarily discharged when penetrated by meteoroids. Arrays of panels, each panel measuring 51 by 102 cm, were mounted on the frame. Each wing had six frames that provided mounting for 16 panels and one that provided for eight panels, making a total of 208 panels on the satellite. A total of 416 capacitors formed 208 detector assemblies, which were located on the wings of the spacecraft. The total area of the detectors was approximately 188 sq m. The outside plates of the capacitors were either 0.4, 0.2, or 0.04 mm thick aluminum. Under the aluminum was a sheet of Mylar plastic. The back surface of the Mylar was coated with a thin layer of copper. The "sandwich" of aluminum, Mylar, and copper was mounted to a soft foam, and, in turn, the larger "sandwich" was mounted to a rigid foam center core. The thickness penetrated provided information about the size of the penetrating meteoroids. Penetration times were recorded with an accuracy of 1 min. The experiment functioned normally.

\*\*\*\*\* PEGASUS 3 \*\*\*\*\*

SPACECRAFT COMMON NAME- PEGASUS 3  
ALTERNATE NAMES 01467

NSSDC ID 65 060A

SPONSORING COUNTRY  
U.S.

LAUNCH DATE 07/30/65

WEIGHT- 1455. KG

ORBIT PARAMETERS

ORBIT TYPE  
ORBIT PERIOD  
PERIAPSIS

MIN  
KM ALT

EPOCH DATE  
INCLINATION-  
APOAPSIS-

DEG  
KM ALT

PERSONNEL

PM UNKNOWN  
PS - J.B. DOZIER, JR.

UNKNOWN  
NASA MSFC

BRIEF DESCRIPTION

The mission of this spacecraft was to measure meteoroid abundances over the mass range 10E-7 to 10E-4 g in the region near the earth. In its stored position with panels folded inside the Apollo service module, the spacecraft was 5.3-m high, 2.1-m wide, and 28-cm deep. The spacecraft was equipped with winglike appendages that extended to form a plane 29.3-m long by 4.3 m wide. These wings carried sensitive penetration surfaces for the experiments. Total weight in orbit was 10,500 kg. The NASA Space Tracking and Data Acquisition Network tracked the satellite using the signal of the telemetry transmitter that transmitted continuously on 136.89 megacycles. Optical tracking coverage was provided by the Smithsonian Astrophysical Observatory's Optical Tracking Network and the Minitrack Optical Tracking System. One FM transmitter failed after 3 months, but no data were lost. For this Pegasus mission, the orbit was adjusted to a nearly circular one.

PEGASUS 3, NAUMANN

INVESTIGATION NAME- METEOROID PENETRATION DETECTORS

NSSDC ID- 65-060A-01

PERSONNEL  
PI - R. J. NAUMANN  
OI - K. S. CLIFTON

NASA-MSFC  
NASA-MSFC

BRIEF DESCRIPTION

The meteoroid detectors on this experiment were parallel-plate capacitors that temporarily discharged when penetrated by meteoroids. A total of 416 capacitors formed 208-detector assemblies, which were located on the wings of the spacecraft. Arrays of panels, each panel measuring 51 by 102 cm, were mounted on the frame. Each wing had six frames that provided mounting for 16 panels and one that provided for eight panels, making a total of 208 panels on the satellite. The total area of the detectors was approximately 188 sq m. The outside plates of the capacitors were either 0.4-, 0.2-, or 0.04-mm-thick aluminum. Under the aluminum was a sheet of Mylar plastic. The back surface of the Mylar was coated with a thin layer of copper. The "sandwich" of aluminum, Mylar, and copper was mounted to a soft foam, and, in turn, the larger "sandwich" was mounted to a rigid foam center core. The thickness penetrated provided information about the size of the penetrating meteoroids. Penetration times were recorded to an accuracy of 1 min. Experiment operation was normal.

\*\*\*\*\* PROGN07 9 \*\*\*\*\*

SPACECRAFT COMMON NAME PROGN07 9  
ALTERNATE NAMES- 14163

NSSDC ID 83-067A  
LAUNCH DATE 07/01/83

SPONSORING COUNTRY  
U. S. S. R.  
WEIGHT

ORBIT PARAMETERS  
ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD 38448. MIN  
PERIAPSIS- 380. KM ALT

EPOCH DATE 07/02/83  
INCLINATION 65.5 DEG  
APDAPSIS- 720000. KM ALT

PERSONNEL  
PS - A. A. GALEEV

IKI

BRIEF DESCRIPTION

This spacecraft was one of a continuing series to measure electromagnetic radiation, magnetic fields, plasma, and charged particles. Although the specifics on what experiments were flown are not available, it is known that a magnetic field measuring experiment was flown on PROGN07 9. Possibly one plasma experiment was on board. Clearly the main goals were measurements in the electromagnetic spectrum, and the one experiment that is known specifically is an 8 mm radio telescope.

--- PROGN07 9, UNKNOWN

INVESTIGATION NAME - SOLAR X RAY SPECTROMETER

NSSDC ID- 83-067A 02

PERSONNEL  
PI - UNKNOWN

BRIEF DESCRIPTION

The experiment was designed to measure solar X ray flux. To record the flux in the soft region of the X ray spectrum, one proportional counter with a beryllium window, 7.5 sq-mm, automatically calibrated by Fe55 radioactive source, was used. The amplitude of the Fe55 pulses in the reference part of the counter affected the magnitude of the counter's high voltage in the negative feedback. Two energy ranges (2.4 and 4.8 keV), denoted X1 and X2, were delimited from this detector by amplitude analysis. In the 10-160 keV region a scintillation detector with an NaI crystal was used with a thickness of 3 mm and an area of 450 sq mm. Four energy ranges (10-20, 20-40, 40-80, and 80-160 keV) denoted by X3, X4, X5, and X6, were delimited by amplitude analysis. Numbers of pulses in all energy ranges were digitally counted and recorded in the telemetry memory. All six values (X1-X6) were measured at the same time. To ensure sufficient lifetime of the gas detector, the high voltage was automatically switched off from the detector during its passage through the radiation belt.

\*\*\*\*\* RAE A \*\*\*\*\*

SPACECRAFT COMMON NAME- RAE A  
ALTERNATE NAMES- RADIO ASTRONOMY EXPLORER, RAE 1  
EXPLORER 38, 03307

NSSDC ID- 68-055A  
LAUNCH DATE 07/04/68

SPONSORING COUNTRY  
U. S.  
WEIGHT 602 KG

ORBIT PARAMETERS  
ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD- 224.4 MIN  
PERIAPSIS- 5851. KM ALT

EPOCH DATE- 07/07/68  
INCLINATION- 120.6 DEG  
APOAPSIS- 5861. KM ALT

PERSONNEL  
SC - N.G. ROMAN  
PM - J.T. SHEA  
PS - R.G. STONE

NASA HEADQUARTERS  
NASA-GSFC  
NASA-GSFC

BRIEF DESCRIPTION

The RAE-1 spacecraft measured the intensity of celestial radio sources, particularly the sun, as a function of time, direction, and frequency (0.2 to 20 MHz). The spacecraft was gravity gradient oriented. The spacecraft weight was 193 kg, and average power consumption was 25 W. It carried two 750-ft-long V-antennas, one facing toward the earth and one facing away from the earth. A 120-ft-long dipole antenna was oriented tangentially with respect to the earth's surface. The spacecraft was also equipped with one 136-MHz telemetry turnstile. The onboard experiments consisted of four step-frequency Ryle-Vonberg radiometers operating from 0.45 to 9.18 MHz, two multichannel total power radiometers operating from 0.2 to 5.4 MHz, one step frequency V-antenna impedance probe operating from 0.24 to 7.86 MHz, and one dipole antenna capacitance probe operating from 0.25 to 2.2 MHz. RAE-1 was designed for a 1-year minimum operating lifetime. The spacecraft tape recorder performance began to deteriorate after 2 months in orbit. In spite of several cases of instrument malfunction, good data were obtained on all three antenna systems. For more details, see R. R. Weber, J. K. Alexander, and R. G. Stone, Radio Sci., v. 6, p. 1085, 1971.

-----RAE-A, STONE-----

INVESTIGATION NAME STEP FREQUENCY RADIOMETERS

NSSDC ID- 68-055A-01

PERSONNEL  
PI - R.G. STONE

NASA-GSFC

BRIEF DESCRIPTION

This experiment used four Ryle-Vonberg radiometers connected to the three spacecraft antennas to provide high accuracy and long term stability necessary for the sky mapping over many months of operation. One was connected to the 120 ft dipole, one to the lower 750 ft V antenna, and two to the upper V antenna. The Ryle-Vonberg radiometers used on the V antennas were connected via balun transformers that provided an approximate match to the antenna impedance. Each radiometer was successively tuned to nine different frequencies in the band 0.48 to 9.18 MHz. Precise, automatic, and continuous calibration was inherent in this type of design. The intensities of celestial radio sources were measured by this experiment. The "fine" output channel of the Ryle-Vonberg radiometers failed after 3 to 9 months of operation. The Ryle-Vonberg "coarse" output channels provided good data without interruption, however.

-----RAE-A, STONE-----

INVESTIGATION NAME RADIO BURSTS RECEIVERS

NSSDC ID 68-055A 02

PERSONNEL  
PI - R.G. STONE

NASA GSFC

BRIEF DESCRIPTION

Thirty two channel step frequency radiometers were connected to the lower 750 ft long antenna and to the 120 ft long dipole via high impedance preamplifiers. The burst radiometer on the dipole was stepped rapidly through 32 discrete frequencies between 0.2 and 5.4 MHz to generate dynamic spectra. The radiometers measured the amplitude, rate of change of frequency, and decay time of solar burst and other rapidly varying noise in the 0.2 to 5.4 MHz band. Operating in two sensitivity modes, these receivers could measure signals up to 50 dB above the cosmic background level. The 32 channels were cycled every 7.7 s. The chief advantages of the burst radiometers were high time resolution and relatively few components for high reliability. The radiometer was a simple total power receiver consisting of an input balun, a power divider, and several parallel tuned radio frequency strips. After about 18 months of operation, one of the preamplifiers on the lower V burst radiometer failed, reducing the sensitivity and changing the antenna pattern for that radiometer.

\*\*\*\*\* RAE B \*\*\*\*\*

SPACECRAFT COMMON NAME- RAE B  
ALTERNATE NAMES- RADIO ASTRONOMY EXPLORER, PI 693B  
EXPLORER 49, 06686  
6686

SPACECRAFT COMMON NAME RAE B  
ALTERNATE NAMES RADIO ASTRONOMY EXPLORER, PI 693B  
EXPLORER 49, 06686  
6686

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NSSDC ID- 73-039A  
LAUNCH DATE- 06/10/73

SPONSORING COUNTRY  
U.S.  
WEIGHT 328. KG

ORBIT PARAMETERS  
ORBIT TYPE- GEDCENTRIC  
ORBIT PERIOD- 221.17 MIN  
PERIAPSIS- 1052.98 KM ALT

EPOCH DATE- 06/21/73  
INCLINATION 55.7 DEG  
APOAPSIS 1063.84 KM ALT

PERSONNEL  
MC - J.R. HOLTZ  
SC N.G. ROMAN  
PM J.T. SHEA  
PS - R.G. STONE

NASA HEADQUARTERS  
NASA HEADQUARTERS  
NASA-GSFC  
NASA-GSFC

BRIEF DESCRIPTION

This RAE-B mission was the second of a pair of Radio Astronomy Explorer satellites. It was placed into lunar orbit on June 15, 1973, to provide radio astronomical measurements of the planets, the sun, and the galaxy over the frequency range of 25 kHz to 13.1 MHz. The experiment complement consisted of two Ryle-Vonberg radiometers (nine channels each), three swept-frequency burst receivers (32 channels each), and an impedance probe for calibration. The experiment antennas consisted of a 229-m upper V-antenna pointed away from the moon; a 183-m lower V-antenna pointed toward the moon; and a 37-m dipole antenna parallel to the lunar surface. The lower V-antenna was extended to its full 229-m length in November 1974. The spacecraft body was a truncated cylinder 36.25 in. in diameter and approximately 31 in. high, with four fixed solar paddles. The maneuvering system consisted of a hydrazine velocity correction package, a cold gas attitude control system, and a solid fuel lunar insertion motor. Data were returned to the earth via either a low power UHF (400 MHz) transmitter, in real time, or stored in an onboard tape recorder and transmitted to earth via a high power UHF transmitter (400 MHz). Two tape recorders provided backup storage. A VHF transmitter served primarily for range and range-rate measurements and as a backup. Commands were received on a VHF (148 MHz) receiver, which also was a part of the range and range-rate system. Spacecraft attitude was determined by (1) a solar aspect system, (2) a horizon sensor system, and (3) a panoramic attitude sensor system, and was accurate to 1 deg. The spacecraft was gravity gradient oriented (Z axis parallel to local vertical) and was equipped with libration dampers to damp out oscillations. For additional information, see J. K. Alexander et al., Astron. & Astrophys., v. 40, p. 365, 1975.

RAE B, STONE

INVESTIGATION NAME- STEP FREQUENCY RADIOMETERS

NSSDC ID 73 039A-01

PERSONNEL  
PI - R.G. STONE  
OI - R.R. WEBER  
OI - L.W. BROWN  
OI - J.F. CLARK

NASA-GSFC  
NASA-GSFC  
NASA-GSFC  
NASA-GSFC

BRIEF DESCRIPTION

The Ryle Vonberg (RV) receivers were designed to provide measurements that were relatively insensitive to gain and bandwidth changes. There were two receivers--RV 1 connected to the upper V antenna and RV 2 connected to the lower V-antenna. The radiometers had an effective bandwidth of 40 kHz and a postdetection time constant of 0.1 s. A coarse output channel was obtained from the integrated servo-loop error signal, and a fine output channel was obtained from the noise source output required to match the antenna signal. The time constant for the fine channel was 0.5 s. A thermistor located in the receiver measured the ambient temperature, which was telemetered every 19.7 min in the housekeeping data. The receivers operated at nine frequencies from 0.45 to 9.18 MHz. Each frequency was selected for 15.4 s before stepping to the next. During this time, eight coarse and two fine samples were taken. Of the eight coarse samples, the first was not reliable since not enough time had elapsed for the receiver to stabilize after the frequency switch was made.

RAE B, STONE

INVESTIGATION NAME- RAPID-BURST RECEIVERS

NSSDC ID- 73-039A-02

PERSONNEL  
PI R.C. STONE  
OI - J.K. ALEXANDER, JR  
OI - J. FAIBERG  
OI - J.F. CLARK  
OI - H.H. MALITSON

NASA-GSFC  
NASA-GSFC  
NASA-GSFC  
NASA-GSFC  
NASA-GSFC

BRIEF DESCRIPTION

The burst receivers (BR) were 32-channel, stepped frequency (25 kHz to 13.1 MHz) receivers, which obtained one sample at each frequency every 7.68 s. One receiver (BR-1) was connected to the upper V-antenna and one receiver (BR-2) was connected to the lower V-antenna. A third burst receiver was connected to the dipole antenna, but it failed 1 week into the flight and no significant data resulted. The RF voltage at the feed point of each half of the V antenna

was sampled by a wideband, high impedance preamplifier, and the preamplifier outputs were combined in a balun transformer and fed to the burst receiver. Each burst receiver was composed of a pair of redundant IF amplifiers and detectors, which shared a common set of crystal-controlled local oscillators and mixers. Only one IF strip was powered on at a given time, the other was used as a backup system. Low pass filters at the input of the burst receiver prevented strong signals at the 21.4 MHz intermediate frequency from entering the IF strip. Each receiver had a crystal-controlled IF bandwidth of 20 kHz and a postdetection integration time constant of 6 ms. A thermistor located in each burst receiver provided a measurement of the ambient temperature of the receiver, and this information was included in the housekeeping data telemetered every 19.7 min. Also, the normal antenna signal measurement sequence was interrupted for 1.28 min every 19.7 min, and calibration noise source signals were injected into each burst receiver to provide a check of their long-term gain stability. The total dynamic range of the burst receivers was approximately 60 dB and was divided into two 30-dB ranges by logic circuitry in the detector electronics. The limit of the input signal level resolution that was due to telemetry quantization step size was about 0.3 dB. Saturation level signals at the preamplifier input often resulted in the generation of intermodulation products in the RF amplifiers, which then appeared as wideband signals in the telemetered data. This problem was most acute when intense kilometer wavelength emissions from the terrestrial magnetosphere were observed at frequencies in the 200 to 300 kHz range. BR-1 was less susceptible to intermodulation problems than BR-2 by 6 to 10 dB. Because of a failure in the local oscillator circuitry in BR-1, channels 4 (55 kHz) and 12 (210 kHz) did not provide usable data. During periods when a portion of each orbit was in the lunar shadow, cyclic variations in thermal gradients across the V-antenna booms resulted in scissor-mode oscillations of the booms, which did not occur when the spacecraft was in 100% sunlight. This effect had a period of approximately 50 min (the scissor-mode period) and was most pronounced on the upper V antenna during the first and fifth lunar shadow period and on the lower V antenna during the second and third lunar shadow periods.

\*\*\*\*\* S 15 \*\*\*\*\*

SPACECRAFT COMMON NAME S 15  
ALTERNATE NAMES- 1961 NU 1, EXPLORER 11  
00107

NSSDC ID 61-013A  
LAUNCH DATE 4/27/61

SPONSORING COUNTRY  
U.S.  
WEIGHT- 37. KG

ORBIT PARAMETERS  
ORBIT TYPE- GEDCENTRIC  
ORBIT PERIOD 108.1 MIN  
PERIAPSIS 486.000 KM ALT

EPOCH DATE- 04/27/61  
INCLINATION 28.9 DEG  
APOAPSIS 1786.00 KM ALT

PERSONNEL  
SC - UNKNOWN  
PM - J.E. KUPPERIAN, JR (DECEASED) NASA-GSFC

BRIEF DESCRIPTION

Explorer 11, also known as S 15, was launched for the purpose of detecting the sources of high energy gamma rays. The spacecraft achieved an orbit with an apogee of 1786 km, a perigee of 486 km, a period of 108.1 min, and an inclination of 28.9 deg. In addition to detecting gamma rays, Explorer 11 was designed to map their direction with emphasis on the plane of the galaxy, the galactic center, the sun, and other known radio noise sources; to relate the measurements to the cosmic-ray flux density and the density of interstellar matter; and to measure the high-energy gamma-ray albedo of the earth's atmosphere. The satellite was a spin-stabilized octagonal aluminum box (30.5 by 30.5 by 58.5 cm) on a cylinder (15.2 cm in diameter and 52.2 cm long). Explorer 11 was constructed so that its stable motion was an end-over-end tumble about the transverse principal axis that had the largest moment of inertia. The gamma-ray telescope assembly was mounted so that its axis of sensitivity, which was parallel to the long axis of the satellite, would rotate in the plane of tumble. The orientation of this axis in space was determined to approximately 5 deg by means of optical aspect detectors and the use of the known radiation pattern of the vehicle antenna. Telemetry was provided only in real time by two PM transmitters, since the onboard tape recorder failed at launch.

-----S 15, CARMIRE-----

INVESTIGATION NAME- CRYSTAL SANDWICH/CERENKOV COUNTER

NSSDC ID 61 013A 02

PERSONNEL  
PI - C.P. CARMIRE PENNSYLVANIA STATE U

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BRIEF DESCRIPTION

The instrumentation for the Explorer 11 crystal sandwich Cerenkov counter experiment was the same as that used for the gamma-ray telescope experiment. The gamma-ray experiment was designed by researchers at the Massachusetts Institute of Technology primarily to detect cosmic gamma rays greater than 50 MeV. Charged particle data were collected using the same instrument. This telescope was used to determine the intensity and pitch-angle distribution of geomagnetically trapped protons. The telescope consisted of an anticoincidence plastic shield, layers of NaI and CsI crystals, and a cylindrical Lucite Cerenkov detector. When the anticoincidence requirement of the plastic scintillator shield was removed, charged particle information was recorded by all three counters. In addition, charged particle coincidences between the crystal sandwich and Cerenkov detectors were recorded. In this mode, directional information was obtained. The solid-angle-area factor of the telescope was about 4.3 sq cm sr. The look direction of the telescope was identical to the symmetry axis of the spacecraft. For a beam incident parallel to the look direction of the telescope, the detection efficiency fell to zero at 15 deg from this direction. The energy thresholds for each detector were as follows: (1) scintillation plastic (upper portion), electrons -350 keV, protons -3.5 MeV, (2) scintillation plastic (lower portion), electrons -400 keV, protons -35 MeV, (3) crystal sandwich, electrons -400 keV, protons -75 MeV, and (4) Cerenkov, electrons -15 MeV, protons -350 MeV. The accumulation time for the charged particle data was approximately 30 s. A single scaling circuit in Explorer 11 permitted one channel at a time to be monitored. During the 7 months in which the instrument was turned on and working in orbit, only 141 h (3%) were considered useful observing time. During this time, the telescope was monitored for gamma rays and charged particles. For additional information, see G. Garimore, J. Geophys. Res., v. 68, p. 27, 1963.

-----S 15, KRAUSHAAR-----

INVESTIGATION NAME- PHOSWICH-CERENKOV COUNTER TELESCOPE

NSSDC ID- 61-013A-01

PERSONNEL

PI - W.L. KRAUSHAAR  
OI - G.W. CLARK

U OF WISCONSIN  
MASS INST OF TECH

BRIEF DESCRIPTION

This experiment was designed to search for high-energy gamma rays (greater than 50 MeV) from the celestial sphere. The basic detector scheme consisted of a sandwich of NaI and CsI scintillating crystals (20 g/sq cm), viewed by a single photomultiplier, and a Lucite Cerenkov counter, viewed by two photomultipliers. It was completely surrounded by a shield of scintillating plastic viewed by five photomultipliers. The sandwich detector provided high-atomic-number material for the pair production process, i.e., energetic gamma rays were converted into electron-positron pairs. The electrons and positrons then entered the Cerenkov counter, which detected particles traversing its volume in only the downward sense. The simultaneous electric signals from its two PMIs indicated that one or more charged particles had traversed the telescope. The signals or lack of signals from the surrounding plastic shield at the instant the telescope had been triggered indicated whether the triggering was caused by an uncharged or charged particle. Also, the "last" and "total" components of the signals from the photomultiplier that viewed the sandwich detector afforded a method of distinguishing neutron and gamma-ray induced events. The experiment performed normally from launch until November 17, 1961. For more information, see W. Kraushaar et al., Ap. J., v. 141, p. 845, 1965.

..... S 55B .....

SPACECRAFT COMMON NAME- S 55B  
ALTERNATE NAMES- 1962 BETA CHI 1, EXPLORER 16  
00506

NSSDC ID- 62-070A SPONSORING COUNTRY  
U.S.

LAUNCH DATE- 12/16/62 WEIGHT- 100.8 KG

ORBIT PARAMETERS EPOCH DATE- 12/16/62  
ORBIT TYPE- GEOCENTRIC INCLINATION- 52. DEG  
ORBIT PERIOD- 104.3 MIN APOAPSIS- 1181. KM ALT  
PERIAPSIS- 750. KM ALT

PERSONNEL UNKNOWN UNKNOWN  
SC - UNKNOWN

BRIEF DESCRIPTION

This spacecraft, also known as Explorer 16, was the second in the series of micrometeoroid satellites orbited by NASA. Its purpose was to obtain data on the near-earth meteoroid environment, thus providing an accurate estimate of the probability of penetration in spacecraft structures by meteoroids and allowing a more confident definition of the relationship between penetration flux and material thickness to be derived. The cylindrically shaped spacecraft, about 61 cm in diameter and 192 cm long, was built around the burned-out fourth stage of the Scout launch vehicle that remained as part

of the orbiting satellite. Explorer 16 carried stainless steel pressurized-cell penetration detectors, impact detectors, capacitor detectors, and cadmium sulfide cell detectors to obtain data on the size, number, distribution, and momentum of dust particles in the near-earth environment. The spacecraft operated satisfactorily during its 7-month life (December 16, 1962, to July 1963), and all mission objectives were accomplished.

-----S 55B, BESWICK-----

INVESTIGATION NAME- MICROMETEORITE DETECTOR

NSSDC ID- 62-070A-04

PERSONNEL

PI - A.G. BESWICK

NASA-LARC

BRIEF DESCRIPTION

This experiment was one of five micrometeorite detectors aboard Explorer 16. It used a piezoelectric impact detector to measure micrometeoroid population in a momentum range somewhat higher than that of previous measurements, where few data exist. The detectors, acoustically decoupled from the satellite structure, were mounted at the end of the cylindrical satellite casing near the antennas. The detectors provided a total of 0.35 sq m of area exposed to micrometeoroids. The momentum of a micrometeoroid impacting on the detector assembly was converted into an electrical impulse. The detector had three levels of sensitivity. Data from the impact detectors were correlated with those of micrometeoroid effects on materials in the pressurized cell experiment. The impact detector sent useful data for 7-1/2 months. By July 1, 1963, 15,000 meteoroid impacts had been recorded by the sensors.

-----S 55B, DAVISON-----

INVESTIGATION NAME- GRID DETECTORS OF MICROMETEORITES

NSSDC ID- 62-070A-02

PERSONNEL

PI - E.H. DAVISON

NASA-LERC

BRIEF DESCRIPTION

This experiment was one of five micrometeorite detectors aboard the spacecraft. Sixty foil gauge detectors, each in the shape of an equilateral triangle with a 11.60-cm base, were installed around the forward usable half of the fourth-stage launch vehicle support structure. Each detector consisted of a circuit obtained by an electrochemical deposition process, about 2.3E-3 mm thick attached to 0.025-mm Mylar and mounted on the underside of 304 stainless steel skin samples. Twenty-four of the skin samples were 0.025-mm thick, and four were 0.15-mm thick. The experiment utilized thin grids of conducting gold deposited on the bottom surface of three stainless steel sheets of different thickness to record micrometeoroid penetration. A particle penetrating the steel sheet would almost invariably break one of the current channels underneath, lowering its resistance level and recording the penetration. Six penetrations were recorded in the 25-micron stainless steel sheet, and one penetration was indicated in the 152-micron stainless steel sheet. The experiment functioned well in the 7 1/2 months in which the satellite transmitted useful micrometeoroid data. For more details, see E. C. Hastings, NASA TMX-810, 1963.

-----S 55B, CURTLER-----

INVESTIGATION NAME- PRESSURIZED CELL MICROMETEORITE DETECTOR

NSSDC ID- 62-070A-01

PERSONNEL

PI - C.A. CURTLER

NASA-LARC

BRIEF DESCRIPTION

This experiment was one of five micrometeorite detectors aboard Explorer 16. It utilized pressurized cells shaped like half cylinders with walls of 25-, 51-, and 127-micron-thick beryllium copper to record micrometeoroid impacts. The cells contained helium gas held under pressure. As a micrometeoroid punctured the cell wall, it released the gas and dropped the pressure. This drop in pressure activated an electronic circuit and transmitted this information to earth. The pressurized-cell sensors were divided into two identical groups that were telemetered separately on the two telemeters. During the 7 1/2 months in which the experiment transmitted useful data, 44 punctures were indicated in the one hundred 25-micron beryllium copper walls, and none of the twenty 127-micron beryllium copper sensors was punctured. The puncture rate for the 25-micron material was 0.32 puncture per sq m per day, and the puncture rate for the 51-micron material was 0.19 puncture per sq m per day.

-----S 55B, SECRETAN-----

INVESTIGATION NAME- COPPER WIRE MICROMETEORITE DETECTOR

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PERSONNEL  
 PI - L. SECRETAN (RETIRED) NASA-LARC

BRIEF DESCRIPTION

This experiment was one of five micrometeorite detectors aboard Explorer 16. There were 46 wire grid detectors consisting of a winding of five copper wires, 52- and 76-microns thick, mounted on 3.68 x 17.8-cm rectangular melamine cards, to obtain measurements of micrometeoroid impact. Fourteen of the cards were wound with 0.05-mm wire and 32 cards with 0.076-mm wire, providing a total exposed area of 0.3 sq m to penetration by micrometeoroids. When a micrometeoroid broke the wires, the lowered resistance level of an electronic circuit was recorded. Impacts were measured separately on the satellite's two telemeters and were then relayed for transmission to earth. During the 7 1/2 months in which the experiment transmitted useful data, telemeter A gave no indication of a break in either the 52-micron or the 76-micron copper wires on the card detectors. Telemeter B recorded one break in the 52-micron and 76 micron wire on June 28, 1963, and one in the 76-micron wire on July 13, 1963. More details on this experiment are contained in E. C. Hastings, NASA TMX-810, 1963.

-----S 55B, SECRETAN-----

INVESTIGATION NAME- CADMIUM SULFIDE CELL MICROMETEORITE DETECTOR

NSSDC ID 62-070A-05

PERSONNEL  
 PI - L. SECRETAN (RETIRED) NASA-LARC

BRIEF DESCRIPTION

This micrometeorite detector consisted of two cadmium sulfide cells with a total effective area of 48 sq cm. Each cell was shielded by a microthin sheet of polymer plastic coated with aluminized Mylar 0.00063 cm thick. The detectors were mounted at the end of the cylindrical satellite casing just ahead of the antennas. When a micrometeoroid pierced the shield, it admitted light to the cell and changed the cell's resistance. Resistance was calibrated to the size of the micrometeoroid. Data were obtained from cell A for 20 days and from cell B for 55 days. A more complete experimental description may be found in "Measurements of Interplanetary Dust Particle Flux from Explorer XVI CDS and Wire Grid Dust Particles Detectors," NASA-GSFC, X 613-66-451.

..... S 55C .....

SPACECRAFT COMMON NAME- S 55C  
 ALTERNATE NAMES EXPLORER 23, 00924

NSSDC ID- 64-074A	SPONSORING COUNTRY U.S.
LAUNCH DATE- 11/06/64	WEIGHT- 134. KG
ORBIT PARAMETERS	PODCH DATE- 02/01/73
ORBIT TYPE- GECENTRIC	INCLINATION- 51.9 DEG
ORBIT PERIOD- 97.9 MIN	APDAPSIS- 865. KM ALT
PERIAPSIS- 451. KM ALT	

PERSONNEL

BRIEF DESCRIPTION

The Explorer 23 micrometeoroid satellite was the third in the series of S 55 micrometeoroid satellites orbited by NASA. Its purpose was to obtain data on the near earth meteoroid environment, thus providing an accurate estimate of the probability of penetration in spacecraft structures by meteoroids and allowing a more confident definition of the penetration flux-material thickness relation to be derived. The cylindrically shaped spacecraft, about 61 cm in diameter and 234 cm long, was built around the burned out fourth stage of the Scout launch vehicle, which remained as part of the orbiting satellite. Explorer 23 carried stainless steel pressurized-cell penetration detectors, impact detectors, and cadmium sulfide cell detectors to obtain data on the size, number, distribution, and momentum of dust particles in the near-earth environment. In addition, the spacecraft was designed to provide data on the effects of the space environment on the operation of capacitor penetration detectors and solar-cell power supplies. The spacecraft mass, neglecting the fourth stage vehicle hardware and motor, was 96.4 kg. The spacecraft operated satisfactorily during its 1 year life (November 6, 1964, through November 7, 1965), and all mission objectives were accomplished, except for the cadmium sulfide cell detector experiment, which was damaged on liftoff and provided no data.

-----S 55C, CURTLER-----

INVESTIGATION NAME- PRESSURIZED CELLS

PERSONNEL  
 PI - C.A. GURTLER NASA-LARC  
 OI - G.W. GREEN NASA-LARC

BRIEF DESCRIPTION

The frequency at which two different thicknesses of stainless steel were punctured in space was obtained by use of 216 stainless steel cells with a thickness of 9.87E-3 cm. The cells were pressurized with helium (absolute pressure of 1300 mm Hg) and mounted in seven rows around the periphery of the spacecraft. The test material was half hard type 302 stainless steel coated with a 1.4-micron-thick thermal balance cover consisting of successive layers of chromium, silicon monoxide, aluminum, and silicon monoxide. Of the 210 active cells (six cells were inactive because of telemetry limitations), 70 had 2.54 plus or minus 2.5-micron-thick test material, and 40 had 50.8 plus or minus 2.5-micron-thick test material. The total exposed area of each class of detector was 0.69 sq cm and 1.38 sq cm, respectively. When a cell was punctured the gas leaked out, and the drop in pressure caused a switch to open indicating that a puncture had occurred. The frequency at which cells lost pressure was a direct measure of the frequency at which the test material was being punctured by meteoroids. Although the cells could not detect any additional punctures, they did provide a permanent record of the initial puncture. The experiment operated satisfactorily during its 365-day life, recording 50 punctures of the 25-micron cells and 74 punctures of the 50 micron cells. The data obtained were in good agreement with puncture rates obtained in previous satellite experiments.

-----S 55C, HOLDEN-----

INVESTIGATION NAME- IMPACT DETECTORS

NSSDC ID- 64-074A-02

PERSONNEL  
 PI - D.G. HOLDEN NASA-LARC  
 OI - A.G. BESWICK NASA-LARC

BRIEF DESCRIPTION

The mass distribution of meteoroids in space was determined by an impact-detection system consisting of 24 triangular 0.13 cm thick 6061 aluminum alloy sounding boards. Each one had a piezoelectric transducer mounted on the center of the sounding board underside. The detectors provided 1440 sq cm of area exposed to meteoroids. Four groups of six electrically parallel sounding boards were mounted around the periphery of the spacecraft. When a meteoroid impacted on a sounding board, an electrical signal was produced from the transducer. It was then amplified, threshold-detected, counted, and stored until readout. The amplifier for each group had three stages of amplification, which corresponded to three levels of momentum low, medium, and high. By assigning a velocity to the particles impacting on the sounding boards in space, the system output was directly related to the threshold levels of particle mass. The system sensitivity was adjusted during final calibrations so that all 24 sounding boards acted as a single detector for all three sensitivity levels. The momentum thresholds obtained by calibration for the low, medium, and high ranges were 1.2E-4, 8.E-6, and 3.E-7 newton-s, respectively. The data obtained showed 14,169 counts, 218 counts, and 2 counts for the high-, medium-, and low-sensitivity systems, respectively, over a 1-yr period (November 6, 1964, to November 5, 1965).

-----S 55C, SECRETAN-----

INVESTIGATION NAME- CADMIUM SULFIDE CELLS

NSSDC ID- 64-074A-03

PERSONNEL  
 PI - L. SECRETAN (RETIRED) NASA LARC

BRIEF DESCRIPTION

The objective of this experiment was to determine the size of penetrating meteoroids by measuring the size of holes produced by the impacts in two thicknesses of a plastic film using two light-sensitive CdS cells. The cells were both mounted on the forward face of the spacecraft, one beneath a sheet of 6.35-micron-thick PET film and the other beneath a sheet of 3.18-micron-thick PET film. Each detector provided 24 sq cm of surface area exposed to meteoroids. Each sheet of PET film had a thin coating of aluminum deposited on both sides. Penetration of the aluminized PET sheets would allow sunlight (direct or reflected) to illuminate the cell and reduce its resistance, the cell being calibrated to relate the resistance change to accumulative hole sizes in the PET film. Prior to liftoff, all detectors were functioning properly; however, on the first interrogation made shortly after fourth stage burnout, it was found that the CdS cells were saturated with light. Apparently the aluminized PET film covers were damaged during launch, preventing data acquisition.

-----S 55C, SIVITER-----

INVESTIGATION NAME- CAPACITOR DETECTORS

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NSSDC ID- 64-074A-04

PERSONNEL  
PI - J.H. SIVITER

NASA-LARC

PERSONNEL  
PI - R. GIACCONI  
OI - E.M. KELLOGG  
OI - H. CURSKY  
OI - H. TANANBAUM

SPACE TELESCOPE SCI IN  
HARVARD COLLEGE OBS  
US NAVAL RESEARCH LAB  
SAO

BRIEF DESCRIPTION

The purpose of the experiment was to determine whether the space radiation environment had any adverse effects on the operation of the capacitor as a meteoroid-penetration detector. Observations in the laboratory indicated that energetic electrons in space might collect in the dielectric and produce false penetration counts. The instrumentation consisted essentially of two capacitors made up of a thin film polymer dielectric (bilaminate 3.8-micron thick, half-hard, type 302), which served as one electrode. A copper layer, about 0.65-micron thick, was vacuum-deposited on the outer surface of the dielectric, thus permitting it to serve as the second electrode. The capacitors were each mounted on a 0.63-cm-thick layer of polyurethane foam support by means of a 2.5-micron adhesive. The foam support, in turn, was seated in a laminated fiberglass tray that served as the mounting fixture. A penetration into the charged capacitor by a projectile caused the capacitor to be momentarily shorted and discharged. This discharge was detected and stored in a counter for later transmission. The conduction path dissipated in less than 1 microsecond and allowed the capacitor to recharge and detect any additional penetrations. Two discharges were recorded for one of the detectors during the 365-day lifetime of the experiment (November 6, 1964, to November 5, 1965). No discharges were recorded for the second capacitor. More refined laboratory tests, however, revealed that the number of radiation-induced pulses would be about the same as or less than the number resulting from actual punctures, thus making it difficult, if not impossible, to distinguish between the two. Hence, the origin of the two counts (electron or meteoroid) could not be determined. It was determined from the data, however, that any radiation-induced pulses greater than 2 V were at a minimum and would not likely affect the meteoroid flux data to any great extent, particularly when the penetration rates were relatively high.

BRIEF DESCRIPTION

The X-ray instrument aboard SAS-A (Explorer 42) consisted of two nearly identical sides, both physically and electronically. Each side contained an X-ray detection system composed of a collimator, proportional counters, associated processing electronics, and an aspect sensing system. The high spatial resolution side had a viewing angle of 0.5-deg by 5-deg FWHM and a detection range from 1 to 20 keV. The other side had a high-sensitivity collimator with a viewing angle of 5-deg by 5-deg FWHM. This side had a detection range from 1 to 10 keV. Six proportional counters, composed of a beryllium shell with 2.5-mm beryllium foil windows, were behind each collimator. The interior contained a 2-mm tungsten anode wire and a gas composition of 90% argon, 9.5% carbon dioxide for quenching, and 0.5% helium at a pressure of 940 mm of mercury. Low-intensity radioactive sources were used for inflight calibration of the instrument. The spin axis of the spacecraft was held fixed in the sky for about a day at a time. During this period a band of approximately 10 deg about the equator of the spin axis was scanned. The primary data reduction objective was to superimpose the X-ray data recorded as "count rate vs time" to "count rate vs azimuth" so that the superimposition data would be equivalent to a single sweep through the observing 10-deg band with a total observing time of 1 day. An array was created of X-ray superimposition (representing the 360-deg circle scanned) broken into 4320 elements of azimuth of 5 min each for the 0.5-deg detector and 1080 elements of azimuth of 20 min each for the 5-deg detector.

..... SAS-B .....

SPACECRAFT COMMON NAME- SAS-B  
ALTERNATE NAMES- PL-723D, EXPLORER 48  
06282, SAS 2

NSSDC ID- 72-091A

SPONSORING COUNTRY  
U.S.  
WEIGHT- 166. KG

LAUNCH DATE- 11/15/72

ORBIT PARAMETERS  
ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD- 95.4 MIN  
PERIAPSIS- 443. KM ALT

EPOCH DATE- 11/16/72  
INCLINATION- 1.9 DEG  
APOAPSIS- 632. KM ALT

PERSONNEL  
SC - N.C. ROMAN  
PM - M.R. TOWNSEND  
PS - C.E. FICHTEL

NASA HEADQUARTERS  
NASA GSFC  
NASA-GSFC

BRIEF DESCRIPTION

Explorer 48 (SAS-B) was the second in the series of small spacecraft designed to extend the astronomical studies in the X-ray, gamma ray, ultraviolet, visible, and infrared regions. The primary objective of the Explorer 48 was to measure the spatial and energy distribution of primary galactic and extragalactic gamma radiation with energies between 20 and 300 MeV. The instrumentation consisted principally of a guard scintillation detector, an upper and a lower spark chamber, and a charged particle telescope. Explorer 48 was launched from the San Marco platform off the coast of Kenya, Africa, into a nearly equatorial orbit. The orbiting spacecraft was in the shape of a cylinder approximately 59 cm in diameter and 135 cm in length. Four solar paddles were used to recharge the 6-amp-h nickel-cadmium battery and provide power to the spacecraft and telescope experiment. The spacecraft was spin stabilized, and a magnetically torqued commandable control system was used to point the spin axis of the spacecraft to any position in space within approximately 1 deg. The experiment axis lay along this axis allowing the telescope to look at any selected region of the sky with its plus or minus 30-deg acceptance aperture. The nominal spin rate was 1/12 rpm. Data were taken at 1000 bps and could be recorded on an onboard tape recorder and simultaneously transmitted in real time. The recorded data were transmitted once per orbit. This required approximately 5 min. The telescope experiment was initially turned on November 20, 1972, and by November 27, 1972, the spacecraft became fully operational. The low-voltage power supply for the experiment failed on June 8, 1973. No useful scientific data were obtained after that date. With the exception of a slightly degraded star sensor, the spacecraft control section performed in an excellent manner. For more details, see S. M. Derdeyn et al., Nuc. Ins. & Meth., v. 98, p. 557, 1972; C. Fichtel, K. Greisen, and D. Kniffen, Phys. Today, v. 28, p. 42, 1975.

..... SAS-B, FICHTEL .....

INVESTIGATION NAME- GAMMA RAY TELESCOPE

..... SAS-A .....

SPACECRAFT COMMON NAME- SAS A  
ALTERNATE NAMES- SAS 1, EXPLORER 42  
UHURU, PL-701C  
04797

NSSDC ID 70-107A

SPONSORING COUNTRY  
U.S.  
WEIGHT- 143. KG

LAUNCH DATE- 12/12/70

ORBIT PARAMETERS  
ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD- 95.7 MIN  
PERIAPSIS- 531. KM ALT

EPOCH DATE- 12/13/70  
INCLINATION- 3.0 DEG  
APOAPSIS- 572. KM ALT

PERSONNEL  
MC - J.R. HOLTZ  
SC - N.C. ROMAN  
PM - M.R. TOWNSEND  
PS - C.E. FICHTEL

NASA HEADQUARTERS  
NASA HEADQUARTERS  
NASA-GSFC  
NASA-GSFC

BRIEF DESCRIPTION

SAS-A was the first in the series of small spacecraft whose objectives were to survey the celestial sphere and search for sources radiating in the X-ray, gamma-ray, UV, and other spectral regions. The primary mission of SAS-A was to develop a catalog of celestial X-ray sources by systematic scanning of the celestial sphere in the energy range from 2 to 20 keV. The spacecraft was launched December 12, 1970, from the San Marco platform off the coast of Kenya, Africa, into a near-circular equatorial orbit. The orbiting spacecraft was in the shape of a cylinder approximately 56 cm in diameter and 116 cm in length. It weighed 141.5 pounds and consumed 9.6 W. Four solar paddles were used to recharge a 6-amp-h, eight cell, nickel-cadmium battery, and to provide power to the spacecraft and experiment. The spacecraft was stabilized by an internal wheel, and a magnetically torqued commandable control system was used to point the spin axis of the spacecraft to any point of the sky. The aspect sensing system consisted of both a star and sun sensor that shared the same processing electronics. The system was designed with heavy emphasis on redundancy, not only in the more obvious areas such as aspect sensors and high and low voltage power supplies, but also in signal switching and high voltage distribution. The resulting instrument was capable of sustaining several simultaneous major failures without seriously compromising the scientific objectives. Data were stored on a one-orbit storage tape recorder and telemetered during a 3.4-min playback cycle. A 1000-bps PCH/PM system was used. For more details, see N. Jagoda et al., IEEE Tra. Nuc. Sci., v. 19, p. 579, 1972; D. G. Mullens, IEEE Trans. Ins. & Meas., v. IM-20, p. 235, 1971.

..... SAS-A, GIACCONI .....

INVESTIGATION NAME- ALL-SKY X-RAY SURVEY

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PERSONNEL  
PI - C.E. FICHEL

NASA-GSFC

BRIEF DESCRIPTION

The instrument consisted of two spark-chamber assemblies, four plastic scintillation counters, four Cerenkov counters, and an anticoincidence scintillation counter dome assembled to form a telescope. The spark chamber assembly consisted of 16-wire spark-chamber modules with a magnetic core readout system. Sandwiched between these two assemblies was a plane of plastic scintillator formed by the four scintillation counters. Thin tungsten plates, averaging 0.010-cm thick, were interleaved between the spark chamber modules, which had an active area of 640 sq cm. These plates provided the material for the gamma ray to convert into an electron-positron pair and provided a means of determining the energy of these particles by measuring their coulomb scattering. The spark chamber modules revealed the position and direction of the particles; from this information, the energy and direction of the gamma ray was determined. The scintillation counters and the four directional Cerenkov counters that were placed below the second spark chamber assembly constituted four independent counter coincidence systems. The single piece plastic scintillator dome surrounded the whole assembly except at the bottom to discriminate against charged particles. The threshold of the instrument was about 30 MeV, and energies up to about 200 MeV could be measured along with the integral flux above 200 MeV. The angular resolution of the telescope varied as a function of energy and arrival direction from 1.5 to 5 deg. During the lifetime of the experiment from November 15, 1972, to June 8, 1973, approximately 55% of the celestial sphere, including most of the galactic plane, was surveyed.

\*\*\*\*\* SAS-C \*\*\*\*\*

SPACECRAFT COMMON NAME SAS-C  
ALTERNATE NAMES PL-743D, SAS 3  
EXPLORER 53

NSSDC ID 75 037A

SPONSORING COUNTRY

LAUNCH DATE- 05/07/75

U.S.  
WEIGHT 193. KG

ORBIT PARAMETERS

ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD 94.9 MIN  
PERIAPSIS- 509. KM ALT

EPOCH DATE- 05/08/75  
INCLINATION- 3.0 DEG  
APOAPSIS 516. KM ALT

PERSONNEL

MC - J.R. HOLTZ  
SC - N.C. ROMAN  
PM - J.E. KUPPERIAN, JR (DECEASED)  
PS - C.E. FICHEL

NASA HEADQUARTERS  
NASA HEADQUARTERS  
NASA-GSFC  
NASA GSFC

BRIEF DESCRIPTION

SAS-C was the third in the series of small spacecraft whose objectives were to survey the celestial sphere for sources radiating in the X-ray, gamma-ray, UV, and other spectral regions. The primary missions of SAS-C were to measure the X-ray emission of discrete extragalactic sources, to monitor the intensity and spectra of galactic X-ray sources from 0.2 to 60 keV, and to monitor the X-ray intensity of Scorpio X-1. The spacecraft was launched from the San Marco platform off the coast of Kenya, Africa, into a near-circular, equatorial orbit. This spacecraft contained four instruments: the Extragalactic Experiment, the Galactic Monitor Experiment, the Scorpio Monitor Experiment, and the Galactic Absorption Experiment. In the orbital configuration, the spacecraft was 145.2-cm high and the tip-to-tip dimension was 470.3 cm. The total payload weight was 196.7 kg. Four solar paddles were used in conjunction with a 12-cell nickel-cadmium battery to provide 65 W of average power over the entire orbit. The spacecraft was stabilized along the Z axis and rotated at about 0.1 deg/s. Changes to the spin axis orientation were by ground command, either delayed or in real time. The spacecraft could be made to move back and forth plus or minus 2.5 deg across a selected source along the X axis at 0.01 deg/s. The experiments looked along the Z axis of the spacecraft, perpendicular to it, and at an angle.

-----SAS-C, CLARK-----

INVESTIGATION NAME- EXTRAGALACTIC EXPERIMENT (EGE)

NSSDC ID- 75-037A 01

PERSONNEL

PI - G.W. CLARK  
OI - H.V.D. BRADT  
OI - W.H.G. LEWIN  
OI - H.W. SCHNOPPER

MASS INST OF TECH  
MASS INST OF TECH  
MASS INST OF TECH  
DANISH SPACE RES INST

BRIEF DESCRIPTION

This experiment determined the positions of very weak extragalactic X-ray sources. The instrument viewed a 100-sq deg region of the sky around the direction of the spin axis of the satellite. The nominal targets for a 1-year study were (1) the Virgo cluster of galaxies for 4 months, (2) the galactic equator for 2 months, (3) the Andromeda Nebula for 3 months, and (4) the Magellanic Clouds for 3 months. The instrumentation consisted of one 2.5-arc-min and one 4.5-arc-min FWHM modulation collimator, as well as proportional counters sensitive over the energy range from 1.5 to 10 keV. The effective area of each collimator was about 225 sq cm. The aspect system provided information on the orientation of the collimators to an accuracy of 15 arc-s. For additional information, see H. W. Schnopper et al., Ap. J., v. 210, p. L75, 1976.

-----SAS-C, CLARK-----

INVESTIGATION NAME- GALACTIC MONITOR EXPERIMENT (GME)

NSSDC ID- 75 037A-02

PERSONNEL

PI - G.W. CLARK  
OI - H.V.D. BRADT  
OI - W.H.G. LEWIN  
OI - H.W. SCHNOPPER

MASS INST OF TECH  
MASS INST OF TECH  
MASS INST OF TECH  
DANISH SPACE RES INST

BRIEF DESCRIPTION

The objectives of this experiment were to locate galactic X-ray sources to 15 arc-s and to monitor these sources for intensity variations. The source positions were determined with the use of the modulation collimators of the Extragalactic Experiment during the nominal 2 month observation of the galactic equator. The monitoring of the X-ray sky was accomplished by the use of three slat collimators. One collimator, 1- by 70-deg FWHM, was oriented perpendicular to the equatorial plane of the satellite, while the other two, each 0.5- by 45-deg FWHM, were oriented 30 deg above and 30 deg below the first. The detector behind each collimator was a proportional counter, sensitive from 1.5 to 13 keV, with an effective area of about 100 sq cm. The 1.0-deg collimator had an additional counter of the same area, sensitive from 8 to 50 keV. Three lines of position were obtained for any given source when the satellite was being spun at a steady rotation of 4 arc-min/s about the Z axis. For additional information, see W. H. G. Lewin et al., Ap. J., v. 207, p. L95, 1976.

-----SAS-C, CLARK-----

INVESTIGATION NAME- SCORPIO MONITOR EXPERIMENT (SME)

NSSDC ID 75 037A-03

PERSONNEL

PI - G.W. CLARK  
OI - H.V.D. BRADT  
OI - W.H.G. LEWIN  
OI - H.W. SCHNOPPER

MASS INST OF TECH  
MASS INST OF TECH  
MASS INST OF TECH  
DANISH SPACE RES INST

BRIEF DESCRIPTION

A 12- by 50-deg FWHM slat collimator was oriented with its long axis perpendicular to the satellite spin axis such that a given point on the sky could be monitored for about 25% of a rotation. This collimator was inclined by 31 deg with respect to the equatorial plane of the satellite, so that Scorpio X-1 was observed while the Z axis was oriented to the Virgo cluster of galaxies. The detectors used in this experiment were proportional counters with 1-mm beryllium windows. The energy range was from 1.0 to 60 keV, and the total effective area was about 40 sq cm.

-----SAS-C, CLARK-----

INVESTIGATION NAME GALACTIC ABSORPTION EXPERIMENT (GAE)

NSSDC ID 75-037A-04

PERSONNEL

PI - G.W. CLARK  
OI - H.V.D. BRADT  
OI - W.H.G. LEWIN  
OI - H.W. SCHNOPPER

MASS INST OF TECH  
MASS INST OF TECH  
MASS INST OF TECH  
DANISH SPACE RES INST

BRIEF DESCRIPTION

The density and distribution of interstellar matter was determined by measuring the variation in the intensity of the low-energy diffuse X-ray background as a function of galactic latitude. A 1-micrometer polypropylene window proportional counter was used for the 0.1- to 0.4-keV and 0.4- to 1.0-keV energy ranges, while a 2-micrometer titanium window counter covered the energy range from 0.3 to 0.5 keV. In addition, two 1-mm beryllium window counters were used for the 1.0- to 10-keV energy range. The collimators in this experiment had fields of view of 3 deg for the 1-micrometer counter, 2 deg for the 2-micrometer counter, and 2 deg for the 1-mm counters. For additional information, see D. R. Hearn et al., Ap. J., v. 203, p. L21, 1976.

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\*\*\*\*\* SKYLAB \*\*\*\*\*

SPACECRAFT COMMON NAME- SKYLAB  
ALTERNATE NAMES- 6633NSSDC ID- 73-027A  
LAUNCH DATE- 05/14/73SPONSORING COUNTRY  
U.S.  
WEIGHT- 90607. KGORBIT PARAMETERS  
ORBIT TYPE- GECENTRIC  
ORBIT PERIOD- 93.4 MIN  
PERIAPSIS- 434.0 KM ALTEPOCH DATE- 05/14/73  
INCLINATION- 50.0 DEG  
APDAPSIS- 442.0 KM ALTPERSONNEL  
PM - O.C. SMITH

NASA JSC

## BRIEF DESCRIPTION

The Skylab (SL) was a manned, orbiting spacecraft composed of five parts, the Apollo telescope mount (ATM), the multiple docking adapter (MDA), the airlock module (AM), the instrument unit (IU), and the orbital workshop (OWS). The Skylab was in the form of a cylinder, with the ATM being positioned 90 deg from the longitudinal axis after insertion into orbit. The ATM was a solar observatory, and it provided attitude control and experiment pointing for the rest of the cluster. It was attached to the MDA and AM at one end of the OWS. The retrieval and installation of film used in the ATM was accomplished by astronauts during extravehicular activity (EVA). The MDA served as a dock for the command and service modules, which served as personnel taxis to the Skylab. The AM provided an airlock between the MDA and the OWS, and contained controls and instrumentation. The IU, which was used only during launch and the initial phases of operation, provided guidance and sequencing functions for the initial deployment of the ATM, solar arrays, etc. The OWS was a modified Saturn 4B stage suitable for long duration manned habitation in orbit. It contained provisions and crew quarters necessary to support three-person crews for periods of up to 84 days each. All parts were also capable of unmanned, in-orbit storage, reactivation, and reuse. The Skylab itself was launched on May 14, 1973. It was first manned during the period May 25 to June 22, 1973, by the crew of the SL-2 mission (73-032A). Next, it was manned during the period July 28 to September 25, 1973, by the crew of the SL-3 mission (73-050A). The final manned period was from November 16, 1973, to February 8, 1974, when it was manned by the crew from the SL-4 mission (73-090A).

----- SKYLAB, GREENBERG -----

INVESTIGATION NAME- CORONOGRAPH CONTAMINATION MEASUREMENTS

NSSDC ID- 73-027A-45

PERSONNEL  
PI - M. GREENBERG  
OI - G.P. BONNERDUDLEY OBS  
NASA JSC

## BRIEF DESCRIPTION

The primary objective of Skylab experiment T025 was to visually and photographically observe and record the amount of light scattered by particles from thruster firings and waste dumps. One purpose of T025 was to determine the extent and nature of the induced contaminant and to assess its effect on other optical experiments on the spacecraft. Another objective was to look through the earth's upper atmosphere to determine the type and amount of particular matter. The T025 experimental hardware consisted of a modified 35-mm Nikon camera attached to a coronagraph that was placed in the solar scientific airlock of the OWS. From this position, a series of external disks could occult the sun, thereby allowing direct visual and photographic observations of the microscopic contaminant particles as they scattered the solar radiation incident on them. This observing program was involuntarily curtailed when the solar airlock was rendered unusable following the launch. The instrument was quickly modified for extravehicular activity (EVA) and the observing program was reduced to just the atmosphere mode monitoring the stratospheric aerosols. Although the required modifications were made in time for the second manned Skylab mission, the instrument was not deployed during that flight because the astronauts were not trained for its extravehicular operation. The addition of the Comet Kohoutek program to the Skylab mission objectives in late 1973 enlarged the scope of the T025 experiment again. The T025 coronagraph allowed near-perihelion photographic observations of the comet; the addition of narrowband filters allowed the principal emission features of the comet to be observed. The T025 experiment was deployed on four EVAs during SL-3. Two EVAs were used to observe the earth's atmosphere, and two were used to study the comet near perihelion. Unfortunately, the electric Nikon camera used with the coronagraph during EVA did not function properly, although a few useful frames were obtained. For additional details, see F. Giovane, D. W. Schuerman, and J. M. Greenberg, App. Opt., v. 16, p. 993, 1977.

----- SKYLAB, HENIZE -----

INVESTIGATION NAME- ULTRAVIOLET STELLAR ASTRONOMY

PERSONNEL  
PI - K.G. HENIZE  
OI - J.D. WRAYNASA-JSC  
U OF TEXAS, AUSTIN

## BRIEF DESCRIPTION

The objectives of this experiment were to take UV photographs of young and hot stars, nebulae, interstellar dust, and stellar gas shells in large areas of the Milky Way, and evaluate large numbers of spectra for spectral classes, temperatures, and compositions of stars, using a reflecting telescope and an objective prism in front of a 35 mm camera. The telescope had a 15-cm reflecting mirror. Several different prisms could be inserted in front of the telescope, depending on the desired spectral resolution and sensitivity. The instrument was sensitive in the spectral region from 1400 to 3000 A. The instrument was mounted in the antisolar airlock of the orbital workshop, and the telescope looked at different portions of the sky by means of a movable flat mirror. Photographs were taken only while Skylab was on the dark side of its orbit. The image of each star was drawn out into a small spectrum. About fifty 4 x 5 deg star fields were observed during each of the three Skylab missions. Details could be resolved to about 20 arc-s. Films were developed and evaluated on the ground. For more details, see F. G. O'Callaghan, K. G. Henize, and J. D. Wray, App. Opt., v. 16, p. 973, 1977.

----- SKYLAB, KRIEGER -----

INVESTIGATION NAME- X-RAY SPECTROGRAPHIC TELESCOPE

NSSDC ID- 73-027A-05

PERSONNEL  
PI - A.S. KRIEGER  
PI - G.S. VAIANAAS+E, INC  
HARVARD COLLEGE OBS

## BRIEF DESCRIPTION

The objectives of this experiment, located in the Apollo Telescope Mount, were to observe images of the sun and X-ray emissions of flares in the 2-60 A range with high spatial (about 2 arc-s), spectral ( $\Delta\lambda/\lambda=0.02$ ), and temporal resolution, use selective filters and a transmission grating to obtain spectral information, and follow the evolution of active areas and correlate X ray emissions with solar events observed in ultraviolet and visible light. X ray sources were imaged with mirror optics utilizing very flat angles of incidence below about 0.5 deg. This experiment used two cylindrical, coaxial mirrors of this kind with diameters of 31 and 23 cm, with a total collecting area of 42 sq cm, and with a focal length of 213 cm. The transmission grating was mounted behind the rear end of the cylindrical mirrors; it produced first-order spectra on both sides of the zero order image of a source. A filter wheel mechanism permitted the insertion of selective filters into the path of the X-rays, thus providing broadband spectral filtering of the flux. A 7.6-cm diameter, coaxial X ray mirror produced an X ray image of the sun on a scintillator crystal, where it was sensed by the photocathode of an image dissector tube. The output of this tube was used for a visual display on the ATM console. X ray images were recorded on 70-mm film. A photomultiplier tube, oriented toward the sun, measured the total solar X-ray flux; when a preset level was exceeded, an alarm for the astronauts was given. The signal from this tube also served as a reference for the exposure setting of the film camera on the main telescope. For additional information, see R. Tousey, App. Opt., v. 16, p. 828, 1977.

----- SKYLAB, MACQUEEN -----

INVESTIGATION NAME WHITE LIGHT CORONAGRAPH

NSSDC ID 73-027A 04

PERSONNEL  
PI - R.M. MACQUEEN  
OI - G.A. NEWKIRK, JR.HIGH ALTITUDE OBS  
HIGH ALTITUDE OBS

## BRIEF DESCRIPTION

The objectives of this experiment were to study brightness, form, size, composition, polarization, and movements of the corona, and correlate the observations with solar surface events and with solar wind effects. The experiment, located in the ATM, used an externally occulted coronagraph to monitor, between 4000 and 6000 A, the brightness, form, and polarization of the solar corona at radial distances of 1.5 to 6.0 solar radii. The coronagraphs were designed to block out the image of the sun's disk and to take pictures of the faint corona that extends from the sun far into space. Light scattering by optical elements and by structural surfaces was carefully avoided. This instrument contained four coaxial occulting disks and photodetectors for alignment corrections. Pictures were recorded on 35-mm film; they were taken either in unpolarized light or in one of three possible orientations of plane polarized light. Also, the instrument could operate in the "video mode," which permitted display for the astronauts or TV transmission to the ground. For more details, see A. L. Poland et al., App. Opt., v. 16, p. 926, 1977.

