NASA -TMX-72531

74-15a

Data Catalog of Satellite Experiments

Supplement No. 2a to NSSDC 71-20

OCTOBER 1974

Ionospheric Physics, Meteorology, and Planetary Atmospheres

NATIONAL SPACE SCIENCE DATA CENTER

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.

Definitions of Discipline Categories for Announcing the Availability of Space Science Experiment Data

. *ASTRONOMY* - This category includes all observations of astronomical objects, both outside and within the solar system, made at various wavelengths (i.e., gamma rays through radio waves). Observed objects outside the solar system include stars, nebulae, galaxies, and all other matter. Observed objects within the solar system include zodiacal light sources, meteoroids, asteroids, dust, micrometeorites, and planetary radio emission sources. Other planetary observations (see Planetary Atmospheres, Planetology, or Ionospheric Physics) and solar observations (see Solar Physics) are excluded. Observations of cosmic-ray particles are listed under Particles and Fields. Celestial mechanics measurements are included under Geodesy and Gravimetry.

. *GEODESY AND GRAVIMETRY* - This category includes experiments that measure size, shape, mass, coordinates, altitudes, or gravity fields or experiments concerned with the mapping of a body. It includes the mechanics of orbiting artificial and natural bodies.

. *IONOSPHERIC PHYSICS* - This category includes observations of the ionosphere, which is defined as that region of a planetary atmosphere which contains a significant number of free thermal electrons on a daily basis and which has a free electron density maximum in the vertical direction. Its upper and lower extents are roughly defined as the areas in which densities approach 10^{-4} of the peak values. Included are all in situ and remotely sensed observations of ionospheric charged particles with thermal energies. This category is used for remotely sensed propagation experiments that primarily focus on the ionosphere, including very low frequency (VLF) and extremely low frequency (ELF) experiments; for other remotely sensed propagation experiments, an appropriate category, such as Particles and Fields, is used.

. *METEOROLOGY* - This category includes observations made in the Earth's hydrosphere and atmosphere up to the mesopause or D region.

. *PARTICLES AND FIELDS* - The subcategory Particles includes all in situ charged-particle measurements except those of thermal plasma in terrestrial or other planetary ionospheres (see Ionospheric Physics). It includes all neutron measurements and electromagnetic signal propagation experiments designed to measure columnar electron densities (except those in which the most significant portion of the free electrons within the column is within an ionosphere). The subcategory Fields includes all in situ measurements of electric and magnetic fields. It includes VLF and ELF experiments other than those primarily concerned with observing ionospheric properties. It excludes electromagnetic radiation (radio waves through gamma waves) propagating away from remote sources. (In such cases, either Solar Physics or Astronomy is used, as appropriate.)

. *PLANETARY ATMOSPHERES* - This category includes all observations of the gaseous envelope above the surface of a planet. For the Earth the lower limit for observations that belong in this category is about 65 km, the height of the mesopause or D region. (For studies below this altitude, Meteorology is used.) The upper limit is defined as the transition level of the lightest gas. This region overlaps the ionosphere for planets which have an ionosphere; however, ionospheric observations are restricted to observations related to the charge aspects of matter, while Planetary Atmospheres relates to the mass aspects of matter (e.g., composition measurements). For cases in which both atmospheric and ionospheric categories apply, both may be used.

. *PLANETOLOGY* - This category includes experiments for the purpose of deriving and analyzing data from the solid or liquid parts (excluding the oceans of the Earth) of any solar system body. Chemical, physical, and geologic studies of properties of gross or small surface features, materials of the surface, internal properties, magnetic properties, etc., are included. Gravitational and geodetic experiments are excluded from this category (see Geodesy and Gravimetry). When the primary purpose of the study is to measure the residual effects of some external phenomena (such as meteorite or cosmic-ray impacts), the external phenomena should determine the choice of category. If necessary, the experiment may be assigned to more than one category.

. *SOLAR PHYSICS* - This category includes all solar observations, regardless of the wavelength being observed. The source region considered here extends outward from the Sun to include that area observed with solar coronagraphs (nominally to 10 solar radii). All in situ measurements of electric or magnetic fields and of particles for which the source is believed to be the Sun are considered to fall in the domain of Particles and Fields.

NSSDC 74-15a

NATIONAL SPACE SCIENCE DATA CENTER
DATA CATALOG OF SATELLITE EXPERIMENTS

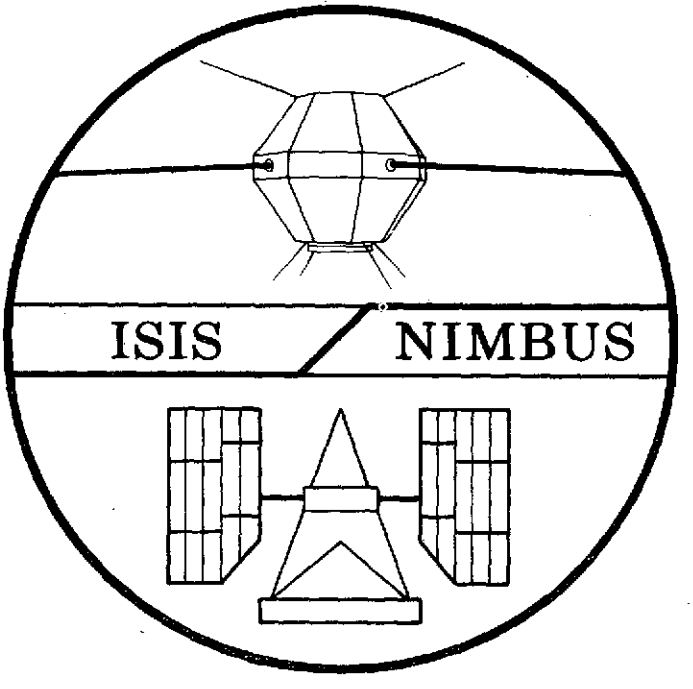
IONOSPHERIC PHYSICS, METEOROLOGY, AND PLANETARY ATMOSPHERES

SUPPLEMENT NO. 2a to NSSDC 71-20

- - -

Technical Coordinator

Leland L. Dubach



National Space Science Data Center
Goddard Space Flight Center
National Aeronautics and Space Administration
Greenbelt, Maryland 20771

October 1974

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*Because of the number of entries in this section, only the spacecraft and experiments are listed here.

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INTRODUCTION

Purposes and Organization

The purposes of the Data Catalog of Satellite Experiments are to announce the availability of experimental space science data, to describe these data, and to inform potential users of the policies and procedures associated with the data dissemination services provided by the National Space Science Data Center (NSSDC). The space science experiment data available as of June 1973 are described in the Data Catalog of Satellite Experiments, December 1971 (NSSDC 71-20), and its supplement, October 1973 (NSSDC 73-11).

Beginning with this issue, a new concept for announcing the availability of data at NSSDC has been adopted. This concept is based upon the Selective Dissemination of Information (SDI) principle. Under the NSSDC SDI system, the types of satellite experiment data acquired have been divided into the following eight major discipline categories: Astronomy, Geodesy and Gravimetry, Ionospheric Physics, Meteorology, Particles and Fields, Planetary Atmospheres, Planetology, and Solar Physics. The Data Center definitions of these categories are provided on the inside front cover. (It should be noted that these category definitions reflect the best judgment of the NSSDC staff and are not intended as definitive descriptions of discipline boundaries.) The current issue of the catalog has been published in four volumes. One volume covers the categories of Astronomy and Solar Physics. Another combines the categories of Ionospheric Physics, Meteorology, and Planetary Atmospheres. Particles and Fields constitutes one separate volume, and Planetology, another separate volume. The few experiments which fall under more than one category have been included in each of the relevant discipline volumes. Generally, each volume describes only those data sets and associated spacecraft and experiments not included in the 1971 or 1973 issues of the catalog and are currently suitable for announcement. Additionally, the volumes may contain descriptions of data sets previously announced for which sufficient quantities of new data have been acquired to merit their inclusion.

Cumulative volumes for the discipline categories will be prepared in spring 1975. An index volume will also be prepared at that time that will be sent to all participants in the SDI system. This volume will contain indexes by Spacecraft Name, Investigator Name, Original Experiment Institution and/or Current Experiment Institution, and Phenomenon Measured for all data included in any of the discipline volumes. Also included will be descriptions of spacecraft from which NSSDC has acquired data, as well as descriptions of ephemeris or other special spacecraft-related data sets appropriate for announcement.

Each index will refer to the discipline volumes in which the description of the experiment or its associated data set can be found. The index volume alone may satisfy the needs of many users; in addition, subject volumes in the various categories will be sent automatically to users who have expressed an interest in any category in that volume. Subject volumes will be available to others on special request.

Data Availability, Costs, and Ordering Procedures

The purpose of the National Space Science Data Center (NSSDC) is to provide data and information from space science 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). 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. 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 and colleges
4. State and local governments
5. Nonprofit organizations

A user may obtain data in any of the following ways:

1. Letter request
2. Data Request Form (contained at the end of this document)
3. Telephone request
4. On-site visit

Anyone who wishes to obtain data for a scientific study should specify the NSSDC identification number, the common name and/or number of the satellite and the experiment, the form of data, and the time span (or location, when appropriate) of data requested. A requester should also specify why the data are needed, the subject of his work, the name of the organization with which he is affiliated, and any Government contracts he may have for performing his study. Upon special request, data may be provided in a medium other than that noted in the heading of the data set descriptions. For example, computer printout or microfilmed listings could be produced from magnetic tape data sets. Enlarged paper prints are available from data sets on photographic film and microfilm. The Data Center will provide the requester with an estimate of the response time and cost that will be incurred for such requests, if appropriate.

When requesting data on magnetic tape, the user should specify whether he will supply new tapes prior to the processing, return the original NSSDC tapes after the data have been copied, or pay for new tapes.

The Data Center's official address for requests is:

National Space Science Data Center
Code 601.4
Goddard Space Flight Center
Greenbelt, Maryland 20771

Phone: 301 982-6695

Users who reside outside the U.S. should direct requests for data to:

World Data Center A for Rockets and Satellites
Code 601
Goddard Space Flight Center
Greenbelt, Maryland 20771 U.S.A.

Phone: 301 982-6695

Since WDC-A-R&S also maintains listings of rocket experiments, requests for information concerning rocket launchings and the experiments flown may be directed to this institution.

NSSDC Facilities and Services

NSSDC provides facilities for reproduction of data and for on-site data use. Resident and visiting scientists are invited to study the data while at the Data Center. The Data Center staff will assist users with additional data searches and with the use of equipment. In addition to satellite and space probe data, the Data Center maintains some correlative data and information on other correlative data that may be related to a specific request. These correlative data are described in the NSSDC Handbook of Correlative Data, NSSDC 71-05, which is available from the Data Center.

In addition to its main function of providing selected data and supporting information for further analysis of space science flight experiments, the Data Center produces a wide spectrum of publications. Among these are a report on active and planned spacecraft and experiments, a report of recent sounding rocket launchings, and lunar and planetary photographic catalogs and users guides. For additional information on NSSDC and WDC-A-R&S document availability and distribution services, write to the appropriate address identified in the previous section and ask for document NSSDC/WDC-A-R&S 74-10.

Participation

The National Space Science Data Center (NSSDC) invites members of the scientific community to contribute data from satellite experiments. NSSDC assigns a specialist in the appropriate scientific discipline for each experiment to arrange for data acquisition with the principal investigator and to help solve related problems. Acquired data are cataloged and made available to users according to established procedures. Scientists who have not been contacted by one of the subject specialists and who have analyzed or reduced data available for contribution are requested to contact NSSDC so that transfer of the data may be arranged.

The Data Center is continually striving to increase the usefulness of the data catalog by improving the data descriptions and including all pertinent information. Scientists are invited to submit their comments or recommendations to NSSDC regarding the data available, the services provided, and the contents and format of the catalog. Recipients are urged to inform potential data users of its availability. Anyone wishing to receive a copy of this publication can have his name added to this distribution list by phone or letter request.

Abbreviations and Acronyms

The abbreviations and acronyms used in this volume are listed in the October 1973 supplement (NSSDC 73-11) to the data catalog.

DESCRIPTION OF DATA

General

This section was produced from the computerized NSSDC information system, which provides the Data Center with an efficient means for maintaining up-to-date descriptions of available data and for announcing the acquisition of new data. For each data set* description contained in the information system, descriptions of the experiment and spacecraft from which the data originated are also included as background information. This section is organized by spacecraft common name and within that by the last name of the principal investigator associated with each experiment on that spacecraft. Data set descriptions follow the experiments to which they pertain and are ordered by NSSDC ID code which appears in the upper right-hand corner of the description.

Identification of Spacecraft, Experiments, and Data Sets

In the NSSDC information system, each spacecraft, experiment, and data set is assigned an identification number, the NSSDC ID No., that is based on the launch sequence of the spacecraft. Subsequent to 1962, the NSSDC ID No. for a spacecraft (e.g., 65-042A for Explorer 28) corresponds to the COSPAR (Committee on Space Research) international designation. The Data Center has provided corresponding numbers for satellites that were launched during the years 1957 to 1962. (For example, Explorer 1, which carries COSPAR designation 1958 Alpha 1, was the first spacecraft launched in 1958; therefore, it has been assigned NSSDC ID No. 58-001A.) The experiment and data set ID numbers are based on the spacecraft number. For example, the experiments carried aboard spacecraft 67-031A (ATS 2) are numbered 67-031A-01, 67-031A-02, etc. Data sets derived from experiment 67-031A-01 are designated 67-031A-01A, 67-031A-01B, etc.

*A data set is defined as (1) a body of data that is the result of the reduction or analysis of data from a given experiment or (2) certain supporting information (catalogs, ephemeris, etc.) that is uniquely related to a given experiment or spacecraft. The content, characteristics, form, format, or organization of this body of data is different from that of any other body of data or supporting information associated with the given experiment or spacecraft.

Spacecraft, Experiment, and Data Set Descriptions

Each entry in this section is composed of two parts -- a heading and a brief description. Each type of entry (i.e., spacecraft, experiment, and data set) contains its own heading. The headings list generic characteristics of satellites, experiments, and data sets. Details on the contents of the three kinds of entries are described in the following paragraphs.

Contents of Spacecraft Entries

The heading for each spacecraft description contains the following information about the spacecraft: launch date, spacecraft weight in orbit, spacecraft status of operation, and, for inoperable or operationally off spacecraft, the date last spacecraft data were recorded or, if available, the date last usable spacecraft data were recorded. Orbiting spacecraft also have the following orbital parameters included in the heading: epoch date, orbit type, orbit period, apoapsis and periapsis (distance from the surface of the reference body to the furthest and nearest orbit points, respectively), and inclination (the angle between the satellite orbital plane and the equatorial plane of the primary gravitational body). For satellites with heliocentric orbits, the ecliptic plane is used in lieu of the equatorial plane.

Each spacecraft brief description contains a concise summary of the spacecraft mission, specifically outlining the overall objectives of the mission and the scientific studies being performed. Information about the operational performance and status of the spacecraft during a given period of time also is included and is frequently updated. In some cases the performance and status information reflected in the description may disagree with information found in the heading under "Status of Operation." When there are disagreements, consider the information in the heading as more up to date.

Contents of Experiment Entries

Each experiment entry heading lists the name of the original experiment institution and the name and address of the principal investigator for the experiment. The names and addresses of other investigators associated with the experiment are also listed. The status of operation of the experiment is then listed as "normal," "partial," "operational off," or "inoperable." For inoperable or operationally off experiments, the date last experiment data were recorded or, if available, the date last usable experiment data were recorded, is also presented. In addition, if the experiment is functioning in other than a normal mode, the brief description explains the circumstances of, and periods affected by, the change.

The experiment brief description contains a concise summary of the experiment purpose and instrument characteristics, emphasizing those relevant to the scientific use of the resulting data. Information about the operational performance and status of the experiment during a given period of time also is included and is frequently updated. In some cases the performance and status information reflected in the description may disagree with information found in the heading under "Status of Operation." When there are disagreements, consider the information in the heading as more up to date.

Contents of Data Set Entries

Each data set entry contains three elements in the heading: the time period covered by the data, the quantity of data and medium on which the data are stored, and an indicator describing the availability of the data. The time period covered is annotated with one of two additional comments: (1) "as verified by NSSDC" - identifying that portion of the data set for which the period of data coverage has been verified, and (2) "as reported by the experimenter" - identifying the period of coverage provided by the experimenter, regardless of the amount held or verified by NSSDC. Several indicators are used to describe the status of data availability to requesters:

- Data at NSSDC Ready for Distribution - designates a data set for which cataloging, verification, and documentation are sufficient to provide a comprehensible set of data to satisfy requests.

- Data in Published Reports - indicates either that all or a significant portion of the data are contained in a published report or journal, or that the only accessible source of any reduced data from an experiment is the published document. The publications cited in the brief descriptions for spacecraft, experiment, or data set entries normally are available through scientific libraries or document distribution centers. NSSDC provides copies of publications only if they cannot be obtained through such libraries or centers.

- Data at NSSDC - identifies data sets for which documentation and verification activities are in process. These data are usually sufficiently documented and verified to satisfy routine requests.

- Data at NSSDC Processing Deferred - indicates that the verifying, documenting, or cataloging of the data set is not complete, and that no additional work will be performed unless specifically requested. NSSDC may be able to supply the data from such a data set in a suitable form, depending upon the completeness of the processing and documentation and the particular requirements of the user. The completeness of the data set is indicated in its brief description.

- Data Available from Experimenter - is used for data sets that NSSDC does not plan to acquire, and that the experimenter is willing to make available to other scientists, usually in limited amount. These data sets are not feasible for storing at NSSDC, either because they are large in volume or because they require special equipment to process. Requests for data sets carrying this indicator should be addressed directly to the experimenter. The experimenter's name and address and the expected date that the data will be ready for processing are given in the brief description of such a data set.

- Data at Another Center - is used for data sets stored and distributed by any other data center. Requests for data sets with this indicator should be made directly to the organization identified in the brief description.

- Data at Another Center that NSSDC can Process - denotes a data set held by another data center but to which NSSDC has access for limited processing. Requests for this type of data set should be submitted to NSSDC.

For information on the procedures for ordering the data described herein, please refer to page viii in the Introduction.

NATIONAL SPACE SCIENCE DATA CENTER
DATA CATALOG OF SATELLITE EXPERIMENTS
IONOSPHERIC PHYSICS, METEOROLOGY, AND PLANETARY ATMOSPHERES

SUPPLEMENT NO. 2A TO NSSDC 71-20

**********ALOUETTE 1 **********

SPACECRAFT COMMON NAME- ALOUETTE 1 NSSDC ID 62-049A
ALTERNATE NAMES- 1962 BETA ALPHA 1, S 27, ALOUETTE-A, 00424, S 27A

LAUNCH DATE- 09/29/62 SPACECRAFT WEIGHT IN ORBIT- 145.7 KG

SPACECRAFT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST USABLE SPACECRAFT DATA RECORDED- 09/29/72

EPOCH DATE- 10/07/62 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 105.4 MIN
APOAPSIS- 1031.00 KM ALT PERIAPSIS- 996.000 KM ALT INCLINATION- 80.46 DEG

SPACECRAFT BRIEF DESCRIPTION

ALOUETTE 1 WAS A SMALL IONOSPHERIC OBSERVATORY INSTRUMENTED WITH AN IONOSPHERIC SOUNDER, A VLF RECEIVER, AN ENERGETIC PARTICLE DETECTOR, AND A COSMIC NOISE EXPERIMENT. EXTENDED FROM THE SATELLITE SHELL WERE TWO DIPOLE ANTENNAS (45.7- AND 22.8-M LONG, RESPECTIVELY) WHICH WERE SHARED BY THREE OF THE EXPERIMENTS ON THE SPACECRAFT. THE SATELLITE WAS SPIN-STABILIZED AT ABOUT 1.4 RPM AFTER ANTENNA EXTENSION. AFTER ABOUT 500 DAYS, THE SPIN SLOWED MORE THAN HAD BEEN EXPECTED, TO ABOUT 0.6 RPM WHEN SATELLITE SPIN-STABILIZATION FAILED. IT IS BELIEVED THAT THE SATELLITE GRADUALLY PROGRESSED TOWARD A GRAVITY GRADIENT STABILIZATION WITH THE LONGER ANTENNA POINTING EARTHWARD. ATTITUDE INFORMATION WAS DEDUCED ONLY FROM A SINGLE MAGNETOMETER, AND FROM TEMPERATURE MEASUREMENTS ON THE UPPER AND LOWER HEAT SHIELDS. (ATTITUDE DETERMINATION MAY BE IN ERROR BY AS MUCH AS 10 DEG.) THERE WAS NO TAPE RECORDER, SO DATA WERE AVAILABLE ONLY FROM THE VICINITY OF TELEMETRY STATIONS. TELEMETRY STATIONS WERE LOCATED TO PROVIDE PRIMARY DATA COVERAGE NEAR THE 80 DEG W MERIDIAN PLUS AREAS NEAR HAWAII, SINGAPORE, AUSTRALIA, EUROPE, AND CENTRAL AFRICA. INITIALLY, DATA WERE RECORDED FOR ABOUT 6 HR PER DAY. THE SPACECRAFT WAS PLACED ON STANDBY STATUS DUE TO BATTERY DEGRADATION IN SEPTEMBER 1972, AND HAS SINCE BEEN OPERATED OCCASIONALLY TO CHECK ITS OPERATING CONDITION.

**********ALOUETTE 1, WHITTEKER

EXPERIMENT NAME- SWEEP FREQUENCY SOUNDER NSSDC ID 62-049A-01

ORIGINAL EXPERIMENT INSTITUTION- DRTE

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - J.H.	WHITTEKER	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI - J.E.	JACKSON	NASA-GSFC	GREENBELT, MD
OI - L.	COLIN	NASA-ARC	MOFFETT FIELD, CA
OI - J.W.	KING	APPLETON LABS	SLOUGH, BUCKS, ENGLAND
OI - R.W.	KNECHT	NATL BUREAU OF STAND	BOULDER, CO
OI - G.L.	NELMS	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA

EXPERIMENT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST USABLE EXPERIMENT DATA RECORDED- 09/29/72

EXPERIMENT BRIEF DESCRIPTION

THE SWEEP FREQUENCY IONOSONDE WAS A RADIO TRANSMITTER/RECEIVER THAT RECORDED THE TIME DELAY BETWEEN A TRANSMITTED AND RETURNED RADIO PULSE. A CONTINUUM OF FREQUENCIES BETWEEN 0.5 AND 12 MHZ WERE SAMPLED ONCE EVERY 18 SEC. SEVERAL DELAY TIMES WERE USUALLY OBSERVED FOR EACH FREQUENCY DUE TO GROUND REFLECTIONS, PLASMA RESONANCES, BIREFRINGENCE OF THE IONOSPHERE, NON-VERTICAL PROPAGATION, ETC. DELAY TIME WAS PRIMARILY A FUNCTION OF DISTANCE TRAVERSED BY THE SIGNAL, ELECTRON DENSITY ALONG THE PROPAGATION PATH, AND THE MODE OF PROPAGATION. THE STANDARD DATA FORM WAS AN IONOGRAM (GRAPH) SHOWING TIME (VIRTUAL DISTANCE OF SIGNAL REFLECTION FROM THE SATELLITE) VS RADIO FREQUENCY. TWO OTHER COMMON FORMS OF DATA WERE PREPARED FROM THE IONOGRAMS. THEY WERE (1) DIGITAL FREQUENCY DATA AND/OR VIRTUAL HEIGHT VALUES OF CHARACTERISTIC IONOSPHERIC FEATURES AND (2) COMPUTATIONS OF ELECTRON DENSITY PROFILES. PERFORMANCE FAR EXCEEDED EXPECTATIONS FOR THE EXPERIMENT. INITIALLY, OBSERVATIONS WERE RECORDED FOR ABOUT 6 HR PER DAY. THE EXPERIMENT PROVIDED DATA FOR 10 FULL YEARS. AN INDEX OF OPERATION TIMES AND LOCATIONS FOR THIS EXPERIMENT IS AVAILABLE IN DATA SETS 62-049A-00G AND 62-049A-00I.

DATA SET NAME- SWEEP FREQUENCY REDUCED IONOGRAMS ON MICROFILM — NSSDC ID 62-049A-01A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 09/29/62 TO 11/30/70 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 5067 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THESE IONOGRAMS ARE REDUCED DATA PLOTS ON 35-MM MICROFILM SHOWING FREQUENCY VS ECHO TIME DELAY (VIRTUAL RANGE) OF PULSED RADIO SIGNALS. THEY ARE AN ORIGINAL FORM OF THE DATA PREPARED DIRECTLY FROM THE TELEMETRY TAPE. THE DATA ARE AS COMPLETE AS PERMITTED BY THE LIMITATIONS OF SPACECRAFT POWER, LACK OF ONBOARD TAPE RECORDING (TELEMETRY STATION LOCATION, TELEMETRY STATION SCHEDULING, ETC.), AND DATA PROCESSING FACILITIES. THE DATA COVERAGE IS PRIMARILY NEAR THE 80 DEG W MERIDIAN FOR PERIODS OF TIME UP TO 7 HR PER DAY. SINCE ONLY TIME IS NOTED ON EACH IONOGRAM, POSITION AND OTHER RELATED DATA MUST BE OBTAINED FROM WORLD MAPS (NSSDC DATA SETS INCLUDED UNDER 62-049A-00). A PROGRAM FOR THE REDUCTION OF TOPSIDE IONOGRAMS TO ELECTRON DENSITY PROFILES IS AVAILABLE FROM NSSDC (NSSDC DATA SET NSDF PI-21A).

DATA SET NAME- ALOUETTE SYNOPTIC (ALOSYN) SCALED DATA — NSSDC ID 62-049A-01K

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 09/29/62 TO 10/31/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 90 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THESE ALOSYN DATA ARE AVAILABLE IN PUBLISHED FORM AND CONSIST OF TABULATIONS OF SELECTED IONOSPHERIC PARAMETERS THAT WERE READ (SCALED) FROM THE IONOGRAM AND, IN SOME CASES, ALSO CALCULATED FROM OTHER SCALED VALUES. FOUR PARAMETERS ARE PRESENTED -- (1) PLASMA FREQUENCY AT THE SATELLITE, (2) PLASMA FREQUENCY AT THE F2 MAXIMUM, (3) MAXIMUM FREQUENCY OF OBSERVED SPORADIC E, AND (4) STRENGTH OF GROUND ECHOES. SUPPORTING INFORMATION INCLUDES SATELLITE LOCAL TIME, LOCATION (INCLUDING DIP), SOLAR ZENITH ANGLE

AT THE SATELLITE, KP, AND QUALITY AND ACCURACY NOTATIONS FOR SOME OF THE SCALINGS. A MAJOR PORTION OF THE IONOGRAMS HAVE BEEN SCALED. ALL LISTINGS ARE CHRONOLOGICALLY SORTED AND CONTAIN DATA FROM MORE THAN 12 STATIONS. AN INDEX BY PASS APPEARS AT THE FRONT OF EACH BOOK, AND EACH BOOK CONTAINS DATA FOR 2 WEEKS OR MORE. THE BOOKS, PUBLISHED BY THE DEPARTMENT OF COMMUNICATIONS, COMMUNICATIONS RESEARCH CENTRE (FORMERLY DRTE), OTTAWA, CANADA, ARE TITLED "ALOUETTE 1 IONOSPHERIC DATA ALOSYN." THESE DATA ARE ALSO AVAILABLE ON TAPE (62-049A-01C) AND MICROFILM (62-049A-01B). IF THE BOOKS ARE NO LONGER AVAILABLE FROM THE ORIGINAL SOURCE, NSSDC WILL TRY TO PROVIDE COPIES OF THEM.

DATA SET NAME- INDEX OF IONOGRAMS SHOWING DUCTED ECHOES NSSDC ID 62-049A-01G

AVAILABILITY OF DATA SET- DATA AT NSSDC READY FOR DISTRIBUTION

TIME PERIOD COVERED- 12/01/62 TO 12/31/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, PROVIDED BY THE EXPERIMENTER'S OFFICE, IS AN INDEX TO QUITO IONOGRAMS CONTAINING DUCTED ECHOES. THE CRITERION FOR SELECTION WAS THAT AT LEAST ONE TRACE FROM THE CONJUGATE HEMISPHERE APPEARS ON THE IONOGRAM. THIS TRACE HAS A POSITIVE SLOPE AS OPPOSED TO THE NEGATIVE SLOPE OF THE NORMAL X OR O TRACE. EACH RECORD CONTAINS THE SATELLITE IDENTIFICATION, GROUND STATION (QUITO=5), PASS START TIME (UT), THE NUMBER OF IONOGRAMS IN THE PASS SHOWING DUCTED ECHOES, AND THE NUMBER NOT SHOWING DUCTED ECHOES. THE TIME PERIOD COVERED IS FROM 1962 THROUGH 1968 (1966 MISSING). FOR 205 PASSES (ABOUT 6000 IONOGRAMS), 116 IONOGRAMS WITH DUCTED ECHOES ARE IDENTIFIED. THE DATA ARE AVAILABLE ON 9-TRACK, 800-BPI, EBCDIC MAGNETIC TAPE. SIMILAR DATA FOR OTHER TIMES AND FOUR OTHER STATIONS ARE STORED ON THE SAME TAPE AND ARE DESCRIBED IN DATA SETS 65-098A-01N, 69-009A-01E, AND 71-024A-01E.

DATA SET NAME- RSRS ELECTRON DENSITY (AND SCALE HEIGHT) NSSDC ID 62-049A-01R
PLOTS AND LISTINGS WITH PASS SUMMARY PLOTS

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 10/03/62 TO 09/04/66 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 7 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THESE DATA CONSIST OF SEVERAL DIFFERENT DIGITAL AND PLOTTED FORMS PREPARED FROM THE SINGAPORE, WINKFIELD, AND FALKLAND ISLAND (UK-OPERATED) STATIONS RECEIVING ALOUETTE 1 IONOGRAMS. FOR EACH PASS, A NUMBER OF IONOGRAMS HAVE BEEN DIGITIZED AND PLOTTED (THREE FRAMES PER IONOGRAM). AT THE END OF DATA FOR EACH PASS, THERE APPEARS A THREE-FRAME PASS SUMMARY IN TWO PLOTS AND A LISTING. FRAME 1 FOR EACH IONOGRAM SHOWS THE SUBSATELLITE LOCATION WITH CORRESPONDING LOCAL TIME AND UT. TRACE USED FOR ANALYSIS AND GYROFREQUENCY AT THE SATELLITE (CALCULATED AND OBSERVED) MAY ALSO BE SHOWN. ON FRAME 2 ARE THE INPUT SCALINGS FOR THE RAW (UNINTERPOLATED) AND INTERPOLATED (EACH 10 KM) PROFILES APPEARING ON FRAME 1. FRAME 2 ALSO CONTAINS INTERPOLATED GEOPOTENTIAL SCALE HEIGHTS (EACH 10 KM), AND TOTAL CONTENT VALUES FOR THREE LAYERS FROM 350, 400, AND 450 KM UP TO 950 KM. ON FRAME 3 IS A LOG PLOT OF N(H) VS GEOPOTENTIAL HEIGHT (LINEAR SCALE). THE

PASS SUMMARY CONTAINS A PLOT OF SELECTED STANDARD N(H) VALUES FROM EACH PROFILE VS GEOGRAPHIC LATITUDE, AND A SIMILAR PLOT FOR SCALE HEIGHTS. FINALLY, LISTINGS ARE GIVEN OF TOTAL N, BY LATITUDE, FOR EACH OF THE THREE LAYERS.