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SKYLAB, NOYES

INVESTIGATION NAME- UV SCANNING  
POLYCHROMATOR/SPECTROHELIO METER

NSSDC ID 73-027A 06

PERSONNEL

PI - R.W. NOYES HARVARD COLLEGE OBS  
OI - E.M. REEVES NASA HEADQUARTERS

BRIEF DESCRIPTION

The objective of this experiment, which was located on the ATM, was to obtain photometric data of six spectral lines (O IV, Mg X, C II, O VI, H I, C II) and the Lyman continuum, and extreme ultraviolet (EUV) observations of a variety of structures in the solar chromosphere, corona, and chromospheric coronal transition layer. An ultraviolet scanning polychromator spectroheliometer operated in a spectral range of 296 to 1350 Å with a resolution of 1.5 Å. An off-axis paraboloidal primary mirror formed a solar image on a 56- by 56-micron entrance slit of the spectrometer, corresponding to a 5- by 5-arc-min area on the sun. Diffraction by a concave grating, ruled in gold with 1800 grooves per mm, produced a spectrum on the Rowland circle where seven photomultiplier detectors in fixed positions simultaneously recorded the intensities of the six lines and the Lyman continuum. The instrument had three basic observing modes. First, a mirror raster scanning mode was used in which spectroheliograms of a 5.5- by 5-arc-min area were acquired in up to seven wavelengths simultaneously. Each scan took approximately 5.5 min to complete. Second, a mirror line scanning mode acquired data for seven wavelengths simultaneously in an area 5-arc-min by 5.5-arc-min. This took approximately 5.5 s. Third, a grating wavelength scanning mode was used, in which the spectrum of a 5- by 5-arc-min area was scanned in 3.8 min. The scan consisted of 5270 data points. The instrument could be operated during manned, unattended, or unmanned periods of the Skylab mission. Count data were recorded and then transmitted to earth every orbit. For more details, see E. M. Reeves, M. C. E. Huber, and J. C. Timothy, App. Opt., v. 16, p. 837, 1977.

SKYLAB, NOYES

INVESTIGATION NAME HYDROGEN ALPHA TELESCOPE NUMBER 1

NSSDC ID- 73-027A 15

PERSONNEL

PI - R.W. NOYES HARVARD COLLEGE OBS  
OI - E.M. REEVES NASA HEADQUARTERS

BRIEF DESCRIPTION

The objective of the experiment was to obtain high-resolution photographs of the sun in the H-alpha line of the Balmer series (6562.8 Å). The H-alpha telescopes were the most useful devices for showing the crew member the precise pointing position of the ATM instruments relative to features on the solar disk and for recording this position. Not only did this provide backup capability, it also made possible viewing at the same time a highly magnified image of a small part of the sun and an image of the entire sun. The control and display panel was equipped with two identical monitors of 6 in. diameter. A spectral resolution of 0.7 Å was provided by means of Fabry-Perot type filters. The optical telescopic system was arranged with a zoom-type lens so that either telescope could be used at low magnification or at high magnification where it was possible to resolve 1-2 arc-s. Photographs were taken using a camera mounted at the second image plane of the telescope. The field of view of the camera was 35 arc-min. The zoom ratio was 3.5 to 1. The camera could be operated either automatically or manually. In the automatic mode, photographs were taken at 1, 2, or 4 frames per minute. In the manual mode, only one frame was exposed per command. A system was worked out so that the H-alpha telescope could be used to determine the degree of coalignment between S055 and S082B. This made it possible for the H-alpha telescope to record the precise position of pointing of S082B and S055, by using a mechanically movable reticle system placed in the field of view.

SKYLAB, PACKER

INVESTIGATION NAME- UV AIRGLOW HORIZON PHOTOGRAPHY

NSSDC ID- 73 027A-08

PERSONNEL

PI - D.M. PACKER US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

The Skylab experiment S063 was flown to provide data for several studies: photography of airglow, ozone, aurora, and Comet Kohoutek. The objective of the airglow investigation was to study the altitude and intensity variations of some airglow emissions by means of photography from the spacecraft. The method of acquiring the data was to obtain 35-mm photographs through filters at wavelengths of 2500, 3914, 5577, and 6300 Å. The ozone effort involved investigating a method for acquiring measurements of the changing patterns of ozone concentration using photography. The procedure used was to obtain three

photographs of a given area beneath the spacecraft. One photograph was exposed through a filter that transmitted radiation within the ozone absorption band, the second photograph was obtained through a filter transmitting just beyond the long wavelength end of the ozone band, and the third photograph was in color of the same observed area. A measure of the relative ozone might be obtained by subtraction, picture element by picture element, of the combined data of the two photographs outside the ozone band from that of the "ozone" data. Mounted at a window in the antisolar scientific airlock, the camera obtained "ozone" data during daylight when it could view the earth at nadir. The auroral study required photographing aurorae in profile from above the lower atmosphere and obtaining vertical cross-sections of aurorae with the spatial distribution of emissions from atmospheric constituents delineated by color. The Comet Kohoutek effort had the objective of obtaining a time sequence of exposures of the comet as it approached and receded from the sun. In addition to the camera and filter system of this experiment, several filters were borrowed from experiment T025 in both the UV and visible spectral range. Additional details, including flight performance, can be found in the report, "Skylab Experiment S063 U.V. Airglow Horizon Photography," D. M. Packer and J. C. Packer, NRL Memorandum Report No. 3381, October 1976. Also see D. M. Packer and J. C. Packer, App. Opt., v. 16, p. 983, 1977.

SKYLAB, TOUSEY

INVESTIGATION NAME- UV CORONAL SPECTROHELIOGRAPH

NSSDC ID- 73-027A-10

PERSONNEL

PI - R. TOUSEY US NAVAL RESEARCH LAB  
OI - J.D. PURCELL US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

The objectives of this experiment were to record monochromatic images of the entire sun in the emission lines of a spectral range from 150 to 625 Å, to obtain information about composition, temperature, energy conversion and transfer, and plasma processes within the chromosphere and lower corona, and to correlate these data with results from simultaneous observations in the other wavelength regions. This experiment, located in the ATM, consisted of an extreme ultraviolet (XUV) slitless spectroheliograph. Imaging of the sun and generation of the spectrum were achieved by a single concave mirror of 2-m focal length, ruled in gold with 3600 lines per mm. The instrument had a field of view of 1.75 solar diameters with a spatial resolution of as fine as 2 arc-s. It covered the wavelength range from 171 to 730 Å with a spectral resolution as fine as 0.027 Å. A single exposure simultaneously recorded full-disk images in a multitude of XUV emission lines, showing solar features whose temperatures range from 2.0E+4 K to over 2.0E+7 K in their relationship to their overall surroundings. The unneeded part of the solar spectrum was reflected out into space in order to avoid unnecessary heating of the instrument. A thin aluminum filter in front of the film kept stray light out. Four film cameras were used, each loaded with 200 film strips; a crew member exchanged cameras by extravehicular activity (EVA). This instrument operated almost perfectly and recorded 1032 XUV spectroheliograms on strips of Schumann type XUV sensitive film (35 mm x 258 mm each). For more details, see R. Tousey et al., App. Opt., v. 16, p. 870, 1977.

SKYLAB, TOUSEY

INVESTIGATION NAME- EUV SPECTROGRAPH

NSSDC ID- 73 027A-11

PERSONNEL

PI - R. TOUSEY US NAVAL RESEARCH LAB  
OI - J.D. PURCELL US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This experiment, located in the ATM, was designed to record photographically the line spectra of the solar chromosphere and part of the transition region. For stray light elimination, a predisperser grating assembly with two gratings generated a light beam containing only the desired wavelength regions. The main grating was a concave mirror ruled at 600 grooves per mm. The spectrum from 970 to 3940 Å was covered in two bands with a spectral resolution of between 0.04 and 0.08 Å and a spatial resolution of about 3 arc-s. The entrance slit admitted light from a 2- by 60-arc-min area on the sun. Several operational modes could be selected by the crew members, such as the boresight mode that permitted an astronaut to point at a specific area on the solar disk, the limb scanning mode that produced a sequence of exposures across the limb by stepwise angular motion of the primary mirror, and the flare mode in which the instrument took a preprogrammed series of exposures of flares or other active areas when commanded by a crew member. Data were recorded on strips of film, with eight frames being recorded on each film strip. Included in this package was an XUV monitor, which provided a real-time video image of the chromosphere and corona from sun center to two solar radii over the entire passband of 170 to 550 Å, with no spectral resolution and 10 to 20 arc-s spatial resolution. Data from the XUV monitor were available to the crew and were transmitted to the ground over an S-band video channel. For

more details, see J.-D. F. Bartoe et al., App. Opt., v. 16, p. 79, 1977.

-----SKYLAB, UNDERWOOD-----

INVESTIGATION NAME- DUAL X-RAY TELESCOPE

NSSDC ID- 73-027A-07

PERSONNEL  
PI - J.H. UNDERWOOD AEROSPACE CORP  
PI - E. TANDBERG-HANSSSEN NASA-MSFC

BRIEF DESCRIPTION  
This experiment consisted of two instruments: an X-ray event analyzer (XREA) consisting of two proportional counters with pulse-height analyzers and associated data processing and telemetry equipment, and an X-ray telescope assembly consisting of a Wolter type-I glancing incidence X-ray telescope and a camera assembly, which included a six-position filter wheel, a shutter, and a replaceable film magazine. One XREA proportional counter was equipped with a beryllium window, and the other was equipped with an aluminum window. Neither counter was collimated, and both viewed the full sun. A four-position aperture wheel was fitted in front of each counter to increase the dynamic range. The beryllium counter had six pulse-height analyzer channels and covered the passband from 2.5 to 7.25 A with a spectral resolution of about 0.5 A. The aluminum counter had four pulse height analyzer channels and covered the passband from 6.1 to 20 A with about 4 A spectral resolution. The XREA had a temporal resolution of 2.5 s. The filter wheel on the X-ray telescope contained five thin metallic filters, which isolated five broad wavelength bands in the soft X-ray spectrum, and a sixth filter, which yielded an overexposed image in the visible spectrum. The filters were normally changed after each exposure. The X-ray telescope could be operated only during the manned missions. Several operating modes were available with three sets of exposure times (short, normal, and long). In the patrol mode, the camera cycled through each filter for a total of six frames. The active modes were used for studying bright regions that were evolving rapidly, and only three filters were used. An automatic mode was used for flares or other transient phenomena, and a single frame mode allowed a particular filter to be selected for a single photograph. A super long mode allowed exposures of arbitrary length to be made. Over 27,000 filter heliograms were made during the Skylab mission (four rolls of black-and-white film and one roll of color film were exposed). For more details, see J. H. Underwood et al., App. Opt., v. 16, p. 858, 1977.

\*\*\*\*\* SMM \*\*\*\*\*

SPACECRAFT COMMON NAME SMM  
ALTERNATE NAMES- SOLAR MAXIMUM MISSION, 11703

NSSDC ID- 80-014A SPONSORING COUNTRY U.S.  
LAUNCH DATE 02/14/80 WEIGHT 2315. KG

ORBIT PARAMETERS  
ORBIT TYPE GEOCENTRIC EPOCH DATE 02/15/80  
ORBIT PERIOD 94.8 MIN INCLINATION 28.5 DEG  
PERIAPSIS 508. KM ALT APDAPSIS 512. KM ALT

PERSONNEL  
MG - B.R. MCCULLAR NASA HEADQUARTERS  
SC - D.M. BOHLIN NASA HEADQUARTERS  
PM - J.P. CORRIGAN NASA-CSFC  
PS - B.E. WOODGATE NASA-CSFC

BRIEF DESCRIPTION  
The Solar Maximum Mission (SMM) was designed to provide coordinated observations of solar activity, in particular solar flares, during a period of maximum solar activity. The payload was made up of seven instruments, specifically selected to study the short-wavelength and coronal manifestations of flares. Data were obtained on the storage and release of flare energy, particle acceleration, formation of hot plasma, and mass ejection. Complementary studies were made as part of the SMM guest investigator program, and coordinated in situ measurements of flare particle emissions were made from the ISEE 3 satellite. The SMM observatory was approximately 4 m in length, fitting into a circular envelope 2.3 m in diameter. The construction was modular. The instrument module occupied the top 2.3 m and contained all the solar payload instruments together with the fine-pointing sun sensor system. Below the instrument module was the Multimission Modular Spacecraft (MMS) containing the systems for attitude control, power, communication, and data handling. Between the instrument module and the MMS was the transition adaptor, supporting two fixed solar paddles that supplied between 1500 and 3000 W of power. Quick and coordinated responses to solar flares were considered essential for meeting the scientific objectives of the mission. Therefore, the ground system was designed to facilitate coordinated data evaluation, observation, planning, and command uplink to the onboard stored command processor. Onboard coordination of response to a flare was performed in real time. The attitude-control software allowed observatory repointings and slow scanning motions; there was also a special module for

tracking a solar feature over many days. A repair mission on STS-13 was completed. For this mission, astronauts rendezvoused with SMM to make repairs and an orbital adjustment. For more details, see E. G. Chipman, Ap. J., v. 244, p. L113, 1981; J. D. Bohlin et al., Solar Phy., v. 65, p. 5, 1980.

-----SMM, DE JAGER-----

INVESTIGATION NAME- HARD X-RAY IMAGING SPECTROMETER (HXIS)

NSSDC ID- 80-014A-05

PERSONNEL  
PI - C. DE JAGER U OF UTRECHT  
OI - H.F. VAN BEEK SPACE RESEARCH LAB  
OI - A.P. WILLMORE U OF BIRMINGHAM

BRIEF DESCRIPTION  
The objective of the Hard X-ray Imaging Spectrometer (HXIS) experiment was to measure the position, structure, and thermodynamic properties of hot thermal and nonthermal sources in active regions and in flares. This instrument produced two-dimensional images with 8-arc-s resolution over an approximately square area of side 2 min 40 s, or 32-arc-s resolution over a square of side 6 min 24 s. These images were observed in six selectable energy channels, between 3.5 and 30 keV, with a temporal resolution of 0.5 to 7 s, depending on the mode of operation. By means of a flare flag, the experiment alerted other SMM instruments when a flare began and indicated the position of the brightest pixel of the observation. The instrument consisted of 10 etched grid plates, each divided into 576 sections that formed the collimator, and 900 miniproportional counters that provided a position-sensitive detector system capable of spectral analysis. A dual microcomputer system permitted three modes of operation with commandable parameters that provided for a flexible tradeoff between temporal resolution and spatial coverage during different phases of a solar flare. For more details on this experiment, see H. R. Van Beek et al., Solar Phy., v. 65, p. 39, 1980.

-----SMM, FROST-----

INVESTIGATION NAME- HARD X-RAY BURST SPECTROMETER (HXRBS)

NSSDC ID- 80-014A 06

PERSONNEL  
PI - K.J. FROST NASA GSFC  
OI - L.E. DRWIG NASA GSFC  
OI - B.R. DENNIS NASA GSFC  
OI - T.L. CLINE NASA GSFC  
OI - U.D. DESAI NASA-GSFC

BRIEF DESCRIPTION  
The Hard X-ray Burst Spectrometer (HXRBS) was concerned with impulsive flare emission to determine the role of energetic electrons in solar flare mechanisms. The instrument consisted of a disk-shaped CsI(Na) central detector and a CsI(Na) active collimator element that surrounded the central detector. Photomultiplier (PM) tubes were used to view the crystals. The central crystal was 0.635 cm thick with a sensitive area of 71 sq cm. The collimator provided a 40 deg FWHM FOV. The energy range 20 to 260 keV was covered by 15 energy loss channels that provided continuous measurements with a time resolution of 128 ms. The system possessed an energy resolution of 30% FWHM at 122 keV. By use of a circulating 32K word memory, time resolutions as short as 1 ms were obtained for fast-rising bursts, but no spectral data were available with this memory. Either a constant time (CT) or constant count (CC) mode for the memory could be selected. Using the CT mode during solar observing periods, 10 ms resolution could be obtained for any flare output that triggered the device. Using the CC mode during spacecraft night, gamma ray bursts could be detected effectively. A charged particle detector was used to sense the South Atlantic anomaly region and to turn off the voltage to the PM tubes. For more detailed information about this experiment, see L. E. Drwig, K. J. Frost, and B. R. Dennis, Solar Phy., v. 65, p. 25, 1980.

-----SMM, MACQUEEN-----

INVESTIGATION NAME CORONAGRAPH/POLARIMETER

NSSDC ID- 80-014A-01

PERSONNEL  
PI - R. MACQUEEN HIGH ALTITUDE OBS  
OI - W.J. WAGNER NOAA  
OI - G.A. DULK U OF COLORADO  
OI - R. KOPP LOS ALAMOS NAT LAB  
OI - C.W. PNEUMAN HIGH ALTITUDE OBS  
OI - C.W. QUERFELD HIGH ALTITUDE OBS  
OI - H.U. SCHMIDT MPI PHYS ASTROPHYS  
OI - K.V. SHERIDAN CSIRO, DIV OF RADIODPHYS

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BRIEF DESCRIPTION

The prime objective of this experiment was to measure the response of the coronal electron density and magnetic field structure to the passage of transient phenomena on rapid time scales. The secondary objective was to determine the density and orientation of the magnetic field structure of the corona on a synoptic basis. The Coronagraph/Polarimeter (C/P) was the most recent version of a spaceborne externally occulted Lyot coronagraph designed to produce images of the solar corona in seven wavelength bands in the visual spectral range. The C/P was occulted by three disks with a 2.6-cm diameter primary objective lens of air-spaced doublet design. Coronal quadrants were imaged at f/34 on a meshless Vidicon with a nutating mirror arrangement and were recorded on a dedicated tape recorder for subsequent transmission to the earth. Fields of view ranged from 1.5 to 6.0 sq solar radii and were selectable within the coronal quadrant. Spatial resolution was selectable between 6.4 and 12.8 arc-s. Seven filters were available within the range 4465 to 6583 A and polarization was measured by a sequence of three Polaroids oriented 60 deg apart (a clear position was also available). The stray radiance was about 3E-10 of the solar brightness in the outer field. The instrument was on an independent gimballed mount and was sun-centered to within 10 arc-s. Experiments with the C/P involved either radiance observations or polarization sequences. For further information, see R. M. MacQueen et al., Solar Phy., v. 65, p. 91, 1980; L. L. House et al., Ap. J., v. 244, p. L117, 1981.

PERSONNEL
PH - UNKNOWN
US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

The SOLRAD 1 spin-stabilized spacecraft was put into orbit by the same launch vehicle that launched Transit 2A. The spacecraft carried two Lyman-alpha photometers and one X-ray photometer mounted along the equator of the satellite, looking out in a direction parallel to its equatorial plane. A visible light aspect system that used a vacuum photocell to determine the solar aspect angle was also attached. The aspect system had the same direction of view as the UV photometers and the opposite view with respect to the X-ray photometer. The objective of the project was to make long-term continuous observations of the solar hydrogen Lyman-alpha and soft X-ray emissions and to correlate these emissions with ground based observations.

SOLRAD 1, FRIEDMAN
INVESTIGATION NAME- X-RAY AND LYMAN-ALPHA STUDY
NSSDC ID- 60-007B-01

PERSONNEL
PI - H.D. FRIEDMAN
US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This experiment was designed to provide long term observations of the ionizing radiation from the sun by monitoring the solar emission in the X ray (2 to 8 A) and the hydrogen Lyman-alpha (1050 to 1350 A) regions. The measurements were made over the period June 22, 1960, to November 1, 1960, by two Lyman-alpha photometers and one X-ray photometer mounted on the equator of the satellite. The Lyman-alpha detectors were nitric oxide ion chambers, whereas the X-ray detector was an argon ion chamber. To eliminate the responses of the latter detector from Van Allen belt radiation (charged particles), a 2400-gauss permanent magnet was incorporated into the chamber design. This shielding magnet, however, had a significant effect upon the rotational stability of the satellite and, combined with other factors, was responsible for a severe reduction in the amount of data received. The data that were received, however, were of good quality.

SMM, TANDBERG-HANSEN
INVESTIGATION NAME ULTRAVIOLET SPECTROMETER AND POLARIMETER
NSSDC ID- 80-014A-02

PERSONNEL
PI E. TANDBERG-HANSEN NASA-MSFC
DI R.C. ATHAY HIGH ALTIITUDE OBS
DI J.M. BECKERS NATL OPT ASTRON OBS
DI J.C. BRANDT NASA-GSFC
DI M. BRUNER LOCKHEED PALD ALTD
DI R.D. CHAPMAN NASA-GSFC
DI B.E. WOODGATE NASA-GSFC

BRIEF DESCRIPTION

The Ultraviolet Spectrometer and Polarimeter (UVSP) was a modified version of the telescope spectrograph system flown on OSO 8. The objective of the experiment was to study solar ultraviolet radiation from active regions, flares, prominences, and the corona, in order to determine temperature, density, velocity, and the magnetic field in the solar plasma. A secondary objective was to conduct an aeronomy program to measure the height distribution of major absorbers in the earth's atmosphere, such as ozone and oxygen, and to detect trace constituents and their changes as a result of solar flares. The instrument consisted of a Gregorian telescope and an Ebert spectrometer. The telescope had an effective focal length of 1.8 m, a collecting area of 66.4 sq cm, and a field of view of 256 by 256 arc-s. The secondary mirror had a raster mechanism that allowed up to a 256 by 256 arc-s scan range. Spatial resolution was determined by an entrance slit mechanism that was adjustable from 1 by 1 arc-s to 30 by 30 arc-s. A choice of 22 entrance/exit slit combinations was available. The Ebert spectrometer had a spectral range of 1750 to 3600 A with a resolution of 0.04 A FWHM in the first order and 1150 to 1800 A with a resolution of 0.02 A FWHM in the second order. The polarimeter was located behind the entrance slit and consisted of two retarders (waveplates), a linear polarizer, and drive mechanisms. The control electronics for the instrument included a programmable microprocessor. Simultaneous measurements, at different heights in the chromosphere and in the corona, could be made by selecting any of three sets of four line pairs for polarimetry. For further information, see B. E. Woodgate et al., Solar Phy., v. 65, p. 73, 1980; M. S. Miller et al., App. Opt., v. 20, p. 3805, 1981.

SOLRAD 7A

SPACECRAFT COMMON NAME SOLRAD 7A
ALTERNATE NAMES- GREB 5, 00730

NSSDC ID- 64-001D SPONSORING COUNTRY U.S.
LAUNCH DATE 01/11/64 WEIGHT- 45.4 KG

ORBIT PARAMETERS
ORBIT TYPE-
ORBIT PERIOD- 103.3 MIN EPOCH DATE-
PERIAPSIS- 903. KM ALT INCLINATION 69.9 DEG
APOAPSIS 926. KM ALT

PERSONNEL
PH - UNKNOWN UNKNOWN

BRIEF DESCRIPTION

This solar X-ray monitoring satellite was launched in January 1964. It was equipped with ionization chambers to cover the ranges 1-8 A, 8-12 A, and 44-60 A. It was placed into orbit by an Agena D launch vehicle, with its spin axis roughly perpendicular to the sun-satellite direction with an initial spin rate of about 2 cps. The satellite was constructed so that the moments of inertia favored stable rotation about the spin axis; however, the magnetic brooms produced varying torques by interacting with the earth's magnetic field. This resulted in a slow precession of the spin axis. The orbit was nearly circular at 900 km and each pass provided 10 to 20 min of data at a ground station. This satellite contained five X-ray photometers, four UV photometers, and two systems to accurately determine the solar aspect angle. Its purposes were to monitor the soft component of solar X-rays (2 to 60 A) and the low-frequency portion of the solar hydrogen Lyman-alpha emission spectrum (1225 to 1350 A), and to transmit these quantitative analog data back to earth. Data were transmitted in real time on 136 Mc per second, and several European observatories successfully recorded the telemetry. The satellite transmitted data continuously until September 1964 from all but the 44- to 55-A and 8- to 16-A detectors, both of which failed soon after launch. Sporadic data were received until February 1965. For more details, see R. W. Kreplin, Space Res., v. 5, p. 951, 1964.

SOLRAD 1

SPACECRAFT COMMON NAME SOLRAD 1
ALTERNATE NAMES- 1960 (TA 2, GREB 1
SUNRAY 1, SR 1
00046

NSSDC ID- 60-007B SPONSORING COUNTRY U.S.
LAUNCH DATE 06/22/60 WEIGHT- 19.05 KG

ORBIT PARAMETERS
ORBIT TYPE- GEDCENTRIC EPOCH DATE- 06/22/60
ORBIT PERIOD- 101.7 MIN INCLINATION 66.69 DEG
PERIAPSIS- 614. KM ALT APOAPSIS- 1061. KM ALT

SOLRAD 7A, KREPLIN

INVESTIGATION NAME- SOLAR X-RAY (2 TO 60 A) AND UV (1225 TO 1350 A) FLUX

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PERSONNEL  
PI - R.W. KREPLIN

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

The experiment was designed to provide real-time analog data consisting of quantitative measurements of the solar X-ray flux from 2 to 60 A. This wavelength interval was monitored by five gas-filled (argon or nitrogen) ion chamber photometers (2 to 8 A, 8 to 14 A, 8 to 16 A, 44 to 55 A, and 44 to 60 A). Each of the X-ray photometers was sensitive to the trapped particle radiation in the Van Allen belts. To reduce interference from this source, a magnetic broom was placed in front of each X-ray photometer. The composition of the detector windows was either beryllium, aluminum, or Mylar. The wavelength sensitivity of the detector was determined by the window material and thickness, and the gas filling. A sixth detector, composed of four UV photometers connected in parallel, monitored solar photospheric emission in the 1225- to 1350-A band (hydrogen Lyman-alpha). All four UV photometers had 2-mm-thick calcium fluoride windows but contained no gas filler. They required no magnetic protection. Each of 24 stations received about four satellite passes per day and obtained 5 to 15 min of good data on each pass. Useful data were received from January 11, 1964, to February 6, 1965. Sporadic data were obtained from February 1965 until July 1966 but were of limited value because of spacecraft wobble. For more details, see R.W. Kreplin, Space Res., v. 5, p. 951, 1964.

\*\*\*\*\* SOLRAD 7B \*\*\*\*\*

SPACECRAFT COMMON NAME- SOLRAD 7B  
ALTERNATE NAMES- GREB 6, 01291

NSSDC ID- 65-016D  
LAUNCH DATE- 03/09/65

SPONSORING COUNTRY  
U.S.  
WEIGHT- 47. KC

ORBIT PARAMETERS  
ORBIT TYPE-  
ORBIT PERIOD- 103.4 MIN  
PERIAPSIS- 903. KM ALT

EPOCH DATE-  
INCLINATION- 70.1 DEG  
APOAPSIS- 931. KM ALT

PERSONNEL

BRIEF DESCRIPTION

The 1965-16D satellite, the seventh satellite of the SOLRAD series, was launched from Wallops Island on January 11, 1965. This NRL satellite was spherical and, when measurements were obtained, it rotated around the spin axis at the speed of 1-2 turns per second. The satellite was not spin stabilized, and two suitably designed photocells gave the necessary information about the solar aspect angle, i.e., the angle between the equatorial plane and the direction from the sun to the satellite. This satellite was instrumented to detect the solar X ray emission and telemetered daily at Arcetri. As the other SOLRAD satellites, this satellite was equipped with ionization chambers and GM counters sensitive to the soft X-ray radiation, located on the equatorial plane of the satellite. The gradual absorption of the radiation as the satellite passed into and out of the shadow of the earth was used to measure the atmospheric density between 120 and 200 km. The bands used for such measurements were the 44-60, 8-14, and 8-12 A bands. For additional information, see M. Landini, D. Russo, and G. L. Tagliaferri, Space Res. VII, v. 2, p. 1281, 1967; M. Landini, D. Russo, and G. L. Tagliaferri, Icarus, v. 6, p. 236, 1967.

----- SOLRAD 7B, FRIEDMAN -----  
INVESTIGATION NAME- SOLAR X-RAY MONITORING EXPERIMENT

NSSDC ID 65-016D 01

PERSONNEL  
PI - H.D. FRIEDMAN

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This experiment was designed to observe solar soft X-ray emission. Six ionization chambers and GM counters were aboard and provided measurements of solar flux in the bands 0.5-3 A, 1-8 A, 8-12 and 8-29 A, and 44-55 and 44-60 A. The threshold limit at normal incidence for the chambers below 8 A was 2.0E 5 erg/sq cm s for the 0.5-3 A chamber and 1.0E-4 erg/sq cm s for the 1-8 A one. The threshold limits for the other chambers were: 1.0E 4 erg/sq cm s for the 8-12 and 8-20 A chambers and 1.0E 2 erg/sq cm s for the 44-60 A chamber. The solar flux gave detectable signals up to the solar aspect angles of 35 deg. From May 25 to June 17, 1965, no data were available because the aspect angle was larger than 35 deg. For more details, see M. Landini, D. Russo, and G. L. Tagliaferri, Space Res. VII, v. 2, p. 1281, 1967.

\*\*\*\*\* SOLRAD 8 \*\*\*\*\*

SPACECRAFT COMMON NAME- SOLRAD 8  
ALTERNATE NAMES- SE-A, EXPLORER 30  
01738

NSSDC ID- 65-093A  
LAUNCH DATE- 11/19/65

SPONSORING COUNTRY  
U.S.  
WEIGHT- 57. KC

ORBIT PARAMETERS  
ORBIT TYPE- GEOCENTRIC  
ORBIT PERIOD- 100.8 MIN  
PERIAPSIS- 704. KM ALT

EPOCH DATE- 11/19/65  
INCLINATION- 59.7 DEG  
APOAPSIS 891. KM ALT

PERSONNEL  
SC - UNKNOWN  
PM - M.J. AUCREMANNE  
PS - R.W. KREPLIN

UNKNOWN  
NASA HEADQUARTERS  
US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

The NRL SOLRAD 8 satellite was one of the SOLRAD series that began in 1960 to provide continuous coverage of solar radiation with a set of standard photometers. SOLRAD 8 was a spin-stabilized satellite oriented with its spin axis perpendicular to the sun-satellite line so that the 14 solar X-ray and ultraviolet photometers pointing radially outward from its equatorial belt viewed the sun with each revolution. Data were transmitted in real time by means of an FM/AM telemetry system and were recorded by the stations on the STADAN tracking network. The satellite performed normally except for the spin system, which failed to maintain 60 rpm (at spin rates below 10 rpm data reduction became difficult). The spin rate gradually decreased to 4 rpm on September 12, 1966. At that time, ground command succeeded in reactivating spinup to 78 rpm, which exhausted the gas supply. From this point, the spin rate gradually decreased to 10 rpm in August 1967, when data collection was substantially decreased.

----- SOLRAD 8, KREPLIN -----  
INVESTIGATION NAME- SOLAR X-RAY AND ULTRAVIOLET MONITOR

NSSDC ID 65-093A-01

PERSONNEL  
PI - R.W. KREPLIN

US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This experiment was designed to monitor solar X-ray and ultraviolet emissions with a set of standardized detectors so that the data could be compared directly with that produced by other experiments in the SOLRAD series. Eight ion chambers and two Geiger counters covering the spectral regions from 0.5 A to 60 A and 1080 A to 1350 A were mounted perpendicular to the satellite spin axis. Analog outputs from the detectors were transmitted continuously on six IRIG telemetry channels. The experiment provided good data for all detectors from November 27, 1965, to August 24, 1967, with the following exceptions: (1) the Lyman-alpha detector and the UV detectors were saturated for normal aspect angles, (2) the core memory failed at launch so that the data were collected in real-time telemetry only, and (3) a gradual decrease in spin rate caused the aspect angle to drift away from normal in the second year of operation.

\*\*\*\*\* SOLRAD 9 \*\*\*\*\*

SPACECRAFT COMMON NAME SOLRAD 9  
ALTERNATE NAMES EXPLORER 37, 03141

NSSDC ID- 68-017A  
LAUNCH DATE 03/05/68

SPONSORING COUNTRY  
U.S.  
WEIGHT 198. KC

ORBIT PARAMETERS  
ORBIT TYPE-  
ORBIT PERIOD- 95.5 MIN  
PERIAPSIS- 448. KM ALT

EPOCH DATE  
INCLINATION 59.4 DEG  
APOAPSIS 638. KM ALT

PERSONNEL  
MG - J.R. HOLTZ  
SC - G.K. OERTEL  
PM - R.W. KREPLIN

NASA HEADQUARTERS  
NASA HEADQUARTERS  
US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This NRL satellite was one of the SOLRAD series that began in 1960 to provide continuous coverage of solar radiation with a set of standard photometers. SOLRAD 9 was a spin-stabilized satellite oriented with its spin axis perpendicular to the sun-satellite line so that the 14 solar X-ray and UV photometers pointing radially outward from its equatorial belt viewed the sun with each revolution. Data were simultaneously transmitted via FM/AM telemetry and recorded in a core memory that read out its contents on command. Individual scientists and institutions were invited to receive and use the data transmitted on the 136-MHz telemetry band on the standard IRIG channels 3 through 8. For the period July 1971 to June 1973, the core memory data of SOLRAD 10 were used

rather than those from SOLRAD 9. The SOLRAD 10 core memory failed June 11, 1973, and SOLRAD 9 was heavily used until February 25, 1974, when the gas supply of the attitude control system was exhausted. Lacking attitude control, SOLRAD 9 was operationally useless and was turned off. For more details, see R. W. Kreplin and D. M. Moran, "The NRL SOLRAD 9 Satellite Solar Explorer B 1968-17A," NRL Report 6800, 1969.

-----SOLRAD 9, KREPLIN-----

INVESTIGATION NAME - SOLAR RADIATION DETECTORS

NSSDC ID- 68-017A-01

PERSONNEL

PI - R.W. KREPLIN	US NAVAL RESEARCH LAB
O1 - T.A. CHUBB	US NAVAL RESEARCH LAB
O1 - H.D. FRIEDMAN	US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This experiment consisted of 14 detectors covering the ranges 20 to 80 keV, 0.5 to 60 A, and 1080 to 1350 A. The detectors were designed to measure wavelength and flux shifts of solar radiation during periods of low and high solar activity. The detectors were standardized photometers similar to those flown on SOLRAD 8. Data from three pairs of these detectors, covering the range 0.5 to 16 A, were stored in the onboard memory to provide full time coverage, while the other data were transmitted in real time only (real time data were recorded for at least 10 min per orbit). The UV and 20 to 80 keV detectors failed shortly after launch.

\*\*\*\*\* SOLRAD 10 \*\*\*\*\*

SPACECRAFT COMMON NAME - SOLRAD 10  
ALTERNATE NAMES - EXPLORER 44, SOLAR EXPLORER-C  
SE-C, SOLRAD-C  
PI 703A

NSSDC ID 71 058A

SPONSORING COUNTRY  
U.S.

LAUNCH DATE - 07/08/71

WEIGHT - 260. KG

ORBIT PARAMETERS

ORBIT TYPE - GEOFENICENTRIC	EPOCH DATE - 07/09/71
ORBIT PERIOD - 95.3 MIN	INCLINATION - 51.0 DEG
PERIAPSIS - 436. KM ALT	APDAPSIS - 630. KM ALT

PERSONNEL

MC - J.R. HOLTZ	NASA HEADQUARTERS
SC - J.D. BOHIN	NASA HEADQUARTERS
PM - E.W. PETERLIN	US NAVAL RESEARCH LAB
PS - R.W. KREPLIN	US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

SOLRAD 10, a spin stabilized satellite, was one of the SOLRAD series designed to provide continuous coverage of wavelength and intensity changes in solar radiation in the UV, soft, and hard X-ray regions. SOLRAD 10 also mapped the celestial sphere using a high-sensitivity X-ray detector. The spacecraft was a 12-sided cylinder that measured 76 cm in diameter and 58 cm in height. Four symmetrically placed 17.8-by-53.3-cm solar cell panels, hinged at the central section of the structure, served as the elements of a turnstile antenna system. Eighteen solar sensors were mounted pointing parallel to the spin axis of the satellite, which pointed directly at the solar disk. The plane of rotation shifted about 1 deg/day so that a stellar detector mounted to point radially outward from the axis scanned the celestial sphere. Data from all detectors were stored in a 54 kbs core memory and telemetered on command to the NRL tracking station at Blossom Point, MD. Data were also transmitted in real time at 137.710 MHz. For additional information, see Naval Res. Review, v. 25, p. 1, 1971.

----- SOLRAD 10, KREPLIN -----

INVESTIGATION NAME - SOLAR RADIATION DETECTORS

NSSDC ID 71-058A 01

PERSONNEL

PI - R.W. KREPLIN	US NAVAL RESEARCH LAB
O1 - D.D. BROUSSEAU	US NAVAL RESEARCH LAB
O1 - E.I. BYRAM	US NAVAL RESEARCH LAB
O1 - J.H. CARVER	U OF ADELAIDE
O1 - R.E. EISENHAUER	US NAVAL RESEARCH LAB
O1 - C.C. FRITZ	US NAVAL RESEARCH LAB
O1 - D.M. HORAN	US NAVAL RESEARCH LAB
O1 - A.T. MCCLINTON, JR.	PHOENIX CORP
O1 - R.G. TAYLOR	US NAVAL RESEARCH LAB
O1 - J.C. WINKLER	US NAVAL RESEARCH LAB

BRIEF DESCRIPTION

This experiment was designed to monitor the solar X-ray flux in eight bands and the solar UV flux in five bands as part of a long-term project to observe solar X-ray and UV activity with sets of standardized sensors over an entire solar cycle. The X-ray bands observed were 0.08 to 0.8 A, 0.1 to 1.6 A, 0.5 to 3 A, 1 to 5 A, 1 to 8 A, 8 to 16 A, 1 to 20 A, and 44 to 60 A. All the detectors for these bands, with the exception of that for the 0.08- to 0.8-A band, were ion chambers fitted with a variety of window material (beryllium, aluminum, and Mylar) of various thicknesses and filled with several different gases (krypton, argon, nitrogen, carbon tetrachloride, and xenon) at various pressures. The 0.08- to 0.8-A band had as a detector a cesium iodide (Na) scintillating crystal surrounded by a plastic scintillating material viewed by a single photomultiplier. This detector was designed to collect data on the very high energy solar X-ray emission observed only during solar flares. The UV bands observed were 170 to 500 A, 170 to 700 A, 1080 to 1350 A, 1225 to 1350 A, and 1450 to 1600 A. The two shorter wavelength bands had lithium fluoride, photosensitive surfaces protected by aluminum, aluminum oxide, and carbon windows for detectors, while the remaining bands had ion chambers with windows composed of lithium fluoride, calcium fluoride, or silicon dioxide, and various gas filters (nitric oxide or triethylamine B). Some of the solar detectors were protected from charged particles by cone-shaped aluminum collimators. The data were transmitted over two telemetry systems in one of three forms--stored data, real time digital (PCM) data, and real-time analog data. Telemetry system 1 (TM 1) used a PAM/PCM/FM/PM transmitter that operated at 137.710 MHz with a radiated power of 250 MW. Under normal operating conditions, TM 1 continuously transmitted analog and PCM real-time data, although the real-time digital PCM was the primary real-time transmission format. Telemetry system 2 (TM 2) used a PCM/PM transmitter that operated at 136.380 MHz with a radiated power of 250 MW. TM 2 transmitted stored data (up to one data sample a minute for 14.25 h) on command.

\*\*\*\*\* UK 5 \*\*\*\*\*

SPACECRAFT COMMON NAME - UK 5  
ALTERNATE NAMES - UNITED KINGDOM-5, PL-732B  
ARIEL 5

NSSDC ID- 74-077A

SPONSORING COUNTRY

U.K./U.S.

LAUNCH DATE 10/15/74

WEIGHT - 135. KG

ORBIT PARAMETERS

ORBIT TYPE - GEOFENICENTRIC	EPOCH DATE - 10/16/74
ORBIT PERIOD - 95.3 MIN	INCLINATION - 2.9 DEG
PERIAPSIS - 512.0 KM ALT	APDAPSIS - 557.0 KM ALT

PERSONNEL

MC - J.R. HOLTZ	NASA HEADQUARTERS
SC - A.C. OPP	NASA HEADQUARTERS
PM - J.P. CORRIGAN	NASA-GSFC
PS - S.S. HOLT	NASA-GSFC

BRIEF DESCRIPTION

UK 5 was the fifth scientific satellite in a U.K./U.S. collaborative space research program. The satellite was the fifth such satellite and the third to be wholly built in the United Kingdom. It carried six experiments (five U.K. and one U.S.) for cosmic X-ray studies that measured the spectra, polarization, and pulsar features of X-ray sources. The tasks of the scientists with experiments on the UK 5 satellite were, in general, to improve the accuracy of position measurement of X-ray stars and to measure their energy spectra. The spacecraft was spin stabilized. Two experiments scanned the sky perpendicular to the spin axis, while four experiments pointed parallel to the spin axis. When fully equipped, UK 5 weighed 300 lb. The satellite was approximately cylindrical in shape, 38 in. in diameter by 34-in. high. UK 5 was launched into a quasi-circular orbit at a height of 400 to 500 km. During operation in orbit UK 5 spun at a rate of 10 revolutions per minute. The satellite was designed to operate over a restricted range of solar aspects with the sun within 45 deg of normal to the spin axis. To enable various parts of the sky to be observed, the pointing direction of the spin axis could be altered by a pulsed gas jet system. The UK 5 data system generated sector information with respect to the sun's position to enable the position of X-ray sources to be determined. Data were stored on board the spacecraft in a core storage and dumped to ground stations once per orbit. All satellite operations were directed from a control center at the Appleton Lab, U.K. For additional information, see D. J. McLauchlan, J. Brit. Interpl. Soc., v. 26, p. 174, 1973.

----- UK 5, POUNDS -----

INVESTIGATION NAME 2 TO 10-KEV SKY SURVEY INSTRUMENT (SSI)

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NSSDC ID- 74-077A-02

PERSONNEL

PI - K.A. POUNDS	U OF LEICESTER
OI - B.A. COOKE	U OF LEICESTER
OI - D.J. ADAMS	U OF LEICESTER
OI - R.E. GRIFFITHS	SPACE TELESCOPE SCI IN

BRIEF DESCRIPTION

This experiment consisted of a large-area proportional counter arranged to view in a direction perpendicular to the satellite spin axis. The satellite rotation, therefore, allowed a scan of a 360-deg band of the sky. When the satellite spin axis was arranged to point at a galactic pole, the whole of the Milky Way could be scanned at once. The experiment covered the photon energy range 1.5 to 20 keV and effected a high-sensitivity survey, obtaining source locations, intensity, and spectra. A number of different modes of operation were used in which the available storage space in the core stored obtained spatial information at the expense of spectral resolution, or the converse. The sensitivity of the experiment allowed the detection of sources of the order of  $1.E-4$  times the intensity of Sco X-1, within the time of about 1 day. The ability of the survey instruments to determine the position of a source depended on the strength of the source and the number of other sources in a given part of the sky. A source of  $5E-3$  times the strength of Sco X-1 could be located with a precision of about 15 arc-min.

..... UK 6 .....

SPACECRAFT COMMON NAME- UK 6  
 ALTERNATE NAMES- UNITED KINGDOM-6, ARIEL 6  
 11382

NSSDC ID- 79-047A	SPONSORING COUNTRY
	U.K./U.S.
LAUNCH DATE- 06/02/79	WEIGHT- 152. KG

ORBIT PARAMETERS	EPDCH DATE 06/02/79
ORBIT TYPE- GEOCENTRIC	INCLINATION 55. DEG
ORBIT PERIOD- 97.3 MIN	APDAPSIS 651. KM ALT
PERIAPSIS- 605. KM ALT	

PERSONNEL	RUTHERFORD APPLETON L.
PM J.L. FOSTER	U COLLEGE LONDON
PS J.L. CULHANE	

BRIEF DESCRIPTION

UK 6 was the sixth and last satellite in the Ariel series. This satellite was launched on June 3, 1979, into a near circular 625 km, 55-deg inclination orbit. The objective of this mission was to undertake studies in high-energy astrophysics. Two X ray experiments, one cosmic ray experiment, and three technology experiments were carried. The spacecraft was spin stabilized, with the spin axis commanded into a sequence of orientations to accommodate the X ray experiment requirements.

UK 6, POUNDS

INVESTIGATION NAME X-RAY PROPORTIONAL COUNTER SPECTROMETER

NSSDC ID- 79 047A-02

PERSONNEL	U OF LEICESTER
PI K.A. POUNDS	

BRIEF DESCRIPTION

The instrument consisted of an array of xenon filled proportional counters designed for detailed measurement of time variability and spectra of both galactic and extragalactic sources. The detector array was sensitive over the energy range 1.2 to 50 keV and viewed along the spacecraft spin axis through 3 deg FWHM field collimators. Bright X ray sources could be measured to several microseconds time resolution, and spectral data were obtained in 32 channels.

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1960 ETA 2	SEE SOLRAD 1				
1961 NU 1	SEE S 15				
1962 BETA CHI 1	SEE S 55B				
1962 ZETA 1	SEE OSD 1				
ANS	THE NETHERLANDS UNITED STATES GRINDLAY VAN DUINEN	NIVR NASA OSS HARD X-RAY EXPERIMENT (HXX) UV TELESCOPE	08/30/74 GEOCENTRIC	74-070A 74-070A-03 74-070A-01	9 9 9
ARIEL 5	SEE UK 5				
ARIEL 6	SEE UK 6				
ASTRO NETHERLAND SAT.	SEE ANS				
COPERNICUS	SEE DAO 3				
EINSTEIN	SEE HEAD 2				
EXPLORER 11	SEE S 15				
EXPLORER 16	SEE S 55B				
EXPLORER 23	SEE S 55C				
EXPLORER 30	SEE SOLRAD 8				
EXPLORER 37	SEE SOLRAD 9				
EXPLORER 38	SEE RAE-A				
EXPLORER 42	SEE SAS-A				
EXPLORER 44	SEE SOLRAD 10				
EXPLORER 48	SEE SAS-B				
EXPLORER 49	SEE RAE-B				
EXPLORER 53	SEE SAS-C				
GREB 1	SEE SOLRAD 1				
GREB 5	SEE SOLRAD 7A				
GREB 6	SEE SOLRAD 7B				
HEAD 1	UNITED STATES BOLDT FRIEDMAN PETERSON SCHWARTZ	NASA OSS COSMIC X-RAY EXPERIMENT (A-2) LARGE AREA COSMIC X-RAY SURVEY (A-1) LOW-ENERGY GAMMA-RAY AND HARD X-RAY SKY SURVEY (A-4) X-RAY SCANNING MODULATION COLLIMATOR (A-3)	08/12/77 GEOCENTRIC	77-075A 77-075A-02 77-075A-01 77-075A-04 77-075A-03	9 10 10 10 10
HEAD 2	UNITED STATES GIACCONI GIACCONI GIACCONI GIACCONI GIACCONI	NASA-OSS MONITOR PROPORTIONAL COUNTER (MPC) HIGH RESOLUTION IMAGER (HRI) FOCAL PLANE CRYSTAL SPECTROMETER (FPCS) IMAGING PROPORTIONAL COUNTER (IPC) SOLID-STATE SPECTROMETER (SSS)	11/13/78 GEOCENTRIC	78-103A 78-103A-01 78-103A-02 78-103A-03 78-103A-04 78-103A-05	10 11 11 11 11 11
HEAD 3	UNITED STATES ISRAEL JACOBSON KOCH	NASA OSS HEAVY NUCLEI GAMMA RAY LINE SPECTROMETER ISOTOPIIC COMPOSITION OF COSMIC RAYS	09/20/79 GEOCENTRIC	79-082A 79-082A-03 79-082A-01 79-082A-04	11 12 12 12
HEAD A	SEE HEAD 1				
HEAD B	SEE HEAD 2				
HEAD C	SEE HEAD 3				
HIGH ENERGY ASTRON OBS A	SEE HEAD 1				
HIGH ENERGY ASTRON OBS B	SEE HEAD 2				
HIGH ENERGY ASTRON OBS-C	SEE HEAD 3				
IK-4	SEE INTERCOSMOS 4				

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INFRA RED ASTRONOM SAT	SEE IRAS					
INT ULTRAVIOLET EXPL	SEE IUE					
INTERCOSMOS 4 TINDO	U. S. S. R. SOLAR X-RAY POLARIMETER	10/14/70	GEOCENTRIC	70 084A 70-084A-01	12 12	
IR ASTRON. SAT.	SEE IRAS					
IRAS	THE NETHERLANDS UNITED STATES UNITED KINGDOM	NIVR NASA OSSA SERC	01/25/83	GEOCENTRIC	83 004A	12
JOINT IRAS SWG	IR TELESCOPE			83-004A-01	13	
JOINT IRAS SWG	LOW RESOLUTION SPECTROMETER			83-004A-02	13	
IUE	INTERNATIONAL UNITED STATES UNITED KINGDOM	ESA NASA-OSSA SRC	01/26/78	GEOCENTRIC	78 012A	13
GUEST INVESTIGATORS	LOW-/HIGH-RESOLUTION, ULTRAVIOLET SPECTROGRAPH PACKAGE			78-012A-01	13	
NONE ASSIGNED	PARTICLE FLUX MONITOR (SPACECRAFT)			78-012A-02	14	
DAO 2	UNITED STATES WISCONSIN EXPERIMENT PACKAGE HIGH-RESOLUTION TELESCOPES	NASA-OSSA	12/07/68	68-110A 68-110A-02 68-110A-01	14 14 14	
DAO 3	UNITED STATES STELLAR X RAYS HIGH RESOLUTION TELESCOPES	NASA-OSS	08/21/72	GEOCENTRIC	72-065A 72-065A-02 72-065A-01	14 15 15
DAO-A2	SEE DAO 2					
DAO-C	SEE DAO 3					
OSO 1	UNITED STATES HIGH-ENERGY GAMMA-RAY 20- TO 100-KEV SOLAR X-RAY DETECTOR 0.1- TO 0.7-MEV SOLAR GAMMA-RAY MONITOR 3800 TO 4800-A SOLAR FLUX MONITOR SOLAR HYDROGEN LYMAN-ALPHA FLUX MONITOR BF 3 PROPORTIONAL COUNTER NEUTRON DETECTOR	NASA-OSSA	03/07/62	62-006A 62-006A-09 62-006A-02 62-006A-03 62-006A-06 62-006A-07 62-006A-10	15 15 15 15 16 16 16	
NEUPERT PETERSON SCHRADER WHITE	SOLAR SPECTROMETER GAMMA RAY SCINTILLATION DETECTOR PROTON ELECTRON ANALYZER 1- TO 8 A SOLAR X-RAY FLUX			62-006A-01 62-006A-08 62-006A-11 62-006A-04	16 16 16 16	
OSO 2	UNITED STATES SOLAR X-RAY BURSTS	NASA-OSSA	02/03/65	65-007A 65-007A-02	17 17	
OSO 3	UNITED STATES HIGH ENERGY GAMMA RAY SOLAR EUV SPECTROMETER 1 TO 400 A SOLAR AND CELESTIAL GAMMA-RAY TELESCOPE 8- TO 12-A SOLAR X-RAY ION CHAMBER	NASA-OSSA	03/08/67	GEOCENTRIC	67-020A 67-020A-01 67-020A-05 67-020A-07 67-020A-06	17 17 17 17 18
OSO 4	UNITED STATES X RAY SPECTROMETER SOLAR X-RAY TELESCOPE SOLAR EUV SPECTROMETER PROTON ELECTRON DETECTOR	NASA-OSSA	10/18/67	GEOCENTRIC	67-100A 67-100A-09 67-100A-08 67-100A-07 67-100A-04	18 18 18 18 19
FRIEDMAN GIACCONI GOLDBERG WAGGONER						
OSO 5	UNITED STATES SOLAR X-RAY RADIATION ION CHAMBER PHOTOMETER SOLAR SPECTRUM STUDIES ZODIACAL LIGHT MONITOR SOLAR EXTREME ULTRAVIOLET MONITOR	NASA-OSS	01/22/69	GEOCENTRIC	69-006A 69-006A-04 69-006A-03 69-006A-07 69-006A-08	19 19 19 19 20
CHUBB NEUPERT NEY RENSE						
OSO 6	UNITED STATES X-RAY SPECTROMETER STUDY OF SOLAR HELIUM I, HELIUM II, OXYGEN, AND NITROGEN RADIATION SOLAR UV SCANNING SPECTROMETER, SPECTROHELIO METER (300 TO 1400 A)	NASA-OSSA	08/09/69	69-068A 69-068A-04 69-068A-06 69-068A-01	20 20 20 20	
ARGO BOYD GOLDBERG						
OSO 7	UNITED STATES SOLAR GAMMA-RAY MONITOR COSMIC X-RAY SOURCES IN THE RANGE 1.5 TO 9 A COSMIC X-RAY EXPERIMENT HARD SOLAR X-RAY MONITORING WHITE-LIGHT CORONAGRAPH AND EXTREME ULTRAVIOLET CORONA	NASA OSSA	09/29/71	GEOCENTRIC	71-083A 71-083A-06 71-083A-04 71-083A-03 71-083A-05 71-083A-02	21 21 21 22 22 22
CHUPP CLARK PETERSON PETERSON TOUSEY						
OSO 8	UNITED STATES	NASA OSS	06/21/75	GEOCENTRIC	75-057A	22



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ACTON	MAPPING X-RAY HELIOMETER			75-057A-04	22
BARTH	HIGH-RESOLUTION ULTRAVIOLET SPECTROMETER MEASUREMENTS			75-057A-01	23
FROST	HIGH-ENERGY CELESTIAL X RAYS			75-057A-07	23
KRAUSHAAR	SOFT X-RAY BACKGROUND RADIATION INVESTIGATION			75-057A-05	23
NOVICK	HIGH-SENSITIVITY CRYSTAL SPECTROSCOPY OF STELLAR AND SOLAR X RAYS			75-057A-03	23
SERLEMITSOS	COSMIC X-RAY SPECTROSCOPY			75-057A-06	23
WELLER, JR.	EDV FROM EARTH AND SPACE			75-057A-08	23
OS0-A	SEE OS0 1				
OS0-B	SEE OS0 2				
OS0-B2	SEE OS0 2				
OS0-D	SEE OS0 4				
OS0-E	SEE OS0 3				
OS0-EYE	SEE OS0 8				
OS0-F	SEE OS0 5				
OS0-G	SEE OS0 6				
OS0-H	SEE OS0 7				
OS0-I	SEE OS0 8				
PEGASUS 1 NAUMANN	UNITED STATES METEOROID PENETRATION DETECTORS	NASA-DAST 02/16/65		65-009A 65-009A-01	24 24
PEGASUS 2 NAUMANN	UNITED STATES METEOROID PENETRATION DETECTORS	NASA-DAST 05/25/65		65-039A 65-039A-01	24 24
PEGASUS 3 NAUMANN	UNITED STATES METEOROID PENETRATION DETECTORS	NASA-DAST 07/30/65		65-060A 65-060A-01	24 25
PR0GN0Z 9 UNKNOWN	U.S.S.R. SOLAR X-RAY SPECTROMETER	SAS 01/01/83	GEOCENTRIC	83-067A 83-067A-02	25 25
RADIO ASTRONOMY EXPLORER	SEE RAL-A				
RADIO ASTRONOMY EXPLORER	SEE RAL-B				
RAF 1	SEE RAF-A				
RAF-A STONE STONE	UNITED STATES STEP FREQUENCY RADIOMETERS RADIO BURSTS RECEIVERS	NASA-DSSA 07/04/68	GEOCENTRIC	68-055A 68-055A-01 68-055A-02	25 25 25
RAF-B STONE STONE	UNITED STATES STEP FREQUENCY RADIOMETERS RAPID-BURST RECEIVERS	NASA-DSS 06/10/73	GEOCENTRIC	73-039A 73-039A-01 73-039A-02	26 26 26
S 15 GARMIRE KRAUSHAAR	UNITED STATES CRYSTAL SANDWICH/CERENKOV COUNTER PHOSWICH CERENKOV COUNTER TELESCOPE	NASA-DSSA 4/27/61	GEOCENTRIC	61-013A 61-013A-02 61-013A-01	26 26 27
S 16	SEE OS0 1				
S 17	SEE OS0 2				
S 55B BESWICK DAVISON GURTLER SECRETAN SECRETAN	UNITED STATES MICROMETEORITE DETECTOR GRID DETECTORS OF MICROMETEORITES PRESSURIZED CELL MICROMETEORITE DETECTOR COPPER WIRE MICROMETEORITE DETECTOR CADMIUM SULFIDE CELL MICROMETEORITE DETECTOR	NASA-DAST 12/16/62	GEOCENTRIC	62-070A 62-070A-04 62-070A-02 62-070A-01 62-070A-03 62-070A-05	27 27 27 27 28 28
S 55C GURTLER HOLDEN SECRETAN SIVITER	UNITED STATES PRESSURIZED CELLS IMPACT DETECTORS CADMIUM SULFIDE CELLS CAPACITOR DETECTORS	NASA-DAST 11/06/64	GEOCENTRIC	64-074A 64-074A-01 64-074A-02 64-074A-03 64-074A-04	28 28 28 28 29
SAS 1	SEE SAS A				
SAS 2	SEE SAS B				
SAS 3	SEE SAS C				
SAS-A	UNITED STATES	NASA-DSSA 12/12/70	GEOCENTRIC	70-107A	29

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GIACCONI	ALL-SKY X-RAY SURVEY			70-107A-01	29
SAS-B	UNITED STATES NASA-OSS	11/15/72	GEOCENTRIC	72-091A 72-091A-01	29 30
FICHTEL	GAMMA RAY TELESCOPE				
SAS-C	UNITED STATES NASA-OSS	05/07/75	GEOCENTRIC	75-037A 75-037A-01 75-037A-02 75-037A-03 75-037A-04	30 30 30 30 30
CLARK CLARK CLARK CLARK	EXTRAGALACTIC EXPERIMENT (EGE) GALACTIC MONITOR EXPERIMENT (GME) SCORPIO MONITOR EXPERIMENT (SME) GALACTIC ABSORPTION EXPERIMENT (GAE)				
SAS-D	SEE IUE				
SE-A	SEE SOLRAD 8				
SE-C	SEE SOLRAD 10				
SKYLAB	UNITED STATES NASA-DMSF	05/14/73	GEOCENTRIC	73-027A 73-027A-02 73-027A-05 73-027A-04 73-027A-06 73-027A-15 73-027A-08 73-027A-10 73-027A-11 73-027A-07	31 31 31 31 32 32 32 32 32 33
HENIZE KRIEGER MACQUEEN NOYES NOYES PACKER TOUSEY TOUSEY UNDERWOOD	ULTRAVIOLET STELLAR ASTRONOMY X-RAY SPECTROGRAPHIC TELESCOPE WHITE LIGHT CORONAGRAPH UV SCANNING POLYCHROMATOR/SPECTROHELIDMETER HYDROGEN ALPHA TELESCOPE NUMBER 1 UV AIRGLOW HORIZON PHOTOGRAPHY UV CORONAL SPECTROHELIDGRAPH EUV SPECTROGRAPH DUAL X-RAY TELESCOPE				
SMM	UNITED STATES NASA-OSSA	02/14/80	GEOCENTRIC	80-014A 80-014A-05 80-014A-06 80-014A-01 80-014A-02	33 33 33 33 34
DE JAGER FROST MACQUEEN TANDBERG-HANSSEN	HARD X-RAY IMAGING SPECTROMETER (HXIS) HARD X-RAY BURST SPECTROMETER (HXRBS) CORONAGRAPH/POLARIMETER ULTRAVIOLET SPECTROMETER AND POLARIMETER				
SOLAR EXPLORER-C	SEE SOLRAD 10				
SOLAR MAXIMUM MISSION	SEE SMM				
SOLRAD 1	UNITED STATES DDD-NAVY	06/22/60	GEOCENTRIC	60-007B 60-007B-01	34 34
FRIEDMAN	X-RAY AND LYMAN ALPHA STUDY				
SOLRAD 7A	UNITED STATES DDD-NAVY	01/11/64		64-001D 64-001D-01	34 35
KREPLIN	SOLAR X-RAY (2 TO 60 A) AND UV (1225 TO 1350 A) FLUX				
SOLRAD 7B	UNITED STATES DDD-NAVY	03/09/65		65-016D 65-016D-01	35 35
FRIEDMAN	SOLAR X-RAY MONITORING EXPERIMENT				
SOLRAD 8	UNITED STATES NASA-OSSA DDD-NAVY	11/19/65	GEOCENTRIC	65-093A 65-093A-01	35 35
KREPLIN	SOLAR X-RAY AND ULTRAVIOLET MONITOR				
SOLRAD 9	UNITED STATES NASA-OSSA DDD-NAVY	03/05/68		68-017A 68-017A-01	35 36
KREPLIN	SOLAR RADIATION DETECTORS				
SOLRAD 10	UNITED STATES NASA-OSS DDD-NAVY	07/08/71	GEOCENTRIC	71-058A 71-058A-01	36 36
KREPLIN	SOLAR RADIATION DETECTORS				
SOLRAD-C	SEE SOLRAD 10				
SR 1	SEE SOLRAD 1				
SUNRAY 1	SEE SOLRAD 1				
UHURU	SEE SAS-A				
UK 5	UNITED KINGDOM SRC NASA-OSS	10/15/74	GEOCENTRIC	74-077A 74-077A-02	36 37
POUNDS	2- TO 10-KEV SKY SURVEY INSTRUMENT (SSI)				
UK 6	UNITED KINGDOM SRC NASA-OSSA	06/02/79	GEOCENTRIC	79-047A 79-047A-02	37 37
POUNDS	X-RAY PROPORTIONAL COUNTER SPECTROMETER				
UNITED KINGDOM-5	SEE UK 5				
UNITED KINGDOM-6	SEE UK 6				

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# APPENDICES



## APPENDIX A DEFINITIONS

Investigation Discipline	The subject to which an investigation pertains. The possible entries are limited, and the NSSDC information files can be searched using this field.
Investigative Program	Code of the cognizant NASA Headquarters office or name of other sponsoring agency program. "CO-OP" added to a code indicates a cooperative effort with another agency or a foreign country.
NLA	No Longer Affiliated. Used in the spacecraft personnel section to indicate that the person had the specified affiliation at the time of participation in the project but is no longer there. Used in the investigation personnel section to indicate that the affiliation shown is the last known scientific affiliation and that the given person is no longer there.
NSSDC ID	An identification code used in the NSSDC information system. In this system, each successfully launched spacecraft and experiment is assigned a code based on the launch sequence of the spacecraft. Subsequent to 1962, this code (e.g., 80-014A for the spacecraft SMM) corresponds to the COSPAR international designation. The experiment codes are based on the spacecraft code. For example, the experiments carried aboard the spacecraft 80-014A are numbered 80-014A-01, 80-014A-02, etc. Similarly, data sets corresponding to experiment 80-014A-01 are coded 80-014A-01A, -01B, etc. Each prelaunch spacecraft and experiment is also assigned an NSSDC ID code based on the name of the spacecraft. Prior to launch, for example, the approved NASA launch Solar Maximum Mission was coded SMM. The experiments carried aboard this spacecraft were coded SMM-01, SMM-02, etc. Once it was launched, its prelaunch designation was changed to a postlaunch one: 80-014A.
OI	Other Investigator.
PI	Principal Investigator.
PM	Project Manager. If a spacecraft has had several project managers, the initial and the latest project managers are indicated in the spacecraft personnel section. For international programs there is usually a project manager in each of the two principal participating nations. The current or more recent PM is listed first.
PS	Project Scientist. The above comments for project managers also apply to project scientists.
TL	Team Leader.
TM	Team Member.

TRF

Technical Reference File. A computerized space-investigation-oriented bibliographic reference list maintained by NSSDC. Journal publications and other documents are cited and can be retrieved by author, title, or NSSDC ID of the relevant investigation. Used to keep track of descriptive and documentational material, as well as to produce bibliographies of certain spacecraft. The TRF accession number begins with the letter B and contains five digits, for example, B10851.

## APPENDIX B ABBREVIATIONS AND ACRONYMS

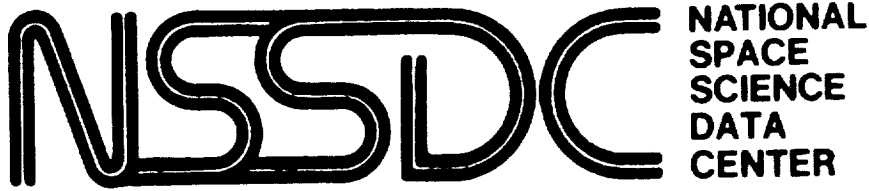
A	angstrom
AM	amplitude modulation, airlock module
amp	ampere
ANS	Astronomical Netherlands Satellite
arc-min	arc-minute
arc-s	arc-second
atm	atmosphere
ATM	Apollo Telescope Mount
BF3	BF <sub>3</sub>
bps	bits per second
c	speed of light
cps	cycles per second
d	day
dB	decibel
dc	direct current
deg	degree
EDDT	ethylenediamine-d-tartrate
ESA	European Space Agency
EUV	extreme ultraviolet
eV	electronvolt
EVA	extravehicular activity
FM	frequency modulation
FOV	field of view
ft	foot (feet)
FWHM	full width at half maximum
g	gram
GeV	gigaelectronvolts (10 <sup>9</sup> eV)
GM	Geiger-Mueller
GSFC	Goddard Space Flight Center (NASA)
h	hour
HEAO	High-Energy Astrophysical Observatory
Hz	hertz (cycles per second)
IF	intermediate frequency
in.	inch
IR	infrared
IRAS	Infrared Astronomical Satellite
IRIG	Inter-Range Instrumentation Group
IU	instrument unit
IUE	International Ultraviolet Explorer
Jy	Jansky (10E-26 W/sq m Hz)

K	kelvin
KAP	potassium acid phthalate
kb	kilobit
kb/s	kilobits per second
keV	kiloelectronvolt
kg	kilogram
kHz	kilohertz
km	kilometer
lb	pound
LiF	lithium fluoride
m	meter; milli- (prefix)
Mc	megacycle
MDA	multiple docking adapter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
MW	megawatt
NASA	National Aeronautics and Space Administration
NRL	Naval Research Laboratory
NSSDC	National Space Science Data Center (NASA)
OAo	Orbiting Astronomical Observatory
OSO	Orbiting Solar Observatory
OWS	Orbital Workshop
PAM	pulse amplitude modulation
PCM	pulse-coded modulation
PET	pentaerythritol
PM	pulse modulation; photomultiplier
PMT	photomultiplier tube
RAE	Radio Astronomy Explorer
RCA	Radio Corporation of America
RF	radio frequency
rpm	revolutions per minute
s	second
SAO	Smithsonian Astrophysical Observatory (Smithsonian Institution)
SAS	Small Astronomy Satellite
SEC	secondary electron conduction (vidicon tube)
SL	Skylab
SMM	Solar Maximum Mission
SOLRAD	Solar Radiation (Monitoring Satellite)
sq	square
sr	steradian
STADAN	Spacecraft Tracking and Data Acquisition Network (now STDN)



UHF	ultrahigh frequency
UCSD	University of California at San Diego
U.K.	United Kingdom
UV	ultraviolet
V	volt
VHF	very high frequency
W	watt
XUV	extreme ultraviolet
yr	year
Z	atomic number





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WORLD DATA CENTER A for ROCKETS AND SATELLITES

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# DATA CATALOG SERIES FOR SPACE SCIENCE AND APPLICATIONS FLIGHT MISSIONS

Volume 5B

Descriptions of Data Sets From  
Astronomy, Astrophysics, and  
Solar Physics Spacecraft  
and Investigations

June 1988



DATA CATALOG SERIES FOR SPACE SCIENCE  
AND APPLICATIONS FLIGHT MISSIONS

Volume 5B

DESCRIPTIONS OF DATA SETS FROM ASTRONOMY, ASTROPHYSICS,  
AND SOLAR PHYSICS SPACECRAFT AND INVESTIGATIONS

Edited by

Sang J. Kim

June 1988

National Space Science Data Center (NSSDC)/  
World Data Center A for Rockets and Satellites (WDC-A-R&S)  
National Aeronautics and Space Administration  
Goddard Space Flight Center  
Greenbelt, Maryland 20771



## PREFACE

This document is part of a series (see inside front cover) that describes data sets and related spacecraft and investigations from space and earth science flight missions. The series describes the data sets held by the National Space Science Data Center (NSSDC) and some of the data sets held by NASA-funded and other investigators. The series also refers to extensive data sets held and serviced by other Government agencies.

This is the second and last volume of the astronomy, astrophysics, and solar physics spacecraft and investigations catalog. The first volume describes the spacecraft and investigations along with personnel names and affiliations. This publication describes the data sets associated with the various investigations. As NSSDC is issuing this series, it is working toward remote electronic accessibility of its information files.

We would like to thank the many investigators who have submitted their data for archiving at NSSDC. Their cooperation in supplying supporting information is gratefully acknowledged. We are particularly indebted to the many past and present NSSDC personnel who interacted with the investigators in bringing to NSSDC the flight data, and who provided the descriptions appearing in this catalog. Thanks are also extended to the other NSSDC personnel who have been involved in the information handling necessary to produce this volume. Special acknowledgment is given to Patricia Ross and Betty Anderson for the production of the computerized portion of the catalog. Extensive editorial assistance was provided by Karen Satin.

The Data Center is continually striving to increase the usefulness of its data holdings, supporting indexes, and documentation. Scientists are invited to submit their space and earth science data and related documentation to NSSDC. Their comments on and corrections to the present catalog will be greatly appreciated. Catalog recipients are urged to inform potential data users of its availability.

Sang J. Kim

June 1988





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# INTRODUCTION



# 1. INTRODUCTION

## 1.1 PURPOSE

The National Space Science Data Center (NSSDC) was established by the National Aeronautics and Space Administration (NASA) to provide data and information from space and earth science flight investigations in support of additional studies beyond those performed as the principal part of any flight mission. This volume is one of a series of 11 that describes (1) the spaceflight investigations for which NSSDC possesses data or can direct people to the data source, (2) all data sets held by NSSDC, (3) some data sets held and serviced by NASA-funded investigators, and (4) some data sets held and serviced by foreign investigators. The series also refers to extensive data sets held and serviced by other Government agencies, particularly the National Oceanographic and Atmospheric Administration (NOAA). There is one major omission from this series: the extensive set of data obtained from the lunar missions conducted by NASA, supplemented by a few small photographic data sets from Soviet missions. These are described in the *Catalog of Lunar Mission Data* (NSSDC/WDC-A-R&S 77-02) and are not repeated in this series.

The series consists of (1) five volumes that describe the spacecraft and their associated investigations separated into various categories, (2) five corresponding volumes that describe investigation data sets and the available orbital information, and (3) a master index volume. The five categories of spacecraft are (i) Planetary and Heliocentric, which includes planetary flybys and probes; (ii) Meteorology and Terrestrial Applications; (iii) Astronomy, Astrophysics, and Solar Physics; (iv) Geostationary and High-Altitude Scientific; and (v) Low- and Medium-Altitude Scientific. It is impossible to provide an organization of categories that separates the investigations cleanly into scientific disciplines, since many missions were multidisciplinary. With the above organization, which is partly discipline-oriented and partly orbit-oriented, it was found that in nearly all cases a given spacecraft belonged clearly to only one of the five categories.

The organization for each volume is described in Section 1.2, Organization. The standard description of a data set from an investigation is a free-text brief description, since the wide variety of instruments precludes using a tabular format in most cases.

This catalog series and the periodic *NSSDC Data Listing*, which briefly identifies NSSDC data sets, are the principal offline sources of information on NSSDC holdings in the disciplines that NSSDC handles. However, NSSDC is bringing its information files to a state of remote electronic accessibility so that users can have easy access to the most current information.

## 1.2 ORGANIZATION

Volumes 5A and 5B of the *NSSDC Data Catalog Series for Space Science and Applications Flight Missions* deal with astronomy, astrophysics, and solar physics spacecraft that measure properties and characteristics of the extra-solar system objects, the sun, and micrometeoroids. Volume 5A describes the sources (spacecraft and instruments) of the data sets described in Volume 5B. Volumes 5A and 5B are organized alphabetically by spacecraft common name. In Volume 5B, under each spacecraft name, the appropriate investigations are arranged according to the NSSDC ID.<sup>1</sup>

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<sup>1</sup> The NSSDC ID is an identification code used in the NSSDC information system, where each successfully launched spacecraft and experiment is assigned a code based on the launch sequence of the spacecraft. This code (e.g., 72-065A for the spacecraft OAO 3) corresponds to the COSPAR international designation. The experiment codes are based on the spacecraft code. For example, the experiments carried aboard the spacecraft 72-065A are numbered 72-065A-01, 72-065A-02, etc. Similarly, data sets corresponding to experiment 72-065A-01 are coded 72-065A-01A, -01B, etc.

Under each investigation heading, the data set descriptions are also arranged according to the NSSDC ID.

Whenever the notation N/A appears in the "time span of data" field, it indicates that the time span is either not applicable or not available. For data contained on magnetic tapes, the stated characteristics are those of the magnetic tapes that currently hold the data. If these characteristics are not suitable, NSSDC staff may be able to provide the same data in a tape format that is more convenient for the data user. Additional information is often available for the data sets and is provided either on request or with the information packet that is sent by NSSDC with the requested data. As a general rule, NSSDC does not provide publications that are referenced in the data set descriptions. If the publication of interest is not readily available, such as might be the case for an internal agency report, in most cases NSSDC can provide a microfiche of its file copy.

For most of the data sets in this catalog, the corresponding spacecraft ephemeris data are merged with the data from the investigations. In other cases, the ephemeris data must be obtained from a spacecraft data set, i.e., a data set identified by the spacecraft ID followed by the designation 00D, 00E, etc. Spacecraft data sets may contain ephemeris information, or they may provide other spacecraft-related data such as tables showing when the spacecraft was turned on or indexes providing a comprehensive summary of available data. Spacecraft data sets are listed after the spacecraft name and ahead of the investigation data sets.

Section 3, Index of Data Sets, follows the data set descriptions section and is ordered in the same manner as the descriptions. It provides, in effect, a detailed table of contents for the catalog.

The Appendix is a listing of abbreviations and acronyms appearing in this volume. Document Request Forms and Data Request Forms have been provided at the end of this catalog.

### 1.3 NSSDC PURPOSE, FACILITIES, AND SERVICES

The National Space Science Data Center was established by the National Aeronautics and Space Administration to provide data and information from space and earth science investigations in support of additional studies beyond those performed by principal investigators. As part of that support, NSSDC has prepared this series of volumes providing descriptions of archived data, divided into five categories as presented in Section 1.1, Purpose. (See also inside front cover.) In addition to its function of providing selected data and supporting information for further analysis of space science flight experiments, NSSDC produces other publications. Among these are the *Report on Active and Planned Spacecraft and Experiments* and various user's guides.

Virtually all the data available at or through NSSDC result from individual experiments carried on board individual spacecraft. The Data Center has developed an information system utilizing a spacecraft/investigation/data identification hierarchy. This catalog is based on the information contained in that system. The Data Center is initiating an effort to design a new information base, using a relational data base model, to facilitate easy electronic access by remote users. This new information base is intended to describe many more data sets held outside NSSDC than has been the case in the past.

NSSDC provides facilities for reproduction of data and for onsite data use. Researchers are invited to study the data while at the Data Center. The Data Center staff will assist users with data searches and with the use of equipment. In addition to spacecraft data, the Data Center maintains some supporting information and data that may be related to the needs of the researchers.

The services provided by NSSDC are available to any individual or organization residing in the United States and to researchers outside the United States through WDC-A-R&S. Normally, a charge is made to cover the cost of processing a request and reproducing the data. The researcher is notified of the charge, and payment must be received prior to processing. However, as resources permit, the director of NSSDC may waive charges for modest amounts of data when they are to be used for scientific studies or for specific educational purposes and when they are requested by an individual affiliated with (1) NASA installations, NASA contractors, or NASA grantees; (2) other U.S. Government agencies, their contractors, or their grantees; (3) universities or colleges; (4) state or local governments; or (5) nonprofit organizations.

Data Request Forms have been provided at the end of this report to facilitate ordering data from NSSDC. A researcher may also obtain data described in this catalog by a letter, a telephone request, an onsite visit, or electronic mail utilizing the Space Physics Analysis Network (SPAN). Anyone who wishes to obtain data for a scientific study should specify the NSSDC ID and the time span (and/or location) of interest. A researcher should also specify why and when the data are needed, the subject of the work, organizational affiliation, and any Government contracts used for performing the study. The Data Center staff is available to help requesters identify data sets for use.

NSSDC would appreciate receiving copies of all publications resulting from studies in which data supplied by the Data Center have been used. It is further requested that both NSSDC and the original data provider be acknowledged as sources of the data.

Data can be provided in a format or medium other than that used in this catalog. For example, magnetic tapes can be reformatted; computer printouts or microfilmed listings can be reproduced from magnetic tape; enlarged paper prints can be provided from data on photographic film and microfilm, etc. NSSDC/WDC-A-R&S will provide the requester with an estimate of the response time and, when appropriate, the charge for such requests.

The Data Center's address for information (for U.S. researchers) follows:

National Space Science Data Center  
Code 633.4  
Goddard Space Flight Center  
Greenbelt, Maryland 20771  
Telephone: (301) 286-6695  
Telex: 89675 NASCOM GBLT  
TWX: 7108289716  
SPAN Address: NCF::REQUEST

Researchers residing outside the United States should direct requests for information to the following address:

World Data Center A for Rockets and Satellites  
Code 630.2  
Goddard Space Flight Center  
Greenbelt, Maryland 20771 U.S.A.  
Telephone: (301) 286-6695  
Telex: 89675 NASCOM GBLT  
TWX: 7108289716  
SPAN Address: NCF::REQUEST

For access to a menu of information, limited data directory, and limited data display, requesters may use SPAN to log onto the NSSDCA node, with NSSDC as Username. No password is required. NSSDC may also be reached by Telenet; current procedures are available from the NSSDC Network Hotline (301-286-7251). The limited data directory is being continually expanded and developed, and allows users to search for useful data sets by several methods.

#### 1.4 DATA ACQUISITION

NSSDC invites members of the scientific community involved in spaceflight investigations to submit data to the Data Center or to provide information about the data sets that they prefer to make accessible themselves. The Data Center assigns a discipline specialist to work with each investigator or science working team to determine the forms of data that are likely to be most useful to the community of users that obtain data from NSSDC. The pamphlet *Guidelines for Submitting Data to the National Space Science Data Center* can be provided on request.



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# **DATA SET DESCRIPTIONS**



\*\*\*\*\*  
\*\*\*\*\* ANS \*\*\*\*\*  
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ANS, GRINDLAY  
HARD X-RAY EXPERIMENT (HXX)

Data set name - REDUCED DATA IN 4,16,64 SEC INTEGRATIONS,  
ATTITUDE, ABSOLUTE TIME AND BACKGROUND

NSSDC ID 74-070A-03A, REDUCED DATA BASE

Time period covered - (N/A)

This data set is held by the experimenter. It consists of both original and reduced data stored on one-half inch, 9-track, digital magnetic tape produced on a NOVA 3 computer system. Reduced data are stored on total counts detected in 4-, 16-, or 64-s integrations, on and off the source being observed. Summed counts detected in the total observation period of low background data (approximately 2000-s exposure time) are available for spectral fits. Attitude and absolute time are included for the data. This data set can be accessed by using the computer reduction facilities at HCO/SAO. Further information or access can be obtained through NSSDC or by contacting: Prof. Jonathan E. Grindlay, Harvard College Observatory, 60 Garden Street, Cambridge, MA 02138. For an observing catalog of X-ray sources observed by this experiment, the total experiment, and the total exposure time on each source, see data set NSSDC ID 74-070A-03B.

Data set name - CATALOG OF THE 161 UHURU SOURCES  
OBSERVED BY THE HARD X-RAY EXPERIMENT

NSSDC ID 74-070A-03B, HXX OBSERVING CATALOG

Time period covered - (N/A)

Quantity of data - 1 CARD OF B/W MICROFICHE

This catalog is a listing of observations made by the Hard X Ray Experiment (HXX) on the ANS spacecraft (H. Gursky et al., Astrophys. J., v. 201, p. L27, 1975) of the 161 X-ray sources listed in the 3rd Uhuru Catalog (R. Giacconi et al., Astrophys. J. Suppl., v. 27, p. 37, 1974). The order of the catalog table is by increasing right ascension. For each source, the data are divided into "low background" vs "high background." The data base from this experiment is still held by the original investigators (see NSSDC data set 74 070A 03A). The catalog can be used as an initial reference for parties interested in these data. It contains source identifications and information on the type and amount of data collected on each source.

ANS, VAN DUINEN  
UV TELESCOPE

Data set name - UV POINTSOURCES CATALOG ON MAGNETIC TAPE

NSSDC ID 74-070A 01A, UV POINTSOURCES CAT

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This ANS Ultraviolet Photometry Catalogue of Point Sources (Wesselius et al., Astron. Astrophys. Suppl., v. 49, p. 427, 1982) is a compilation of UV photoelectric measurements at 15, 18, 22, 25, and 33 nm for 3573 objects (mostly stars) observed with the Astronomical Netherlands Satellite in the period October 1974 to April 1976. The tape characteristics of this data set are described as follows: number of files is 1; logical record length is 131 bytes; total number of logical records is 3573. The reported stellar magnitudes were obtained from mean count rates converted to fluxes using the ANS absolute calibration of Wesselius et al. (Astron. Astrophys., v. 85, p. 221, 1980). In addition to the ultraviolet magnitudes, the catalog contains positions taken from the satellite pointing, spectral types, and UVB data taken from other sources, plus comments on duplicity, variability, and miscellaneous notes concerning individual objects. Parties interested in the main data base should contact Dr. Paul R. Wesselius, Kapteyn Observatory, Mensingheweg 20, 9301 KA Roden, Netherlands.

Data set name - UV INTERSTELLAR EXTINCTION EXCESSES DATA  
ON MAGNETIC TAPE

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set is a Catalog of Ultraviolet Interstellar Extinction Excesses for 1415 Stars containing interstellar extinction excesses in the ultraviolet region derived from five-channel UV photometry carried out with the ANS spacecraft. Filters centered at approximately 1550, 1800, 2200, 2500, and 3300 A were used for the observations, and excesses were derived for each UV wavelength with reference to the V magnitude of the UB system. The photometric data used to derive the UV excesses are taken from the ANS Ultraviolet Photometry Catalogue of Point Sources (P. Wesselius, R. van Duinen, A. de Jonge, J. Aalders, W. Luinge, and K. Wildeman, Astron. Astrophys. Suppl., v. 49, p. 427, 1982). For additional information concerning the source data, object selection, extinction parameters, and relations among the color excesses themselves and with the excess extinction in the 2200 A bump, see B. Savage, D. Massa, M. Meade, and P. Wesselius, Astrophys. J. Suppl., v. 59, p. 397, 1985.

\*\*\*\*\*  
\*\*\*\*\* HEAD 1 \*\*\*\*\*  
\*\*\*\*\*

HEAD 1, BOLDT  
COSMIC X-RAY EXPERIMENT (A 2)

Data set name - COSMIC X-RAY PULSE HEIGHT DATA ON  
MAGNETIC TAPE

NSSDC ID 77-075A-02A, PULSE HEIGHT DATA ON MAG. TAPE

Time period covered - 09/14/77 TO 10/04/78

Quantity of data - 11 REELS OF TAPE

These Caltech experimenter-supplied, pulse-height data are on 9-track, 1600-bpi, binary magnetic tapes created on an IBM 370 computer. The data were written in unblocked logical records of 3336 bytes. Each record consists of time in day and fraction of day (since January 1, 1977); unit vectors in the direction of the satellite Z and Y axis in rectangular celestial coordinates at the center of each minor frame; and a 640-word array of pulse height or temporal data for detectors LED1 and LED2 (low energy detectors). For further information on the A 2 data archive, contact Dr. Gordon Garmire, Astronomy Department, 504 Davey Laboratory, Pennsylvania State University, University Park, PA 16802.

Data set name - DISCOVERY SCALER ON MAGNETIC TAPE

NSSDC ID 77-075A 02B, DISCOVERY SCALER ON MAG. TAPE

Time period covered - 08/11/77 TO 01/04/79

Quantity of data - 6 REELS OF TAPE

These Caltech experimenter-supplied, discovery scaler data are on 9-track, 1600 bpi, binary magnetic tapes created on an IBM 370 computer. The physical records of 10,280 bytes contain five logical blocks of 2056 bytes. The data consist of time in day and fraction of day (since January 1, 1977); unit vectors in the direction of the satellite Z and Y axis in rectangular celestial coordinates at the center of each minor frame; and a 320-word array of scaler count data for two low energy detectors (LED1 and LED2), each with eight scalars. Every four minor frame counts are followed by a total of the four frames. For further information on the A 2 data archive, contact Dr. Gordon Garmire, Astronomy Department, 504 Davey Laboratory, Pennsylvania State University, University Park, PA 16802.

Data set name - STATUS INFORMATION DATA ON TAPE

NSSDC ID 77-075A-02C, STATUS INFORMATION DATA ON TAPE

Time period covered - 08/11/77 TO 02/17/78

Quantity of data - 1 REEL OF TAPE

These Caltech experimenter-supplied, low energy detector status information data are on 9-track, 1600-bpi, binary magnetic tape created on an IBM 370 computer. The records are blocked with 15 240-byte logical records per physical record. These status tapes contain satellite status information, attitude and ephemeris information, and data quality information. The satellite status information consists of time in day and fraction of day (since January 1, 1977); mode of discovery scalars; pulse-height windows; number of first and

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last good readout; position of earth in spacecraft; polar coordinates; angle to sun; sun horizon angle; position of spacecraft; geodetic coordinates; orbit number; altitude of spacecraft; unit vectors to sun and moon; magnetic field direction and strength; angle to magnetic field; housekeeping and electron rates; high voltage stability; back and front plate temperatures; and various data flags. The attitude information consists of right ascension and declination of Z axis of satellite; RA and Dec of Y axis at center of first good minor frame in major frame; RA and Dec of Y axis at center of last good minor frame in major frame; and position number (1-32) of first good minor frame in major frame. The ephemeris information contains position of earth in satellite coordinates; angle from Y axis to sun in radians; angle from sun to earth's center from satellite's view point in radians; longitude and latitude of satellite over earth in decimal degrees; sunlight and anomaly flag; orbit number; altitude of satellite over earth in kilometers; unit vector in direction of sun in rectangular celestial coordinates; and vector from earth to moon in rectangular celestial coordinates and in kilometers. The data quality information consists of electron contamination flags for detectors LED1 and LED2; high voltage steps for detectors LED1 and LED2; and high voltage flags for detectors LED1 and LED2. For more detailed information on this data set, contact Dr. Gordon Garmire, Astronomy Department, 504 Davey Laboratory, Pennsylvania State University, University Park, PA 16802.

-----  
Data set name - NEW HARD X-RAY SOURCES OBSERVED WITH HEAD  
A2 ON MAGNETIC TAPE

NSSDC ID 77-075A-02D, NEW HARD X-RAY SOURCES

Time period covered - 09/01/77 TO 03/09/78

Quantity of data - 1 REEL OF TAPE

This data set contains on tape the results of a complete sky survey conducted by the Cosmic X-ray Experiment on the HEAD 1 satellite. This particular survey identified new weak (<30 UFU) X-ray sources. Included are 47 new sources for which intensity is typically 1-2 UFU, seven sources only recently discovered, and improved positions for another six previously known sources. The data are in the form of a list of error boxes, size, source intensities, approximate times of observation, and suggested identification. The data set is on 9-track, 1600-bpi magnetic tape. The tape contains two identical files of the source list, one written in ASCII and the other in EBCDIC. The logical record size is 124 bytes. Each logical record is an image of a line normally printed on a line printer. The physical block size is 2480 bytes. This source list, together with a brief description of the instrument and analytical method used in determining the error boxes, was published in the paper "New Hard X-ray Sources with HEAD A-2," F.E. Marshall et al., "Astrophys. J. Suppl., v. 40, pp. 657-665, 1979.

-----  
Data set name - CATALOG OF HIGH LATITUDE EXTRAGALACTIC  
X-RAY SOURCES ON MAGNETIC TAPE

NSSDC ID 77-075A-02E, EXTRAGALACTIC X-RAY SOURCE CATALOG

Time period covered 09/05/77 TO 09/11/78

Quantity of data - 1 REEL OF TAPE

This data set contains a complete X-ray survey of the 8.2 steradians of the sky at  $-20 \text{ deg} < b < 20 \text{ deg}$ , down to a limiting sensitivity of  $< 3.1E-11 \text{ ergs/cm}^2 \text{ s}$  in the 2-10 keV band, on one 9-track, 1600-bpi, ASCII magnetic tape. Of the 85 detected sources (excluding the Large Magellanic Cloud and Small Magellanic Cloud sources), 17 have been identified with galactic objects, 61 have been identified with extragalactic objects, and 7 remain unidentified. Relevant data for the sources include (1) source name, (2) previous catalog names, (3) X-ray fluxes plus one-sigma error, (4) identification with known objects, (5) type of object, (6) redshift value and reference, and (7) luminosities. A description of source selection methods and data analysis can be found in NASA TM 82168, "A Complete X-ray Sample of the High Latitude Sky from HEAD 1 A-2: log N, log S and Luminosity Functions," G. Piccinotti et al.

-----  
Data set name - A-2 LED SOFT X-RAY SKY CATALOG DATA ON  
MAGNETIC TAPE

NSSDC ID 77-075A-02F, A-2 LED SOFT X-RAY SKY CATALOG

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set consists of a single 9-track, 800-bpi, EBCDIC magnetic tape containing the HEAD A-2 low-energy X-ray source catalog as published in the Astrophysical Journal Supplement Series. Some 95% of the sky was surveyed in the spectral bands 0.18 to 0.44 and 0.44 to 2.8 keV to limiting sensitivities of  $1E-11$  and  $3E-11 \text{ ergs/(cm}^2 \text{ s)}$ , respectively.

The catalog lists 114 sources to a six-sigma significance criterion. The data are arranged in the form of pages in the published catalog where each record, containing 132 bytes, represents a line in the catalog, and each source listing consists of six lines. Source positions are given in galactic coordinates as well as in RA and Dec. Measured intensity is expressed in counts/s. For further details see Nugent et al., Astrophys. J. Suppl., v. 51, p. 1, 1983.

-----  
Data set name - SOURCE TARGET LIST SORTED BY TIME AND  
RIGHT ASCENSION DATA ON MAGNETIC TAPE

NSSDC ID 77-075A-02C, SOURCE TARGET LIST, TIME/RA ORDER

Time period covered - 11/15/77 TO 12/29/78

Quantity of data - 1 REEL OF TAPE

This data set contains lists of targets that the HEAD A-2 experiment pointed at during its mission. The lists are identical except that one is ordered by time and the other is ordered by right ascension of the Y axis. Each list has ten columns of information: target name, whether the target was on the +Y or -Y side of the spacecraft, RA and Dec of Y axis (1950 epoch), day and second of 1977 of start of pointing, day and second of 1977 of end of pointing, 'PP' indicating spacecraft alternated between two positions during pointing, and pointing number. This data set consists of a 9-track, 6250 bpi magnetic tape, created on the IBM 3081, containing a file written in EBCDIC with three binary header records. For further detailed information on the A-2 data archive, contact Dr. Elihu Boldt, Code 661, GSFC/NASA, Greenbelt Road, Greenbelt, MD 20771.

-----  
Data set name - PHA DATA ON MAGNETIC TAPE

NSSDC ID 77-075A-02H, PHA DATA BASE

Time period covered - 08/15/77 TO 01/09/79

Quantity of data 26 REELS OF TAPE

These data telemetered from the HEAD A-2 experiment were used to create a primary experiment data base. PHA, a secondary data base, was created from the primary data base to make scientific data analysis more convenient. Only major frames from the primary data base that are not in engineering format are included. Each PHA physical record contains data that were accumulated in one major frame except the digital status, which completes a cycle in two major frames, and the analog status, which completes a cycle in eight major frames. Each production PHA file corresponds to approximately 12 h of data. If no acceptable data exist for a 12 h interval, no PHA file exists for the interval. Each tape contains about 25 days of PHA data and no more than 40 files. There are three checks made on the quality of data. A block encoder error indicates a transmission error from the spacecraft to ground. A bit error indicates that one or more bits within a major frame have been improperly received. Fill data indicate that data for that minor frame are missing. This data set consists of 26 9-track, 6250-bpi magnetic tapes blocked by 5952 bytes. Examples of the use of this data base can be found in F.E. Marshall et al., Astrophys. J. Suppl., v. 40, p. 657, 1979; F.E. Marshall et al., Astrophys. J., v. 235, p. 4, 1980.

-----  
Data set name - XRATES DATA ON MAGNETIC TAPE

NSSDC ID 77-075A-02I, XRATES DATA BASE

Time period covered - 08/15/77 TO 01/09/79

Quantity of data 26 REELS OF TAPE

These data telemetered from the HEAD A-2 experiment were used to create a primary experiment data base. XRATES, a secondary data base, was created from the primary data base to make scientific data analysis more convenient. The XRATES data base is used primarily to search for possible sources and to examine possible variability of detected sources. Only major frames from the primary data base that are not in engineering format are included. Each XRATES physical record contains data that were accumulated in one major frame except the digital status, which completes a cycle in two major frames, and the analog status, which completes a cycle in eight major frames. Each production XRATES file corresponds to approximately 12 h of data. If no acceptable data exist for a 12-h interval, no XRATES file exists for the interval. Each tape contains about 25 days of XRATES data and no more than 40 files. There are three checks made on the quality of data. A block encoder error indicates a transmission error from the spacecraft to ground. A bit error indicates that one or more bits within a major frame have been improperly received. Fill data indicate that data for that minor frame are missing. This data set consists of 26 9 track, 6250-bpi magnetic tapes blocked by 5048 bytes. Examples of the use of this data base can be found in F.E. Marshall et al., Astrophys. J. Suppl., v. 40, p. 657,

HEAD 1, FRIEDMAN  
LARGE AREA COSMIC X-RAY SURVEY (A-1)

Data set name - X-RAY SOURCE CATALOG ON MICROFILM

NSSDC ID 77-075A-01A, HEAD A-1 X-RAY SOURCE CATALOG

Time period covered - (N/A)

Quantity of data - 4 CARDS OF B/W MICROFICHE

This data set is a catalog of sources on microfiche as observed by the HEAD A-1 Large Area Sky Survey Experiment. The catalog is derived from the first 6 months of data from HEAD A-1, during which time one scan of the entire sky was completed. Positions and intensities for 842 sources are cataloged, with a limiting flux of 250 nJy at 5 keV, or about 0.25 UFU. The catalog is more than 90% complete at a flux level equivalent to 1.5 Jy at 5 keV, for a Crablike spectrum. Included are source positions in 1950.0 RA and Dec, plus the four corners of a 95% confidence error box and the solid angle enclosed by the error box, position in galactic and ecliptic longitude and latitude, apparent source intensity, and identification of the source with other cataloged objects. Included in the data set is a description of the HEAD A-1 instrument, a description of data summation, and source fitting techniques used to extract the source specifications appearing in the catalog. A machine-readable version of this data set is available on a tape under NSSDC data set ID SX-D10. For further information on data listed in this catalog, contact Dr. Kent Wood, Code 4121, Naval Research Laboratory, Washington, DC 20375.

Data set name - ONE-DAY SCAN SUMMATIONS DATA ON MAGNETIC TAPE

NSSDC ID 77-075A-01B, ONE-DAY SCAN SUMMATIONS DATA

Time period covered - 08/19/77 TO 04/28/78

Quantity of data - 1 REEL OF TAPE

This tape is a copy of the HEAD A-1 X-ray source list in the microfiche catalog (77-075A 01A) that was shipped with the tape. The data set consists of one 6250 bpi, 9 track, ASCII tape, and contains two files. The tape was created on a VAX 11/780 computer. The first file is labeled HCA184. The second file is the same except for the label. For further information on the A-1 data archive, contact Dr. Kent Wood, Code 4121, Naval Research Laboratory, Washington, DC 20375.

HEAD 1, PETERSON  
LOW ENERGY GAMMA RAY AND HARD X RAY SKY  
SURVEY (A 4)

Data set name - PRELIMINARY DATA SUBMISSION PLDTS,  
LISTS, SCAN TRACK MAP, DAY-DATA TABLES

NSSDC ID 77-075A-04A, DATA PLDTS AND TABLES

Time period covered - 08/14/77 TO 01/13/79  
(Date supplied by experimenter)

Quantity of data - 9 CARDS OF B/W MICROFICHE

This data set is the reduced data base for the HEAD A-4 experiment, on microfiche cards. It includes plots, source listings, scan-track maps, conversion tables, and appropriate documentation. No magnetic tape version is available. The plots are 10-day data summations of the background-subtracted count rate over each detector's energy range, binned into 1-deg azimuth bins around the spacecraft scan plane. Maps are included of the spacecraft scan track as a function of time. Tables are provided of the detector properties and of day number-date conversions. Source lists can be related to the plots for identification of signal peaks. For information on the A-4 main data base, contact Dr. Duane E. Gruber, C 011, Center for Astrophysics and Space Astronomy, University of California San Diego, La Jolla, CA 92093.

Data set name - SKYMAP DISPLAY FILES ON MAGNETIC TAPE

NSSDC ID 77-075A-04B, SKYMAP DISPLAY FILES

Time period covered - 08/21/77 TO 01/08/79

Quantity of data - 2 REELS OF TAPE

This data set was obtained from the Low Energy Detectors (LEDs) of the Hard X-ray and Low-Energy Gamma-ray Instrument. The data, which were all obtained when the satellite was spinning, consist of event counts and detector lifetimes for four broad energy channels for each of the two LEDs, and have been accumulated as a function of satellite orientation. The skymap display files contain background subtracted count rates that are used to construct visual displays. Each file contains roughly 6 months of data. The files with epoch code 1 cover the first 6 months of the mission; epoch code 2 stands for the second 6 months and epoch code 3 stands for the remainder, i.e., about 5 months, of the mission. The epoch "1" stands for the total and indicates that the data are the superposition of data from all three epochs. The count rate data in the skymap display files have been smoothed so as to reduce the high frequency spatial noise. The lifetime data in the exposure files have been left unsmoothed. This data set consists of two tapes covering the time span August 21, 1977, to January 8, 1979. The tapes are multitracked, 9 track, 1600 bpi, and binary, and were created on a Data General Nova 830 computer. For additional information, contact Dr. Duane E. Gruber, C-011, Center for Astrophysics and Space Astronomy, University of California-San Diego, La Jolla, CA 92093.

Data set name - REDUCED DATA BASE, .MH AND .FB FILES ON  
MAGNETIC TAPE

NSSDC ID 77-075A-04C, REDUCED DATA BASE, .MH + .FB FILE

Time period covered - 08/21/77 TO 01/08/79

Quantity of data - 4 REELS OF TAPE

This data set was obtained from the Low Energy Detectors (LEDs) of the Hard X-ray and Low-Energy Gamma-ray Instrument when the satellite was spinning. The data consist of event counts and detector lifetimes for four broad energy channels for each of the two LEDs, and have been binned and accumulated in a .MH file as a function of satellite orientation. Each of these files is named MQaaaaabbbb.MH, where aaaa (or aaa) is the sequence number of the first orbit of data and bbbb is the sequence number of the last orbit of data included in the file. Each data record contains the data accumulated in one satellite orientation bin. Records do not exist for those orientation bins in which no data were accumulated. Estimates of the background component of the count rate data in the MH files are parameterized in the .FB files. Each of the .FB files contains the parameters for both LEDs for one broad energy channel. The file names are of the form MaaaaabbbbX.FB, where aaaa is the beginning sequence number, bbbb is the end sequence number, and X is the energy channel code. This data set consists of four tapes covering the time span August 21, 1977, to January 8, 1979. The tapes are multitracked, 9 track, 1600 bpi, and binary, and were created on a Data General Nova 830 computer. For more detailed information on this data set, contact Dr. Duane E. Gruber, C-011, Center for Astrophysics and Space Astronomy, University of California San Diego, La Jolla, CA 92093.

Data set name - SKYMAP VISUAL DISPLAY ON FILM

NSSDC ID 77-075A-04D, SKYMAP VISUAL DISPLAY ON FILM

Time period covered - 08/22/77 TO 12/30/78

Quantity of data - 95 B/W NEGATIVE FRAMES

This data set consists of 95 4 x 5 in. black-and-white negatives that are pictorial displays of the X-ray sky survey data. Each film is a sky image of one of the following nominal X-ray energy channels: 13-25, 25-40, 40-80, 80-180, 13-40, and 13-80 keV. Each film is properly oriented for direct viewing, with the emulsion side down and the sticker with the film serial number on the upper right. The user should note that the coordinate system is oriented so that theta, the ecliptic longitude of the spacecraft spin axis, increases from the bottom to the top of each skymap. Therefore, for those skymaps that are not superpositions of data from different epochs, time also increases from the bottom to the top of the skymap. A comprehensive list of these sky survey photographs can be found in Figure 3 of A.M. Levine et al., *Astrophys. J. Suppl.*, v. 54, pp. 581-617, 1984.

Data set name - HIGH-ENERGY X-RAY SOURCE CATALOG ON TAPE

NSSDC ID 77 075A 04E, HIGH-ENERGY X RAY SOURCE CATALOG

Time period covered - 08/22/77 TO 12/30/78

Quantity of data 1 REEL OF TAPE

This data set is a machine readable catalog of high-energy X-ray sources that are clearly evident in the pictorial displays (77-075A-04D) of the sky survey data. Tape files 0 and 1 contain an ASCII transcription of the catalog having a total length of 35,620 bytes. The files are lists of source name, RA and Dec, ecliptic longitude and latitude, scan dates, epoch code, and X ray count rate per second in energy channels 13-25, 25-40, 40-80, 80-180, and 13-80 keV. Tape files 2 and 3 have the same content as files 0 and 1 in non-ASCII format. The files contain one record per source and have a total length of 18,144 bytes. This data set is on one 9-track, 1600-bpi magnetic tape. This catalog has been published in Astrophys. J. Suppl., v. 54, pp. 581-617, 1984.

HEAD 1, SCHWARTZ  
X-RAY SCANNING MODULATION COLLIMATOR  
(A-3)

Data set name - REDUCED X-RAY COUNT DATA ON MAGNETIC TAPE

NSSDC ID 77 075A 03A, REDUCED X-RAY COUNT DATA

Time period covered (N/A)

Quantity of data - 3 REELS OF TAPE

This data set was obtained by the Scanning Modulation Collimator experiment (HEAD A-3). One file was generated for each of about 1500 trial binning positions at which a possible X-ray source was thought to exist. The files preserve data from each satellite revolution (a 20 s sample at 30 min intervals) and each of the two or three celestial scans (about 4 to 8 days at 6-month intervals) through the region. Raw counts and exposure units are folded and coadded into 60 phase bins for each collimator [30 arcs and 2 arc-min (FWHM), respectively], for each of three energy channels. This data set consists of three magnetic tapes. For additional information on the A 3 data archive, contact Dr. Daniel Schwartz, Smithsonian Astrophysical Observatory, 60 Garden Street, Cambridge, MA 02138.

Data set name - X-RAY REDUCED SCANNING DATA ON MAGNETIC TAPE

NSSDC ID 77-075A-03B, X-RAY REDUCED SCANNING DATA

Time period covered - (N/A)

Quantity of data 100 REELS OF TAPE

These data represent the Scanning Modulation Collimator (MC) data binned around trial positions at which X-ray sources were thought to exist. The data are exposure units and raw counts separately saved for each satellite rotation, each energy channel (0.9 to 2.5 keV, 2.5 to 5.5 keV, and 5.5 to 13.5 keV), and each of the two collimator banks (MC1 is 30 arcs FWHM with 4 arc min periodicity, MC2 is 2 arc-min FWHM with 16 arc-min periodicity). Data for the two or three different 6-month intervals in which the satellite scanned a fixed celestial location are collated into one file for each source. The data are binned according to the phase of the peak response of the collimator from the trial position of the given source and are coadded by the precise periodicity of the collimator. Data are binned along azimuths within plus and minus 3 deg of the trial position. Along with the primary X ray counts and time data, each scan contains the elevation of that scan circle from the source, the "jitter" angle measuring how much the actual scan deviated from an ideal great circle when passing the source, the orbit number and minor frame number that allow a calculation of universal time, and some detailed parameters used by software that performs analysis processing. For data analysis, the files are used to determine when the MC has, in fact, detected a source and then are used to produce the allowed locations of the source on the sky. In using the files, one can choose various combinations of energy channels, individual scans or passes, jitter angle, detector count rate, etc., in order to maximize the signal to noise. This data set consists of 100 magnetic tapes. For further information on the A 3 data archive, contact Dr. Daniel Schwartz, Smithsonian Astrophysical Observatory, 60 Garden Street, Cambridge, MA 02138.

HEAD 2, GIACCONI  
MONITOR PROPORTIONAL COUNTER (MPC)

Data set name - CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY ON MAGNETIC TAPE

NSSDC ID 78 103A 01A, CATALOG OF OBSERVED TARGETS-TAPE

Time period covered - 11/16/78 TO 04/25/81

Quantity of data - 1 REEL OF TAPE

This data set is a listing of all targets observed by the Einstein Observatory over its operational lifetime, from November 16, 1978, through April 25, 1981. The tape contains 51 separate files. File 1 is a list of all targets in order of increasing right ascension. Also included is information on the instrument used and the exposure time for each observation, plus comments on the nature of the observation. Files 2-48 are a further breakdown of all observations by scientific category, and files 49-51 contain all spectral observations listed by instrument. Documentation is provided to interpret the coded entries and sequence numbers. These same listings are available on microfiche as NSSDC data set 78 103A 01B. For information on the main data base archive, contact Dr. Martin Weisskopf, Code ES-62, Marshall Space Flight Center/ NASA, Huntsville, AL 35812.

Data set name - CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY - MICROFICHE

NSSDC ID 78-103A-01B, CATALOG OF OBSERVED TARGETS-FICHE

Time period covered - 11/16/78 TO 04/25/81

Quantity of data - 4 CARDS OF B/W MICROFICHE

This data set is the catalog of Einstein observations on microfiche cards. The microfiche has been produced directly from the tape listings (NSSDC data set 78 103A 01A). Each tape file is printed as a separate list. Documentation is included to identify each file and all coded entries. For information on the main data base, contact Dr. Martin Weisskopf, Code ES-62, Marshall Space Flight Center/NASA, Huntsville, AL 35812.

HEAD 2, GIACCONI  
HIGH-RESOLUTION IMAGER (HRI)

Data set name - CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY ON MAGNETIC TAPE

NSSDC ID 78-103A-02A, CATALOG OF OBSERVED TARGETS-TAPE

Time period covered 11/16/78 TO 04/25/81

Quantity of data - 1 REEL OF TAPE

This data set is a listing of all targets observed by the Einstein Observatory over its operational lifetime, from November 16, 1978, through April 25, 1981. The tape contains 51 separate files. File 1 is a list of all targets in order of increasing right ascension. Also included is information on the instrument used and the exposure time for each observation, plus comments on the nature of the observation. Files 2-48 are a further breakdown of all observations by scientific category, and files 49-51 contain all spectral observations listed by instrument. Documentation is provided to interpret the coded entries and sequence numbers. These same listings are available on microfiche as NSSDC data set 78 103A-01B. Information on the B-2 main data base can be obtained by contacting Dr. Fred Seward, Smithsonian Astrophysical Observatory, 60 Garden Street, Cambridge, MA 02138.

Data set name - CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY - MICROFICHE

NSSDC ID 78 103A-02B, CATALOG OF OBSERVED TARGETS-FICHE

Time period covered - 11/16/78 TO 04/25/81

Quantity of data - 4 CARDS OF B/W MICROFICHE

This data set is the catalog of Einstein observations on microfiche cards. The microfiche has been produced directly from the tape listings (NSSDC data set 78-103A-01A). Each tape file is printed as a separate list. Documentation is included to identify each file and all coded entries. Information on the B 2 main data base can be obtained by contacting Dr. Fred Seward, Smithsonian Astrophysical Observatory, 60 Garden Street, Cambridge, MA 02138.

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\*\*\*\*\* HEAD 2 \*\*\*\*\*  
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Data set name - X-RAY DATA OF JOVIAN AURORAE ON MAGNETIC TAPE.

NSSDC ID 78-103A-02C, X-RAY DATA OF JOVIAN AURORAE

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set consists of a 1600-bpi magnetic tape written in FITS format containing high spatial resolution images of the X-ray aurorae of Jupiter. At the time of high resolution imager (HRI) observation, its FOV was 25 arc-min and its angular resolution for a strong source was about 4 arc-s. The raw data were smoothed by three Gaussian functions with widths of 64, 128, and 256 arc-s. All of the arrays are integer and have been scaled to a maximum pixel value of 4000. Each field has a 256x256 in. pixel dimension and a resolution of 1 arc-s per pixel, and was centered on RA 12 h 36 min 41 s, Dec -2 deg 30 min 35 s. The HRI responded to essentially the same energy range of 0.15-3.0 keV as the IPC (Imaging Proportional Counter) with no effective energy resolution. The measured emission intensities of the northern and southern auroral sources are 3.4 plus and minus 1.1E-3 counts per second and 3.3 plus and minus 0.9E-3 counts per second, respectively. This observation was performed on January 6, 1981, beginning at 2.1 h UT and ending at 7.8 h UT. For a more detailed description of the data analysis process, see A.E. Metzger et al., J. Geophys. Res., v. 88, pp. 7731-7741, 1983.

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HEAD 2, GIACCONI  
FOCAL PLANE CRYSTAL SPECTROMETER (FPCS)

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Data set name - CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY ON MAGNETIC TAPE

NSSDC ID 78-103A-03A, CATALOG OF OBSERVED TARGETS-TAPE

Time period covered - 11/16/78 TO 04/25/81

Quantity of data 1 REEL OF TAPE

This data set is a listing of all targets observed by the Einstein Observatory over its operational lifetime, from November 16, 1978, through April 25, 1981. The tape contains 51 separate files. File 1 is a list of all targets in order of increasing right ascension. Also included is information on the instrument used and the exposure time for each observation, plus comments on the nature of the observation. Files 2-48 are a further breakdown of all observations by scientific category, and files 49-51 contain all spectral observations listed by instrument. Documentation is provided to interpret the coded entries and sequence numbers. These same listings are available on microfiche as NSSDC data set 78-103A-01B. Information on the B-3 data archive can be obtained by contacting Dr. Claude Canizares, Room 37 501, Department of Physics, Massachusetts Institute of Technology, Cambridge, MA 02139.

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Data set name CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY - MICROFICHE

NSSDC ID 78 103A-03B, CATALOG OF OBSERVED TARGETS-FICHE

Time period covered - 11/16/78 TO 04/25/81

Quantity of data 4 CARDS OF B/W MICROFICHE

This data set is the catalog of Einstein observations on microfiche cards. The microfiche has been produced directly from the tape listings (NSSDC data set 78 103A 01A). Each tape file is printed as a separate list. Documentation is included to identify each file and all coded entries. Detailed information on the B-3 data archive can be obtained by contacting Dr. Claude Canizares, Room 37 501, Department of Physics, Massachusetts Institute of Technology, Cambridge, MA 02139.

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Data set name - FOCAL PLANE CRYSTAL SPECTROMETER (FPCS)  
REDUCED DATA ON TAPE

NSSDC ID 78-103A-03C, FPCS REDUCED DATA TAPES

Time period covered - (N/A)

Quantity of data - 17 REELS OF TAPE

This data set consists of 17 FPCS (Focal Plane Crystal Spectrometer) reduced data tapes. Each tape file contains reduced data for a particular X-ray target as well as files that describe the parameters used in the reduction process. These tapes contain four types of files for each of the sources observed by FPCS: two source files, an index parameter file,

and an event file. The source files contain the parameters used by a processing program when the data were reduced. The index parameter file contains a short description of each of the data intervals and the definitions of grouping data. The event file contains the reduced data and is the file used by analysis programs. Accompanying documentation describes the FPCS experiment and the data on the tapes. This document also contains a brief description of the organization of the FPCS data, the method of data reduction, a catalog of observations, and a description of the physical characteristics of the tapes. Detailed scientific aspects of these reduced data can be obtained by contacting Dr. Thomas H. Markert, Room 37-515, Department of Physics, Massachusetts Institute of Technology, Cambridge, MA 02139.

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HEAD 2, GIACCONI  
IMAGING PROPORTIONAL COUNTER (IPC)

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Data set name - CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY ON MAGNETIC TAPE

NSSDC ID 78-103A-04A, CATALOG OF OBSERVED TARGETS-TAPE

Time period covered - 11/16/78 TO 04/25/81

Quantity of data - 1 REEL OF TAPE

This data set is a listing of all targets observed by the Einstein Observatory over its operational lifetime, from November 16, 1978, through April 25, 1981. The tape contains 51 separate files. File 1 is a list of all targets in order of increasing right ascension. Also included is information on the instrument used and the exposure time for each observation, plus comments on the nature of the observation. Files 2-48 are a further breakdown of all observations by scientific category, and files 49-51 contain all spectral observations listed by instrument. Documentation is provided to interpret the coded entries and sequence numbers. These same listings are available on microfiche as NSSDC data set 78-103A-01B. Information on the B-4 data archive can be obtained by contacting Dr. Fred Seward, Smithsonian Astrophysical Observatory, 60 Garden Street, Cambridge, MA 02138.

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Data set name - CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY - MICROFICHE

NSSDC ID 78 103A 04B, CATALOG OF OBSERVED TARGETS-FICHE

Time period covered - 11/16/78 TO 04/25/81

Quantity of data - 4 CARDS OF B/W MICROFICHE

This data set is the catalog of Einstein observations on microfiche cards. The microfiche has been produced directly from the tape listings (NSSDC data set 78 103A-01A). Each tape file is printed as a separate list. Documentation is included to identify each file and all coded entries. Information on the B-4 data archive can be obtained by contacting Dr. Fred Seward, Smithsonian Astrophysical Observatory, 60 Garden Street, Cambridge, MA 02138.

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HEAD 2, GIACCONI  
SOLID STATE SPECTROMETER (SSS)

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Data set name CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY ON MAGNETIC TAPE

NSSDC ID 78-103A-05A, CATALOG OF OBSERVED TARGETS-TAPE

Time period covered - 11/16/78 TO 04/25/81

Quantity of data - 1 REEL OF TAPE

This data set is a listing of all targets observed by the Einstein Observatory over its operational lifetime, from November 16, 1978, through April 25, 1981. The tape contains 51 separate files. File 1 is a list of all targets in order of increasing right ascension. Also included is information on the instrument used and the exposure time for each observation, plus comments on the nature of the observation. Files 2-48 are a further breakdown of all observations by scientific category, and files 49-51 contain all spectral observations listed by instrument. Documentation is provided to interpret the coded entries and sequence numbers. These same listings are available on microfiche as NSSDC data set 78-103A 01B. Information about the B-3 instrument and data archive can be obtained by contacting Dr. Frank Marshall, Code 666, GSFC/NASA, Greenbelt Road, Greenbelt, MD 20771.

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Data set name - CATALOG OF ALL TARGETS OBSERVED BY THE EINSTEIN OBSERVATORY MICROFICHE

Time period covered 11/16/78 TO 04/25/81

Quantity of data - 4 CARDS OF B/W MICROFICHE

This data set is the catalog of Einstein observations on microfiche cards. The microfiche has been produced directly from the tape listings (NSSDC data set 78-103A 01A). Each tape file is printed as a separate list. Documentation is included to identify each file and all coded entries. Information about the B3 instrument and data archive can be obtained by contacting Dr. Frank Marshall, Code 666, GSFC/NASA, Greenbelt Road, Greenbelt, MD 20771.

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..... HEAD 3 .....  
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HEAD 3, ISRAEL  
HEAVY NUCLEI

Data set name - HEAVY NUCLEI PROCESSED DATA "GOLD" FROM  
HEAD C 3 ON 22 TAPES

NSSDC ID 79 082A 03A, HEAVY NUCLEI REDUCED DATA GOLD

Time period covered - (N/A)

Quantity of data - 21 REELS OF TAPE

This data set is 21 tapes of "gold" processed data from 600 tapes of the basic data set that contains all HEAD C-3 data. The Heavy Nuclei Experiment collected data for 600 days, and the data contain information on more than 2.0E+7 iron nuclei with more than 1.0E+4 nuclei of Z > 40. The 600 library tapes have been compressed into two small processed data sets - "gold," which contains all data for nuclei with atomic number above 30, and "cobalt," which contains all data for nuclei that pass through the center of the instrument at small angles of incidence. The "gold" data include pulse heights and subsidiary information for each event to allow selections and charge estimates to be made such as: trajectory, geomagnetic cutoff, data consistency, etc. For more information contact Dr. Thomas Garrard, 220 47, Downs Laboratory, Caltech, Pasadena, CA 91125.

Data set name HEAVY NUCLEI PROCESSED DATA "COBALT" FROM  
HEAD C 3 ON 18 TAPES

NSSDC ID 79 082A 03B, HEAVY NUCLEI REDUCED DATA COBALT

Time period covered (N/A)

Quantity of data - 11 REELS OF TAPE

This data set is 11 tapes of "cobalt" processed data from 600 tapes of the basic data set that contains all HEAD C-3 data. The Heavy Nuclei Experiment collected data for 600 days, and the data contain information on more than 2.0E+7 iron nuclei with more than 1.0E+4 nuclei of Z > 40. The 600 library tapes have been compressed into two small processed data sets "gold," which contains all data for nuclei with atomic number above 30, and "cobalt," which contains all data for nuclei that pass through the center of the instrument at small angles of incidence and, thus, have good resolution. For more information contact Dr. Thomas Garrard, 220-47, Downs Laboratory, Caltech, Pasadena, CA 91125.

Data set name HEAD C-3 VERIFY PROGRAM READING PROCESSED  
DATA

NSSDC ID 79 082A 03C, HEAD C-3 VERIFY PROGRAM

Time period covered (N/A)

Quantity of data - 1 REEL OF TAPE

This data set is a HEAD C-3 VERIFY program reading a "gold" (NSSDC ID 79-082A-03A) or "cobalt" (NSSDC ID 79-082A-03B) tape in chapter/verse format and records--start and stop times; time gaps in excess of a specified interval; number of tape records; chapter counts; and read errors. The execution is in two stages. First, run VERIFY, which requests a minimum gap time and the tape unit number. Next, run PRVERIFY, which reads the output files VTIMES and REJCHP99 and prints out the results. For more detailed information, contact Dr. Thomas Garrard, 220-47, Downs Laboratory, Caltech, Pasadena, CA 91125.

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..... INTERCOSMOS 4 .....  
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INTERCOSMOS 4, TINDO  
SOLAR X-RAY POLARIMETER

Data set name - SOLAR X-RAY POLARIZATION DATA, FLARES OF  
OCT 24, NOV 5, AND NOV 16 1970

NSSDC ID 70-084A-01A, SOLAR X-RAY POLARIZATION DATA

Time period covered - 10/24/70 TO 11/16/70

Quantity of data - 1 CARD OF B/W MICROFICHE

This data set consists of a document received from World Data Center B1 in Moscow, U.S.S.R. The data consist of lists of count rates and backgrounds for three separate channels. The three channels measure different scattered fluxes depending on the plane and degree of polarization. The data cover three events on three different days: October 24, November 5, and November 10, 1972. Temporal resolution is 22 s. The original document is in Russian, and a translated version is also included in the data set. For a detailed analysis of these data, see I.P. Tindo et al., Solar Phys., v. 24, p. 429, 1972.

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..... IRAS .....  
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IRAS, JOINT IRAS SWG  
IR TELESCOPE

Data set name - SKYPLATE IMAGES H-CON 3, COLOR

NSSDC ID 83-004A-01A, SKYPLATE IMAGES 3RD HCON, COLOR

Time period covered (N/A)

Quantity of data 188 COLOR NEGATIVE FRAMES

This data set consists of "Skyplate Images HCON(Hours-Confirmed)-3" on 4x5 in color negatives. The IRAS observations were made by the confirmation process that consisted of examining multiple observations and identifying which plausibly belonged to the same object. HCON-1 represents the first hours confirmed data observed with time separations from 100 min up to 36 h. HCON-2 represents the data confirmed about 2 weeks after the first hours confirmation, and HCON 3 data were confirmed after the second confirmation. Generally, the hours confirmation was run on groups of three successive satellite operation plans. Each skyplate image covers 16.5x16.5 deg on the celestial sphere, with a pixel size of 2 arc-min and an angular resolution of 4.6 arc-min. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name SKYPLATE IMAGES 12,25,60 AND 100 MICROMET  
ERS FOR HCON 3 ON BLACK AND WHITE FILM.

NSSDC ID 83-004A-01B, SKYPLATE IMAGES 3RD HCON, B/W

Time period covered - (N/A)

Quantity of data - 188 B/W POSITIVE FRAMES

This data set consists of "Skyplate Images HCON(Hours-Confirmed)-3" on 5x5 in black and white positives. The IRAS observations were made by the confirmation process that consisted of examining multiple observations and identifying which plausibly belonged to the same object. HCON-1 represents the first hours confirmed data observed with time separations from 100 min up to 36 h. HCON-2 represents the data confirmed about 2 weeks after the first hours confirmation, and the HCON-3 data were confirmed after the second confirmation. Generally, the hours confirmation was run on groups of successive satellite operation plans. Each skyplate image covers 16.5x16.5 deg on the celestial sphere, with a pixel size of 2 arc-min and an angular resolution of 4.6 arc-min. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - SKYPLATE OVERLAYS

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NSSDC ID 83-004A-01C, SKYPLATE OVERLAYS

Time period covered - (N/A)

Quantity of data - 20 B/W NEGATIVE FRAMES

This data set is a set of coordinate overlays for the photographs as photographic negative transparencies in 5 in. sq. format. The scale is identical to the corresponding map product, so the overlays will be the correct size if enlarged by the same factor as the map. One overlay is provided for each declination zone from -30 deg to +30 deg; the overlays for zones of opposite sign are obtained by rotating the grids through 180 deg. Five overlays are provided for each declination zone between 45 deg and 75 deg to accommodate the fact that integer hour meridians cross the plates in these zones in five different configurations. Again, the overlay for the zone of opposite sign is obtained by rotating the grid 180 deg. All integer hour meridians are labeled OOH. The hour of right ascension should be determined from the position of the plate center given in the label on the photograph. The plate number to which a particular overlay pertains is printed in the lower right corner of the overlay. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - POINT SOURCE CATALOG ON MICROFICHE

NSSDC ID 83-004A-01D, POINT SOURCE CAT VER 2.0

Time period covered - (N/A)

Quantity of data - 24 CARDS OF B/W MICROFICHE

This data set is a catalog on microfiche cards identifying 245,839 confirmed infrared sources and, for each, giving position, infrared flux density, angular positional association with previously cataloged astronomical sources, and miscellaneous information such as uncertainties and data quality flags. The sources are smaller than 0.5 - 1.0 arc min depending on wavelength. The covered wavelength bands are 12, 25, 60, and 100 micrometers. The catalog is ordered by source right ascension. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base is available by contacting IPAC, 100 22, Caltech, Pasadena, CA 91125.