**********ALOUETTE 2 **********

SPACECRAFT COMMON NAME- ALOUETTE 2 NSSDC ID 65-098A
ALTERNATE NAMES- ALOUETTE-B, S 27B, ISIS-X, 01804

LAUNCH DATE- 11/29/65 SPACECRAFT WEIGHT IN ORBIT- 145. KG

SPACECRAFT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST SPACECRAFT DATA RECORDED- 06/03/73

EPOCH DATE- 11/29/65 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 121. MIN
APOAPSIS- 2956.00 KM ALT PERIAPSIS- 529.000 KM ALT INCLINATION- 79.724 DEG

SPACECRAFT BRIEF DESCRIPTION

ALOUETTE 2 WAS A SMALL IONOSPHERIC OBSERVATORY INSTRUMENTED WITH A SWEEP FREQUENCY IONOSPHERIC SOUNDER, A VLF RECEIVER, TWO ENERGETIC PARTICLE EXPERIMENTS, A COSMIC NOISE EXPERIMENT, AND AN ELECTROSTATIC PROBE. THE SPACECRAFT USED TWO LONG DIPOLE ANTENNAS (78.9 M AND 22.8 M LONG, RESPECTIVELY) FOR THE SOUNDER, VLF, AND COSMIC NOISE EXPERIMENTS. THE SATELLITE WAS SPIN-STABILIZED AT ABOUT 2.25 RPM AFTER ANTENNA DEPLOYMENT. BY JANUARY 1970, THE SPIN HAD DECAYED TO 1.84 RPM. END PLATES ON THE LONG ALOUETTE 2 ANTENNA SEEM TO HAVE CORRECTED THE RAPID DESPIN OCCURRING ON ALOUETTE 1, WHICH WAS BELIEVED TO RESULT FROM THERMAL DISTORTION OF THE ANTENNA AND RADIATION PRESSURE. THERE WAS NO TAPE RECORDER, SO THAT DATA ARE AVAILABLE ONLY WHEN THE SPACECRAFT WAS IN LINE OF SIGHT OF TELEMETRY STATIONS. TELEMETRY STATIONS ARE LOCATED SO THAT PRIMARY DATA COVERAGE IS NEAR THE 80 DEG W MERIDIAN PLUS AREAS NEAR HAWAII, SINGAPORE, AUSTRALIA, ENGLAND, INDIA, NORWAY, AND CENTRAL AFRICA. INITIALLY, DATA WERE RECORDED FOR ABOUT 7-1/2 HR PER DAY. IN 1972, OBSERVATIONS WERE MADE FOR ABOUT 2 HR PER DAY. ROUTINE SPACECRAFT OPERATION WAS DISCONTINUED IN THE SUMMER OF 1973, BUT SPECIAL REQUEST OPERATION HAS OCCURRED OCCASIONALLY SINCE THEN.

**********ALOUETTE 2, WHITTEKER

EXPERIMENT NAME- SWEEP FREQUENCY SOUNDER NSSDC ID 65-098A-01

ORIGINAL EXPERIMENT INSTITUTION- DRTE

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - J.H. WHITTEKER	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI - J.E. JACKSON	NASA-GSFC	GREENBELT, MD
OI - J.W. KING	APPLETON LABS	SLOUGH, BUCKS, ENGLAND
OI - L. COLIN	NASA-ARC	MOFFETT FIELD, CA
OI - J. TURNER	DEPARTMENT OF INTERIOR	SYDNEY, AUSTRALIA
OI - C. TAIEB	CNET	PARIS, FRANCE
OI - O. HOLT	THE AURORAL OBS	TROMSO, NORWAY
OI - G.L. NELMS	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI - Y. OGATA	RRL	TOKYO, JAPAN
OI - R. RAGHAVARAO	PHYSICAL RESEARCH LAB	AHMEDABAD, INDIA
OI - E.S. WARREN	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI - G.E.K. LOCKWOOD	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA

EXPERIMENT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST EXPERIMENT DATA RECORDED- 06/03/73

EXPERIMENT BRIEF DESCRIPTION

THE SWEEP FREQUENCY IONOSONDE WAS A RADIO TRANSMITTER/RECEIVER THAT RECORDED THE TIME DELAY BETWEEN A TRANSMITTED AND RETURNED RADIO FREQUENCY PULSE. A CONTINUUM OF FREQUENCIES BETWEEN 0.12 AND 14.5 MHZ WERE SAMPLED ONCE EVERY 32 SEC. A MULTIPLICITY OF DELAY TIMES WAS USUALLY OBSERVED DUE TO BIREFRINGENCE OF THE IONOSPHERE, NON-VERTICAL PROPAGATION, GROUND ECHOES, PLASMA RESONANCES, ETC. DELAY TIME WAS PRIMARILY A FUNCTION OF DISTANCE TRAVERSED BY THE SIGNAL, ELECTRON DENSITY ALONG THE PROPAGATION PATH, AND MODE OF PROPAGATION. THE STANDARD DATA FORM IS AN IONOGRAM (GRAPH) SHOWING DELAY TIME (VIRTUAL DISTANCE OF SIGNAL REFLECTION FROM THE SATELLITE) VERSUS FREQUENCY. TWO OTHER COMMON FORMS OF DATA ARE PREPARED FROM THE IONOGRAMS. THEY ARE DIGITAL FREQUENCY AND/OR VIRTUAL HEIGHT VALUES OF CHARACTERISTIC IONOSPHERIC FEATURES, AND COMPUTATIONS OF ELECTRON DENSITY PROFILES. PERFORMANCE HAS BEEN EXCELLENT. INITIALLY, ABOUT 7-1/2 HR OF OBSERVATIONS PER DAY WERE RECORDED. IN APRIL 1973 ABOUT 1 HR PER DAY WAS BEING RECORDED. AN INDEX OF OPERATION TIMES AND LOCATIONS FOR THIS EXPERIMENT IS AVAILABLE IN DATA SET 65-098A-00E.

DATA SET NAME- SWEEP-FREQUENCY IONOGRAMS ON MICROFILM NSSDC ID 65-098A-01A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/29/65 TO 06/00/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 2554 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THESE IONOGRAMS ARE REDUCED DATA PLOTS ON 35-MM MICROFILM SHOWING FREQUENCY VS ECHO TIME DELAY (VIRTUAL RANGE) OF PULSED RADIO SIGNALS. THEY ARE AN ORIGINAL FORM OF THE DATA PREPARED DIRECTLY FROM THE TELEMETRY TAPE. THE DATA ARE AS COMPLETE AS IS PERMITTED BY THE LIMITATIONS OF SPACECRAFT POWER, LACK OF ONBOARD TAPE RECORDING (TELEMETRY STATION LOCATION, TELEMETRY STATION SCHEDULING, ETC.), AND DATA PROCESSING FACILITIES. DATA EXIST FROM NOVEMBER 29, 1965, THROUGH JUNE, 1973. THE DATA COVERAGE IS PRIMARILY NEAR THE 80 DEGREE W MERIDIAN FOR PERIODS OF TIME UP TO 7-1/2 HR PER DAY. SINCE ONLY TIME IS NOTED ON EACH IONOGRAM, SATELLITE POSITION AND OTHER RELATED DATA MUST BE OBTAINED FROM ANOTHER SOURCE. (NSSDC DATA SET 65-098A-00C). A PROGRAM FOR THE REDUCTION OF TOPSIDE IONOGRAMS TO ELECTRON DENSITY PROFILES IS AVAILABLE FROM NSSDC (NSSDC DATA SET NSDF PI-21A).

DATA SET NAME- RRL PUBLISHED ELECTRON DENSITY AND SCALE HEIGHT PROFILES NSSDC ID 65-098A-01D

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 10/12/66 TO 12/27/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 5 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF ELECTRON DENSITY PROFILES COMPUTED FROM THE DIGITAL VALUES OF FREQUENCY AND VIRTUAL HEIGHT THAT WERE SCALED FROM IONOGRAMS. THESE ARE ANALYZED DATA IN ONE BOUND BOOK PREPARED BY THE RADIO

RESEARCH LABORATORIES, MINISTRY OF POSTS AND TELECOMMUNICATIONS, TOKYO, JAPAN. WITHIN THE VOLUME, DATA ARE ORDERED CHRONOLOGICALLY. ALL DATA WERE OBSERVED FROM THE JAPANESE TELEMETRY STATION AT KASHIMA. SATELLITE LOCATION, OBSERVATION TIME, SOLAR ZENITH ANGLE AT THE SATELLITE, HEIGHT OF THE F2 MAXIMUM, DENSITY AT THE F2 MAXIMUM, TOTAL ELECTRON CONTENT BETWEEN THE SATELLITE AND THE F2 MAXIMUM, KP, AND AN INDICATION OF PROFILE QUALITY ARE INCLUDED WITH EACH PROFILE. HEIGHT OF MAXIMUM, ELECTRON DENSITY AT MAXIMUM, AND TOTAL ELECTRON CONTENT ARE MISSING FROM A MAJORITY OF THE PROFILES BECAUSE OF THE LACK OF IONOSPHERIC REFLECTIONS ON THE IONOGRAMS NEAR THE F2 CRITICAL FREQUENCIES. THIS HAPPENS FREQUENTLY DUE TO WEAK SIGNALS WHEN THE SATELLITE ALTITUDE IS HIGH, I.E., ABOVE 1200 TO 1500 KM. PROFILE DATA CONSIST OF ELECTRON DENSITY AND REAL HEIGHT VALUES INTERPOLATED FOR EACH 50 KM AND EXTENDING FROM THE NEXT STANDARD LEVEL BELOW THE SATELLITE DOWN TO THE LOWEST STANDARD LEVEL FROM WHICH REFLECTIONS WERE OBSERVED. TEN PROFILES ARE LISTED ON EACH PAGE. AN INDEX OF THE PASSES, BY PASS, IS INCLUDED WITH THE EXPLANATORY TEXT. SIMILARLY FORMATTED SCALE HEIGHT PROFILES ARE ALSO INCLUDED. THESE APPEAR TO INCLUDE ALL OBSERVATIONS MADE FROM KASHIMA DURING THE LAST QUARTER OF 1966, ALL OF 1967, AND 1968. THEY REPRESENT A VERY SMALL PORTION OF THE TOTAL ALOUETTE 2 IONOSONDE OBSERVATIONS.

DATA SET NAME- IONOGRAM INVENTORY ON TAPE NSSDC ID 65-098A-01I

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/29/65 TO 04/23/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS FILE INDEXES THE ALOUETTE 2 IONOGRAMS (DATA SET 65-098A-01A) IN UNITS BY STATION PASS. THE INDEX CAN BE SORTED BY STATION, BY TIME, OR BY OTHER METHODS, AS DESIRED. INFORMATION IN THE DATA SET INCLUDES TELEMETRY STATION AND START AND STOP TIME FOR THE PASSES AND ORBIT NUMBER. THE INDEX, WHICH IS BEING PREPARED FROM A PHYSICAL INVENTORY OF FILM RECEIVED AND SATELLITE EPHEMERIDES, IS MAINTAINED ON 556-BPI, 7-TRACK, BCD MAGNETIC TAPES AND IS UPDATED MONTHLY UNLESS FEW DATA ARE RECEIVED.

DATA SET NAME- AMES INTERPOLATED ELECTRON NUMBER DENSITY NSSDC ID 65-098A-01K
VERSUS REAL HEIGHT PROFILES ON MICROFILM

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/29/65 TO 03/11/70 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 8 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THESE ANALYZED DATA WERE COMPUTED FROM DIGITAL VALUES OF FREQUENCY AND VIRTUAL RANGE THAT WERE SCALED FROM IONOGRAMS. DIGITAL ELECTRON DENSITY VALUES WERE LISTED AT THE SATELLITE AND FOR EACH 100 KM FROM 3500 KM ALTITUDE DOWN TO THE LOWEST HEIGHT OF SIGNAL REFLECTIONS (NORMALLY NEAR 300 KM). THERE ARE 17,315 PROFILES LISTED FOR TIMES BETWEEN NOVEMBER 1965 AND APRIL 1970, FROM THE VICINITY OF 18 DIFFERENT GROUND STATIONS. THESE DATA ARE A SMALL BLOCK OF THE TOTAL ALOUETTE 2 IONOGRAM DATA (LESS THAN 1 PERCENT) BUT FORM ONE OF THE LARGEST BLOCKS OF REDUCED SATELLITE IONOGRAMS AVAILABLE. THESE REDUCTIONS ARE OF OPTIMUM QUALITY BECAUSE BOTH X AND Y TRACE VALUES WERE CHECKED AGAINST ONE ANOTHER DURING COMPUTATION OF THE

DENSITY VALUES. THIS DATA SET ON 35-MM MICROFILM IS A MICROFILM VERSION OF DATA SET 65-098A-01J.

DATA SET NAME- INDEX OF IONOGRAMS SHOWING DUCTED ECHOES NSSDC ID 65-098A-01N

AVAILABILITY OF DATA SET- DATA AT NSSDC READY FOR DISTRIBUTION

TIME PERIOD COVERED- 11/29/65 TO 10/30/71 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, PROVIDED BY THE EXPERIMENTER'S OFFICE, IS AN INDEX TO LOW-LATITUDE IONOGRAMS CONTAINING DUCTED ECHOES. THE CRITERION FOR SELECTION WAS THAT AT LEAST ONE TRACE FROM THE CONJUGATE HEMISPHERE APPEARED ON THE IONOGRAM. THIS TRACE HAD A POSITIVE SLOPE, AS OPPOSED TO THE NEGATIVE SLOPE OF THE NORMAL X OR O TRACE. EACH RECORD CONTAINED THE SATELLITE IDENTIFICATION, GROUND STATION (QUITO=5, SANTIAGO=8, FT. MEYER=3, ORRORAL=21, SINGAPORE=48), PASS START TIME (UT), THE NUMBER OF IONOGRAMS IN THE PASS SHOWING DUCTED ECHOES, AND THE NUMBER NOT SHOWING DUCTED ECHOES. THE TIME COVERED WAS FROM 1965 THROUGH OCTOBER 1971. FOR 4452 PASSES (ABOUT 110,000 IONOGRAMS), APPROXIMATELY 2000 IONOGRAMS WITH DUCTED ECHOES WERE IDENTIFIED. THE DATA ARE AVAILABLE ON 9-TRACK, 800-BPI, EBCDIC MAGNETIC TAPE. SIMILAR DATA FOR OTHER TIMES ARE STORED ON THE SAME TAPE AND ARE DESCRIBED UNDER DATA SETS 62-049A-01Q, 65-009A-01E, AND 71-024A-01E.

DATA SET NAME- CRC ELECTRON DENSITY PROFILES AT SCALED POINTS ON MAGNETIC TAPES NSSDC ID 65-098A-01O

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 12/15/65 TO 03/10/70 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF ANALYZED ELECTRON DENSITY PROFILES COMPUTED FROM DIGITAL VALUES OF FREQUENCY AND VIRTUAL HEIGHT, SCALED FROM IONOGRAMS. THESE ARE ANALYZED DATA ON 800-BPI, 9-TRACK MAGNETIC TAPE, WRITTEN IN EBCDIC AND PREPARED BY THE COMMUNICATIONS RESEARCH CENTRE, OTTAWA, CANADA. TELEMETRY STATIONS ARE NOT IDENTIFIED BUT SATELLITE LOCATION, TIME OF OBSERVATION, SOLAR ZENITH ANGLE AT THE SATELLITE, DIP LATITUDE AT THE SATELLITE, TOTAL ELECTRON CONTENT DOWN TO THE ALTITUDE OF HIGHEST IONOSPHERICALLY REFLECTED FREQUENCY, AND OTHER RELEVANT INFORMATION IS NOTED WITH EACH PROFILE. PROFILE DATA CONSIST OF ELECTRON DENSITY AND GEOMETRIC HEIGHT VALUES FOR EACH POINT SCALED FROM THE IONOGRAM. FOR INTERPOLATED VALUES OF ELECTRON DENSITY AT STANDARD INCREMENTS OF GEOMETRIC HEIGHT, A CRC INTERPOLATION PROGRAM (AVAILABLE AT NSSDC) CAN BE RUN WITH THIS DATA SET. THESE IONOGRAMS WERE SELECTED FOR THEIR SCIENTIFIC INTEREST AND COMPRISE ONLY A VERY SMALL PORTION OF REDUCTIONS POSSIBLE FROM THE AVAILABLE IONOGRAMS.

DATA SET NAME- RSRS ELECTRON DENSITY (AND SCALE HEIGHT) PLOTS AND LISTINGS WITH PASS SUMMARY PLOTS NSSDC ID 65-098A-01P

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 12/12/65 TO 08/11/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 5 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THESE DATA CONSIST OF SEVERAL DIFFERENT DIGITAL AND PLOTTED FORMS PREPARED FROM THE SINGAPORE, WINKFIELD, AND FALKLAND ISLAND (UK-OPERATED) STATIONS RECEIVING ALOUETTE 2 IONOGRAMS. FOR EACH PASS, A NUMBER OF IONOGRAMS HAVE BEEN DIGITIZED AND PLOTTED (THREE FRAMES PER IONOGRAM). AT THE END OF DATA FOR EACH PASS, THERE APPEARS A THREE-FRAME PASS SUMMARY IN TWO PLOTS AND A LISTING. FRAME 1 FOR EACH IONOGRAM SHOWS THE SUBSATELLITE LOCATION WITH CORRESPONDING LOCAL TIME AND UT. THE TRACE USED FOR ANALYSIS AND THE GYROFREQUENCY AT THE SATELLITE (CALCULATED AND OBSERVED) MAY ALSO BE SHOWN. ON FRAME 2 ARE THE INPUT SCALINGS FOR THE RAW (UNINTERPOLATED) AND INTERPOLATED (EACH 10-KM) PROFILES APPEARING ON FRAME 1. FRAME 2 ALSO CONTAINS INTERPOLATED GEOPOTENTIAL SCALE HEIGHTS (EACH 10 KM), AND TOTAL CONTENT VALUES FOR THREE LAYERS FROM 350, 400, AND 450 KM UP TO 950 KM. ON FRAME 3 IS A SEMI-LOGARITHMIC PLOT OF N(H) VS GEOPOTENTIAL HEIGHT. THE PASS SUMMARY CONTAINS A PLOT OF SELECTED STANDARD N(H) VALUES FROM EACH PROFILE VS GEOGRAPHIC LATITUDE, AND A SIMILAR PLOT FOR SCALE HEIGHTS. FINALLY, LISTINGS ARE GIVEN OF TOTAL N, BY LATITUDE, FOR EACH OF THE THREE LAYERS.

**********APOLLO 15 CSM **********

SPACECRAFT COMMON NAME- APOLLO 15 CSM NSSDC ID 71-063A
ALTERNATE NAMES- 05351

LAUNCH DATE- 07/26/71 SPACECRAFT WEIGHT IN ORBIT- 57760. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 08/07/71

EPOCH DATE- 07/31/71 ORBIT TYPE- SELENOCENTRIC ORBIT PERIOD- 118.8 MIN
APOAPSIS- 120. KM ALT PERIAPSIS- 93. KM ALT INCLINATION- 26. DEG

SPACECRAFT BRIEF DESCRIPTION

APOLLO 15 WAS THE FIFTH SPACECRAFT (FOURTH ACCOMPLISHED) AND THE FIRST OF THE J-SERIES APOLLO MISSIONS DESIGNED TO LAND MEN ON THE MOON. THE LUNAR LANDING SITE FOR THE 12-DAY SCIENTIFIC MISSION WAS THE HADLEY RILLE-APENNINE MOUNTAIN REGION AT 26 DEG 06 MIN 54 SEC N, 3 DEG 39 MIN, 30 SEC E ON THE LUNAR SURFACE. THE DATE OF LAUNCH WAS JULY 26, 1971. THE LUNAR MODULE (LM) CARRYING ASTRONAUTS DAVID SCOTT AND JAMES IRWIN AND THE LUNAR ROVING VEHICLE (LRV) LANDED ON THE MOON ON JULY 31, 1971. THE COMMAND MODULE (CM) PILOTED BY ALFRED WORDEN REMAINED IN A SLIGHTLY ELLIPTICAL ORBIT AT AN ALTITUDE OF 97 BY 115 KM WITH AN INCLINATION OF 23 DEG. THE PROJECTS CARRIED OUT ON THE SURFACE INCLUDED THE DEPLOYMENT OF THE APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP), GEOLOGICAL FIELD EXPLORATION IN THREE EVA EXCURSIONS, DOCUMENTING PHOTOGRAPHY, AND ACQUISITION OF SAMPLES OF THE LUNAR TERRAIN. PHOTOGRAPHS USING 16- AND 70-MM FILM WERE OBTAINED FROM BOTH THE SURFACE AND FROM ORBIT, AND 35-MM AND TWO KINDS OF 5-IN. FILM PHOTOGRAPHS WERE OBTAINED FROM ORBIT. SPECIAL UV AND DIM-LIGHT PHOTOGRAPHIC EXPERIMENTS WERE PERFORMED DURING ORBIT. BEFORE LEAVING THE LUNAR ENVIRONMENT, A SUBSATELLITE WITH AN EXPERIMENTS PACKAGE WAS RELEASED FROM THE COMMAND SERVICE MODULE (CSM) ON AUGUST 4, 1971, INTO AN ORBIT 135 BY 97 KM. THE LRV WAS USED TO EXPLORE REGIONS WITHIN 5 KM OF THE LM LANDING SITE. THIS WAS THE FIRST TIME A VEHICLE OF THIS TYPE HAD BEEN USED, AND ITS PERFORMANCE ON THE LUNAR TERRAIN

WAS VERY SUCCESSFUL. THE CM AND LM VEHICLES REJOINED ON AUGUST 2, 1971. PERFORMED FURTHER PHOTOGRAPHIC EXPERIMENTS IN ORBIT AROUND THE MOON FOR TWO DAYS. THE LM WAS SEPARATED FOR LUNAR IMPACT AND THE CSM WAS PLACED IN EARTHBOUND TRAJECTORY. ENROUTE THE SM WAS SEPARATED AND THE CM RETURNED TO EARTH ON AUGUST 7, 1971. MORE INFORMATION ON THE LM MAY BE FOUND UNDER SPACECRAFT 71-063C.

**********APOLLO 15 CSM, HOFFMAN

EXPERIMENT NAME- MASS SPECTROMETER NSSDC ID 71-063A-13

ORIGINAL EXPERIMENT INSTITUTION- U OF TEXAS

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - J.H.	HOFFMAN	U OF TEXAS, DALLAS	DALLAS, TX
OI - V.M.	DAUPHIN	NASA-JSC	HOUSTON, TX

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 08/07/71

EXPERIMENT BRIEF DESCRIPTION

THE LUNAR ORBITAL SCIENCE EXPERIMENTS PACKAGE INCLUDED A MASS SPECTROMETER EXPERIMENT WHOSE OBJECTIVE WAS TO USE THE MEASURED COMPOSITION DATA TO STUDY THE SOURCES, SINKS, AND TRANSPORT MECHANISMS OF THE AMBIENT LUNAR ATMOSPHERE. FROM JULY 26 TO AUGUST 7, 1971, THE DURATION OF THE APOLLO 15 FLIGHT, 90 HR OF DATA WERE OBTAINED - 40 HR WHILE IN LUNAR ORBIT AND 50 HR DURING TRANSEARTH COAST. THE ANALYZER FLOWN, A DUAL COLLECTOR SINGLE FOCUSING SECTOR-FIELD SPECTROMETER, WAS MOUNTED ON A RETRACTABLE BOOM. WHEN FULLY EXTENDED THE BOOM PLACED THE SPECTROMETER 7.3 M FROM THE SPACECRAFT, A DISTANCE ANTICIPATED TO BE BEYOND THE OUTGASSED MOLECULAR CLOUD. CONTROL OF THE EXPERIMENT FUNCTIONS AND BOOM MOTION WAS PROVIDED BY A SET OF FIVE SWITCHES IN THE COMMAND MODULE, WHICH WERE OPERATED BY A CREW MEMBER ACCORDING TO THE MISSION TIME LINE OR BY INSTRUCTION FROM THE GROUND CONTROLLER. INSTRUMENT WEIGHT WAS 11 KG, AND ITS DIMENSIONS WERE APPROXIMATELY 30 X 32 X 23 CM. A SCOOP MOUNTED ON THE TOP OF THE PACKAGE WAS THE GAS INLET PLENUM. THIS INLET WAS ORIENTED ALONG THE SPACECRAFT VELOCITY VECTOR FOR MAXIMUM RAM WHEN AMBIENT MEASUREMENTS WERE OBTAINED, AND IT WAS ORIENTED IN THE WAKE DIRECTION TO DETERMINE BACKGROUND SPECTRA AND INSTRUMENT OUTGASSING. THE PLENUM CONTAINED THE SPECTROMETER ION SOURCE, WHICH HAD REDUNDANT FILAMENTS MOUNTED ON EITHER SIDE OF THE IONIZATION CHAMBER. SEVERAL OUTGASSING OPERATIONS DURING FLIGHT MAINTAINED THE ION SOURCE IN A REASONABLY OUTGASSED STATE. USE OF A TWO-COLLECTOR SYSTEM IN THE ANALYZER PERMITTED THE SIMULTANEOUS SCANNING OF TWO MASS RANGES -- 12 TO 28 AND 28 TO 66 AMU. MASS RESOLUTION WAS THE ORDER OF A 1 PERCENT VALLEY AT MASS 40 AMU. THE MASS SWEEP WAS ACHIEVED BY VARYING THE APPLIED HIGH VOLTAGE IN A SERIES OF 590 STEPS OVER THE RANGE FROM 620 TO 1560 V WITH A DWELL TIME OF APPROXIMATELY 0.1 SEC. THIRTY ADDITIONAL STEPS AT ZERO VOLTS WERE USED TO DETERMINE BACKGROUND COUNTING RATE AND TO APPLY INTERNAL CALIBRATION, SO THAT 62 SEC WERE REQUIRED TO COMPLETE A MASS SCAN. THE VOLTAGE STEP NUMBER THAT DETERMINED THE MASS NUMBER OF THE ION BEING MEASURED WAS IDENTIFIED BY COUNTING FROM STEP ONE -- A SWEEP START FLAG. BENDIX ELECTRON MULTIPLIERS WERE USED AS PULSE AMPLIFIERS TO DETERMINE THE COUNTING RATE OF IONS PASSING EACH COLLECTOR SLIT FOR EACH VOLTAGE STEP. PRELAUNCH EXPERIMENT CALIBRATION INCLUDED OPERATION IN A MOLECULAR BEAM FACILITY. MORE DETAILS OF THIS EXPERIMENT CAN BE FOUND IN "LUNAR ORBITAL MASS SPECTROMETER," J. H. HOFFMAN, INT. J. MASS SPECTROM. ION PHYS., 8, 403-416, 1972.

DATA SET NAME- MASS SPECTROMETER DATA ON MAGNETIC TAPE NSSDC ID 71-063A-13A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 07/28/71 TO 08/07/71 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 3 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

DATA PROCESSING RESULTED IN BLOCKING THE DATA INTO COMPLETE MASS SPECTRA ON MAGNETIC TAPE. REDUCED DATA INCLUDE THE BACKGROUND COUNT LEVEL OF EACH ANALYZER CHANNEL, THE AMPLITUDE OF EACH MASS PEAK, DECOMMUTATED HOUSEKEEPING DATA, AND PERTINENT SPACECRAFT TRAJECTORY INFORMATION, INCLUDING -- ORBIT NUMBER, LATITUDE AND LONGITUDE, VELOCITY, ALTITUDE, AND RELATIVE SUN POSITION. THIS DATA SET CONSISTS OF IBM 360, 800-BPI, AND 7-TRACK VARIABLE LENGTH RECORD TAPES HAVING NO LABELS. ALL INTEGERS AND REAL NUMBERS ARE INTERNAL 360 BINARY AND FLOATING POINT REPRESENTATION. EACH SPECTRA OF DATA IS CONTAINED IN THREE RECORDS.

DATA SET NAME- MASS SPECTROMETER DATA ON MICROFILM NSSDC ID 71-063A-13B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 07/30/71 TO 08/07/71 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 6 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THESE MICROFILM RECORDS ARE FORMATTED OUTPUTS OF THE DATA ON MAGNETIC TAPE. THE FORMAT PRESENTS SEQUENTIAL PAIRS OF MASS SPECTRA (HIGH- AND LOW-MASS CHANNELS) ALONG WITH BACKGROUND, PEAK AMPLITUDE, HOUSEKEEPING, AND TRAJECTORY DATA. IN ADDITION, THERE ARE SOME TABULATED SUMMARIES OF PEAK AMPLITUDES, TRAJECTORY DATA, AND HOUSEKEEPING MEASUREMENTS AS A FUNCTION OF GROUND ELAPSED TIME (GET). EACH SUMMARY CHART COVERS SEVERAL HOURS OF EXPERIMENT OPERATION.

**********APOLLO 16 CSM **********

SPACECRAFT COMMON NAME- APOLLO 16 CSM NSSDC ID 72-031A
ALTERNATE NAMES- 06000

LAUNCH DATE- 04/16/72 SPACECRAFT WEIGHT IN ORBIT- 48606. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 04/27/72

EPOCH DATE- 04/20/72 ORBIT TYPE- SELENOCENTRIC ORBIT PERIOD- 120. MIN
APOAPSIS- 120. KM ALT PERIAPSIS- 94. KM ALT INCLINATION- 12. DEG

SPACECRAFT BRIEF DESCRIPTION

APOLLO 16 WAS THE FIFTH MISSION IN THE APOLLO SERIES IN WHICH MEN LANDED ON THE MOON. THE 11-DAY SCIENTIFIC MISSION BEGAN ON APRIL 16, 1972, AT 1754 UT. (THE LAUNCH WAS POSTPONED FROM THE ORIGINALLY SCHEDULED DATE, MARCH 17, OWING TO A DOCKING RING JETTISON MALFUNCTION.) NAVY CAPTAIN JOHN W. YOUNG AND AIR FORCE LIEUTENANT CHARLES M. DUKE LANDED ON THE LUNAR SURFACE IN THE LUNAR MODULE (LM) ON APRIL 21. NAVY LIEUTENANT THOMAS K.

MATTINGLY REMAINED IN THE COMMAND MODULE (CM) PERFORMING SCIENTIFIC EXPERIMENTS WHILE THE CM WAS IN AN EQUATORIAL ORBIT ABOUT THE MOON. THE LM LANDED IN THE DESCARTES REGION OF THE MOON AT APPROXIMATELY 16 DEG E, 9 DEG S. AN APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP) WAS DEPLOYED ON THE SURFACE, TERRAIN SAMPLES WERE ACQUIRED, AND PHOTOGRAPHS WERE OBTAINED BY THE SURFACE ASTRONAUTS AND FROM THE CM USING 16-, 35-, AND 70-MM FILM, 5- BY 48-IN. PANORAMIC FILM, AND 5- BY 5-IN. MAPPING FILM. THE SURFACE ASTRONAUTS ALSO TESTED THE SECOND LUNAR ROVING VEHICLE TO BE TAKEN TO THE MOON BY EXPLORING REGIONS WITHIN 4 KM OF THE LM LANDING SITE. A SUBSATELLITE CARRYING AN EXPERIMENT PACKAGE WAS LAUNCHED INTO LUNAR ORBIT ON APRIL 24, 1972, AND IMPACTED WITH THE MOON AFTER 425 REVOLUTIONS ON MAY 29, 1972. THE CM AND LM REJOINED AND THE CM RETURNED TO EARTH, LANDING IN THE PACIFIC OCEAN ON APRIL 27, 1972.

**********APOLLO 16 CSM, HOFFMAN

EXPERIMENT NAME- ORBITAL MASS SPECTROMETER NSSDC ID 72-031A-11

ORIGINAL EXPERIMENT INSTITUTION- U OF TEXAS

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - J.H. HOFFMAN U OF TEXAS, DALLAS DALLAS, TX

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 04/24/72

EXPERIMENT BRIEF DESCRIPTION

THE OBJECTIVE OF THIS COMPOSITION EXPERIMENT WAS TO USE THE MEASURED CONCENTRATIONS TO STUDY THE SOURCES, SINKS, AND TRANSPORT MECHANISMS OF THE LUNAR AMBIENT ATMOSPHERE. THE FLIGHT NEUTRAL MAGNETIC MASS SPECTROMETER WAS SIMILAR TO THAT FLOWN ON APOLLO 15 (71-063A-13). IT WAS MOUNTED AT THE END OF A RETRACTABLE BOOM, WHICH, WHEN FULLY EXTENDED, MEASURED 7.3 M. THIS DISTANCE WAS EXPECTED TO BE BEYOND THE OUTGASSED MOLECULAR CLOUD. CONTROL OF THE EXPERIMENT FUNCTIONS AND THE BOOM MOTION WAS PROVIDED BY A SET OF COMMAND MODULE SWITCHES THAT WERE OPERATED BY A CREW MEMBER ACCORDING TO THE MISSION TIME LINE OR BY INSTRUCTION FROM THE GROUND CONTROLLER. A SCOOP MOUNTED ON THE TOP OF THE PACKAGE WAS THE GAS INLET PLENUM. THIS INLET WAS ORIENTED ALONG THE SPACECRAFT VELOCITY VECTOR FOR MAXIMUM RAM EFFECT WHEN AMBIENT MEASUREMENTS WERE OBTAINED, AND IT WAS ORIENTED IN THE WAKE DIRECTION TO DETERMINE BACKGROUND SPECTRA AND INSTRUMENT OUTGASSING. FOR THIS FLIGHT, THE INLET STRUCTURE WAS FITTED WITH A THERMALLY CONTROLLED INNER PLENUM, WHICH WAS HEATED TO APPROXIMATELY 250 DEG C FOR 1 HR BEFORE OPERATION TO OUTGAS THE STRUCTURE. SUBSEQUENTLY, THE TEMPERATURE WAS KEPT AT 70 DEG C DURING DATA COLLECTION. TWO MASS RANGES, 12 TO 28 AND 28 TO 67 AMU, WERE SCANNED SIMULTANEOUSLY BECAUSE THIS ANALYZER HAD TWO COLLECTORS. IONS OF A GIVEN MASS, WHEN FOCUSED ON ONE OF THE COLLECTORS, WERE COUNTED FOR A PERIOD OF 0.1 SEC AND THEN THE ACCUMULATED COUNT WAS TELEMETERED. FORMATION OF THE IONS AT THE JUNCTION OF THE GAS INLET PLENUM AND ANALYZER WAS ACCOMPLISHED BY AN ELECTRON BEAM WITH 70-EV ENERGY. THE FLIGHT INSTRUMENT WAS CALIBRATED IN A MOLECULAR BEAM FACILITY TO DETERMINE THE ABSOLUTE SENSITIVITY FACTORS. FOR MOST GASES, ONE COUNT CORRESPONDED TO 260 MOLECULES/CC. AN IMPORTANT EXCEPTION WAS NEON, FOR WHICH ONE COUNT CORRESPONDED TO 1100 ATOMS/CC IN THE LUNAR ATMOSPHERE. THESE SENSITIVITY NUMBERS WERE APPLICABLE ONLY WHEN THE INLET FACED IN THE DIRECTION OF MOTION. OWING TO A BOOM MALFUNCTION APPROXIMATELY 200 HR. AFTER LAUNCH, THE MASS SPECTROMETER WAS JETTISONED BEFORE TRANSEARTH INJECTION. SOME PRELIMINARY RESULTS AND MORE EXPERIMENT DETAIL CAN BE FOUND IN "APOLLO 16 - LUNAR ORBITAL MASS SPECTROMETER EXPERIMENT," R. R. HODGES, J. H. HOFFMAN, AND D. E. EVANS, IN THE APOLLO 16 PRELIMINARY SCIENCE REPORT, JULY 19, 1972.

DATA SET NAME- MASS SPECTROMETER DATA ON MAGNETIC TAPE NSSDC ID 72-031A-11A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/18/72 TO 04/24/72 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 4 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION
DATA PROCESSING RESULTED IN BLOCKING THE DATA INTO COMPLETE MASS SPECTRA ON MAGNETIC TAPE. REDUCED DATA INCLUDE THE BACKGROUND COUNT LEVEL OF EACH ANALYZER CHANNEL, THE AMPLITUDE OF EACH MASS PEAK, DECOMMUTATED HOUSEKEEPING DATA, AND PERTINENT SPACECRAFT TRAJECTORY INFORMATION INCLUDING -- ORBIT NUMBER, LATITUDE AND LONGITUDE, VELOCITY, ALTITUDE, AND RELATIVE SUN POSITION. THIS DATA SET CONSISTS OF IBM 360, 800-BPI, AND 7-TRACK VARIABLE LENGTH RECORD TAPES HAVING NO LABELS. ALL INTEGERS AND REAL NUMBERS ARE INTERNAL 360 BINARY AND FLOATING POINT REPRESENTATION. EACH SPECTRA OF DATA IS CONTAINED IN THREE RECORDS.

DATA SET NAME- MASS SPECTROMETER DATA ON MICROFILM NSSDC ID 72-031A-11B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/20/72 TO 04/24/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 4 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION
THE MICROFILM RECORDS ARE FORMATTED OUTPUTS OF THE DATA ON MAGNETIC TAPE. THE FORMAT PRESENTS SEQUENTIAL PAIRS OF MASS SPECTRA (HIGH- AND LOW-MASS CHANNELS) ALONG WITH BACKGROUND, PEAK AMPLITUDE, HOUSEKEEPING, AND TRAJECTORY DATA. IN ADDITION, THERE ARE SOME TABULATED SUMMARIES OF PEAK AMPLITUDES, TRAJECTORY DATA, AND HOUSEKEEPING MEASUREMENTS AS A FUNCTION OF GROUND ELAPSED TIME (GET). EACH SUMMARY CHART COVERS SEVERAL HOURS OF EXPERIMENT OPERATION.

**********APOLLO 16 LM/ALSEP **********

SPACECRAFT COMMON NAME- APOLLO 16 LM/ALSEP NSSDC ID 72-031C
ALTERNATE NAMES- ALSEP 16, LEM 16, ROVER 16, 06005, APOLLO 16C

LAUNCH DATE- 04/16/72 SPACECRAFT WEIGHT IN ORBIT- 5040. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

SPACECRAFT BRIEF DESCRIPTION
THE APOLLO 16 LUNAR MODULE (LM) CONSISTED OF A LUNAR LANDING CRAFT, A LUNAR ROVING VEHICLE (LRV), AND AN APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP) THAT CONTAINED SCIENTIFIC EXPERIMENTS TO BE LEFT ON THE LUNAR SURFACE AFTER COMPLETION OF THE MANNED PORTION OF THE MISSION. THE LM LANDED IN THE DESCARTES HIGHLAND REGION JUST NORTH OF THE CRATER DOLLAND AT 8 DEG 59 MIN 55 SEC S LATITUDE, AND 15 DEG 31 MIN 12 SEC E LONGITUDE. THE ALSEP WAS DEPLOYED AT THE LANDING SITE. THE LRV WAS USED DURING EXTRAVEHICULAR

ACTIVITIES (EVA) TO EXTEND THE RANGE OF MANNED LUNAR EXPLORATION. THE NUCLEAR-POWERED ALSEP PACKAGE CONTAINED SEISMIC, MAGNETIC FIELD, AND HEAT FLOW.

**********APOLLO 16 LM/ALSEP, CARRUTHERS

EXPERIMENT NAME- FAR ULTRAVIOLET CAMERA/SPECTROSCOPE NSSDC ID 72-031C-10

ORIGINAL EXPERIMENT INSTITUTION- NAVAL RESEARCH LAB

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - G.R.	CARRUTHERS	NAVAL RESEARCH LAB	WASHINGTON, DC
OI - T.	PAGE	NASA-JSC	HOUSTON, TX

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST EXPERIMENT DATA RECORDED- 04/24/72

EXPERIMENT BRIEF DESCRIPTION

THIS EXPERIMENT CONSTITUTED THE FIRST PLANETARY-BASED ASTRONOMY OBSERVATORY AND CONSISTED OF A TRIPOD-MOUNTED 3-IN. ELECTRONOGRAPHIC SCHMIDT CAMERA WITH A CESIUM IODIDE CATHODE AND FILM CARTRIDGE. SPECTROSCOPIC DATA WERE PROVIDED IN THE 300- TO 1350-A RANGE (30-A RESOLUTION), AND IMAGERY DATA WERE PROVIDED IN TWO PASSBANDS (1050 TO 1260 A AND 1200 TO 1550 A). DIFFERENCE TECHNIQUES ALLOWED LYMAN-ALPHA (1216-A) RADIATION TO BE IDENTIFIED. THE ASTRONAUTS DEPLOYED THE CAMERA IN THE SHADOW OF THE LM AND THEN POINTED IT TOWARD OBJECTS OF INTEREST. SPECIFIC PLANNED TARGETS WERE THE GEOCORONA, THE EARTH'S ATMOSPHERE, THE SOLAR WIND, VARIOUS NEBULAE, THE MILKY WAY, GALACTIC CLUSTERS AND OTHER GALACTIC OBJECTS, INTERGALACTIC HYDROGEN, SOLAR BOW CLOUD, THE LUNAR ATMOSPHERE, AND LUNAR VOLCANIC GASES (IF ANY). AT THE END OF THE MISSION, THE FILM WAS REMOVED FROM THE CAMERA AND RETURNED TO EARTH.

DATA SET NAME- DIGITIZED SCANS OF THE FAR-UV CAMERA/SPECTROSCOPE FRAMES ON MAG TAPE NSSDC ID 72-031C-10B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/21/72 TO 04/23/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 31 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF MAGNETIC TAPES CONTAINING THE DIGITIZED RESULTS OF MICRODENSITOMETERING THE 209 MISSION FRAMES FROM THE APOLLO 16 FAR-UV CAMERA EXPERIMENT OF CARRUTHERS AND PAGE. THESE SCANS WERE ALL PERFORMED ON THE DICOMED MODEL 57 MICRODENSITOMETER USING A SPOT SIZE OF 38 MICRONS AND A SCAN INTERVAL OF 32 MICRONS. THE TAPES CONTAIN A TOTAL OF 476 SCANS. THERE ARE 288 SCANS OF THE 190 MISSION PICTURE FRAMES, 58 SCANS OF THE 19 MISSION CALIBRATION-FRAMES, AND 130 SCANS OF THE SPECIAL FRAMES USED FOR CALIBRATION CONTROL DURING THE SCANNING PROCESS. ALL TAPES IN THIS DATA SET WERE WRITTEN IN BINARY (9-TRACK) AT ODD PARITY AT 800 BPI, AND WERE PACKED AT 8 BITS/BYTE. EACH TAPE CONTAINS MORE THAN ONE FILE. THE TAPES HAVE NO INFORMATION ON THEM OTHER THAN THE DIRECT SCANNING DATA. THE DATA ON THE TAPES ARE BLOCKED OUT IN THE FOLLOWING MANNER -- (1) THE SCAN OF ONE COMPLETE FRAME IS CONTAINED IN ONE FILE. THERE ARE APPROXIMATELY 15 FILES/TAPE. (2) EACH RECORD WITHIN A FILE REPRESENTS ONE SCAN LINE OF DATA RECORDED LEFT-TO-RIGHT. THE FULL SCAN OF ONE MISSION FRAME IS EQUIVALENT TO

1024 RECORDS, AND (3) EACH BYTE (8 BITS) WITHIN A RECORD REPRESENTS THE LIGHT TRANSMITTANCE VALUE RECORDED BY THE SCANNER FOR ONE INCREMENT OF THE SCAN INTERVAL. THE 8-BIT A/D DIGITIZATION ALLOWS FOR A POSSIBLE RANGE FROM 0 TO 255 IN THE RECORDED TRANSMITTANCE VALUES ALONG THE SCAN LINE. THE MAXIMUM NUMBER OF ELEMENTS (BYTES) PER SCAN LINE FOR A MISSION FRAME IS 1024. (NOTE - TO LOCATE THE SCAN OF PARTICULAR FRAMES ON THESE TAPES, AND TO KNOW HOW THAT SCAN WAS PERFORMED REQUIRES USE OF THE NSSDC DATA SET 72-031C-10C. DATA SET 72-031C-10C WILL BE SENT AUTOMATICALLY TO THOSE REQUESTING DATA SET 72-031C-10B.)

DATA SET NAME- CATALOG OF INFORMATION ON MISSION FRAMES AND HOW THEY WERE MICRODENSITOMETERED NSSDC ID 72-031C-10C

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/21/72 TO 04/23/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET IS A MICROFILM OF THE 476 PAGES SUBMITTED BY DR. T. PAGE TO ACCOMPANY THE MAGNETIC TAPES THAT CONTAIN THE MICRODENSITOMETER (DICOMED MODEL 57) SCAN RESULTS OF THE 209 MISSION FRAMES GATHERED ON THE LUNAR SURFACE BY THE APOLLO 16 FAR UV CAMERA/ SPECTROMETER EXPERIMENT. THE 209 MISSION FRAMES THAT WERE SCANNED INCLUDE 190 UV PICTURES AND 19 CALIBRATION FRAMES. A NUMBER OF THESE FRAMES WERE SCANNED MORE THAN ONCE. IN ADDITION, DURING THE MICRODENSITOMETER SCANS MANY PASSES WERE MADE OF A GRAY-SCALE STEP-WEDGE AS A QUALITATIVE CONTROL VARIABLE ON THE SCANNING PROCEDURE. IN ALL, 476 SCANS WERE MADE, AND THE INFORMATION ON EACH SCAN IS CONTAINED ON A SINGLE CATALOG PAGE. THE NATURE OF THE INFORMATION GIVEN ON EACH SCAN MAKES THIS CATALOG USEFUL FOR THREE PURPOSES -(1) AS THE SOURCE OF GENERAL INFORMATION ON EACH OF THE MISSION FRAMES, SINCE THE PAGES GIVE DATA ON CAMERA POINTING, FILTER(S) USED, EXPOSURE TIME, OBJECTS VISIBLE, ETC., (2) AS A USEFUL ADJUNCT TO THE VIEWING OF THE MISSION FRAMES, AND (3) AS AN ESSENTIAL GUIDE IN DETERMINING THE LOCATION OF THE MICRODENSITOMETER SCAN-(S) OF THE MISSIONS FRAMES ON THE DIGITIZED-SCAN MAGNETIC TAPES, AND AS THE SOURCE OF INFORMATION ON HOW THE SCANS WERE PERFORMED AND THE SIZE OF THE SCANS. COPIES OF THE MISSION FRAMES AND THE DIGITIZED-SCAN MAGNETIC TAPES ARE AVAILABLE THROUGH NSSDC AS DATA SETS 72-031C-10A AND 72-031C-10B, RESPECTIVELY.

**********ARIEL 3 **********

SPACECRAFT COMMON NAME- ARIEL 3 NSSDC ID 67-042A
ALTERNATE NAMES- UK 3, UK-E, 02773, S 53

LAUNCH DATE- 05/05/67 SPACECRAFT WEIGHT IN ORBIT- 89.8 KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 09/00/69

EPOCH DATE- 05/05/67 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 96. MIN
APOAPSIS- 500.000 KM ALT PERIAPSIS- 494.000 KM ALT INCLINATION- 80.181 DEG

SPACECRAFT BRIEF DESCRIPTION

ARIEL 3 WAS DESIGNED TO FURTHER THE PREVIOUS UK SATELLITE INVESTIGATIONS IN SPACE. IT WAS A SMALL OBSERVATORY WITH FIVE EXPERIMENTS.

THE SPACECRAFT CONSISTED OF A 57-CM-HIGH, 12-SIDED PRISM WITH 69.6 CM BETWEEN ANY PAIR OF PARALLEL SIDES. A 24.2-CM-HIGH CONICAL STRUCTURE BEARING VARIOUS ANTENNAS WAS MATED TO THE TOP OF THE PRISM. FROM THE LOWER END OF THE PRISM, FOUR PADDLES EXTENDED DIAGONALLY DOWNWARD AT AN ANGLE OF 25 DEG FROM THE SPIN AXIS NORMAL. TWO SETS OF ANTENNAS WERE STRUNG AROUND THE OUTER ENDS OF THESE PADDLES. THE PADDLES ALSO SERVED AS MOUNTS FOR SOME OF THE INSTRUMENT SENSORS. SOLAR CELLS FOR POWER WERE MOUNTED ON BOTH THE SIDES OF THE PRISM AND THE PADDLES. THE SPACECRAFT WAS INITIALLY SPIN STABILIZED AT ABOUT 31 RPM BUT SLOWED TO ABOUT 12 RPM BY THE END OF THE FIRST YEAR IN ORBIT. ATTITUDE AND SPIN WERE MONITORED BY A COMBINATION OF ONBOARD SUN SENSORS AND BY OPTICAL OBSERVATIONS OF SOLAR REFLECTION FROM A SERIES OF SIX MIRRORS MOUNTED NEAR THE SATELLITE EQUATOR. A TAPE RECORDER WAS INCLUDED TO OBTAIN DATA FOR GLOBAL SURVEYS OF OBSERVED VARIABLES. EXPERIMENT OUTPUT FOR OVER ONE ORBIT COULD BE RECORDED IN A LOW-SPEED MODE, WITH ONE COMPLETE SET OF SENSOR DATA EACH 0.9 SEC. A HIGH-SPEED MODE OF OBSERVATION PROVIDED FOR REAL-TIME TELEMETRY WITH A COMPLETE SET OF SENSOR SAMPLING 55 TIMES PER SECOND. THE DATA WERE DUMPED IN 140 SEC IN THE HIGH-SPEED MODE. ALL EXPERIMENTS OPERATED WELL. A MOLECULAR OXYGEN EXPERIMENT DETERIORATED RAPIDLY, AS EXPECTED, AND COMPLETELY FAILED WITHIN 2 MONTHS AFTER LAUNCH DUE TO LIMITATIONS IN SENSOR DESIGN. ON OCTOBER 24, 1967, THE TAPE RECORDER BEGAN TO MALFUNCTION. IT OPERATED SPORADICALLY UNTIL ITS COMPLETE FAILURE ON FEBRUARY 6, 1968. REAL-TIME OPERATION PROVIDED CONSIDERABLE DATA UNTIL A SATELLITE POWER FAILURE IN DECEMBER 1968 RESTRICTED OPERATION TO DAYLIGHT HOURS ONLY. BY APRIL 1969, OPERATIONS HAD DECREASED TO ABOUT 15 PASSES PER WEEK, AND OBSERVATIONS WERE MADE ONLY FROM WINKFIELD, ENGLAND. AT THIS TIME, THE SATELLITE SPIN HAD DECAYED TO 1 RPM. THE SATELLITE WAS TURNED OFF IN SEPTEMBER 1969 AND DECAYED ON DECEMBER 5, 1970.

**********ARIEL 3, SAYERS

EXPERIMENT NAME- LANGMUIR PROBE NSSDC ID 67-042A-01

ORIGINAL EXPERIMENT INSTITUTION- U OF BIRMINGHAM

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - J. SAYERS U OF BIRMINGHAM, UK BIRMINGHAM, ENGLAND

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 09/01/69

EXPERIMENT BRIEF DESCRIPTION

ELECTRON TEMPERATURES WERE DETERMINED BY EMPLOYING AN EXTENSION OF THE LANGMUIR PROBE TECHNIQUE. TWO IDENTICAL RHODIUM PLATED SPHERICAL PROBES, 3.2-CM IN DIAMETER AND WITH A 6.4-CM CENTER-TO-CENTER DISTANCE, WERE LINEARLY SWEPT FROM MINUS SIX TO PLUS SIX V IN 5.2 SEC. THIS SWEEP VOLTAGE WAS MODULATED BY A LOW-LEVEL SINE WAVE SIGNAL OF 6.0 KHZ. THE TWO PROBES, HOWEVER, WERE KEPT AT SLIGHTLY DIFFERENT POTENTIALS WITH RESPECT TO THE SPACECRAFT. THE DIFFERENTIAL CURRENTS TO EACH PROBE WERE COMPARED, AND AUTOMATICALLY KEPT IN A FIXED RATIO BY ADJUSTMENT OF THIS VOLTAGE DIFFERENCE BETWEEN THE TWO PROBES. UNDER THESE CONDITIONS, THE ELECTRON TEMPERATURE WAS A FUNCTION OF THIS KNOWN RATIO AND THE VALUE OF THE VOLTAGE DIFFERENCE AS THE PROBES WERE SWEPT THROUGH THE RETARDING REGION. (THE RETARDING REGION IS THAT VOLTAGE INTERVAL JUST BELOW SPACE POTENTIAL DURING WHICH THE CURRENT INCREASES FROM ALMOST ZERO TO JUST BELOW THE VALUE THAT WOULD BE CAUSED BY AMBIENT CONDITIONS.) THE EXPERIMENT WAS OPERATED FOR 5.2 SEC AND THEN TURNED OFF FOR THE SAME AMOUNT OF TIME WHILE THE ELECTRON DENSITY EXPERIMENT WAS TURNED ON. THE EXPERIMENT OPERATED NORMALLY AND USEFUL DATA WAS OBTAINED. A MORE DETAILED EXPLANATION OF THE EXPERIMENT CAN BE FOUND IN 'THE RADIO AND ELECTRONIC ENGINEER,' VOL. 35, NO. 1, JANUARY 1968, PAGES 55-63.

DATA SET NAME- ELECTRON DENSITY AND TEMPERATURE PLOTS ON MICROFILM NSSDC ID 67-042A-01C

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 05/05/67 TO 04/15/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET, PREPARED BY THE EXPERIMENTER, IS ORGANIZED IN PAIRS OF MICROFILM FRAMES, ONE PAIR PER SATELLITE ORBIT. THE SECOND FRAME IN EACH PAIR IS A GRAPHIC REPRESENTATION OF THE SUBSATELLITE PATH. LATITUDE AND LONGITUDE ARE SHOWN ON LINEAR SCALES ALONG WITH CONTINENTAL OUTLINES AND ORBIT PATH FOR WHICH DATA ARE PLOTTED ON THE COMPANION FRAME. DATA START AND STOP POSITIONS ALONG THE ORBIT PATH EVERY MINUTE AND EVERY TEN MINUTES, ARE MARKED. THE FIRST OF EACH PAIR OF FRAMES CONSISTS OF A PLOT WHICH MAY BE DIVIDED INTO THREE PARTS. THE CENTER PART IS A LOGARITHMIC PLOT (10E3 TO 2X10E6) OF ELECTRON NUMBER DENSITY PER CC VS A LINEAR PLOT OF TIME FROM DATA START. THE UPPER PORTION OF THE FRAMES CONSISTS OF A LINEAR PLOT OF ELECTRON TEMPERATURE (0-4500 DEG K) VS A LINEAR PLOT OF TIME. THE LOWER PORTION OF THE FRAMES PROVIDES SCALING OF THE TIME COORDINATE SO THAT ONE CAN READ CORRESPONDING VALUES OF GEOGRAPHIC LONGITUDE AND LATITUDE, INVARIANT LATITUDE, LOCAL AND MAGNETIC LOCAL TIME, AND SOLAR ZENITH ANGLE. THE FRAME PAIRS ARE NOT IN A USEFUL SEQUENCE, SO AN INDEX OF THE ENTIRE DATA SET IS AVAILABLE ON THE FRONT OF EACH MICROFILM REEL. THIS INDEX SHOWS TIME SEQUENCE OF THE DATA, AND A SEQUENCE OF EQUATOR CROSSING LONGITUDES.

DATA SET NAME- ELECTRON DENSITY AND TEMPERATURE LISTINGS ON MICROFILM NSSDC ID 67-042A-01D

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 05/06/67 TO 12/31/67 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF CHRONOLOGICAL MICROFILMED MACHINE LISTINGS OF ELECTRON NUMBER DENSITY (ELECTRONS PER CC) AND ELECTRON TEMPERATURE (IN DEG KELVIN). INCLUDED IN THE LISTING FOR EACH SET OF THESE VALUES ARE UT (DECIMAL HRS), GEOGRAPHIC AND MAGNETIC LONGITUDES AND LATITUDES, ALTITUDE (KM), SOLAR ZENITH ANGLE, AND MCILWAIN MAGNETIC FIELD MODEL SHELL AND INTENSITY VALUES. THESE DATA WERE REDUCED AND PROVIDED BY THE EXPERIMENTER.

**********ATS 3 **********

SPACECRAFT COMMON NAME- ATS 3 NSSDC ID 67-111A
ALTERNATE NAMES- ATS-C, 03029

LAUNCH DATE- 11/05/67 SPACECRAFT WEIGHT IN ORBIT- 365.0 KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

EPOCH DATE- 11/06/67 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 1422. MIN
APOAPSIS- 35705.0 KM ALT PERIAPSIS- 35330.0 KM ALT INCLINATION- 0.536 DEG

SPACECRAFT BRIEF DESCRIPTION

ATS 3 (APPLICATIONS TECHNOLOGY SATELLITE) WAS ONE OF A SERIES OF SPACECRAFT DESIGNED TO DEMONSTRATE THE UTILITY AND FEASIBILITY OF A VARIETY OF TECHNOLOGICAL AND SCIENTIFIC ACTIVITIES THAT COULD BE CARRIED OUT BY AN EARTH-SYNCHRONOUS SPACECRAFT. OF THE 12 EXPERIMENTS ON BOARD, NINE WERE TECHNOLOGICAL ENGINEERING EXPERIMENTS CONCERNED WITH NAVIGATION, COMMUNICATIONS, AND SPACECRAFT OPERATION AND EQUIPMENT. TWO OF THE REMAINING EXPERIMENTS WERE PHOTOGRAPHIC IMAGING EXPERIMENTS THAT COULD PRODUCE NEAR REAL-TIME DAYLIGHT PICTURES OF THE EARTH-ATMOSPHERE SYSTEM. THE REMAINING EXPERIMENT WAS AN IONOSPHERIC BEACON. THE SPIN-STABILIZED SPACECRAFT WAS CYLINDRICALLY SHAPED AND MEASURED 180 CM IN LENGTH AND 142 CM IN DIAMETER. THE PRIMARY STRUCTURAL MEMBERS WERE A HONEYCOMBED EQUIPMENT SHELF AND THRUST TUBE. SUPPORT RODS EXTENDED RADIALLY OUTWARD FROM THE THRUST TUBE AND WERE AFFIXED TO SOLAR PANELS WHICH FORMED THE OUTER WALLS OF THE SPACECRAFT. EQUIPMENT COMPONENTS AND PAYLOAD WERE MOUNTED IN THE ANNULAR SPACE BETWEEN THE THRUST TUBE AND SOLAR PANELS. IN ADDITION TO SOLAR PANELS, THE SPACECRAFT WAS EQUIPPED WITH TWO RECHARGEABLE NICKEL-CADMIUM BATTERIES TO PROVIDE ELECTRICAL POWER. EIGHT 150-CM VHF EXPERIMENT WHIP ANTENNAS WERE MOUNTED AROUND THE AFT END OF THE SPACECRAFT, WHILE EIGHT TELEMETRY AND COMMAND WHIP ANTENNAS WERE PLACED ON THE FORWARD END. SPACECRAFT GUIDANCE AND ORBITAL CORRECTIONS WERE ACCOMPLISHED BY 2.3-KG HYDROGEN PEROXIDE AND HYDRAZINE THRUSTERS, WHICH WERE ACTIVATED BY GROUND COMMAND. INITIALLY PLACED AT 48 DEG W LONGITUDE OVER THE ATLANTIC OCEAN IN A GEOSTATIONARY EQUATORIAL ORBIT, THE SATELLITE POSITION HAS BEEN VARIED BETWEEN 45 AND 95 DEG W LONGITUDE IN SUPPORT OF METEOROLOGICAL OPERATIONS. IN GENERAL, THE VARIOUS EXPERIMENTS HAVE BEEN SUCCESSFUL.

**********ATS 3, DAROSA

EXPERIMENT NAME- RADIO BEACON NSSDC ID 67-111A-02

ORIGINAL EXPERIMENT INSTITUTION- STANFORD U

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - A.V. DAROSA STANFORD U STANFORD, CA

EXPERIMENT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST EXPERIMENT DATA RECORDED- 00/00/74

EXPERIMENT BRIEF DESCRIPTION

THE IONOSPHERIC PROPAGATION EXPERIMENT CONSISTS OF CONTINUOUS TRANSMISSION OF TWO PHASE COHERENT RADIO FREQUENCIES (137.350 AND 412.050 MHZ) FROM THE SPACECRAFT. BY STUDY OF FARADAY ROTATION ANGLE MEASUREMENTS OF THE LOWER FREQUENCY OR DIFFERENTIAL DOPPLER FREQUENCY RECORDINGS OF THE TWO FREQUENCIES, THE TOTAL ELECTRON CONTENT ALONG THE PROPAGATION PATH CAN BE CALCULATED. IONOSPHERIC IRREGULARITIES CAN ALSO BE OBSERVED. PERFORMANCE HAS BEEN NOMINAL.

DATA SET NAME- TOTAL ELECTRON CONTENT NEAR WALLOPS, FOR MAGNETIC STORMS FROM 1967 THROUGH 1972 NSSDC ID 67-111A-02B

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 11/30/67 TO 12/19/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION
THESE ARE REDUCED DATA IN BOTH DIGITAL AND PLOTTED FORM. SEVENTY-SIX STORMS ARE IDENTIFIED AND DATA FOR FIVE DAYS, STARTING WITH STORM COMMENCEMENT, ARE GIVEN FOR THESE STORMS. THE DATA FOR EACH STORM REQUIRE THREE PAGES, WITH TWO GRAPHS AT THE TOP OF EACH PAGE PREPARED FROM DATA APPEARING ON THE LOWER PORTION OF THE PAGE. THE FIRST PAGE CONTAINS TOTAL ELECTRON CONTENT (TEC) DATA NORMALIZED TO A PERPENDICULAR COLUMN THROUGH THE IONOSPHERIC POINT (INTERSECTION OF THE PROPAGATION PATH WITH THE F2 MAX). THE SECOND PAGE CONTAINS F2 PEAK DENSITY DATA FROM GROUND OBSERVATIONS. THE SLAB-THICKNESS DATA ON THE THIRD PAGE ARE COMPUTED FROM DATA GIVEN ON PAGE 1 AND PAGE 2. ALL THE GRAPHS ARE OF A PARAMETER VERSUS TIME, BUT THE PARAMETER FOR THE SECOND GRAPH ON EACH PAGE IS A VARIATION OF THE PARAMETER FROM ITS 7-DAY MEAN VALUE. MORE COMPLETE DATA DESCRIPTION AND DOCUMENTATION APPEARS WITH THE DATA. THE DATA ARE IN MENDILLO AND KLOBUCHAR, "AN ATLAS OF THE MID-LATITUDE F-REGION RESPONSE TO GEOMAGNETIC STORMS."

**********DAPP(72-018A) **********

SPACECRAFT COMMON NAME- DAPP(72-018A) NSSDC ID 72-018A
ALTERNATE NAMES- 05903, DSAP(72-018A), CODE 417, BLOCK 5C

LAUNCH DATE- 03/24/72 SPACECRAFT WEIGHT IN ORBIT- 150. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

EPOCH DATE- 03/28/72 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 101.8 MIN
APOAPSIS- 885. KM ALT PERIAPSIS- 803. KM ALT INCLINATION- 98.8 DEG

SPACECRAFT BRIEF DESCRIPTION
ORIGINALLY PART OF A CLASSIFIED SYSTEM OF U.S. AIR FORCE WEATHER SATELLITES, THE SPACECRAFT'S MISSION WAS NOT REVEALED UNTIL MARCH 1973. THE CYLINDRICALLY SHAPED SPACECRAFT CARRIED BOTH VISUAL AND INFRARED SENSORS FOR DAYLIGHT AND NIGHT CLOUDCOVER SURVEILLANCE. THE SATELLITE WAS MAINTAINED IN A NOON-MIDNIGHT, SUN SYNCHRONOUS ORBIT. IN ADDITION, THE SPACECRAFT WAS ALSO CAPABLE OF TAKING INDIRECT ATMOSPHERIC TEMPERATURE PROFILES. THE SATELLITE COULD PRODUCE PHOTOGRAPHIC DATA WITH A HORIZONTAL RESOLUTION AT NADIR BETWEEN 0.6 AND 3.2 KM. DATA FROM THE SATELLITE WERE RECEIVED AT GROUND RECEIVING SITES AND RELAYED TO THE U.S. AIR FORCE GLOBAL WEATHER CENTRAL WHERE THE DATA WERE USED FOR OPERATIONAL FORECASTS AND ANALYSES. THE SATELLITE ALSO HAD A DIRECT READOUT CAPABILITY TO PROVIDE DATA TO VARIOUS UNDISCLOSED RECEIVING SITES LOCATED AROUND THE EARTH.