Data set name - POINT SOURCE CATALOG ON MAGNETIC TAPE

NSSDC ID 83 004A-01E, POINT SOURCE CATALOG ON TAPE

Time period covered (N/A)

Quantity of data 2 REELS OF TAPE

This data set is a catalog on magnetic tapes identifying 245,839 confirmed infrared sources and, for each, giving position, infrared flux density, angular positional association with previously cataloged astronomical sources, and miscellaneous information such as uncertainties and data quality flags. The sources are smaller than 0.5 - 1.0 arc min depending on wavelength. The covered wavelength bands are 12, 25, 60, and 100 micrometers. The catalog is ordered by source right ascension. The catalog is contained on one 6250 bpi character coded tape, but it is divided into two files of 12-h right ascension increments if 1600-bpi tapes are requested. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - WSDB ANCILLARY DATA ON MAGNETIC TAPE

NSSDC ID 83 004A-01F, WSDB ANCILLARY DATA

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

In addition to the "Working Survey Data Base" (WSDB-83-004A-01I), the "WSDB Ancillary" file contains flags and derived quantities obtained during the final processing of the Point Source Catalog. This WSDB Ancillary data set is in binary format, with variable length and blocked records. It is available only on 6250-bpi and 1600-bpi density tapes. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - HIGH SOURCE DENSITY BINS CATALOG

NSSDC ID 83-004A-01G, HIGH SOURCE DENSITY BINS CATALOG

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

The "High Source Density Bins" file was created for point sources in certain regions of the sky. In the regions of the sky, particularly near the galactic plane and small regions in Orion, Ophiuchus, and the LMC, the density of IR sources exceeds the resolving capability of the instrument. A special processing was done for the point sources in these regions. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - ZODIACAL HISTORY FILE ON MAGNETIC TAPE

NSSDC ID 83-004A-01H, ZODIACAL HISTORY FILE ON MAG TAPE

Time period covered - (N/A)

Quantity of data - 2 REELS OF TAPE

This data set was created as an aid to modeling and extracting the zodiacal emission contribution in any of the extended source products. The file contains, at 0.5 deg sample spacing, the time (UTC), celestial coordinates, sun-referenced observing angles, and measured brightness in the survey bands for all observations included in the extended source image products. This data set is on FITS formatted magnetic tape. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100 22, Caltech, Pasadena, CA 91125.

Data set name - WORKING SURVEY DATA BASE (WSDB) ON MAGNETIC TAPE

NSSDC ID 83 004A-01I, WORKING SURVEY DATA BASE (WSDB)

Time period covered (N/A)

Quantity of data 1 REEL OF TAPE

The "Working Survey Data Base (WSDB)" contains the most complete observational and data reduction history for the point sources observed during the survey. Information in the WSDB includes separate detectors, individual HCON observations, and history of each observation. The WSDB is broken up into 20 files. One for each range of ecliptic longitude is called a lune. Each file is preceded by a header file containing a simple 80-character record giving the date and version of the WSDB. The WSDB is on a binary formatted tape with variable length, blocked records (due to the variable number of HCON sightings or associations). Extra information has been added to the WSDB to make it possible to read in these variable length records. The WSDB is available only on 6250 bpi and 1600-bpi density tapes. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100 22, Caltech, Pasadena, CA 91125.

Data set name - PRESS RELEASE COLOR PHOTOS

NSSDC ID 83 004A-01J, PRESS RELEASE COLOR PHOTOS

Time period covered - (N/A)

Quantity of data - 4 COLOR NEGATIVE FRAMES

The "Press Release Color Photos" include IRAS images of a protostar, the Milky Way, the constellation of Orion, and the Andromeda galaxy on 4x5 in. color negatives. The IRAS image of a protostar shows a new star emerging from the cloud of dust and gas in which it was born. IRAS found that this cloud, called Barnard 5, contains as many as five such protostars. The IRAS image of the Milky Way shows the center of our galaxy. The yellow and green knots and blobs scattered along the band are giant clouds of interstellar gas and dust heated by nearby stars. Red areas represent regions dominated by cold gas and dust. The large yellow bulge near the middle is the center of the galaxy. The constellation of Orion is also a false-color image - the intense red and yellow areas mark regions of active star formation, and the blue areas show the thermal radiation from sun-warmed zodiacal dust in our solar system.

The IRAS image of the Andromeda galaxy identifies regions where young stars are forming, seen in red, orange, and yellow. Blue areas represent regions of faint infrared radiation while green, yellow, orange, and red areas show more intense infrared emissions. Brighter areas represent regions populated by either numerous or massive young stars. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - SKY PLATE-CALIBRATED SURFACE BRIGHTNESS VALUES ON MAGNETIC TAPE

NSSDC ID 83-004A-01K, SKY PLATE (HCON 3) DATA ON TAPE

Time period covered (N/A)

Quantity of data 24 REELS OF TAPE

This data set consists of "Skyplate Images HCON(Hours-Confirmed) 3" on FITS formatted magnetic tape. The IRAS observations were made by the confirmation process that consisted of examining multiple observations and identifying which plausibly belonged to the same object. HCON 1 represents the first hours confirmed data observed with time separations from 100 min up to 36 h. HCON 2 represents the data confirmed about 2 weeks after the first hour confirmation, and the HCON-3 data were confirmed after the second confirmation. Generally, the hours confirmation was run on groups of successive satellite operation plans. Each skyplate image covers 16.5x16.5 deg on the celestial sphere, with a pixel size of 2 arc-min and an angular resolution of 4-6 arc-min. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name ALL SKY MAPS DATA ON MAGNETIC TAPE

NSSDC ID 83-004A-01L, ALL SKY MAPS DATA ON TAPE

Time period covered (N/A)

Quantity of data 1 REEL OF TAPE

This data set was produced by dividing the 0.5x0.5 deg beam data contained in the Zodiacal History File (83-004A-01H) into the three separate sky coverages (HCONs) and assembling them into three maps with an Aitoff equal area projection in galactic coordinates. Two fields of each sky coverage were produced, one centered on the galactic center (l=0 deg) and one on the galactic anticenter (l=180 deg). The data are available in digital form on one 6250 bpi FITS formatted tape similar in structure to the skyplate tapes. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - ALL SKY IMAGES H-CON 1,2,3, BLACK AND WHITE

NSSDC ID 83-004A-01M, ALL SKY IMAGES 1,2,3 HCON, B/W

Time period covered (N/A)

Quantity of data - 24 B/W NEGATIVE FRAMES

This data set was produced by dividing the 0.5x0.5-deg beam data contained in the Zodiacal History File (83-004A-01H) into the three separate sky coverages (HCONs) and assembling them into three maps with an Aitoff equal area projection in galactic coordinates. Two fields of each sky coverage were produced, one centered on the galactic center (l=0 deg) and one on the galactic anticenter (l=180 deg). This data set is available on 5x5 in. black and white negatives. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - ALL SKY IMAGES H CON 1,2,3, COLOR

NSSDC ID 83-004A-01N, ALL SKY IMAGES 1,2,3 HCON, COLOR

Time period covered - (N/A)

Quantity of data - 6 COLOR NEGATIVE FRAMES

This data set was produced by dividing the 0.5x0.5-deg beam data contained in the Zodiacal History file (83-004A-01H)

into the three separate sky coverages (HCONs) and assembling them into three maps with an Aitoff equal area projection in galactic coordinates. Two fields of each sky coverage were produced, one centered on the galactic center (l=0 deg) and one on the galactic anticenter (l=180 deg). This data set is available on 4x5 in. color negatives. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - ALL SKY OVERLAYS ON BLACK AND WHITE NEGATIVES

NSSDC ID 83-004A 01O, ALL SKY OVERLAYS

Time period covered - (N/A)

Quantity of data - 2 B/W NEGATIVE FRAMES

This data set is a set of coordinate overlays for the photographs as photographic negative transparencies in 5 in. sq. format. The scale is identical to the corresponding map product, so the overlays will be the correct size if enlarged by the same factor as the map. One overlay is provided for each declination zone from -30 deg to +30 deg; the overlays for zones of opposite sign are obtained by rotating the grids through 180 deg. Five overlays are provided for each declination zone between 45 deg and 75 deg to accommodate the fact that integer hour meridians cross the plates in these zones in five different configurations. Again, the overlay for the zone of opposite sign is obtained by rotating the grid 180 deg. All integer hour meridians are labeled OOM. The hour of right ascension should be determined from the position of the plate center given in the label on the photograph. The plate number to which a particular overlay pertains is printed in the lower right corner of the overlay. The overlays for the low resolution, all-sky maps come in two varieties: galactic longitude = 0.0 deg in the center and galactic longitude = 180 deg in the center. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - SKYPLATE IMAGES ON BLACK AND WHITE NEGATIVES, HCON 1

NSSDC ID 83-004A-01P, SKYPLATE IMAGES 1S1 HCON, B/W

Time period covered - (N/A)

Quantity of data - 212 B/W NEGATIVE FRAMES

This data set consists of "Skyplate Images HCON(Hours-Confirmed) 3" on 5x5 in. black and white negatives. The IRAS observations were made by the confirmation process that consisted of examining multiple observations and identifying which plausibly belonged to the same object. This data set is one of the primary data products of the IRAS mission. HCON 1 represents the first hours confirmed data observed with time separations from 100 min up to 36 h. HCON 2 represents the data confirmed about 2 weeks after the first hours confirmation, and the HCON 3 data were confirmed after the second confirmation. Generally, the hours confirmation was run on groups of successive satellite operation plans. Each skyplate image covers 16.5x16.5 deg on the celestial sphere, with a pixel size of 2 arc-min and an angular resolution of 4-6 arc-min. There are 212 fields in HCON 1. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - SKY PLATE (HCON 1) DATA ON MAGNETIC TAPE

NSSDC ID 83-004A-01Q, SKY PLATE (HCON 1) DATA ON TAPE

Time period covered - (N/A)

Quantity of data - 27 REELS OF TAPE

This data set consists of "Skyplate Images HCON(Hours-Confirmed)-3" on FITS formatted magnetic tape. The IRAS observations were made by the confirmation process that consisted of examining multiple observations and identifying which plausibly belonged to the same object. This data set is one of the primary data products of the IRAS mission. HCON 1 represents the first hours confirmed data observed with time separations from 100 min up to 36 h. HCON-2 represents the data confirmed about 2 weeks after the first hours confirmation, and the HCON-3 data were confirmed after the second confirmation. Generally, the hours-confirmation was run on groups of successive satellite operation plans. Each skyplate image covers 16.5x16.5 deg on the celestial sphere, with a pixel size of 2 arc-min and an angular resolution of 4-6 arc-min. There are 212 fields in HCON 1. For more information

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on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - GALACTIC PLANE IMAGES, HCON-1 ON BLACK AND WHITE FILM.

NSSDC ID 83-004A-01R, GALACTIC PLANE IMAGES 1ST HCON, B/W

Time period covered - (N/A)

Quantity of data - 24 B/W NEGATIVE FRAMES

This data set consists of galactic plane maps produced by mapping the skyplate images in galactic coordinates within 10 deg of the galactic plane to cover the full circle of the galaxy. This mapping was done because of the importance of the IRAS survey data for analyzing structure near the plane of the Milky Way. These remapped data are called the "galactic plane maps" or "galactic plane images." Although the pixel size in the galactic plane maps is the same as for the skyplate images, the remapping resulted in a slight degradation of resolution. The data set includes 24 16.7x20 deg fields, with centers at integral multiples of 15 deg in galactic longitude. This data set, remapped from the skyplate images HCON-1, is on 5x5 in. black and white negatives. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - GALACTIC PLANE OVERLAYS, ON BLACK AND WHITE NEGATIVES

NSSDC ID 83-004A-01S, GALACTIC PLANE OVERLAY

Time period covered - (N/A)

Quantity of data - 1 B/W NEGATIVE FRAME

This data set is a coordinate overlay for the photographs as a photographic negative transparency in 5 in. sq. format. The scale is identical to the corresponding map product, so the overlay will be the correct size if enlarged by the same factor as the map. One overlay is used for all galactic plane maps. It is aligned by the same method as the skyplates. One orientation of the overlay is used for even numbered fields and has 0 deg as the center longitude; the other orientation, used for all fields, has 5 deg as the center longitude. The tens digit of the true longitude should be obtained from the label of the picture. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100 22, Caltech, Pasadena, CA 91125.

Data set name - GALACTIC PLANE DATA ON MAGNETIC TAPE

NSSDC ID 83-004A-01T, GALACTIC PLANE DATA ON MAG TAPE

Time period covered - (N/A)

Quantity of data - 6 REELS OF TAPE

This data set consists of galactic plane maps produced by mapping the skyplate images in galactic coordinates within 10 deg of the galactic plane to cover the full circle of the galaxy. This mapping was done because of the importance of the IRAS survey data for analyzing structure near the plane of the Milky Way. These remapped data are called the "galactic plane maps" or "galactic plane images." Although the pixel size in the galactic plane maps is the same as for the skyplate images, the remapping resulted in a slight degradation of resolution. The data set includes 24 16.7x20 deg fields with centers at integral multiples of 15 deg in galactic longitude. This data set, remapped from the skyplate images HCON-1, -2, and -3, is on FITS formatted magnetic tape. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100 22, Caltech, Pasadena, CA 91125.

Data set name - SMALL SCALE STRUCTURE (SSS) CATALOG ON MAGNETIC TAPE.

NSSDC ID 83-004A-01U, SMALL SCALE STRUCTURE (SSS) CAT.

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

The "Small Scale Structure Catalog (SSS)" is a companion to the "Point Source Catalog" for extended sources larger than pointlike but smaller than 8 arc min, listing objects such as

galaxies, planetary nebulae, or compact H II regions. The catalog contains 16,740 sources. In spite of every effort to select only resolved, well-defined, and isolated sources for inclusion in the catalog, a few problems remain. At low signal-to-noise ratios, the researcher is cautioned in deciding whether a source is resolved or not. This data set is on a tape containing a file ordered by right ascension. For more information on this data set, see "IRAS Small Scale Structure Catalog," by George Helou and D.W. Walker, IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - POINTED OBSERVATIONS DIRECTORY ON TAPE.

NSSDC ID 83-004A-01V, POINTED OBSERVATIONS DIRECTORY

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set is a directory for requesters desiring observations of a particular object. In addition to the three nearly full sky surveys during the 10-month lifetime of the satellite, roughly 40% of the observing time was used to obtain pointed observations of selected objects. The "pointed observations," also commonly called "additional observations (AO)," were made of virtually every kind of astronomical object, using either the survey array or the Chopped Photometric Channel (CPC). The selected targets for areas of scientific interest are: active galaxies, bright stars, close galaxies, deep fields, molecular clouds, galactic structure, and solar system. A typical pointed observation took about 15 min. The primary data products resulting from the AO are a directory of all observations, available as a character-coded data file, and the "deep sky grids," each of which consists of eight two-dimensional arrays of numbers, called maps. A requester consults the AO directory to see if observations in a particular region of interest have been made; the images are then requested by asking for coordinate identifications. For more information on this data set, see "User's Guide to IRAS Pointed Observation Products," by E.L. Young et al., IPAC preprint No. PRE-008N, 1985; "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - POINTED OBSERVATIONS ON TAPE.

NSSDC ID 83-004A-01W, POINTED OBSERVATIONS ON TAPE

Time period covered - (N/A)

Quantity of data - 66 REELS OF TAPE

In addition to the three nearly full sky surveys during the 10 month lifetime of the satellite, roughly 40% of the observing time was used to obtain pointed observations of selected objects. The "pointed observations," also commonly called "additional observations (AO)," were made of virtually every kind of astronomical object, using either the survey array or the Chopped Photometric Channel (CPC). The selected targets for areas of scientific interest are: active galaxies, bright stars, close galaxies, deep fields, molecular clouds, galactic structure, and solar system. A typical pointed observation took about 15 min. The primary data products resulting from the AO are a directory of all observations, available as a character-coded data file, and the "deep sky grids," each of which consists of eight two dimensional arrays of numbers, called maps. A requester consults the AO directory (83-004A-01V) to see if observations in a particular region of interest have been made; the images are then requested by asking for coordinate identifications. For more information on this data set, see "User's Guide to IRAS Pointed Observation Products," by E.L. Young et al., IPAC preprint No. PRE-008N, 1985; "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base is available by contacting IPAC, 100 22, Caltech, Pasadena, CA 91125.

Data set name - SMALL SCALE STRUCTURE (SSS) CATALOG ON MICROFILM

NSSDC ID 83-004A-01X, SMALL SCALE STRUCTURE CAT, MICROFILM

Time period covered - (N/A)

Quantity of data - 3 CARDS OF B/W MICROFILM

The "Small Scale Structure Catalog (SSS)" is a companion to the "Point Source Catalog" for extended sources larger than pointlike but smaller than 8 arc min, listing objects such as galaxies, planetary nebulae, or compact H II regions. The catalog contains 16,740 sources. In spite of every effort to select only resolved, well-defined, and isolated sources for inclusion in the catalog, a few problems remain. At low signal to noise ratios, the researcher is cautioned in deciding whether a source is resolved or not. This data set is on

microfiche cards. For more information on this data set, see "IRAS Small Scale Structure Catalog," by George Helou and D.W. Walker, IPAC, 100-22, Caltech, Pasadena, CA 91125.

NSSDC ID 83-004A-01b, GALACTIC PLANE IMAGES 3RD HCON, B/W

Time period covered - (N/A)

Quantity of data - 24 B/W NEGATIVE FRAMES

Data set name - HCON 2, SKYPLATE IMAGES 12, 25, 60, AND 100 MICRONS.

NSSDC ID 83 004A-01Y, SKYPLATE IMAGES 2ND HCON, B/W

Time period covered - (N/A)

Quantity of data - 212 B/W NEGATIVE FRAMES

This data set consists of "Skyplate Images HCON(Hours-Confirmed) 3" on 5x5 in. black and white negatives. The IRAS observations were made by the confirmation process that consisted of examining multiple observations and identifying which plausibly belonged to the same object. HCON-1 represents the first hours confirmed data observed with time separations from 100 min up to 36 h. HCON-2 represents the data confirmed about 2 weeks after the first hours confirmation, and the HCON-3 data were confirmed after the second confirmation. Generally, the hours-confirmation was run on groups of successive satellite operation plans. Each skyplate image covers 16.5x16.5 deg on the celestial sphere, with a pixel size of 2 arcmin and an angular resolution of 4-6 arc-min. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

This data set consists of galactic plane maps produced by mapping the skyplate images in galactic coordinates within 10 deg of the galactic plane to cover the full circle of the galaxy. This mapping was done because of the importance of the IRAS survey data for analyzing structure near the plane of the Milky Way. These remapped data are called the "galactic plane maps" or "galactic plane images." Although the pixel size in the galactic plane maps is the same as for the skyplate images, the remapping resulted in a slight degradation of resolution. The data set includes 24 16.7x20-deg fields with centers at integral multiples of 15 deg in galactic longitude. This data set, remapped from the skyplate images HCON-3, is on 5x5 in. black and white negatives. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - ASTEROID AND COMET SURVEY DATA ON TAPE.

NSSDC ID 83-004A-01c, ASTEROID AND COMET SURVEY

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

Data set name - SKY PLATE (HCON 2) DATA ON MAGNETIC TAPE.

NSSDC ID 83-004A-01Z, SKY PLATE (HCON 2) DATA ON TAPE

Time period covered (N/A)

Quantity of data 27 REELS OF TAPE

This data set consists of "Skyplate Images HCON(Hours-Confirmed) 3" on FIIIS formatted magnetic tape. The IRAS observations were made by the confirmation process that consisted of examining multiple observations and identifying which plausibly belonged to the same object. HCON-1 represents the first hours confirmed data observed with time separations from 100 min up to 36 h. HCON-2 represents the data confirmed about 2 weeks after the first hours confirmation, and the HCON-3 data were confirmed after the second confirmation. Generally, the hours confirmation was run on groups of successive satellite operation plans. Each skyplate image covers 16.5x16.5 deg on the celestial sphere, with a pixel size of 2 arc min and an angular resolution of 4.6 arc min. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100 22, Caltech, Pasadena, CA 91125.

The "Asteroid and Comet Survey" is the survey for moving sources, while the all-sky survey is for fixed sources. Some 96% of the sky was scanned, providing data for 25 comets, 1811 known asteroids, and a number of unknown asteroids. This survey was the first to observe thermal emission from these moving objects, and it avoided the severe albedo bias presence in visual surveys. Sixteen data products were generated: (1) possible asteroids/comets, (2) catalog of asteroid sightings, (3) probable asteroids/comets, (4) asteroid catalog, (5) graphic data, (6) asteroid statistics, (7) comet catalog, (8) fast moving objects, (9) asteroid and comet LRS spectra, (10) unknown asteroids' LRS spectra, (11) master asteroid data base, (12) asteroid names and pointers, (13) asteroid ground-based data, (14) deep-sky asteroid catalog, (15) rejected sightings, and (16) asteroid and comet supplement. NSSDC holds seven data products, including a header file with a catalog of asteroid sightings, in addition to an asteroid catalog, asteroid statistics, a comet catalog, asteroid names and pointers, asteroid ground-based data, and asteroid rejected sightings. For more information on this data set, see "IRAS Asteroid and Comet Survey," edited by Dennis L. Matson, 1986, IPAC, Caltech, Pasadena, CA 91109.

Data set name - SERENDIPITOUS SURVEY CATALOG.

NSSDC ID 83-004A 01d, SERENDIPITOUS SURVEY CAT.

Time period covered (N/A)

Quantity of data - 10 CARDS OF B/W MICROFICHE

Data set name GALACTIC PLANE IMAGES, H-CON 2 ON BLACK AND WHITE FILM.

NSSDC ID 83-004A-01a, GALACTIC PLANE IMAGES 2ND HCON, B/W

Time period covered - (N/A)

Quantity of data - 24 B/W NEGATIVE FRAMES

This data set consists of galactic plane maps produced by mapping the skyplate images in galactic coordinates within 10 deg of the galactic plane to cover the full circle of the galaxy. This mapping was done because of the importance of the IRAS survey data for analyzing structure near the plane of the Milky Way. These remapped data are called the "galactic plane maps" or "galactic plane images." Although the pixel size in the galactic plane maps is the same as for the skyplate images, the remapping resulted in a slight degradation of resolution. The data set includes 24 16.7x20 deg fields with centers at integral multiples of 15 deg in galactic longitude. This data set, remapped from the skyplate images HCON-2, is on 5x5 in. black and white negatives. For more information on this data set, see "IRAS Catalogs and Atlases Explanatory Supplement," edited by C. Beichman et al., 1985. Detailed information on the data base and this data set is available by contacting IPAC, 100 22, Caltech, Pasadena, CA 91125.

The "Serendipitous Survey Catalog (SSC)" contains fortuitous observations of 43,866 pointlike sources that happened to lie in the 1813 individual fields included in the Pointed Observation Program. Its limiting sensitivity is higher than that of the "Point Source Catalog" typically by a factor of 4 because of longer integration times for each source. The amount of sky sampled in the SSC is nearly 1400 sq deg, but because of uneven sensitivity across the point observation fields, the effective sky coverage is 1108 sq deg. This data set is on microfiche cards. For more information on this data set, see "Explanatory Supplement to the IRAS Serendipitous Survey Catalog," by S.G. Kleinmann et al., 1986. Detailed information on the data base is available by contacting IPAC, 100 22, Caltech, Pasadena, CA 91125.

Data set name - SERENDIPITOUS SURVEY CATALOG ON TAPE.

NSSDC ID 83-004A-01e, SERENDIPITOUS SURVEY CATALOG

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

Data set name GALACTIC PLANE IMAGES, HCON 3 ON BLACK AND WHITE FILM.

The "Serendipitous Survey Catalog (SSC)" contains fortuitous observations of 43,866 pointlike sources that happened to lie in the 1813 individual fields included in the Pointed Observation Program. Its limiting sensitivity is higher than that of the "Point Source Catalog" typically by a factor of 4 because of longer integration times for each source. The amount of sky sampled in the SSC is nearly 1400 sq deg, but because of uneven sensitivity across the point observation fields, the effective sky coverage is 1108 sq deg.

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This data set is on magnetic tape. For more information on this data set, see "Explanatory Supplement to the IRAS Serendipitous Survey Catalog," by S.C. Kleinmann et al., 1986. Detailed information on the data base is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

Data set name - IRAS SURFACE BRIGHTNESS MAPS OF LARGE OPTICAL GALAXIES (RICE AND KOPLAN 1988)

NSSDC ID 83-004A-01f, SURF BRIGHT MAPS OF LARGE OPT GAL

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

IRAS, JOINT IRAS SWG  
LOW RESOLUTION SPECTROMETER

Data set name - CATALOG OF LOW RESOLUTION SPECTRA DATA ON MAGNETIC TAPE

NSSDC ID 83-004A-02A, CATALOG OF LOW RESOLUTION SPECTRA

Time period covered (N/A)

Quantity of data 1 REEL OF TAPE

This data set provides spectra of selected bright point sources in two overlapping wavelength regions, one extending from 7.7-13.4 micrometers, the other from 11.0-22.6 micrometers. The spectral resolution varied from 12 to 60 depending on wavelength. Three selection criteria were applied for the inclusions of the sources, as follows: (1) the source is contained in the IRAS Point Source Catalog, (2) the entire spectrum was observed at least twice with agreement in the results, and (3) each source passed a subjective inspection. The spectra are presented in two forms -- a tape version, called "The Catalog of Low Resolution IRAS Spectra," containing flux vs wavelength data, and a hard copy version, entitled "The Atlas of Low Resolution IRAS Spectra," containing graphical representations of the spectra. The latter has been published by the IRAS science team in Astron. Astrophys. Suppl., v. 65, p. 607, 1986. Detailed information on the data base and this data set is available by contacting IPAC, 100-22, Caltech, Pasadena, CA 91125.

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..... IUE .....  
.....

IUE, GUEST INVESTIGATORS  
LOW /HIGH RESOLUTION, ULTRAVIOLET  
SPECTROGRAPH PACKAGE

Data set name LOW /HIGH-RESOLUTION, ULTRAVIOLET  
SPECTROGRAPH IMAGES ON FILM

NSSDC ID 78-012A-01A, IUE SPECTROSCOPIC IMAGE DATA, FLM

Time period covered 06/20/78 TO 03/25/88

Quantity of data - 49674 B/W NEGATIVE FRAMES

This data set consists of images reduced by the image processing system at the IUE Observatory. Each image has a photographic hard copy generated by an Optronics photowrite device. Photometric representations of the IUE two dimensional spectral images in 256 discrete grey levels are produced on 8x10 in. (20.3x25.4 cm) film sheets, using digital images on magnetic tape as input. In addition to the images themselves, ancillary information also transmitted to the photowrite film includes a 16 step linear grey scale, a tickmarked border, and selected lines of the IUE spectral imaging processing system (IUESIPS) label associated with each image. A typical photowrite film sheet is arranged to display two adjacent images, e.g., the raw image and the image as it appears after appropriate processing operations have been performed on it. The precise nature of the processed image on photowrite film sheet depends on the type of original raw image. For wavelength calibration (WLC) images, the processed image is simply a geometrically corrected version of the original image; for astronomical target images, the processed image is a geometrically and photometrically corrected version of the original; for flat field images used in the construction of intensity transfer functions, the processed image is a geometrically corrected version of the image after the fiducial reseaux have been "removed" by the computer. Although these prints are processed to be as photometrically accurate as possible compared to the original digital data, it is recommended that they not be used to produce intensity plots of IUE spectra. Only digital image data on tape should be used for spectral analysis purposes requiring photometrically

accurate data. Detailed information on the data base is available by contacting Dr. Catherine Imhoff, Regional Data Analysis Facility, GSFC/NASA, Greenbelt, MD 20771.

Data set name - LOW-/HIGH-RESOLUTION, ULTRAVIOLET  
SPECTROGRAPH IMAGES ON TAPE

NSSDC ID 78-012A-01B, SPECTROSCOPIC IMAGE DATA ON TAPE

Time period covered - 04/01/78 TO 06/30/87

Quantity of data - 665 REELS OF TAPE

This data set consists of digital spectral data in image-type format provided by the IUE Observatory spectral image processing system group at NASA/GSFC; consequently, these spectra are referred to as images. Images on tape consist of various numbers of files depending upon their types, such as low dispersion, double aperture, calibration, etc. A raw image consists of 768 SEC vidicon scan lines containing 768 8-bit picture elements ("pixels") each. All reduced images (except for some calibrations) contain a geometrically and photometrically corrected (GPI or GPHOT) image, plus an extracted spectrum. Low-dispersion images contain image segment files in addition to the above. Images are supplied to NSSDC on blocked, 1600-bpi tapes prepared on the IUESIPS Sigma 9 computer. The tapes are processed by NSSDC to 6250-bpi tapes in variable block size, spanned record format so that several IUE tapes can be combined onto each NSSDC archive tape. Supplied with the data tapes are computer-generated hard copy reports giving information relevant to each object observed, including object and program identifications, a date on which the image will become releasable to the general scientific community, IUE tape identification and files, date delivered to NSSDC, and a series of codes to indicate nonstandard data reduction, reprocessing, or other anomalous circumstances related to the image processing. Detailed information on the data base is available by contacting Dr. Catherine Imhoff, Regional Data Analysis Facility, GSFC/NASA, Greenbelt, MD 20771.

Data set name - EUROPEAN SPECTROSCOPIC IMAGE DATA ON TAPE

NSSDC ID 78 012A 01C, EUROPEAN SPECT. IMAGE DATA

Time period covered 04/01/78 TO 06/30/87

Quantity of data 262 REELS OF TAPE

This data set consists of digital spectral data in image type format provided by the IUE Observatory spectral image processing system group at NASA/GSFC; consequently, these spectra are referred to as images. Images on tape consist of various numbers of files depending upon their types, such as low dispersion, double aperture, calibration, etc. A raw image consists of 768 SEC vidicon scan lines containing 768 8-bit picture elements ("pixels") each. All reduced images (except for some calibrations) contain a geometrically and photometrically corrected (GPI or GPHOT) image, plus an extracted spectrum. Low-dispersion images contain image segment files in addition to the above. Images are supplied to NSSDC on blocked, 1600-bpi tapes prepared on the IUESIPS Sigma 9 computer. The tapes are processed by NSSDC to 6250-bpi tapes in variable block size, spanned record format so that several IUE tapes can be combined onto each NSSDC archive tape. Supplied with the data tapes are handwritten hard copy pages giving identifications and file locations for each image on an associated tape. Monthly reports supplied on magnetic tape contain flags indicating when an image is releasable to the scientific community. Images from the VILSPA IUE Observatory are not supplied to NSSDC before an agreed upon proprietary period of 6 months has elapsed. For detailed information on this data set, contact Dr. Wayne Warren, Code 633, NASA/GSFC, Greenbelt, MD 20771.

Data set name - IUE NASA AND VILSPA EXTRACTED SPECTRUM  
IMAGE DATA ON MAGNETIC TAPE

NSSDC ID 78 012A-01D, EXTRACTED SPECTRA ON TAPE

Time period covered - 04/01/78 TO 06/30/87

Quantity of data - 255 REELS OF TAPE

The "Extracted IUE Spectra" were created by subsetting the principal IUE image data (78 012A-01A, -01B, and -01C). Using software developed by IUE project personnel, tapes of extracted spectra are produced on a continuing basis by NSSDC personnel directly from newly completed primary data tapes. The extracted spectra are also transferred to the mass storage system on the IBM 3081 computer at GSFC in order to make the data readily available to IUE project personnel and to visiting scientists. Detailed information on the data base is available by contacting Dr. Catherine Imhoff, Regional Data Analysis Facility, GSFC/NASA, Greenbelt, MD 20771.

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Data set name - IUE (NASA/VILSPA) MERGED OBSERVATORY LOG  
ON MICROFILM

NSSDC ID 78-012A-01E, IUE (NASA/VILSPA) MERGED OBS LOG

Time period covered - 04/01/78 TO 03/31/85

Quantity of data - 21 CARDS OF B/W MICROFICHE

This data set, contained on microfiche, is a merged IUE observatory (GSFC/VILSPA) log. The dates for observations are April 1, 1978 - May 31, 1982. The log lists object identification, program identification, RA and Dec, magnitude, color index, spectral type, luminosity, object class, FES mode, FES counts, camera used, image sequence number, high or low dispersion, large or small aperture, large aperture status, exposure length, time of observation, acquisition station, notes, processing data, and general comments. Solar system objects, sorted by right ascension, are listed separately at the end of the log. For detailed information on this data set, contact Dr. Wayne Warren, Code 633, NASA/GSFC, Greenbelt, MD 20771.

Data set name - IUE (NASA/VILSPA) MERGED OBSERVATORY LOG  
ON MAGNETIC TAPE

NSSDC ID 78-012A-01F, IUE (NASA/VILSPA) MERGED OBS LOG

Time period covered - 04/03/78 TO 05/31/87

Quantity of data - 1 REEL OF TAPE

This data set consists of one 9-track, EBCDIC, 1600-bpi magnetic tape with one file of data containing merged IUE observatory (GSFC/VILSPA) log. The dates for observations are April 1, 1978 - May 25, 1985. The logical record length is 109 bytes. This log lists object identification, program identification, RA and Dec, magnitude, color index, spectral type, luminosity, object class, FES mode, FES counts, camera used, image sequence number, high or low dispersion, large or small aperture, large aperture status, exposure length, time of observation, acquisition station, notes, processing data, and general comments. For detailed information on this data set, contact Dr. Wayne Warren, Code 633, NASA/GSFC, Greenbelt, MD 20771.

Data set name - VILSPA PHOTOWRITES

NSSDC ID 78-012A-01G, VILSPA PHOTOWRITES

Time period covered - 10/03/78 TO 04/04/82

Quantity of data - 753 B/W NEGATIVE FRAMES

This data set, contained on 8x10 in. black and white negatives, is photowrites of VILSPA images. Each film contains six raw image only photowrites. Images are grouped by camera used and ordered by image sequence number. Each image is annotated by five or six lines of selected image header information. The size of each image is the same as that used in the three-image, processed-image photowrite films created for GSFC IUE images, i.e., 100-micron picture elements with the SEC vidicon target about 70 mm in diameter. No images with superimposed wavelength scales and no photometrically corrected images were in this data set. For detailed information on this data set, contact Dr. Wayne Warren, Code 633, NASA/GSFC, Greenbelt, MD 20771.

Data set name - UV SPECTRAL ATLAS (1983) DATA ON MAGNETIC  
TAPE

NSSDC ID 78-012A-01H, UV SPECTRAL ATLAS (1983) ON MAG TP

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set consists of one 9 track, 1600- or 6250-bpi magnetic tape with a mixed EBCDIC and binary mode. The data set is an atlas listing HD number and name or BD number of the star, spectral type, color index, color excess, [(B-V)] IUE image number, aperture used for exposure, exposure time in seconds, temperature of the camera head amplifier during exposure, maximum exposure level expressed in unit of data number (DN), which has a range from 0 to 255, and general comments. For detailed information on processing of IUE spectra, a copy of the "International Ultraviolet Explorer Image Processing Information Manual" is available from NSSDC or WDC-A.

Data set name - IUE LOW DISPERSION SPECTRA FLUX CATALOGUE  
PART 1. NORMAL STARS

NSSDC ID 78-012A-01I, LOW DISPERSION ATLAS VILSPA 1984

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This atlas, known as the "IUE Low-Dispersion Spectra Flux Catalogue. Part 1. Normal Stars," is a compilation of flux data issued by European IUE scientists. The atlas was published by A. Heck, D. Egret, M. Jaschek, and C. Jaschek as ESA SP-1052, with a brief description and announcement of availability on magnetic tape in Astron. Astrophys. Suppl., v. 57, p. 213, 1984. The atlas contains 229 spectra of 229 stars and is available on a character-coded, fixed-length-record file; hence, no special processing software is needed to work with the data. The spectra for individual objects are arranged back-to-back in the data file. Each spectrum contains the same number of records, with the first record giving the object identification and ancillary information, and the following records containing the absolute fluxes in 2-A steps in the wavelength range 1150-3200 A. The file is contained on one magnetic tape and is adequately documented by the published paper and an accompanying format description that is disseminated with the data. For more information on this data set, contact Dr. Wayne Warren, Code 633, GSFC/NASA, Greenbelt, MD 20771.

Data set name - IUE ATLAS OF O TYPE STARS

NSSDC ID 78-012A-01J, ATLAS O-TYPE SPECTRA (1987)

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

The data set is the "IUE Atlas of O-Type Stars," by N.R. Walborn, J. Nichols-Bohlin, R.J. Panek, 1985, NASA Ref. Publ. 1155, containing 101 high-dispersion spectra of 98 O stars in the wavelength range 1200-1900 A. The data are in character-coded form with header and flux records in a uniform format. They are contained on one magnetic tape and are well documented by the published atlas and by special documentation for the machine-readable version, prepared by the Astronomical Data Center (ADC), GSFC/NASA, Greenbelt, MD 20771.

IUE, NONE ASSIGNED  
PARTICLE FLUX MONITOR (SPACECRAFT)

Data set name - ANALOG TELEMETRY STRIP CHARTS ON  
MICROFICHE

NSSDC ID 78-012A-02A, ANALOG TELEMETRY CHARTS, MFICHE

Time period covered - 02/03/78 TO 01/21/83

Quantity of data - 84 CARDS OF B/W MICROFICHE

This data set, contained on 84 microfiche cards, is analog telemetry strip charts. The hard copy charts were supplied by Ivan Mason, GSFC/NASA, and they were microfilmed at NSSDC. Note that the time order of the panels is written on the plots as 1, 2, 3, 4. The order for a day is 1 & 3 and 2 & 4. For detailed information on this data set, contact Dr. James Vette, Code 630.2, GSFC/NASA, Greenbelt, MD 20771.

Data set name - 5 MINUTE MEDIAN COUNT RATE DATA ON  
MAGNETIC TAPE

NSSDC ID 78-012A-02B, 5 MINUTE MEDIAN COUNT RATE DATA

Time period covered - 11/06/80 TO 08/15/86

Quantity of data - 34 REELS OF TAPE

This data set, contained on 9 track, 1600 bpi, EBCDIC, multitracked magnetic tapes, is median count rate data of the IUE Flux Particle Monitor over a time interval of 5 min. Also included in this data set are additional data providing spacecraft orbit and attitude information associated with the median count rate data. Currently this data set covers the time period November 6, 1980, to August 15, 1986. As new tapes are received by NSSDC, they will be stacked and added to this data set. For detailed information on this data set, contact Dr. James Vette, Code 630.2, GSFC/NASA, Greenbelt, MD 20771.

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DAO 2, CODE  
WISCONSIN EXPERIMENT PACKAGE

Data set name - REDUCED PHOTOMETER DATA ON MAGNETIC TAPE

NSSDC ID 68-110A-02A, REDUCED PHOTOMETER DATA MAGTAPE

Time period covered - 12/11/68 TO 02/08/73

Quantity of data - 414 REELS OF TAPE

This data set, on 414 tapes containing raw data from all of the seven Wisconsin telescopes as well as reduced data from the stellar photometers, is ordered by the date and time of observation. Sufficient information is included on each tape to allow hand reduction of the raw stellar photometer data. To find observations of a particular object or location, the user must first refer to the catalogs available on microfilm (data set 68-110A-02C) or on magnetic tape (data set 68-110A-02G), find the orbits containing the data desired, and then request those tapes containing the desired orbit(s). These data, received from the experimenter, are contained on 7-track, 556-bpi, bcd magnetic tape. Each reel contains data covering 2 to 3 days of operation. For more detailed information on the main data base, contact Dr. Arthur Code, Washburn Observatory, University of Wisconsin, 475 N. Charter St., Madison, WI 53706.

Data set name - REDUCED PHOTOMETER DATA ON MICROFILM  
PLUS SUPPLEMENTAL OPERATIONAL INFORMATION

NSSDC ID 68-110A-02B, REDUCED PHOTOMETER DATA, MICROFILM

Time period covered - 12/11/68 TO 02/08/73

Quantity of data - 99 REELS OF MICROFILM

This data set consists of microfilmed printouts of the data contained in data set 68-110A-02A. Although raw data from all instruments are included in this data set, the principal data are the raw and reduced stellar photometer data. These data are ordered by the date and time of observation. To find observations of a particular object or location, the user should first refer to the catalogs available on microfilm (data set 68-110A-02C) or on magnetic tape (data set 68-110A-02G), find the orbits containing the data desired, and then order only the reels of microfilm containing those orbits. For detailed information on the data base, contact Dr. Arthur Code, Washburn Observatory, University of Wisconsin, 475 N. Charter St., Madison, WI 53706.

Data set name - CATALOG OF DAO 2 - WEP DATA, ORDERED BY  
DATE OF OBS., R.A., AND SPECTRAL TYPE

NSSDC ID 68-110A-02C, INDEX TO 68-110A-02A, 02B

Time period covered - 12/11/68 TO 12/15/72

Quantity of data - 1 REEL OF MICROFILM

These data, contained on 16-mm microfilm, are a catalog of data sets 68-110A-02A and 68-110A-02B. The catalog data are listed in three ways: (1) by the contact number, which is the number of the spacecraft orbit during which data taken previously were being transmitted to the earth during a contact with a telemetry station--thus, this sort is ordered by the time of observation; (2) by the right ascension of the observed object with all observed objects having the same right ascension ordered by contact number; and (3) by the spectral type and luminosity class of the observed object. Objects having the same spectral type are ordered by their luminosity class. Objects having the same spectral type and the same luminosity class are ordered by the contact number. All catalog listings provide the orbit numbers of the times when a particular object was observed, thus enabling the user to find the appropriate data in the tape or microfilm data sets. This data set was generated at NSSDC from tape data set 68-110A-02C. For detailed information on the data base, contact Dr. Arthur Code, Washburn Observatory, University of Wisconsin, 475 N. Charter St., Madison, WI 53706.

Data set name - CATALOG OF OBSERVATIONS, ON MAGNETIC  
TAPE, ORDERED BY VARIOUS PARAMETERS

NSSDC ID 68-110A-02G, INDEX TO 68-110A-02A (MAGTAPE)

Time period covered - 12/11/68 TO 02/08/73

Quantity of data - 3 REELS OF TAPE

This data set, submitted by the experimenter and contained on 7 track, 556 bpi, bcd magnetic tape, is a catalog

of the data contained on data sets 68-110A-02A and 68-110A-02B. The catalog data are listed in three ways: (1) by the contact number, which is the number of the spacecraft orbit during which data taken previously were being transmitted to the earth during a contact with a telemetry station--thus, this sort is ordered by the time of observation; (2) by the right ascension/declination of the observed object, with all observed objects having the same right ascension ordered by contact number; and (3) alphabetically by the name of the observed object. All catalog listings provide the orbit numbers of the times when a particular object was observed, thus enabling the user to find the appropriate data on the tape or microfilm data sets. For more detailed information on this data set, contact Dr. Arthur Code, Washburn Observatory, University of Wisconsin, 475 N. Charter St., Madison, WI 53706.

Data set name - ARCHIVE MAPS ON MICROFILM

NSSDC ID 68-110A-02H, DAO-2, ARCHIVE MAPS, MICROFILM

Time period covered - 12/11/68 TO 02/08/73

Quantity of data - 7 REELS OF MICROFILM

The archive maps describe an orbit-by-orbit history of the DAO 2 spacecraft. A header record containing the orbit number, station, estimated time of arrival, and duration of the first contact in the orbit is given for each orbit. The following information is reported in plot form as a function of Greenwich Mean Time (GMT): ground contacts during the orbit, spacecraft night, and position of the South Atlantic Anomaly. For each star observed during the orbit the following information is given: (1) star card containing object identification, 1950 equatorial coordinates, visual magnitude, spectral type, and UBV photometry; (2) miscellaneous comments (if any); (3) rise and set periods for the object; and (4) one line showing periods of photometry and spectrophotometry with either scanner 1 or scanner 2. Instrument identifications and periods are plotted only if observations were made. For more detailed information on this data set, contact Dr. Arthur Code, Washburn Observatory, University of Wisconsin, 475 N. Charter St., Madison, WI 53706.

Data set name - DAO 2 ULTRAVIOLET SPECTRA: AN ATLAS OF  
STELLAR SPECTRA

NSSDC ID 68-110A-02I, ULTRAVIOLET PHOTOMETRY

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set is a subset of ultraviolet stellar spectra comprising the highest quality data obtained with both spectrometers aboard the DAO 2. The first file of the data set contains ultraviolet stellar fluxes for 164 bright stars in the spectral range between 1200 to 1300 A, with resolutions of about 22 A in the region from 3600 to 1850 A and about 12 A in the region from 1850 to 1160 A. Files 2 and 3 contain spectra for 132 stars in the region 1200-1850 A and 34 stars in the region 1800-3600 A, respectively, with resolutions as stated above. The monochromatic flux is given in units of ergs/sq cm s A for all data. The data have been published in graphical and tabular form by A.D. Code and M.R. Meade, *Astrophys. J. Suppl.*, v. 39, p. 195, 1979; M.R. Meade and A.D. Code, *Astrophys. J. Suppl.*, v. 42, p. 283, 1980.

Data set name - DAO 2 ULTRAVIOLET FILTER PHOTOMETRY FOR  
531 STARS

NSSDC ID 68-110A-02J, ULTRAVIOLET FILTER PHOTOMETRY

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set consists of one file of the ultraviolet photometry data of 531 stars observed with the Wisconsin Experiment Package aboard the DAO 2. The data were obtained with medium band interference filters and have been reduced to a uniform magnitude system. They represent a subset of partially reduced data currently on file at NSSDC and described in NSSDC/WDC-A document 74-02. The ultraviolet magnitudes contained in the tape file were published by A.D. Code, A.V. Holm, and R.L. Bottemiller, *Astrophys. J. Suppl.*, v. 43, p. 501, 1980.

DAO 2, WHIPPLE  
HIGH-RESOLUTION TELESCOPES

Data set name - REDUCED OBSERVATIONS OF UV OBJECTS IN  
CATALOG FORM ON MAGNETIC TAPE

NSSDC ID 68-110A-01A, CELESCOPE CATALOGUE - MAG TAPE

Time period covered - 12/08/68 TO 04/30/70  
(Date supplied by experimenter)

Quantity of data - 1 REEL OF TAPE

This data set, contained on magnetic tape, is the complete telescope catalog of objects observed in the ultraviolet region. These are reduced data supplied by the experimenter. This catalog is a tabular listing including, for each object observed, (1) the Henry Draper number, (2) the right ascension/declination (equinox 1950), (3) the visual magnitude, (4) the photoelectric colors B-V and U-B, (5) spectral type and luminosity class (including a peculiarity flag), (6) the observed ultraviolet magnitudes (for the four passbands) and standard deviations, (7) the right ascension/declination (epoch 2000), (8) the weighting values used to obtain the average ultraviolet magnitudes reported, (9) a code referring to the general type of object observed (galactic cluster, radio source, etc.), (10) code(s) indicating photometric properties of the object (e.g., visual binary, classical cepheid variable, novalike variable), (11) codes indicating spectral characteristics of the star (e.g., spectroscopic binary, peculiar A-type spectrum, magnetic field), (12) a remarks column, and (13) a listing of bibliographic references. Included with the data set are programs that enable the user to search the tape for various types of stars, as well as for specific objects. This tape was generated on a CDC series computer and is written in binary format at 556 bpi on 7-track tape. For information on the main data base, contact Dr. Robert J. Davis, Harvard Smithsonian Center for Astrophysics, 60 Garden St., Cambridge, MA 02138.

Data set name - CELESCOPE CATALOG REORDERED BY VARIOUS PARAMETERS ON MICROFILM

NSSDC ID 68-110A-01B, CELESCOPE CATALOG - MICROFILM

Time period covered - 12/08/68 TO 04/30/70  
(Date supplied by experimenter)

Quantity of data 1 REEL OF MICROFILM

This data set includes the complete catalog of the telescope data and is contained on 16-mm microfilm. It was generated at NSSDC from data set 68-110A-01A and includes all its data. These cataloged data are divided into five segments, each ordered in a different manner. The first ordering is by right ascension/declination. This ordering is a longitude sort, with all sources appearing at the same right ascension, then being ordered by declination (north to south, or +90 deg to -90 deg). The coordinates used are epoch 1950. This ordering is the form in which the telescope catalog is ordered on the magnetic tape. The second ordering is by Henry Draper (HD) number. This ordering is based on the serial numbers assigned sources in the Henry Draper star catalog. Sources not assigned HD numbers appear at the end of the listing. The third ordering is by Durchmusterung number. This ordering is sorted on declination (north to south, or +90 deg to -90 deg). The fourth ordering is by visual magnitude. This ordering lists the sources in order by ascending magnitude. The fifth ordering is by spectral class and subclass and, within each subclass, lists sources by ascending luminosity. In the last two sorts, objects with the same sort parameter (e.g., visual magnitude) are ordered by right ascension and then, if necessary, by declination. For information on the main data base, contact Dr. Robert J. Davis, Harvard Smithsonian Center for Astrophysics, 60 Garden St., Cambridge, MA 02138.

Data set name - BIBLIOGRAPHY, ON MAGNETIC TAPE, FOR USE WITH THE CELESCOPE CATALOG

NSSDC ID 68-110A-01C, BIBLIOGRAPHY - MAGTAPE

Time period covered - (N/A)

Quantity of data - 2 REELS OF TAPE

This data set contains full citations for the bibliographic entries that are listed by serial number in data sets 68-110A-01A and 68-110A-01B. These entries are ordered both by the assigned serial number and by author. This data set, which is supplemental information for data sets 68-110A-01A and 68-110A-01B, is contained on 7-track, 556-bpi, bcd magnetic tapes supplied by the experimenter. For information on the main data base, contact Dr. Robert J. Davis, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge, MA 02138.

Data set name - BIBLIOGRAPHY ON MICROFILM FOR USE WITH THE CELESCOPE CATALOG

NSSDC ID 68-110A-01D, BIBLIOGRAPHY - MICROFILM

Time period covered - (N/A)

This data set contains full citations for the bibliographic entries that are listed by serial number in data sets 68-110A-01A and 68-110A-01B. These entries are ordered both by the assigned serial number and by author. This data set, which is supplemental information for data sets 68-110A-01A and 68-110A-01B, is contained on 16-mm microfilm that was generated at NSSDC from data set 68-110A-01C. For information on the main data base, contact Dr. Robert J. Davis, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge, MA 02138.

Data set name - HARDCOPY CELESCOPE CATALOG OF ULTRAVIOLET STELLAR OBSERVATIONS

NSSDC ID 68-110A-01E, CELESCOPE CATALOG - HARDCOPY

Time period covered - 12/07/68 TO 01/00/70  
(Date supplied by experimenter)

This hard copy data set is the complete telescope catalog of objects observed in the ultraviolet region. These reduced data were published by the experimenters. This catalog is a tabular listing of each object observed and includes: (1) the Henry Draper number, (2) the right ascension/declination (epoch 1950), (3) the visual magnitude, (4) the photoelectric B-V and U-B colors, (5) the spectrum and luminosity class (including a peculiarity flag), (6) the observed ultraviolet magnitudes (for the four passbands) and standard deviations, (7) the right ascension/declination (epoch 2000), (8) weighting values used to obtain the average UV magnitudes reported, (9) a code referring to the general type of object observed (e.g., galactic cluster, radio source), (10) code(s) indicating photometric properties of the object (e.g., visual binary, cepheid variable), (11) codes indicating spectral characteristics of the star (e.g., spectroscopic binary, peculiar A-type spectrum), (12) a remarks column, and (13) a listing of bibliographic references. This document, "The Telescope Catalog of Ultraviolet Stellar Objects," by R.J. Davis, W.A. Deutschman, and K.L. Haramundanis (B14387), is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, stock no. 4700-00260.

Data set name - SOFTWARE TO AID THE USE OF THE MAGNETIC TAPE VERSION OF THE CELESCOPE CATALOG

NSSDC ID 68-110A-01F, CDC UTILITY PRINT PROGRAM ON TAPE

Time period covered - 12/08/68 TO 04/30/70

Quantity of data 1 REEL OF TAPE

This data set, contained on 556 bpi, 7 track magnetic tapes, consists of programs that are needed to read and process the catalog data set 68-110A-01A easily, and are supplemental data for that data set. This software package is intended to allow users to access the magnetic tape version of the catalog with a minimum of programming effort. This package consists of a driver subroutine plus several printing and processing subroutines. All routines have been written in USA Standard Fortran, except where otherwise noted. Several subroutines (reading and unpacking of records) must be written by the users to conform to the word size of their machines. Detailed descriptions of this software are to be found in the "Users Guide to the Magnetic Tape Version of the Telescope Catalog of Ultraviolet Observations," by R. Davis et al. (B17101).

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\*\*\*\*\* DAO 3 \*\*\*\*\*  
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DAO 3, BOYD  
STELLAR X RAYS

Data set name REDUCED DATA ON MAGNETIC TAPE

NSSDC ID 72-065A-02A, REDUCED DATA TAPES

Time period covered - 08/25/72 TO 12/14/80

Quantity of data - 28 REELS OF TAPE

This data set, contained on 9-track, 800 bpi, binary, multitracked tape, is digitized data from the University College London Stellar X-Ray Experiment on the Copernicus satellite. The data are all in a continuous time sequence from tape number 1, covering the interval from August 1972 to December 1980. The data record contains UT of start of data frame, observation constraint symbols providing pointing of the instrument, X-ray count acceptance period, detector counts in 1-3 A, 3-9 A, and 6-18 A spectral channels, background shutter position, Pulse

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Height Analyser (PHA) fed from 1-3 A, 3-9 A, and 6-18 A channels, PHA channel counts, guard counts, high or low sensitivity, pulse shape discriminator speed and mode, detector high tension, experiment heater condition, background alternate mode, low voltage power supply condition, iris selected, filter selected, analog telemetry group, operating mode, startracker axis count, analog telemetry word, day of year, and year. For more detailed information on this data set, contact Dr. Keith Mason, Department of Physics and Astronomy, University College London, Gower Street, London WC1E 6BT, England.

Data set name - QUICK LOOK PLOTS OF REDUCED X-RAY  
FLUX VS TIME IN 30 MIN BINS WITH SOURCE ID

NSSDC ID 72-065A-02B, QUICK LOOK PLOTS FLUX VS TIME

Time period covered - 08/30/72 TO 12/14/80  
(Date supplied by experimenter)

Quantity of data - 2 REELS OF MICROFILM

This data set consists of two sets of quick look plots of reduced data. The plots are X-ray flux vs time on and off X-ray sources. They are a continuous record of all observations from instrument turn-on in August 1972 to shutdown in December 1980. The flux is in DAO counts per 62.9 s integration period and binned in 30 min bins. Sources observed are identified by name. An averaged background subtraction is done. These plots can be used for differential flux variations and time relations, but they should not be used to obtain absolute fluxes. One set of plots is scaled for weak low-resolution X-ray sources and the other set is for stronger sources that go off scale on the low-resolution plots. A more quantitative analysis can be done from the complete data base on tape. See NSSDC data set 72-065A-02A. For more information on the main data base, contact Dr. Keith Mason, Department of Physics and Astronomy, University College London, Gower Street, London WC1E 6BT, England.

Data set name - UCL CATALOG OF OBSERVED SOURCES  
1972 - 1980

NSSDC ID 72-065A-02C, UCL OBSERVING CATALOG

Time period covered - 08/26/72 TO 12/14/80

Quantity of data - 1 REEL OF MICROFILM

This data set consists of an observing catalog from the UCL Stellar X-Ray Experiment and contains two separate listings. The first listing is in chronological order and the second is in ascending order of the right ascension (1950 epoch) of the source. Both listings contain: (1) source name - common name, HD number, or an identifier for an offset pointing or scan; (2) RA and Dec. 1950 epoch of the actual spacecraft pointing; (3) day and GMT day and time of the start of the spacecraft orbit during which the observation begin; (4) orbit-spacecraft orbit number. The catalog covers the timeframe August 1972 through February 1981. For more information on this data set, contact Dr. Keith Mason, Department of Physics and Astronomy, University College London, Gower Street, London WC1E 6BT, England.

DAO 3, SPITZER  
HIGH-RESOLUTION TELESCOPES

Data set name - UV DATA OF STELLAR OBJECTS ON MAG TAPE

NSSDC ID 72-065A-01A, ULTRAVIOLET DATA

Time period covered - 08/21/72 TO 07/29/79

Quantity of data - 10 REELS OF TAPE

These ultraviolet data are contained on 9-track, 1600-bpi, binary magnetic tape created on an IBM 360 computer. The tapes are multitracked with a physical record length of 7294 bytes. Each logical record consists of a 13-word header and an array of scan information containing a variable number of words. The header information consists of star observation number; spacecraft equivalent timeclock reading; number of points in data scan; photomultiplier tube number; longitude of ascending node and orbit; GMT of observation; first and last times and wavelengths of scan; satellite and earth orbital parameter; total observed counts; sigma and average counts; and reduction year, day, and fraction of day. The array contains wavelength and count information in pairs of words. The time for each measurement must be computed from the fields containing time information. For more detailed information on the main data base, contact Dr. John Rogerson Jr., Department of Astrophys. Sci., Peyton Hall, Princeton University, Princeton, NJ 08540.

Data set name - UV SPECTRAL ATLAS OF TAU SCORPII ON MAG  
TAPE

NSSDC ID 72-065A-01B, TAU SCORPII UV SPECTRAL ATLAS, TPE

Time period covered - 07/02/73 TO 08/27/73  
(Date supplied by experimenter)

Quantity of data - 1 REEL OF TAPE

This data set consists of one 9-track, 1600-bpi, magnetic tape with two files. File one contains the second order spectrum of Tau Scorpii in the wavelength range from 948.735 - 1420.510 A. File two is the first order spectrum of the same star (observed from the Copernicus satellite) in the wavelength range of 1418.187 - 1560.372 A. Construction of both files is identical, except that the variable IB2 and IBN2 (defined in the documentation) contain zeros because there is no alternative calculation for the scattered light in this part of the spectrum. The printout columns (atlas variables) are as follows. N = number of sets of data (24). Col 1, IW = wavelength of a datum point in milliangstroms, which may be converted to the published atlas wavelength by dividing by 1000.0 [publication is J.B. Rogerson, Jr., "The Copernicus Ultraviolet Spectral Atlas of Tau Scorpii," Astrophys. J. Suppl. Series 35, (1), September 1977]. Col 2, IC = corrected count rate for wavelength point multiplied by 10.0. The scattered light has not been subtracted from IC. Dividing by 10 will return it to the count scale tabulated in the published atlas. Col 3, IB1 = a scattered light estimate for the datum point multiplied by 10.0 to obtain the scale of the published counts. Col 4, IB2 = another scattered light estimate, multiplied by 10.0. It, too, should be divided by 10.0 to agree with published atlas values. Col 5, ICN = normalized count, which is plotted in the atlas; multiplying by 1000.0 will return it to the published scale of 0.0 to 1.0. Col 6, IBN1 = scattered light discussed in IB1, normalized using the same normalization factor. Dividing IBN1 by 10,000 will place it on the scale as the published one. Col 7, IBN2 = IB2 normalized in the same manner as discussed for IBN1.

Data set name - IOTA HERCULIS ULTRAVIOLET SPECTRAL ATLAS  
ON MAGNETIC TAPE

NSSDC ID 72-065A-01C, IOTA HERCULIS UV SPECTRAL ATLAS

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

These Iota Herculis UV spectral atlas data are on 9-track, 1600-bpi, binary magnetic tape created on an IBM 360 computer. The tape contains three files. File one is the second order spectrum; file two is the first-order spectrum; and file three contains a program to read and list files one and two. The spectral data are blocked at ten 145 word logical records per physical block. The first word of each logical record contains the number of sets of data (24, except for the last set) in each read. It is followed by words containing wavelength in angstroms of a data point; corrected count rate for the wavelength point (scattered light has not been removed); smoothed count rate computed at the wavelength point using a Fourier smoother; scattered light estimate derived by experimenter; normalized smooth count rates as displayed in the atlas, with unity at the top of each plot; and scattered light normalized using the same normalization factors as were used on smoothed count rates. These data are detailed in W.L. Upson II and J.B. Rogerson, Jr., "The Copernicus Ultraviolet Atlas of Iota Herculis," Astrophys. J. Suppl., v. 42, p. 1, 1980.

Data set name - UV PLOTS

NSSDC ID 72-065A-01D, UV PLOTS ON MICROFILM

Time period covered - 12/09/72 TO 07/05/77

Quantity of data - 164 REELS OF MICROFILM

These data are UV spectral plots on microfilm. These UV spectra were obtained by the Princeton Telescope-Spectrometer in the period from December 9, 1972, through July 5, 1977. The spectra cover the 950 - 3000 A range. The plots contain observation times in UT, observed astronomical objects, and flux scales. For additional information on these plots, contact Dr. Edward Jenkins, Princeton University Observatory, Princeton, NJ 08544.

Data set name - COPERNICUS OBSERVING CATALOG FOR THE  
PRINCETON UV EXPERIMENT

REPRODUCED FROM THE  
BEST AVAILABLE COPY  
OF POOR QUALITY

NSSDC ID 72-065A-01E, COPERNICUS UV OBSERVATION DIRECT

Time period covered - 08/27/72 TO 02/15/81  
(Date supplied by experimenter)

Quantity of data - 4 CARDS OF B/W MICROFICHE

This data set is a catalog of observations made with the Princeton University UV Experiment on Copernicus. It covers the full mission lifetime from August 1972 to February 1981. There are two separate listings of information, one ordered by HD number and the second ordered by star/object name. This catalog lists information on date observed, date reduced, orbit number, first serial number, number of scans, spectral type of the object, and color excess. Data from these observations are available on magnetic tape from NSSDC (data set ID 72-065A-01A). The observations can be identified on tape by the orbit numbers in this catalog. For more information on this catalog, contact Dr. Edward Jenkins, Princeton University Observatory, Princeton, NJ 08544.