**********DAPP(72-018A), SNYDER

EXPERIMENT NAME- AURORAL IMAGERY NSSDC ID 72-018A-01

ORIGINAL EXPERIMENT INSTITUTION- GLOBAL WEATHER CTR

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - L. SNYDER GLOBAL WEATHER CTR OFFUTT AIR FORCE BASE, NJ

EXPERIMENT STATUS OF OPERATION- UNKNOWN
DATE LAST EXPERIMENT DATA RECORDED-

EXPERIMENT BRIEF DESCRIPTION
THIS IMAGERY SYSTEM WAS SENSITIVE IN THE WAVELENGTH RANGE FROM 4,000 TO 11,000 A, AND PEAKED AT ABOUT 8,000 A. THE FORWARD MOTION OF THE SATELLITE AND A ROTATING MIRROR PROVIDED THE SCANNING NEEDED TO GENERATE THE AURORAL IMAGES. THE INSTRUMENT RESOLUTION AT SUBTRACK WAS BETWEEN 0.6 AND 3.2 KM. THE IMAGERY WAS PRIMARILY USED FOR OPERATIONAL WEATHER FORECASTING. HOWEVER, POLAR NIGHT PASSES WERE SELECTED FOR THEIR CONTENT OF AURORAL EMISSION IMAGERY.

DATA SET NAME- AURORAL IMAGERY ON MICROFILM NSSDC ID 72-018A-01A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 06/16/72 TO 10/04/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 15 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION
THIS DATA SET OF 35-MM FILM CONTAINS AURORAL IMAGES WHICH WERE TELEMETERED FROM THE SATELLITE SENSORS. THE DATA ARE CORRECTED FOR ROLL AND ALTITUDE VARIATIONS, BUT ARE NOT CORRECTED FOR SMALL PITCH AND YAW VARIATIONS. THE DATA FRAME WIDTH IS ABOUT 3000 KM. THE GEOGRAPHIC POSITIONS OF THE AURORAL FORMS CAN BE DETERMINED FROM THE EPHEMERIS INFORMATION AND COORDINATE GRIDS ACCOMPANYING THE DATA. A DATA USER INFORMATION SHEET AND NOTES ON THE USE OF THESE AURORAL IMAGES ARE ALSO PROVIDED WITH THE DATA.

**********ESSA 3 **********

SPACECRAFT COMMON NAME- ESSA 3 NSSDC ID 66-087A
ALTERNATE NAMES- TOS-A, 02435

LAUNCH DATE- 10/02/66 SPACECRAFT WEIGHT IN ORBIT- 316. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 10/09/68

EPOCH DATE- 10/03/66 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 114.5 MIN
APOAPSIS- 1475.00 KM ALT PERIAPSIS- 1378.00 KM ALT INCLINATION- 101.0 DEG

SPACECRAFT BRIEF DESCRIPTION
ESSA 3 WAS A SUN-SYNCHRONOUS OPERATIONAL METEOROLOGICAL SATELLITE DESIGNED TO TAKE AND RECORD DAYTIME EARTH CLOUDCOVER PICTURES ON A GLOBAL BASIS FOR SUBSEQUENT PLAYBACK TO A GROUND ACQUISITION FACILITY. THE SPACECRAFT WAS ALSO CAPABLE OF PROVIDING WORLDWIDE MEASUREMENTS OF REFLECTED SOLAR AND LONG-WAVE RADIATION LEAVING THE EARTH. THE SPACECRAFT HAD ESSENTIALLY THE SAME CONFIGURATION AS THAT OF A TIROS SATELLITE, I.E., AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARRYING MOST OF THE SUBSYSTEMS AND A COVER ASSEMBLY (HAT). ELECTRICAL POWER WAS PROVIDED BY APPROXIMATELY 10,000 1- BY 2-CM SOLAR CELLS THAT WERE MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. TWO REDUNDANT ADVANCED VIDICON CAMERA SYSTEM (AVCS) CAMERAS WERE MOUNTED ON OPPOSITE SIDES OF THE SPACECRAFT, WITH THEIR OPTICAL AXES PERPENDICULAR TO THE SPIN AXIS. TWO SETS OF FLAT PLATE RADIOMETERS WERE ALSO

SUSPENDED ON OPPOSITE SIDES OF THE SATELLITE BENEATH THE EDGE OF THE BASEPLATE. A PAIR OF CROSSED-DIPOLE COMMAND RECEIVER ANTENNAS PROJECTED OUT AND DOWN FROM THE BASEPLATE. A MONOPOLE TELEMETRY AND TRACKING ANTENNA EXTENDED OUT FROM THE TOP OF THE COVER ASSEMBLY. THE SATELLITE SPIN RATE WAS CONTROLLED BY MEANS OF A MAGNETIC ATTITUDE SPIN COIL (MASC), WITH THE SPIN AXIS MAINTAINED NORMAL TO THE ORBITAL PLANE (CARTWHEEL ORBIT MODE) TO WITHIN PLUS OR MINUS 1 DEG. THE MASC WAS A CURRENT-CARRYING COIL MOUNTED IN THE COVER ASSEMBLY. THE MAGNETIC FIELD INDUCED BY THE CURRENT INTERACTED WITH THE EARTH'S MAGNETIC FIELD TO PROVIDE THE TORQUE NECESSARY TO MAINTAIN A DESIRED SPIN RATE OF 9.225 RPM. ESSA 3 PERFORMED NORMALLY UNTIL JANUARY 20, 1967, WHEN THE RADIOMETER EXPERIMENT FAILED. THE FIRST AVCS CAMERA FAILED ON SEPTEMBER 29, 1967, THE REMAINING CAMERA FAILED ON OCTOBER 9, 1968, AND THE SATELLITE WAS DEACTIVATED ON DECEMBER 2, 1968.

**********ESSA 3, NESS STAFF

EXPERIMENT NAME- ADVANCED VIDICON CAMERA SYSTEM (AVCS) NSSDC ID 66-087A-01

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD.

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 10/09/68

EXPERIMENT BRIEF DESCRIPTION

THE ESSA 3 ADVANCED VIDICON CAMERA SYSTEM (AVCS) WAS A COMBINATION CAMERA, TAPE RECORDER, AND TRANSMITTER THAT COULD RECORD AND STORE A SERIES OF REMOTE DAYTIME CLOUDCOVER PICTURES FOR SUBSEQUENT PLAYBACK TO A GROUND DATA ACQUISITION FACILITY. THE CAMERAS AND TAPE RECORDER SYSTEM WERE ESSENTIALLY THE SAME AS THOSE ON NIMBUS 1 AND 2. THE ESSA AVCS SYSTEM CONSISTED OF TWO REDUNDANT WIDE-ANGLE CAMERAS WITH 2.54-CM VIDICONS. THE CAMERAS WERE MOUNTED 180 DEG APART ON THE SIDE OF THE SPACECRAFT, WITH THEIR OPTICAL AXES PERPENDICULAR TO THE SPIN AXIS. THE CAMERA OPTIC SYSTEM EMPLOYED A 108-DEG LENS WITH A FOCAL LENGTH OF 6.0 MM. EACH CAMERA WAS INDEPENDENTLY TRIGGERED INTO ACTION ONLY WHEN IT CAME IN VIEW OF THE EARTH. A VIDEO FRAME CONSISTED OF 0.25 SEC OF BLANKED VIDEO FOLLOWED BY 6.25 SEC OF VIDICON SCAN (833 LINES) AND A FINAL 0.25-SEC PERIOD OF BLANKED VIDEO. CONCURRENT WITH SHUTTER ACTUATION, A 16-INCREMENT GRAY SCALE WAS INCLUDED AT THE EDGE OF EACH PICTURE FRAME AS A CONTRAST CHECK. FOUR-TRACK TAPE RECORDER COULD STORE UP TO 36 PICTURES. THE DATA COULD BE READ OUT BETWEEN PICTURE-TAKING CYCLES WITHOUT LOSING A PICTURE OR INTERRUPTING A SEQUENCE. SIX OR TWELVE AVCS PICTURES PER ORBIT COULD BE PROGRAMMED. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 1450 KM), A PICTURE COVERED A 3100- BY 3100-KM SQUARE WITH A HORIZONTAL RESOLUTION OF ABOUT 3 KM AT NADIR. THERE WAS A 50 PERCENT OVERLAP ALONG THE TRACK BETWEEN SUCCESSIVE PICTURES TO ENSURE COMPLETE COVERAGE. THE EXPERIMENT WAS A SUCCESS, WITH OVER 90,000 USABLE PICTURES TRANSMITTED. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR AN INDEX OF AVAILABLE DATA, SEE THE 'CATALOG OF METEOROLOGICAL SATELLITE DATA - ESSA 3, ESSA 5, AND ESSA 7 TELEVISION CLOUD PHOTOGRAPHY' FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 66-087A-01A. IDENTICAL EXPERIMENTS WERE FLOWN ON ESSA 5, 7, AND 9.

DATA SET NAME- GLOBAL DAILY NEPHANALYSIS OF SATELLITE NSSDC ID 66-087A-01A

CLOUD OBSERVATIONS

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 10/04/66 TO 08/31/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS ORBIT NUMBER AND TRACK OR SWATH NUMBER (A FUNCTION OF EQUATORIAL CROSSING LONGITUDE), ALONG WITH TIME OF FIRST PICTURE AND SUBSATELLITE LOCATION FOR EACH OF THE 12 PICTURES IN EACH SWATH. A COMPUTER-PRODUCED AND GRIDDED MAP INDEX SHOWING BOTH HEMISPHERES, ONCE A DAY, SERVES AS THE BASIC DATA INDEX. WITH TWO EXCEPTIONS, THESE MAPS ARE COMPUTER-PRODUCED COMPOSITE MOSAICS FOR A RELATIVELY FIXED LOCAL TIME. THE TWO EXCEPTIONS ARE THE OCTOBER 1966 - DECEMBER 1966 INDEX (NEPHANALYSIS MAPS ARE USED AS FOR TIROS DATA), AND THE JANUARY 1968 - MARCH 1968 INDEX (MOSAICS MADE OF INDIVIDUAL PICTURES). CONTINENTAL OUTLINES HAVE BEEN ADDED FOR DATA AFTER SEPTEMBER 7, 1967, EXCEPT FOR THE PERIOD JANUARY TO APRIL, 1968. BEST PICTURES FROM ANY OF THE THREE SATELLITES WERE USED, BUT USERS CAN DETERMINE WHICH PICTURES WERE INCLUDED BY REFERRING TO ORBIT NUMBERS IN THE TABULAR INDEX (ESSA 3 NUMBERS ARE GENERALLY ABOUT 2500 GREATER THAN THOSE OF ESSA 5, AND ESSA 5 ABOUT 6000 GREATER THAN ESSA 7). THESE PRINTED MAPS ARE CLEAR AND COMPLETE ENOUGH TO HAVE POTENTIAL UTILITY FOR RESEARCH. THESE INDEXES AND THE PHOTOGRAPHY MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED AND LARGER LIBRARIES, LISTED AS U.S. DEPT OF COMMERCE, ESSA, EDS, "CATALOG OF METEOROLOGICAL SATELLITE DATA - ESSA 3 (ESSA 5 AND ESSA 7) TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.313 THROUGH 5.319)."

DATA SET NAME- CATALOG OF METEOROLOGICAL SATELLITE DATA- NSSDC ID 66-087A-01B
ESSA 3 TELEVISION CLOUD PHOTOGRAPHY

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 01/01/67 TO 09/03/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 7 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES OBTAINED FROM ESSA 3. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS ORBIT NUMBER AND TRACK OR SWATH NUMBER (A FUNTION OF EQUATORIAL CROSSING LONGITUDE), ALONG WITH TIME OF FIRST PICTURES AND SUBSATELLITE LOCATION OF EACH OF 12 PICTURES IN EACH SWATH, A MAP INDEX SHOWING BOTH HEMISPHERES, ONCE PER DAY, COMPUTER-PRODUCED AND GRIDDED AND WITH CONTINENTS OUTLINED, SERVES AS THE BASIC DATA INDEX. THESE MAPS ARE COMPOSITE MOSAICS FOR RELATIVELY FIXED LOCAL SOLAR TIME. THESE PRINTED MAPS ARE CLEAR AND COMPLETE ENOUGH TO HAVE POTENTIAL UTILITY FOR RESEARCH. THIS INDEX AND THE PHOTOGRAPHY MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEX IS ON FILE AND AVAILAELE FOR USE AT NSSDC. IT MAY BE AVAILABLE AT SOME STABILIZED AND LARGER LIBRARIES AS U.S. DEPT OF COMMERCE, ESSA, EDS, "CATALOG OF METEOROLOGICAL SATELLITE DATA- ESSA TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.313 THROUGH 5.319)."

**********ESSA 5 **********

SPACECRAFT COMMON NAME- ESSA 5 NSSDC ID 67-036A
ALTERNATE NAMES- TOS-C, 02757

LAUNCH DATE- 04/20/67 SPACECRAFT WEIGHT IN ORBIT- 327. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 10/08/69

EPOCH DATE- 04/21/67 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 113.6 MIN
APOAPSIS- 1423. KM ALT PERIAPSIS- 1361. KM ALT INCLINATION- 101.97 DEG

SPACECRAFT BRIEF DESCRIPTION

ESSA 5 WAS A SUN-SYNCHRONOUS OPERATIONAL METEOROLOGICAL SATELLITE DESIGNED TO TAKE AND RECORD DAYTIME EARTH CLOUDCOVER PICTURES ON A GLOBAL BASIS FOR SUBSEQUENT PLAYBACK TO A GROUND ACQUISITION FACILITY. THE SPACECRAFT WAS ALSO CAPABLE OF PROVIDING WORLDWIDE MEASUREMENTS OF REFLECTED SOLAR AND LONG-WAVE RADIATION LEAVING THE EARTH. THE SPACECRAFT HAD ESSENTIALLY THE SAME CONFIGURATION AS THAT OF A TIROS SATELLITE, I.E., AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARRYING MOST OF THE SUBSYSTEMS AND A COVER ASSEMBLY (HAT). ELECTRIC POWER WAS PROVIDED BY APPROXIMATELY 10,000 1- BY 2-CM SOLAR CELLS THAT WERE MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. TWO REDUNDANT ADVANCED VIDICON CAMERA SYSTEM (AVCS) CAMERAS WERE MOUNTED ON OPPOSITE SIDES OF THE SPACECRAFT, WITH THEIR OPTICAL AXES PERPENDICULAR TO THE SPIN AXIS. TWO SETS OF FLAT PLATE RADIOMETERS WERE ALSO SUSPENDED ON OPPOSITE SIDES OF THE SATELLITE, BENEATH THE EDGE OF THE BASEPLATE. A PAIR OF CROSSED-DIPOLE COMMAND RECEIVER ANTENNAS PROJECTED OUT AND DOWN FROM THE BASEPLATE. A MONOPOLE TELEMETRY AND TRACKING ANTENNA EXTENDED OUT FROM THE TOP OF THE COVER ASSEMBLY. THE SATELLITE SPIN RATE WAS CONTROLLED BY MEANS OF A MAGNETIC ATTITUDE SPIN COIL (MASC), WITH THE SPIN AXIS MAINTAINED NORMAL TO THE ORBITAL PLANE (CARTWHEEL ORBIT MODE) TO WITHIN PLUS OR MINUS 1 DEG. THE MASC WAS A CURRENT-CARRYING COIL MOUNTED IN THE COVER ASSEMBLY. THE MAGNETIC FIELD INDUCED BY THE CURRENT INTERACTED WITH THE EARTH'S MAGNETIC FIELD TO PROVIDE THE TORQUE NECESSARY TO MAINTAIN A DESIRED SPIN RATE OF 9.225 RPM. THE SPACECRAFT PERFORMED NORMALLY AFTER LAUNCH UNTIL SEPTEMBER 22, 1967, WHEN THE RADIOMETER EXPERIMENT FAILED. THE AVCS FUNCTIONED UNTIL OCTOBER 8, 1969, WHEN THE SATELLITE WAS PLACED IN A STANDBY MODE. ESSA 5 WAS DEACTIVATED ON FEBRUARY 20, 1970.

**********ESSA 5, NESS STAFF

EXPERIMENT NAME- ADVANCED VIDICON CAMERA SYSTEM (AVCS) NSSDC ID 67-036A-01

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD.

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 10/08/69

EXPERIMENT BRIEF DESCRIPTION

THE ESSA 5 ADVANCED VIDICON CAMERA SYSTEM (AVCS) WAS A COMBINATION CAMERA, TAPE RECORDER, AND TRANSMITTER THAT COULD RECORD AND STORE A SERIES OF REMOTE DAYTIME CLOUDCOVER PICTURES FOR SUBSEQUENT PLAYBACK TO A GROUND

DATA ACQUISITION FACILITY. THE ESSA AVCS SYSTEM CONSISTED OF TWO REDUNDANT WIDE-ANGLE CAMERAS WITH 2.54-CM VIDICONS. THE CAMERAS WERE MOUNTED 180 DEG APART ON THE SIDE OF THE SPACECRAFT, WITH THEIR OPTICAL AXES PERPENDICULAR TO THE SPIN AXIS. THE CAMERA OPTIC SYSTEM EMPLOYED A 108-DEG LENS WITH A FOCAL LENGTH OF 6.0 MM. EACH CAMERA WAS INDEPENDENTLY TRIGGERED INTO ACTION ONLY WHEN IT CAME IN VIEW OF THE EARTH. A VIDEO FRAME CONSISTED OF 0.25 SEC OF BLANKED VIDEO FOLLOWED BY 6.25 SEC OF VIDICON SCAN (833 LINES) AND A FINAL 0.25-SEC PERIOD OF BLANKED VIDEO. CONCURRENT WITH SHUTTER ACTUATION, A 16-INCREMENT GRAY SCALE WAS INCLUDED AT THE EDGE OF EACH PICTURE FRAME AS A CONTRAST CHECK. A FOUR-TRACK TAPE RECORDER COULD STORE UP TO 36 PICTURES. THE DATA COULD BE READ OUT BETWEEN PICTURE-TAKING CYCLES WITHOUT LOSING A PICTURE OR INTERRUPTING A SEQUENCE. SIX OR TWELVE AVCS PICTURES PER ORBIT COULD BE PROGRAMMED. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 1450 KM), A PICTURE COVERED A 3100- BY 3100-KM SQUARE WITH A HORIZONTAL RESOLUTION OF ABOUT 3 KM AT NADIR. THERE WAS A 50 PERCENT OVERLAP ALONG THE TRACK BETWEEN SUCCESSIVE PICTURES TO ENSURE COMPLETE COVERAGE. THE EXPERIMENT WAS A SUCCESS, AND GOOD DATA WERE OBTAINED UNTIL OCTOBER 8, 1969, WHEN THE SYSTEM WAS TURNED OPERATIONALLY OFF. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR AN INDEX OF AVAILABLE DATA, SEE THE 'CATALOG OF METEOROLOGICAL SATELLITE DATA - ESSA 3, ESSA 5, AND ESSA 7 TELEVISION CLOUD PHOTOGRAPHY' FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 67-036A-01A. IDENTICAL EXPERIMENTS WERE FLOWN ON ESSA 3, 7, AND 9.

DATA SET NAME- CATALOG OF METEOROLOGICAL SATELLITE DATA- ESSA 5 TELEVISION CLOUD PHOTOGRAPHY NSSDC ID 67-036A-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 06/01/67 TO 09/03/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 7 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS ORBIT NUMBER AND TRACK OR SWATH NUMBER (A FUNCTION OF EQUATORIAL CROSSING LATITUDE), ALONG WITH TIME OF FIRST PICTURE AND SUBSATELLITE LOCATION OF EACH 12 PICTURES IN EACH SWATH. A MAP INDEX SHOWING BOTH HEMISPHERES, ONCE A DAY, COMPUTER PRODUCED AND GRIDDED, SERVES AS THE BASIC DATA INDEX. WITH ONE EXCEPTION, THESE MAPS ARE COMPUTER PRODUCED COMPOSITE MOSAICS FOR A RELATIVELY FIXED LOCAL SOLAR TIME. THE EXCEPTION IS THE INDEX FROM JANUARY TO APRIL, 1968, IN WHICH MOSAICS ARE MADE OF INDIVIDUAL PICTURES. CONTINENTAL OUTLINES WERE ADDED AFTER SEPTEMBER 7, 1967, EXCEPT THE INTERVAL FROM JANUARY TO APRIL, 1968. THE BEST PICTURES FROM ANY THREE SATELLITES WERE USED, BUT USERS MAY DETERMINE WHICH PICTURES WERE INCLUDED BY REFERRING TO ORBIT NUMBERS IN THE TABULAR INDEX (ESSA 3 NUMBERS ARE GENERALLY ABOUT 2500 GREATER THAN THOSE OF ESSA 5, AND ESSA 5 ABOUT 6000 GREATER THAN ESSA 7). THESE PRINTED MAPS ARE CLEAR AND COMPLETE ENOUGH TO HAVE POTENTIAL UTILITY FOR RESEARCH. THESE INDEXES AND THE PHOTOGRAPHY MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED AND LARGER LIBRARIES, LISTED AS U.S. DEPT OF COMMERCE, ESSA, EDS 'CATALOG OF METEOROLOGICAL SATELLITE DATA - ESSA 3 (ESSA 5 AND ESSA 7) TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.314 THROUGH 5.319).'

**********ESSA 7 **********

SPACECRAFT COMMON NAME- ESSA 7 NSSDC ID 68-069A
ALTERNATE NAMES- PL-6838, TOS-E, 03345

LAUNCH DATE- 08/16/68 SPACECRAFT WEIGHT IN ORBIT- 347. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 07/19/69

EPOCH DATE- 08/16/68 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 114.9 MIN
APOAPSIS- 1476. KM ALT PERIAPSIS- 1432. KM ALT INCLINATION- 101.826 DEG

SPACECRAFT BRIEF DESCRIPTION

ESSA 7 WAS A SUN-SYNCHRONOUS OPERATIONAL METEOROLOGICAL SATELLITE DESIGNED TO TAKE AND RECORD DAYTIME EARTH-CLOUD PICTURES ON A GLOBAL BASIS FOR SUBSEQUENT PLAYBACK TO A GROUND ACQUISITION FACILITY. THE SPACECRAFT WAS ALSO CAPABLE OF PROVIDING WORLDWIDE MEASUREMENTS OF REFLECTED SOLAR AND LONG-WAVE RADIATION LEAVING THE EARTH. THE SPACECRAFT HAD ESSENTIALLY THE SAME CONFIGURATION AS THAT OF A TIROS SATELLITE, I.E., AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARVING MOST OF THE SUBSYSTEMS AND A COVER ASSEMBLY (HAT). ELECTRICAL POWER WAS PROVIDED BY APPROXIMATELY 10,000, 1- BY 2-CM SOLAR CELLS THAT WERE MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. TWO REDUNDANT ADVANCED VIDICON CAMERA SYSTEM (AVCS) CAMERAS WERE MOUNTED ON OPPOSITE SIDES OF THE SPACECRAFT, WITH THEIR OPTICAL AXES PERPENDICULAR TO THE SPIN AXIS. TWO SETS OF FLAT PLATE RADIOMETERS WERE ALSO SUSPENDED ON OPPOSITE SIDES OF THE SATELLITE, BENEATH THE EDGE OF THE BASEPLATE. A PAIR OF CROSSED-DIPOLE COMMAND RECEIVER ANTENNAS PROJECTED OUT AND DOWNWARD FROM THE BASEPLATE. A MONOPOLE TELEMETRY AND TRACKING ANTENNA EXTENDED OUTWARD FROM THE TOP OF THE COVER ASSEMBLY. THE SATELLITE SPIN RATE WAS CONTROLLED BY MEANS OF A MAGNETIC ATTITUDE SPIN COIL (MASC), WITH THE SPIN AXIS MAINTAINED NORMAL TO THE ORBITAL PLANE (CARTWHEEL ORBIT MODEL) TO WITHIN PLUS OR MINUS 1 DEG. THE MASC WAS A CURRENT- CARRYING COIL MOUNTED IN THE COVER ASSEMELY. THE INTERNAL MAGNETIC FIELD INDUCED BY THE CURRENT INTERACTED WITH THE EARTH'S MAGNETIC FIELD TO PROVIDE THE TORQUE NECESSARY TO MAINTAIN A DESIRED SPIN RATE OF 9.225 RM. ONE AVCS CAMERA FAILED ALMOST IMMEDIATELY AFTER LAUNCH. THE RADIOMETER EXPERIMENT FAILED ON JUNE 23, 1969, AND THE REMAINING CAMERA SYSTEM FAILED ON JULY 19, 1969. THE SPACECRAFT WAS DEACTIVATED ON MARCH 10, 1970, AFTER BEING LEFT ON FOR AN ADDITIONAL TIME PERIOD FOR ENGINEERING PURPOSES.

**********ESSA 7, NESS STAFF

EXPERIMENT NAME- ADVANCED VIDICON CAMERA SYSTEM (AVCS) NSSDC ID 68-069A-01

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 07/19/69

EXPERIMENT BRIEF DESCRIPTION

THE ESSA 7 ADVANCED VIDICON CAMERA SYSTEM (AVCS) WAS A COMBINATION CAMERA, TAPE RECORDER, AND TRANSMITTER THAT COULD RECORD AND STORE A SERIES OF REMOTE DAYTIME CLOUDCOVER PICTURES FOR SUBSEQUENT PLAYBACK TO A GROUND DATA ACQUISITION FACILITY. THE CAMERAS AND TAPE RECORDER SYSTEM WERE

ESSENTIALLY THE SAME AS THOSE ON NIMBUS 1 AND 2. THE ESSA AVCS SYSTEM CONSISTED OF TWO REDUNDANT WIDE-ANGLE CAMERAS WITH 2.54-CM-DIAMETER VIDICONS. THE CAMERAS WERE MOUNTED 180 DEG APART ON THE SIDE OF THE SPACECRAFT, WITH THE OPTICAL AXES PERPENDICULAR TO THE SPIN AXIS. THE CAMERA OPTIC SYSTEM EMPLOYED A 108-DEG LENS WITH A FOCAL LENGTH OF 6.0 MM. EACH CAMERA WAS INDEPENDENTLY TRIGGERED INTO ACTION ONLY WHEN IT CAME IN VIEW OF THE EARTH. A VIDEO FRAME CONSISTED OF 0.25 SEC OF BLANKED VIDEO FOLLOWED BY 6.25 SEC OF VIDICON SCAN (833 LINES) AND A FINAL 0.25-SEC PERIOD OF BLANKED VIDEO. CONCURRENT WITH SHUTTER ACTUATION, A 16-INCREMENT GRAY SCALE WAS INCLUDED AT THE EDGE OF EACH PICTURE FRAME AS A CONTRAST CHECK. A FOUR-TRACK TAPE RECORDER COULD STORE UP TO 36 PICTURES. THE DATA COULD BE READ OUT BETWEEN PICTURE TAKING CYCLES WITHOUT LOSING A PICTURE OR INTERRUPTING A SEQUENCE. SIX OR 12 AVCS PICTURES PER ORBIT COULD BE PROGRAMMED. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 1450 KM), A PICTURE COVERED A 3100- BY 3100-KM SQUARE WITH A HORIZONTAL RESOLUTION OF ABOUT 3 KM AT NADIR. THERE WAS A 50 PERCENT OVERLAP ALONG THE TRACK BETWEEN SUCCESSIVE PICTURES TO ENSURE COMPLETE COVERAGE. ONE CAMERA FAILED SOON AFTER LAUNCH. HOWEVER, APPROXIMATELY 80,000 USABLE PICTURES WERE OBTAINED FROM THE REMAINING CAMERA BEFORE ITS TAPE RECORDER FAILED ON JULY 19, 1969. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA. FOR AN INDEX OF AVAILABLE DATA, SEE THE "CATALOG OF METEOROLOGICAL SATELLITE DATA - ESSA 7 TELEVISION CLOUD PHOTOGRAPHY," FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS. IDENTICAL EXPERIMENTS WERE FLOWN ON ESSA 3, 5, AND 9.

DATA SET NAME- CATALOG OF METEOROLOGICAL SATELLITE DATA- ESSA 7 TELEVISION CLOUD PHOTOGRAPHY NSSDC ID 68-069A-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 09/03/68 TO 03/31/69 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX, ARRANGED CHRONOLOGICALLY, LISTS ORBIT NUMBER AND TRACK OR SWATH NUMBER (A FUNCTION OF EQUATORIAL CROSSING LONGITUDE), ALONG WITH TIME OF FIRST PICTURE AND SUBSATELLITE LOCATION OF EACH 12 PICTURES IN EACH SWATH. A COMPUTER-PRODUCED MAP INDEX SHOWING BOTH HEMISPHERES ONCE PER DAY, GRIDDED AND WITH CONTINENTS OUTLINED, SERVES AS THE BASIC DATA INDEX. THESE MAPS ARE COMPOSITE MOSAICS FOR A RELATIVELY FIXED LOCAL SOLAR TIME. THE BEST PICTURES FROM ANY OF THREE SATELLITES WERE USED, BUT THOSE INTERESTED MAY DETERMINE WHICH PICTURES WERE USED BY REFERRING TO ORBIT NUMBERS IN THE TABULAR INDEX (ESSA 3 NUMBER ARE GENERALLY ABOUT 2500 GREATER THAN THOSE OF ESSA 5 ABOUT 6000 GREATER THAN ESSA 7). THESE PRINTED MAPS ARE CLEAR AND COMPLETE ENOUGH TO HAVE POTENTIAL UTILITY FOR RESEARCH. THIS INDEX AND THE PHOTOGRAPHY MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NORTH CAROLINA. THE INDEX IS ON FILE AND AVAILABLE FOR USE AT NSSDC. IT MAY BE AVAILABLE AT SOME SPECIALIZED AND LARGER LIBRARIES AS U. S. DEPT. OF COMMERCE, ESSA EDS "CATALOG OF METEOROLOGICAL SATELLITE DATA - ESSA 5 (ESSA 5 AND ESSA 7) TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.319 THROUGH 5.21)."

**********ESSA 9 **********

SPACECRAFT COMMON NAME- ESSA 9 NSSDC ID 69-016A
ALTERNATE NAMES- PL-691L. TOS-G. 03764

LAUNCH DATE- 02/26/69 SPACECRAFT WEIGHT IN ORBIT- 347. KG

SPACECRAFT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST USABLE SPACECRAFT DATA RECORDED- 11/24/72

EPOCH DATE- 02/26/69 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 115.2 MIN
APOAPSIS- 1504. KM ALT PERIAPSIS- 1423. KM ALT INCLINATION- 101.790 DEG

SPACECRAFT BRIEF DESCRIPTION

ESSA 9 WAS A SUN-SYNCHRONOUS METEOROLOGICAL SATELLITE DESIGNED TO TAKE AND RECORD DAYTIME EARTH-CLOUD PICTURES ON A GLOBAL BASIS FOR SUBSEQUENT PLAYBACK TO A GROUND ACQUISITION FACILITY. THE SPACECRAFT WAS ALSO CAPABLE OF PROVIDING WORLDWIDE MEASUREMENTS OF REFLECTED SOLAR AND LONG-WAVE RADIATION LEAVING THE EARTH. THE SPACECRAFT HAD ESSENTIALLY THE SAME CONFIGURATION AS THAT OF A TIROS SATELLITE, I.E., AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56-CM HIGH, WITH A REINFORCED BASEPLATE CARRYING MOST OF THE SUBSYSTEMS AND A COVER ASSEMBLY (HAT). ELECTRICAL POWER WAS PROVIDED FROM APPROXIMATELY 10,000 1- BY 2-CM SOLAR CELLS THAT WERE MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. TWO REDUNDANT ADVANCED VIDICON CAMERA SYSTEM (AVCS) CAMERAS WERE MOUNTED ON OPPOSITE SIDES OF THE SPACECRAFT, WITH THEIR OPTICAL AXES PERPENDICULAR TO THE SPIN AXIS. TWO SETS OF FLAT PLATE RADIOMETERS WERE ALSO SUSPENDED ON OPPOSITE SIDES OF THE SATELLITE, BENEATH THE EDGE OF THE BASEPLATE. A PAIR OF CROSSED-DIPOLE COMMAND RECEIVER ANTENNAS PROJECTED OUT AND DOWN FROM THE BASEPLATE. A MONOPOLE TELEMETRY AND TRACKING ANTENNA EXTENDED OUTWARD FROM THE TOP OF THE COVER ASSEMBLY. THE SATELLITE SPIN RATE WAS CONTROLLED BY MEANS OF A MAGNETIC ATTITUDE SPIN COIL (MASC), WITH THE SPIN AXIS MAINTAINED NORMAL TO THE ORBITAL PLANE (CARTWHEEL ORBIT MODE) TO WITHIN PLUS OR MINUS 1 DEG. THE MASC WAS A CURRENT-CARRYING COIL MOUNTED IN THE COVER ASSEMBLY. THE MAGNETIC FIELD INDUCED BY THE CURRENT INTERACTED WITH THE EARTH'S MAGNETIC FIELD TO PROVIDE THE TORQUE NECESSARY TO MAINTAIN A DESIRED SPIN RATE OF 9.225 RPM. THE SPACECRAFT PERFORMED NORMALLY AFTER LAUNCH. THE RADIOMETER EXPERIMENT WAS TERMINATED IN MAY 1970. FOLLOWING THE SUCCESSFUL LAUNCH OF ITOS 1, ESSA 9 WAS TEMPORARILY DEACTIVATED. IT WAS REACTIVATED AFTER ITOS 1 ENDED ITS OPERATIONS. ESSA 9 WAS AGAIN TURNED OFF IN NOVEMBER 1972, WITH THE LAUNCHING OF NOAA 2.