Data set name - A CATALOG OF 0.2-A RESOLUTION FAR UV  
STELLAR SPECTRA MEASURED WITH COPERNICUS

NSSDC ID 72-065A 01H, FAR UV SPECTRA COPERNICUS

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set, contained on 9-track magnetic tape, consists of one file representing a subset of far-ultraviolet stellar spectral data for 80 D- and B-type stars. The data cover the spectral region 1000-1450 A with a resolution of 0.2 A. The tape has 151 logical records and 2250 data points each. The first data point for each star begins at 1000 A and the points step in 0.2-A intervals to 1450 A. Record 1 contains the object identification in the first 16 bytes; the remainder of the record is blank (bytes 17-120). Records 2-151 contain the spectral data, 15 data points per record. Each data point is of the form "Average Corrected Signal/Number of Observations" in format (16, 1H/, 11) or blank. If a data point is blank, it was deleted from the originally published results because of the obvious flaw attributable to guidance errors or to overcorrection or undercorrection for particle background. The data have been published in graphical and tabular form by I.P. Snow and E.B. Jenkins, Astrophys. J. Suppl., v. 23, p. 269, 1977. For more detailed information on this atlas, contact Dr. Edward Jenkins, Princeton University Observatory, Princeton, NJ 08544.

Data set name - ULTRAVIOLET SPECTRAL ATLAS OF BETA  
ORIONIS DATA ON MAGNETIC TAPE

NSSDC ID 72 065A 01J, BETA ORIONIS UV SPECTRAL ATLAS TP

Time period covered (N/A)

Quantity of data - 1 REEL OF TAPE

This data set is an ultraviolet spectral atlas of Beta Orionis covering the 999 - 1561 A spectral range. The spectrum was observed by the Princeton spectrometer aboard the Copernicus satellite with a nominal spectral resolution of 0.05 A from the 999 to 1420 A range (second order spectrum), and 0.1 A for the longer wavelengths (first order spectrum). The data were obtained between December 3 and 17, 1974, with a short observation on January 19, 1975, to replace some unusable measurements. This atlas was published in the Astrophysical Journal Supplement Series, v. 49, pp. 353-404, 1982, by J.B. Rogerson, Jr., and W. Upson II. The data are contained on a 9 track, 1600 bpi tape written on an IBM 3033 computer. The tape contains three files: (1) the second order spectrum, (2) the first order spectrum, and (3) a program to read the tape. For more detailed information, contact Dr. John Rogerson, Jr., Peyton Hall, Princeton University Observatory, Princeton, NJ 08544.

Data set name - UV EXPERIMENT OBSERVING HISTORY

NSSDC ID 72-065A-01J, UV EXPERIMENT OBSERVING HISTORY

Time period covered (N/A)

Quantity of data - 145 PAGES OF UNBOUND HARDCOPY

This data set is a hard copy directory of all Copernicus observations. This directory lists chronological orbit number, star number, star name, star HD number, number of scans, date observed, date reduced, etc. For additional information on this directory, contact Dr. Edward Jenkins, Princeton University Observatory, Princeton, NJ 08544.

Data set name - GAMMA PEGASI UV ATLAS OBSERVED BY UV  
PRINCETON EXPERIMENT ABOARD COPERNICUS

NSSDC ID 72-065A-01K, GAMMA PEGASI UV ATLAS

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set is an ultraviolet spectral atlas for the B2 IV star Gamma Pegasi. The spectrum was observed by the Princeton spectrometer aboard the Copernicus satellite in the 970 - 1501 A spectral range. From 970 to 1430 A the observations have a nominal resolution of 0.05 A, and at the longer wavelengths the resolution is 0.1 A. The data for this atlas were obtained at four different periods, on July 27, 1978, October 30-November 22, 1978, December 16-22, 1978, and December 10-17, 1979. This atlas was published in the Astrophysical Journal Supplement Series, v. 57, p. 751, April 1985, by John Rogerson, Jr. The center wavelengths of over 2950 absorption features in this atlas have been measured, and approximately 57% of them have been identified. This data set is on a 9-track, 1600-bpi tape written in ASCII by a UNIX operating system on a VAX 8200. Each record is terminated by a new-line character whose ASCII decimal code is 10. Physical tape records are blocked to 512 bytes. The tape contains three files. File 1 is the second order spectrum covering 970 to 1430 A, file 2 is the first order spectrum covering 1417 to 1501 A, and file 3 is a description file for the tape.

Data set name - ULTRAVIOLET SPECTRAL ATLAS OF SIRIUS  
OBSERVED BY PRINCETON UV EXP ON COPERNICUS

NSSDC ID 72-065A 01L, COPERNICUS UV ATLAS OF SIRIUS

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set is a near-ultraviolet spectral atlas for the A1 V star alpha CMa (Sirius) in the 1649 to 3170 A spectral range with a resolution of 0.1 A. This atlas has been prepared from the data taken by the Princeton spectrometer aboard the Copernicus satellite. The data for this atlas were obtained mainly during the periods March 5-8, March 12-16, and March 18-April 5, 1977. Several gaps in the observations were filled during the period February 8-9, 1981, although a 0.5 A gap starting around 2292.7 A was overlooked. This atlas has been published in the Astrophysical Journal Supplement Series, v. 63, p. 369, February 1987, by John Rogerson, Jr. This data set is on a 9 track, 1600-bpi tape written in ASCII by a UNIX operating system on a VAX 8200. Each record is terminated by a new-line character whose ASCII decimal code is 10. Physical tape records are blocked to 512 bytes. The tape contains seven files. File 1 is the tape description file; file 2 contains the counts for the vacuum spectrum; file 3 contains the normalizing continuum and the scattered light values for the vacuum spectrum; file 4 contains the identification table for the vacuum spectrum; file 5 contains the counts for the air spectrum; file 6 contains the normalizing continuum and the scattered light values for the air spectrum; and file 7 contains the identification table for the air spectrum.

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\*\*\*\*\* DS0 1 \*\*\*\*\*  
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DS0 1, FAZIO  
HIGH-ENERGY GAMMA-RAY

Data set name - SKY EVENT, EARTH EVENT, AND ASPECT DATA  
ON MICROFILM

NSSDC ID 62-006A-09A, HIGH ENERGY GAMMA 50 MEV

Time period covered - 03/17/62 TO 09/22/62

Quantity of data 13 REELS OF MICROFILM

This data set consists of 16,000 computer printout sheets on 13 reels of 16-mm microfilm. The printout was provided by the experimenter. The data include time of observation (UT), orbit number, spin axis orientation, counts of sky-oriented events, counts of earth-oriented events, and combined counts. Abnormal pulses are flagged in the listings. Van Allen Belt anomaly, however, is not included in total counts and number of samples. This is the complete set of reduced data from the High-Energy Gamma-Ray Experiment covering the time period March 7, 1962, to May 14, 1962. Information on the main data base can be obtained by contacting Dr. Giovanni Fazio, Center for Astrophysics, HCO/SAO, 60 Garden St., Cambridge, MA 02138.

DS0 1, FROST  
20- TO 100-KEV SOLAR X-RAY DETECTOR

Data set name - REDUCED X-RAY COUNT RATE PLOTS VS TIME,  
LATITUDE, AND LONGITUDE ON MICROFILM

NSSDC ID 62-006A-02A, X-RAY COUNT RATE VS UT,LAT, LONG

Time period covered - 03/07/62 TO 05/15/62

Quantity of data - 4 REELS OF MICROFILM

This reduced data set, contained on a single reel of microfilm, consists of plots of 20 to 100 keV X-ray flux counts per second vs UT. The geocentric latitude and longitude of the spacecraft are also plotted with the flux data. Except for periods when the satellite was in the earth's shadow or in the South Atlantic Anomaly (where particle interference degraded the data), the data are continuous from March 7 to May 15, 1962, and cover the first 1039 orbits. For a complete discussion of the data, see "Comments on High Energy X-ray Bursts Observed by OSO 1," by K.J. Frost, NASA SP-50, X-610-64-60, 1964. Information on the main data base can be obtained by contacting Kenneth J. Frost, Code 600.0, GSFC/NASA, Greenbelt, MD 20771.

Data set name - REDUCED X-RAY COUNT RATE LISTING VS  
TIME, LATITUDE, AND LONGITUDE ON MICROFILM

NSSDC ID 62-006A-02B, TABULATED VALUES OF 62-006A-02A

Time period covered - 03/07/62 TO 05/15/62

Quantity of data - 3 REELS OF MICROFILM

This data set, contained on three rolls of microfilm, consists of a listing of 20 to 100 keV X-ray counting rates as a function of time (UT). Included are the spacecraft latitude and longitude and the average count rate in each 20-s frame (there were eight rates recorded per frame, and these were also listed). Also included on the same rolls of microfilm are the 1-8 A X-ray measurements as a function of UT. These reduced data are available from March 7 to May 15, 1962, covering orbits 1-1039. These data appear on plots in data set 62-006A-02A. For more information on this data set, contact Kenneth J. Frost, Code 600.0, GSFC/NASA, Greenbelt, MD 20771.

OSO 1, FROST  
0.1- TO 0.7 MEV SOLAR GAMMA-RAY MONITOR

Data set name - REDUCED GAMMA RAY COUNTS PER ENERGY  
CHANNEL VS TIME ON MICROFILM

NSSDC ID 62 006A 03A, GAMMA EVENT AVERAGE VS CHANNEL NO

Time period covered 03/07/62 TO 05/15/62

Quantity of data 9 REELS OF MICROFILM

The reduced data from the gamma ray monitor experiment consist of computer printouts on 35 mm microfilm. Two dimensional arrays of the 16 pulse height channel outputs are printed vs universal time. The data cover orbits 1 to 1039 (March 7 to May 15, 1962). The data listed are (1) time of observation, (2) pass number, (3) detector, (4) average number of gamma events per channel, and (5) energy channel. Information on the main data base can be obtained by contacting Kenneth J. Frost, Code 600.0, GSFC/NASA, Greenbelt, MD 20771.

OSO 1, HALLAM  
3800 TO 4800 A SOLAR FLUX MONITOR

Data set name - REDUCED TABULATIONS OF PHOTODIODE OUTPUT  
CURRENT VS TIME ON MICROFILM

NSSDC ID 62 006A 06A, 3800 4800A SOLAR FLUX MONITOR

Time period covered 03/07/62 TO 05/15/62

Quantity of data 9 REELS OF MICROFILM

This reduced data set, provided by the experimenter, is contained on nine reels of 35-mm microfilm. The data consist of tabulations of photodiode current in microamps vs UT. A measurement is given for each OSO wheel rotation period (approximately 2 s). Orbit start time, orbit number, and spin axis orientation are indicated for each orbit. The data are inclusive for orbits 1 through 1039 (March 7 to May 15, 1962). Information on the main data base can be obtained by contacting Dr. Kenneth Hallam, Code 684.0, GSFC/NASA, Greenbelt, MD 20771.

OSO 1, HALLAM  
SOLAR HYDROGEN LYMAN-ALPHA FLUX MONITOR

Data set name - REDUCED PEAK FLUX DATA ON MICROFILM

NSSDC ID 62-006A-07A, LYMAN-ALPHA

Time period covered - 03/07/62 TO 05/15/62

Quantity of data - 9 REELS OF MICROFILM

These experimenter-supplied reduced data, on 35-mm microfilm, consist of tables listing peak flux reading of the Lyman alpha ion chamber in volts and corrected universal time. There is one table per orbit. Orbit number, start time of an orbit in UT, and spin axis attitude in RA and Dec averaged over the orbit are also tabulated. The data cover orbits 1 through 1039 (March 7 to May 15, 1962). Information on the main data base can be obtained by contacting Dr. Kenneth Hallam, Code 684.0, GSFC/NASA, Greenbelt, MD 20771.

OSO 1, HESS  
BF-3 PROPORTIONAL COUNTER NEUTRON  
DETECTOR

Data set name - COUNT RATE PLOTS ON MICROFILM

NSSDC ID 62-006A-10A, CNTS VS TIME,L,SUN ELEV./MICROFILM

Time period covered - 03/07/62 TO 07/14/63

Quantity of data - 21 REELS OF MICROFILM

This reduced data set consists of 21 reels of 35-mm microfilmed plots received from the experimenter. The graphs include one-orbit plots of enriched and depleted counter rates vs UT, and of enriched counter rates (1) vs L (McIlwain's magnetic coordinate) during day, (2) vs L during night, and (3) vs angle of sun elevation. There are approximately two measurements per minute. The microfilm also includes graphs of protons and electrons for data set 62-006A-11C and plots of GMT vs satellite altitude, latitude, and longitude. Information on the main data base can be obtained by contacting Dr. Wilmut Hess, NOAA/ERL, Boulder, CO 80303.

OSO 1, NEUPERT  
SOLAR SPECTROMETER

Data set name - SOLAR EUV SPECTRAL SCANS ON MICROFILM

NSSDC ID 62 006A 01A, SOLAR UV, 170-340 A, COUNT RATE

Time period covered - 03/07/62 TO 05/15/62

Quantity of data - 12 REELS OF MICROFILM

This data set consists of over 7000 spectral scans of solar EUV radiation in the range of 140 to 400 A. The EUV counting rate was recorded on a semilogarithmic scale for each spectral scan. Markers corresponding to wavelengths of 140 and 230 A have been labeled by hand with UT. It took about 95 s for a scan between 140 and 230 A. Only the data between 170 and 340 A can be considered usable. The 10 to 140-A data were plotted separately and can be obtained from Dr. Werner Neupert of GSFC. The 140 to 400-A plots have been microfilmed, and the data are available on 12 reels of 35-mm microfilm. Some of the plots have either missing time marks, gaps in the data, or unusual spikes. For more information on the main data base, contact Dr. Werner Neupert, Code 680, GSFC/NASA, Greenbelt, MD 20771.

OSO 1, PETERSON  
GAMMA-RAY SCINTILLATION DETECTOR

Data set name - COSMIC-RAY AND SOLAR GAMMA-RAY FLUX DATA  
ON TAPE

NSSDC ID 62-006A-08A, GAMMA RAY FLUX IN COUNTS PER SQ C

Time period covered - 03/07/62 TO 05/15/62

Quantity of data - 3 REELS OF TAPE

A total of 614 h of good daytime data and 318 h of nighttime data are available from the first 1039 orbits, which covered the time period March 7, 1962, to May 15, 1962. These reduced data are on three reels of magnetic tape in bcd mode at a density of 556 bpi, with 960 characters per record. The following information is included for each pass: (1) pass number, date, and identification information; (2) UT; (3) geographic latitude, longitude, and altitude; (4) B and L (McIlwain's magnetic coordinate); (5) computed trapped

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radiation environment; (6) decommutated digital data; (7) counting rates and ID for each data frame; and (8) necessary spacecraft orientation parameters. Because of background problems, data can be used only to determine the upper limits of gamma-ray flux. Information on the main data base can be obtained by contacting Dr. Laurence Peterson, Center for Astrophysics and Space Science, Code C-011, University of California at San Diego, La Jolla, CA 92093.

OSO 1, SCHRADER  
PROTON ELECTRON ANALYZER

Data set name - TIME ORDERED PROTON AND ELECTRON COUNT RATES ON TAPE

NSSDC ID 62-006A 11B, PROTONS,ELECTRONS,CLEAN TAPES

Time period covered - 03/07/62 TO 07/08/62

Quantity of data - 4 REELS OF TAPE

This data set consists of four 7-track, 556-bpi, bcd tapes that were generated at the Lawrence Radiation Laboratory (LRL). The tapes contain one file per orbit with a variable number of physical records per file. Each physical record is made up of 40 80-character logical records. The 80-character records are the card images that were used to generate some of the proton and electron plots found in data set 62-006A 11C. The data are in the form of electron and proton count rates (6.4 s averages) as functions of UT, B, and L. There is no neutron data from the LRL neutron detector on these tapes. Ephemeris information is presented in the form of latitude, longitude, and altitude vs UT. These tapes contain data from approximately 75% of the orbits between March 7, 1962, and May 15, 1962 (orbits 1 through 1039). For more detailed information on this data set, contact Dr. James Waggoner, Lawrence Radiation Laboratory, P.O. Box 808, Livermore, CA 94550.

Data set name - PLOTS OF PROTON AND ELECTRON COUNT RATES ON MICROFILM

NSSDC ID 62 006A 11C, PROTON ELECTRON,MICROFILM

Time period covered 03/07/62 TO 07/14/63

Quantity of data - 21 REELS OF MICROFILM

This data set consists of 21 reels of 35 mm microfilm submitted by the experimenter. Each frame contains data from approximately one orbit. Electron and proton count rates, in the form of 6.4 s averages, are plotted against UT, B, L, invariant latitude, and the difference between the spacecraft spin axis and the geomagnetic field. Each frame is identified by date and orbit number. Ephemeris information is presented in the form of plots of latitude, longitude, and altitude vs UT. The data are time ordered and cover approximately 50% of the period from March 7, 1962, to July 6, 1962 (orbits 1 through 1802) and approximately 10% of the period from July 6, 1962, to July 14, 1963 (orbits 1803 through 7419). Also presented are data from the University of California Neutron Detector on the spacecraft. For more information on this data set, contact Dr. James Waggoner, Lawrence Radiation Laboratory, P.O. Box 808, Livermore, CA 94550.

OSO 1, WHITE  
1- TO B-A SOLAR X-RAY FLUX

Data set name - REDUCED PLOTS OF 1-MIN AVERAGED X-RAY FLUX VALUES ON MICROFILM

NSSDC ID 62-006A-04A, X-RAY FLUX PLOT VS UT,LAT, LONG

Time period covered - 03/07/62 TO 05/15/62

Quantity of data - 1 REEL OF MICROFILM

These reduced data, as supplied by the principal investigator, consist of plots of 1-min averaged X-ray flux values [in ergs/(sq cm-sec)] assuming a 2.8 by 10 to the 6 power deg K blackbody distribution) vs UT. The data are on one reel of 35-mm microfilm. Each frame contains one orbit of data along with satellite geocentric latitude and longitude plots. Except for data lost as a result of particle interference in the South Atlantic Anomaly and as a result of nighttime interruptions, all data for orbits 1 to 1039 (March 7 to May 15, 1962) are present. For information on the main data base, contact Kenneth J. Frost, Code 600.0, GSFC/NASA, Greenbelt, MD 20771.

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..... OSO 2 .....  
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OSO 2, CHUBB  
SOLAR X-RAY BURSTS

Data set name - PLOTS AND LISTINGS OF SOLAR X-RAY BURST DATA ON MICROFILM

NSSDC ID 65-007A 02A, SOLAR X-RAY(2-8-20A,44-60)

Time period covered - 02/04/65 TO 03/08/65

Quantity of data - 2 REELS OF MICROFILM

The data set is contained on two reels of 35-mm microfilm. The data are in reduced form, having been converted from GM tube counting rates to units of X-ray flux by use of appropriate conversion factors. The conversion factors for each detector are included in the data set. Only the data from the pointed mode of the experiment are given, since the raster mode failed to function. The first reel of microfilm covers the period February 4, 1965 (1327 UT), to February 19, 1965 (0247 UT), and the second reel covers February 19, 1965 (0326 UT), to March 8, 1965 (1858 UT). Plots of hourly and minute flux averages, tabular listings of minute flux averages and their standard deviations, detector energy calibration curves, and detector spectral sensitivity curves are included on the microfilm. For information on the main data base, contact Dr. Robert Kreplin or Dr. Talbot Chubb, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

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..... OSO 3 .....  
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Data set name - ORBIT-ATTITUDE TAPES

NSSDC ID 67-020A-00D, ORBIT-ATTITUDE TAPE

Time period covered - 03/08/67 TO 04/29/68

Quantity of data - 60 REELS OF TAPE

This data set, consisting of 7-track, 556-bpi binary magnetic tapes of orbit and spacecraft aspect data, was supplied by the principal investigator of experiment 67-020A 05. This data set is particularly useful in interpreting this data but may be helpful in other data sets. For more information on this data set, contact Dr. Minoru Nakada, Code 682.0, GSFC/NASA, Greenbelt, MD 20771.

OSO 3, CLARK  
HIGH ENERGY GAMMA RAY

Data set name - REDUCED DIRECTIONAL GAMMA-RAY FLUX DATA ON TAPE

NSSDC ID 67-020A-01A, REAL+ARTIFICIAL EVENTS,ATTITUDE

Time period covered - 03/08/67 TO 06/28/68

Quantity of data - 19 REELS OF TAPE

This data set consists of 19 7-track, 556-bpi, bcd magnetic tapes compatible to IBM 7094. The original tapes of this data set were processed at MIT on an IBM 360/65 computer. Each tape contains one file. The data, which cover the period from launch (March 1967) until the second tape recorder failed (June 1968), represent the complete set of reduced data from the MIT Celestial Gamma-Ray Experiment. The data were provided to NSSDC by the experimenter. The information recorded consists of directional parameters in celestial coordinates for real and artificial gamma-ray events along with some data quality flags. The real events were those seen by the anticoincidence detector array aboard the satellite, and the artificial events were those generated by a computer at a constant random rate and proportional to the observing time in each portion of the celestial sphere. The ratio of real to artificial events is the directional gamma-ray flux. For information on the main data base, contact Dr. George Clark, Department of Physics, Massachusetts Institute of Technology, Bldg. 37-611, Cambridge, MA 02139.

OSO 3, NEUPERT  
SOLAR EUV SPECTROMETER 1 TO 400 A

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Data set name - REDUCED SPECTROMETER DATA ON MAGNETIC TAPE

NSSDC ID 67-020A-05A, REDUCED SPECTROMETER DATA-TAPE

Time period covered - 03/08/67 TO 08/06/68

Quantity of data - 82 REELS OF TAPE

This data set consists of reduced data from the principal investigator and is contained on 81 9-track, multitracked, 1600-bpi magnetic tapes. Data from 96 main frames are grouped together into one logical record, where a main frame consists of 32 words covering a 640 millisecond data readout cycle. The data include both detector readouts and relevant housekeeping parameters. Orbit and aspect data are not included and are contained in data set 67-020-00D. For information on the main data base, contact Dr. Minoru Nakada, Code 682.0, or Dr. Werner Neupert, Code 680.0, GSFC/NASA, Greenbelt, MD 20771.

OSO 3, PETERSON  
SOLAR AND CELESTIAL GAMMA-RAY TELESCOPE

Data set name - REDUCED SOLAR AND COSMIC SOURCE DATA PER ENERGY CHANNEL VS TIME ON TAPE

NSSDC ID 67-020A-07A, SO+ST EVENTS VS TIME + E.CH NO.

Time period covered - 03/09/67 TO 04/08/68

Quantity of data - 100 REELS OF TAPE

This data set, provided by the experimenter, consists of 7-track, 800-bpi tapes generated on a CDC 3600 computer. Each physical record consists of 960 bcd characters. These tapes contain the complete set of reduced solar and cosmic source data. The solar data include counts per energy channel, channel number and universal time. The cosmic source data include the direction, in celestial coordinates, of an X-ray event and the energy channel in which it fell. Except for nighttime gaps, data coverage is continuous from launch through April 8, 1968. For relevant references, see D.A. Schwartz, H.S. Hudson, and L.E. Peterson (1970), *Astrophys. J.*, v. 162, pp. 431-437; D.A. Schwartz (1970), *Astrophys. J.*, v. 162, pp. 439-444; D.A. Schwartz (1974), *Astrophys. J.*, v. 190, pp. 297-303. For information on the main data base, contact Dr. Daniel A. Schwartz, Smithsonian Astrophysical Observatory, 60 Garden Street, Cambridge, MA 02138.

OSO 3, TESKE  
8- TO 12-A SOLAR X-RAY IDN CHAMBER

Data set name - SOLAR X RAY FLUX, 8- TO 12 A, ON MAGNETIC TAPE

NSSDC ID 67-020A-06A, CORRECTED 8 12A X-RAY FLUX VS T

Time period covered - 03/09/67 TO 07/16/68

Quantity of data - 20 REELS OF TAPE

The data set, which consists of 7-track, 556-bpi, mixed mode magnetic tapes and 7-track, 800-bpi, binary magnetic tapes produced on an IBM 7094 computer, contains first generation reduced data. The data set includes a sequence of solar flux data words [in ergs/(sq cm-s), assuming a 2E6 K blackbody energy distribution] with background subtracted, alternating with a flag containing universal time, sensitivity level, and data quality. All valid data are included in this data set. For information on the main data base, contact Dr. Richard Teske, Astronomy Department, David M. Dennison Bldg., University of Michigan, Ann Arbor, MI 48109.

Data set name - NSSDC STANDARD TAPE VERSION OF DATA SET 67-020A-06A

NSSDC ID 67-020A-06B, 67-020A 06A IN STANDARD NSSDC FMT

Time period covered - 03/09/67 TO 07/15/68

Quantity of data - 12 REELS OF TAPE

This data set consists of 12 magnetic tapes generated at NSSDC as the standard tape version of data set 67-020A-06A. For more information on this data set, contact Dr. Richard Teske, Astronomy Department, David M. Dennison Bldg., University of Michigan, Ann Arbor, MI 48109.

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\*\*\*\*\* OSO 4 \*\*\*\*\*  
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OSO 4, GIACCONI  
SOLAR X-RAY TELESCOPE

Data set name - X-RAY HELIOGRAPH RASTER SCANS ON MAGNETIC TAPE

NSSDC ID 67-100A-08A, COUNTS/FRAME VS RASTER P, UT

Time period covered - 10/20/67 TO 05/12/68

Quantity of data - 7 REELS OF TAPE

This data set, provided by the experimenter, consists of 9-track, 800-bpi, IBM 360 binary magnetic tapes with variable length records. It consists of a sequence of 48- by 40-word arrays of photoemission scintillation X-ray detector count rates (counts/0.14 s) as a function of raster position and universal time. Also included are flags indicating filter and aperture wheel positions and data quality. Reduced raster data are obtained by subtracting the corresponding background raster values described in data set 67-100A-08B. Programming support to produce the reduced data is available at NSSDC and can be provided upon request. For information on the main data base, contact Dr. Riccardo Giacconi, Space Telescope Science Institute, Homewood Campus, Baltimore, MD 21218.

Data set name - BACKGROUND RASTER SCANS ON MAGNETIC TAPE

NSSDC ID 67-100A-08B, AVI BKGND COUNTS/FRAME VS RASTER

Time period covered - 10/26/67 TO 05/12/68

Quantity of data - 2 REELS OF TAPE

This data set, supplied by the experimenter, provides background correction for the raw raster data in data set 67-100A-08A. It consists of 9-track, 800 bpi, IBM 360 binary magnetic tapes with variable length records. It is made up of 48 by 40-word arrays generated by summing all calibration rasters that were made by scanning in a direction away from the sun and subtracting the counting rate that was due to the Fe55 calibration source. Flag words indicating detector calibration and count rate statistics are also included. For more information on this data set, contact Dr. Riccardo Giacconi, Space Telescope Science Institute, Homewood Campus, Baltimore, MD 21218.

OSO 4, GOLDBERG  
SOLAR EUV SPECTROMETER

Data set name - EUV RASTER SCANS ON MAGNETIC TAPE

NSSDC ID 67-100A-07A, EUV RASTER SCANS

Time period covered - 10/25/67 TO 11/29/67

Quantity of data - 6 REELS OF TAPE

This data set consists of all recorded spectroheliograms. The data are contained on 800 bpi, 7-track, binary magnetic tapes. The tapes, furnished to NSSDC by the principal investigator, were created on an IBM 7094 and copied on a CDC 6400. The data are contained in two logical records that occur in alternating sequence. Record A is either 119 words or 129 words in length and contains identification information. Record B contains the raster array data and consists of seven physical records of 256 words and one record of 136 words. For information on the main data base, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

Data set name - 300-1400 A POINTED SPECTRAL SCANS ON MAGNETIC TAPE

NSSDC ID 67-100A-07B, 300 1400A POINTED SPECTRAL SCANS

Time period covered - 10/25/67 TO 11/27/67

Quantity of data - 1 REEL OF TAPE

This data set consists of all spectral scan data obtained by the EUV spectrometer. The data are contained on a 800-bpi, 7-track, binary magnetic tape. The tape, furnished to NSSDC by the principal investigator, was created on an IBM 7094 and copied on a CDC 6400. The data are contained in two logical records. Record A consists of 127 words and contains identifying information for the particular scan. Record B

contains the spectral scan data and consists of several physical records 256 words in length. The count rate has been entered for each step of the spectrometer. For more information on this data set, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

NSSDC ID 69-006A-04A, X-RAY PLOTS, 4 CHANNELS, MICROFILM

Time period covered - 01/23/69 TO 08/02/70

Quantity of data - 13 REELS OF MICROFILM

This data set, supplied by the experimenter, consists of plots of reduced X-ray fluxes in four spectral channels recorded on 13 reels of 35-mm first generation microfilm. The plots were generated from digitized telemetered information contained on the original experiment data tapes. The X-ray fluxes [ergs/(sq cm-s)] were plotted vs time. The beginning of each plot starts at the same earth longitudinal point so as to distinguish the photometer response to the energetic particles of the South Atlantic Anomaly from its response to solar X-rays. The photometer outputs were converted to fluxes by assuming that the sun emits (1) as a 10-million K blackbody in the 0.5 to 3-A region, (2) as a 2-million K blackbody in the 1- to 8 A and 8- to 16-A regions, and (3) as a .5-million K blackbody in the 44- to 60-A region. With the exception of a few small gaps, the data set covers the period January 23, 1969, to August 2, 1970. However, the 44 to 60-A detector output became intermittent on June 9, 1969, and by June 20, 1969, it was completely off. The coverage for the other three channels began to deteriorate in April 1970, and by July 1970 the usefulness of the data obtained was minimal. For information on the main data base, contact Dr. Robert Kreplin or Dr. Talbot Chubb, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - ATLAS OF EUV RASTER SCANS ON MAGNETIC TAPE

NSSDC ID 67-100A-07C, ATLAS EUV RASTER SCANS

Time period covered - 10/25/67 TO 11/29/67

Quantity of data - 1 REEL OF TAPE

This data set consists of 379 mean spectroheliograms published in the Astrophysical Journal Supplement, v. 22, August 1970. Each mean spectroheliogram was constructed for a given orbit by averaging the high quality count data from the good quality rasters to form a matrix of recorded counts. Calibration constant and identification information are supplied for each of the mean spectroheliograms. The data, which are contained in one file of a 7-track, 556-bpi, CDC 6400 binary magnetic tape, were supplied to NSSDC by the principal investigator. Identifying information and raster data for each mean spectroheliogram are contained in one record of 1997 words. For more information on this data set, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

DSO 5, NEUPERT SOLAR SPECTRUM STUDIES

Data set name - 300-1400 A QUIET SUN SPECTRUM ON MAGNETIC TAPE

NSSDC ID 67-100A-07D, 300 1400A QUIET SUN SPECTRUM

Time period covered - 10/26/67 TO 10/27/67

Quantity of data - 1 REEL OF TAPE

A number of spectral scans were made during quiet solar conditions on October 26 and 27, 1967 (orbits 114 to 127). The counts for the same grating step of each of the scans were averaged to provide maximum signal-to-noise ratio. These averages, divided by 2 for approximately 11,821 steps starting with step 1, are contained in one file of a 7-track, 556 bpi tape that was produced at NSSDC from punch cards supplied by the principal investigator. Data have been entered as bed card images using an IBM 7094. For detailed information on this data set, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

Data set name - REDUCED SPECTROMETER DATA ON MAGNETIC TAPE

NSSDC ID 69-006A-03A, REDUCED SPECTROMETER DATA-TAPE

Time period covered - 01/28/69 TO 01/12/73

Quantity of data - 393 REELS OF TAPE

This data set, consisting of reduced data supplied by the principal investigator, resides on 393 magnetic tapes written in binary format in odd parity. The 7 track tapes have a density of 800 bpi and were created on an IBM 7094 computer. The data are grouped into segments of six main frames of data, with each main frame consisting of 96 minor frames of data. Each minor frame is the information from one 320 millisecond readout cycle. Each main frame includes instrument housekeeping parameters and time information for each minor frame. Each minor frame includes relevant housekeeping data and data from each detector. For more information on the main data base, contact Dr. Minoru Nakada, Code 682.0, GSFC/NASA, Greenbelt, MD 20771.

DSO 4, WAGGONER PROTON ELECTRON DETECTOR

Data set name - COUNT RATE DATA ON MAGNETIC TAPE

NSSDC ID 67-100A 04A, ELECTRON, PROTON COUNT RATES, TAPES

Time period covered 10/23/67 TO 12/30/67

Quantity of data - 11 REELS OF TAPE

This data set consists of 11 experimenter-generated, 7-track, 556-bpi, binary multifile tapes generated on a CDC 3600 computer. Data from one orbit fills one tape file, which itself has a maximum of 18 physical records. Full temporal, spectral, and angular resolution of the measured fluxes was preserved in the generation of these tapes. Ephemeris information is also included. The time period October 23, 1967, to December 30, 1967, is covered by these tapes with essentially 100% completeness. Very few data were reduced by the experimenter for 1968. For information on the main data base, contact Dr. James Waggoner, Lawrence Radiation Laboratory, P.O. Box 808, Livermore, CA 94550.

DSO 5, NEY ZODIACAL LIGHT MONITOR

Data set name - ZODIACAL LIGHT AND AIRGLOW PLOTS ON MICROFILM

NSSDC ID 69-006A-07A, ZODIACAL LGT + AIRGLOW, PLOTS

Time period covered - 01/27/69 TO 03/15/71

Quantity of data - 400 REELS OF MICROFILM

This data set consists of sets of plots of 20-s max/min values for four of the six photometers and two monitor eyes (photodiodes) plotted vs time. This data set is a subset of 69-006A 07B. Approximately 40 min of data are on each plot, and a set of four plots covers a given time period. One plot contains the intensities measured by photometers 3 and 5, another contains the intensities measured by photometers 4 and 6, and the last contains the intensities measured by the photodiodes. The intensity scales are 0 to 4000 for the photometers, and 0 to 256 for the photodiodes. The date of observation is given on the plots. The data, supplied by the experimenter, are partly reduced and are contained on 16-mm microfilm. For information on the main data base, contact Dr. Edward Ney, Astronomy Department, University of Minnesota, 116 Church Street S.E., Minneapolis, MN 55455.

DSO 5, CHUBB SOLAR X-RAY RADIATION ION CHAMBER PHOTOMETER

Data set name - PLOTS OF REDUCED SOLAR X-RAY FLUX VS. TIME ON MICROFILM

Data set name - ZODIACAL LIGHT AND AIRGLOW TABLES ON MICROFILM

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NSSDC ID 69-006A-07B, ZODIACAL LGT + AIRGLOW, TABLES

Time period covered - 01/27/69 TO 03/15/71

Quantity of data - 300 REELS OF MICROFILM

This data set consists of photometer and monitor eye data in tabular form on microfilm. All photometer outputs are listed as a function of main frame time for each period of spacecraft night. Each page contains data from 15.36 s. At the top of each page, in the header, the outputs from the monitor eyes, sunrise/sunset times, spacecraft position, and spacecraft orientations are given. These data are partly reduced data supplied by the experimenter and are contained on 16-mm microfilm. A subset of these data appears on plots as data set 69-006A-07A. However, users may have access to the data on the premises of NSSDC. For more information on this data set, contact Dr. Edward Ney, Astronomy Department, University of Minnesota, 116 Church Street S.E., Minneapolis, MN 55455.

Data set name - REDUCED PHOTOMETER DATA ON MAGNETIC TAPE

NSSDC ID 69-006A-07C, ZODIACAL LGT + AIRGLOW, MAG TAPE

Time period covered - 01/26/69 TO 07/12/70

Quantity of data - 78 REELS OF TAPE

This data set, received from the experimenter, is contained on odd-parity, 7-track, 800-bpi, binary magnetic tapes written on a CDC 6600. Data cover only nighttime operation of the spacecraft, and each nighttime period covered includes complete spacecraft altitude, aspect, and ephemeris information along with relevant housekeeping information and the count rates of the six telescopes. The data from the individual telescopes are packed as 12-bit words, yielding a count rate range of from 0 to 4095. The third word of telescope 3 is incomplete, containing only 8 bits, and should not be used for detailed analysis. Questionable or missing data were set to 0. When turned off because of excessive light, the telescopes read a small number of counts (fewer than 20). For more information on this data set, contact Dr. Edward Ney, Astronomy Department, University of Minnesota, 116 Church Street S.E., Minneapolis, MN 55455.

DSO 5, RENSE  
SOLAR EXTREME ULTRAVIOLET MONITOR

Data set name - REDUCED AND MERGED 3 CHANNEL ULTRA-VIOLET DATA ON MAGNETIC TAPE

NSSDC ID 69-006A-08A, REDUCED, MERGED 3 CH UV DATA TAPES

Time period covered - 02/05/69 TO 07/19/71

Quantity of data - 28 REELS OF TAPE

These experimenter-supplied reduced and merged three channel UV data are on 7-track magnetic tape created on a CDC 6400 computer at 556 bpi in binary format. The tapes are multifiled, with one orbit of data per file. Each file begins with one label record of 50 CDC 60-bit words followed by variable length data records containing one attitude/orbit record and a variable number of spacecraft data records. The label records contain satellite ID, begin and end orbit numbers, begin and end year, day of year, seconds of day, number of 1-min records in file, pitch, spin, calibration values for three channels, time (milliseconds), record and line numbers for five calibrations, midday and total counts for three channels, exposure time, and number of calibrations in file. Each data (attitude/orbit) record contains day count, milliseconds of day, ephemeris information, data type indicator, orbit number, orbit start and end times, day/night indicator, sunlight exit and entrance day, and milliseconds of day. The spacecraft data consist of time, code, sensor, background, digital, and wheel data. For more information on the main data base and this data set, contact Dr. William Rense, Department of Physics and Astrophysics, Duane Physics Laboratory, University of Colorado, Boulder, CO 80302.

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..... DSO 6 .....  
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DSO 6, ARGO  
X-RAY SPECTROMETER

Data set name - REDUCED SOLAR X-RAY LINE EMISSIONS ON MAGNETIC TAPE

NSSDC ID 69-068A-04A, COUNT RATES, 6 CHANNELS, MAG. TAPE

Time period covered - 08/14/69 TO 01/20/70

Quantity of data - 1 REEL OF TAPE

This data set, supplied by the experimenter, consists of one file of reduced X-ray count rates recorded on 7-track, 556-bpi, IBM 7094, binary (odd-parity) magnetic tape. The tape was derived from 62 reels of NASA OSO 6 7-track, 800-bpi, binary data tapes, which contained the original data obtained from the X-ray spectrometer experiment during the period August 14, 1969, to January 20, 1970. Data contained on the tape include (1) the sum of counts, (2) the average count rate per second, and (3) the standard deviation for that rate for each spectral channel for each orbit. These parameters are listed in tabular form by record number for both the "sun" (solar-centered) and "shade" (60 deg away from the sun) spectrometer sweep modes. Each record contains the above three parameters for each of the six channels in addition to the date and time (UT) of observation. The first 30 s of data after solar X-ray data acquisition and the last 30 s at sunset have been removed arbitrarily from the count summations to eliminate atmospheric transmission errors. The count rates can be converted to absolute fluxes by use of the calibration factors given in Tables 1 and 2 of "The OSO 6 X-ray Spectrometer Experiment and Data Description" by Dr. Harold V. Argo, August 4, 1971 (unpublished). The data set covers the period August 14, 1969, to January 20, 1970. However, the data after the first 60 days are probably not useful because the detectors suffered severe gain degradation. For more information on the main data base, contact Dr. Harold Argo, Los Alamos Scientific Laboratory, MS 436, P.O. Box 1663, Los Alamos, NM 87545.

DSO 6, 80YD  
STUDY OF SOLAR HELIUM I, HELIUM II,  
OXYGEN, AND NITROGEN RADIATION

Data set name - EXPERIMENT ASPECT TAPES

NSSDC ID 69-068A-06A, EXPERIMENT ASPECT TAPES

Time period covered - 08/11/69 TO 08/08/70

Quantity of data - 3 REELS OF TAPE

This data set, received from the experimenter, is on 800-bpi, 9-track, binary magnetic tapes created on an IBM series 360 computer and contains the aspect information needed to interpret data sets 69-068A-06B and 69-068A-06C. Listed are day, hour (in seconds of GMT), spacecraft geodetic latitude and longitude, spacecraft altitude in kilometers, declination of the solar vector, McIlwain's L parameter, magnetic field strength, and spacecraft spin rate (in rotations per second). For information on the main data base and this data set, contact Dr. Bruce Woodgate, Code 681, GSFC/NASA, Greenbelt, MD 20771.

Data set name - LISTING OF SOLAR EUV FLUXES ON MAGNETIC TAPE (4 SECOND FRAMES)

NSSDC ID 69-068A-06B, FLUX VS TIME, FINE TIME RES TAPE

Time period covered - 08/14/69 TO 10/03/70

Quantity of data - 9 REELS OF TAPE

This data set, obtained from the experimenter, is on 800 bpi, 9 track, binary magnetic tape created on an IBM series 360 computer and incorporates the fluxes observed by each detector during each frame with relevant housekeeping data. Listed are the fluxes observed at 180, 256, 304, 537, 584, 835, 991, and 1175 A and Lyman-alpha (1216 A) from a continuum channel, from an electron detector, and from a scattered light detector. Also included are date, time (GMT), spacecraft pitch, spin rate, temperature, and various voltages. Information allowing the data to be placed with regard to their location in the spacecraft main frame data stream is given. Data are provided for about 60 min of each 96-min orbit. Pitch and spin rates are incorrect for satellite dusk or dawn conditions, when the aspect tapes (data set 69-068A-06A) must be used instead. For information on the main data base and this data set, contact Dr. Bruce Woodgate, Code 681, GSFC/NASA, Greenbelt, MD 20771.

Data set name - 2-MIN AVERAGES OF SOLAR EUV FLUXES ON MAGNETIC TAPE

NSSDC ID 69-068A-06C, 2 MINUTE AVERAGES (MAGTAPE)

Time period covered - 08/15/69 TO 09/29/70

Quantity of data - 1 REEL OF TAPE

This data set, obtained from the experimenter, is on 800 bpi, 9 track, binary magnetic tape generated on an IBM

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series 360 computer and contains 2-min averages of the data listed in data set 69-068A-06B. Listed are the day number, a dawn/dusk flag, the satellite pitch and spin rate, and the counts averaged over 2-min intervals for the 180, 256, 304, 537, 584, 835, 991, and 1175 A and Lyman-alpha channels from a continuum channel, from an electron detector, and from a scattered light detector. Also listed are the spacecraft spin rate, pitch angle, and hour and minute data over 60 min of each 96-min orbit. Each variable is averaged over an entire sunlit pass, and this average and its standard deviation are also given. High count rates that are due to the South Atlantic Anomaly, as detected by the scattered light detector, are not included in the pass long averages. Following the above information, the same data are reported with the count rates converted to a "counts per second" scale. For more information on this data set, contact Dr. Bruce Woodgate, Code 681, GSFC/NASA, Greenbelt, MD 20771.

OSO 6, GOLDBERG  
SOLAR UV SCANNING SPECTROMETER,  
SPECTROHELIO METER (300 TO 1400 A)

Data set name - EUV RASTER SCANS ON MAGNETIC TAPE

NSSDC ID 69-068A-01A, EUV RASTER SCANS

Time period covered - 08/12/69 TO 05/12/70

Quantity of data - 51 REELS OF TAPE

This data set, supplied by the principal investigator, consists of all recorded full-disk (large) and small spectroheliograms that were obtained while the spacecraft operated in a raster pattern. The data are contained on 800-bpi, 9-track, binary magnetic tapes generated on an IBM 360/65 computer. The tapes contain, for each spectroheliogram, the time each was obtained and the intensity measurements as a function of position in the spectroheliogram. For information on the main data base and this data set, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

Data set name 300 TO 1400-A POINTED SPECTRAL SCANS ON  
MAGNETIC TAPE

NSSDC ID 69-068A-01B, 300-1400A POINTED SPECTRAL SCANS

Time period covered - 08/11/69 TO 05/11/70

Quantity of data - 15 REELS OF TAPE

This data set, supplied by the principal investigator, consists of all spectral scan data obtained by pointing the spectrometer at the center of the solar disk or at one of the pointing positions. The data are contained on 800 bpi, 9-track, binary magnetic tapes generated on an IBM 360/65 computer. The tapes contain, for each scan, the time of scan and intensity measurements in a serial list. The procedure for relating position in the serial list to wavelength and time is given in the documentation furnished with the data. For more information on the main data base and this data set, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

Data set name - EXPERIMENT COMMAND LOGS ON MAGNETIC TAPE

NSSDC ID 69-068A-01C, COMMAND LOGS

Time period covered - 08/12/69 TO 05/12/70

Quantity of data - 1 REEL OF TAPE

This data set contains the Harvard College Observatory (HCO) OSO 6 experiment observing log, available as one file on 556-bpi, bcd, 7-track tape. The information, which includes UT, spacecraft and experiment operating modes, all of the HCO commands sent to the spacecraft, etc., is given for each orbit. This log also contains index information that permits rapid computer searching for given types of observations to satisfy a particular criterion. For detailed information on this data set, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

Data set name - MARCH 7, 1970 SOLAR ECLIPSE DATA ON  
MAGNETIC TAPE

NSSDC ID 69-068A-01D, MARCH 7, 1970 SOLAR ECLIPSE DATA

Time period covered - 03/07/70 TO 03/08/70

Quantity of data - 1 REEL OF TAPE

This solar eclipse data set contains data taken from the tapes described under data set 69-068A-01A and copied on 800-bpi, 9-track, binary tape by NSSDC. During the period from 0246 UT on March 7 to 2213 UT on March 8, 1970, the spacecraft was operated primarily in the raster mode. A number of large raster scans were made at wavelengths of 625 A (Mg X), 630 A (O V), 977 A (C III), 1026 A (Ly beta), 1032 A (O VI), and 1216 A (Ly alpha). For more information on these data, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

Data set name - SEARCH PROGRAM FOR DATA ON MAGNETIC TAPE

NSSDC ID 69-068A-01E, COMMAND LOG SEARCH PROGRAM

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set is a Fortran IV program available as one file on a 556-bpi, bcd, 7-track magnetic tape generated on an IBM 7094 computer by NSSDC. It is designed to search the log described under data set 69-068A-01C for all blocks of data satisfying the criteria chosen by the user. The input data for a search must be provided on two cards. Instructions for preparing the cards are contained in the documentation furnished with the data. For more information on this data set, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

Data set name - CALIBRATION FACTOR ON MAGNETIC TAPE

NSSDC ID 69-068A-01F, CALIBRATION FACTOR COMPUTATION

Time period covered - (N/A)

Quantity of data 1 REEL OF TAPE

This data set is composed of a program written in Fortran IV contained as two files on 556-bpi, bcd, 7-track magnetic tape generated on an IBM 7094 computer by NSSDC. The program can be used to calculate the calibration factor that converts the observed intensities from engineering to absolute units. Also included are the standard data required in the calculation. For more information on this data set, contact Dr. George Withbroe, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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\*\*\*\*\* OSO 7 \*\*\*\*\*  
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OSO 7, CHUPP  
SOLAR GAMMA-RAY MONITOR

Data set name - OSO-7 SOLAR X-RAY DATA (7.5 - 120KEV) ON  
TAPES

NSSDC ID 71-083A-06A, X-RAY (7.5-120KEV) DATA

Time period covered - 09/30/71 TO 12/27/72

Quantity of data - 19 REELS OF TAPE

This experimenter-generated data set consists of 9 track, IBM 360-compatible magnetic tape packed at 800 bpi. The information on the tapes is the X-ray counting rates detected by the instrument over the period from September 30, 1971, to December 31, 1972. The data are for the four energy intervals from 7.5 to 15 keV, 15 to 30 keV, 30 to 60 keV, and 60 to 120 keV. These data are the uncorrected observed counting rates. Data coverage is evenly divided among solar counting rates and counting rates obtained from the dayside of the earth, the nightside of the earth, and the celestial antisolar point (25% for each of the four). For information on the main data base, contact Dr. Edward Chupp, Physics Department, DeMeritt Hall, University of New Hampshire, Durham, NH 03824.

Data set name - TAPE OF OSO-7 GAMMA-RAY EXPERIMENTS  
RESPONSE FUNCTION



NSSDC ID 71-083A-06B, GAMMA-RAY EXP. RESPONSE FUNCTION

Time period covered - 06/12/71 TO 06/17/71  
(Date supplied by experimenter)

Quantity of data - 1 REEL OF TAPE

This data set, obtained from the experimenter, is on 9-track, bcd magnetic tape packed at 800 bpi. The data are of the calibration runs made with the fully loaded spacecraft at Ball Brothers Research Corporation during the period from June 12-17, 1971. These data are in the form of pulse-height spectra produced by the instrument. Each spectrum is of 400 channels in length. The spectra were taken with the instrument irradiated by gamma rays from Sn113, Ca137, Zn65, and Na24 sources. In addition, gamma-ray lines 1.460 MeV (K40) and 2.615 MeV (Th228) were imposed onto the background. These lines were used to determine the gain and channel/energy registration as a function of time over the 5-day study period. Each spectrum is for a particular choice of radiation source/instrument elevation and azimuth angles. The methods used to produce these spectra and the procedure used in calibrating the instrument from these results are described by Higbie et al. in "Nuclear Instruments and Methods" (North-Holland Publishing Co.), v. 108, pp. 167-176, 1973. For detailed information on this data set, contact Dr. Edward Chupp, Physics Department, DeMeritt Hall, University of New Hampshire, Durham, NH 03824.

Data set name - DS0-7 GAMMA-RAY DATA (0.3 - 9.1MEV) ON TAPES

NSSDC ID 71-083A-06C, GAMMA-RAY (0.3-9.1MEV) DATA

Time period covered - 10/03/71 TO 12/25/72

Quantity of data - 48 REELS OF TAPE

This data set was obtained from the experimenter. The data set consists of 9-track, bcd magnetic tape packed at 800 bpi. The set gives the gamma-ray pulse-height spectra (0.3 to 9.1 MeV) gathered by the University of New Hampshire instrument over the period October 3, 1971, to December 25, 1972. Each pulse-height spectrum is represented by the contents in 350 to 380 energy channels. The data are corrected for variations in the gain of the instrument during its lifetime. The spectra are of the sun (25%), the dayside of the earth (25%), the nightside of the earth (25%), and the celestial antisolal point (25%). Each spectrum is accompanied by such ancillary information: starting and end times for the integration, positional information for the satellite, magnetic parameters, pointing coordinates, Van Allen parameters, etc. For information on the main data base and this data set, contact Dr. Edward Chupp, Physics Department, DeMeritt Hall, University of New Hampshire, Durham, NH 03824.

DS0 7, CLARK  
COSMIC X-RAY SOURCES IN THE RANGE  
1.5 TO 9 A

Data set name - MASTER DATA TAPES FOR CELESTIAL SOURCES OF X-RAYS, 1-60 KEV

NSSDC ID 71-083A-04A, 1-60KEV CELESTIAL XRAY DATA TAPES

Time period covered - 10/02/71 TO 05/24/73

Quantity of data - 66 REELS OF TAPE

These experimenter-supplied, X-ray master event data are on 9-track magnetic tape written on an IBM 360 computer at 800-bpi in binary format. The records are blocked with seven logical records per physical record. Each tape begins with a label record containing descriptive information and the year and day of the data. The telemetry data records (one subcommunication cycle) comprise 48 digital main frames of (1) the four main frame words, (2) the wheel, sail, and digital subcommunication words, and (3) quality flags. The subcommunication cycle contains 15.36 s of data. Just over 12 subcommunication cycles contribute to one MIT format, which is 190.08 s of data. The MIT format is composed of 264 lines of nine 8-bit words each. The 264 lines are broken into eight data blocks, each of which is, in turn, composed of either a format start line or a block start line and 32 data lines. The beginning line of the block is used to transmit synchronization and experiment status information. The following 32 lines are used to transmit data. Each data line begins with the number of the bin from which the data about to be read out were accumulated. In sequence, but without identification, the contents of the submemories associated with that bin and each of the eight measurement chains whose outputs have been accumulated are read out. That this sequencing is being performed is verified by the first three bits of MIT word 3 of every block start line. The bin number is transferred directly from the readout location register, giving a positive indication of the memory location during readout. For information on the main data base and this data set, contact Dr. Thomas Markert, Center for Space Research, Massachusetts Institute of Technology, 37-515, Cambridge, MA 02139.

Data set name - ANNOTATED PLOTS OF THE 1-60 KEV X-RAY RESULTS ON MICROFILM

NSSDC ID 71-083A-04B, MICROFILM PLOTS 1-60KEV XRAY DATA

Time period covered - 03/27/72 TO 01/11/74

Quantity of data - 115 REELS OF MICROFILM

This data set contains microfilm plots of 1-60 keV data on celestial X-ray sources. There is one plot for each MIT telemetry format (190.08 s). The descriptive labels on each plot are explained on the sample frame furnished by MIT. The stronger known X-ray sources are listed in a table at the top of the frame when they were detectable during the format. These sources are also cited in the bin where they should be observed. When more than eight sources are in view, the sources are cited but not labeled. Refer to printouts of these sample data, provided upon request, for identification of the unlabeled sources. There are about 450 frames on microfilm for each day of data to day 869, when the tape recorder failed. The amount of data after day 869 is reduced accordingly. For more information on this data set, contact Dr. Thomas Markert, Center for Space Research, Massachusetts Institute of Technology, 37-515, Cambridge, MA 02139.

DS0 7, PETERSON  
COSMIC X-RAY EXPERIMENT

Data set name - UCSD COSMIC RAY SKYMAP

NSSDC ID 71-083A-03A, UCSD, COSMIC X-RAY SKYMAP

Time period covered - 09/29/71 TO 05/18/73

Quantity of data - 57 CARDS OF B/W MICROFICHE

This data set on microfiche, provided by the experimenter, consists of computer printout page images. Each image contains three 1-deg solid-angle data sets. The data are ordered by increasing galactic latitude, beginning with minus 90 deg and going through 0 deg to plus 90 deg. For each latitude there is a set of longitude bins whose size is adjusted to give a 1-deg solid angle. The number of longitude bins per latitude ranges from 1 (at plus or minus 90 deg) to 360 (at the equator) or approximately 42,000 bins for the entire sky. This data set covers approximately 37,000 of these bins averaged over from one to three of the sky scans performed in the 221 days of the mission between September 29, 1971, and May 18, 1973. The data in each set are ordered in four columns. The columns are labeled as CH, COUNTS, SIGMA, and LIVETIME. CH is the pulse height channel (PHA) of the event. COUNTS is the number of background subtracted photons observed from that portion of the sky in that PHA channel. SIGMA is the variance (not the standard deviation) on the net counts. LIVETIME is the livetime for that channel for that bin on the sky. For information on the main data base, contact Dr. Richard Rothschild, Center for Astrophysics and Space Science, UCSD, C-011, La Jolla, CA 92093.

DS0 7, PETERSON  
HARD SOLAR X-RAY MONITORING

Data set name - UCSD SOLAR X-RAY CATALOG ON MICROFILM

NSSDC ID 71-083A-05A, UCSD SOLAR X-RAY CATALOG

Time period covered - 10/02/71 TO 02/27/73

Quantity of data - 9 CARDS OF B/W MICROFICHE

This data set is a microfiche copy of a catalog that lists the times of complete data coverage of, and the principal X-ray events observed with, the University of California at San Diego (UCSD) DS0 7 solar X-ray experiment (71-083A-05). The catalog is intended as a data reference for scientific investigators wishing to do correlative studies involving solar X-ray data. The UCSD instrument observed a large number of X-ray events during the period covered by this catalog, October 2, 1971, to February 27, 1973. The basic data contained in the catalog are (1) the times of observations, (2) the times of occurrence of charged-particle events, (3) the times of the peaks in solar X-ray bursts, and (4) the peak fluxes in photons/(sq cm-s-keV) for the 5.1 to 6.6 keV channel of the proportional counter and for the 20 to 30 keV channel of the scintillation counter. The catalog was generated using the set of magnetic tapes containing the reduced data that were produced by the UCSD experimenters for NSSDC. Each requester should receive a hard copy of "Data Users Note for the DS0-7 UCSD Solar X-ray Instrument's Data Coverage and Deleted X-ray Events Catalog (B22876-000A)" and a listing of the TRF

bibliography for the experiment 71-083A-05 and its associated data sets. For information on the main data base and this data set, contact Dr. Laurence Peterson, Center for Astrophysics and Space Sciences, University of California at San Diego, Code C-011, La Jolla, CA 92093.

OSD 7, TOUSEY  
WHITE-LIGHT CORONAGRAPH AND EXTREME  
ULTRAVIOLET CORONA

Data set name - SYNOPSIS OBSERVATIONS OF THE SOLAR CORONA  
DURING ROTATIONS 1580-1596

NSSDC ID 71-083A-02A, SYNOPSIS OBS OF SOLAR CORONA

Time period covered - 10/11/71 TO 01/15/73

Quantity of data - 1 BOOK OR BOUND VOLUME

This data set is contained in report UAG-48A, entitled "Synoptic Observations of the Solar Corona During Carrington Rotations 1580 - 1596 (October 11, 1971 - January 15, 1973)." It includes images of the white light corona between 3 and 10 solar radii taken with the OSD 7 white light coronagraph, solar XUV (171 - 630 A) coronagrams taken with the OSD 7 XUV coronagraph, polar plots of coronal brightness at 1.5 and 4 solar radii (using data from the Mauna Loa K coronameter as well as from the OSD 7 coronagraph), synoptic maps of coronal brightness at 1.1, 1.5, and 4 solar radii (Mauna Loa data plus OSD 7 data), and a list of white light transients observed between 3 and 10 solar radii. Daily images of the white-light corona for the period February 1972 through June 1974 have been published in Solar-Geophysical Data, number 332, part 1 (April 1972), through number 360, part 1 (August 1974). Daily solar XUV coronagrams for the period October 1972 through October 1973 have been published in Solar-Geophysical Data, number 340, part 1 (December 1972), through number 352, part 1 (December 1973). This data set is available through National Climate Center, Asheville, North Carolina. Information on the main data base can be obtained by contacting Dr. Richard Tousey, Naval Research Laboratory, Code 4107, Washington, DC 20375.

.....  
..... OSD 8 .....

Data set name SKY MAPS OF SPACECRAFT POSITIONS

NSSDC ID 75 057A-00D, SKY MAPS OF SPACECRAFT POSITIONS

Time period covered - (N/A)

Quantity of data - 5 CARDS OF B/W MICROFICHE

This data set consists of maps that indicate the approximate position of the OSD 8 spin axis during the lifetime of the mission with respect to selected X-ray sources, displayed on a local coordinate system (i.e., sky map). The right ascension and declination of the marked central position in each map are shown at the bottom. Sources are indicated by abbreviations, as listed in the accompanying catalog. Sources relevant to both the positive spin-axis-pointing detector of experiment 75-057A-06 and the negative axis-pointing detectors are shown on the same map. Starred sources refer to the negative spin axis direction. The right ascension and declination of the marked position relate to the starred sources. The catalog was compiled before the OSD 8 launch, so most of the candidate sources are now known to have fluxes that are undetectable by experiment 75 057A 06. Other sources, although detectable, have by now improved positions. However, with the maps and the catalog, one should be able to find the approximate coordinates of any point on the maps. Catalog source positions are given in 1975 epoch coordinates. Day numbers along the spin axis path are indicated, with day 0 corresponding to January 1, 1975. For more information on this data set, contact Dr. Peter Serlemitsos, Laboratory for High Energy Astrophysics, Code 661, GSFC/NASA, Greenbelt, MD 20771.

OSD 8, ACTON  
MAPPING X-RAY HELIOMETER

Data set name - DAILY SOLAR X-RAY DATA

NSSDC ID 75-057A-04A, DAILY SOLAR X-RAY DATA

Time period covered 06/24/75 TO 09/30/78

Quantity of data - 101 CARDS OF B/W MICROFICHE

This data set consists of two major parts: (1) a printout of all available solar data coverage times, and (2) a daily graphic presentation of the variation of X-ray intensity with

time for selected points corresponding primarily to the centers of optically detected solar active regions at 1-min time resolution. The data are accompanied by extensive documentation that explains the process of converting the raw data on the original tapes to solar histogram X-ray maps. For information on the main data base and this data set, contact Dr. Loren Acton, Dept. 91-20, Bldg. 255, Lockheed Palo Alto Research Laboratory, 3251 Hanover Street, Palo Alto, CA 94304.

OSD 8, BARTH  
HIGH-RESOLUTION ULTRAVIOLET SPECTROMETER  
MEASUREMENTS

Data set name - SPECTROHELIOGRAM ON MAGNETIC TAPE

NSSDC ID 75-057A-01A, SPECTROHELIOGRAM ON MAG. TAPE

Time period covered - 06/28/75 TO 09/30/78

Quantity of data - 38 REELS OF TAPE

These experimenter-supplied, spectroheliogram data are on 7-track, 800-bpi, binary magnetic tape created on a PDP 11/34 computer. The tapes are multitracked, with each file containing a seven-word header of Radix-50 title information for internal PDP use followed by an experiment header record and a variable number of logical header records and data records of 1024 bytes each. The experiment header record contains tape and experiment identification information, date and orbit number, and satellite position. A logical header record precedes each data record. It contains the dimension of the logical data array of the data record, wavelength information, time at start of logical record, absolute and differential temperatures, gate time, true spacecraft mode, calculated actual azimuth and elevation (for raster experiments only), and experiment type. Each data record contains an array of one of the following five experiment types: (1) spectroheliogram (observation of the variation of a single wavelength or several wavelengths in a line profile with time and with position on the solar disk); (2) spectroheliogram emission maximum or minimum; (3) flare watch (observation of the intensities at one wavelength with position within a small raster frame); (4) spectroheliogram with limb offset; and (5) emission maximum or minimum with limb offset. Data reduction programs for data analysis are available on data set -011. For more information on the main data base, contact Dr. Charles Barth, Laboratory for Atmospheric and Space Physics, Campus Box 392, University of Colorado, Boulder, CO 80309.

Data set name LIMB BRIGHTENING ON MAGNETIC TAPE

NSSDC ID 75 057A-01B, LIMB BRIGHTENING ON MAG. TAPE

Time period covered - 09/28/75 TO 09/30/78

Quantity of data - 15 REELS OF TAPE

These experimenter-supplied, limb brightening data are on 7-track, 800-bpi, binary magnetic tape created on a PDP 11/34 computer. The tapes are multitracked, with each file containing a seven-word header of Radix-50 title information for internal PDP use followed by an experiment header record and a variable number of logical header records and data records of 1024 bytes each. The experiment header record contains tape and experiment identification information, date and orbit number, and satellite position. A logical header record precedes each data record. It contains the dimension of the logical data array of the data record, wavelength information, time at start of record, absolute and differential temperatures, gate time, true spacecraft mode, calculated actual azimuth and elevation (for raster experiments only), and experiment type. Each data record contains an array of one of the following three experiment types: (1) limb brightening (observation of a line profile repeated fewer than 64 times at each preselected position on the disk or above the limb); (2) detailed limb brightening (identical to limb brightening except the user is allowed to observe up to 1024 data points per line profile instead of up to 64); and (3) limb brightening, multiple line profile (observation of up to eight line profiles at positions on the disk and above the limb). Data reduction programs for data analysis are contained on data set -011. For more information on this data set, contact Dr. Charles Barth, Laboratory for Atmospheric and Space Physics, Campus Box 392, University of Colorado, Boulder, CO 80309.

Data set name - VELOCITY STUDY ON MAGNETIC TAPE

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NSSDC ID 75-057A-01C, VELOCITY STUDY ON MAG. TAPE

Time period covered - 06/25/75 TO 09/30/78

Quantity of data - 16 REELS OF TAPE

These experimenter-supplied, velocity study data are on 7-track, 800-bpi, binary magnetic tape created on a PDP 11/34 computer. The tapes are multitracked, with each file containing a seven-word header of Radix-50 title information for internal PDP use followed by an experiment header record and a variable number of logical header records and data records of 1024 bytes each. The experiment header record contains tape and experiment identification information, date and orbit number, and satellite position. A logical header record precedes each data record. It contains the dimension of the logical data array of the data record, wavelength information, time at start of logical record, absolute and differential temperatures, gate time, true spacecraft mode, calculated actual azimuth and elevation (for raster experiments only), and experiment type. Each data record contains an array of one of the following three experiment types: (1) multiple line scan (observation of up to eight individual line profiles at a single position) -- a group of lines may be scanned repeatedly to observe changes or shifts in the lines with time, (2) velocity study (identical to line scan except that no more than 64 data points per line profile are allowed and up to 127 wavelength drive steps between observations may be used), and (3) velocity study with limb offset. Data reduction programs for data analysis are available on data set -01I. For more information on this data set, contact Dr. Charles Barth, Laboratory for Atmospheric and Space Physics, Campus Box 392, University of Colorado, Boulder, CO 80309.

Data set name - SPECTRUM SCAN ON MAGNETIC TAPE

NSSDC ID 75-057A-01D, SPECTRUM SCAN ON MAG TAPE

Time period covered - 06/23/75 TO 09/30/78

Quantity of data - 18 REELS OF TAPE

These experimenter-supplied, spectrum scan data are on 7-track, 800-bpi, binary magnetic tape created on a PDP 11/34 computer. The tapes are multitracked, with each file containing a 7-word header of Radix-50 title information for internal PDP use followed by an experiment header record and a variable number of logical header records and data records of 1024 bytes each. The experiment header record contains tape and experiment identification information, date and orbit number, and satellite position. A logical header record precedes each data record. It contains the dimension of the data array, wavelength information, start time of logical record, absolute and differential temperatures, gate time, true spacecraft mode, calculated actual azimuth and elevation (for raster experiments only), and experiment type. Each data record contains an array of one of the following eight experiment types: (1) wavelength maximum (observation of a single line profile at one position on the solar disk), (2) line scan (observation of the profile of a single position in point mode), (3) spectrum scan (observation of a large part of the solar spectrum), (4) multiple line scan (observation of up to eight individual line profiles at a single point), (5) wavelength maximum with limb offset, (6) line scan with limb offset, (7) spectrum scan with limb offset, and (8) multiple line with limb offset. Data reduction programs for data analysis are available on data set -01I. For more information on this data set, contact Dr. Charles Barth, Laboratory for Atmospheric and Space Physics, Campus Box 392, University of Colorado, Boulder, CO 80309.

Data set name - SPECTRUM RANGE SCAN ON MAGNETIC TAPE

NSSDC ID 75-057A-01E, SPECTRUM RANGE SCAN ON MAG. TAPE

Time period covered - 06/23/75 TO 06/24/78

Quantity of data - 7 REELS OF TAPE

These experimenter-supplied, spectrum range scan data are on 7-track, 800-bpi, binary magnetic tape created on a PDP 11/34 computer. The tapes are multitracked, with each file containing a seven-word header of Radix-50 title information for internal PDP use followed by an experiment header record and a variable number of logical header records and data records. The experiment header contains tape and experiment identification information, date and orbit number, and satellite position. A logical header precedes each data record. It contains the dimension of the logical data array, wavelength information, start time of logical record, absolute and differential temperatures, gate time, true spacecraft mode, calculated actual azimuth and elevation (for raster experiments only), and experiment type. Each data record contains an array of one of the following two experiment types: (1) spectrum range scan and (2) spectrum range scan with limb offset. These are similar to the spectrum scan data (-01D). The differences are in the original wavelength specification, the number of wavelength positions observed, and the number of steps between observed points. Data reduction programs for data analysis are

available on data set -01I. For more information on this data set, contact Dr. Charles Barth, Laboratory for Atmospheric and Space Physics, Campus Box 392, University of Colorado, Boulder, CO 80309.

Data set name - SINGLE WAVELENGTH MONITORING DATA ON MAGNETIC TAPE

NSSDC ID 75-057A-01F, SINGLE WAVELENGTH MONITORING DATA

Time period covered - 06/23/75 TO 09/18/78

Quantity of data - 5 REELS OF TAPE

These experimenter-supplied, single wavelength monitoring data are on 7-track, 800-bpi, binary magnetic tape created on a PDP 11/34 computer. The tapes are multitracked, with each file containing a seven-word header of Radix-50 title information for internal PDP use followed by an experiment header record and a variable number of logical header and data records of 1024 bytes each. The experiment header record contains tape and experiment identification information, date and orbit number, and satellite position. A logical header record precedes each data record. It contains the dimension of the logical data array, wavelength information, start time of logical record, absolute and differential temperatures, gate time, true spacecraft mode, calculated actual azimuth and elevation (for raster experiments only), and experiment type. Each data record contains an array of one of the following two experiment types: (1) single wavelength monitoring (repeated observation of the intensity at one wavelength at one position on the solar disk to monitor changes with time), and (2) single wavelength monitoring with limb offset. Both experiment types are point mode. Data reduction programs for data analysis are available on data set -01I. For more information on this data set, contact Dr. Charles Barth, Laboratory for Atmospheric and Space Physics, Campus Box 392, University of Colorado, Boulder, CO 80309.

Data set name - MISCELLANEOUS DATA ON MAGNETIC TAPE

NSSDC ID 75-057A-01G, MISCELLANEOUS DATA ON MAG. TAPE

Time period covered - 06/28/75 TO 07/22/78

Quantity of data - 4 REELS OF TAPE

These experimenter supplied, miscellaneous data are on 7-track, 800-bpi, binary magnetic tape created on a PDP 11/34 computer. The tapes are multitracked, with each file containing a 7-word header of Radix-50 title information for internal PDP use followed by an experiment header record and a variable number of logical header and data records of 1024 bytes each. The experiment header record contains tape and experiment identification information, date and orbit number, and satellite position. A logical header record precedes each data record. It contains the dimension of the data array, wavelength information, start time of logical record, absolute and differential temperatures, gate time, true spacecraft mode, calculated actual azimuth and elevation (for raster experiments only), and experiment type. Each data record in this miscellaneous data set contains an array of one of the following six experiment types: (1) wavelength maximum (observation of a single line profile at one position on the solar disk), (2) limb finder (observation of intensities at one wavelength at each series of 20 selectable spacecraft offset positions), (3) spectroheliogram with limb offset (observation of a single wavelength for one or more raster frames or a different wavelength along a line profile with each repeat of a raster), (4) wavelength maximum with limb offset, (5) wavelength monitoring with limb offset repeated observations at a fixed wavelength, and (6) spectrum range scan with limb offset (one or repeated observations of a large section of the spectrum where starting and ending wavelengths are specified). Data reduction programs for data analysis are available on data set -01I. For more information on this data set, contact Dr. Charles Barth, Laboratory for Atmospheric and Space Physics, Campus Box 392, University of Colorado, Boulder, CO 80309.

Data set name - CATALOG OF SORTED FINAL DATA TAPES

NSSDC ID 75-057A-01H, CAT. OF SORTED FINAL DATA TAPES

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This experimenter-supplied catalog of sorted final data tapes is on 7-track, 800-bpi, binary magnetic tape created on a PDP 11/34 computer. The catalog contains 103 formatted files. The first record of each file is a seven-word header containing Radix-50 title information for internal PDP use. The second record is a 1024-byte record of filler data. The data records consist of eight 32-word logical records per physical block. Each logical record contains catalog number; sequence number on tape; sequence number of experiment; starting and ending

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wavelength; roll angle; first and second dimensions of data arrays; commanded azimuth and elevation in arc minutes; number of first and last logical record in file; gate time in seconds; start time in day, hour, and minute; experiment type and category; number of wavelength drive steps between observations; number of observations of a line; duration of experiment in minutes; experiment complete/incomplete flag; year code; number of lines observed; spacecraft mode; slit length in arc seconds; orbit number; minutes since sunrise at start of experiment; length of day for orbit in minutes; and day, hour, and minute of sunrise for this orbit. Data reduction programs for data analysis are available on data set -011. For more information on this data set, contact Dr. Charles Barth, Laboratory for Atmospheric and Space Physics, Campus Box 392, University of Colorado, Boulder, CO 80309.

Data set name - DATA REDUCTION PROGRAMS ON TAPE

NSSDC ID 75 057A-011, DATA REDUCTION PROGRAMS ON TAPE

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

These experimenter-supplied data reduction programs are on 7-track, 800-bpi, ASCII magnetic tape created on a PDP 11/34 computer. The programs are contained on 67 data files. The first record of each file is a seven-word header containing Radix-50 title information for internal PDP use. The most useful program is SOL, an interactive data processing language developed specifically for OSO 8 data analysis. The language is statement oriented and is designed to handle scalars, vectors, line profiles, and matrices of both integer and floating point modes. The interactive nature of the language allows single statement execution as well as stored program execution. The stored programs include RDCAT.FTN, which is used to read the sorted catalog tape (-01H) and make a list of files whose parameters satisfy the input criteria; SORTED.FTN, which separates the data tape's experiment types into categories; LOCAT.PRO, which allows the user to input the name of an experiment and find the pointing coordinates of that experiment on a particular hydrogen-alpha picture; SDI.FTN, which is a collection of Fortran routines to read and write SOL-formatted data files; BLKSET MAC, which is a routine to open a block access file; CFI.FIN, a collection of subroutines that use a Newton Raphson technique to fit a Gaussian to the input data, and MASSAGE, which is a data processing routine designed to smooth spectrum scans and correct for distortion of the line profiles. For more information on this data set, contact Dr. Charles Barth, Laboratory for Atmospheric and Space Physics, Campus Box 392, University of Colorado, Boulder, CO 80309.

OSO 8, FROST  
HIGH-ENERGY CELESTIAL X RAYS

Data set name TABLE OF ALL CELESTIAL X-RAY SOURCES  
OBSERVED BY THE HIGH ENERGY DETECTOR

NSSDC ID 75 057A-07A, CELESTIAL X-RAY SOURCES OBS

Time period covered 06/21/75 TO 09/30/78

Quantity of data 1 PAGE OF UNBOUND HARDCOPY

This data set is a hard copy table of all X-ray sources observed by the high energy celestial X-ray detector. The table is arranged in chronological order, covering a period from June 21, 1975, to September 30, 1978, and includes the source name and the day, month, and year of the start and end of each observation. Magnetic tapes of the data obtained during these observations are available from NSSDC. For information on the main data base and this data set, contact Kenneth Frost, Code 600.0, GSFC/NASA, Greenbelt, MD 20771.

OSO 8, KRAUSHAAR  
SOFT X-RAY BACKGROUND RADIATION  
INVESTIGATION

Data set name - REDUCED COSMIC X-RAY COUNTS BY DETECTOR,  
ENERGY CHANNEL, AND SECTOR ON TAPE

NSSDC ID 75-057A-05A, REDUCED DATA TAPES

Time period covered - 06/25/75 TO 09/30/78

Quantity of data - 150 REELS OF TAPE

This data set consists of soft X-ray data on 1600-bpi, binary, 9-track, multitracked magnetic tape recorded on a UNIVAC 1110 computer. Logical records are packed 10 to a physical record giving 300 x 10 = 3000 word blocks. All references to "word" mean 36 bit words. An end-of-file mark was written if more than 12 h elapsed after the beginning of a file or if the

total movement of the positive spin axis was greater than or equal to a 10 deg change after the beginning of a file. Each data record contains ID and flag words; day and seconds of day; minor frames of telemetry words; digital subcommunication words; high voltage power supply analog monitors; right ascension (RA) and declination (Dec) of top sky; RA and Dec of centers of sectors; magnetic field strength and roll axis; geodetic latitude and longitude; McIlwain's L and B parameters; zenith, azimuth, and height of the satellite (kilometers); relay monitors; spin rate; and attitude flags. For information on the main data base and this data set, contact Dr. William Kraushaar, Department of Physics, University of Wisconsin, 1150 University Avenue, Madison, WI 53706.

OSO 8, NOVICK  
HIGH-SENSITIVITY CRYSTAL  
SPECTROSCOPY OF STELLAR AND SOLAR X RAYS

Data set name - STELLAR AND SOLAR X-RAY SPECTROSCOPE  
MERGED DATA TAPES

NSSDC ID 75-057A-03A, MERGED X-RAY DATA

Time period covered - 07/24/75 TO 09/15/78

Quantity of data - 370 REELS OF TAPE

This data set contains merged X-ray data from the following three sources: stellar X-ray polarimeter, stellar X-ray spectrometer, and solar X-ray spectrometer. Although the two spectrometers are physically the same instrument, the data from each appear in different formats in the telemetry stream. In addition, only one of these three experiments can be conducted at a given time. The fundamental time period for data collection is one revolution of the satellite, and each of the logical records represents 1432 bytes of information relevant to one revolution. The data are on 9-track, 1600-bpi, binary magnetic tape created on an IBM 360 computer. There are five logical records per physical block. A logical record contains day and seconds of day; spin, roll, and aspect right ascension and declination; pitch angle; position X, Y, and Z; height; magnetic field B; right ascension; declination; longitude; latitude; spin; high-voltage readouts; temperature readouts; low voltage readouts; flare and window thresholds; raster one and two; sungate, reference and status used; number of missing events; number of events; and data words. This data set is accompanied by a program that reads the tapes and writes onto three output tapes, so that the three kinds of data referred to above can be separated onto three sets of tapes. For information on the main data base and this data set, contact Dr. Martin Weisskopf, Code ES-62, MSFC/NASA, Huntsville, AL 35812.

OSO 8, SERLEMITSOS  
COSMIC X-RAY SPECTROSCOPY

Data set name - SPIN AXIS POINTING MAPS

NSSDC ID 75-057A-06A, SPIN AXIS POINTING MAPS

Time period covered - 07/02/75 TO 10/01/78

Quantity of data - 5 CARDS OF B/W MICROFICHE

This is the same data set as 75-057A-000. It consists of sky maps showing the approximate position of the OSO 8 spin axis with respect to selected X-ray sources and is accompanied by a catalog. Sources are displayed on a local coordinate system. The right ascension and declination of the marked central position in each map are shown at the bottom. Sources are indicated by abbreviations, as listed in the accompanying catalog. Sources relevant to both the positive-spin-axis-pointing detector of experiment 75-057A-06 and the negative-axis-pointing detectors are shown on the same map. Starred sources refer to the negative spin axis direction. The right ascension and declination of the marked position relate to the starred sources. The catalog was compiled before the OSO 8 launch, so most of the candidate sources are now known to have fluxes that are undetectable by experiment 75-057A-06. Other sources, although detectable, have by now improved positions. However, with the maps and the catalog, one should be able to find the approximate coordinates of any point on the maps. Catalog source positions are given in 1975 epoch coordinates. Day numbers along the spin axis path are indicated, with day 0 corresponding to January 1, 1975. For information on the main data base and this data set, contact Dr. Peter Serlemitsos, Laboratory for High Energy Astrophysics, Code 661, GSFC/NASA, Greenbelt, MD 20771.

OSO 8, WELLER, JR.  
EUV FROM EARTH AND SPACE

Data set name - COLOR PLOTS ON UV EMISSIONS IN SPACE

NSSDC ID 75-057A-08A, COLOR DATA PLOTS ON UV EMISSION

Time period covered - (N/A)

Quantity of data - 30 COLOR SLIDES

This data set consists of 35-mm slides, supplied by the experimenter, that are copies of computer plots of data on ultraviolet emission in space. There are 30 slides in color (data set 75-057A-08A) and 59 in black and white (data set 75-057A-08B). The color slides each show two charts. The lower chart presents the intensity of ultraviolet radiation measured in space using three different detector-filter combinations for three different wavelength ranges. These combinations are identified on the chart in color for each of the three data plots (one in green, one in blue, and one in red). The upper chart gives four angles of interest: the sun-earth-satellite angle, the local zenith angle, and the latitude and longitude of the intercept of the line of sight on a 100-km-radius sphere. The black-and-white slides also contain two charts. The lower chart shows the intensity of ultraviolet background emission in Rayleighs measured with background detector 1. The upper chart shows the following four angles: the right ascension and declination of the intersection of the line of sight with the celestial sphere, the local zenith angle, and the angle between the line of sight and the downstream flow axis of the local interstellar medium. For information on the main data base and this data set, contact Dr. Charles Weller, Naval Research Laboratory, Washington, DC 20375.

Data set name - BLACK AND WHITE PLOTS ON UV EMISSIONS IN SPACE

NSSDC ID 75-057A-08B, B/W DATA PLOTS ON UV EMISSION

Time period covered - (N/A)

Quantity of data - 59 B/W SLIDES

This data set consists of 35 mm slides, supplied by the experimenter, that are copies of computer plots of data on ultraviolet emission in space. There are 30 slides in color (data set 75-057A-08A) and 59 in black and white (data set 75-057A-08B). The color slides each show two charts. The lower chart presents the intensity of ultraviolet radiation measured in space using three different detector-filter combinations for three different wavelength ranges. These combinations are identified on the chart in color for each of the three data plots (one in green, one in blue, and one in red). The upper chart gives four angles of interest: the sun-earth-satellite angle, the local zenith angle, and the latitude and longitude of the intercept of the line of sight on a 100-km-radius sphere. The black and white slides also contain two charts. The lower chart shows the intensity of ultraviolet background emission in Rayleighs measured with background detector 1. The upper chart shows the following four angles: the right ascension and declination of the intersection of the line of sight with the celestial sphere, the local zenith angle, and the angle between the line of sight and the downstream flow axis of the local interstellar medium. For detailed information on this data set, contact Dr. Charles Weller, Naval Research Laboratory, Washington, DC 20375.

..... PEGASUS 1 .....

PEGASUS 1, NAUMANN METEOROID PENETRATION DETECTORS

Data set name - METEOROID PENETRATION DATA ON TAPE

NSSDC ID 65-009A-01A, CARDS AND TAPE IMAGES OF CARDS

Time period covered - 02/17/65 TO 03/29/66

Quantity of data - 1 REEL OF TAPE

These reduced data were received from the experimenter. This data set is available as one tape containing approximately 4000 card images. The tape was written on an IBM 7094 in even parity, with 84 bcd characters per record, at a density of 556 bpi. The following information is included for each meteoroid penetration event--date, time, side penetrated, panel penetrated, thickness penetrated, latitude and longitude of the spacecraft, and either spacecraft housekeeping data (e.g., temperatures, spacecraft clock) or spacecraft location in equatorial and ecliptic coordinates. See "Pegasus Meteoroid Penetration Detectors," NSSDC Data Users Note 69 15, by C. Fuller and M. Beeler. Data from Pegasus 2 (65-039A-01A) and Pegasus 3 (65-060A-01A) are also contained on this tape.

..... PEGASUS 2 .....

PEGASUS 2, NAUMANN METEOROID PENETRATION DETECTORS

Data set name - METEOROID PENETRATION DATA ON TAPE

NSSDC ID 65-039A-01A, CARDS AND TAPE IMAGES OF CARDS

Time period covered - 05/25/65 TO 10/31/67

Quantity of data - 1 REEL OF TAPE

These reduced data are from the experimenter. This data set is available as one tape containing approximately 4000 card images. The tape was written on an IBM 7094 in even parity, with 84 bcd characters per record, at a density of 556 bpi. The following information is included for each meteoroid penetration event--date, time, side penetrated, panel penetrated, thickness penetrated, latitude and longitude of the spacecraft, and either spacecraft housekeeping data (e.g., temperatures, spacecraft clock) or spacecraft location in equatorial and ecliptic coordinates. See "Pegasus Meteoroid Penetration Detectors," NSSDC Data Users Note 69-15, by C. Fuller and M. Beeler. Data from Pegasus 1 (65-009A-01A) and Pegasus 3 (65-060A-01A) are also contained on this tape.

..... PEGASUS 3 .....

PEGASUS 3, NAUMANN METEOROID PENETRATION DETECTORS

Data set name - METEOROID PENETRATION DATA ON TAPE

NSSDC ID 65-060A-01A, CARDS AND TAPE IMAGES OF CARDS

Time period covered - 07/30/65 TO 08/15/67

Quantity of data - 1 REEL OF TAPE

These reduced data were provided by the experimenter. This data set, containing approximately 4000 card images, is on magnetic tape. The tape was written on an IBM 7094 in even parity, with 84 bcd characters per record, at a density of 556 bpi. Listed for each meteoroid penetration event are date, time, side penetrated, panel penetrated, thickness penetrated, latitude and longitude of the spacecraft, and either spacecraft housekeeping data (e.g., temperatures, spacecraft clock) or spacecraft location in equatorial and ecliptic coordinates. See "Pegasus Meteoroid Penetration Detectors," NSSDC Data Users Note 69 15, by C. Fuller and M. Beeler. Data from Pegasus 1 (65-009A-01A) and Pegasus 2 (65-039A-01A) are also contained on this tape.

..... PROGNOZ 9 .....

PROGNOZ 9, UNKNOWN SOLAR X-RAY SPECTROMETER

Data set name - SOLAR X-RAY SURVEY PLOTS ON MICROFICHE

NSSDC ID 83-067A-02A, SOLAR X-RAY SURVEY PLOTS, MFICHE

Time period covered - 07/01/83 TO 01/13/84

Quantity of data - 5 CARDS OF B/W MICROFICHE

This microfiche data set was produced at NSSDC from a hard copy submitted by Dr. Farnik of the Ondrejov Observatory, Czechoslovakia, entitled Prognoz Data-Part IV, and published by the Astronomical Institute of Czechoslovakia in 1985. It contains plots of solar X-rays detected by a 4-8 keV band detector. Each page has 24 h of data, at a time resolution of 1 min. The fluxes are in relative units. Data contaminated during flights through the radiation belt are plotted as horizontal lines. Higher time-resolution data may be obtained by request to the Ondrejov Observatory.

ORIGINAL PAGE IS OF POOR QUALITY

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\*\*\*\*\* RAE-A \*\*\*\*\*  
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RAE-A, STONE  
STEP FREQUENCY RADIOMETERS

Data set name - RYLE VONBERG RECEIVER PLOTS

NSSDC ID 68 055A-01A, RYLE-VONBERG RECEIVER PLOTS

Time period covered - 09/25/68 TO 12/25/72

Quantity of data - 308 REELS OF MICROFILM

In this data set, a complete orbit of data is plotted on nine frames of microfilm, one for each operating frequency. On each frame, all three antenna systems (upper V-shaped antenna, lower V-shaped antenna, and dipole) are indicated at the right edge of the frame for the frequency listed in the upper left-hand corner. The abscissa is marked every 10 min in GMT and labeled every hour. The actual span of data plotted is listed at the top of the frame in a yymmddhhmmss format. Every half hour of GMT, the pointing positions of the V antennas are listed directly below the appropriate abscissa value. The ordinate is logarithmic and shows five decades of calibration temperature, with each decade marked at the 1, 2, 4, 6, and 8 levels. For information on the main data base and this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

RAE-A, STONE  
RADIO BURSTS RECEIVERS

Data set name - SWEEP FREQUENCY BURST RECEIVER CONTOUR PLOTS

NSSDC ID 68 055A 02A, SWEEP FREQUENCY BR CONTOUR PLOTS

Time period covered 05/25/69 TO 03/13/71

Quantity of data - 79 REELS OF MICROFILM

This data set consists of contour plots made from swept-frequency data from the 32-frequency burst receiver. Contours of equal intensity referenced to the galactic background are plotted against time in minutes on the abscissa and frequency number on the ordinate. The frequency number is complemented on the right by an actual frequency scale in MHz (logarithmic). The galactic background reference is scaled from Alexander et al., Astron. Astrophys., v. 6, p. 476, 1970. The date and time of the first data point are shown at the lower left, along with satellite position. The plotted frame always starts on the minute. At the lower right, the minimum and maximum levels show the dynamic range in decibels, and the increment gives the contour interval. The actual minimum and maximum values in the frame are listed in decibels at the bottom center. The individual contour lines are labeled in decibels. For information on the main data base and this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

Data set name - SWEEP FREQUENCY BURST RECEIVER MULTIGRID PLOTS

NSSDC ID 68-055A-02B, SWEEP FREQUENCY BR MULTIGRID PLOT

Time period covered - 09/26/68 TO 12/03/72

Quantity of data - 530 REELS OF MICROFILM

This data set contains the same data presented in data set 68-055A-02A (Swept Frequency Burst Receiver Contour Plots), but in this case the intensity of radio emission in each of 24 individual frequencies is plotted on the abscissa, and each panel covers an hour. On the ordinate, intensity is plotted in the unit T sub cal, which is proportional to antenna temperature. There are three frames for each hour of time, each consisting of eight plots for eight frequencies. For more information on this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

Data set name - BURST RECEIVER MULTIGRID TEN-MINUTE PLOTS

NSSDC ID 68-055A-02C, BR MULTIGRID 10-MINUTE PLOTS

Time period covered - 07/23/68 TO 07/20/71

Quantity of data - 1041 REELS OF MICROFILM

The data from burst receiver 2 are plotted in 10-min segments for each of 24 frequencies. Each frame consists of six plots, and there are four frames in each set, covering the 24 frequencies. The horizontal scale is 11-min long with every 20 s. The starting time of the frame is indicated at the top. The frequency in kilohertz is shown in the upper right-hand corner of each plot. The spacecraft coordinates at the time of the first data point are shown at the bottom of the frame. The ordinate can be either linear or logarithmic (see upper right-hand corner of frame). A standard set of four frames consists of two logarithmic plots displaying six decades and three decades of dynamic range and two linear plots showing a factor of 20 and a factor of 2 in dynamic range based on the minimum temperature in the frame. In the linear mode, all ordinate lines are labeled; in the log mode, the integral decades are labeled. For more information on this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

Data set name - FULL ORBIT BURST RECEIVER PLOTS

NSSDC ID 68-055A 02D, FULL ORBIT BURST RECEIVER PLOTS

Time period covered - 07/23/68 TO 12/22/72

Quantity of data - 523 REELS OF MICROFILM

The data are displayed on two frames. The particular receiver is indicated at the top of each frame. The observing frequency in kilohertz is given at the right of each plot. When burst receiver 2 is displayed, the top two plots on the second frame are missing. The abscissa is marked every 10 min of GMT and labeled every hour. The date is at the bottom of each frame, in yymmdd format, and corresponds to the beginning of the frame. The ordinate of the receiver data is logarithmic, and five decades of calibration temperature are shown, marked once per decade. The bottom four plots of frame 2 show various coordinates as functions of GMT. The third plot from the top shows the satellite right ascension and declination. Right ascension is read in hours using the left-hand coordinate and is the plotted curve marked with "R." Declination in degrees is read from the right-hand ordinate and is the plotted curve marked with "D." Similarly, the next plot shows subsatellite local time in hours and geomagnetic latitude in degrees. The local time curve is marked "T" and the geomagnetic latitude curve, "L." The bottom two plots show a dipole representation of invariant latitude in degrees and the L-shell parameter in earth radii. For more information on this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

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\*\*\*\*\* RAE-B \*\*\*\*\*  
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RAE-B, STONE  
STEP FREQUENCY RADIOMETERS

Data set name - RYLE-VONBERG 24 HOUR PLOTS

NSSDC ID 73-039A-01A, RYLE-VONBERG 24 HOUR PLOTS

Time period covered - 10/31/74 TO 04/26/77

Quantity of data - 8 REELS OF MICROFILM

This data set is contained on 16-mm microfilm. It summarizes the observations made with the Ryle-Vonberg receivers (RV-1 and RV-2) on RAE-B. Each frame represents the observations taken on a particular day (shown in yy/mm/dd format in the lower left-hand corner) at a particular frequency, one of the nine frequencies of operation, from 0.45 to 9.18 MHz. The upper plot is for RV-1, connected to the upper V-antenna; the lower plot is for RV-2, connected to the lower V-antenna. The fine and coarse measurements of the relative antenna temperature (called calibration temperature) are plotted logarithmically as squares and dots, respectively, on a scale that covers 60 dB, with horizontal grid lines at decade intervals. Vertical grid lines are drawn every hour and labeled. For information on the main data base and this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

Data set name - RYLE-VONBERG 24-HOUR DATA ON MAGNETIC TAPE

NSSDC ID 73-039A-01B, RYLE-VONBERG 24-HOUR TAPES

Time period covered - 07/12/73 TO 06/28/75

Quantity of data - 11 REELS OF TAPE

These tapes are the basic data base for the Ryle-Vonberg receiver investigation. Each tape file contains 4 days of data, and there are 15 files per tape. The tapes are 1600 bpi and 9 track, with IBM standard labels. The logical record length is 908 bytes, consisting of a 4-byte logical record control word and 904 data bytes. The physical record length is 31,784 bytes, consisting of a control word and 35 logical records. Each logical record contains day and date; channel number (i.e., frequency); X, Y, and Z spacecraft vectors; right ascension and declination of the upper V-antenna; coarse and fine data samples from both the RV-1 and RV-2 receivers; and RV ambient temperature. Each frequency is selected for 15.4 s before stepping to the next, and each logical record contains a set of the parameters for each frequency step in a given sequence. Twenty-four-hour plots of these parameters are available on microfilm (NSSDC data set 73-039A-01A). For more information on this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

RAE-B, STONE  
RAPID-BURST RECEIVERS

Data set name - DATA SUMMARY (10 MIN. INTERVALS) FROM BURST RECEIVER ON LOWER V ANTENNA, ON MFILM

NSSDC ID 73-039A-02A, LOWER ANT, DATA SUMMARY, M/FILM

Time period covered - 07/12/73 TO 06/30/75

Quantity of data - 1 REEL OF MICROFILM

This data set is contained on one reel of 16-mm microfilm and is supplied by the PI. It summarizes the observations made with the burst receiver, BR-2, on RAE-B. The data are four dynamic spectral displays showing the variation in the average, minimum, maximum, and mode of the received noise as a function of frequency and time with 10-min resolution. The data are displayed as a series of four plots per day, with frequency being the ordinate and time being the abscissa, and appear as darkness variations. For information on the main data base and this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

Data set name - DATA SUMMARY (10 MIN INTERVALS) FROM BURST RECEIVER ON LOWER V ANTENNA, ON TAPE

NSSDC ID 73-039A-02B, LOWER ANT, DATA SUMMARY - MAGTAPE

Time period covered 07/12/73 TO 03/09/76

Quantity of data 2 REELS OF TAPE

This data set, contained on two reels of magnetic tape (9-track, 1600 bpi, standard labeled 32-bit word length, generated on an IBM 360 computer), summarizes the observations made with the burst receiver, BR 2, on RAE B. The data show the variations in the average, minimum, maximum, and mode of the received noise as a function of frequency and time with 10-min resolution. These data are presented graphically on data set 73-039A-02A. For more information on this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

Data set name - BURST RECEIVER HOURLY PLOTS ON MICROFILM

NSSDC ID 73-039A 02C, BURST RECEIVER HOURLY PLOTS, MFILM

Time period covered 07/12/73 TO 04/26/77

Quantity of data 49 REELS OF MICROFILM

These plots, on 16 mm microfilm, display relative antenna temperature as a function of time at eight selected frequency channels for both the upper V-antenna (burst receiver, BR-1) and the lower V-antenna (burst receiver, BR 2). For BR-1, the frequencies displayed are 9.18, 4.17, 2.20, 1.03, 0.475, 0.250, 0.110, and 0.044 MHz. The same frequencies are used in the BR-2 plots except for the lowest channel, which is 0.055 MHz. The UT hour is at the beginning of the plot interval, and the dates (yy/mm/dd format) are shown in the lower left-hand corner. Eight panels of data are displayed, with the highest frequency data in the top panel and the lowest frequency data at the bottom. The frequency channel for each plot is identified in megahertz at the right-hand end of each plot. The relative antenna temperature displays (called calibration temperature) are logarithmic plots that cover a total dynamic range of 80 dB; the horizontal grid lines are plotted at decade intervals. The calibration temperature is the equivalent noise temperature (in K) from a 50-ohm generator that would give the

same receiver output as that observed in flight. Vertical grid lines are plotted every 2 min and are labeled for every 4 min after the hour. When lunar occultations of earth or sun occurred, the times of the geometric occultation (first contact to last contact) are shown by solid lines along the bottom of the frame. Such occultation periods are identified by an E for earth and an S for sun. For more information on this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

Data set name - BURST RECEIVED 24-HOUR PLOTS

NSSDC ID 73-039A-02D, BURST RECEIVER 24-HOUR PLOTS

Time period covered - 07/12/73 TO 04/26/77

Quantity of data - 12 REELS OF MICROFILM

These plots, on microfilm, display relative antenna temperature as a function of time at 32 frequency channels for both the upper V-antenna (burst receiver 1, or BR-1) and the lower V-antenna (burst receiver 2, or BR-2). The date (yy/mm/dd format) is shown in the lower left-hand corner. Eight panels of data are displayed on each frame, with the highest-frequency data in the top panel and the lowest-frequency data at the bottom. The frequency channel for each plot is identified in megahertz at the right-hand end of each plot. The relative antenna temperature displays (called calibration temperature) are logarithmic plots that cover a total dynamic range of 60 dB; the horizontal grid lines are plotted at decade intervals. The calibration temperature is the equivalent noise temperature (in K) from a 50-ohm generator that would give the same receiver output as that observed in flight. Vertical grid lines are drawn and labeled for every hour. For more information on this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

Data set name - SPECTRAL BURST RECEIVER HOURLY PLOTS ON MICROFILM

NSSDC ID 73-039A-02E, SPECTRAL BURST RECEIVER HRLY PLOT

Time period covered - 05/07/75 TO 04/24/77

Quantity of data - 1 REEL OF MICROFILM

These plots, supplied by the experimenter as hard copy, were microfilmed at NSSDC. As in data set 73-039A 02A, the observations made with the BR-2 (burst receiver) on RAE-B are presented, but in this case much more detail is shown. The data for each day are plotted in 24 1-h long strips that show the variation in the received noise as a function of frequency and time. The 32 frequencies are spread along the ordinate, with 25 kHz at the bottom and 13.1 MHz at the top, and time is plotted along the abscissa. The data appear as darkness variations. For more information on this data set, contact Dr. Robert Stone, Code 690.0, GSFC/NASA, Greenbelt, MD 20771.

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\*\*\*\*\* S 15 \*\*\*\*\*  
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S 15, GARMIRI  
CRYSTAL SANDWICH/CERENKOV COUNTER

Data set name - DETECTOR COUNT RATES ON MAGNETIC TAPE

NSSDC ID 61-013A-02A, COUNT RATE, LONG, LAT, B,L, UT

Time period covered - 04/28/61 TO 11/12/61

Quantity of data - 1 REEL OF TAPE

These reduced data for the period of April 28 to November 12, 1961, are available on one 7-track, bcd, card image magnetic tape written on an IBM 7094 at a density of 556 bpi. This tape was generated at NSSDC from punched cards supplied by the experimenter. The following items are contained on the tape: detector channel, latitude, longitude, altitude, b (galactic longitude), l (galactic latitude), time (month, day, hour, minute), and uncalibrated count rate. For information on the main data base and this data set, contact Dr. Gordon Carmire, Astronomy Department, 504 Davey Laboratory, Pennsylvania State University, University Park, PA 16802.

S 15, KRAUSHAAR  
PHOSWICH-CERENKOV COUNTER TELESCOPE

Data set name - REDUCED DIRECTIONAL GAMMA RAY FLUX DATA

REPRODUCED FROM  
OF POOR QUALITY

ON TAPE

NSSDC ID 61-013A-01A, ASPECT-OBSERVE TIME GAMMA EVENTS

Time period covered - 04/27/61 TO 11/17/61

Quantity of data - 2 REELS OF TAPE

This data set, supplied by the experimenter, is contained on 7-track, 556-bpi, binary magnetic tapes prepared by an IBM 7094 in Fortran format. One tape contains the direction parameters of 1012 events that were accepted as true gamma-ray events by the instrument circuit logic and subsequent data reduction. The second tape contains direction parameters for random events generated by the experimenter at a rate 25 times that of the real events. The number of these events is proportional to the time that the telescope looked in a given direction, so the ratio of real to random events for one direction is proportional to the directional gamma ray flux. The data include time of observation (decimal Julian date), geographic position of satellite, geomagnetic position, telescope orientation in galactic coordinates, and additional position and orientation information. For information on the main data base and this data set, contact Dr. William Kraushaar, Department of Physics, University of Wisconsin, 1150 University Avenue, Madison, WI 53706.

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S 55B  
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S 55B, BESWICK  
MICROMETEORITE DETECTOR

Data set name - MICROPHONE MICROMETEORITE IMPACT PLOTS ON MICROFICHE

NSSDC ID 62-070A-04A, MICROPHONE IMPACT PLOTS

Time period covered - 12/16/62 TO 04/20/63

Quantity of data - 1 CARD OF B/W MICROFICHE

This data set consists of two types of graphs, namely, count rate vs time and daily impact accumulation vs time. Count rate graphs are included for all three impact sensitivity ranges, but since it appears from these graphs that the high sensitivity detector malfunctioned, only two impact accumulation graphs were prepared. Data and documentation are in E.C. Hastings, "The Explorer XVI Micrometeoroid Satellite Supplement III," NASA TM X-949, pp. 8-14 and pp. 25-29, March 1964.

S 55B, DAVISON  
GRID DETECTORS OF MICROMETEORITES

Data set name - GRID DETECTOR PENETRATION PLOTS ON FICHE

NSSDC ID 62-070A 02A, GRID DET PENETRATION PLOTS, FICHE

Time period covered - 12/16/62 TO 05/30/63

Quantity of data - 2 CARDS OF B/W MICROFICHE

This data set consists of tabular and graphic presentations showing cumulative numbers of recorded penetrations vs time. Documentation and data are in Davison and Winslow, "Micrometeoroid Satellite Stainless Steel Penetration Rate Experiment," (NASA TN D-2445), pp. 6-7. Another plot, along with least squares fit and theoretical scatter, can be found in J.M. Alvarez, "Statistical Analysis of Meteoroid Penetration Data Including Effects of Cutoff," NASA TN D 5668, p. 57.

S 55B, CURTLER  
PRESSURIZED CELL MICROMETEORITE DETECTOR

Data set name - PRESSURE CELL CUMULATIVE PENETRATION PLOTS

NSSDC ID 62-070A-01A, PRESSURE CELL PENETRATION PLOTS

Time period covered - 12/16/62 TO 07/02/63

Quantity of data - 2 CARDS OF B/W MICROFICHE

This data set consists of one graph showing cumulative numbers of cell penetrations vs time. Curves for all three cell wall thicknesses are on one graph. Traces of least squares fit for the data and theoretical scatter are included.

Documentation and data are on page 54 of J.M. Alvarez, "Statistical Analysis of Meteoroid Penetration Data Including Effects of Cutoff," NASA/LRC 1594M.

Data set name - PRESSURE CELL CUMULATIVE PENETRATION TABULATIONS

NSSDC ID 62-070A-01B, DETECTOR PENETRATION LISTINGS

Time period covered - 12/16/62 TO 07/22/63

Quantity of data - 4 BOOKS OR BOUND VOLUMES

This data set consists of four tables showing cumulative cell puncture counts (by wall thickness) for each satellite interrogation time. Three other tables list only interrogation times at which a new puncture occurs and note time since last interrogation. Other descriptive information about the experiment operation is included. Data are in E.C. Hastings, "The Explorer XVI Micrometeoroid Satellite" and three supplements: NASA TM X-810, p. 9; TM X-824, p. 3; TM X-899, p. 7; and TM X-949, p. 4.

S 55B, SECRETAN  
COPPER WIRE MICROMETEORITE DETECTOR

Data set name - GSFC WIRE CARD MICROMETEOROID DETECTOR PLOT ON MICROFICHE

NSSDC ID 62-070A-03A, WIRE CARD DETECTOR PLOT

Time period covered - 12/16/62 TO 07/22/63

Quantity of data - 1 CARD OF B/W MICROFICHE

The record of data from this experiment is contained on page 58 of J.M. Alvarez, "Statistical Analysis of Meteoroid Penetration Data Including Effects of Cutoff," NASA TN D-5668, and on page 8 of E.C. Hastings, "The Explorer XVI Micrometeoroid Satellite Supplement III," NASA TM X-949, March 1964. Hastings gives only a statement of the penetrations as noted in the experiment brief description. Alvarez presents one graph of penetrations vs time, with theoretical scatter boundaries.

S 55B, SECRETAN  
CADMIUM-SULFIDE CELL MICROMETEORITE DETECTOR

Data set name - CADMIUM-SULFIDE CELL MICROMETEORITE DETECTOR DATA TABULATIONS ON MICROFICHE

NSSDC ID 62-070A-05A, CD-S DETECTOR TABULATIONS

Time period covered - 12/16/62 TO 02/09/63

Quantity of data - 1 CARD OF B/W MICROFICHE

These data list cumulative perforation areas of the opaque CdS cell cover for each time for which data could be read. The readout time depended upon the solar aspect of the satellite when the satellite was in range of a readout station, since the desired minimum cell resistance (for a given hole area) occurs only when the sun is normal to the cell surface. Seven lines of data are listed for the 20-day operation of cell A, and eight lines of data are given for the 55-day operation of cell B. The data are on page 10 of L. Secretan, "Measurements of Interplanetary Dust Particle Flux from Explorer XVI CdS and Wire Grid Dust Particle Detectors," NASA/GSFC X-613-66-451.

Data set name - CADMIUM-SULFIDE CELL MICROMETEORITE DETECTOR DATA PLOTS ON MICROFICHE

NSSDC ID 62-070A-05B, CD-S DETECTOR PLOTS, MICROFICHE

Time period covered - 12/16/62 TO 02/09/63

Quantity of data - 2 CARDS OF B/W MICROFICHE

This data set consists of one graph showing plots (for each of two cells) of time vs hole area in the opaque Mylar shield. The time plotted is readout time and depended upon the solar aspect of the satellite when the satellite was in range of a readout station, since the desired minimum cell resistance (for a given hole area) occurs only when the sun is normal to the cell surface. The data are on page 61 of J.M. Alvarez, "Statistical Analysis of Meteoroid Penetration Data Including Effects of Cutoff," NASA/LRC L-5944.



.....  
..... S 55C .....

S 55C, CURTLER  
PRESSURIZED CELLS

Data set name - ANALYZED DATA PUBLISHED IN NASA TN-D-4284

NSSDC ID 64-074A-01A, PUBLISHED REPORT TN-D-4284

Time period covered - 11/06/64 TO 11/05/65

Quantity of data - 2 CARDS OF B/W MICROFICHE

This data set is contained in the published report "The Explorer XXIII Micrometeoroid Satellite. Description and Results for the Period November 6, 1964, through November 5, 1965," compiled by R.L. O'Neal, NASA TN-D-4284, pp. 9-29, June 1968. Accumulated punctures for the 25-micron-thick pressurized cup detectors are given in a time-ordered tabulated form (four pages) including the pass number, Greenwich date, Greenwich mean time at interrogation, and time since last interrogation in hours and minutes. Also included in the report are the time-area products and puncture rates for both detectors as derived from the puncture data. The analyzed data consist of six graphs depicting the following relations: (1) a comparison of puncture history with average puncture curve for the 25-micron detector with boundaries of one standard deviation noted; (2) same as (1) but for the 50-micron detector; (3) a history of punctures for the 25-micron detector as a function of the time-area in which slopes are drawn through groups of data points, indicating possible changes in meteoroid flux rates; (4) a comparison of observed and expected values of the number of punctures for the 25-micron detector whose time-area products between punctures fall within the time-area classifications shown; (5) same as (4) but for the 50-micron detector; and (6) a comparison of Explorer 16 (S 55B) and Explorer 23 (S 55C) pressurized-cell puncture rates. The data consist of 124 counts, are of good quality, and are in reasonable agreement with data obtained from similar experiments flown on earlier satellites.

S 55C, HOLDEN  
IMPACT DETECTORS

Data set name - ANALYZED DATA PUBLISHED IN NASA TN-D-4284

NSSDC ID 64-074A-02A, PUBLISHED REPORT TN-D 4284

Time period covered - 11/06/64 TO 11/05/65

Quantity of data 2 CARDS OF B/W MICROFICHE

The data set is contained in the published report "The Explorer XXIII Micrometeoroid Satellite. Description and Results for the Period November 6, 1964, through November 5, 1965," compiled by R.L. O'Neal, NASA TN D 4284, pp. 45-57, June 1968. The total number of counts for each sensitivity range (low, medium, and high) is given in the text as are four figures describing the impact detector configuration. Four figures in the report display the data in the following ways: the daily impact accumulation for the high- and medium-sensitivity ranges plotted vs time (UT); a comparison of impact data from Explorer 8 (S 30), Explorer 16 (S 55B), and Explorer 23 (S 55C) plotted on an impact rate vs particle mass coordinate system; and the predicted time in sunlight for Explorer 23 compared with the high-sensitivity range daily impact accumulation. The quality of the data is questionable in all sensitivity ranges. The high-sensitivity range data contained false impact counts because of sensor temperature effects and do not compare well with penetration data. The medium-range data were not temperature sensitive but still could not be interpreted with any certainty. The low-sensitivity data were too sparse to be statistically significant.

S 55C, SECRETAN  
CADMIUM SULFIDE CELLS

Data set name - CADMIUM-SULFIDE-CELL-DETECTOR EXPERIMENT REPORT

NSSDC ID 64-074A-03B, CADMIUM-SULFIDE-CELL METEOR DECT.

Time period covered - 11/06/64 TO 11/05/65

Quantity of data - 2 CARDS OF B/W MICROFICHE

This data set is a two-page report by the principal investigator, L. Secretan, and is included in a larger document that describes the results of experiments on Explorer 23 (S 55C). This larger document, written by R.L. O'Neal, is entitled "The Explorer XXIII Micrometeoroid Satellite. Description and Results for the Period November 6, 1964, through November 5, 1965," NASA TN D-4284, June 1968. Secretan states that there are no scientific results from this experiment because the aluminized PET film covers on the cells were damaged during launch and could not provide meteoroid-penetration data.

S 55C, SIVITER  
CAPACITOR DETECTORS

Data set name - ANALYZED DATA PUBLISHED IN NASA TN-D-4284

NSSDC ID 64-074A-04A, PUBLISHED REPORT TN-D-4284

Time period covered - 11/06/64 TO 11/05/65

Quantity of data - 2 CARDS OF B/W MICROFICHE

This data set is contained in the published report "The Explorer XXIII Micrometeoroid Satellite. Description and Results for the Period November 6, 1964, through November 5, 1965," compiled by R.L. O'Neal, NASA TN D-4284, pp. 31-44, June 1968. Only two counts were recorded by the detectors during the 365-day lifetime of the experiment. The dates and times of these events are given in the text. The rest of the article describes the experiment, instrument design and operation, calibration, and attempts to determine if the counts were due to radiation or meteoroid penetration. Also included are six figures depicting the capacitor detector configuration, a typical cross section of the detector, a photograph of the detector, a block diagram of detector circuitry, calibration curves of the capacitor detector signal conditioning units, and photographs of typical oscilloscope patterns of detector discharges caused by hypervelocity-projectile penetration. The origin of the counts could not be determined from laboratory tests because the number of radiation-induced pulses would be about the same as or less than the number resulting from meteoroid punctures. Therefore, the data are too sparse and inconclusive to be of any significance.

.....  
..... SAS-A .....

SAS A, GIACCONI  
ALL-SKY X-RAY SURVEY

Data set name - SOURCE LIBRARY TAPE

NSSDC ID 70-107A-01B, SOURCE LIBRARY TAPL

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPL

This data set consists of a tape, written in 9-track, binary format at 800 bpi, containing the source language listings of the SAS-1 computer programs used to produce the daily summary data. The programs are designed to run on IBM 360/65, 360/75, or 360/95 computers. These programs can be used for further processing of the data, using different control parameters or a new program written to accomplish the specialized needs of the user. For further information on this data set, contact Dr. Stephen Murray, High Energy Astrophysics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

Data set name - DAILY SUMMARY DATA ON TAPE

NSSDC ID 70-107A-01C, DAILY SUMMARY DATA ON TAPES

Time period covered - 12/16/70 TO 05/17/71

Quantity of data - 350 REELS OF TAPE

This data set contains the nighttime summary data up to the time of star-sensor failure in November 1971. Each tape contains the data corresponding to one scan of the sky with the spin axis of the spacecraft fixed. These tapes are images of a

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2314-type disk containing a series of 21 files. The files appear in the following format: (1) processing step that created the file, (2) name of the file, and (3) starting orbit number of telemetry data groups. Details on the various files can be obtained from the documentation associated with the data set. For information on the main data base and this data set, contact Dr. Stephen Murray, High Energy Astrophysics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

Data set name - THE FOURTH UHURU CATALOG OF X-RAY SOURCES

NSSDC ID 70-107A-01D, 4U CATALOG OF X-RAY SOURCES

Time period covered - 12/12/70 TO 03/18/73

Quantity of data - 2 CARDS OF B/W MICROFICHE

This data set, microfiched from hard copy supplied by the experimenter, is the final catalog of 339 X-ray sources observed with the Uhuru (SAS-A) X-ray observatory. The catalog contains positional information in the form of 90% confidence level error boxes, 2-6 keV intensities, possible optical and radio counterparts, and alternate names for sources observed in earlier compilations. The observations employed in producing this catalog were obtained between December 12, 1970, and March 18, 1973. See Astrophys. J. Suppl., v. 38, p. 4, 1978, for the published version. For further information on this data set, contact Dr. William Forman, High Energy Astrophysics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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\*\*\*\*\* SAS-B \*\*\*\*\*  
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SAS-B, FICHEL  
GAMMA RAY TELESCOPE

Data set name - GAMMA RAY EVENT DATA ON MICROFILM

NSSDC ID 72-091A-01A, GAMMA RAY EVENT DATA ON MICROFILM

Time period covered - 11/20/72 TO 06/03/73

Quantity of data - 1691 REELS OF MICROFILM

Each frame of this data set consists of a plot of the tracks of the electron pair arising from a single gamma ray event as the two electrons passed through the spark chamber grid system. On the left side of the frame are given the year, month, day, hour, second, and millisecond of the event. In the spark chamber, there are 32 modules, each consisting of two planes (X and Y) of 200 parallel, evenly spaced wires. The two planes are separated by 3.6 mm, and the directions of the wires in the two planes are orthogonal. The 32 modules are stacked vertically into two 16-module units. The two upper sections of the plot show the path of the electron pair as it crossed the 200 wires of each X-plane (1/200 on the horizontal axis) in the 32-module vertical array (0-31 on the vertical axis). The two lower sections of the plot show the same thing for the Y-planes. The vertical axis has been compressed by a factor of 2.7 relative to the horizontal axis. In all, there are over 3 million gamma ray events depicted in this set. For further information on the main data base and this data set, contact Dr. Carl Fichtel, Code 660, GSFC/NASA, Greenbelt, MD 20771.

Data set name - COUNT RATE OF GAMMA RAY BURSTS ON  
MICROFILM

NSSDC ID 72-091A-01B, COUNT RATE OF GAMMA RAY BURSTS

Time period covered - 11/20/72 TO 06/08/73

Quantity of data - 15 REELS OF MICROFILM

This anticoincidence dome (A-dome) surrounding the high-energy gamma ray experiment is itself an efficient detector of both charged particles and low energy gamma rays. In particular, it has a detection efficiency of about 10% for 150-600 keV photons. Data are read out in major frames, which cover approximately 49 s. Each major frame consists of 64 minor frames, each with a duration of 0.768 s. During each of these minor frames, the counting rate of the A-dome is read out once. The actual number of counts in the dome is scaled before being transmitted by the satellite. The anticoincidence rate (A-rate) data are displayed as follows. The first line gives the start time of the major frame in two different ways. To the left is given day/month/year and hour/minute/second/millisecond. To the right is given days from day 0 of 1970 and millisecond of day. The 1 or 33 following the left-hand time tells whether the line starts with the first or 33rd minor frame of that particular major frame. The following line gives the scaled rate of counts in the A-dome for each of 32 minor frames. The A-rates range from 0

to 255, which correspond to 0 to 1,028,096 counts per 0.768 s as shown on the table that accompanies the data. In the A-rate listing, a "-1" indicates that no data exist for that minor frame. For additional information on this data set, contact Dr. Carl Fichtel, Code 660, GSFC/NASA, Greenbelt, MD 20771.

Data set name - ANTI-COINCIDENCE SCINTILLATOR COUNTING  
RATE PLOTS, ON MICROFILM

NSSDC ID 72-091A-01C, ANTI-COINCID SCINT CNT RTS, MFILM

Time period covered - 11/19/72 TO 06/08/73

Quantity of data - 30 REELS OF MICROFILM

This data set consists of the same data as data set 72-091-01B, only in the form of plots rather than tables. The time along the horizontal axis is given in days and seconds of day. The days are counted from day 0 of 1970, and the table accompanying the data shows the conversion from these days to day/month/year for the period of the SAS 2 observations. The seconds run from 0 to 86,400 each day. The vertical bars on the plot are approximately 49 apart, corresponding to the length of a major frame in data set 72-091-01B. On the vertical axis, the anticoincidence rates (A-rates) have already been converted from the 0-255 scale of data set 72-091-01B to the 0-1,028,096 counts per 0.768 s scale mentioned in the brief description for data set 72-091-01B. For additional information on this data set, contact Dr. Carl Fichtel, Code 660, GSFC/NASA, Greenbelt, MD 20771.

Data set name - HIGH ENERGY GAMMA-RAY TELESCOPE A-RATE  
SUMMARY DATA ON MAGNETIC TAPE

NSSDC ID 72-091A-01D, A-RATE SUMMARY TAPE

Time period covered - 11/18/72 TO 06/08/73

Quantity of data - 1 REEL OF TAPE

This anticoincidence rate (A-rate) summary data set is on magnetic tape written at 1600 bpi, in 9-track, binary format on an IBM 360 computer. Each physical record contains 32 logical records of 72 bytes. The data consist of SAS day and milliseconds of day (the beginning time for the frame), and 64 one-byte A-rates. Each major frame is 49.152 s long. Each A-rate accumulation is 768 ms, with the first one in the frame beginning time. The A-rate readout alternates between two sets of four anticoincidence tubes (A-tubes) and is a prescaled, quasi-log representation of the actual counting rate. For additional information on this data set, contact Dr. Carl Fichtel, Code 660, GSFC/NASA, Greenbelt, MD 20771.

Data set name - TABULATED DATA FROM THE SAS 2 HIGH ENERGY  
GAMMA-RAY TELESCOPE IN PUBLISHED REPORT

NSSDC ID 72-091A-01E, GAMMA RAY TABULATED DATA, PUB

Time period covered - 11/19/72 TO 06/08/73

Quantity of data - 1 BOOK OR BOUND VOLUME

This data set consists of tables taken from the publication NASA TM-79650, "Tabulated Data from the SAS-2 High Energy Gamma-Ray Telescope," by C.E. Fichtel et al., October 1978. The summary tables are presented in two energy bands, 35-100 MeV and greater than 100 MeV. The table entries are pairs of numbers: the upper value is the number of gamma rays observed within a particular bin of galactic longitude and latitude (system II), and the lower value is the exposure factor, or "sensitivity." The "sensitivity" is the ratio of the effective area at the angle of the centroid of the solid angle element to that for the detector axis multiplied by the time in seconds in which an event could have been recorded and divided by 2380. The solid angle elements were determined by dividing the sky into 144 square elements with equal latitudes of 2.5 deg and equal solid angles. For more information on this data set, contact Dr. Carl Fichtel, Code 660, GSFC/NASA, Greenbelt, MD 20771.

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\*\*\*\*\* SAS-C \*\*\*\*\*  
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SAS-C, CLARK  
EXTRAGALACTIC EXPERIMENT (ECE)

Data set name - PLOTS OF DETECTOR COUNTING RATES AT 5 SEC  
RESOLUTION PLUS HOUSEKEEPING DATA

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NSSDC ID 75-037A-01A, QUICK LOOK DATA PLOTS

Time period covered - 01/25/76 TO 04/07/79

Quantity of data - 751 CARDS OF B/W MICROFICHE

These SAS-C data plots provide an overview of data availability and quality for the SAS-C X-ray observatory. A plot contains information obtained during the time interval from one satellite noon to the next. The data are plotted as functions of the minor frame number. One minor frame corresponds to approximately 0.8314 s. The vertical header at the left edge of a plot contains the date on which the plot was created, the sequence number, the epoch of minor frame zero, and the duration of a minor frame in Julian days. A data plot contains 14 separate data panels. Nine panels contain detector photon counts per six minor frames, three contain star tracker information, one contains anticoincidence information, and one contains the low-energy filter wheel position. For information on the main data base and this data set, contact Dr. George Clark, Department of Physics, Bldg. 37-611, Massachusetts Institute of Technology, Cambridge, MA 02139.

SAS-C, CLARK  
GALACTIC MONITOR EXPERIMENT (GME)

Data set name - PLOTS OF DETECTOR COUNTING RATES AT 5 SEC  
RESOLUTION PLUS HOUSEKEEPING DATA

NSSDC ID 75-037A-02A, QUICK LOOK DATA PLOTS

Time period covered - 01/25/76 TO 04/07/79

Quantity of data - 751 CARDS OF B/W MICROFICHE

These SAS-C data plots provide an overview of data availability and quality for the SAS-C X-ray observatory. A plot contains information obtained during the time interval from one satellite noon to the next. The data are plotted as functions of the minor frame number. One minor frame corresponds to approximately 0.8314 s. The vertical header at the left edge of a plot contains the date on which the plot was created, the sequence number, the epoch of minor frame zero, and the duration of a minor frame in Julian days. A data plot contains 14 separate data panels. Nine panels contain detector photon counts per six minor frames, three contain star tracker information, one contains anticoincidence information, and one contains the low-energy filter wheel position. For additional information on this data set, contact Dr. George Clark, Department of Physics, Bldg. 37-611, Massachusetts Institute of Technology, Cambridge, MA 02139.

Data set name - Y AXIS POINTED OBSERVATION LOG

NSSDC ID 75-037A 02B, Y-AXIS POINTED OBSERVATION LOG

Time period covered - 05/30/75 TO 03/23/79

Quantity of data - 8 PAGES OF UNBOUND HARDCOPY

This log identifies possible pointed observations that were performed with the Y-axis detectors of the SAS-C X-ray observatory of celestial X-ray sources. The log was compiled from notes made at the time of the observations. It is neither a complete nor fully accurate list of all pointed observations, but it can be used as an initial reference for the SAS-C data base. The columns in the log are: the right ascension/declination designation of the source in 1950 coordinates, the common name of the X-ray source or its optical counterpart, the start and end universal dates of the observation, and the duration of observation in days. Possible errors in the log are the misclassification of an observation as a pointed observation when it was either a spinning or dither observation, and inaccuracy in the dates of the start and end of an observation. Anyone interested in the listed sources or time periods can obtain further information and data by contacting Dr. George Clark, Department of Physics, Bldg. 37-611, Massachusetts Institute of Technology, Cambridge, MA 02139.