**********ESSA 9, NESS STAFF

EXPERIMENT NAME- ADVANCED VIDICON CAMERA SYSTEM (AVCS) NSSDC ID 69-016A-01

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD.

EXPERIMENT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST USABLE EXPERIMENT DATA RECORDED- 11/00/72

EXPERIMENT BRIEF DESCRIPTION

THE ESSA 9 ADVANCED VIDICON CAMERA SYSTEM (AVCS) WAS A COMBINATION CAMERA, TAPE RECORDER, AND TRANSMITTER THAT COULD RECORD AND STORE A SERIES OF REMOTE DAYTIME CLOUDCOVER TV PICTURES FOR SUBSEQUENT PLAYBACK TO A GROUND DATA ACQUISITION FACILITY. THE CAMERA AND TAPE RECORDER SYSTEM CONSISTED OF TWO REDUNDANT WIDE-ANGLE CAMERAS WITH 2.54-CM VIDICONS. THE CAMERAS WERE MOUNTED 180 DEG APART ON THE SIDE OF THE SPACECRAFT, WITH THEIR OPTICAL AXES

PERPENDICULAR TO THE SPIN AXIS. THE CAMERA OPTIC SYSTEM EMPLOYED A 108-DEG LENS WITH A FOCAL LENGTH OF 6.0 MM. EACH CAMERA WAS INDEPENDENTLY TRIGGERED INTO ACTION ONLY WHEN IT CAME IN VIEW OF THE EARTH. A VIDEO FRAME CONSISTED OF 0.25 SEC OF BLANKED VIDEO FOLLOWED BY 6.25 SEC OF VIDICON SCAN (833 LINES) AND A FINAL 0.25-SEC PERIOD OF BLANKED VIDEO. CONCURRENT WITH SHUTTER ACTUATION, A 16-INCREMENT GRAY SCALE WAS INCLUDED AT THE EDGE OF EACH PICTURE FRAME AS A CONTRAST CHECK. A FOUR-TRACK TAPE RECORDER COULD STORE UP TO 36 PICTURES. THE DATA COULD BE READ OUT BETWEEN PICTURE TAKING CYCLES WITHOUT LOSING A PICTURE OR INTERRUPTING A SEQUENCE. SIX OR TWELVE AVCS PICTURES PER ORBIT COULD BE PROGRAMMED. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 1450 KM), A PICTURE COVERED A 3100- BY 3100-KM SQUARE WITH A HORIZONTAL RESOLUTION OF ABOUT 3 KM AT NADIR. THERE WAS A 50 PERCENT OVERLAP ALONG THE TRACK BETWEEN SUCCESSIVE PICTURES TO ENSURE COMPLETE COVERAGE. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR AN INDEX OF AVAILABLE DATA, SEE THE "CATALOG OF METEOROLOGICAL SATELLITE DATA - ESSA 9 TELEVISION CLOUD PHOTOGRAPHY," FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 69-016A-01A. THE EXPERIMENT WAS PLACED OPERATIONALLY OFF IN EARLY NOVEMBER 1972. IDENTICAL EXPERIMENTS WERE FLOWN ON ESSA 3, 5, AND 7.

DATA SET NAME- CATALOG OF METEOROLOGICAL SATELLITE DATA- NSSDC ID 69-016A-01A
ESSA 9 TELEVISION CLOUD PHOTOGRAPHY

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 04/01/69 TO 09/30/71 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 10 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX, ARRANGED CHRONOLOGICALLY, LISTS ORBIT NUMBER, TRACK OR SWATH NUMBER (FUNCTION OF EQUATORIAL CROSSING LONGITUDE), THE TIME OF FIRST PICTURES, AND THE SUBSATELLITE LOCATION OF EACH OF 12 PICTURES IN EACH SWATH. A MAP INDEX SHOWING BOTH HEMISPHERES, ONCE A DAY, COMPUTER PRODUCED, GRIDDED, AND WITH CONTINENTS OUTLINED, SERVES AS THE BASIC DATA INDEX. THESE MAPS ARE COMPOSITE MOSAICS FOR A RELATIVELY FIXED LOCAL SOLAR TIME. THESE PRINTED MAPS ARE CLEAR AND COMPLETE ENOUGH TO HAVE POTENTIAL UTILITY FOR RESEARCH. THESE INDEXES AND THE PHOTOGRAPHY MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED OR LARGER LIBRARIES LISTED UNDER U.S. DEPT OF COMMERCE, ESSA, EDS "CATALOG OF METEOROLOGICAL SATELLITE DATA - ESSA 9 TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.322 THROUGH 5.324)."

**********ISIS 1 **********

SPACECRAFT COMMON NAME- ISIS 1 NSSDC ID 69-009A
ALTERNATE NAMES- ISIS-A, 03669

LAUNCH DATE- 01/30/69 SPACECRAFT WEIGHT IN ORBIT- 532. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

EPOCH DATE- 01/30/69 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 128. MIN
APOAPSIS- 3522.00 KM ALT PERIAPSIS- 574.000 KM ALT INCLINATION- 88.425 DEG

SPACECRAFT BRIEF DESCRIPTION

ISIS 1 WAS AN IONOSPHERIC OBSERVATORY INSTRUMENTED WITH SWEEP FREQUENCY AND FIXED FREQUENCY IONOSONDES, A VLF RECEIVER, ENERGETIC AND SOFT PARTICLE DETECTORS, AN ION MASS SPECTROMETER, AN ELECTROSTATIC PROBE, AN ELECTROSTATIC ANALYZER, A BEACON TRANSMITTER, AND A COSMIC NOISE EXPERIMENT. THE SOUNDER USED TWO LONG DIPOLE ANTENNAS (78.9 AND 20.2 M LONG, RESPECTIVELY). THE SATELLITE WAS SPIN-STABILIZED AT ABOUT 2.9 RPM AFTER ANTENNA DEPLOYMENT. SOME CONTROL COULD BE EXERCISED OVER THE SPIN RATE AND ATTITUDE BY USING MAGNETICALLY INDUCED TORQUES TO CHANGE THE SPIN RATE AND TO PRECESS THE SPIN AXIS. A TAPE RECORDER WITH 1-HR CAPACITY WAS INCLUDED ON THE SATELLITE. THE SATELLITE COULD BE PROGRAMMED TO TAKE RECORDED OBSERVATIONS FOR FOUR DIFFERENT TIME PERIODS FOR EACH FULL RECORDING PERIOD. THE RECORDER WAS DUMPED ONLY AT OTTAWA. FOR NON-TAPE-RECORDED OBSERVATIONS, DATA FOR THE SATELLITE AND SUBSATELLITE REGIONS COULD BE OBSERVED AND TELEMETERED WHEN THE SPACECRAFT WAS IN THE LINE OF SIGHT OF TELEMETRY STATIONS. THE SELECTED TELEMETRY STATIONS WERE IN AREAS THAT PROVIDED PRIMARY DATA COVERAGE NEAR THE 80-DEG W MERIDIAN, PLUS AREAS NEAR HAWAII, SINGAPORE, AUSTRALIA, ENGLAND, NORWAY, INDIA, JAPAN, ANTARCTICA, NEW ZEALAND, AND CENTRAL AFRICA. NO TAPE-RECORDED DATA WERE AVAILABLE AFTER JANUARY 30, 1970, BECAUSE OF FAILURE OF THE RECORDER. THE ION MASS SPECTROMETER FAILED ABOUT 3 DAYS AFTER LAUNCH. INITIALLY, 6 TO 9 HR OF OBSERVATIONS WERE MADE DAILY, BUT BY THE SPRING OF 1973, ONLY 4 TO 5 HR OF OBSERVATIONS PER DAY WERE BEING MADE. THE DECREASE IN OBSERVATION TIME WAS DUE TO A COMBINATION OF FUNDING AND POWER LIMITATIONS, AND SCHEDULING.

**********ISIS 1, SAGALYN

EXPERIMENT NAME- SPHERICAL ELECTROSTATIC ANALYZER NSSDC ID 69-009A-08

ORIGINAL EXPERIMENT INSTITUTION- AFCRL

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - R.C.	SAGALYN	AFCRL	BEDFORD, MA
OI - M.	SMIDDY	AFCRL	BEDFORD, MA

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE OBJECTIVE OF THE SPHERICAL ELECTROSTATIC ANALYZER (SEA) EXPERIMENT WAS TO MEASURE THE TEMPORAL AND SPATIAL VARIATIONS IN THE CONCENTRATIONS AND ENERGY DISTRIBUTION OF THE CHARGED PARTICLES THROUGHOUT THE ORBIT. SPECIFICALLY, THE OBJECTIVES WERE TO MEASURE THE FOLLOWING PARAMETERS -- (A) THE DENSITY OF POSITIVE IONS HAVING THERMAL ENERGY IN THE CONCENTRATION RANGE FROM 1E1 TO 1E6 IONS PER CUBIC CENTIMETER (LOGARITHMIC AMPLIFIERS WERE USED IN THE INPUT CIRCUIT), (B) THE KINETIC TEMPERATURE OF THE THERMAL IONS IN THE RANGE FROM 700 TO 4000 DEG K, (C) THE FLUX AND ENERGY SPECTRUM OF PROTONS IN THE RANGE FROM 0 TO 2 KEV, AND (D) THE SATELLITE POTENTIAL WITH RESPECT TO THE UNDISTURBED PLASMA. TWO UNITS MADE UP THE EXPERIMENT PACKAGE -- A 96-CM BOOM THAT SUPPORTED THE SENSOR AND MADE POSSIBLE OMNIDIRECTIONAL MEASUREMENTS, AND AN ELECTRONICS PACKAGE (CONSIDERED TO INCLUDE THE SENSOR) TO PERFORM THE MEASUREMENTS AND TO PROCESS THE DATA INTO A SUITABLE FORM FOR TELEMETRY. THE SENSOR WAS MADE UP OF THREE CONCENTRIC SPHERICAL MESHED GRIDS HAVING RADII OF 3.18, 2.54 AND 1.90 CM. THE INNERMOST GRID WAS THE COLLECTOR. THESE GRIDS WERE MADE FROM TUNGSTEN MESH AND HAD A TRANSPARENCY OF 80 TO 90 PERCENT. TO MEASURE THE PARAMETERS LISTED ABOVE, SUITABLE SWEEP AND STEP VOLTAGES WERE APPLIED TO THE GRIDS. THIS INSTRUMENT WAS OPERATED IN SEVERAL MODES. THE ION DENSITIES WERE SAMPLED SIXTY TIMES A SECOND, CORRESPONDING TO A SPATIAL RESOLUTION OF 150 METERS. ONCE PER MINUTE THE

RATIO OF MASS TO TEMPERATURE WAS SAMPLED, AND THE ENERGY DISTRIBUTION WAS SAMPLED ONCE EVERY TWO MINUTES.

DATA SET NAME- ION DENSITY ON 35-MM FILM NSSDC ID 69-009A-08A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 01/31/69 TO 02/25/69 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 2 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET WAS PROVIDED BY THE EXPERIMENTER AND CONTAINS PLOTS OF ION DENSITY VS UNIVERSAL TIME ON 35-MM FILM. THE DENSITY SCALE (ORDINATE) IS LOGARITHMIC, EXTENDS OVER FOUR DECADES FROM 100 TO 1,000,000, AND IS EXPRESSED IN UNITS OF NUMBER OF IONS PER CUBIC CENTIMETER. THE LINEAR TIME SCALE (ABSCISSA) COVERS A 30-MIN TIME INTERVAL PER FILM FRAME, AND HAS TICK MARKS EVERY 2 MINUTES. THE TIME SPAN OF THE DATA PLOTTED VARIES FROM FRAME TO FRAME. OTHER PARAMETERS SHOWN ON EACH FRAME INCLUDE -- DATE OF MEASUREMENT, OREIT NUMBER, GROUND STATION THAT RECEIVED THE DATA, ALTITUDE, LOCAL TIME, GEODETIC LATITUDE AND LONGITUDE, INVARIANT LATITUDE MCILWAIN 'L' PARAMETER, AND MAGNETIC LOCAL TIME.

DATA SET NAME- ION TEMPERATURE AND DENSITY ON MAGNETIC TAPE NSSDC ID 69-009A-08B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 01/31/69 TO 11/30/69 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 4 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET WAS PROVIDED BY THE EXPERIMENTER AND CONTAINS BINARY TAPES WRITTEN ON A CDC 6600 COMPUTER WITH THE SCOPE 3.3 OPERATING SYSTEM. EACH TAPE CONTAINS RESULTS OF THE ANALYSIS ON THE DATA OBSERVED IN ONE MONTH. EACH RECORD IN A FILE CONTAINS EPHEMERIS DATA AND THE RESULTS FROM ONE SWEEP. THE SWEEPS ARE OBTAINED ONCE EVERY MIN AND LAST FOR TWO SEC, HENCE THE OUTPUT PARAMETERS REPRESENT AVERAGED VALUES OVER TWO-SEC PERIODS AT ONE-MIN INTERVALS. THE OUTPUT PARAMETERS PRESENTED INCLUDE ION TEMPERATURE, ION DENSITY, AND VEHICLE POTENTIAL.

**********ISIS 1, WHITTEKER

EXPERIMENT NAME- SWEEP FREQUENCY SOUNDER NSSDC ID 69-009A-01

ORIGINAL EXPERIMENT INSTITUTION- COMM RESEARCH CENTRE

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - J.H.	WHITTEKER	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI - G.E.K.	LOCKWOOD	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI - G.L.	NELMS	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI - J.E.	JACKSON	NASA-GSFC	GREENBELT, MD
OI - J.W.	KING	APPLETON LABS	SLOUGH, BUCKS, ENGLAND
OI - J.	TURNER	DEPARTMENT OF INTERIOR	SYDNEY, AUSTRALIA

OI - M.	SYLVAIN	GRI	ORLEANS, FRANCE
OI - D.	HOLT	AURORAL OBS	TROMSO, NORWAY
OI - Y.	OGATA	RRL	TOKYO, JAPAN
OI - R.	RAGHAVARAO	PHYSICAL RESEARCH LAB	AHMEDABAD, INDIA
OI - W.	CALVERT	NOAA-ERL	BOULDER, CO
OI - T.E.	VAN ZANDT	NOAA-ERL	BOULDER, CO
OI - L.	COLIN	NASA-ARC	MOFFETT FIELD, CA
OI - R.B.	NORTON	NOAA-ERL	BOULDER, CO
OI - C.E.	PETRIE	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE ISIS 1 IONOSONDE WAS A RADIO TRANSMITTER/RECEIVER THAT RECORDED THE TIME DELAY BETWEEN A TRANSMITTED AND A RETURNED RADIO FREQUENCY PULSE. A CONTINUUM OF FREQUENCIES BETWEEN 0.1 AND 20 MHZ WAS SAMPLED ONCE EVERY 19 OR 29 SEC, AND ONE OF SIX SELECTED FREQUENCIES WAS ALSO SOUNDED FOR A PERIOD OF 3 TO 5 SEC DURING THIS 19- OR 29-SEC PERIOD. IN ADDITION TO THE SWEEP AND FIXED FREQUENCY MODES OF OPERATION, A MIXED MODE WAS POSSIBLE WHERE THE TRANSMITTER FREQUENCY WAS FIXED AT 0.82 MHZ WHILE THE RECEIVER SWEPT. SEVERAL VIRTUAL HEIGHT (DELAY TIME) TRACES WERE NORMALLY OBSERVED DUE TO GROUND REFLECTIONS, PLASMA RESONANCES, BIREFRINGENCE OF THE IONOSPHERE, NON-VERTICAL PROPAGATION, ETC. VIRTUAL HEIGHT AT A GIVEN FREQUENCY WAS PRIMARILY A FUNCTION OF DISTANCE TRAVERSED BY THE SIGNAL, ELECTRON DENSITY ALONG THE PROPAGATION PATH, AND MODE OF PROPAGATION. THE STANDARD DATA FORM WAS AN IONOGRAM SHOWING VIRTUAL HEIGHT AS A FUNCTION OF FREQUENCY. TWO OTHER FORMS OF DATA WERE COMMONLY PREPARED FROM THE IONOGRAMS. THEY WERE DIGITAL FREQUENCY AND/OR VIRTUAL HEIGHT VALUES OF CHARACTERISTIC IONOSPHERIC FEATURES AND COMPUTATIONS OF ELECTRON DENSITY PROFILES.

DATA SET NAME- SWEEP FREQUENCY IONOGRAMS ON MICROFILM NSSDC ID 69-009A-01A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 01/30/69 TO 10/12/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 2027 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THESE IONOGRAMS ARE REDUCED DATA PLOTS OF VIRTUAL RANGE VS FREQUENCY. THE DATA SET IS ON 35-MM MICROFILM. VIRTUAL RANGE IS A FUNCTION OF TIME DELAY OF THE REFLECTED PULSE OF EACH FREQUENCY TRANSMITTED. THESE ARE FIRST GENERATION DATA PREPARED FROM THE TELEMETRY TAPES. PROCESSING HAS BEEN CARRIED OUT OR SCHEDULED AT SEVERAL PROCESSING LOCATIONS -- CRC IN OTTAWA, CANADA, RSR IN SLOUGH, BUCKS, ENGLAND, NOAA IN BOULDER, COLORADO (BETWEEN LAUNCH AND MAY 1972), AND AFTER THE FALL OF 1972, INDIA, JAPAN, AUSTRALIA, AND NEW ZEALAND. TIME CODES ARE ENTERED IN THE MARGIN OF THE MICROFILM, AND HEIGHT AND FREQUENCY MARKERS HAVE BEEN PLACED ON EACH IONOGRAM. SATELLITE EPHEMERIDES MUST BE CONSULTED TO DETERMINE POSITION AND OBSERVATION TIME. THE DATA ARE AVAILABLE TO THE EXTENT PERMITTED BY TELEMETRY STATION SCHEDULING, LOCATION OF TELEMETRY STATIONS, AND TAPE RECORDER OPERATION AND SCHEDULING. SPACECRAFT POWER AVAILABILITY, WHICH WAS ALSO AN IMPORTANT FACTOR IN DATA OBSERVATION, LIMITED SOUNDER OPERATION TO ABOUT 7 HR PER DAY, OF WHICH ABOUT 1 HR PER ORBIT COULD BE FOR RECORDED DATA. THE TAPE RECORDER FAILED ON JAN. 30, 1970. PROCESSING LIMITATIONS RESULT IN A DELAY OF ABOUT 6 MONTHS FROM OBSERVATION TIME TO IONOGRAM PROCESSING. EARLY PROCESSING OF SMALL NUMBERS OF IONOGRAMS IS POSSIBLE ON REQUEST. SINCE ONLY TIME IS NOTED ON EACH IONOGRAM, SATELLITE POSITION AND RELATED INFORMATION MUST BE OBTAINED FROM ANOTHER SOURCE (NSSDC DATA SET 69-009A-00C). AN INDEX OF THESE

IONOGRAMS IS ALSO AVAILABLE AS NSSDC DATA SET 69-009A-01B.

DATA SET NAME- IONOGRAM INVENTORY ON TAPE NSSDC ID 69-009A-01B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 01/30/69 TO 10/12/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS FILE INDEXES THE ISIS-1 IONOGRAMS, DATA SET 69-009A-01A. INFORMATION IN THE FILE FOR WHICH IONOGRAMS CAN BE IDENTIFIED INCLUDES IONOGRAM QUALITY, TELEMETRY STATION, STOP AND START DATA FOR THE PASS (TIMES AND LOCATION), LOCATION AT WHICH THE ORIGINAL TELEMETRY TAPES ARE STORED AND IONOGRAMS PREPARED AND EXPERIMENT MODE OF OPERATION. SOME INFORMATION RELATING TO EXPERIMENTS 2, 3, AND 10 ARE ALSO INCLUDED SINCE THESE EXPERIMENTS ARE CLOSELY RELATED TO THE SOUNDER OPERATION, E.G., OPERATING FREQUENCY OF EXPERIMENT 2 (FIXED FREQUENCY) IS GIVEN, PRESENCE OF AGC TRACE (EXPERIMENT 10 DATA) IS NOTED, AND VLF OPERATION (EXPERIMENT 3) IS INDICATED. THIS INDEX IS UPDATED MONTHLY UNLESS FEW DATA ARE RECEIVED. THIS INDEX IS PREPARED FROM PHYSICAL INVENTORY OF FILM RECEIVED. THESE DATA ARE MAINTAINED ON SPECIAL NSSDC SYSTEMS TAPES. THE DATA CAN BE PROVIDED ON HARDCOPY OR ON MICROFILM, SORTED ACCORDING TO THE REQUIREMENTS OF THE REQUESTER.

DATA SET NAME- INDEX OF IONOGRAMS SHOWING DUCTED ECHOES NSSDC ID 69-009A-01E

AVAILABILITY OF DATA SET- DATA AT NSSDC READY FOR DISTRIBUTION

TIME PERIOD COVERED- 02/01/69 TO 12/27/71 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, PROVIDED BY THE EXPERIMENTER'S OFFICE, IS AN INDEX TO IONOGRAMS CONTAINING DUCTED ECHOES. THE CRITERION FOR SELECTION WAS THAT AT LEAST ONE TRACE FROM THE CONJUGATE HEMISPHERE APPEARS ON THE IONOGRAMS. THIS TRACE HAS A POSITIVE SLOPE, AS OPPOSED TO THE NORMAL NEGATIVE SLOPE OF THE X OR O TRACE. EACH RECORD CONTAINS THE SATELLITE IDENTIFICATION, GROUND STATION (QUITO=5, SANTIAGO=8, FT. MEYER=3, GRRORAL=21, SINGAPORE=48), PASS START TIME (UT), THE NUMBER OF IONOGRAMS IN THE PASS SHOWING DUCTED ECHOES, AND THE NUMBER NOT SHOWING DUCTED ECHOES. THE TIME COVERED IS FROM 1969 THROUGH 1971. FOR 3050 PASSES (ABOUT 100,000 IONOGRAMS), APPROXIMATELY 2000 IONOGRAMS WITH DUCTED ECHOES ARE IDENTIFIED. THE DATA ARE AVAILABLE ON 9-TRACK, 800-BPI, EBCDIC MAGNETIC TAPE. SIMILAR DATA FOR OTHER TIMES ARE STORED ON THE SAME TAPE AND ARE DESCRIBED UNDER DATA SETS 62-049A-01G, 65-098A-01N, AND 71-024A-01E.

DATA SET NAME- CRC ELECTRON DENSITY PROFILES AT SCALED POINTS ON MAGNETIC TAPES NSSDC ID 69-009A-01F

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 02/01/69 TO 06/30/70 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 2 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF ANALYZED ELECTRON DENSITY PROFILES COMPUTED FROM DIGITAL VALUES OF FREQUENCY AND VIRTUAL HEIGHT, SCALED FROM IONOGRAMS. THESE ARE ANALYZED DATA ON 800-BPI, 9-TRACK MAGNETIC TAPE, WRITTEN IN EBCDIC AND PREPARED BY THE COMMUNICATIONS RESEARCH CENTRE, OTTAWA, CANADA. TELEMETRY STATIONS ARE NOT IDENTIFIED, BUT SATELLITE LOCATION, TIME OF OBSERVATION, SOLAR ZENITH ANGLE AT THE SATELLITE, DIP LATITUDE AT THE SATELLITE, TOTAL ELECTRON CONTENT DOWN TO THE ALTITUDE OF HIGHEST IONOSPHERICALLY REFLECTED FREQUENCY, AND OTHER RELEVANT INFORMATION IS NOTED WITH EACH PROFILE. PROFILE DATA CONSIST OF ELECTRON DENSITY AND GEOMETRIC HEIGHT VALUES FOR EACH POINT SCALED FROM THE IONOGRAM. FOR INTERPOLATED VALUES OF ELECTRON DENSITY AT STANDARD INCREMENTS OF GEOMETRIC HEIGHT, A CRC INTERPOLATION PROGRAM (AVAILABLE AT NSSDC) CAN BE RUN WITH THIS DATA SET. THESE IONOGRAMS WERE SELECTED FOR THEIR SCIENTIFIC INTEREST AND COMPRISE ONLY A VERY SMALL PORTION OF REDUCTIONS POSSIBLE FROM THE AVAILABLE IONOGRAMS.

**********ISIS 2 **********

SPACECRAFT COMMON NAME- ISIS 2 NSSDC ID 71-024A
ALTERNATE NAMES- ISIS-B, PL-701F, 05104

LAUNCH DATE- 04/01/71 SPACECRAFT WEIGHT IN ORBIT- 570. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

EPOCH DATE- 04/09/71 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 113.6 MIN
APOAPSIS- 1429.00 KM ALT PERIAPSIS- 1358.00 KM ALT INCLINATION- 88.15 DEG

SPACECRAFT BRIEF DESCRIPTION

ISIS 2 WAS AN IONOSPHERIC OBSERVATORY INSTRUMENTED WITH A SWEEP FREQUENCY AND A FIXED FREQUENCY IONOSONDE, A VLF RECEIVER, ENERGETIC AND SOFT PARTICLE DETECTORS, AN ION MASS SPECTROMETER, AN ELECTROSTATIC PROBE, A RETARDING POTENTIAL ANALYZER, A BEACON TRANSMITTER, A COSMIC NOISE EXPERIMENT, AND TWO PHOTOMETERS. THE SOUNDER USED TWO LONG CROSSED-DIPOLE ANTENNAS (78.9 M AND 20.2 M LONG, RESPECTIVELY) FOR THE SOUNDING, VLF, AND COSMIC NOISE EXPERIMENTS. THE SPACECRAFT WAS NOMINALLY SPIN STABILIZED WITH SPIN AXIS IN THE ORBIT PLANE TO ABOUT 2 RPM AFTER ANTENNA DEPLOYMENT. A CARTWHEEL MODE WITH THE AXIS PERPENDICULAR TO THE ORBIT PLANE WAS MADE AVAILABLE OCCASIONALLY FOR PERIODS OF A FEW MONTHS. THIS WAS DONE TO PROVIDE RAM AND WAKE DATA FOR SOME EXPERIMENTS EACH SPIN PERIOD RATHER THAN EACH ORBIT PERIOD. ATTITUDE AND SPIN INFORMATION WAS OBTAINED FROM A THREE-AXIS MAGNETOMETER AND A SUN SENSOR. CONTROL OF ATTITUDE AND SPIN WAS POSSIBLE BY MEANS OF MAGNETIC TORQUING. THE EXPERIMENT PACKAGE ALSO INCLUDED A PROGRAMMABLE TAPE RECORDER WITH A 1-HR CAPACITY. FOR NON-RECORDED OBSERVATIONS, DATA FROM SATELLITE AND SUBSATELLITE LOCATIONS WERE TELEMETERED WHEN THE SPACECRAFT WAS IN LINE OF SIGHT OF A TELEMETRY STATION. TELEMETRY STATIONS WERE LOCATED SO THAT PRIMARY DATA COVERAGE WAS NEAR THE 80-DEG W MERIDIAN AND NEAR HAWAII, SINGAPORE, AUSTRALIA, ENGLAND, FRANCE, NORWAY, INDIA, JAPAN, ANTARCTICA, NEW ZEALAND, AND CENTRAL AFRICA. INITIAL OPERATION OF ALL EXPERIMENTS WAS NOMINAL. THE TAPE RECORDERS FAILED ON FEBRUARY 4, 1972, BUT REAL-TIME OBSERVATIONS CONTINUED TO BE TELEMETERED TO GROUND STATIONS. AFTER APRIL 1973, DATA TAKEN WERE TO BE STORED ON TAPE FOR AT LEAST 18 MONTHS. THESE DATA TAPES MAY BE ERASED FOR REUSE IF NO REQUIREMENT (AND FUNDING) FOR DATA REDUCTION OCCURS WITHIN THAT PERIOD.

SATELLITE OPERATION OCCURS (JUNE 1974) FOR ABOUT 5 HOURS PER DAY.

**********ISIS 2, WHITTEKER

EXPERIMENT NAME- SWEEP FREQUENCY SOUNDER NSSDC ID 71-024A-01

ORIGINAL EXPERIMENT INSTITUTION- COMM RESEARCH CENTRE

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI -	J.H.	WHITTEKER	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI -	G.E.K.	LOCKWOOD	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI -	G.L.	NELMS	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI -	J.	TURNER	DEPARTMENT OF INTERIOR	SYDNEY, AUSTRALIA
OI -	M.	SYLVAIN	CRI	ORLEANS, FRANCE
OI -	O.	HOLT	AURORAL OBS	TROMSO, NORWAY
OI -	Y.	OGATA	RRL	TOKYO, JAPAN
OI -	R.	RAGHAVARAO	PHYSICAL RESEARCH LAB	AHMEDABAD, INDIA
OI -	J.E.	JACKSON	NASA-GSFC	GREENBELT, MD
OI -	C.E.	PETRIE	COMM RESEARCH CENTRE	OTTAWA, ONTARIO, CANADA
OI -	T.E.	VAN ZANDT	NOAA-ERL	BOULDER, CO
OI -	L.	COLIN	NASA-ARC	MOFFETT FIELD, CA
OI -	W.	CALVERT	NOAA-ERL	BOULDER, CO
OI -	R.B.	NORTON	NOAA-ERL	BOULDER, CO
OI -	J.W.	KING	APPLETON LABS	SLOUGH, BUCKS, ENGLAND

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE ISIS 2 IONOSONDE WAS A RADIO TRANSMITTER THAT RECORDED THE TIME DELAY BETWEEN A TRANSMITTED AND RETURNED RADIO FREQUENCY PULSE. A CONTINUUM OF FREQUENCIES BETWEEN 0.1 AND 20 MHZ WERE SAMPLED EVERY 14 OR 21 SEC, AND ONE OF SIX SELECTED FREQUENCIES WAS ALSO USED FOR SOUNDING FOR A FEW SECONDS DURING EACH 14- OR 21-SEC PERIOD. IN ADDITION TO THE SWEEP- AND FIXED-FREQUENCY MODES OF OPERATION, A MIXED MODE WAS AVAILABLE IN WHICH THE TRANSMITTER FREQUENCY WAS FIXED AT ONE OF SIX POSSIBLE FREQUENCIES WHILE THE RECEIVER SWEPT. SEVERAL VIRTUAL RANGE (DELAY TIME) TRACES RESULTING FROM GROUND REFLECTIONS, PLASMA RESONANCES, BIREFRINGENCE OF THE IONOSPHERE, NON-VERTICAL PROPAGATION, ETC., WERE NORMALLY OBSERVED. VIRTUAL RANGE AT A GIVEN FREQUENCY WAS PRIMARILY A FUNCTION OF DISTANCE TRAVERSED BY THE SIGNAL, ELECTRON DENSITY ALONG THE PROPAGATION PATH, AND MODE OF PROPAGATION. THE STANDARD DATA FORM WAS AN IONOGRAM (GRAPH) SHOWING VIRTUAL RANGE AS A FUNCTION OF RADIO FREQUENCY. TWO OTHER FORMS OF DATA WERE COMMONLY PREPARED FROM THE IONOGRAMS. THEY WERE DIGITAL FREQUENCY AND/OR VIRTUAL HEIGHT VALUES OF CHARACTERISTIC IONOSPHERIC FEATURES AND COMPUTATIONS OF ELECTRON DENSITY PROFILES. INITIAL OPERATION OF THIS EXPERIMENT WAS NORMAL AND BOTH REAL-TIME AND TAPE RECORDED DATA WERE TAKEN UNTIL FEBRUARY 4, 1972, WHEN THE RECORDERS FAILED. REAL-TIME DATA HAVE BEEN TAKEN SUBSEQUENTLY.

DATA SET NAME- SWEEP FREQUENCY IONOGRAMS ON MICROFILM NSSDC ID 71-024A-01A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/08/71 TO 01/05/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1276 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THESE IONOGRAMS ARE REDUCED DATA PLOTS OF VIRTUAL RANGE VS FREQUENCY. VIRTUAL RANGE IS A FUNCTION OF TIME DELAY OF THE REFLECTED PULSE OF EACH FREQUENCY TRANSMITTED. THESE ARE FIRST-GENERATION DATA PREPARED DIRECTLY FROM THE TELEMETRY TAPES. PROCESSING IS SCHEDULED AT EITHER CRC IN OTTAWA, CANADA, OR RSRS IN SLOUGH, BUCKINGHAMSHIRE, ENGLAND. PROCESSING ALSO OCCURRED AT BOULDER, COLORADO (NOAA) BETWEEN LAUNCH AND MAY 1972, AND IN INDIA, JAPAN, AUSTRALIA AND NEW ZEALAND BEGINNING IN THE FALL OF 1972. TIME CODES ARE ENTERED IN THE MARGIN OF THE MICROFILM, AND VIRTUAL RANGE AND FREQUENCY MARKERS HAVE BEEN PLACED ON EACH IONOGRAM. THE DATA ARE AVAILABLE TO THE EXTENT PERMITTED BY TELEMETRY STATION SCHEDULING, LOCATION OF TELEMETRY STATIONS, AND TAPE RECORDER OPERATION AND SCHEDULING. SPACECRAFT POWER, WHICH WAS ALSO AN IMPORTANT FACTOR IN DATA OBSERVATION, LIMITED INITIAL SOUNDER OPERATION TO ABOUT 7 HR PER DAY, OF WHICH ABOUT 1 HR PER ORBIT COULD BE FOR RECORDED DATA (THE TAPE RECORDER FAILED ON FEBRUARY 4, 1972). PROCESSING LIMITATIONS RESULTED IN A DELAY OF ABOUT 6 MONTHS FROM OBSERVATION TIME TO IONOGRAM PREPARATION. THE DATA COVERAGE IS PRIMARILY NEAR THE 80 DEG W MERIDIAN FOR PERIODS UP TO 8 HR PER DAY. SINCE ONLY TIME IS NOTED ON EACH IONOGRAM, SATELLITE POSITION AND OTHER RELATED DATA MUST BE OBTAINED FROM ANOTHER SOURCE (NSSDC DATA SET 71-024A-00C).

DATA SET NAME- NSSDC INDEX OF IONOGRAMS ON TAPE NSSDC ID 71-024A-01B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/01/71 TO 10/12/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS FILE INDEXES THE ISIS-2 IONOGRAMS, DATA SET 71-024A-01B. INFORMATION IN THE FILE FOR WHICH IONOGRAMS CAN BE IDENTIFIED INCLUDES IONOGRAM QUALITY, TELEMETRY STATION, STOP AND START DATA FOR THE PASS (TIMES AND LOCATION), LOCATION AT WHICH THE ORIGINAL TELEMETRY TAPES ARE STORED AND IONOGRAMS PREPARED AND EXPERIMENT MODE OF OPERATION. SOME INFORMATION RELATING TO EXPERIMENTS 2, 3, AND 10 ARE ALSO INCLUDED SINCE THESE EXPERIMENTS ARE CLOSELY RELATED TO THE SOUNDER OPERATION, E.G., OPERATING FREQUENCY OF EXPERIMENT 2 (FIXED FREQUENCY) IS GIVEN, PRESENCE OF AGC TRACE (EXPERIMENT 10 DATA) IS NOTED, AND VLF OPERATION (EXPERIMENT 3) IS INDICATED. THIS INDEX IS UPDATED MONTHLY UNLESS LITTLE DATA ARE RECEIVED. THIS INDEX IS PREPARED FROM PHYSICAL INVENTORY OF FILM RECEIVED. THESE DATA ARE MAINTAINED ON SPECIAL NSSDC SYSTEMS TAPES. THE DATA CAN BE PROVIDED IN HARDCOPY LISTINGS, OR ON MICROFILM, SORTED ACCORDING TO THE REQUIREMENTS OF THE REQUESTER.

DATA SET NAME- INDEX OF IONOGRAMS SHOWING DUCTED ECHOES NSSDC ID 71-024A-01E

AVAILABILITY OF DATA SET- DATA AT NSSDC READY FOR DISTRIBUTION

TIME PERIOD COVERED- 04/09/71 TO 06/22/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET, PROVIDED BY THE EXPERIMENTER'S OFFICE, IS AN INDEX TO IONOGRAMS CONTAINING DUCTED ECHOES. THE CRITERION FOR SELECTION WAS THAT AT

LEAST ONE TRACE FROM THE CONJUGATE HEMISPHERE APPEARS ON THE IONOGRAM. THIS TRACE HAS A POSITIVE SLOPE, AS OPPOSED TO THE NEGATIVE SLOPE OF THE NORMAL X OR O TRACE. EACH RECORD CONTAINS THE SATELLITE IDENTIFICATION, GROUND STATION (QUITO=5 AND SINGAPORE=48), PASS START TIME (UT), THE NUMBER OF IONOGRAMS IN THE PASS SHOWING DUCTED ECHOES, AND THE NUMBER NOT SHOWING DUCTED ECHOES. THE TIME COVERED IS FROM APRIL 1971 THROUGH JUNE 1972. FOR 209 PASSES (ABOUT 6000 IONOGRAMS), 2264 IONOGRAMS WITH DUCTED ECHOES ARE IDENTIFIED. THE DATA ARE AVAILABLE ON 9-TRACK, 800-BPI, EBCDIC MAGNETIC TAPE. SIMILAR DATA FOR OTHER TIMES ARE STORED ON THE SAME TAPE AND ARE DESCRIBED IN DATA SETS 65-098A-01N, 69-009A-01E, AND 62-049A-01C.

DATA SET NAME- CRC ELECTRON DENSITY PROFILES AT SCALED POINTS ON MAGNETIC TAPES NSSDC ID 71-024A-01F

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/08/71 TO 10/13/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 2 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF ANALYZED ELECTRON DENSITY PROFILES COMPUTED FROM DIGITAL VALUES OF FREQUENCY AND VIRTUAL HEIGHT, SCALED FROM IONOGRAMS. THESE ARE ANALYZED DATA ON 800-BPI, 9-TRACK MAGNETIC TAPE, WRITTEN IN EBCDIC AND PREPARED BY THE COMMUNICATIONS RESEARCH CENTRE, OTTAWA, CANADA. TELEMETRY STATIONS ARE NOT IDENTIFIED BUT SATELLITE LOCATION, TIME OF OBSERVATION, SOLAR ZENITH ANGLE AT THE SATELLITE, DIP LATITUDE AT THE SATELLITE, TOTAL ELECTRON CONTENT DOWN TO THE ALTITUDE OF HIGHEST IONOSPHERICALLY REFLECTED FREQUENCY, AND OTHER RELEVANT INFORMATION IS NOTED WITH EACH PROFILE. PROFILE DATA CONSIST OF ELECTRON DENSITY AND GEOMETRIC HEIGHT VALUES FOR EACH POINT SCALED FROM THE IONOGRAM. FOR INTERPOLATED VALUES OF ELECTRON DENSITY AT STANDARD INCREMENTS OF GEOMETRIC HEIGHT, A CRC INTERPOLATION PROGRAM (AVAILABLE AT NSSDC) CAN BE RUN WITH THIS DATA SET. THESE IONOGRAMS WERE SELECTED FOR THEIR SCIENTIFIC INTEREST AND COMPRISE ONLY A VERY SMALL PORTION OF REDUCTIONS POSSIBLE FROM THE AVAILABLE IONOGRAMS.

**********ITOS 1 **********

SPACECRAFT COMMON NAME- ITOS 1 NSSDC ID 70-008A
ALTERNATE NAMES- TIROS-M, 04320

LAUNCH DATE- 01/23/70 SPACECRAFT WEIGHT IN ORBIT- 682. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 06/18/71

EPOCH DATE- 02/13/70 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 115.0 MIN
APOAPSIS- 1478.50 KM ALT PERIAPSIS- 1432.75 KM ALT INCLINATION- 101.991 DEG

SPACECRAFT BRIEF DESCRIPTION

ITOS 1 (TIROS-M) WAS THE PROTOTYPE SPACECRAFT FOR THE SECOND GENERATION OF OPERATIONAL SUN-SYNCHRONOUS METEOROLOGICAL SPACECRAFT. THE PRIMARY OBJECTIVE OF ITOS 1 WAS TO PROVIDE IMPROVED OPERATIONAL INFRARED AND VISUAL OBSERVATIONS OF EARTH CLOUD COVER FOR USE IN WEATHER ANALYSIS AND FORECASTING. SECONDARY OBJECTIVES INCLUDED PROVIDING BOTH SOLAR PROTON AND GLOBAL HEAT BALANCE DATA ON A REGULAR DAILY BASIS. TO ACCOMPLISH THESE

TASKS. THE SPACECRAFT CARRIED FOUR CAMERAS. TWO TELEVISION CAMERAS FOR AUTOMATIC PICTURE TRANSMISSION (APT) AND TWO ADVANCED VIDICON CAMERA SYSTEM (AVCS) CAMERAS. IT ALSO CARRIED A LOW-RESOLUTION FLAT PLATE RADIOMETER (FPR), A SOLAR PROTON MONITOR (SPM), AND TWO SCANNING RADIOMETERS THAT NOT ONLY MEASURED EMITTED INFRARED RADIATION BUT ALSO SERVED AS A BACKUP SYSTEM FOR THE APT AND AVCS CAMERAS. THE NEARLY CUBICAL SPACECRAFT MEASURED 1 BY 1 BY 1.2 M. THE TV CAMERAS AND INFRARED SENSORS WERE MOUNTED ON THE SATELLITE BASEPLATE WITH THEIR OPTICAL AXES DIRECTED VERTICALLY EARTHWARD. THE SATELLITE WAS EQUIPPED WITH THREE CURVED SOLAR PANELS THAT WERE FOLDED DURING LAUNCH AND DEPLOYED AFTER ORBIT WAS ACHIEVED. EACH PANEL MEASURED OVER 4.2 M IN LENGTH WHEN UNFOLDED AND WAS COVERED WITH 3420 SOLAR CELLS, EACH MEASURING 2 BY 2 CM. THE ITOS 1 DYNAMICS AND ATTITUDE CONTROL SYSTEM MAINTAINED DESIRED SPACECRAFT ORIENTATION THROUGH GYROSCOPIC PRINCIPLES INCORPORATED INTO THE SATELLITE DESIGN. EARTH ORIENTATION OF THE SATELLITE BODY WAS MAINTAINED BY TAKING ADVANTAGE OF THE PRECESSION INDUCED FROM A MOMENTUM FLYWHEEL SO THAT THE SATELLITE BODY PRECESSION RATE OF ONE REVOLUTION PER ORBIT PROVIDED THE DESIRED 'EARTH LOOKING' ATTITUDE. MINOR ADJUSTMENTS IN ATTITUDE AND ORIENTATION WERE MADE BY MEANS OF MAGNETIC COILS AND BY VARYING THE SPEED OF THE MOMENTUM FLYWHEEL. LAUNCHED INTO A NEAR-POLAR ORBIT, THE SPACECRAFT AND EXPERIMENTS PERFORMED NORMALLY UNTIL THE INCREMENTAL TAPE RECORDER (IR) FAILED ON NOVEMBER 16, 1970, RESULTING IN PARTIAL LOSS OF SPM AND FPR DATA. OVERHEATING DEVELOPED IN THE SATELLITE ATTITUDE CONTROL SYSTEM DURING MARCH 1971. ATTEMPTS TO CORRECT THE PROBLEM WERE UNSUCCESSFUL, AND THE SPACECRAFT WAS DEACTIVATED ON JUNE 18, 1971.

**********ITOS 1, NESS STAFF

EXPERIMENT NAME- ADVANCED VIDICON CAMERA SYSTEM (AVCS) NSSDC ID 70-008A-04

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 06/18/71

EXPERIMENT BRIEF DESCRIPTION

THE ITOS 1 ADVANCED VIDICON CAMERA SYSTEM (AVCS) WAS A REDUNDANT CAMERA AND TAPE RECORDER COMBINATION DESIGNED TO RECORD A SERIES OF WIDE-ANGLE, HIGH-RESOLUTION TELEVISION PICTURES OF THE EARTH AND ITS CLOUD COVER DURING DAYLIGHT. THE AVCS OPERATED IN THREE MODES -- RECORD, PLAYBACK, AND DIRECT READOUT. THE AVCS SYSTEM FOR ITOS 1 WAS ESSENTIALLY THE SAME AS THAT USED ON ALL AVCS-TOS SPACECRAFT (ESSA 3, 5, 7, AND 9). THE TWO MAJOR ELEMENTS OF THE SYSTEM WERE (1) THE CAMERA SENSOR ASSEMBLY, WHICH CONTAINED LENS, SHUTTER, GRAYSCALE CALIBRATOR, VIDICON, DEFLECTION YOKE, CAMERA ELECTRONICS MODULE, AND POWER CIRCUITS AND (2) A PREAMPLIFIER FOR CONVERTING OPTICAL IMAGES INTO ELECTRICAL SIGNALS. THE EARTH-ORIENTED CAMERA USED A 108-DEG WIDE-ANGLE LENS (5.7-MM FOCAL LENGTH) WITH AN F/1.8 APERTURE AND A 2.54-CM-DIAMETER VIDICON WITH 833 SCAN LINES. A VIDEO FRAME CONSISTED OF A 0.25-SEC PERIOD OF BLANKED VIDEO, FOLLOWED BY 6.25 SEC OF VIDICON SCAN VIDEO (833 LINES), AND A FINAL 0.25-SEC PERIOD OF BLANKED VIDEO. ELEVEN PICTURES WERE TAKEN AT 250-SEC INTERVALS TO COVER THE SUNLIT PORTION OF THE EARTH (SUN ELEVATION GREATER THAN 15 DEG). THE TAPE RECORDER COULD BE READ OUT BETWEEN PHOTOGRAPHIC CYCLES WITHOUT LOSING A PICTURE OR INTERRUPTING A SEQUENCE. AT NOMINAL SATELLITE ALTITUDE (1450 KM), THE AVCS PICTURES COVERED A 3000- BY 3000-KM SQUARE WITH A GROUND RESOLUTION OF ABOUT 3 KM AT NADIR. THERE WAS A 50 PERCENT PICTURE OVERLAP ALONG THE TRACK TO INSURE COMPLETE COVERAGE. THE TAPE RECORDER COULD STORE UP TO 38 PICTURES (THREE ORBITS OF

DATA) IN A SINGLE START-STOP OPERATION. THE AVCS FUNCTIONED NORMALLY UNTIL IT WAS PLACED IN A STANDBY MODE ON MARCH 23, 1971, WHEN OVERHEATING DEVELOPED IN THE SATELLITE CONTROL SYSTEM. THE EXPERIMENT WAS OPERATED INTERMITTENTLY UNTIL JUNE 18, 1971, WHEN THE SPACECRAFT WAS DEACTIVATED. DATA FROM THIS EXPERIMENT ARE AVAILABLE THROUGH THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA.

DATA SET NAME- CATALOG OF METEOROLOGICAL SATELLITE DATA- NSSDC ID 70-008A-04A
ITOS 1 TELEVISION CLOUD PHOTOGRAPHY

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 06/16/70 TO 03/31/71 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 4 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES OBTAINED FROM ITOS 1. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS ORBIT NUMBER AND TRACK OR SWATH NUMBER (A FUNCTION OF EQUATORIAL CROSSING LONGITUDE). ALONG WITH TIME OF FIRST PICTURES AND SUB-SATELLITE LOCATION OF EACH OF 12 PICTURES IN EACH SWATH, A MAP INDEX SHOWING BOTH HEMISPHERES, ONCE PER DAY, COMPUTER-PRODUCED AND GRIDDED AND WITH CONTINENTS OUTLINED, SERVES AS THE BASIC DATA INDEX. THESE MAPS ARE COMPOSITE MOSAICS FOR RELATIVELY FIXED LOCAL SOLAR TIME. THESE PRINTED MAPS ARE CLEAR AND COMPLETE ENOUGH TO HAVE POTENTIAL UTILITY FOR RESEARCH. THIS INDEX AND THE PHOTOGRAPHY MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEX IS ON FILE AND AVAILABLE FOR USE AT NSSDC. IT MAY BE AVAILABLE AT SOME STABILIZED AND LARGER LIBRARIES AS U.S. DEPT OF COMMERCE, ESSA, EDS, "CATALOG OF METEOROLOGICAL SATELLITE DATA- ESSA TV CLOUD PHOTOGRAPHY" (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.326 AND 5.327).

**********MARINER 9 **********

SPACECRAFT COMMON NAME- MARINER 9 NSSDC ID 71-051A
ALTERNATE NAMES- MARINER-I, MARINER MARS 71, MARIN-I, PL-7128, 05261

LAUNCH DATE- 05/30/71 SPACECRAFT WEIGHT IN ORBIT- 907. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 10/27/72

EPOCH DATE- 11/16/71 ORBIT TYPE- MARSCENTRIC ORBIT PERIOD- 719. MIN
APOAPSIS- 17168. KM ALT PERIAPSIS- 1250. KM ALT INCLINATION- 64.37 DEG

SPACECRAFT BRIEF DESCRIPTION

THE MARINER MARS 71 MISSION WAS PLANNED TO CONSIST OF TWO SPACECRAFT ON COMPLEMENTARY MISSIONS, BUT DUE TO THE FAILURE OF MARINER 8 TO LAUNCH PROPERLY, ONLY ONE SPACECRAFT WAS AVAILABLE. MARINER 9 COMBINED MISSION OBJECTIVES OF BOTH MARINER 8 (MAPPING 70 PERCENT OF THE MARTIAN SURFACE) AND MARINER 9 (A STUDY OF TEMPORAL CHANGES IN THE MARTIAN ATMOSPHERE AND ON THE MARTIAN SURFACE). FOR THE SURVEY PORTION OF THE MISSION, THE PLANETARY SURFACE WAS TO BE MAPPED WITH THE SAME RESOLUTION AS PLANNED FOR THE ORIGINAL MISSION, ALTHOUGH THE RESOLUTION OF PICTURES OF THE POLAR REGIONS WOULD BE DECREASED DUE TO THE INCREASED SLANT RANGE. THE VARIABLE FEATURES EXPERIMENTS WERE CHANGED FROM STUDIES OF SIX GIVEN AREAS EVERY 5 DAYS TO STUDIES OF SMALLER REGIONS EVERY 17 DAYS. MARINER 9 ARRIVED AT MARS ON

NOVEMBER 14, 1971. THE SPACECRAFT GATHERED DATA ON THE ATMOSPHERIC COMPOSITION, DENSITY, PRESSURE, AND TEMPERATURE AND ON THE SURFACE COMPOSITION, TEMPERATURE, AND TOPOGRAPHY OF MARS. AFTER DEPLETING ITS SUPPLY OF ATTITUDE CONTROL GAS, THE SPACECRAFT WAS TURNED OFF OCTOBER 27, 1972.

**********MARINER 9, HANEL

EXPERIMENT NAME- INFRARED INTERFEROMETER SPECTROMETER (IRIS) NSSDC ID 71-051A-03

ORIGINAL EXPERIMENT INSTITUTION- NASA-GSFC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - R.A.	HANEL	NASA-GSFC	GREENBELT, MD
OI - B.J.	CONRATH	NASA-GSFC	GREENBELT, MD
OI - C.	PRABHAKARA	NASA-GSFC	GREENBELT, MD
OI - G.V.	LEVIN	BIOSPHERICS INC	ROCKVILLE, MD
OI - B.	SCHLACHMAN	NASA-GSFC	GREENBELT, MD
OI - W.A.	HOVIS	NASA-GSFC	GREENBELT, MD
OI - V.G.	KUNDE	NASA-GSFC	GREENBELT, MD
OI - P.D.	LOWMAN, JR.	NASA-GSFC	GREENBELT, MD
OI - J.	PIRRAGLIA	NASA-GSFC	GREENBELT, MD
OI - T.E.	BURKE	NASA-JPL	PASADENA, CA
OI - J.C.	PEARL	NASA-GSFC	GREENBELT, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST EXPERIMENT DATA RECORDED- 10/27/72

EXPERIMENT BRIEF DESCRIPTION

THE MARINER 9 INFRARED INTERFEROMETER SPECTROMETER (IRIS) EXPERIMENT WAS DESIGNED TO PROVIDE INFORMATION ON THE VERTICAL STRUCTURE, COMPOSITION, AND DYNAMICS OF THE ATMOSPHERE AND ON THE EMISSIVE PROPERTIES OF THE SURFACE OF MARS. MEASUREMENTS WERE MADE IN THE REGION OF THERMAL EMISSION SPECTRA FROM 6 TO 50 MICRONS, USING A MODIFIED MICHELSON INTERFEROMETER WITH A SPECTRAL RESOLUTION OF 0.042 CM (APODIZED) AND 0.083 CM (UNAPODIZED), TO DETERMINE THE VERTICAL TEMPERATURE PROFILE, GENERAL ATMOSPHERIC CIRCULATION, MINOR ATMOSPHERIC CONSTITUENTS, AND SURFACE TEMPERATURE, COMPOSITION, AND THERMAL PROPERTIES AS A FUNCTION OF LATITUDE AND LOCAL TIME FOR DARK AND BRIGHT AREAS AND THE POLAR CAP REGION. THE INSTRUMENTATION, MOUNTED ON THE BOTTOM OF THE SPACECRAFT ON A MULTIPLE-POINTING MOTOR-DRIVEN SCAN PLATFORM, CONSISTED PRIMARILY OF -- (1) A SCAN MIRROR, (2) A COATED CESIUM IODIDE ENTRANCE WINDOW, (3) A CESIUM IODIDE BEAM SPLITTER, (4) A FIXED MIRROR, (5) A MOVABLE MIRROR WITH ELECTROMAGNETIC DRIVE, (6) A CONDENSING MIRROR, (7) A THERMISTOR BOLOMETER DETECTOR, (8) A REFERENCE INTERFEROMETER, (9) AN INTERNAL WARM BLACKBODY CALIBRATOR, AND (10) A PROGRAMMER. THE SCAN MIRROR SELECTED IR RADIATION FROM ONE OF THREE DIRECTIONS -- MARS, DEEP SPACE, OR THE INTERNAL WARM BLACKBODY. FROM THIS MIRROR, THE RADIATION WAS REFLECTED TO THE INTERFEROMETER THROUGH THE ENTRANCE WINDOW, WHICH ACTED AS AN IR FILTER AND HAD AN EFFECTIVE APERTURE AREA OF 10 CM SQ. THE BEAM SPLITTER THEN DIVIDED THE INCOMING RADIATION INTO TWO APPROXIMATELY EQUAL COMPONENTS. AFTER REFLECTIONS FROM THE FIXED AND MOVING MIRRORS, RESPECTIVELY, THE TWO BEAMS INTERFERED WITH EACH OTHER AND WERE FOCUSED BY THE CONDENSING MIRROR ONTO THE BOLOMETRIC DETECTOR, WHICH PROVIDED AN ELECTRICAL OUTPUT PROPORTIONAL TO THE INTENSITY AS A FUNCTION OF THE PATH LENGTH DIFFERENCE OR PHASE DIFFERENCE BETWEEN THE IR RADIATION REFLECTED OR TRANSMITTED BY THE BEAM SPLITTER. THE ELECTRICAL OUTPUT, CONVERTED FROM ANALOG TO DIGITAL FORM, WAS CALLED AN INTERFEROGRAM AND REPRESENTED A CIRCULAR FRINGE PATTERN THAT APPEARED AT THE FOCAL PLANE OF THE CONDENSING MIRROR. EACH INTERFEROGRAM HAD A DURATION OF 18.2 SEC AND CONTAINED 4096 SAMPLES. AFTER SEVEN

INTERFEROGRAMS WERE TAKEN IN THE OPERATING MODE, ONE WAS TAKEN OF THE INTERNAL WARM (298 PLUS OR MINUS 3 DEG K) BLACKBODY, FOLLOWED BY ANOTHER SET OF SEVEN MARS INTERFEROGRAMS, AND FINALLY BY AN INTERFEROGRAM FROM THE DEEP SPACE BACKGROUND (4 DEG). THE IRIS, WHICH HAD A FIELD OF VIEW OF 4.5 DEG, VIEWED AN AREA 116 CM IN DIAMETER FROM AN ORBITAL ALTITUDE OF 1600 KM. THE INSTRUMENT WAS IDENTICAL IN ALL CRITICAL AREA TO THE INTERFEROMETERS DESIGNED FOR THE NIMBUS-B AND -D METEOROLOGICAL SATELLITES, EXCEPT THAT THE MARINER 9 IRIS HAD BETTER SPECTRAL RESOLUTION. THE EXPERIMENT BEGAN COLLECTING EXCELLENT DATA SOON AFTER ORBITAL INSERTION ON NOVEMBER 13, 1971, AND CONTINUED UNTIL APRIL 2, 1972, WHEN THE EXPERIMENT WAS SHUT OFF TO CONSERVE SPACECRAFT POWER DURING 2 MONTHS OF SOLAR OCCULTATION. THE EXPERIMENT WAS TURNED BACK ON JUNE 8, 1972, AFTER THE SPACECRAFT MOVED OUT OF SOLAR OCCULTATION. IT CONTINUED TO OPERATE NORMALLY UNTIL 2341 GMT ON OCTOBER 27, 1972, WHEN THE EXPERIMENT WAS TURNED OFF ALONG WITH THE REST OF THE MARINER 9 SPACECRAFT.

DATA SET NAME- INFRARED INTERFEROMETER SPECTROMETER DATA NSSDC ID 71-051A-03A
TAPES

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/14/71 TO 10/16/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 5 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF 1600-BPI BINARY DATA TAPES, PRODUCED ON AN IBM 360. THE TAPES ARE 9-TRACK, AND EACH CONTAINS ONE FILE OF DATA. THE RECORDS HAVE A PHYSICAL RECORD SIZE OF 6408 BYTES AND A LOGICAL RECORD SIZE OF 6404 BYTES. EACH TAPE CONTAINS THE FOLLOWING SEVEN TYPES OF RECORDS -- (1) TAPE SUMMARY, (2) COLD REFERENCE CALIBRATION, (3) WARM REFERENCE CALIBRATION, (4) AVERAGE NORMALIZED RESPONSIVITY, (5) NOISE EQUIVALENT RADIANCE, (6) AVERAGE INSTRUMENT TEMPERATURE AND (7) CALIBRATED MARTIAN SPECTRA. APPROXIMATELY 21,000 CALIBRATED SPECTRA ARE INCLUDED IN THIS DATA SET. FOR A MORE COMPLETE DESCRIPTION OF THIS DATA SET, INCLUDING CALIBRATION PROCEDURES, SEE HANEL, 'MARINER 9 INFRARED INTERFEROMETER SPECTROMETER (IRIS) REDUCED DATA RECORDS DOCUMENTATION,' OCTOBER 1973, GSFC X-622-73-305.

**********MARINER 9, MASURSKY

EXPERIMENT NAME- TELEVISION PHOTOGRAPHY NSSDC ID 71-051A-04

ORIGINAL EXPERIMENT INSTITUTION- NASA-JPL

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - H.	MASURSKY	US GEOLOGICAL SURVEY	FLAGSTAFF, AZ
OI - G.	DE VAUCOULEURS	U OF TEXAS	AUSTIN, TX
OI - J.	LEDERBERG	STANFORD U	STANFORD, CA
OI - W.	THOMPSON	BELLCOMM, INC	WASHINGTON, DC

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 10/27/72

EXPERIMENT BRIEF DESCRIPTION

THIS EXPERIMENT CONSISTED OF A 2-IN. VIDICON TELEVISION CAMERA WHICH TRANSMITTED PHOTOGRAPHY FROM MARS. IT WAS A PHOTOMETRICALLY CALIBRATED

INSTRUMENT PROVIDING OVERLAPPING, SELECTIVELY FILTERED, LOW-RESOLUTION PICTURES AND BROADBAND (UNFILTERED) HIGH-RESOLUTION PICTURES, EACH NESTED IN A LOW-RESOLUTION OVERLAP. BOTH TYPES OF PICTURES HAD APPROXIMATELY A 700- BY 830-ELEMENT FORMAT, AND AN ORDER-OF-MAGNITUDE DIFFERENCE IN RESOLUTION BETWEEN THEM. RESOLUTION OF 500 M/TV LINE AND 50 M/TV LINE RESULTED FROM LOW (11 DEG BY 14 DEG) AND HIGH (1.1 DEG BY 1.4 DEG) RESOLUTION PICTURES TAKEN AT A PERIAPSIS ALTITUDE OF 2000 KM. THE OFFICIAL ORDERING SYSTEM OF IDENTIFICATION OF PICTURES WAS BY A 9-DIGIT NUMBER CALLED DATA AUTOMATION SET (DAS) WHICH IS CHRONOLOGICAL AND A KIND OF TIME. THREE LABORATORIES PRODUCED PROCESSED PHOTOS AND DATA. THE SYSTEMS INVOLVED AND THEIR ACRONYMS ARE AS FOLLOWS -- (1) MISSION TEST VIDEO SYSTEM (MTVS), (2) IMAGE PROCESSING LAB (IPL), AND (3) SUPPLEMENT TO ENGINEERING DATA RECORD (SEDR). IN ADDITION THERE IS A REDUCED DATA RECORD (RDR). THE SEDR DATA ARE THE FINAL AND BEST AVAILABLE SUPPORTING DATA.

DATA SET NAME- PANORAMIC MOSAIC PHOTOGRAPHS ON 4- BY 5-IN. B/W FILM SHEETS — NSSDC ID 71-051A-04G

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/14/71 TO 10/27/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 96 FRAMES

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF 4 X 5 NEGATIVES CONTAINING THE MARINER 9 B CAMERA (NARROW-ANGLE, HIGH-RESOLUTION) PHOTOGRAPHY IN WHICH FRAMES IN A GIVEN QUADRANGLE OF THE MARTIAN SURFACE ARE SHOWN TOGETHER. FRAMES OF ADJACENT AREAS ARE ARRANGED TOGETHER, PRODUCING A KIND OF MOSAIC. THE LAST FOUR DIGITS OF THE DAS TIME ARE GIVEN BESIDE EACH FRAME, THE CARD NUMBER AT THE LOWER RIGHT CORNER, AND THE CAMERA AND TYPE OF PROCESSING (SHADING CORRECTED (SC) OR MAXIMUM DISCRIMINATION - EITHER VERTICALLY (VAGC) OR HORIZONTALLY (HAGC)) IN THE UPPER RIGHT CORNER. THE REVOLUTION NUMBER AND FULL DAS TIME ARE GIVEN IN EACH ROW OF THE CARD. THE QUALITY IS EXCELLENT AND THESE PHOTOS CAN BE USED FOR SOME SCIENTIFIC PURPOSES, BUT THEIR MAIN PURPOSE IS FOR USE AS A CATALOG.