SAS-C, CLARK  
SCORPIO MONITOR EXPERIMENT (SME)

Data set name - PLOTS OF DETECTOR COUNTING RATES AT 5 SEC  
RESOLUTION PLUS HOUSEKEEPING DATA

NSSDC ID 75-037A-03A, QUICK LOOK DATA PLOTS

Time period covered - 01/25/76 TO 04/07/79

Quantity of data - 751 CARDS OF B/W MICROFICHE

These SAS-C data plots provide an overview of data availability and quality for the SAS-C X-ray observatory. A plot contains information obtained during the time interval from one satellite noon to the next. The data are plotted as functions of the minor frame number. One minor frame corresponds to approximately 0.8314 s. The vertical header at the left edge of a plot contains the date on which the plot was created, the sequence number, the epoch of minor frame zero, and the duration of a minor frame in Julian days. A data plot contains 14 separate data panels. Nine of these panels contain detector photon counts per six minor frames, three contain star tracker information, one contains anticoincidence information, and one contains the low-energy filter wheel position. For further information on the main data base and this data set, contact Dr. George Clark, Department of Physics, Bldg. 37-611, Massachusetts Institute of Technology, Cambridge, MA 02139.

Data set name - Y-AXIS POINTED OBSERVATION LOG

NSSDC ID 75-037A-03B, Y-AXIS POINTED OBSERVATION LOG

Time period covered - 05/30/75 TO 03/23/79

Quantity of data - 8 PAGES OF UNBOUND HARDCOPY

This log identifies possible pointed observations that were performed with the Y-axis detectors of the SAS-C X-ray observatory of celestial X-ray sources. The log was compiled from notes made at the time of the observations. It is neither a complete nor fully accurate list of all pointed observations, but it can be used as an initial reference for the SAS-C data base. The columns in the log are: the right ascension/declination designation of the source in 1950 coordinates, the common name of the X-ray source or its optical counterpart, the start and end universal dates of the observation, and duration of observation in days. Possible errors in the log are the misclassification of an observation as a pointed observation when it was either a spinning or dither observation, and inaccuracy in the dates of the start and end of an observation. Anyone interested in the listed sources or time periods can obtain further information and data directly from Dr. George Clark, Department of Physics, Bldg. 37-611, Massachusetts Institute of Technology, Cambridge, MA 02139.

SAS C, CLARK  
GALACTIC ABSORPTION EXPERIMENT (GAF)

Data set name - PLOTS OF DETECTOR COUNTING RATES AT 5 SEC  
RESOLUTION PLUS HOUSEKEEPING DATA

NSSDC ID 75 037A 04A, QUICK LOOK DATA PLOTS

Time period covered - 01/25/76 TO 04/07/79

Quantity of data - 751 CARDS OF B/W MICROFICHE

These SAS-C data plots provide an overview of data availability and quality for the SAS-C X-ray observatory. A plot contains information obtained during the time interval from one satellite noon to the next. The data are plotted as functions of the minor frame number. One minor frame corresponds to approximately 0.8314 s. The vertical header at the left edge of a plot contains the date on which the plot was created, the sequence number, the epoch of minor frame zero, and the duration of a minor frame in Julian days. A data plot contains 14 separate data panels. Nine of these panels contain detector photon counts per six minor frames, three contain star tracker information, one contains anticoincidence information, and one contains the low-energy filter wheel position. For further information on the main data base and this data set, contact Dr. George Clark, Department of Physics, Bldg. 37-611, Massachusetts Institute of Technology, Cambridge, MA 02139.

Data set name - Y-AXIS POINTED OBSERVATION LOG

NSSDC ID 75-037A-04B, Y-AXIS POINTED OBSERVATION LOG

Time period covered - 05/30/75 TO 03/23/79

Quantity of data - 8 PAGES OF UNBOUND HARDCOPY

This log identifies possible pointed observations that were performed with the Y-axis detectors of the SAS-C X-ray observatory of celestial X-ray sources. The log was compiled from notes made at the time of the observations. It is neither a complete nor fully accurate list of all pointed observations, but it can be used as an initial reference for the SAS-C data

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base. The columns in the log are: the right ascension/declination designation of the source in 1950 coordinates, the common name of the X-ray source or its optical counterpart, the start and end universal dates of the observation, and duration of observation in days. Possible errors in the log are the misclassification of an observation as a pointed observation when it was either a spinning or dither observation, and inaccuracy in the dates of the start and end of an observation. Anyone interested in the listed sources or time periods can obtain further information and data directly from Dr. George Clark, Department of Physics, Bldg. 37-611, Massachusetts Institute of Technology, Cambridge, MA 02139.

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\*\*\*\*\* SKYLAB \*\*\*\*\*  
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Data set name - GRAPHICAL CATALOG OF ATM/SKYLAB SOLAR COVERAGE (INCLUDING SOLAR ACTIVITY)

NSSDC ID 73 027A 00D, ATM SOLAR COVERAGE (FILM)

Time period covered 05/28/73 TO 02/08/74

Quantity of data 1 REEL OF MICROFILM

This catalog, contained on one reel of 35 mm film, is intended to portray when the various ATM/Skylab experiments were in operation during spacecraft day (and presumably obtained data) and when solar activity was reported. This catalog is not a definitive guide to spacecraft operations (see data sets 73-027A-00E or 73-027A-00F, the ATM operations log) and concurrent solar activity, but it is intended to enable the users to decide whether to pursue data during a particular time period. The data are first presented on plots (bar charts) covering one terrestrial day (24 h) each. Time is plotted along the abscissa in hours (GMT), with the finest increment being 30 s. The dates are given in standard month-day-year form and in terms of day-of-year 1973, the form usually given in the ATM/Skylab data. Along the ordinate, operating times of the various experiments are shown first, followed by observations of solar activity (solar X-ray flares observed by SOIRAD satellites, followed in turn by hydrogen alpha flare reports, microwave radio bursts, low frequency radio bursts, and finally observations of sudden ionospheric activity, which are indirect observations of solar X ray or EUV flares). The same data are then listed in tabular form. This data set was generated at NSSDC from the ATM mission operations log and solar activity reports obtained from the World Data Center A for solar activity, Boulder, CO.

Data set name ATM MISSION OPERATIONS LOG ON MAGNETIC TAPE

NSSDC ID 73 027A 00L, ATM MISSION OPERATION LOG ON TAPE

Time period covered - 05/28/73 TO 02/08/74  
(Date supplied by experimenter)

Quantity of data 5 REELS OF TAPE

The ATM mission operation log is a chronological listing of the operations of the solar instruments on the ATM/Skylab between days of year (DOY) 148 (May 28, 1973) and 404 (Feb. 8, 1974). Its purpose is to provide rapid access to the detailed operation of the instruments on the ATM and to aid each ATM principal investigator in correlating the as-flown operation of his instrument with those of other ATM instruments. The complete log is contained on five magnetic tapes. Tape 1 contains manned and unmanned portions of the SL-2 mission (DOY 148 - 209). Tape 2 contains manned portions of the SL-3 mission (DOY 209 - 244). Tape 3 contains manned and unmanned portions of the SL-3 mission (DOY 244 - 320). Tape 4 contains manned portions of the SL-4 mission (DOY 320 - 360). Tape 5 contains manned portions of the SL-4 mission (DOY 360 - 404). The primary source of data for the log was the Harvard College Observatory (HCO) compressed user tapes. Additional information concerning individual instrument operation was supplied by each of the PIs. The 9-track, 1600 bpi, EBCDIC tapes contain one file. Each physical record is 120 bytes in length. The data were supplied by the Ball Brothers Research Corp.

Data set name - ATM MISSION OPERATIONS LOG ON MICROFICHE

NSSDC ID 73-027A-00F, ATM MISSION OPERATION LOG - FICHE

Time period covered - 05/28/73 TO 02/08/74

Quantity of data - 48 CARDS OF B/W MICROFICHE

The ATM mission operation log is a chronological listing of the operations of the solar instruments on the ATM/Skylab between days-of-year (DOY) 148 (May 28, 1973) and 404 (Feb. 8, 1974). Its purpose is to provide rapid access to the detailed

operation of the instruments on the ATM and to aid each ATM principal investigator in correlating the as-flown operation of his instrument with those of other ATM instruments. The original log was contained in five volumes of hard copy supplied by the Ball Brothers Research Corp. Volume 1 contains manned and unmanned portions of the SL-2 mission (DOY 148 - 209). Volume 2 contains manned portions of the SL-3 mission (DOY 209 - 244). Volume 3 contains manned and unmanned portions of the SL-3 mission (DOY 244 - 320). Volume 4 contains manned portions of the SL-4 missions (DOY 320 - 360). Volume 5 contains manned portions of the SL-4 mission (DOY 360 - 404). The primary source of data for the log was the Harvard College Observatory (HCO) compressed user tapes. Additional information concerning individual instrument operation was supplied for each of the PIs. The data are contained on microfiche.

Data set name - MISCELLANEOUS SUPPORTING DOCUMENTS FOR ATM EXPERIMENTS ON MICROFICHE

NSSDC ID 73-027A-00G, MISC. ATM SUPPORTING DOC., FICHE

Time period covered - 03/09/73 TO 07/09/73

Quantity of data - 15 CARDS OF B/W MICROFICHE

This data set consists of a set of supporting documents for all of the ATM experiments (73-027A-04, 73-027A-05, 73-027A-06, 73-027A-07, 73-027A-10, and 73-027A-11). They include the ATM experiments reference book, the coordinated observing program observer's information package, and two different sets of ATM job summary sheets. These documents are available in microfiche form.

SKYLAB, HENIZE  
ULTRAVIOLET STELLAR ASTRONOMY

Data set name - MASTER POSITIVES (1.8X) OF FLIGHT FILM OF UV SPECTRA/IMAGERY OF STAR FIELDS

NSSDC ID 73-027A-02A, UV SPECTRA/IMAGERY 4X5 B/W

Time period covered - 06/05/73 TO 01/11/74

Quantity of data - 469 B/W POSITIVE FRAMES

This data set consists of a complete set of 469 master positives, on Kodak commercial type 4127 Estar thick base film, that are enlarged 1.8 times from the flight film obtained from the S-019 Prism Spectrograph Experiment. The SL 2 set was reproduced on acetate base type 6127 film but is otherwise identical to the SL 3 and 4 master positives. Sensitometric strips for process control were contact printed through a step wedge with an effective interval. Accompanying this data set are tables that give data corresponding to the flight exposures, which were identified by frame number. For example, frame SL2-003, taken on June 5, 1973, was a nominal 270 s exposure centered at 11 h 58 min, -65.5 deg (star field no. 360), taken through the objective prism. For information on the main data base and this data set, contact Dr. Karl Henize, Code SN3, Johnson Space Center/NASA, Houston, TX 77058.

Data set name - CATALOG OF FAR ULTRAVIOLET OBJECTIVE-PRISM SPECTROPHOTOMETRY: EXPERIMENT S-019

NSSDC ID 73-027A-02B, SKYLAB S-019 FAR-UV DATA (1979)

Time period covered - (N/A)

Quantity of data - 1 REEL OF TAPE

This data set is a machine-readable version of the catalog of Far-Ultraviolet Objective-Prism Spectrophotometry (S-019). The data are on one 9-track, 1600-bpi, ASCII tape, with two files, created on an IBM 3081 computer. The data set contains arrays of ultraviolet flux measurements at wavelengths of 1300 to 4200 A. The spectra were digitized with a PDS 1010 A microdensitometer, and each spectrum was scanned in a series of strips 30 microns wide. This catalog contains data on 494 stars. The data on each star are quite complex and include a number of parameters in addition to the adopted fluxes. Accompanying this data set is a copy of a document entitled "Documentation for the Machine-Readable Version of the Catalogue of Far-Ultraviolet Objective-Prism Spectrophotometry: Skylab Experiment S-019, Ultraviolet Stellar Astronomy" by R.S. Hill and L.E. Brotzman, 1984 (B35702-000A). For more information on this data set, see the above document or contact Dr. Karl Henize, Code SN3, Johnson Space Center/NASA, Houston, TX 77058.

SKYLAB, KRIEGER  
X-RAY SPECTROGRAPHIC TELESCOPE

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Data set name - REDUCED CONTRAST X-RAY PHOTOGRAPHS OF THE SUN (THIRD GENERATION NEGATIVES ON 70MM)

NSSDC ID 73-027A-05A, RED. CONTRAST, 3RD GEN. NEG. 70MM

Time period covered - 05/28/73 TO 01/31/74

Quantity of data - 8400 B/W NEGATIVES

This data set is contained on reels of 70-mm type 5366 film. The data are third-generation negatives and have been processed to reduce the contrast of the original flight film. This reduction was necessary to enhance the ease of making prints on paper from the negatives. The data are chronologically ordered. Individual frames include a white light image of the sun about 1 in. in diameter, an image of the sun in soft X-rays about 2 cm in diameter, reference marks, and a diode array indicating experiment parameters (grating and filter positions, exposure times, a film counter, and date-time of exposure). In addition, most frames have numbers located outside the sprocket holes. The original flight film was contained on five 1300-ft reels of film, each containing about 7000 frames. For information on the main data base and this data set, contact Dr. Allen Krieger, Radiation Science, Inc., P.O. Box 293, Belmont, MA 02178.

Data set name - FILM IMAGE CATALOG (FIC) ON 16-MM MICROFILM

NSSDC ID 73-027A-05B, FILM IMAGE CATALOG (FIC) 16MM FILM

Time period covered - 05/28/73 TO 01/31/74

Quantity of data - 1 REEL OF MICROFILM

This data set is a copy of the Film Image Catalog (FIC) which catalogs the data obtained by the AS+E (American Science + Engineering) X-ray Spectrographic Telescope (Experiment S-054). This catalog is a computer listing copied onto 16 mm microfilm. The data appear as 22 columns across each page. Each data frame, or X-ray picture of the sun, is described by the data in one row of the catalog. The columns include: a cross-reference index to the frame number printed on the film itself, the calendar date and the Greenwich mean time (UT) to the nearest second of the end of that frame's exposure, the exposure duration in seconds, the filter in place during that exposure, a notation whether the grating was in place or not, pitch and yaw offsets from the sun center (in arc-s), and various other housekeeping parameters such as operational mode, Skylab orbit number, etc. This catalog essentially gives complete data for all five S-054 film magazines. Any errors are of a minor nature and should not affect the user. For more information on this data set, contact Dr. Allen Krieger, Radiation Science, Inc., P.O. Box 293, Belmont, MA 02178.

Data set name - SYNOPSIS SUMMARY OF DATA, ONE FRAME PER DAY, ON 70MM FILM

NSSDC ID 73-027A-05C, SELECTED FRAMES, ONE/DAY - (70MM)

Time period covered - 05/29/73 TO 11/27/73

Quantity of data - 700 B/W POSITIVES

This data set consists of one roll of 70-mm film containing 163 X-ray images of the sun. The data set is a subset of NSSDC data set 73-027A-05A, and it is intended to provide a series of synoptic views of the X-ray sun at approximately 24 h intervals. The filter/exposure combination was chosen to optimize the data for use in studies of coronal holes and other coronal structures, which vary on time scales of days or longer. All images are taken in filter 3 (disjointed passband of 2 to 32 Å and 44 to 54 Å), with 64-s exposure times. Each frame includes the white-light image taken prior to the X-ray exposure, since the corresponding white-light image is offset on the film. The date of each frame and its location on the film are listed next to each frame. Orientation is best accomplished by laying the X-ray image over a hydrogen alpha image of the sun. The documentation cross-references the frame location, the date and time, and the frame number in the film image catalog (data set 73-027A-05B). For more information on this data set, contact Dr. Allen Krieger, Radiation Science, Inc., P.O. Box 293, Belmont, MA 02178.

Data set name - SELECTED FLARE DATA, SET 1

NSSDC ID 73-027A-05E, SELECTED FLARE DATA, SET 1

Time period covered - 06/14/73 TO 09/08/73

Quantity of data - 600 B/W POSITIVES

This data set, contained on one reel of 70-mm black and white film, is also available on 35-mm film and only includes data relevant to the following six solar flares: June 15, 1973,

at 1413 (UT); July 29, 1973, at 1330 (UT); August 9, 1973, at 1553 (UT); September 5, 1973, at 1834 (UT); September 7, 1973, at 1203 (UT); and January 21, 1974, at 2320 (UT). The data set includes samples taken around 24, 18, 12, and 6 h before the flare in question, all data taken from 1 h before through 2 h after the flare, and data samples taken at 6, 12, 18, and 24 h after the flare. It is a subset of 73-027A-05A and was generated at NSSDC. For more information on this data set, contact Dr. Allen Krieger, Radiation Science, Inc., P.O. Box 293, Belmont, MA 02178.

SKYLAB, MACQUEEN  
WHITE LIGHT CORONAGRAPH

Data set name - FOURTH(POS.) AND FIFTH(NEG.) GENERATION COPIES OF A CORONAGRAPH PHOTOGRAPHS

NSSDC ID 73-027A-04A, WHITE LIGHT CORONAGRAPHY-35MM FILM

Time period covered - 05/28/73 TO 02/12/74

Quantity of data - 9 B/W NEGATIVE FRAMES

This data set is a complete set of all frames photographed on all Skylab missions. Approximately 36,000 frames of data were taken, or about 2000 ft of 35-mm black and white film. These frames are in chronological order. Each frame contains an image of the solar corona and the occulting disk with out-of-focus occulting disk pylon, intensity calibration pattern, four fiducial marks, and the diode matrix array. A diode matrix array (6 columns by 12 rows) is printed on the film for each exposed data frame. From the array, information about experiment operating mode, Polaroid wheel position, sun center pointing and instrument internal alignment, spacecraft roll, and time of day can be obtained. The copy supplied to NSSDC was made by contact printing the original flight film (Eastman Kodak 026-02) using Eastman Kodak SO-355 film with processing optimized for the 9-s clear (i.e., no polarizer in place) exposure. These data have a step wedge located in the center of the occulting disk. They are available as 35-mm negative or positive copies or as enlargements on film or paper. For paper enlargements, the step wedge is usually covered. For information on the main data base and this data set, contact Dr. Robert MacQueen, High Altitude Observatory, University Corporation for Atmospheric Research, NCAR, P.O. Box 3000, Boulder, CO 80307.

Data set name - SELECTED FLARE DATA, SET 1

NSSDC ID 73-027A-04B, SELECTED FLARE DATA, SET 1

Time period covered - 07/29/73 TO 01/21/74

Quantity of data - 1 REEL OF MICROFILM

This data set, contained on one reel of 35-mm black and white film, only includes data relevant to the following five solar flares: July 29, 1973, at 1330 (UT); August 9, 1973, at 1553 (UT); September 5, 1973, at 1834 (UT); September 7, 1973, at 1203 (UT); and January 21, 1974, at 2320 (UT). The data set includes samples taken around 24, 18, 12, and 6 h before the flare in question, all data taken from 1 h before through 2 h after the flare, and data samples taken at 6, 12, 18, and 24 h after the flare. This is a subset of 73-027A-04A and was generated at NSSDC. For more information on this data set, contact Dr. Robert MacQueen, High Altitude Observatory, University Corporation for Atmospheric Research, NCAR, P.O. Box 3000, Boulder, CO 80307.

SKYLAB, NOYES  
UV SCANNING  
POLYCHROMATOR/SPECTROHELIO METER

Data set name - UV SCANNING POLYCHROMATOR SOLAR EUV DATA ON MAGNETIC TAPE

NSSDC ID 73-027A-06A, SOLAR EUV DATA ON TAPE

Time period covered - 05/28/73 TO 02/08/74

Quantity of data - 1163 REELS OF TAPE

This tape data set contains the scientific data obtained by the experiment from the three modes of operation during the Skylab 2, 3, and 4 manned mission. It also contains data for periods during the unmanned intervals between the manned missions. The tapes are identified by day, batch, and tape number. The data are contained on 7-track, 556-bpi, multitracked, binary magnetic tapes created on a CDC 6400 computer. Details concerning the experiment (tape, file, and record structure), along with information concerning data problems and diagnostic techniques, are contained in a Harvard College Observatory report, "S055/ATM Scientific User Tape Guide," by H.T. Wadzinski (B29092-000A), which will be

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furnished with the data. For information on the main data base, contact Dr. Robert Noyes, Solar and Stellar Physics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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Data set name - GRAY LEVEL DATA ON MICROFICHE

NSSDC ID 73-027A-06B, GRAY LEVEL MICROFICHE

Time period covered - 05/29/73 TO 02/08/74

Quantity of data - 3601 CARDS OF B/W MICROFICHE

The gray scale microfiche displays variable density plots of rasters and mirror-line scans for each detector that is on during the cycle. The heading displays day/night cycle number, calendar date, and GMT, with the heading at the top of the page. There are up to 77 gray-scale pictures arranged in a matrix of 11 across, from left to right with time increasing, and 7 down, with detector number increasing from 1 to 7. If a detector is turned off, the space for the gray-scale picture is left blank. For more information on this data set, contact Dr. Robert Noyes, Solar and Stellar Physics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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Data set name - DIGITAL DATA ON MICROFICHE

NSSDC ID 73-027A-06C, DIGITAL DATA ON MICROFICHE

Time period covered - 05/29/73 TO 02/08/74

Quantity of data - 13214 CARDS OF B/W MICROFICHE

These data comprise a raster tab and a line tab. The tabs are in four parts: lines 1-30, data samples 1-60; lines 31-60, data samples 61-120; lines 31-60, data samples 1-60; and lines 31-60, data samples 61-120. The heading information for the raster indicates the following: GMT is the day and time of start of the raster; DET-1 is the detector identifier; FSSUD is the ATM fine sun sensor up/down pointing coordinate in arc seconds at the time of start of the raster; GAMRR is the ATM roll coordinate in arc minutes at the time of start of the raster; CYCLE is the number of day/night cycles since the last launch; REF\_SEL\_OPT is the grating reference selected at the time of start of the raster; OPT is the optical reference bit indicator (on or off); MECH is the mechanical reference bit indicator; SAMPLE NO. is the sample number; MODE is the mode selected at the start of the raster; FSSLR is the ATM fine sun sensor left/right coordinate in arc seconds at the time of start of the raster; GRT\_PDS is the number of steps where the grating was moved from the selected reference at the time of start of the raster; N is the number of good data samples in the raster; IBAR is the average of the good data samples in the raster; and ISQR is the average of the squares of the good data samples in the raster. The line tab heading information has the same meaning as the raster tab, except for the following: MECH is the mechanical reference bit indicator in turns of the grating being at or near the mechanical reference; GRT\_PDS is the number of steps where the grating is from the reference selected. More detailed descriptions of these data can be found in the data handbook for the Harvard EUV Spectrometer on ATM. For more information on this data set, contact Dr. Robert Noyes, Solar and Stellar Physics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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Data set name - HLD SUPER RASTER DATA ON MICROFICHE

NSSDC ID 73-027A-06D, HLD SUPER RASTER DATA

Time period covered - 01/28/74 TO 01/29/74

Quantity of data - 17 CARDS OF B/W MICROFICHE

This data set, contained on gray scale microfiche, is all the super rasters made during the observational program. Each super raster consists of a series of 45 rasters and covers the entire solar disk. The centers of the 45 rasters are separated by 290 arc s. For more information on this data set, contact Dr. Robert Noyes, Solar and Stellar Physics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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Data set name - UV SCANNING POLYCHROMATOR SUPER RASTER DATA ON MAGNETIC TAPE

NSSDC ID 73-027A-06E, SUPER RASTER DATA ON TAPE

Time period covered - 01/28/74 TO 01/29/74

Quantity of data - 4 REELS OF TAPE

This data set contains all the super rasters made during the observational program. The difference between the raster and the super raster data on tape is that in super raster tapes

all unnecessary data were eliminated, and raster data were recorded in a normal data flow mode. Each super raster consists of a series of 45 rasters and covers the entire solar disk. The centers of the 45 rasters are separated by 290 arc s. The tape consists of a series of files, with each file consisting of an ID record followed by engineering records, data records, and an end-of-file mark. The data are contained on 7-track, 556-bpi, binary magnetic tapes created on a CDC 6400 computer. For more information on this data set, contact Dr. Robert Noyes, Solar and Stellar Physics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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Data set name - SELECTED FLARE DATA, SET 1

NSSDC ID 73-027A-06F, SELECTED FLARE DATA, SET 1

Time period covered - 06/15/73 TO 01/21/74

Quantity of data - 122 CARDS OF B/W MICROFICHE

This data set, contained on microfiche, only includes data relevant to the following four solar flares: June 15, 1973, at 1413 (UT); August 9, 1973, at 1553 (UT); September 5, 1973, at 1834 (UT); and January 21, 1974, at 2320 (UT). The data set includes samples taken around 24, 18, 12, and 6 h before the flare in question, all data taken from 1 h before through 2 h after the flare, and data samples taken at 6, 12, 18, and 24 h after the flare. It is a subset of data sets 73-027A-06B and 73-027A-06C and was generated at NSSDC. For more information on this data set, contact Dr. Robert Noyes, Solar and Stellar Physics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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SKYLAB, NOYES  
HYDROGEN ALPHA TELESCOPE NUMBER 1

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Data set name - H-ALPHA DATA ON MICROFILM

NSSDC ID 73-027A-15A, H-ALPHA DATA ON 35MM FILM

Time period covered - 05/29/73 TO 02/03/74

Quantity of data - 103 REELS OF MICROFILM

This 35-mm microfilmed data set contains H-alpha image data from Skylabs 2, 3, and 4. The data cover May 29 through June 18, 1973; August 7 through September 21, 1973; and November 26, 1973, through February 3, 1974. Each negative has two prints--one of density appropriate to the solar disk and the second for the solar limb. The disk and limb exposures for the same time period are on separate reels. Each frame is labeled by time in days, hours, minutes, and seconds. The day number, called H-alpha day, is an arbitrary time index from 0 to 63. A calendar is provided to convert H-alpha days to calendar days. There are some sun-orientation anomalies in this data set; the accompanying documentation explains the necessary corrections. Two problems occurred in the D14 films. The first was a film advance malfunction, causing overlapping of solar exposures. The second was a periodic image degradation caused by the telescope filter drift. For information on the main data base and this data set, contact Dr. Robert Noyes, Solar and Stellar Physics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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Data set name - ATM H-ALPHA ATLAS IN HARDCOPY

NSSDC ID 73-027A-15B, ATM H-ALPHA ATLAS IN 47 VOLUMES

Time period covered - 06/29/73 TO 02/03/74

Quantity of data - 47 BOOKS OR BOUND VOLUMES

The H-alpha atlas provides selected photographs of the sun taken from the H-alpha telescope film described in 73-027A-15A. The atlas consists of approximately 47 volumes of prints of 100 pages each. Each volume contains about five prints per day/night cycle. This coverage is close to 8% of the total number of pictures contained in data set 73-027A-15A. Each page of the atlas consists of a 16- by 16-arc-min portion of the solar disk enlarged from the 35-mm film to 8 by 8 in. A film and an atlas guide, which describe the data set in detail, are available. For more information on this data set, contact Dr. Robert Noyes, Solar and Stellar Physics Division, Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138.

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SKYLAB, PACKER  
UV AIRGLOW HORIZON PHOTOGRAPHY

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Data set name - DIGITIZED AIRGLOW DATA ON TAPE

NSSDC ID 73-027A-08A, DIGITIZED AIRGLOW DATA ON TAPE

Time period covered - 03/02/74 TO 03/03/74

Quantity of data - 2 REELS OF TAPE

This 7-track, 556-bpi binary magnetic tape data set was copied at NSSDC from the experimenter's tape. It contains the data from microdensitometer scans of the airglow photographs making up data set 73-027A-08D (airglow photographs on film). Each tape record contains one scan line. A file mark is placed at the end of each complete frame scan. Four file marks indicate the end of recording on a tape. The identification label at the beginning of each record gives the magnetic tape number and file number, date of the tape recording, ID of film frame, frame number, number of steps per scan line, number of scan lines, aperture size in micrometers, and speed of scan. Included in the record are the X and Y coordinates, the distance between density readings, and the density (or transmission) value. Details of the scan technique and calibration procedures are presented in the document distributed with the data. Also see Applied Optics, v. 16, no. 4, pp. 983-992, April 1977. For information on the main data base and this data set, contact Dr. Donald Packer, 1623 Fran Hammond Parkway, Alexandria, VA 22302.

Data set name - DIGITIZED OZONE DATA ON TAPE

NSSDC ID 73-027A-08B, DIGITIZED OZONE DATA ON TAPE

Time period covered - 02/26/74 TO 02/26/74

Quantity of data - 4 REELS OF TAPE

This 7-track, 556-bpi magnetic tape data set was copied at NSSDC from the experimenter's tape. It contains the data from microdensitometer scans of the film frames in data set 73-027A-08E (ozone photographs on film). Each tape record contains one scan line. A file mark is placed at the end of each complete frame scan. Four file marks indicate the end of recording on a tape. The identification label at the beginning of each record gives the magnetic tape number and file number, date of tape recording, ID of film frame, frame number, number of steps per scan line, number of scan lines, aperture size in micrometers, and speed of scan. Included in the record are the X and Y coordinates, the distance between density readings, and the density (or transmission) value. Details of the scan technique, the calibration procedure, and conversion to ozone data are contained in the document distributed with the data. Also see Applied Optics, v. 16, no. 4, pp. 983-992, April 1977. For more information on this data set, contact Dr. Donald Packer, 1623 Fran Hammond Parkway, Alexandria, VA 22302.

Data set name - DIGITIZED AURORAL DATA ON TAPE

NSSDC ID 73-027A-08C, DIGITIZED AURORAL DATA ON TAPE

Time period covered - 03/14/74 TO 04/05/74

Quantity of data - 14 REELS OF TAPE

This 7-track, 556-bpi magnetic tape data set was copied at NSSDC from the experimenter's tape. It contains the data from microdensitometer scans of the auroral and lower atmosphere emission photography contained in data sets 73-027A-08C [auroral photography (black and white) on film] and 73-027A-08H [auroral photography (color) on film]. Each tape record contains one scan line, and a file mark is placed at the end of each complete frame scan. Four file marks indicate the end of the recording on a tape. An identification label at the beginning of each record gives the magnetic tape number and file number, date of tape recording, ID of film frame, frame number, number of steps per scan line, number of scan lines, aperture size in micrometers, and speed of the scan. Included in the record are the X and Y coordinates, the distance between density readings, and the density (or transmission) value. Details of the scan technique, the calibration procedures, and an analysis and interpretation of several auroral frames are contained in the document distributed with the data. Also see Applied Optics, v. 16, no. 4, pp. 983-992, April 1977. For more information on this data set, contact Dr. Donald Packer, 1623 Fran Hammond Parkway, Alexandria, VA 22302.

Data set name - AIRGLOW PHOTOGRAPHS ON FILM

NSSDC ID 73-027A-08D, AIRGLOW PHOTOGRAPHS ON FILM

Time period covered - 08/14/73 TO 09/01/73

Quantity of data - 135 B/W NEGATIVE FRAMES

This data set, on 35-mm black and white negatives, was copied from film provided by the experimenter and consists of

eight frames. Seven night airglow pictures were obtained at 5577 A, and one picture was taken of the airglow without a filter. The film should be viewed with the identification numbers (mission, film roll, and frame) readable at the bottom of the frame. It will then be as in the camera when viewed from the rear loading door. The emulsion side will be on the film side opposite the viewer, and the frame numbers will increase from right to left. Calibration procedures, date and time of measurement, location, exposure time, and other details are found in the report accompanying the data. Microdensitometer scans of these frames were made, and those measurements make up the magnetic tape data set 73-027A-08A (digitized airglow data on tape). See Applied Optics, v. 16, no. 4, pp. 983-992, April 1977. The original flight film is kept at the Johnson Space Center. For more information on this data set, contact Dr. Donald Packer, 1623 Fran Hammond Parkway, Alexandria, VA 22302.

Data set name - OZONE PHOTOGRAPHS ON FILM

NSSDC ID 73-027A-08E, OZONE PHOTOGRAPHS ON FILM

Time period covered - 01/31/74 TO 01/31/74

Quantity of data - 95 B/W NEGATIVE FRAMES

This data set, on 35-mm black and white negatives, was copied from film provided by the experimenter. Several trilogies of photographs were obtained. Two ultraviolet exposures were obtained through different filters, and one color exposure was obtained above the same ground site. This film set contains six frames, i.e., two trilogies, where the filtered frames were taken at wavelengths of 2700 and 3200 A. The film should be viewed with the identification numbers (mission, film roll, and frame) readable at the bottom of the frame. The film will then be as in the camera when viewed from in back of the rear loading door. The emulsion side will be on the film side opposite the viewer, and the frame numbers will increase from right to left. The procedure for obtaining ozone data from this film; the date, time, and location of these measurements; the sun angles; and the calibration procedures are contained in a report accompanying the data set. Microdensitometer scans of these frames were made, and the resulting measurements are in data set 73-027A-08B (digitized ozone data on tape). See Applied Optics, v. 16, no. 4, pp. 983-992, April 1977. The original flight film is kept at the Johnson Space Center. For more information on this data set, contact Dr. Donald Packer, 1623 Fran Hammond Parkway, Alexandria, VA 22302.

Data set name - PHOTOGRAPHY OF COMET KOHOUTEK

NSSDC ID 73-027A-08F, PHOTOGRAPHS OF COMET KOHOUTEK

Time period covered - 12/09/73 TO 01/09/74

Quantity of data - 190 B/W NEGATIVE FRAMES

This data set, on 35-mm black and white negatives, was copied from film supplied by the experimenter and contains 15 photographs of the Comet Kohoutek taken either in white light or with filters in both the ultraviolet and visible spectral regions, i.e., at wavelengths of 3581, 3090, and 4700 A. The film should be oriented so that the frame identification numbers (mission, film roll, and frame) are readable at the bottom of the frame when viewed. The film will then be as in the camera when viewed from the rear loading door. The emulsion side will be on the film side opposite the viewer, and the frame numbers will increase from right to left. Calibration details, tabulated frame numbers with filters used and operational chronology, an isophote plot of microdensitometer traces of the comet, and other details are included in the report distributed with the data. Microdensitometer scans of these frames were made, and the results were recorded on magnetic tape. Since the instructions for locating the comet and star images are too diverse and detailed to be recorded for general distribution, the desired tapes can be obtained directly from the experimenter. See Applied Optics, v. 16, no. 4, pp. 983-992, April 1977. The original flight film is kept at the Johnson Space Center. For more information on this data set, contact Dr. Donald Packer, 1623 Fran Hammond Parkway, Alexandria, VA 22302.

Data set name - AURORAL PHOTOGRAPHY(B-W) ON FILM

NSSDC ID 73-027A-08G, AURORAL PHOTOS. (B-W) ON FILM

Time period covered - 09/11/73 TO 02/07/74

Quantity of data - 134 B/W NEGATIVE FRAMES

This data set, on 35-mm black and white negatives, was copied from film supplied by the experimenter and contains 14 black and white photographs of the aurora and lower atmosphere emissions. Color photographs of these data make up data set

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73-027A-08H. The film should be oriented so that the frame identification numbers (mission, film roll, and frame) are readable at the bottom of the frame when viewed. The film will then be as in the camera when viewed from the rear loading door. The emulsion side will be on the film side opposite the viewer, and the frame numbers will increase from right to left. Calibration details, an analysis and interpretation of several auroral frames, and three plots of relative intensity vs apparent altitude are contained in the document accompanying the data. Microdensitometer scans of the frames in this data set were made, and the measurements make up data set 73-027A-08C (digitized auroral data on tape). See Applied Optics, v. 16, no. 4, pp. 983-992, April 1977. The original flight film is kept at the Johnson Space Center. For more information on this data set, contact Dr. Donald Packer, 1623 Fran Hammond Parkway, Alexandria, VA 22302.

Data set name - AURORAL PHOTOGRAPHY (COLOR) ON FILM

NSSDC ID 73-027A-08H, AURORAL PHOTOS. (COLOR) ON FILM

Time period covered - 09/11/73 TO 02/07/74

Quantity of data - 134 COLOR POSITIVE FRAMES

This 35-mm film data set was copied from the film supplied by the experimenter and contains 14 color photographs of the aurora and lower atmosphere emissions. Black and white photographs of these data make up data set 73-027A-08C [auroral photography (black and white) on film]. The film should be oriented so that the frame identification numbers (mission, film roll, and frame) are readable at the bottom of the frame. The film will be as in the camera when viewed from the rear loading door. The emulsion side will be on the film side opposite the viewer, and the frame numbers will increase from right to left. Calibration details, an analysis and interpretation of several auroral frames, and three plots of relative intensity vs apparent altitude are contained in the document accompanying the data. Microdensitometer scans of the frames in this data set were made, and the measurements make up data set 73-027A-08C (digitized auroral data on tape). See Applied Optics, v. 16, no. 4, pp. 983-992, April 1977. The original flight film is kept at the Johnson Space Center. For more information on this data set, contact Dr. Donald Packer, 1623 Fran Hammond Parkway, Alexandria, VA 22302.

SKYLAB, TOUSEY  
UV CORONAL SPECTROHELIOGRAPH

Data set name - SPECTROHELIOGRAPH SOLAR IMAGES ON 70-MM FILM

NSSDC ID 73-027A-10A, SPECTROHELIOGRAPH IMAGES ON 70MM

Time period covered - 05/28/73 TO 01/31/74

Quantity of data - 1750 B/W POSITIVES

This data set consists of five 400 ft reels of 70-mm black and white film and includes all 1032 spectroheliograms taken with the S-082A instrument. The original flight film (strips 35 mm x 258 mm) were enlarged by the PI to fit on 70-mm roll film. The copies available to the requesters are fourth generation positives and fifth generation negatives (the flight film is considered first generation). Accompanying this data set is a set of transparencies that can identify emission lines of ionized components--He, Ne, Mg, Si, O, and Fe--by overlapping the transparencies on the spectroheliograph images. For information on the main data base and this data set, contact Dr. Richard Tousey, Code 4107, Naval Research Laboratory, Washington, DC 20375.

Data set name - SELECTED FLARE DATA, SET 1

NSSDC ID 73-027A-10B, SELECTED FLARE DATA, SET 1

Time period covered - 06/15/73 TO 01/22/74

Quantity of data - 700 B/W POSITIVES

This data set, contained on one reel of 70-mm black and white film, only includes data relevant to the following five solar flares: June 15, 1973, at 1413 (UT); August 9, 1973, at 1553 (UT); September 5, 1973, at 1834 (UT); September 7, 1973, at 1203 (UT); and January 21, 1974, at 2320 (UT). The data set includes samples taken around 24, 18, 12, and 6 h before the flare in question, all data taken from 1 h before through 2 h after the flare, and data samples taken at 6, 12, 18, and 24 h after the flare. This is a subset of data set 73-027A-10A and was generated at NSSDC. Accompanying this data set is a set of transparencies that can identify emission lines of ionized components--He, Ne, Mg, Si, O, and Fe--by overlapping the transparencies on the spectroheliograph images. For more information on this data set, contact Dr. Richard Tousey, Code

4107, Naval Research Laboratory, Washington, DC 20375.

Data set name - FRAME CATALOG ON MAGNETIC TAPE

NSSDC ID 73-027A-10C, FRAME CATALOG ON MAGTAPE

Time period covered - 05/28/73 TO 01/31/74

Quantity of data - 1 REEL OF TAPE

This data set is contained on one 7-track, 800-bpi, bcd magnetic tape with three files and is a listing of the film index number (appearing on each frame), date, day of year, shutter open/close times, exposure time, and wavelength range used for each of the 1032 frames taken with the S082A experiment. For more information on this data set, contact Dr. Richard Tousey, Code 4107, Naval Research Laboratory, Washington, DC 20375.

Data set name - FRAME CATALOG ON MICROFICHE

NSSDC ID 73-027A-10D, FRAME CATALOG ON MICROFICHE

Time period covered - 05/28/73 TO 01/31/74

Quantity of data - 1 CARD OF B/W MICROFICHE

This data set is contained on one microfiche and is a listing of the film index number (appearing on each frame), date, day of year, shutter open/close times, exposure time, and wavelength range for each of the 1032 frames taken with the S082A experiment. For more information on this data set, contact Dr. Richard Tousey, Code 4107, Naval Research Laboratory, Washington, DC 20375.

Data set name - SYNOPTIC MAPS OF SOLAR CORONAL BOUNDARIES

NSSDC ID 73-027A-10E, HE 304 SYNOPTIC MAPS, HARDCOPY

Time period covered - 05/23/73 TO 02/02/74

Quantity of data - 1 BOOK OR BOUND VOLUME

This data set is contained in a paper document entitled "The World Data Center A for Solar-Terrestrial Physics Report UAG-51, Synoptic Maps of Solar Coronal Hole Boundaries Derived from He II 304 A Spectroheliograms from the Manned Skylab Mission," by J.D. Bohlin and D.M. Rubenstein (B25723 000A). The coronal hole boundaries were plotted as synoptic charts in both the standard Mercator maps as well as polar view projections. The polar view projections emphasize that the major areas occupied by coronal holes during this period were in the polar caps at latitudes greater than 60 deg north and south. The periods of time for which boundaries were determined are May 24 through June 23, 1973 (first manned Skylab mission), August 2 through September 24, 1973 (second manned mission), and November 21, 1973 through February 2, 1974 (third manned mission). These charts are presented for use in the study of Skylab and corroborating space/ground-based data taken during the manned mission periods. A microfiche version of this document is also available upon request. For more information on this data set, contact Dr. David Bohlin, Code E2/Solar and Heliospheric Physics Office, NASA Headquarters, Washington, DC 20546.

SKYLAB, TOUSEY  
EUV SPECTROGRAPH

Data set name - EXTREME ULTRAVIOLET SPECTROGRAPH ON 70 MM FILM

NSSDC ID 73-027A-11B, SOLAR UV SPECTRA ON 70MM FILM

Time period covered - (N/A)

Quantity of data - 1600 B/W NEGATIVES

The data are solar EUV spectra obtained by the NRL EUV spectrograph, recorded on strips of black and white 70-mm film, with eight spectral frames being recorded on each film strip. The strip covers the 970 to 3940 A spectral range, with a spectral resolution of between 0.04 and 0.08 A. The overall spectra are readable, but some film strips were contaminated by outside lights. A compendium of these data, entitled "The High-Resolution Solar Spectrum, 1175-1710 A," by G.D. Sandlin, J.-D.F. Bartoe, G.E. Brueckner, R. Tousey, and M.E. VanHoosier, was published in the Astrophysical Journal Supplement Series, v. 61, pp. 801-898, 1986. Rocket flights were made on September 4, 1973, and January 15, 1974, to calibrate these spectra, and the rocket data are available on magnetic tapes at NSSDC under the identification number RS-12A. Parties

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interested in detailed scientific aspects of these spectra may contact Dr. J.-D.F. Bartoe, Naval Research Laboratory, Washington DC.

Data set name - EUV SPECTROGRAPH FRAME CATALOG ON MAGNETIC TAPE

NSSDC ID 73-027A-11C, FRAME CATALOG ON MAGNETIC TAPE

Time period covered - 05/29/73 TO 02/03/74

Quantity of data - 1 REEL OF TAPE

This data set consists of frame catalog data from the Solar EUV Spectrograph Experiment on 800-bpi, bcd, 7-track magnetic tape. The data are card images created on an IBM 360 computer. The data, three files, consist of strip number; record number; day of year; hour, minute, and second of day; experiment time; yaw; pitch; roll; and mode. For more information on this data set, contact Dr. Richard Tousey, Code 4107, Naval Research Laboratory, Washington, DC 20375.

Data set name - SKYLAB EUV SPECTROGRAPH CATALOG OF FRAME EXPOSURES ON MICROFICHE

NSSDC ID 73-027A-11D, FRAME CATALOG ON MICROFICHE

Time period covered - (N/A)

Quantity of data - 5 CARDS OF B/W MICROFICHE

This data set consists of frame catalog data from the Solar EUV Spectrograph Experiment on five microfiche cards. The data consist of strip number; record number; day of year; hour, minute, and second of day; experiment time; yaw; pitch; roll; and mode. For more information on this catalog, contact Dr. Richard Tousey, Code 4107, Naval Research Laboratory, Washington, DC 20375.

SKYLAB, UNDERWOOD  
DUAL X-RAY TELESCOPE

Data set name - BRIGHT FEATURE AND FAINT FEATURE VERSIONS OF BLACK-AND-WHITE FLIGHT FILM

NSSDC ID 73-027A-07A, SOLAR X-RAY IMAGES-BLACK/WHITE

Time period covered - (N/A)

Quantity of data 6370 B/W POSITIVES

This data set consists of a positive copy exposed for bright features and a positive copy exposed for faint features of each of the four loads of flight film on the total of eight reels of film. Each set of four reels contains 22,000 solar images, mostly in X-rays. For information on the main data base and this data set, contact Dr. Robert Wilson, Space Science Laboratory, ES52, Solar-Terrestrial Physics Division, MSFC/NASA, Huntsville, AL 35812.

Data set name - X-RAY EVENT ANALYZER (XREA) DATA LISTINGS ON MICROFILM

NSSDC ID 73-027A-07C, XREA PRINTOUT ON MICROFILM

Time period covered - 05/29/73 TO 02/05/74

Quantity of data - 50 REELS OF MICROFILM

These reduced data, received from the experimenter, are contained on 50 reels of 16 mm microfilm. The data consist of lists of the day of year, time (hh,mm,ss in GMT), the aperture position for the aluminum (Al) windowed proportional counter, the counts accumulated in each channel of the Al-windowed counter, the total counts accumulated in all channels of the Al-windowed counter, the total counts accumulated in all channels of the beryllium (Be)-windowed counter, the counts accumulated in each channel of the Be-windowed counter, the aperture position of the Be-windowed counter, and the telemetry station receiving the data, for each 2.5-s readout of the X-ray event analyzer. Also included on the microfilm are the telescope housekeeping data, including temperatures, currents, and discrete events. For more information on this data set, contact Dr. Robert Wilson, Space Science Laboratory, ES52, Solar-Terrestrial Physics Division, MSFC/NASA, Huntsville, AL 35812.

Data set name - BLACK AND WHITE RENDITION OF COLOR FILM (73-027A-07B)-HIGH AND LOW CONTRAST COPIES

NSSDC ID 73-027A-07E, BLACK+WHITE VERSION OF 73-027A07B

Time period covered - (N/A)

Quantity of data - 500 B/W POSITIVES

These data are black and white positive copies of solar X-ray images on aerial color reversal film (S-056 film load 5). Two copies were exposed for bright features and two copies were exposed for faint features. Each reel contains 5000 solar images. For more information on this data set, contact Dr. Robert Wilson, Space Science Laboratory, ES52, Solar-Terrestrial Physics Division, MSFC/NASA, Huntsville, AL 35812.

Data set name - FRAME CATALOGS OF S056 X-RAY TELESCOPE DATA, ON MICROFICHE

NSSDC ID 73-027A-07F, FRAME CATALOGS ON MICROFICHE

Time period covered - (N/A)

Quantity of data - 16 CARDS OF B/W MICROFICHE

This data set consists of microfiche copies of (1) the frame listing, which indicates the frame number, operational mode, filter number, sequence number/frame number in sequence (used where an operational mode runs many identical sequences of exposures), day-of-year 1973 or 1974/mission day, start time (GMT) of exposure, end time of exposure (GMT), total exposure time, and comments; and (2) the atlas of Skylab ATM/S056 super-long exposures and stepped-image frames (NASA TM X-64992), which lists the above information except that it excludes the sequence/frame number and includes both primary and secondary exposure stop times and exposure lengths. For more information on this data set, contact Dr. Robert Wilson, Space Science Laboratory, ES52, Solar-Terrestrial Physics Division, MSFC/NASA, Huntsville, AL 35812.

Data set name - SELECTED FLARE DATA, SET 1

NSSDC ID 73-027A-07G, SELECTED FLARE DATA, SET 1

Time period covered - 06/15/73 TO 01/21/74

Quantity of data - 1295 B/W NEGATIVES

This data set, contained on 35 mm black and white film (one copy is a highlight copy and the other is a faint feature copy), only includes data relevant to the following five solar flares: June 15, 1973, at 1413 (UT); August 9, 1973, at 1553 (UT); September 5, 1973, at 1834 (UT); September 7, 1973, at 1203 (UT); and January 21, 1974, at 2320 (UT). The data include samples taken around 24, 18, 12, and 6 h before the flare in question, all data taken from 1 h before through 2 h after the flare, and data samples taken at 6, 12, 18, and 24 h after the flare. It is a subset of data set 73-027A-07A and was generated at NSSDC. For more information on this data set, contact Dr. Robert Wilson, Space Science Laboratory, ES52, Solar Terrestrial Physics Division, MSFC/NASA, Huntsville, AL 35812.

Data set name - POINTING LOG ON MICROFICHE

NSSDC ID 80-014A-00D, POINTING LOG

Time period covered - 02/14/80 TO 11/23/80

Quantity of data 8 CARDS OF B/W MICROFICHE

This data set is a continuous history of SMM pointing covering the period from launch on February 14, 1980, to November 23, 1980, when fine pointing capability was lost. The log is based on a review of planning forms, real-time log books, and real-time pass summaries that were prepared during the SMM mission. The log was printed out by the slow table generator (STAG) software system that ran on GSFC's 360/65. Each output covers one SMM operational day, which runs from 1300 UT to 1300 UT. For more information on this data set, contact Kenneth Frost, Code 600.0, GSFC/NASA, Greenbelt, MD 20771.

SMM, DE JAGER  
HARD X-RAY IMAGING SPECTROMETER (HXIS)

Data set name - HARD X-RAY HIMSEL FORMAT DATA ON MAGNETIC TAPE

NSSDC ID 80-014A-05A, HARD X-RAY HIMSEL FORMAT DATA

Time period covered - 06/29/80 TO 06/29/80

Quantity of data - 2 REELS OF TAPE

This data set consists of data from the Hard X-ray Imaging Spectrometer (HXIS) on 9-track, 1600-bpi binary tapes created on a PDP computer. The number of image files on a tape is restricted to a maximum of 32,767, but physically this number is not likely to be attained. An image is designated by its image number and its file number (e.g., 400/3 indicates image 400 of file 3). The files are preceded by a label of 256 words followed by a tape mark (EDF). A label contains file ID, tape ID, tape number, file number, record number, image number, date, etc. If no files exist, a second tape mark (EDT) is added. The files are separated by one tape mark (EDF), while the last file is closed by two tape marks (EDT). Each image consists of two record blocks of 1920 words each. For further information on the main data base and this data set, contact Dr. C. deJager, Space Science Laboratory, Beneluxlaan 21, Utrecht, the Netherlands.

SMM, FROST  
HARD X-RAY BURST SPECTROMETER (HXRB5)

Data set name - PULSE HEIGHT SPECTROMETER DATA ON MAGNETIC TAPE

NSSDC ID 80-014A-06A, PULSE HEIGHT SPECTROMETER DATA

Time period covered - 06/29/80 TO 06/29/80

Quantity of data - 3 REELS OF TAPE

This data set consists of pulse-height spectrometer (PHS) data on 9-track, 800-bpi, ASCII tapes. Each file on the tape contains a header record followed by data records. The header record contains the following: code identifying header record, start day of interval, start millisecond of interval, time between data intervals in millisecond, source ID, and channel edges in keV. The data records contain the following: record number in data interval, data interval number, PHS channels 1-10 or 11-15, and livetime in seconds. The data records have the form of pairs of data records, and the pairs continue until the selected end time is reached. The PHS data are in units of counts or counts per second depending on an option set. For further information on the main data base and this data set, contact Dr. Brian Dennis, Code 682, GSFC/NASA, Greenbelt, MD 20771.

Data set name - HARD X-RAY EMISSION CURVES FOR FLARES

NSSDC ID 80-014A-06B, X-RAY EMISSION CURVES FOR FLARES

Time period covered - 02/19/80 TO 01/27/83

Quantity of data - 174 CARDS OF B/W MICROFICHE

This data set consists of a listing of all the flares observed by the Hard X-ray Burst Spectrometer (HXRB5), followed by a plot of the hard X-ray emission from flare on microfiche. The list includes a serial number for each flare, date, start and peak times to the nearest second, peak emission rate in counts per second, total counts, solar active region of origin, flare type number, and some explanatory notes. The flare light curves are plots of counts per second vs time. Each plot is marked with the serial number(s) of the flare(s), so that the user is able to refer back to the listing for the pertinent information. For additional information on this data set, contact Dr. Brian Dennis, Code 682, GSFC/NASA, Greenbelt, MD 20771.

SMM, MACQUEEN  
CORONAGRAPH/POLARIMETER

Data set name - COLOR PRESS RELEASE PHOTOGRAPHY

NSSDC ID 80-014A-01A, COLOR, PR PHOTOGRAPHY (DELETED)

Time period covered - (N/A)

Quantity of data - 3 COLOR POSITIVE FRAMES

This data set is SMM coronagraph/polarimeter images. The false color contoured image shows the brightness of the outer corona off the west limb of the sun. (North is to the upper right.) The image was taken through the broadband green filter at 14:16 (UT) on April 12, 1980 (DDY 103), and the 0 degree polarizing filter was used. One particularly bright helmet streamer is visible in this image, and the more diffuse

background is the superposition of many coronal structures -- typical of solar maximum conditions. The second image is simply a direct photo (no contours) of the same DDY 103 exposure. The third image on the poster is of the east limb of the sun. (North is to the upper right.) This 6-s exposure was taken through the broadband green filter at 17:00 (UT) on March 31, 1980 (DDY 091), and no Polaroid filter was used. A knot of bright ejecta (a coronal mass ejection) is seen in the southeast, and a bright front (looplike feature) is visible in the original photo. For information on the main data base, contact Dr. A.J. Hundhausen, High Altitude Observatory, P.O. Box 3000, Boulder, CO 80307.

SMM, TANDBERG-HANSSSEN  
ULTRAVIOLET SPECTROMETER AND POLARIMETER

Data set name - ULTRAVIOLET SPECTROMETER DATA ON MAGNETIC TAPE

NSSDC ID 80-014A-02A, U.V. SPECTROMETER DATA

Time period covered - 06/29/80 TO 06/29/80

Quantity of data - 1 REEL OF TAPE

This data set consists of UV spectrometer data on a 9-track, 1600-bpi magnetic tape created on a PDP computer. The data are multifiled with volume header, file header, and trailer records. The tape begins with an 80-character volume label, and each data file has file header 1, file header 2, UV spectrometer data file, file trailer label 1, file trailer label 2, and end of file marker. Using a PDP computer, the data can be accessed without concern for the header and trailer records. With other computers, one simply reads and ignores the extraneous information except the UV spectrometer files. An important caution in reading the data with non-PDP computers is that PDP computers have a nonstandard way of representing 16-bit integers, i.e., the first 8-bit byte read in is the low-order part, contrary to IBM and most other U.S. computers. Therefore, one should reverse all the byte pairs in integer data. For further information on the main data base and this data set, contact Dr. Einar Tandberg-Hanssen, Code ES-01, MSFC/NASA, Huntsville, AL 35812.

Data set name - UVSP OBSERVING CATALOG ON MICROFILM

NSSDC ID 80-014A-02B, UVSP OBSERVING CATALOG ON MICROFILM

Time period covered - 02/20/80 TO 02/05/81

Quantity of data - 1 REEL OF MICROFILM

This data set, contained on a reel of microfilm, is an observing log of the ultraviolet spectrometer and polarimeter. The data set, provided by Dr. B. Woodgate of GSFC/NASA, covers a time span of February 1, 1980, to February 5, 1981. The log lists chronologically the following information: observation time (year, day, hour, and minute), experiment type, entrance and exit slit number, central wavelength, spatial resolution, picture size, exposure time, etc. The magnetic tape version of this data set is 80-014A-02C. For more information on this data set, contact Dr. B. Woodgate, Code 681, GSFC/NASA, Greenbelt, MD 20771.

Data set name - UVSP OBSERVING CATALOG ON MAGNETIC TAPE

NSSDC ID 80-014A-02C, UVSP OBSERVING CATALOG ON TAPE

Time period covered - 02/20/80 TO 02/05/81

Quantity of data - 1 REEL OF TAPE

This data set, contained on a magnetic tape, is an observing log of the ultraviolet spectrometer and polarimeter. The data set, provided by Dr. B. Woodgate of GSFC/NASA, covers a time span of February 1, 1980, to February 5, 1981. The log lists chronologically the following information: observation time (year, day, hour, and minute), experiment type, entrance and exit slit number, central wavelength, spatial resolution, picture size, exposure time, etc. The microfilm version of this data set is 80-014A-2B. For further information on this data set, contact Dr. B. Woodgate, Code 681, GSFC/NASA, Greenbelt, MD 20771.

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\*\*\*\*\* SOLRAD 1 \*\*\*\*\*  
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SOLRAD 1, FRIEDMAN  
X-RAY AND LYMAN-ALPHA STUDY

Data set name - X-RAY (2 TO 8 A) AND UV (1050 TO 1350 A)  
DATA

NSSDC ID 60-007B-01A, X-RAY 2-8A, UV 1050 - 1350A

Time period covered - 06/22/60 TO 11/01/60

Quantity of data - 1 CARD OF B/W MICROFICHE

This data set is in a published report in the Journal of Geophysical Research, v. 67, pp. 2231-2253, June 1962. The report, written by the principal investigator, consists of 23 pages, 14 of which contain some type of reduced or analyzed X-ray and Lyman-alpha flux data. Included are six pages of time-ordered, reduced X-ray fluxes, in tabulated form, accompanied by data on all reported flares and other associated solar events. Approximately 100 events (17% of the total number of readable satellite records obtained between June 22, 1960, and November 1, 1960, during periods when the solar aspect angle was less than 30 deg) are listed. Only those readings that had measurable fluxes are included. There are also three pages of graphs depicting the spin precession history of the SOLRAD 1 satellite, four pages of graphs showing various kinds of analyzed data, and one page giving a summary of the major events observed. In addition, there are graphs depicting the spectral sensitivity of the Lyman-alpha photometer, the X-ray photometer's spectral response characteristic, the angular response of the X-ray photometer, and 1 day of raw telemetry data from the Lyman-alpha and X-ray detectors. The quality of the data is good. For information on the main data base and this data set, contact Dr. Herbert Friedman or Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

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\*\*\*\*\* SOLRAD 7A \*\*\*\*\*  
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SOLRAD 7A, KREPLIN  
SOLAR X-RAY (2 TO 60 A) AND UV (1225 TO  
1350 A) FLUX

Data set name - MACHINE REDUCED X-RAY FLUX DATA (THREE  
POINTS PER PASS) ON MAGNETIC TAPE

NSSDC ID 64-001D-01A, MACHINE RED. 3 POINTS PER PASS

Time period covered - 01/12/64 TO 08/31/64

Quantity of data - 1 REEL OF TAPE

These reduced data are on bcd magnetic tape. The ion chamber photometer current readings were converted to flux values. The raw data were telemetered to 24 ground stations all over the world. Each of 24 stations received about four satellite passes per day and obtained 5 to 15 min of good data on each pass. The original time-ordered data were then reduced on an IBM 1620, using three points per station pass on a peak flux search in certain wavelength bands. The output from the machine reduction was punched on IBM cards and then transferred onto magnetic tape at NSSDC. There are three card images per pass. The first card is a header, the second is blank, and the third contains the date, start and stop time of the pass (UT), orbit number, station identifier, aspect angle, 8- to 14-A flux, and 44- to 60-A flux. The data, which are of good quality, cover a continuous period from January 12, 1964, to August 31, 1964. For information on the main data base and this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - SOLAR X-RAY (2 TO 60 A) AND UV FLUX  
(1225 TO 1350 A) DATA ON TAPE

NSSDC ID 64-001D-01B, HAND RED. 1 POINT PER PASS

Time period covered - 01/11/64 TO 02/03/65

Quantity of data - 1 REEL OF TAPE

These reduced data are on bcd magnetic tape. The photometer current readings were converted to flux values. The raw data were telemetered to 24 ground stations all over the world. Each of 24 stations received about four satellite passes per day and obtained 5 to 15 min of good data on each pass. The original time-ordered data were hand reduced, using one point per station pass on a peak flux search in five wavelength bands. The data resulting from the hand reduction were fed into an IBM 1620 system that produced an output on IBM cards. These data were later transferred onto magnetic tape at

NSSDC. There are from one to five card images for each station pass. The first card of each group contains the date, start and stop time of the station pass (UT), station pass number, and some references to solar aspect sensors and UV detectors. The second card gives the aspect angle (deg) and the UV detector current. The remaining cards contain the currents from the X-ray detectors (2 to 8 A, 8 to 14 A, 8 to 16 A, 44 to 55 A, and 44 to 60 A) and the corresponding fluxes computed from them. The data, which are of good quality, cover a continuous period from January 11, 1964, to August 31, 1964, except for the 44- to 55-A and 8- to 16-A detectors, which failed soon after launch. Sporadic data were obtained from September 1964 until February 1965, with the coverage for each detector varying somewhat. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

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\*\*\*\*\* SOLRAD 7B \*\*\*\*\*  
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SOLRAD 7B, FRIEDMAN  
SOLAR X-RAY MONITORING EXPERIMENT

Data set name - PLOTS OF SOLAR X-RAY FLUXES  
(ON MICROFICHE)

NSSDC ID 65-016D-01A, PLOTS OF SOLAR X-RAY FLUXES

Time period covered - 03/10/65 TO 10/31/65

Quantity of data - 1 CARD OF B/W MICROFICHE

This data set, supplied by the PI, consists of a microfiche copy of a paper entitled "NRC Solar Radiation Monitoring Satellite 1965-16D X-ray Data Plots" by A.T. McClinton, Jr. (1968), which contains a series of plots. Each plot contains the solar X-ray flux in 44- to 60-A, 8- to 20-A, 8- to 12-A, and 0.5- to 3.0-A passbands plotted vs time in days. The satellite transmitted useful data from March 10, 1965, to October 1965, after which time the data could be reduced by hand only because of a failure of the subcarrier oscillator on channel 5. The plots included in this report comprise of three sections: (1) satellite aspect--the aspect of the satellite was defined as the angle between the photometers as they spin on the axis of the satellite and the line of sight to the sun, (2) full month plots, prepared for March 1965 through October 1965, and (3) half month plots, prepared on the same basis as the full month plots except the time scale was broadened and grid lines were placed on the plot to make it easier for determining the values. For information on the main data base and this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - TABLES OF SOLAR X-RAY FLUX ON MICROFICHE

NSSDC ID 65-016D-01B, TABLES OF SOLAR X-RAY FLUXES

Time period covered - 03/10/65 TO 10/30/65

Quantity of data - 1 CARD OF B/W MICROFICHE

This data set was supplied by the PI and reproduced on microfiche. The data set consists of tables giving the daily average X-ray flux calculated from individual records. Five X-ray bands were normally monitored, but, because the 0-8 and 0.5-3 A bands were below threshold, these data were not included in the table of daily averages. The data set contains (1) 44-60 A index--the reduction of the 44-60 A photometer signal to flux values involved the use of a "gray body" approximation in which a temperature of 0.5E6 K was used to define the wavelength distribution, (2) 8-20 A index--this flux index was calculated on the assumption that this region of the solar spectrum may be approximated by a 2.0E6 K "gray body," (3) 8-12 A index--this flux index was calculated from the 8-12 A detector using a 2.0E6 K "gray body" approximation, (4) outstanding events--this table lists those intervals and flux indices when the flux in the 0-8 A and 0-3 A bands was significantly different from the average for the day or when a change in flux value with time was observed, and (5) times of observation--these are the intervals of time when the satellite was in range of a telemetry station. Intervals have not been included when X-ray flux could not be reduced because of noise or other interference. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

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\*\*\*\*\* SOLRAD 8 \*\*\*\*\*  
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more information on this data set, contact Dr. Robert Kreplin,  
Naval Research Laboratory, 4555 Overlook Avenue S.W.,  
Washington, DC 20375.