DATA SET NAME- TV PHOTOGRAPHIC SUPPORTING DATA ON 16-MM MICROFILM — NSSDC ID 71-051A-04H

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/14/71 TO 10/27/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF 16-MM MICROFILM GENERATED AT NSSDC, AND CONTAINS THE SUPPORTING DATA FOR THE COMPLETE 70-MM PHOTOGRAPHY OF THE MARINER 9 MISSION. THIS INCLUDES THE EXTENDED MISSION (REVOLUTION 676). EXPLANATORY TABLES AND DIAGRAMS ARE AT THE BEGINNING OF THE ROLL AND PERTAIN TO THE FOLLOWING SUPPORTING DATA -- REVOLUTION NUMBER, DAS TIME, CAMERA, SHUTTER TIME IN GMT, DAY OF YEAR, FILTER AND EXPOSURE TIME, LOCAL TIME FROM TIME OF PERIAPSIS, DISTANCE FROM SPACECRAFT TO CENTER OF PLANET (RMAG), TRUE ANOMALY OF THE SPACECRAFT (SC/TA), SUN'S LATITUDE AND LONGITUDE, SPACECRAFT'S LATITUDES AND LONGITUDES, PRINCIPAL POINT'S LATITUDE AND LONGITUDE (0 LAT AND 0 LONG), PICTURE HEIGHT AND WIDTH, NORTH DIRECTION ON

THE PLANETARY SURFACE MEASURED IN THE IMAGE PLANE AND PIXEL SIZE, AND SUN ANGLE (WHICH IS THE SUN'S DIRECTION ON THE PLANET MEASURED IN THE IMAGE PLANE). THESE SUPPORT DATA ARE EARLY DATA THAT CONTAIN SOME ERRORS. THE SEDR SUPPORT DATA (DATA SET 71-051A-04K) ON MAGNETIC TAPE CONTAIN THE FINAL BEST DATA.

DATA SET NAME- TV PHOTOGRAPHY INDEX DATA ON 16-MM B/W NEGATIVE FILM — NSSDC ID 71-051A-04I

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/14/71 TO 10/27/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 2 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF THE COMPLETE INDEXES OF MTVS AND IPL LABORATORIES' VERSIONS OF THE MARINER 9 70-MM PHOTOGRAPHY, REPRODUCED AT NSSDC ON 16-MM MICROFILM FOR CATALOG PURPOSES. THE INDEXES ARE ARRANGED IN SIX DIFFERENT SORTS -- (1) PRINCIPAL POINT LATITUDE, (2) PRINCIPAL POINT LONGITUDE, (3) DAS TIME, (4) MTVS ROLL AND FILE NUMBER, (5) IPL ROLL AND PROCESS TIME, AND (6) COMMENTS. EACH SORT CONTAINS THE PARAMETERS LISTED ABOVE AND, IN ADDITION, GIVES THE RESOLUTION NUMBER. THE PAGES HAVE BEEN REDUCED TO SUCH AN EXTENT THAT A HIGH MAGNIFICATION IS NEEDED ON THE MICROFILM READER.

DATA SET NAME- IPL MICROFICHE CATALOG OF SELECTED PHOTOGRAPHY — NSSDC ID 71-051A-04J

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/14/71 TO 08/06/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 279 CARDS OF B/W MICROFICHE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF MARINER 9 PHOTOGRAPHY ON MICROFICHE FROM THE IPL/RDR LABORATORY. THE FIRST CARD CONTAINS EXPLANATIONS OF DATA FOR THIS MICROFICHE CATALOG. THE QUALITY OF REPRODUCTION IS SUFFICIENT FOR SOME SCIENTIFIC STUDIES TO BE MADE DIRECTLY FROM THEM.

DATA SET NAME- SEDR FINAL SUPPORT DATA ON MAGNETIC TAPE — NSSDC ID 71-051A-04K

AVAILABILITY OF DATA SET- DATA AT NSSDC READY FOR DISTRIBUTION

TIME PERIOD COVERED- 11/12/71 TO 10/18/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF THE FINAL AND MOST CORRECT SUPPORT DATA TAPE FOR THE MARINER 9 PHOTOGRAPHY. THE TAPE WAS WRITTEN IN 7-TRACK BINARY CODE AT 556 BPI ON AN IBM 360. THE CONTENTS OF THE TAPE SUPERSEDE ANY OTHER SUPPORT DATA, SUCH AS THE RECORDS ON THE DATA BLOCKS ON THE IMAGERY, OR THOSE ON THE REDUCED DATA RECORDS (RDR).

DATA SET NAME- CATALOG OF MARINER 9 MTVS PHOTOGRAPHY ON 16-MM MICROFILM — NSSDC ID 71-051A-04L

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/09/71 TO 10/31/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 20 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF THE COMPLETE MARINER 9 MTVS PHOTOGRAPHY ON 16-MM FILM FOR CATALOG PURPOSES. GENERALLY, THREE RENDITIONS OF EACH FRAME ARE GIVEN -- (A) RAW, (B) ALBEDO RECTIFIED, AND (C) HIGH PASS FILTERED (FOR MAXIMUM DISCRIMINATION). THE QUALITY IS VERY GOOD, AND THE PHOTOS CAN BE DIRECTLY USED FOR SOME SCIENTIFIC PURPOSES.

DATA SET NAME- MOSAIC PHOTOGRAPHS AND INDEX CATALOG ON 16 MM MICROFILM — NSSDC ID 71-051A-04N

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/13/71 TO 10/27/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF JPL PREPARED MOSAIC BOARDS OF SELECTED AREAS OF THE MARTIAN TERRAIN TOGETHER WITH AN INDEX ON 16-MM MICROFILM. THE PHOTOGRAPHIC MOSAICS ARE GROUPED ACCORDING TO SPECIFIC GEOGRAPHICAL AREAS AND WERE FILMED FROM 4- X 5-IN NEGATIVES. THE INDEX CONSISTS OF TWO LISTINGS WHICH ARE IDENTICAL IN CONTENT. THE FIRST IS ORDERED BY MOSAIC NUMBER AND THE SECOND BY DAS TIME. THIS MOSAIC CATALOG ENABLES USERS TO IDENTIFY THOSE MOSAICS FOR WHICH THEY REQUIRE HIGHER QUALITY REPRODUCTIONS.

DATA SET NAME- LIMB PHOTOGRAPHY INDEX ON B/W MICROFICHE — NSSDC ID 71-051A-04O

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/14/71 TO 10/27/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 16 CARDS OF B/W MICROFICHE

DATA SET BRIEF DESCRIPTION

THIS DATA SET BY JPL CONSISTS OF B/W POSITIVE MICROFICHE CARDS, INDEXING THE COMPLETE SET OF LIMB PHOTOGRAPHY FROM THE MARINER 9 IPL REDUCED DATA. EACH FRAME CONTAINS THE SUPPORT DATA THAT ALL MARINER 9 PHOTOGRAPHY POSSESSES. THE LISTINGS ARE ORDERED BY IPL ROLL NUMBER, AND SEDR/DAS TIME. THE LISTINGS, HOWEVER, CONTAIN BLEEDING LETTERS, AND WILL BE HARD TO HOLD FOR FURTHER REPRODUCTION. THE PHOTOGRAPHY IS VERY GOOD.

DATA SET NAME- LIMB PHOTOGRAPHY CATALOG ON B/W — NSSDC ID 71-051A-04P

MICROFICHE

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/14/71 TO 10/27/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 166 CARDS OF B/W MICROFICHE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF JPL MICROFICHE OF THE MARTIAN LIMB PHOTOGRAPHY. IN ADDITION TO THE PHOTOGRAPHIC IMAGERY, THERE ARE PLOTS OF LIMB PROFILES, SUPPORTING DATA BLOCKS FOR THE PHOTOGRAPHS, AND SUPPORTING DATA FOR THE PLOTS. THE DATA BLOCKS FOR THE PHOTOGRAPHY CONTAIN THE FOLLOWING INFORMATION -- PICTURE NUMBER, DAS TIME, ALTITUDE, VIEW ZENITH ANGLE, CENTER AND CORNER COORDINATES, YEAR, DAY, MONTH, GMT TIME, FILTER, PICTURE HEIGHT AND WIDTH IN KM ON THE SURFACE, PHASE ANGLE, PROCESS DATA, AND IPL NUMBER. THE DATA BLOCKS ON THE LIMB PROFILE PLOTS CONTAIN THE FOLLOWING INFORMATION -- DAS TIME, FILTER, LIMB ABSCISSA, PLOT LINE NUMBER, LOCAL TIME, LONGITUDE AND LATITUDE, LINE SAMPLE, ILLUMINATION ANGLE, PHASE ANGLE, SUN AZIMUTH, SCALE, START LINE, START SAMPLE, END LINE, AND END SAMPLE. THE IMAGERY IS GENERALLY VERY GOOD, INCLUDING THE PLOTS AND THE DATA BLOCKS. OCCASIONALLY SOME OF THE LETTERS BLEED A LITTLE IN THE DATA BLOCKS, BUT EVEN THESE SHOULD BE LEGIBLE.

DATA SET NAME- SELECTED MTVS AND IPL PHOTOGRAPHY ON MICROFICHE FROM CAL TECH NSSDC ID 71-051A-04Q

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/12/71 TO 10/27/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 467 CARDS OF B/W MICROFICHE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF NEGATIVE MICROFICHE, SELECTED BY CAL TECH PERSONNEL REPRESENTING THE BEST FRAMES FROM THE MTVS AND IPL LABORATORIES. MOST OF THE PHOTOGRAPHS ARE THE ALBEDO-STRETCHED AND MAXIMUM-DISCRIMINATION VERSIONS OF THE ORIGINAL IMAGERY. INCLUDED WITH THE PHOTOGRAPHS ARE GRAY SCALES, QUADRANT MAPS, AND SUPPORTING DATA FOR THE IMAGES THAT APPEAR ON EACH CARD. THE SUPPORTING DATA CONTAIN THE FOLLOWING INFORMATION -- PICTURE IDENTIFICATION, DAS TIME, ORBIT NUMBER, CAMERA, FILTER, ROLL AND FILE NUMBER (MTVS), DATA PICTURES FOOTPRINTS (MAPS), CORNER COORDINATES, SLANT RANGE, VIEWING ANGLE, RESOLUTION, SOLAR LIGHTING ANGLE, PHASE ANGLE, VIEWING ANGLE, LOCAL TIME OF THE CENTER FROM MIDNIGHT, SUN DIRECTION IN THE IMAGE, DIRECTION OF NORTH IN THE IMAGE, AND EXPOSURE INTERVAL. THE TIME PERIOD COVERED IS FROM NOVEMBER 12, 1971 (FAR-ENCOUNTER PHOTOS), TO OCTOBER 27, 1972. SOME OF THE SUPPORTING DATA BLOCKS ARE ALMOST ILLEGIBLE, AND WILL BE VERY HARD TO REPRODUCE, ESPECIALLY SINCE THEY ARE POSITIVE ON THE CARDS IN WHICH THE IMAGERY IS NEGATIVE, AND WILL THEREFORE REPRODUCE WHITE ON BLACK. THE SUPPORTING DATA IN THESE CARDS ARE EQUIVALENT TO THE SEDR DATA, WHICH IS THEREFORE THE MOST CORRECT. A MICROFICHE CARD WITH A COMPLETE DESCRIPTION OF ALL DATA AND FOOTPRINTS WILL BE MADE AVAILABLE SOON. THE PHOTOGRAPHIC IMAGERY IS GENERALLY VERY GOOD. THE FOOTPRINT AND SUPPORTING DATA IMAGERY VARY FROM FAIR TO POOR. THESE MICROFICHE ARE FOR CATALOG PURPOSES, BUT THE IMAGERY MAY BE USEFUL IN SOME AREAS OF RESEARCH.

DATA SET NAME- PICTURE AND ENHANCEMENT CATALOG ON MAGNETIC TAPE — NSSDC ID 71-051A-04T

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/14/71 TO 10/27/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF A MAGNETIC TAPE OF THE PICTURE AND ENHANCEMENT CATALOG FOR MARINER MARS 71. THE TAPE IS 556 BPI, BINARY, 7 TRACK, AND CREATED ON AN IBM 360 COMPUTER. EACH RECORD ON THE TAPE IS DIVIDED INTO THREE SECTIONS. SECTION 1, LEVEL 1 OCCURS ONE TIME FOR EACH PICTURE. TWO OF THE FIELDS IT CONTAINS, PL COUNT (IMAGE PROCESSING LABORATORY COUNT) AND MTV COUNT (MARINER 71 TV-PICTURE COUNT), REFLECT THE NUMBER OF ENTRIES IN THE OTHER TWO SECTIONS. SEGMENT 2, LEVEL 2 CONTAINS ENTRIES WHICH REFLECT THE NUMBER AND TYPE OF PROCESSING OF A PICTURE BY THE IMAGE PROCESSING LABORATORY. SEGMENT 3, LEVEL 2 CONTAINS ENTRIES WHICH REFLECT THE NUMEER AND TYPE OF MTVS FRAMES ON WHICH A PICTURE EXISTS (USUALLY THREE OR FOUR).

DATA SET NAME- MARINER 9 JPL MOSAIC CATALOG AND INDEX ON MICROFICHE — NSSDC ID 71-051A-04U

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 11/14/71 TO 10/27/72 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 7 CARDS OF B/W MICROFICHE

DATA SET BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF THE JPL MOSAICS PHOTOGRAPHY AND THE INDEX TO THIS PHOTOGRAPHY THAT HAVE BEEN REPRODUCED ON MICROFICHE AT NSSDC FOR CATALOG PURPOSES.

**********NIMBUS 2 **********

SPACECRAFT COMMON NAME- NIMBUS 2 — NSSDC ID 66-040A
ALTERNATE NAMES- 02173

LAUNCH DATE- 05/15/66 SPACECRAFT WEIGHT IN ORBIT- 414. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 01/17/69

EPOCH DATE- 05/15/66 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 108. MIN
APOAPSIS- 1179.00 KM ALT PERIAPSIS- 1109.00 KM ALT INCLINATION- 100.311 DEG

SPACECRAFT BRIEF DESCRIPTION
NIMBUS 2, THE SECOND IN A SERIES OF SECOND-GENERATION METEOROLOGICAL R AND D SATELLITES, WAS DESIGNED TO SERVE AS A STABILIZED, EARTH-ORIENTED PLATFORM FOR THE TESTING OF ADVANCED SYSTEMS FOR SENSING AND COLLECTING METEOROLOGICAL DATA. THE POLAR-ORBITING SPACECRAFT CONSISTED OF THREE MAJOR ELEMENTS -- (1) A SENSORY RING, (2) SOLAR PADDLES, AND (3) THE CONTROL HOUSING UNIT, WHICH WAS CONNECTED TO THE SENSORY RING BY A TRUSS STRUCTURE. SHAPED SOMEWHAT LIKE AN OCEAN BUOY, NIMBUS 2 WAS NEARLY 3.7 M TALL, 1.5 M IN

DIAMETER AT THE BASE, AND ABOUT 3 M ACROSS WITH SOLAR PADDLES EXTENDED. THE SENSORY RING, WHICH FORMED THE SATELLITE BASE, HOUSED THE ELECTRONICS EQUIPMENT AND BATTERY MODULES. THE LOWER SURFACE OF THE TORUS-SHAPED SENSORY RING PROVIDED A MOUNTING SPACE FOR SENSORS AND TELEMETRY ANTENNAS. AN H-FRAME STRUCTURE MOUNTED WITHIN THE CENTER OF THE TORUS PROVIDED SUPPORT FOR THE LARGER EXPERIMENTS AND TAPE RECORDERS. MOUNTED ON THE CONTROL HOUSING UNIT, WHICH WAS LOCATED ON TOP OF THE SPACECRAFT, WERE SUN SENSORS, HORIZON SCANNERS, GAS NOZZLES FOR ATTITUDE CONTROL, AND A COMMAND ANTENNA. USE OF A STABILIZATION AND CONTROL SYSTEM PERMITTED THE SPACECRAFT'S ORIENTATION TO BE CONTROLLED TO WITHIN PLUS OR MINUS 1 DEG FOR ALL THREE AXES (PITCH, ROLL, AND YAW). THE SPACECRAFT CARRIED (1) AN ADVANCED VIDICON CAMERA SYSTEM (AVCS) FOR RECORDING AND STORING REMOTE CLOUDCOVER PICTURES, (2) AN AUTOMATIC PICTURE TRANSMISSION (APT) CAMERA FOR PROVIDING REAL-TIME CLOUDCOVER PICTURES, AND (3) BOTH HIGH- AND MEDIUM-RESOLUTION INFRARED RADIOMETERS (HRIR AND MRIR) FOR MEASURING THE INTENSITY AND DISTRIBUTION OF ELECTROMAGNETIC RADIATION EMITTED BY AND REFLECTED FROM THE EARTH AND ITS ATMOSPHERE. THE SPACECRAFT AND EXPERIMENTS PERFORMED NORMALLY AFTER LAUNCH UNTIL JULY 26, 1966, WHEN THE SPACECRAFT TAPE RECORDER FAILED. ITS FUNCTION WAS TAKEN OVER BY THE HRIR TAPE RECORDER UNTIL NOVEMBER 15, 1966, WHEN IT ALSO FAILED. SOME REAL-TIME DATA WERE COLLECTED UNTIL JANUARY 17, 1969, WHEN THE SPACECRAFT MISSION WAS TERMINATED OWING TO DETERIORATION OF THE HORIZON SCANNER USED FOR EARTH REFERENCE.

**********NIMBUS 2, SCHULMAN

EXPERIMENT NAME- ADVANCED VIDICON CAMERA SYSTEM (AVCS) NSSDC ID 66-040A-01

ORIGINAL EXPERIMENT INSTITUTION- NASA-GSFC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - J.R. SCHULMAN NASA-GSFC GREENBELT, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 11/15/66

EXPERIMENT BRIEF DESCRIPTION

THE NIMBUS 2 ADVANCED VIDICON CAMERA SYSTEM (AVCS) WAS A CAMERA, TAPE RECORDER, AND TRANSMITTER COMBINATION THAT COULD RECORD AND STORE A SERIES OF REMOTE DAYTIME CLOUDCOVER PICTURES FOR SUBSEQUENT PLAYBACK TO A GROUND-DATA ACQUISITION STATION. THE AVCS SENSORS CONSISTED OF THREE VIDICON CAMERAS MOUNTED ON THE SATELLITE SENSORY RING, FACING EARTHWARD AND DEPLOYED IN A FAN-LIKE ARRAY TO PRODUCE A THREE-SEGMENT COMPOSITE PICTURE. EACH CAMERA COVERED A 37-DEG FIELD OF VIEW WITH THE CENTER CAMERA POINTING STRAIGHT DOWN. THE OPTICAL AXES OF THE OTHER TWO CAMERAS WERE DIRECTED 35 DEG TO EITHER SIDE. EACH OF THE CAMERAS EMPLOYED AN F/4 LENS WITH A FOCAL LENGTH OF 17.0 MM. A POTENTIOMETER ATTACHED TO THE SOLAR ARRAY CONTROLLED THE LENS OPENING FROM F/16 WHEN THE SPACECRAFT WAS OVER THE EQUATOR TO F/4 WHEN IT WAS NEAR THE POLES. THE 800-SCAN-LINE, 2.54-CM VIDICON PICKUP TUBES YIELDED A LINEAR RESOLUTION OF BETTER THAN 1 KM AT NADIR FROM AN APPROXIMATE ALTITUDE OF 1100 KM. AT THIS ALTITUDE, THE CAMERA ARRAY COULD PRODUCE A COMPOSITE PICTURE COVERING AN AREA OF 720 BY 3400 KM. SUCCESSIVE FRAMES WERE TAKEN AT 91-SEC INTERVALS PROVIDING ABOUT 20 PERCENT OVERLAP IN COVERAGE. A 40-MSEC EXPOSURE TIME WAS USED, AND THE IMAGE WAS SCANNED BY THE ELECTRON BEAM IN 6.5 SEC. THE RESULTING SIGNAL WAS FREQUENCY MODULATED AND RECORDED ON THREE TRACKS OF A MAGNETIC TAPE, ONE TRACK FOR EACH CAMERA. SUFFICIENT TAPE WAS PROVIDED FOR RECORDING 53 PICTURES (ABOUT 1-2/3 ORBITS OF DATA). THE AVCS DATA WERE MULTIPLEXED WITH THE HIGH-RESOLUTION INFRARED RADIOMETER (HRIR) DATA AND, USING A TRANSMISSION FREQUENCY OF 1707.5 MHZ, WERE TELEMETERED TO A GROUND STATION IN 4 MIN. THE EXPERIMENT WAS SUCCESSFUL. IT

PROVIDED HIGH-QUALITY CLOUDCOVER PICTURES OVER AN ENTIRE SEASON ON A NEAR-GLOBAL BASIS IN ADDITION TO CONFIRMING THE RELIABILITY OF THE CAMERA SYSTEM FOR USE IN FUTURE OPERATIONAL WEATHER SATELLITES. DATA FROM THIS EXPERIMENT CAN BE OBTAINED FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR AN INDEX OF ALL DATA, SEE 'NIMBUS 2 AVCS WORLD MONTAGE CATALOG,' AVAILABLE FROM NSSDC (66-040A-01B).

DATA SET NAME- AVCS WORLD MONTAGE CATALOG NSSDC ID 66-040A-01B

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 05/15/66 TO 11/15/66 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THE 'NIMBUS 2 ADVANCED VIDICON CAMERA SYSTEM DATA WORLD MONTAGE CATALOG' CONTAINS BLACK AND WHITE PICTORIAL MONTAGES FROM THE NIMBUS 2 ADVANCED VIDICON CAMERA SYSTEM (AVCS). THESE MONTAGES CONSIST OF MINIATURE REPRODUCTIONS OF THE DAYTIME TELEVISION PICTURES OBTAINED EACH DAY AND ARE MADE UP OF ADJACENT SWATHS OF DATA FROM SUCCESSIVE ORBITS. THE SATELLITE ORBIT NUMBER IS PRINTED BELOW EACH SWATH. TRANSPARENT GRID OVERLAYS (ONE FOR THE EASTERN AND ONE FOR THE WESTERN HEMISPHERE) PROVIDE GEOGRAPHIC REFERENCES. THESE MONTAGES MAY ASSIST A USER TO IDENTIFY HIS SPECIFIC AVCS FILM DATA REQUIREMENTS AND MAY BE DIRECTLY USEFUL FOR SOME RESEARCH. THIS CATALOG DOES NOT CONTAIN BACKGROUND INFORMATION ON THE SPACECRAFT OR EXPERIMENT, NOR IS THERE A DESCRIPTION OF THE TECHNIQUES USED IN PROCESSING THE DATA. SUCH INFORMATION IS CONTAINED IN THE 'NIMBUS 2 USERS GUIDE' WHICH SHOULD BE USED IN CONJUNCTION WITH THIS CATALOG WHEN ORDERING DATA.

**********NIMBUS 4 **********

SPACECRAFT COMMON NAME- NIMBUS 4 NSSDC ID 70-025A
ALTERNATE NAMES- NIMBUS-D, PL-701E, 04362

LAUNCH DATE- 04/08/70 SPACECRAFT WEIGHT IN ORBIT- 1448. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

EPOCH DATE- 05/04/70 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 107.1 MIN
APOAPSIS- 1097.00 KM ALT PERIAPSIS- 1090.00 KM ALT INCLINATION- 99.9007 DEG

SPACECRAFT BRIEF DESCRIPTION

NIMBUS 4, THE FOURTH IN A SERIES OF SECOND-GENERATION METEOROLOGICAL R AND D SATELLITES, WAS DESIGNED TO SERVE AS A STABILIZED, EARTH-ORIENTED PLATFORM FOR THE TESTING OF ADVANCED SYSTEMS FOR SENSING AND COLLECTING METEOROLOGICAL DATA. THE POLAR-ORBITING SPACECRAFT CONSISTED OF THREE MAJOR STRUCTURES -- (1) A RING-SHAPED SENSOR MOUNT, (2) SOLAR PADDLES, AND (3) THE CONTROL HOUSING UNIT, WHICH WAS CONNECTED TO THE SENSOR MOUNT BY A TRUSS STRUCTURE, SHAPED SOMEWHAT LIKE AN OCEAN BUOY. NIMBUS 4 WAS NEARLY 3.7 M TALL, 1.5 M IN DIAMETER AT THE BASE, AND ABOUT 3 M ACROSS WITH SOLAR PADDLES EXTENDED. THE TORUS-SHAPED SENSOR MOUNT, WHICH FORMED THE SATELLITE BASE, HOUSED THE ELECTRONICS EQUIPMENT AND BATTERY MODULES. THE LOWER SURFACE OF THE TORUS RING PROVIDED A MOUNTING SPACE FOR SENSORS AND TELEMETRY ANTENNAS. AN H-FRAME STRUCTURE MOUNTED WITHIN THE CENTER OF THE TORUS PROVIDED SUPPORT FOR THE LARGER EXPERIMENTS AND TAPE RECORDERS. MOUNTED ON THE CONTROL HOUSING UNIT, WHICH WAS LOCATED ON TOP OF THE SPACECRAFT, WERE SUN SENSORS,

HORIZON SCANNERS, GAS NOZZLES FOR ATTITUDE CONTROL, AND A COMMAND ANTENNA. USE OF AN ADVANCED ATTITUDE CONTROL SUBSYSTEM PERMITTED THE SPACECRAFT'S ORIENTATION TO BE CONTROLLED TO WITHIN PLUS OR MINUS 1 DEG FOR ALL THREE AXES (PITCH, ROLL, AND YAW). PRIMARY EXPERIMENTS CONSISTED OF (1) AN IMAGE DISSECTOR CAMERA SYSTEM (IDCS) FOR PROVIDING DAYTIME CLOUDCOVER PICTURES BOTH IN REAL-TIME AND RECORDED MODES, (2) A TEMPERATURE-HUMIDITY INFRARED RADIOMETER (THIR) FOR MEASURING DAYTIME AND NIGHTTIME SURFACE AND CLOUDTOP TEMPERATURES AS WELL AS THE WATER VAPOR CONTENT OF THE UPPER ATMOSPHERE, (3) AN INFRARED INTERFEROMETER SPECTROMETER (IRIS) FOR MEASURING THE EMISSION SPECTRA OF THE EARTH/ATMOSPHERE SYSTEM, (4) A SATELLITE INFRARED SPECTROMETER (SIRS) FOR DETERMINING THE VERTICAL PROFILES OF TEMPERATURE AND WATER VAPOR IN THE ATMOSPHERE, (5) A MONITOR OF ULTRAVIOLET SOLAR ENERGY (MUSE) FOR DETECTING SOLAR UV RADIATION, (6) A BACKSCATTER ULTRAVIOLET (BUV) SPECTROMETER FOR MONITORING THE VERTICAL DISTRIBUTION AND TOTAL AMOUNT OF ATMOSPHERIC OZONE ON A GLOBAL SCALE, (7) A FILTER WEDGE SPECTROMETER (FWS) FOR ACCURATE MEASUREMENT OF IR RADIANCE AS A FUNCTION OF WAVELENGTH FROM THE EARTH/ATMOSPHERE SYSTEM, (8) A SELECTIVE CHOPPER RADIOMETER (SCR) FOR DETERMINING THE TEMPERATURES OF SIX SUCCESSIVE 10-KM LAYERS IN THE ATMOSPHERE FROM ABSORPTION MEASUREMENTS IN THE 15-MICRON CARBON DIOXIDE BAND, AND (9) AN INTERROGATION, RECORDING, AND LOCATION SYSTEM (IRLS) FOR LOCATING, INTERROGATING, RECORDING, AND RETRANSMITTING METEOROLOGICAL AND GEOPHYSICAL DATA FROM REMOTE COLLECTION STATIONS. THE SPACECRAFT OPERATION WAS A SUCCESS, AND IT PERFORMED NORMALLY UNTIL APRIL 8, 1971, WHEN THE YAW GYRO FAILED, CAUSING THE SPACECRAFT TO FACE BACKWARDS IN ORBIT. IT WAS SUCCESSFULLY TURNED AROUND ON MAY 12, 1971. YAW PROBLEMS CONTINUED TO AFFECT THE SPACECRAFT THEREAFTER. THE IRIS EXPERIMENT WAS PLACED IN AN OPERATIONAL OFF MODE ON FEBRUARY 2, 1972.

**********NIMBUS 4, HANEL

EXPERIMENT NAME- INFRARED INTERFEROMETER SPECTROMETER (IRIS) NSSDC ID 70-025A-03

ORIGINAL EXPERIMENT INSTITUTION- NASA-GSFC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - R.A. HANEL NASA-GSFC GREENBELT, MD

EXPERIMENT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST USABLE EXPERIMENT DATA RECORDED- 02/02/72

EXPERIMENT BRIEF DESCRIPTION

THE NIMBUS 4 INFRARED INTERFEROMETER SPECTROMETER (IRIS) EXPERIMENT WAS DESIGNED TO PROVIDE INFORMATION ON THE VERTICAL STRUCTURE OF THE ATMOSPHERE AND EMISSIVE PROPERTIES OF THE EARTH'S SURFACE BY MEASURING THE SURFACE AND ATMOSPHERIC RADIATION IN THE 6.25- TO 50-MICRON RANGE USING A MODIFIED MICHELSON INTERFEROMETER. RADIATION FROM A CONE OF THE ATMOSPHERE, WHOSE BASE ON THE SURFACE OF THE EARTH WAS A CIRCLE ABOUT 92.5 KM IN DIAMETER FOR A NOMINAL SATELLITE ALTITUDE OF APPROXIMATELY 1100 KM, WAS RECEIVED AND REFLECTED BY A MIRROR. THE REFLECTED RADIATION WAS SPLIT INTO TWO APPROXIMATELY EQUAL BEAMS BY A BEAMSPLITTER. AFTER REFLECTION ON A FIXED AND MOVING MIRROR, RESPECTIVELY, THE TWO BEAMS INTERFERED WITH EACH OTHER WITH A PHASE DIFFERENCE PROPORTIONAL TO THE OPTICAL PATH DIFFERENCE BETWEEN BOTH BEAMS. THE MOVING MIRROR TRAVELED ABOUT 3 MM IN 13 SEC TO GIVE AN OUTPUT SIGNAL FROM THE BOLOMETER. THIS SIGNAL, AN INTERFEROGRAM, WAS RECORDED ON TAPE. THE INTERFEROGRAMS WERE TRANSMITTED TO A GROUND RECEIVING STATION, WHERE A FOURIER TRANSFORM WAS PERFORMED TO PRODUCE A THERMAL EMISSION SPECTRUM OF THE EARTH. FROM THESE SPECTRA, VERTICAL PROFILES OF TEMPERATURE, WATER VAPOR, AND OZONE WERE DERIVED, AS WELL AS OTHER

PARAMETERS OF METEOROLOGICAL INTEREST. THE INSTRUMENT HAD A FIELD OF VIEW OF 5 DEG AND A SPECTRAL RESOLUTION OF 1.4 CM TO THE -1 POWER. FOR A COMPLETE DESCRIPTION OF THE IRIS EXPERIMENT, SEE SECTION 4 IN 'THE NIMBUS IV USER'S GUIDE.' THE IRIS EXPERIMENT WAS SUCCESSFUL IN SPITE OF A TRANSMISSION CONFLICT WITH THE REAL-TIME TRANSMISSION SYSTEM (RTTS) THAT RESULTED IN SOME PERIODS OF LOST DATA. THE IRIS EXPERIMENT WAS PLACED IN AN OPERATIONAL OFF MODE ON FEBRUARY 2, 1972.