SOLRAD 8, KREPLIN  
SOLAR X-RAY AND ULTRAVIOLET MONITOR

Data set name - THREE CHANNEL TABULATED DAILY X-RAY  
FLUXES IN PUBLISHED REPORT

Data set name - ONE-MIN AVERAGES OF X-RAY FLUX DATA ON  
TAPE

NSSDC ID 65-093A-01E, DAILY X-RAY FLUXES IN PUBL. RPT.

NSSDC ID 65-093A-01A, 1 MIN FLUX AVG FOR 12 DETECTORS

Time period covered - 12/01/65 TO 11/05/67

Time period covered 11/27/65 TO 08/24/67

Quantity of data - 1 CARD OF B/W MICROFICHE

Quantity of data - 19 REELS OF TAPE

This data set consists of 19 7-track, 556-bpi, bcd tapes that were produced on an IBM 7094. The data on these tapes constitute the complete set of reduced data from this experiment as provided by the experimenter. The data include year, month, day, and universal time of each observation, and station, pass number, aspect angle, number of samples averaged, minute average of X-ray flux, or UV current for each detector. These data contain the following errors: During certain known orbits, the noise counts for two detectors were added to the data. For other orbits, two data fields were interchanged, and, for certain orbits, one data field was multiplied by 100. For aspect angles greater than 14 deg, one detector had an improper conversion factor. Data set 65-093A-01B contains a corrected version of these data. For information on the main data base and this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

This data set was supplied by the Arcetri Astrophysical Observatory in Italy, which has received telemetered data direct from SOLRAD satellites since 1964. The data set is published in hard copy form as "X-ray Fluxes from the SOLRAD 8 Satellite from December 1965 to November 1967," by M. Landini, B. Monsignori Fossi, D. Russo, and G.L. Tagliaferrri, Fascicolo 91, Osservazioni e Memorie dell'Osservatorio Astrofisico di Arcetri, September 1968, Bologna, Italy (B08026-000A). The document consists of tabulated daily X-ray fluxes in the 44- to 60-A, 8- to 20-A, and 0- to 8-A channels in units of 1.E-1, 1.E-3, and 1.E-4 erg/(sq cm-s), respectively. These daily fluxes were obtained by selecting fluxes that ranged between the minimum value for that day and 1.25 times that minimum value and then taking the arithmetic mean. The data were reduced from counts to fluxes by assuming that the 44- to 60-A spectrum could be represented by a one-half million kelvin gray body and the 8- to 20-A and 0- to 8-A spectra by a two million kelvin gray body. The maximum error in the flux values is plus or minus 20%, mainly due to reading errors. Blanks in the data mean (1) aspect angles greater than 30 deg, (2) malfunctions in the receiving station, (3) extremely quiet days, (4) very high activity, and (5) satellite in the earth's shadow. The data were processed with an IBM 1620 computer and cover the period December 1, 1965, through November 30, 1967. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - ONE-MIN AVERAGES OF X-RAY FLUX VALUES ON  
REFORMATTED TAPE

NSSDC ID 65-093A-01B, COMPACT AND EDITED 1 MIN FLUX AVG

Time period covered - 11/27/65 TO 08/24/67

Quantity of data - 1 REEL OF TAPE

The data set consists of one bcd, variable, blocked IBM 7094 magnetic tape written at 556 bpi. A physical record for each pass over a telemetry station contains a logical header record and a series of logical detector records. The length of the detector record varies with the number of samples obtained during the pass. The data span the period November 27, 1965, through August 24, 1967. Data include (1) year, month, day, (2) pass number, (3) station, (4) aspect angle, (5) number of samples, (6) universal time, and (7) 1-min averages of X-ray flux (or UV current) for each detector. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

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\*\*\*\*\* SOLRAD 9 \*\*\*\*\*  
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SOLRAD 9, KREPLIN  
SOLAR RADIATION DETECTORS

Data set name - PLOTS OF REDUCED SOLAR X-RAY FLUX VS  
TIME ON MICROFILM

NSSDC ID 68-017A 01A, 3 X RAY FLUXES+BKGNND VS TIME

Time period covered - 03/14/68 TO 12/31/71

Quantity of data - 2 REELS OF MICROFILM

This data set consists of 16-mm microfilmed plots of the detector outputs, in X-ray flux units of ergs/(sq cm-s), for the 0.5- to 3-A, 1- to 8-A, and 8- to 20-A photometers (assuming a 2.0E6 K gray body temperature distribution for the 1- to 8-A and 8- to 20-A detectors and a 10.E6 K gray body distribution for the 0.5- to 3-A detector). Each frame presents data covering 24 h, with 1-min time resolution, on a log base 10 semi-log grid. The data gaps that occur indicate satellite night. Particle interference is indicated by a background count plot that was produced by the 0.5- to 3-A photometer when it was facing away from the sun. The data, which cover the period March 14, 1968, to December 31, 1971, were provided by the experimenter. A complete description of the SOLRAD 9 satellite can be found in NRL report No. 6800, "The NRL SOLRAD 9 Satellite, Solar Explorer 8, 1968-17A." For information on the main data base, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - CATALOG OF TRACKING STATION PASSES THAT  
RESULTED IN SOLAR X-RAY DATA ON TAPE

NSSDC ID 65 093A-01C, EDIT CARDS

Time period covered - 11/19/65 TO 08/24/67

Quantity of data - 1 REEL OF TAPE

This data set, generated at NSSDC from experimenter-supplied data, is contained on 7-track, bcd, 556-bpi magnetic tape. It catalogs each pass over a tracking station that resulted in solar X-ray data being obtained. Listed are the year, start and stop times of each pass, station ID and pass number, and an assortment of flags indicating the quality of the data received. This data set, supplied by the experimenter, indexes data set 65-093A-01B. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - X-RAY FLUX PLOTS AND HOURLY AVERAGES IN  
PUBLISHED REPORT

NSSDC ID 68-017A-01B, HOURLY AVERAGES PUBLISHED IN SGD

Time period covered - 02/01/69 TO 04/24/74

Quantity of data - 533 PAGES OF UNBOUND HARDCOPY

Data set name - CATALOG OF SOLAR X-RAY OBSERVATIONS ON  
MAGNETIC TAPE

NSSDC ID 65-093A-01D, STATION LIST START/STOP + PASS NO

Time period covered - 11/27/65 TO 08/23/67

Quantity of data - 1 REEL OF TAPE

This data set, generated at NSSDC from experimenter-supplied data, is contained on 7-track, bcd, 556-bpi magnetic tape. It catalogs, in ascending order of time, the data acquired from this experiment. Listed on the tape for each observation are the date, pass number, station ID, solar-aspect angle, number of 1-min averages obtained, and start and stop times of each pass. This data set, supplied by the experimenter, indexes data in data set 65-093A-01B. For

These data are contained in the bulletin "Solar-Geophysical Data," published monthly by the U.S. Department of Commerce. The prompt report section of this bulletin contains solar X-ray fluxes for 1- to 8-A and 8- to 20-A pass bands, averaged in 1-h intervals. These averages are usually for the third month prior to the date of publication (e.g., October 1972 averages are found in the December 1972 issue). The comprehensive report section of this bulletin contains plots of solar X-ray flux (0.5- to 3-A, 1- to 8-A, and 8- to 20-A) as well as a background particle count rate, all vs

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time of day. The plots are semilogarithmic, with time being the linear dimension, and each plot contains all the data from 1 day. These plots generally are for 6 months prior to the publication (e.g., plots for June 1972 are found in the December 1972 issues). These publications are available from the Publications Department, National Climatic Center, Department of Commerce, NOAA, Federal Building, Asheville, NC 28801. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - THREE-CHANNEL TABULATED X-RAY FLUXES IN PUBLISHED REPORT

NSSDC ID 68-017A-01C, 3-CHANNEL X-RAY FLUXES IN PUB.RPT

Time period covered - 03/08/68 TO 12/31/68

Quantity of data - 1 CARD OF B/W MICROFICHE

This data set was supplied by the Arcetri Astrophysical Observatory in Italy, which has received telemetered data direct from SOLRAD satellites since 1964. The data set is published in hard copy form as "X-ray Fluxes from the SOLRAD 9 Satellite (1968-17A) from March 1968 to December 1968," by M. Landini, B. Monsignori Fossi, G. Poletto, D. Russo, and G.L. Tagliaferri, Fascicolo 92, Osservazioni e Memorie dell'Osservatorio Astrofisico di Arcetri, March 1969 (B08027-000A). The document consists of tabulated X-ray fluxes in the 44- to 60-A, 8- to 16-A, and 1- to 8-A channels in units of 1.E-1, 1.E-3, and 1.E-4 ergs/(sq cm-s), respectively, along with the start and end times (UT) of the pass. These fluxes were derived from counts by assuming that the 44- to 60-A spectrum could be represented by a one-half million kelvin gray body and the 8- to 20-A, 8- to 16-A, and 1- to 8-A spectra by a two million kelvin gray body. Some 700 passes were recorded between March and December 1968. On the average, three passes, each approximately 8 min in duration, were made each day. The tabulated fluxes are for 636 passes monitored during the period (the records obtained when the satellite was in the earth's shadow were excluded). The maximum error in the fluxes is plus or minus 20% mainly due to reading errors, apart from the errors in absolute values involved in the gray body assumption. The data were processed with an IBM 7090 computer and cover the period March 8 through December 31, 1968. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - FIVE CHANNEL TABULATED X RAY FLUXES IN PUBLISHED REPORT

NSSDC ID 68-017A-01D, 5-CHANNEL X-RAY FLUXES IN PUB.RPT

Time period covered - 01/01/69 TO 11/02/69

Quantity of data - 1 CARD OF B/W MICROFICHE

This data set was supplied by the Arcetri Astrophysical Observatory in Italy, which has received telemetered data direct from SOLRAD satellites since 1964. The data set is published in hard copy form as "X-ray Fluxes from the SOLRAD 9 Satellite (1968-17A) from January 1969 to October 1969," by M. Landini, B.C. Monsignori Fossi, G. Poletto, F. Russo, and G.L. Tagliaferri, Fascicolo 94, Osservazioni e Memorie dell'Osservatorio Astrofisico di Arcetri, April 1970 (B08027-000A). The document consists of tabulated X-ray fluxes in the 1- to 8-A, 8- to 16-A, 0.5- to 3-A, 44- to 60-A, and 1- to 20-A bands in units of 1.E-3, 1.E-2, 1.E-4, 1.E-1, and 1.E-2 ergs/(sq cm-s), respectively, along with the start and stop times (UT) of each pass. These data were reduced from ion chamber currents or GM counts to fluxes by assuming that the 44- to 60-A channel spectrum could be represented by a one-half million kelvin gray body and the 8- to 16-A, 1- to 20-A, 1- to 8-A, and 0.5- to 3-A channels by a two million kelvin gray body. Data from 619 passes monitored in the period January to October 1969 were processed with an IBM 7090 computer. The data from the 44- to 60-A photometer after February 11, 1969, are not reliable because of detector malfunction. On the average, three passes, each approximately 8 min in duration, were made each day. Data obtained when the satellite was in the earth's shadow are excluded. The maximum error in the fluxes is plus or minus 20%, mainly because of reading errors, apart from the errors in absolute values involved in the gray body assumption. The data set covers the period January 1 to November 2, 1969. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - REDUCED SOLAR X-RAY FLUXES ON MAGNETIC TAPE

NSSDC ID 68-017A-01E, REDUCED SOLAR X-RAY FLUXES (TAPE)

Time period covered - 03/14/68 TO 09/30/72

Quantity of data - 36 REELS OF TAPE

This data set was supplied by the PI on 556-bpi, even parity, 7-track magnetic tapes generated on a CDC 3800 computer. The tapes contain one or more calendar months of reduced data and are unlabeled, i.e., the flux data begin in the first record. The date and time (UT) associated with each data sample are uniquely defined by appropriate fields within the format. The data are partitioned into records and files according to the following scheme. Each record contains 1 h of data. Each file contains 1 calendar day of data and, thus, is composed of a maximum of 24 records. The records are of variable length, since the number of minutes of data present in each hour commonly varies. The files are also of variable length, since occasionally there are days during which one or more hours of data are lacking. The satellite collected samples of data once a minute. Each minute of reduced data was encoded into a string of 80 bcd characters suitable for punching on cards. The following are general comments about the format of the 80-character string and the measurements it contains: (1) in each string, the date is specified by giving the last digit of the year followed by the day of the year, and the time (UT) is given in hours and minutes; (2) the measurements obtained from experiments 5, 6, and 7B are given in units of energy flux (ergs/sq cm-s); (3) a zero value in any one of the floating-point fields indicates the absence of a measurement from that experiment for that minute; (4) periods of time lasting several minutes during which no solar radiation measurements could be obtained, such as when the satellite passed through the earth's shadow. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - PLOTS OF REDUCED SOLAR X-RAY FLUXES, ON MICROFICHE

NSSDC ID 68-017A-01F, SOLAR X-RAY FLUX PLOTS, FICHE

Time period covered - 01/01/70 TO 04/30/74

Quantity of data - 70 CARDS OF B/W MICROFICHE

This data set is in the form of plots of X-ray flux vs time. The abscissa of each plot is scaled in hours of universal time (UT). The date and year are printed at the top left in yymmdd format. The ordinate is scaled in X-ray flux units of ergs/sq cm-s multiplied by the indicated power of 10. There are three different flux scales along the ordinate. One scale pertains to the 8- to 20-A flux data and the second scale pertains to both the 1- to 8-A and 0.5- to 3-A flux data, although each is separately identified. The 0.5- to 3-A flux scale is denoted as 0-3 flux for brevity. The third ordinate scale pertains to the digital count output for the background data of the 0.5- to 3-A detector. These background data are used as indicators of charged particle interference with the X-ray experiments. Starting from the top of the frame, the first plot is the X-ray flux for the 8- to 20-A detector. The next lower plot represents the X-ray flux for the 1- to 8-A detector. Then comes that for the 0.5- to 3-A detector, which is often intermittent because the flux level is generally below the detection threshold. Finally, the bottom plot is the digital count background reading of the 0.5- to 3-A detector. Gaps occurring simultaneously in all data lines and at regularly spaced time intervals indicate satellite night. Gaps in one or more data lines, not regularly spaced in time, indicate particle interference. For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

Data set name - X-RAY MEMORY DATA ON MICROFILM

NSSDC ID 68-017A-01G, X-RAY MEMORY DATA, MICROFILM

Time period covered - 11/19/69 TO 12/09/70

Quantity of data - 1 REEL OF MICROFILM

For more information on this data set, contact Dr. Robert Kreplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

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\*\*\*\*\* SOLRAD 10 \*\*\*\*\*  
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SOLRAD 10, KREPLIN  
SOLAR RADIATION DETECTORS

Data set name - PLOTS OF REDUCED SOLAR X-RAY FLUXES, ON MICROFICHE

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NSSDC ID 71-058A-01A, SOLAR X-RAY FLUX PLOTS (FICHE)

Time period covered - 01/01/72 TO 06/30/73

Quantity of data - 18 CARDS OF B/W MICROFICHE

This data set is in the form of plots of X-ray flux vs time. The abscissa of each plot is scaled in hours of universal time (UT). The date and year are printed at the top left in yymmdd format. The ordinate is scaled in X-ray flux units of ergs/sq cm-s multiplied by the indicated power of 10. Starting from the top of the frame, the first plot is the X-ray flux for the 8- to 20-A detector; the second, that from the 1- to 8-A detector; the third, that from the 1- to 5-A detector; and the fourth, that from the 0.5- to 3-A detector, denoted as 0-3 flux for brevity. The bottom plot, which has its own scale running from 2 to 16 counts, is the digital count output for the background data of the 0.5- to 3-A detector. These background data are used as indicators of charged particle interference with the X-ray experiments. Gaps occurring simultaneously in all data lines and at regularly spaced time intervals indicate satellite night. Gaps in one or more data lines, not regularly spaced in time, indicate particle interference. For information on the main data base, contact Dr. Robert Kraplin, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375.

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\*\*\*\*\* UK 5 \*\*\*\*\*  
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UK 5, POUNDS  
2- TO 10-KEY SKY SURVEY INSTRUMENT (SSI)

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Data set name - ARIEL V SSI 3A X-RAY CATALOG ON MAGNETIC TAPE

NSSDC ID 74-077A-02A, 3A CATALOGUE OF X-RAY SOURCES

Time period covered - 10/18/74 TO 03/14/80

Quantity of data - 1 REEL OF TAPE

This data set is the 3A catalog of X-ray sources observed by a large-area proportional counter flown on UK 5. The data are on an 800-bpi, 9-track, ASCII tape with four files, created on the PDP 11/34 computer. The files 0 and 2 correspond to high latitude catalogs, and the files 1 and 3 correspond to low latitude catalogs. The first record in the file contains 3A name and alternative names. The second record contains error box centers and corners in terms of right ascension and declination, and error box areas. The third record contains average, minimum, and maximum fluxes and errors, variability codes, identifications, and identification codes. The fourth record contains comments. Parties interested in the main data base should contact Dr. Ian McHardy, Department of Physics, X-ray Astronomy Group, University of Leicester, University Road, Leicester LE1 7RH, England.

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Data set name - ARIEL V SSI 3A X-RAY CATALOGUE ON MICROFICHE

NSSDC ID 74-077A-02B, 3A CATALOGUE ON MICROFICHE

Time period covered - 10/18/74 TO 03/14/80

Quantity of data - 1 CARD OF B/W MICROFICHE

This data set is the 3A catalog of X-ray sources observed by a large-area proportional counter flown on UK 5. The catalog is on a microfiche card containing 3A names and alternative names of X-ray objects; positions and error boxes of positions in terms of right ascension and declination; fluxes and error fluxes for average, minimum, and maximum intensities; identifications; object codes; and other information. Parties interested in the main data base should contact Dr. Ian McHardy, Department of Physics, X-ray Astronomy Group, University of Leicester, University Road, Leicester LE1 7RH, England.

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\*\*\*\*\* UK 6 \*\*\*\*\*  
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UK 6, POUNDS  
X-RAY PROPORTIONAL COUNTER SPECTROMETER

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Data set name - LIST OF SOURCES OBSERVED BY THE X-RAY PROPORTIONAL COUNTER EXPERIMENT

NSSDC ID 79-047A-02A, X-RAY PROP COUNTER SOURCE LIST

Time period covered - 06/11/79 TO 03/20/81  
(Date supplied by experimenter)

Quantity of data - 1 PAGE OF UNBOUND HARDCOPY

This data set is a list of objects observed between June 1979 and March 1981 by the X-ray proportional counter experiment flown on UK 6. The list is in chronological order and gives the name of the source observed and the day number of the start and end of each observation. The data base from these observations is maintained at the University of Leicester. Parties interested in any of these sources should contact: Dr. M. Ricketts or Dr. R. Hall, University of Leicester, University Road, Leicester, LE1 7RH, England.

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				SOLAR X-RAY SPECTROMETER	67-020A-06			
				CORRECTED 8-12A X-RAY FLUX VS T	67-020A-06A	03/09/67	07/16/68	27
				67-020A-06A IN STANDARD NSSDC FMT	67-020A-06B	03/09/67	07/15/68	27
				SOLAR X-RAY TELESCOPE	67-100A			
				COUNTS/FRAME VS RASTER P, UT	67-100A-08			
OSO 4	10/18/67	GIACCONI	OSO 4, SOLAR X-RAY TELESCOPE	67-100A-08A	67-100A-08A	10/20/67	05/12/68	27
				AVE BKGND COUNTS/FRAME VS RASTER	67-100A-08B	10/26/67	05/12/68	27
				300-1400 EUV SPECTROMETER	67-100A-07			
				EUV RASTER SCANS	67-100A-07A	10/25/67	11/29/67	27
				300-1400A POINTED SPECTRAL SCANS	67-100A-07B	10/25/67	11/27/67	27
				ATLAS EUV RASTER SCANS	67-100A-07C	10/25/67	11/29/67	28
				300-1400A QUIET SUN SPECTRUM	67-100A-07D	10/26/67	10/27/67	28
				PROTON-ELECTRON TELESCOPE	67-100A-04			
				ELECTRON, PROTON COUNT RATES, TAPES	67-100A-04A	10/23/67	12/30/67	28
				SOLAR X-RAY, 0.5-60A	69-006A			
OSO 5	01/22/69	CHUBB	OSO 5, SOLAR X-RAY, 0.5-60A	69-006A-04	69-006A-04			
				X-RAY PLOTS, 4 CHANNELS, MICROFILM	69-006A-04A	01/23/69	08/02/70	28
				SOLAR UV+X-RAY SPECT.	69-006A-03			
REDUCED SPECTROMETER DATA-TAPE	69-006A-03A	01/28/69	01/12/73	28				

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SPACECRAFT NAME	LAUNCH DATE	INVESTIGATOR NAME	EXPERIMENT NAME DATA SET NAME	NSSDC ID	DATA SET INFORMATION TIME SPAN OF DATA	PAGE				
NEY			OS0 5,ZODIACAL LGT+TERRS AIRGLOW	69-006A-07						
			ZODIACAL LGT + AIRGLOW, PLOTS	69-006A-07A	01/27/69	03/15/71	28			
			ZODIACAL LGT + AIRGLOW, TABLES	69-006A-07B	01/27/69	03/15/71	29			
RENSE			ZODIACAL LGT + AIRGLOW, MAG TAPE	69-006A-07C	01/26/69	07/12/70	29			
			OS0 5,SOLAR,UV,280-1030A	69-006A-08						
			REDUCED,MERGED 3-CH.UV DATA TAPES	69-006A-08A	02/05/69	07/19/71	29			
OS0 6	08/09/69	ARCO	OS0 6,SOLAR X-RAYS, 16-40A	69-068A-04						
			COUNT RATES,6 CHANNELS, MAG. TAPE	69-068A-04A	08/14/69	01/20/70	29			
			OS0 6,HE RESONANCE RAD.584+304A	69-068A-06						
			EXPERIMENT ASPECT TAPES	69-068A-06A	08/11/69	08/08/70	29			
			FLUX VS TIME, FINE TIME RES TAPE	69-068A-06B	08/14/69	10/03/70	29			
			2 MINUTE AVERAGES (MAGTAPE)	69-068A-06C	08/15/69	09/29/70	29			
			GOLDBERG			OS0 6,SPECTRO HELIOMTR,300-1400A	69-068A-01			
						EUV RASTER SCANS	69-068A-01A	08/12/69	05/12/70	30
						300-1400A POINTED SPECTRAL SCANS	69-068A-01B	08/11/69	05/11/70	30
			OS0 7	09/29/71	CHUPP	COMMAND LOGS	69-068A-01C	08/12/69	05/12/70	30
						MARCH 7, 1970 SOLAR ECLIPSE DATA	69-068A-01D	03/07/70	03/08/70	30
						COMMAND LOG SEARCH PROGRAM	69-068A-01E		N/A	30
CALIBRATION FACTOR COMPUTATION	69-068A-01F					N/A	30			
OS0 7	7,GAMMA RAY SPECT 0.3-10MEV	71-083A-06								
X-RAY (7.5-120KEV) DATA	71-083A-06A	09/30/71				12/27/72	30			
GAMMA-RAY EXP RESPONSE FUNCTION	71-083A-06B	06/12/71				06/17/71	31			
GAMMA-RAY (0.3-9.1MEV) DATA	71-083A-06C	10/03/71				12/25/72	31			
CLARK						OS0 7, X-RAY SOURCES, 1.5-9A	71-083A-04			
						1-60KEV CELESTIAL XRAY DATA TAPES	71-083A-04A	10/02/71	05/24/73	31
						MICROFILM PLOTS 1-60KEV XRAY DATA	71-083A-04B	03/27/72	01/11/74	31
PETERSON	OS0 7, X-RAY SKY SURVEY,10-550KEV	71-083A-03								
UCSD, COSMIC X-RAY SKYMAP	71-083A-03A	09/29/71	05/18/73	31						
PETERSON	OS0 7, SOLAR X RAYS, 2-323 KEV	71-083A-05								
UCSD SOLAR X-RAY CATALOG	71-083A-05A	10/02/71	02/27/73	31						
OS0 8	06/21/75	TOUSEFY	OS0 7, WHITE + EUV CORONAGRAPHS	71-083A-02						
			SYNOPTIC OBS OF SOLAR CORONA	71-083A-02A	10/11/71	01/15/73	32			
			OS0 8	SKY MAPS OF SPACECRAFT POSITIONS	75-057A					
			8, MAPPING X-RAY HELIOMETER	75-057A-00D		N/A	32			
			DAILY SOLAR X-RAY DATA	75-057A-04						
			OS0 8,HIGH-RESOLUTION UV SPECTROM	75-057A-04A	06/24/75	09/30/78	32			
			SPECTROHELIOGRAM ON MAG. TAPE	75-057A-01						
			LIMB BRIGHTENING ON MAG. TAPE	75-057A-01A	06/28/75	09/30/78	32			
			VELOCITY STUDY ON MAG. TAPE	75-057A-01B	09/28/75	09/30/78	32			
			SPECTRUM SCAN ON MAG TAPE	75-057A-01C	06/25/75	09/30/78	33			
			SPECTRUM RANGE SCAN ON MAG. TAPE	75-057A-01D	06/23/75	09/30/78	33			
			SINGLE WAVELENGTH MONITORING DATA	75-057A-01E	06/23/75	06/24/78	33			
MISCELLANEOUS DATA ON MAG. TAPE	75-057A-01F	06/23/75	09/18/78	33						
CAT. OF SORTED FINAL DATA TAPES	75-057A-01G	06/28/75	07/22/78	33						
DATA REDUCTION PROGRAMS ON TAPE	75-057A-01H		N/A	33						
OS0 8,HIGH ENERGY CELESTIAL X RAY	75-057A-01I		N/A	34						
CELESTIAL X-RAY SOURCES OBS	75-057A-07									
OS0 8,SOFT X-RAY BKGND RADIATION	75-057A-07A	06/21/75	09/30/78	34						
REDUCED DATA TAPES	75-057A-05									
OS0 8,STELL+SDL X-TAL SPECTROSCOP	75-057A-05A	06/25/75	09/30/78	34						
MERGED X-RAY DATA	75-057A-03									
OS0 8, COSMIC X-RAY SPECTROSCOPY	75-057A-03A	07/24/75	09/15/78	34						
SPIN AXIS POINTING MAPS	75-057A-06									
OS0 8,EUV FROM EARTH + SPACE EXP.	75-057A-06A	07/02/75	10/01/78	34						
COLOR DATA PLOTS ON UV EMISSION	75-057A-08									
B/W DATA PLOTS ON UV EMISSION	75-057A-08A		N/A	35						
	75-057A-08B		N/A	35						
PEGASUS 1	02/16/65	NAUMANN	PEGASUS 1,METEOROID DETECTORS	65-009A						
			CARDS AND TAPE IMAGES OF CARDS	65-009A-01						
			OS0 1,METEOROID DETECTORS	65-009A-01A	02/17/65	03/29/66	35			
PEGASUS 2	05/25/65	NAUMANN	CARDS AND TAPE IMAGES OF CARDS	65-039A						
			OS0 2,MICROMETEORITE	65-039A-01						
			CARDS AND TAPE IMAGES OF CARDS	65-039A-01A	05/25/65	10/31/67	35			
PEGASUS 3	07/30/65	NAUMANN	CARDS AND TAPE IMAGES OF CARDS	65-060A						
			OS0 3,MICROMETEORITE	65-060A-01						
			CARDS AND TAPE IMAGES OF CARDS	65-060A-01A	07/30/65	08/15/67	35			
PRCGNDZ 9	07/01/83	UNKNOWN	OS0 83-067A	83-067A						
			SOLAR X-RAY SPECTROMETER	83-067A-02						
			SOLAR X-RAY SURVEY PLOTS, MFICHE	83-067A-02A	07/01/83	01/13/84	35			
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			RYLE-VONBERG RECEIVER PLOTS	68-055A-01						
			RAE-A,RADIO BURSTS RECEIVERS	68-055A-01A	09/25/68	12/25/72	36			
			SWEPT FREQUENCY BR CONTOUR PLOTS	68-055A-02						
			SWEPT FREQUENCY BR MULTIGRID PLOT	68-055A-02A	05/25/69	03/13/71	36			
			BR MULTIGRID 10-MINUTE PLOTS	68-055A-02B	09/26/68	12/03/72	36			
			FULL ORBIT BURST RECEIVER PLOTS	68-055A-02C	07/23/68	07/20/71	36			
				68-055A-02D	07/23/68	12/22/72	36			
			RAE-B	06/10/73	STONE	73-039A	73-039A			
						RAE-B,RADIO AST 9 FREQ.V ANT	73-039A-01			
						RYLE-VONBERG 24-HOUR PLOTS	73-039A-01A	10/31/74	04/26/77	36
						RYLE-VONBERG 24-HOUR TAPES	73-039A-01B	07/12/73	06/28/75	37
RAE-B,RADIO BURST RCVR	73-039A-02									
LOWER ANT. DATA SUMMARY, M/FILM	73-039A-02A	07/12/73				06/30/75	37			
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S 15	4/27/61	CARMIRE				S 15,CHARGED PARTICLE	61-013A			
						COUNT RATE, LONG, LAT, B,L, UT	61-013A-02			
			S 15,GAMMA RAY TELESCOPE	61-013A-02A	04/28/61	11/12/61	37			
S 55B	12/16/62	BESWICK	ASPECT+OBSERVE TIME GAMMA EVENTS	61-013A-01						
				61-013A-01A	04/27/61	11/17/61	38			
			S 55B,MICROMETEORITE	62-070A						
				62-070A-04						

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			DATA SET NAME		TIME SPAN OF DATA		PAGE
			MICROPHONE IMPACT PLOTS	62-070A-04A	12/16/62	04/20/63	38
DAVISON			S 55B, GRID DETECTORS	62-070A-02			
			GRID DET PENETRATION PLOTS, FICHE	62-070A-02A	12/16/62	05/30/63	38
GURLER			S 55B, PRESSURIZED CELLS	62-070A-01			
			PRESSURE CELL PENETRATION PLOTS	62-070A-01A	12/16/62	07/02/63	38
			DETECTOR PENETRATION LISTINGS	62-070A-01B	12/16/62	07/22/63	38
SECRETAN			S 55B, COPPER WIRE CARD	62-070A-03			
			WIRE CARD DETECTOR PLOT	62-070A-03A	12/16/62	07/22/63	38
SECRETAN			S 55B, CADMIUM SULPHIDE CELL	62-070A-05			
			CD-S DETECTOR TABULATIONS	62-070A-05A	12/16/62	02/09/63	38
			CD-S DETECTOR PLOTS, MICROFICHE	62-070A-05B	12/16/62	02/09/63	38
S 55C	11/06/64			64-074A			
			S 55C, PRESSURIZED CELLS	64-074A-01			
			PUBLISHED REPORT TN-D-4284	64-074A-01A	11/06/64	11/05/65	39
HOLDEN			S 55C, IMPACT DETECTORS	64-074A-02			
			PUBLISHED REPORT TN-D-4284	64-074A-02A	11/06/64	11/05/65	39
SECRETAN			S 55C, CADMIUM SULFIDE CELLS	64-074A-03			
			CADMIUM-SULFIDE-CELL METEOR DECT.	64-074A-03B	11/06/64	11/05/65	39
SIVITER			S 55C, CAPACITY DETECTORS	64-074A-04			
			PUBLISHED REPORT TN-D-4284	64-074A-04A	11/06/64	11/05/65	39
SAS-A	12/12/70			70-107A			
			SAS-A, XRAY ALL-SKY SURVEY	70-107A-01			
			SOURCE LIBRARY TAPE	70-107A-01B		N/A	39
			DAILY SUMMARY DATA ON TAPES	70-107A-01C	12/16/70	05/17/71	39
			4U CATALOG OF X-RAY SOURCES	70-107A-01D	12/12/70	03/18/73	40
SAS-B	11/15/72			72-091A			
			SAS-B, HI-ENERGY GAMMA-RAY TELE	72-091A-01			
			GAMMA RAY EVENT DATA ON MICROFILM	72-091A-01A	11/20/72	06/03/73	40
			COUNT RATE OF GAMMA RAY BURSTS	72-091A-01B	11/20/72	06/08/73	40
			ANTI-COINCID SCINT CNT RTS, MFILM	72-091A-01C	11/19/72	06/08/73	40
			A-RATE SUMMARY TAPE	72-091A-01D	11/18/72	06/08/73	40
			GAMMA-RAY TABULATED DATA, PUB	72-091A-01E	11/19/72	06/08/73	40
SAS-C	05/07/75			75-037A			
			SAS-C, EXTRAGALACTIC 1.5-10KEV	75-037A-01			
			QUICK LOOK DATA PLOTS	75-037A-01A	01/25/76	04/07/79	41
CLARK			SAS-C, SCORPIO MONITOR 0.4-80KEV	75-037A-02			
			QUICK LOOK DATA PLOTS	75-037A-02A	01/25/76	04/07/79	41
			Y-AXIS POINTED OBSERVATION LOG	75-037A-02B	05/30/75	03/23/79	41
CLARK			SAS-C, GALACTIC ABS. 0.2-10KEV	75-037A-03			
			QUICK LOOK DATA PLOTS	75-037A-03A	01/25/76	04/07/79	41
			Y-AXIS POINTED OBSERVATION LOG	75-037A-03B	05/30/75	03/23/79	41
CLARK			SAS-C, GALACTIC MONITOR 1.8-8KEV	75-037A-04			
			QUICK LOOK DATA PLOTS	75-037A-04A	01/25/76	04/07/79	41
			Y-AXIS POINTED OBSERVATION LOG	75-037A-04B	05/30/75	03/23/79	41
SKYLAB	05/14/73			73-027A			
			ATM SOLAR COVERAGE (FILM)	73-027A-00D	05/28/73	02/08/74	42
			ATM MISSION OPERATION LOG ON TAPE	73-027A-00E	05/28/73	02/08/74	42
			ATM MISSION OPERATION LOG - FICHE	73-027A-00F	05/28/73	02/08/74	42
			MISC. ATM SUPPORTING DOC., FICHE	73-027A-00G	03/09/73	07/09/73	42
HENIZE			SKYLAB, UV STELLAR ASTRONOMY(S019)	73-027A-02			
			UV SPECTRA/IMAGERY 4X5 B/W	73-027A-02A	06/05/73	01/11/74	42
			SKYLAB S 019 FAR UV DATA (1979)	73-027A-02B		N/A	42
KRIEGER			SKYLAB, X-RAY SPECT. TELESC.(S054)	73-027A-05			
			RED. CONTRAST, 3RD GEN. NEG. 70MM	73-027A-05A	05/28/73	01/31/74	43
			FILM IMAGE CATALOG (FIC) 16MM FILM	73-027A-05B	05/28/73	01/31/74	43
			SELECTED FRAMES, ONE/DAY - (70MM)	73-027A-05C	05/29/73	11/27/73	43
			SELECTED FLARE DATA, SET 1	73-027A-05E	06/14/73	09/08/73	43
MACQUEEN			SKYLAB, WHITE LT. CORONAGPH (S052)	73-027A-04			
			WHITE LIGHT CORONAGRAPHY-35MM FLM	73-027A-04A	05/28/73	02/12/74	43
			SELECTED FLARE DATA, SET 1	73-027A-04B	07/29/73	01/21/74	43
NOYES			SKYLAB, UV SCAN. POLYCHROM. (S055A)	73-027A-06			
			SOLAR EUV DATA ON TAPE	73-027A-06A	05/28/73	02/08/74	43
			GRAY LEVEL MICROFICHE	73-027A-06B	05/29/73	02/08/74	44
			DIGITAL DATA ON MICROFICHE	73-027A-06C	05/29/73	02/08/74	44
			HLD SUPER RASTER DATA	73-027A-06D	01/28/74	01/29/74	44
			SUPER RASTER DATA ON TAPE	73-027A-06E	01/28/74	01/29/74	44
			SELECTED FLARE DATA, SET 1	73-027A-06F	06/15/73	01/21/74	44
NOYES			SKYLAB, H.ALPHA TELESC.1(PHOTO)HA1	73-027A-15			
			H-ALPHA DATA ON 35MM FILM	73-027A-15A	05/29/73	02/03/74	44
			ATM H-ALPHA ATLAS IN 47 VOLUMES	73-027A-15B	06/29/73	02/03/74	44
PACKER			SKYLAB, UV AIRGLOW HOR. PHOTO(S063)	73-027A-08			
			DIGITIZED AIRGLOW DATA ON TAPE	73-027A-08A	03/02/74	03/03/74	45
			DIGITIZED OZONE DATA ON TAPE	73-027A-08B	02/26/74	02/26/74	45
			DIGITIZED AURORAL DATA ON TAPE	73-027A-08C	03/14/74	04/05/74	45
			AIRGLOW PHOTOGRAPHS ON FILM	73-027A-08D	08/14/73	09/01/73	45
			OZONE PHOTOGRAPHS ON FILM	73-027A-08E	01/31/74	01/31/74	45
			PHOTOGRAPHS OF COMET KHOUTEK	73-027A-08F	12/09/73	01/09/74	45
			AURORAL PHOTOS. (B-W) ON FILM	73-027A-08G	09/11/73	02/01/74	45
			AURORAL PHOTOS. (COLOR) ON FILM	73-027A-08H	09/11/73	02/07/74	46
TOUSEY			SKYLAB, EUV CORONA S-HELIO. (S082A)	73-027A-10			
			SPECTROHELIOGRAPH IMAGES ON 70MM	73-027A-10A	05/28/73	01/31/74	46
			SELECTED FLARE DATA, SET 1	73-027A-10B	06/15/73	01/22/74	46
			FRAME CATALOG ON MAGTAPE	73-027A-10C	05/28/73	01/31/74	46
			FRAME CATALOG ON MICROFICHE	73-027A-10D	05/28/73	01/31/74	46
			HE 304 SYNOPSIS MAPS, HARDCOPY	73-027A-10E	05/23/73	02/02/74	46
TOUSEY			SKYLAB, EUV SPECTROGRAPH (S082B)	73-027A-11			
			SOLAR UV SPECTRA ON 70MM FILM	73-027A-11B		N/A	46
			FRAME CATALOG ON MAGNETIC TAPE	73-027A-11C	05/29/73	02/03/74	47
			FRAME CATALOG ON MICROFICHE	73-027A-11D		N/A	47
UNDERWOOD			SKYLAB, DUAL X-RAY TELESCOPE(S056)	73-027A-07			
			SOLAR X-RAY IMAGES-BLACK/WHITE	73-027A-07A		N/A	47
			XREA PRINTOUT ON MICROFILM	73-027A-07C	05/29/73	02/05/74	47
			BLACK+WHITE VERSION OF 73-027A07B	73-027A-07E		N/A	47
			FRAME CATALOGS ON MICROFICHE	73-027A-07F		N/A	47
			SELECTED FLARE DATA, SET 1	73-027A-07G	06/15/73	01/21/74	47
SMM	02/14/80			80-014A			

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					TIME SPAN OF DATA		
			POINTING LOG	80-014A-00D	02/14/80	11/23/80	47
DE JAGER			SMM, HARD X-RAY IMAGING SPECTROM	80-014A-05			
			HARD X-RAY HIMSEL FDRMAT DATA	80-014A-05A	06/29/80	06/29/80	48
FROST			SMM, HARD X-RAY BURST SPECT (HXRBS)	80-014A-06			
			PULSE HEIGHT SPECTROMETER DATA	80-014A-06A	06/29/80	06/29/80	48
			X-RAY EMISSION CURVES FOR FLARES	80-014A-06B	02/19/80	01/27/83	48
HACQUEEN			SMM CORONAGRAPH/POLARIMETER	80-014A-01			
			COLOR, PR PHOTOGRAPHY (DELETED)	80-014A-01A		N/A	48
TANDBERG-HANSEN			SMM, UV SPECTROMETER/POLARIMETER	80-014A-02			
			U.V. SPECTROMETER DATA	80-014A-02A	06/29/80	06/29/80	48
			UVSP OBSERVING CATALOG ON MICROFL	80-014A-02B	02/20/80	02/05/81	48
			UVSP OBSERVING CATALOG ON TAPE.	80-014A-02C	02/20/80	02/05/81	48
SOLRAD 1	06/22/60	FRIEDMAN	SOLRAD 1, X-RAY AND LYMAN ALPHA	60-007B			
			X-RAY 2-8A, UV 1050 - 1350A	60-007B-01	06/22/60	11/01/60	49
SOLRAD 7A	01/11/64	KREPLIN	SOLRAD 7A, X-RAY (2-60A), UV DET.	64-001D			
			MACHINE RED. 3 POINTS PER PASS	64-001D-01	01/12/64	08/31/64	49
			HAND RED. 1 POINT PER PASS	64-001D-01B	01/11/64	02/03/65	49
SOLRAD 7B	03/09/65	FRIEDMAN	SOLRAD 7B, X-RAY+UV DET.	65-016D			
			PLOTS OF SOLAR X-RAY FLUXES	65-016D-01	03/10/65	10/31/65	49
			TABLES OF SOLAR X-RAY FLUXES	65-016D-01B	03/10/65	10/30/65	49
SOLRAD 8	11/19/65	KREPLIN	SOLRAD 8, SOLAR RADIATION	65-093A			
			1 MIN FLUX AVG FOR 12 DETECTORS	65-093A-01	11/27/65	08/24/67	50
			COMPACT AND EDITED 1 MIN FLUX AVG	65-093A-01A	11/27/65	08/24/67	50
			EDIT CARDS	65-093A-01B	11/19/65	08/24/67	50
			STATION LIST START/STOP + PASS NO	65-093A-01C	11/27/65	08/23/67	50
			DAILY X-RAY FLUXES IN PUBL. RPT.	65-093A-01E	12/01/65	11/05/67	50
SOLRAD 9	03/05/68	KREPLIN	SOLRAD 9, SOLAR RADIATION	68-017A			
			3 X-RAY FLUXES+BKNGND VS TIME	68-017A-01			
			HOURLY AVERAGES PUBLISHED IN SGD	68-017A-01A	03/14/68	12/31/71	50
			3-CHANNEL X-RAY FLUXES IN PUB RPT	68-017A-01B	02/01/69	04/24/74	50
			5 CHANNEL X-RAY FLUXES IN PUB RPT	68-017A-01C	03/08/68	12/31/68	51
			REDUCED SOLAR X-RAY FLUXES (TAPE)	68-017A-01D	01/01/69	11/02/69	51
			SOLAR X-RAY FLUX PLOTS, FICHE	68-017A-01E	03/14/68	09/30/72	51
			X RAY MEMORY DATA, MICROFILM	68-017A-01F	01/01/70	04/30/74	51
SOLRAD 10	07/08/71	KREPLIN	SOLRAD 10, SOLAR X RAY-UVDETECTS	71-058A			
			SOLAR X-RAY FLUX PLOTS (FICHE)	71-058A-01			
				71-058A-01A	01/01/72	06/30/73	52
UK 5	10/15/74	POUNDS	UK 5, 2-10 KEV SKY SURVEY	74-077A			
			3A CATALOGUE OF X-RAY SOURCES	74-077A-02	10/18/74	03/14/80	52
			3A CATALOGUE ON MICROFICHE	74-077A-02A	10/18/74	03/14/80	52
UK 6	06/02/79	POUNDS	UK 6, X-RAY PROPORTIONAL COUNTERS	79-047A			
			X-RAY PROP COUNTER SOURCE LISI	79-047A-02	06/11/79	03/20/81	52
				79-047A-02A			



# APPENDIX





## APPENDIX ABBREVIATIONS AND ACRONYMS

A	angstrom
ADC	Astronomical Data Center (NSSDC)
ANS	Astronomical Netherlands Satellite
arc-min	arc-minute
ASCII	American Standard Code for Information Interchange
ATM	Apollo Telescope Mount
B and L	McIllwain's magnetic coordinate
bcd	binary coded decimal
BD	Bonner Durchmusterung
bpi	bits per inch
BR	burst receiver
B-V	color index between blue and visual magnitude
B/W	black and white
Caltech	California Institute of Technology
CdS	cadmium sulfide
cm	centimeter
dB	decibel
Dec	declination
deg	degree
DOY	day of year
EBCDIC	extended binary coded decimal
EUV	extreme ultraviolet
ERL	Environmental Research Laboratory (NOAA)
eV	electronvolt
FES	Fine Error Sensor
FITS	Flexible Image Transport System
FOV	field of view
FPCS	Focal Plane Crystal Spectrometer on HEAO-2
FWHM	full width at half maximum
GM	Geiger-Mueller
GMT	Greenwich mean time
GSFC	Goddard Space Flight Center (NASA)
HCON	hours-confirmed
HCO/SAO	Harvard College Observatory/Smithsonian Astrophysical Observatory
HD	Henry Draper
HEAO	High-Energy Astrophysical Observatory
hr, h	hour
HRI	High Resolution Imager on HEAO-2
HXX	Hard X-ray Experiment on ANS

ID	identification
in.	inch
IPAC	Infrared Processing and Analysis Center
IPC	Imaging Proportional Counter on HEAO-2
IRAS	Infrared Astronomical Satellite
IUE	International Ultraviolet Explorer
IUESIPS	IUE Spectral Imaging Processing System
Jy	Jansky (10E-26 W/sq m Hz)
K	kelvin
keV	kiloelectronvolt
kHz	kilohertz
km	kilometer
LED	Low Energy Detector
LMC	Large Magellanic Cloud
LRC	Langley Research Center (NASA)
LRL	Lawrence Radiation Laboratory
LRS	Low Resolution Spectrometer
MeV	megaelectronvolt
MHz	megahertz
min	minute
MIT	Massachusetts Institute of Technology
mm	millimeter
ms	millisecond
MSFC	Marshall Space Flight Center (NASA)
NASA	National Aeronautics and Space Administration
NCAR	National Center for Atmospheric Research (National Science Foundation)
nJy	nano-Jansky
nm	nanometer
NOAA	National Oceanic and Atmospheric Administration
NRL	Naval Research Laboratory
NSSDC	National Space Science Data Center (NASA)
OA0	Orbiting Astronomical Observatory
OSO	Orbiting Solar Observatory
p.	page
PET	pentaerythritol
PHA	Pulse Height Analyser
PI	principal investigator
RA	right ascension
RAE	Radio Astronomy Explorer
RV	Ryle-Vonberg

s	second
SAS	Small Astronomy Satellite
SEC	secondary electron conduction (vidicon tube)
SL	Skylab
SMM	Solar Maximum Mission
SOLRAD	Solar Radiation (Monitoring Satellite)
sq	square
U-B	color index between ultraviolet and blue magnitude
UBV	apparent magnitude in ultraviolet, blue, and visual system
UCSD	University of California at San Diego
UFU	Uhuru flux unit
U.K.	United Kingdom
U.S.S.R.	Union of Soviet Socialist Republics
UT	universal time
UTC	universal coordinated time
UV	ultraviolet
V	visible magnitude in the UBV system
v.	volume
VILSPA	Villafranca Satellite Tracking Station near Madrid, Spain (ESA)
WSDB	Working Survey Data Base
WDC-A	World Data Center (NASA)
XUV	extreme ultraviolet
Z	atomic number



DOCUMENT AND DATA  
REQUEST FORMS



## NSSDC CHARGE AND SERVICE POLICY

The purpose of the National Space Science Data Center (NSSDC) is to provide data and information from space science flight experiments in support of additional studies beyond those performed by the principal investigators. Therefore, NSSDC will provide data and information upon request to any individual or organization resident in the United States. In addition, the same services are available to scientists outside the United States through the World Data Center A for Rockets and Satellites (WDC-A-R&S). (The addresses for both NSSDC and WDC-A-R&S are given on the reverse side.) Normally, a charge is made for the requested data to cover the cost of reproduction and the processing of the request. The requester will be notified of the cost, and payment must be received prior to processing the request. However, the Director of NSSDC may waive, as resources permit, the charge for modest amounts of data when they are to be used for scientific studies or for specific educational purposes and when they are requested by an individual affiliated with (1) NASA installations, NASA contractors, or NASA grantees; (2) other U.S. Government agencies, their contractors, or their grantees; (3) universities or colleges; (4) state or local governments; and (5) nonprofit organizations.

## DATA REQUESTED

NSSDC DATA SET ID NUMBER	Spacecraft, Experiment, and Data Set Names	Form of Data* (e.g., 16mm microfilm) or Size of Reproduction (e.g., contact, 8x10, etc.)	Data Take No., FDS/DAS Times, Mission Frame No., Timespan Needed, Film Frame Numbers, etc.

Additional Specifications (Negatives, Positives, Paper Prints, etc.)

\*If requesting data on magnetic tape, please supply the necessary information below.

<u>Density</u>	<u>Mode</u>	<u>No. of Tracks</u>	<u>Computer</u>
<input type="checkbox"/> 800 bpi	<input type="checkbox"/> BIN	<input type="checkbox"/> 7	(Type/Model)
<input type="checkbox"/> 1600 bpi	<input type="checkbox"/> BCD	<input type="checkbox"/> 9	
<input type="checkbox"/> 6250 bpi	Maximum block size _____		

- New tapes will be supplied prior to processing.
- Original NSSDC tapes will be returned.
- I shall pay for new tapes.

## NSSDC DATA REQUEST FORM\*

Requesters WITHIN the United States send order to: NATIONAL SPACE SCIENCE DATA CENTER CODE 633.4 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771	Scientists OUTSIDE the United States send order to: WORLD DATA CENTER A ROCKETS AND SATELLITES CODE 630.2 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771, USA
<b>REQUESTER INFORMATION (Please print)</b>	
NAME (First, Middle Initial, Last)	TITLE/POSITION (Dr., Prof., Mr., Ms., Graduate Student, Research Associate, etc.)
DIVISION/BRANCH/DEPARTMENT	MAIL CODE
ORGANIZATION	
ADDRESS	
CITY	STATE
ZIP CODE OR COUNTRY	TELEPHONE (Area Code) (Number) (Extension)
DATE OF REQUEST	DATE DATA DESIRED (Our average processing time for a request is 3 to 4 weeks. Please allow ample time for delivery. We will notify you if we cannot meet the date specified.)

### INTENDED USE OF DATA (check all that apply)

<input type="checkbox"/> Support of a NASA effort (project, study, etc.); Contract No. _____ <input type="checkbox"/> Support of a U.S. Government effort (other than NASA) <input type="checkbox"/> Research and analysis project (individual or company sponsored) <input type="checkbox"/> Educational purposes (explain below) <input type="checkbox"/> Preparation of Master's thesis <input type="checkbox"/> Preparation of Doctoral thesis <input type="checkbox"/> Other: _____ _____ _____ _____	<input type="checkbox"/> Exhibit or display <input type="checkbox"/> Reference material <input type="checkbox"/> Use in publication
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NSSDC requests the submission of all publications resulting from studies in which data supplied by NSSDC have been used. Please state briefly the research projects in which you are engaged and if you plan to prepare any articles based on this research.

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\*This form supersedes all other NSSDC Data Request Forms.



## NSSDC CHARGE AND SERVICE POLICY

The purpose of the National Space Science Data Center (NSSDC) is to provide data and information from space science flight experiments in support of additional studies beyond those performed by the principal investigators. Therefore, NSSDC will provide data and information upon request to any individual or organization resident in the United States. In addition, the same services are available to scientists outside the United States through the World Data Center A for Rockets and Satellites (WDC-A-R&S). (The addresses for both NSSDC and WDC-A-R&S are given on the reverse side.) Normally, a charge is made for the requested data to cover the cost of reproduction and the processing of the request. The requester will be notified of the cost, and payment must be received prior to processing the request. However, the Director of NSSDC may waive, as resources permit, the charge for modest amounts of data when they are to be used for scientific studies or for specific educational purposes and when they are requested by an individual affiliated with (1) NASA installations, NASA contractors, or NASA grantees; (2) other U.S. Government agencies, their contractors, or their grantees; (3) universities or colleges; (4) state or local governments; and (5) nonprofit organizations.

## DATA REQUESTED

NSSDC DATA SET ID NUMBER	Spacecraft, Experiment, and Data Set Names	Form of Data* (e.g., 16mm microfilm) or Size of Reproduction (e.g., contact, 8x10, etc.)	Data Take No., FDS/DAS Times, Mission Frame No., Timespan Needed, Film Frame Numbers, etc.

Additional Specifications (Negatives, Positives, Paper Prints, etc.)

\*If requesting data on magnetic tape, please supply the necessary information below.

<u>Density</u>	<u>Mode</u>	<u>No. of Tracks</u>	<u>Computer</u>
<input type="checkbox"/> 800 bpi	<input type="checkbox"/> BIN <input type="checkbox"/> EBCDIC	<input type="checkbox"/> 7	(Type/Model)
<input type="checkbox"/> 1600 bpi	<input type="checkbox"/> BCD <input type="checkbox"/> ASCII	<input type="checkbox"/> 9	
<input type="checkbox"/> 6250 bpi	Maximum block size _____	_____	

- New tapes will be supplied prior to processing.
- Original NSSDC tapes will be returned.
- I shall pay for new tapes.

## NSSDC DATA REQUEST FORM\*

Requesters <b>WITHIN</b> the United States send order to: NATIONAL SPACE SCIENCE DATA CENTER CODE 633.4 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771	Scientists <b>OUTSIDE</b> the United States send order to: WORLD DATA CENTER A ROCKETS AND SATELLITES CODE 630.2 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771, USA
<b>REQUESTER INFORMATION (Please print)</b>	
NAME (First, Middle Initial, Last)	TITLE/POSITION (Dr., Prof., Mr., Ms., Graduate Student, Research Associate, etc.)
DIVISION/BRANCH/DEPARTMENT	MAIL CODE
ORGANIZATION	
ADDRESS	
CITY	STATE
ZIP CODE OR COUNTRY	TELEPHONE (Area Code) (Number) (Extension)
DATE OF REQUEST	DATE DATA DESIRED (Our average processing time for a request is 3 to 4 weeks. Please allow ample time for delivery. We will notify you if we cannot meet the date specified.)

**INTENDED USE OF DATA** (check all that apply)

- Support of a NASA effort (project, study, etc.); Contract No. \_\_\_\_\_
- Support of a U.S. Government effort (other than NASA)
- Research and analysis project (individual or company sponsored)
- Educational purposes (explain below)  Exhibit or display
- Preparation of Master's thesis  Reference material
- Preparation of Doctoral thesis  Use in publication
- Other: \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

NSSDC requests the submission of all publications resulting from studies in which data supplied by NSSDC have been used. Please state briefly the research projects in which you are engaged and if you plan to prepare any articles based on this research.

\_\_\_\_\_

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\*This form supersedes all other NSSDC Data Request Forms.



National Aeronautics and Space Administration

### NSSDC/WDC-A-R&S DOCUMENT REQUEST FORM

Goddard Space Flight Center  
Greenbelt, Maryland 20771

<p>Researchers WITHIN the United States send order to:</p> <p>NATIONAL SPACE SCIENCE DATA CENTER CODE 633.4 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771</p>	<p>Researchers OUTSIDE the United States send order to:</p> <p>WORLD DATA CENTER A ROCKETS AND SATELLITES CODE 630.2 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771 U.S.A.</p>
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#### REQUESTER INFORMATION (Please print)

NAME	TITLE
ORGANIZATION	
ADDRESS	
CITY	STATE
ZIP CODE OR COUNTRY	
TELEPHONE (Area Code) (Number) (Ext.)	
DATE OF REQUEST	DATE DESIRED
<p>(Our average processing time for a request is 3 to 4 weeks after receipt of request. Please allow ample time for delivery. We will notify you if we cannot meet the date specified.)</p>	

#### INTENDED USE OF MATERIAL (Check all that apply)

<input type="checkbox"/> Support of a NASA effort (project, study, etc.) <input type="checkbox"/> Support of a U.S. Government effort (other than NASA) <input type="checkbox"/> Research and analysis project (individual or company) <input type="checkbox"/> Educational purposes (explain below) <input type="checkbox"/> Preparation of Master's thesis <input type="checkbox"/> Preparation of Doctoral thesis <input type="checkbox"/> Exhibit or display <input type="checkbox"/> Reference material <input type="checkbox"/> Use in publication <input type="checkbox"/> Other: _____ _____ _____ _____
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#### DOCUMENT DISTRIBUTION CATEGORIES

Please indicate the document(s) you wish to receive on routine distribution by placing an X in the box next to the specific category desired. Use the reverse side of this form to order specific documents.

<input type="checkbox"/> Documents describing the operation of NSSDC and WDC-A-R&S
<input type="checkbox"/> Documents describing the availability of satellite experiment data
<input type="checkbox"/> NSSDC Data Listing <input type="checkbox"/> Particles and Fields <input type="checkbox"/> Astronomy <input type="checkbox"/> Planetary Atmospheres <input type="checkbox"/> Geodesy and Gravimetry <input type="checkbox"/> Planetology <input type="checkbox"/> Ionospheric Physics <input type="checkbox"/> Solar Physics <input type="checkbox"/> Meteorology <input type="checkbox"/> Earth Resources Survey
<input type="checkbox"/> Report on Active and Planned Spacecraft and Experiments
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<input type="checkbox"/> Reports on Models of the Near-Earth Environment
<input type="checkbox"/> World Data Center A for Rockets and Satellites Launch Summaries
<input type="checkbox"/> SPACEWARN Bulletin
<input type="checkbox"/> NSSDC Newsletter
<input type="checkbox"/> Crustal Dynamics mailings
<input type="checkbox"/> Pilot Climate mailings
<input type="checkbox"/> Pilot Land mailings





National Aeronautics and Space Administration

Goddard Space Flight Center  
Greenbelt, Maryland 20771

### NSSDC/WDC-A-R&S DOCUMENT REQUEST FORM

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#### REQUESTER INFORMATION (Please print)

NAME		TITLE	
ORGANIZATION			
ADDRESS			
CITY		STATE	
ZIP CODE OR COUNTRY			
TELEPHONE (Area Code) (Number) (Ext.)			
DATE OF REQUEST		DATE DESIRED	
<p>(Our average processing time for a request is 3 to 4 weeks after receipt of request. Please allow ample time for delivery. We will notify you if we cannot meet the date specified.)</p>			

#### INTENDED USE OF MATERIAL (Check all that apply)

<input type="checkbox"/> Support of a NASA effort (project, study, etc.) <input type="checkbox"/> Support of a U.S. Government effort (other than NASA) <input type="checkbox"/> Research and analysis project (individual or company) <input type="checkbox"/> Educational purposes (explain below) <input type="checkbox"/> Preparation of Master's thesis <input type="checkbox"/> Preparation of Doctoral thesis <input type="checkbox"/> Exhibit or display <input type="checkbox"/> Reference material <input type="checkbox"/> Use in publication <input type="checkbox"/> Other: _____ _____ _____ _____
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- Documents describing the availability of satellite experiment data
  - NSSDC Data Listing
  - Astronomy
  - Geodesy and Gravimetry
  - Ionospheric Physics
  - Meteorology
  - Particles and Fields
  - Planetary Atmospheres
  - Planetology
  - Solar Physics
  - Earth Resources Survey
- Report on Active and Planned Spacecraft and Experiments
- Spacecraft Program Bibliographies
- Reports on Models of the Near-Earth Environment
- World Data Center A for Rockets and Satellites Launch Summaries
- SPACEWARN Bulletin
- NSSDC Newsletter
- Crustal Dynamics mailings
- Pilot Climate mailings
- Pilot Land mailings





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