DATA SET NAME- INFRARED INTERFEROMETER SPECTROMETER (IRIS) RADIANCE TAPES — NSSDC ID 70-025A-03A

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER THAT NSSDC PROCESSES

TIME PERIOD COVERED- 04/09/70 TO 01/30/71 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 238 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF 9-TRACK, 1600-BPI, IRIS RADIANCE TAPES CONTAINING CALIBRATED ATMOSPHERIC SPECTRUM DATA. THESE TAPES WERE GENERATED ON AN IBM 360 COMPUTER. THE TAPES CONTAIN THERMAL EMISSION SPECTRA OF THE EARTH-ATMOSPHERE SYSTEM FOR WAVE NUMBERS BETWEEN 400 TO 1600 RECIPROCAL CM. THE SPECTRA HAVE A NOMINAL RESOLUTION OF 2.8 RECIPROCAL CM. THE TAPES ALSO CONTAIN DOCUMENTATION INFORMATION, REFERENCE CALIBRATION, AVERAGE INSTRUMENT TEMPERATURES, AND A SUMMARY FOR EACH ORBITAL PASS. NINETY DEGREES HAVE BEEN ADDED TO ALL LATITUDE VALUES TO ELIMINATE NEGATIVE SIGNS. A MORE COMPLETE DESCRIPTION OF THE NIMBUS 4 IRIS RADIANCE TAPES APPEARS IN SECTION 4 OF 'THE NIMBUS 4 USERS GUIDE' AVAILABLE FROM NSSDC. SOME OF THESE TAPES ARE CONSIDERED PRELIMINARY AND WILL BE REPLACED AS FINAL TAPES BECOME AVAILABLE. THESE DATA ARE HELD BY THE EXPERIMENTER, BUT SHOULD BE REQUESTED THROUGH NSSDC.

**********NIMBUS 4, HEATH

EXPERIMENT NAME- BACKSCATTER ULTRAVIOLET (BUV) SPECTROMETER — NSSDC ID 70-025A-05

ORIGINAL EXPERIMENT INSTITUTION- NASA-GSFC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - D.F.	HEATH	NASA-GSFC	GREENBELT, MD
OI - J.V.	DAVE	NATL CNTR ATMOS RSCH	BOULDER, CO
OI - A.J.	KRUEGER	NASA-GSFC	GREENBELT, MD
OI - C.L.	MATEER	NATL CNTR ATMOS RSCH	BOULDER, CO

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE NIMBUS 4 BACKSCATTER ULTRAVIOLET (BUV) SPECTROMETER EXPERIMENT WAS DESIGNED TO MONITOR THE VERTICAL DISTRIBUTION AND TOTAL AMOUNT OF ATMOSPHERIC OZONE ON A GLOBAL SCALE BY MEASURING THE INTENSITY OF ULTRAVIOLET RADIATION BACKSCATTERED BY THE EARTH/ATMOSPHERE SYSTEM DURING DAY AND NIGHT IN THE 2500- TO 3400-A SPECTRAL BAND. THE PRIMARY INSTRUMENTATION CONSISTED OF A DOUBLE MONOCHROMATOR CONTAINING ALL REFLECTIVE OPTICS AND A PHOTOMULTIPLIER DETECTOR. THE DOUBLE MONOCHROMATOR WAS COMPOSED OF TWO FASTIE-EBERT-TYPE MONOCHROMATORS IN TANDEM. EACH MONOCHROMATOR HAD A 64- BY 64-MM GRATING WITH 2400 LINES PER MM. LIGHT FROM

A 0.05-STER SOLIC ANGLE (SUBTENDING APPROXIMATELY A 222-KM-SQUARE AREA ON THE EARTH'S SURFACE FROM A SATELLITE HEIGHT OF APPROXIMATELY 1100 KM) ENTERED THE NADIR-POINTING INSTRUMENT THROUGH A DEPOLARIZING FILTER. A MOTOR-DRIVEN CAM STEP ROTATED THE GRATINGS TO MONITOR THE INTENSITY OF 12 OZONE ABSORPTION WAVELENGTHS. THE DETECTOR WAS A PHOTOMULTIPLIER TUBE. FOR BACKGROUND READINGS, A FILTER PHOTOMETER MEASURED THE REFLECTED ULTRAVIOLET RADIATION IN AN OZONE FREE ABSORPTION AREA NEAR 3800 A. SIGNALS FROM BOTH UNITS WERE READ BY SEPARATE RANGE-SWITCHING ELECTROMETERS WITH SEVEN RANGES. THE BUV EXPERIMENT CYCLE REQUIRED 6144 SEC. EACH CYCLE, IN TURN, WAS DIVIDED INTO 192 BUV FRAMES OF 32-SEC DURATION. CALIBRATION BY ONBOARD LIGHT SOURCES WAS PERFORMED IN 26 OF THE 192 FRAMES. THE OTHER FRAMES WERE USED FOR EXPERIMENTAL DATA. DURING EACH OF THESE DATA FRAMES, THE MONOCHROMATOR MEASURED THE INTENSITY OF THE UV RADIATION IN EACH OF THE 12 WAVELENGTH BANDS WHILE THE PHOTOMETER MEASURED THE UV INTENSITY IN A SINGLE WAVELENGTH BAND. THE DWELL TIME AT EACH WAVELENGTH WAS 1.8 SEC, AND, DURING THIS INTERVAL, FOUR ANALOG UV INTENSITY MEASUREMENTS WERE TAKEN AT 400-MSEC INTERVALS. IN ADDITION TO AN INTEGRATED PULSE COUNT MEASUREMENT OF THE UV INTENSITY AND ENERGETIC PARTICLE FLUX. ONCE EACH ORBIT, THE FIELD OF VIEW WAS CHANGED TO MONITOR THE SUN OR MOON DIRECTLY. THE MEASUREMENT RANGE OF THE SIGNAL CURRENT WAS FROM 0.2 TO 3000 MICROAMPS. THE VERTICAL DISTRIBUTION OF OZONE WAS OBTAINED BY MATHEMATICAL INVERSION TECHNIQUES. FOR A COMPLETE DESCRIPTION OF THE BUV EXPERIMENT, SEE SECTION 7 IN "THE NIMBUS IV USER'S GUIDE."

DATA SET NAME- BACKSCATTER ULTRAVIOLET ATMOSPHERIC OZONE NSSDC ID 70-025A-05A
DATA ON TAPE

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 04/11/70 TO 12/31/70 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 94 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONTAINS EPHEMERIS INFORMATION, MONOCHROMATOR AND PHOTOMETER SIGNALS CONVERTED TO PHOTOCATHODE CURRENT INTENSITIES, OTHER BACKSCATTER UV DATA AND A SUMMARY OF CALIBRATION AND HOUSEKEEPING DATA. THESE ARE RAW DATA IN UNITS OF AMPERES OF CURRENT OR COUNTS, WITH CALIBRATION INFORMATION PRESENT BUT NOT YET APPLIED TO THE DATA. "THE NIMBUS 4 USERS GUIDE" (PP 149-171) AND "THE NIMBUS 4 DATA CATALOG VOL 1" (PP 1-21 THROUGH 1-34) CONTAIN INFORMATION AND FORMATS ESSENTIAL TO USERS OF THESE DATA.

**********NIMBUS 5 **********

SPACECRAFT COMMON NAME- NIMBUS 5 NSSDC ID 72-097A
ALTERNATE NAMES- NIMBUS-E, PL-7218, C6305

LAUNCH DATE- 12/11/72 SPACECRAFT WEIGHT IN ORBIT- 770. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

EPOCH DATE- 12/11/72 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 107.16 MIN
APOAPSIS- 1101.27 KM ALT PERIAPSIS- 1089.52 KM ALT INCLINATION- 99.945 DEG

SPACECRAFT BRIEF DESCRIPTION

THE NIMBUS 5 R AND D SATELLITE WAS DESIGNED TO SERVE AS A STABILIZED, EARTH-ORIENTED PLATFORM FOR THE TESTING OF ADVANCED SYSTEMS FOR SENSING AND COLLECTING METEOROLOGICAL AND GEOLOGICAL DATA ON A GLOBAL SCALE. THE POLAR-ORBITING SPACECRAFT CONSISTED OF THREE MAJOR STRUCTURES -- (1) A HOLLOW RING-SHAPED SENSOR MOUNT, (2) SOLAR PADDLES, AND (3) A CONTROL HOUSING UNIT THAT WAS CONNECTED TO THE SENSOR MOUNT BY A TRIPOD TRUSS STRUCTURE. CONFIGURED SOMEWHAT LIKE AN OCEAN BUOY, NIMBUS 5 WAS NEARLY 3.7 M TALL, 1.5 M IN DIAMETER AT THE BASE, AND ABOUT 3 M WIDE WITH SOLAR PADDLES EXTENDED. THE SENSOR MOUNT, WHICH FORMED THE SATELLITE BASE, HOUSED THE ELECTONICS EQUIPMENT AND BATTERY MODULES. THE LOWER SURFACE OF THE TORUS PROVIDED MOUNTING SPACE FOR SENSORS AND ANTENNAS. A BOX-BEAM STRUCTURE MOUNTED WITHIN THE CENTER OF THE TORUS PROVIDED SUPPORT FOR THE LARGER SENSOR EXPERIMENTS. MOUNTED ON THE CONTROL HOUSING UNIT, WHICH WAS LOCATED ON TOP OF THE SPACECRAFT, WERE SUN SENSORS, HORIZON SCANNERS, AND A COMMAND ANTENNA. AN ADVANCED ATTITUDE CONTROL SYSTEM PERMITTED THE SPACECRAFT ORIENTATION TO BE CONTROLLED TO WITHIN PLUS OR MINUS 1 DEG IN ALL THREE AXES. PRIMARY EXPERIMENTS INCLUDED (1) A TEMPERATURE/HUMIDITY INFRARED RADIOMETER (THIR) FOR MEASURING DAY AND NIGHT SURFACE AND CLOUDTOP TEMPERATURES, AS WELL AS THE WATER VAPOR CONTENT OF THE UPPER ATMOSPHERE, (2) AN ELECTRICALLY SCANNING MICROWAVE RADIOMETER (ESMR) FOR MAPPING THE THERMAL RADIATION FROM THE EARTH'S SURFACE AND ATMOSPHERE, (3) AN INFRARED TEMPERATURE PROFILE RADIOMETER (ITPR) FOR OBTAINING VERTICAL PROFILES OF TEMPERATURE AND MOISTURE, (4) A MICROWAVE SPECTROMETER (NEMS) FOR DETERMINING TROPOSPHERIC TEMPERATURE PROFILES, ATMOSPHERIC WATER VAPOR ABUNDANCES, AND CLOUD LIQUID WATER CONTENTS, (5) A SELECTIVE CHOPPER RADIOMETER (SCR) FOR OBSERVING THE GLOBAL TEMPERATURE STRUCTURE OF THE ATMOSPHERE, AND (6) A SURFACE COMPOSITION MAPPING RADIOMETER (SCMR) FOR MEASURING THE DIFFERENCES IN THE THERMAL EMISSION CHARACTERISTICS OF THE EARTH'S SURFACE. TRANSMISSION OF USEFUL DATA FROM THE SCMR WAS TERMINATED ON JANUARY 4, 1973, AND THE ITPR IS OPERATING IN A RESTRICTED MODE.

**********NIMBUS 5, MCCULLOCH

EXPERIMENT NAME- TEMPERATURE/HUMIDITY INFRARED RADIOMETER NSSDC ID 72-097A-08
(THIR)

ORIGINAL EXPERIMENT INSTITUTION- NASA-GSFC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - A.W. MCCULLOCH NASA-GSFC GREENBELT, MD

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE NIMBUS 5 TEMPERATURE-HUMIDITY INFRARED RADIOMETER (THIR) WAS DESIGNED TO DETECT EMITTED THERMAL RADIATION IN BOTH THE 10.5- TO 12.5-MICRON REGION (IR WINDOW) AND THE 6.5- TO 7.0-MICRON REGION (WATER VAPOR). THE WINDOW CHANNEL MEASURED CLOUDTOP TEMPERATURES AND WAS CAPABLE OF PRODUCING CLOUDCOVER AND THERMAL GRADIENTS ON LAND AND WATER SURFACES IN CLOUD-FREE AREAS DURING BOTH THE DAY AND NIGHT PORTIONS OF THE ORBIT. THE OTHER CHANNEL OPERATED PRIMARILY AT NIGHT TO MAP THE WATER VAPOR DISTRIBUTION IN THE UPPER TROPOSPHERE AND STRATOSPHERE. SENSOR DATA FROM THESE TWO CHANNELS WAS PRIMARILY USED TO SUPPORT THE OTHER, MORE SOPHISTICATED METEOROLOGICAL EXPERIMENTS ON BOARD NIMBUS 5. THE INSTRUMENT CONSISTED OF A 12.7-CM CASSEGRAIN SYSTEM, A SCANNING MIRROR COMMON TO BOTH CHANNELS, A BEAM SPLITTER, FILTERS, AND TWO GERMANIUM-IMMERSED THERMISTOR BOLOMETERS. IN CONTRAST TO TV, NO IMAGE WAS FORMED WITHIN THE RADIOMETER. INCOMING RADIANT ENERGY WAS COLLECTED BY A FLAT SCANNING MIRROR INCLINED AT 45 DEG TO THE OPTICAL AXIS. THE MIRROR ROTATED AT 48 RPM AND SCANNED IN A

PLANE PERPENDICULAR TO THE SPACECRAFT VELOCITY. THE ENERGY WAS FOCUSED ON A DICHROMATIC BEAM SPLITTER. WHICH DIVIDED THE ENERGY SPECTRALLY AND SPATIALLY INTO THE TWO CHANNELS. BOTH CHANNELS OF THE THIR SENSOR TRANSFORMED THE RECEIVED RADIATION INTO AN ELECTRIC OUTPUT (VOLTAGES). WHICH WAS RECORDED ON MAGNETIC TAPE FOR SUBSEQUENT PLAYBACK TO A GROUND ACQUISITION STATION. A SIMILAR EXPERIMENT IS PLANNED FOR NIMBUS-F.

DATA SET NAME- 11.5-MICRON THIR PHOTOFACSIMILE FILM NSSDC ID 72-097A-08A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 12/19/72 TO 08/12/74 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 65 FRAMES

DATA SET BRIEF DESCRIPTION

ALL THE NIMBUS 5 TEMPERATURE-HUMIDITY INFRARED RADIOMETER (THIR) 11.5-MICRON (WINDOW) DATA PROCESSED TO DATE ARE AVAILABLE ON 70-MM PHOTOFACSIMILE FILM STRIPS. POSITIVE OR NEGATIVE COPIES OF THE FILM STRIPS ARE AVAILABLE IN UNIFORM DENSITY EXPOSURE IN EITHER TRANSPARENCIES OR PAPER PRINTS. EACH ORBIT IS SEPARATED INTO DAYTIME OR NIGHTTIME SWATHS. ONE STRIP CORRESPONDING TO A FULL SWATH COVERS A DISTANCE APPROXIMATELY FROM POLE TO POLE. THE WIDTH OF EACH SWATH IS FROM HORIZON TO HORIZON AS THE THIR SCANNED NORMAL TO THE SUBSATELLITE PATH. RESOLUTION DECREASED AS THE DISTANCE FROM THE SUBSATELLITE POINT INCREASED. EACH FILM STRIP IS GRIDDED WITH GEOGRAPHIC COORDINATES AND IS IDENTIFIED BY ORBIT NUMBER, TIME, AND AN INDICATION OF WHETHER IT IS DAYTIME (D) OR NIGHTTIME (N). THE STRIPS ARE ARRANGED CHRONOLOGICALLY ON 100 TO 500 FT ROLLS OF FILM. FOR A COMPLETE DESCRIPTION OF THE THIR PHOTOFACSIMILE FILM STRIPS, SEE SECTION 2.4.1 IN THE 'NIMBUS V USERS GUIDE,' WHICH CAN BE OBTAINED ON REQUEST FROM NSSDC.

DATA SET NAME- 6.7-MICRON THIR PHOTOFACSIMILE FILM NSSDC ID 72-097A-08B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 12/19/72 TO 07/08/74 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 171 FRAMES

DATA SET BRIEF DESCRIPTION

THE NIMBUS 5 TEMPERATURE-HUMIDITY INFRARED RADIOMETER (THIR), 6.7-MICRON WATER VAPOR CHANNEL DATA ARE AVAILABLE ON 70-MM PHOTOFACSIMILE FILM STRIPS. THE FILM STRIPS ARE AVAILABLE IN UNIFORM DENSITY EXPOSURE POSITIVE OR NEGATIVE COPIES IN EITHER TRANSPARENCIES OR PAPER PRINTS. EACH ORBIT IS SEPARATED INTO DAYTIME AND NIGHTTIME SWATHS. HOWEVER, THE 6.7-MICRON CHANNEL OPERATED MOSTLY AT NIGHT. ONE STRIP CORRESPONDS TO A FULL SWATH AND COVERS A DISTANCE APPROXIMATELY FROM POLE TO POLE. THE WIDTH OF EACH SWATH IS FROM HORIZON TO HORIZON AS THE THIR SCANNED NORMAL TO THE SUBSATELLITE PATH. RESOLUTION DECREASED AS THE DISTANCE FROM THE SUBSATELLITE POINT INCREASED. EACH FILM STRIP IS GRIDDED WITH GEOGRAPHIC COORDINATES AND IS IDENTIFIED BY ORBIT NUMBER, TIME, AND AN INDICATION OF WHETHER IT IS DAYTIME (D) OR NIGHTTIME (N). THE STRIPS ARE ARRANGED CHRONOLOGICALLY ON 100 TO 500 FT ROLLS OF FILM. FOR A COMPLETE DESCRIPTION OF THE THIR PHOTOFACSIMILE FILM STRIPS, SEE SECTION 2.4.1 IN THE 'NIMBUS 5 USER'S GUIDE.'

**********NIMBUS 5, WILHEIT, JR.

EXPERIMENT NAME- ELECTRICALLY SCANNING MICROWAVE RADIOMETER (ESMR) NSSDC ID 72-097A-04

ORIGINAL EXPERIMENT INSTITUTION- NASA-GSFC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - T.T.	WILHEIT, JR.	NASA-GSFC	GREENBELT, MD
OI - P.	GLOERSEN	NASA-GSFC	GREENBELT, MD

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE PRIMARY OBJECTIVES OF THE NIMBUS-5 ELECTRICALLY SCANNING MICROWAVE RADIOMETER (ESMR) WERE (1) TO DERIVE THE LIQUID WATER CONTENT OF CLOUDS FROM BRIGHTNESS TEMPERATURES OVER OCEANS, (2) TO OBSERVE DIFFERENCES BETWEEN SEA ICE AND THE OPEN SEA OVER THE POLAR CAPS, AND (3) TO TEST THE FEASIBILITY OF INFERRING SURFACE COMPOSITION AND SOIL MOISTURE. TO ACCOMPLISH THESE OBJECTIVES, THE ESMR WAS CAPABLE OF CONTINUOUS GLOBAL MAPPING OF THE 1.55-CM (19.36 GHZ) RADIO THERMAL (MICROWAVE) RADIATION EMITTED BY THE EARTH/ATMOSPHERE SYSTEM AND COULD FUNCTION EVEN IN THE PRESENCE OF CLOUD CONDITIONS THAT BLOCK CONVENTIONAL SATELLITE INFRARED SENSORS. A 90- BY 90-CM RADIOMETER ANTENNA SYSTEM, DEPLOYED AFTER LAUNCH, SCANNED THE EARTH SUCCESSIVELY AT VARIOUS ANGLES IN A PLANE PERPENDICULAR TO THE SPACECRAFT ORBITAL TRACK, PRODUCING A BRIGHTNESS TEMPERATURE MAP OF THE SURFACE OF THE EARTH AND ITS ATMOSPHERE. THE SCANNING PROCESS WAS CONTROLLED BY A COMPUTER ON BOARD AND CONSISTED OF 78 SYMMETRICALLY DISTRIBUTED INDEPENDENT SCAN SPOTS EXTENDING 50 DEG TO EITHER SIDE OF NADIR. ANGULAR SEPARATION OF THE SCAN SPOTS ALLOWED FOR AN 8.5 PERCENT OVERLAP BETWEEN VIEW POSITIONS. FROM A MEAN ORBITAL HEIGHT OF 1100 KM, THE RADIOMETER HAD AN ACCURACY OF ABOUT PLUS OR MINUS 1 DEG C WITH A SPATIAL RESOLUTION OF ABOUT 25 KM. THE ESMR DATA WERE STORED ON MAGNETIC TAPE FOR TRANSMISSION TO GROUND ACQUISITION STATIONS. A SIMILAR EXPERIMENT WILL BE FLOWN ON NIMBUS-F.

DATA SET NAME- ELECTRICALLY SCANNING MICROWAVE RADIOMETER (ESMR) DATA TAPES NSSDC ID 72-097A-04A

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER THAT NSSDC PROCESSES

TIME PERIOD COVERED- 12/13/72 TO 06/24/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 258 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

ESMR (ELECTRICALLY SCANNING MICROWAVE RADIOMETER) 19.35-MHZ BRIGHTNESS TEMPERATURE DATA ARE AVAILABLE ON 9-TRACK, 1600-BPI BINARY TAPES. THESE TAPES, ALSO REFERRED TO AS ESMR-CBTT'S (CALIBRATED BRIGHTNESS TEMPERATURE TAPES) WERE GENERATED ON AN IBM 360 COMPUTER AND CONTAIN ONE FILE FOR EACH INTERROGATION CREIT. EACH LOGICAL RECORD CONSISTS OF 1916 DATA WORDS CORRESPONDING TO 8 SCANS (32 SECONDS) OF DATA. TEMPERATURE VALUES ALONG WITH THE GEOGRAPHIC LOCATION, TIME OF OBSERVATION, AND ORBITAL INFORMATION ARE GIVEN FOR INDIVIDUAL POINTS ALONG EACH SCAN. THE EXACT FORMAT OF THE ESMR-CBTT'S IS GIVEN IN SECTION 4 OF THE "NIMBUS 5 USERS GUIDE." SUPPLEMENTAL INFORMATION CAN BE FOUND IN THE "NIMBUS 5 DATA CATALOG." THESE DATA ARE HELD BY THE EXPERIMENTER, BUT CAN BE ORDERED THROUGH NSSDC.

DATA SET NAME- SELECTED ESMR COLOR IMAGES NSSDC ID 72-097A-04B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 12/15/72 TO 02/10/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3620 FRAMES

DATA SET BRIEF DESCRIPTION

THE NIMBUS 5 ELECTRICALLY SCANNING MICROWAVE RADIOMETER (ESMR) COLOR COMPOSITES CONSIST OF FALSE COLOR IMAGES FOR CERTAIN SELECT DAYS AND AREAS. THESE COMPOSITES DEPICT TERRESTRIAL RADIO BRIGHTNESS TEMPERATURES FROM 163 TO 310 DEG K. THE DATA CAN BE USED TO INFER INFORMATION ABOUT SEA ICE CONDITIONS, HYDROLOGIC FEATURES, CLOUD LIQUID WATER CONTENT AND AREAS OF PRECIPITATION. THE DATA ARE DISPLAYED USING EITHER POLAR OR MERCATOR PROJECTIONS WITH EACH FRAME REPRESENTING A COMPOSITE OF OBSERVATIONS FROM ONE DAY (13 ORBITS) OF OBSERVATIONS. HORIZONTAL RESOLUTION OF THE DATA VARIES FROM 25 TO 160 KM DEPENDING ON THE SENSOR VIEWING ANGLE. THESE DATA ARE NORMALLY AVAILAELE IN 8- X 10-IN. POSITIVE OR NEGATIVE TRANSPARENCIES AND PRINTS. LARGER SIZED PRINTS ARE ALSO AVAILABLE, BUT ON A LIMITED BASIS. FOR AN INDEX OF THE DAYS AND AREAS FOR WHICH ESMR COLOR COMPOSITES ARE AVAILABLE, SEE THE NIMBUS 5 DATA CATALOG.

**********NOAA 2 **********

SPACECRAFT COMMON NAME- NOAA 2 NSSDC ID 72-082A
ALTERNATE NAMES- PL-701J, ITOS-D, 06235

LAUNCH DATE- 10/15/72 SPACECRAFT WEIGHT IN ORBIT- 306. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

EPOCH DATE- 10/15/72 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 114.9 MIN
APOAPSIS- 1453.97 KM ALT PERIAPSIS- 1448.18 KM ALT INCLINATION- 101.768 DEG

SPACECRAFT BRIEF DESCRIPTION

NOAA 2 WAS THE FIRST IN A SERIES OF RECONFIGURED ITOS-M SATELLITES LAUNCHED WITH NEW METEOROLOGICAL SENSORS ON BOARD TO EXPAND THE OPERATIONAL CAPABILITY OF THE ITOS SYSTEM. NOAA 2 WAS NOT EQUIPPED WITH CONVENTIONAL TV CAMERAS. IT WAS THE FIRST OPERATIONAL WEATHER SATELLITE TO RELY SOLELY UPON RADIOMETRIC IMAGING TO OBTAIN CLOUDCOVER DATA. THE PRIMARY OBJECTIVE OF NOAA 2 WAS TO PROVIDE GLOBAL DAYTIME AND NIGHTTIME DIRECT READOUT REAL-TIME CLOUDCOVER DATA ON A DAILY BASIS. THE SUN-SYNCHRONOUS SPACECRAFT WAS ALSO CAPABLE OF SUPPLYING GLOBAL ATMOSPHERIC TEMPERATURE SOUNDINGS AND VERY HIGH RESOLUTION INFRARED CLOUDCOVER DATA FOR SELECTED AREAS IN EITHER A DIRECT READOUT OR A TAPE-RECORDER MODE. A SECONDARY OBJECTIVE WAS TO OBTAIN GLOBAL SOLAR-PROTON FLUX DATA ON A REAL-TIME DAILY BASIS. THE PRIMARY SENSORS CONSISTED OF A VERY HIGH RESOLUTION RADIOMETER (VHRR), A VERTICAL TEMPERATURE PROFILE RADIOMETER (VTPR), AND A SCANNING RADIOMETER (SR). THE VHRR, VTPR, AND SR WERE MOUNTED ON THE SATELLITE BASEPLATE WITH THEIR OPTICAL AXES DIRECTED VERTICALLY EARTHWARD. THE NEARLY CUBICAL SPACECRAFT MEASURED 1 BY 1 BY 1.2 M. THE SATELLITE WAS EQUIPPED WITH THREE CURVED SOLAR PANELS THAT WERE FOLDED DURING LAUNCH AND DEPLOYED AFTER ORBIT WAS ACHIEVED. EACH PANEL MEASURED OVER 4.2 M IN LENGTH WHEN UNFOLDED AND WAS COVERED WITH 3420 SOLAR CELLS MEASURING 2 BY 2 CM. THE NOAA 2 DYNAMICS AND ATTITUDE CONTROL SYSTEM MAINTAINED DESIRED SPACECRAFT ORIENTATION THROUGH GYROSCOPIC

PRINCIPLES INCORPORATED INTO THE SATELLITE DESIGN. EARTH ORIENTATION OF THE SATELLITE BODY WAS MAINTAINED BY TAKING ADVANTAGE OF THE PRECESSION INDUCED FROM A MOMENTUM FLYWHEEL SO THAT THE SATELLITE BODY PRECESSION RATE OF ONE REVOLUTION PER ORBIT PROVIDED THE DESIRED EARTH-LOOKING ATTITUDE. MINOR ADJUSTMENTS IN ATTITUDE AND ORIENTATION WERE MADE BY MEANS OF MAGNETIC COILS AND BY VARYING THE SPEED OF THE MOMENTUM FLYWHEEL. THE SPACECRAFT OPERATED SATISFACTORILY UNTIL MARCH 18, 1974, WHEN VTPR FAILED. ON JUNE 13, 1974, VTPR WAS SUCCESSFULLY RESTARTED AND IS OPERATIONAL. THE SPACECRAFT OPERATED NORMALLY FROM LAUNCH UNTIL 18 MARCH 1974 WHEN THE VTPR SENSOR FAILED. NOAA-2 WAS THEN PLACED IN A MARGINAL STANDBY MODE ON 19 MARCH AND IS NOW SERVING AS A BACKUP SATELLITE TO NOAA-3.

**********NOAA 2, NESS STAFF

EXPERIMENT NAME- SCANNING RADIOMETER (SR) NSSDC ID 72-082A-02

ORIGINAL EXPERIMENT INSTITUTION- NOAA-NESS

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE NOAA 2 SCANNING RADIOMETER (SR) SUBSYSTEM CONSISTED OF TWO SCANNING RADIOMETERS, A DUAL SR PROCESSOR, AND TWO SR RECORDERS. THIS SUBSYSTEM PERMITTED THE DETERMINATION OF SURFACE TEMPERATURES OF THE GROUND, THE SEA, OR CLOUD TOPS VIEWED BY THE RADIOMETER. THE RADIOMETER MEASURED REFLECTED RADIATION FROM THE EARTH ATMOSPHERE SYSTEM IN THE 0.52- TO 0.73-MICRON BAND DURING THE DAY AND EMITTED RADIATION FROM THE EARTH AND ITS ATMOSPHERE IN THE 10.5- TO 12.6-MICRON BAND DURING THE DAY AND NIGHT. UNLIKE A CAMERA, THE SR DID NOT TAKE A PICTURE BUT INSTEAD FORMED AN IMAGE USING A CONTINUOUSLY ROTATING MIRROR. THE MIRROR SCANNED THE EARTH'S SURFACE PERPENDICULAR TO THE SATELLITE'S ORBITAL PATH AT A RATE OF 48 RPM. AS THE SATELLITE PROGRESSED ALONG ITS ORBITAL PATH, EACH ROTATION OF THE MIRROR PROVIDED ONE SCAN LINE OF PICTURE. RADIATION COLLECTED BY THE MIRROR WAS PASSED THROUGH A BEAM SPLITTER AND SPECTRAL FILTER TO PRODUCE THE DESIRED SPECTRAL SEPARATION. UP TO TWO FULL ORBITS OF DATA (145 MIN) COULD BE STORED ON MAGNETIC TAPE FOR SUBSEQUENT TRANSMISSION (1697.5 MHZ) TO AN ACQUISITION STATION. THE DATA COULD BE TRANSMITTED IN REAL TIME TO LOCAL APT STATIONS. ONCE THE SIGNAL WAS RECEIVED BY THE GROUND STATION, A CONTINUOUS PICTURE WAS FORMED BY USING A FACSIMILE RECORDER WHOSE SCAN WAS IN PHASE WITH THE SATELLITE'S FORWARD MOTION. AT A NOMINAL SPACECRAFT ALTITUDE OF 1460 KM, THE RADIOMETER HAD A GROUND RESOLUTION OF BETTER THAN 4 KM AT NADIR. THE RADIOMETER WAS CAPABLE OF YIELDING RADIANCE TEMPERATURES BETWEEN 185 AND 330 DEG K TO AN ACCURACY OF 4 AND 1 DEG K, RESPECTIVELY. DATA FROM THIS EXPERIMENT ARE PRESENTLY MAINTAINED AT NOAA-NESS, SUITLAND, MD. IDENTICAL EXPERIMENTS WILL BE FLOWN ON ITOS-E, -F, AND -G. DATA FROM THIS EXPERIMENT ARE INDEXED IN DATA SET 72-084A-02A.

DATA SET NAME- PICTORIAL INDEX TO SR IMAGERY NSSDC ID 72-082A-02A
'ENVIROMENTAL SATELLITE IMAGERY'

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 11/01/72 TO 12/31/73 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 9 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF BOOKLETS, EACH CONTAINING ONE MONTH OF ANALYZED DATA. IMAGES FOR ALL PASSES DURING ONE DAY ARE COMBINED INTO THREE PAGES OF DATA. ONE PAGE CONSISTS OF VISUAL WAVELENGTH IMAGES FOR 9 A.M. LOCAL TIME, THE OTHER TWO PAGES ARE IR WAVELENGTH IMAGES FOR 9 A.M. AND 9 P.M. LOCAL TIME. THESE COMPUTER-PRODUCED MOSAIC MAPS HAVE BEEN RECTIFIED, AND GRIDDED. IN ADDITION, COUNTRY OUTLINES ARE SHOWN. THE IR AND VISUAL RANGE MAPS LOOK LIKE BLACK AND WHITE CLOUDCOVER PHOTOS, BUT THE IR SHOWS EMITTER TEMPERATURES SCALED FROM HOT DESERTS AND OCEANS (BLACK) TO COLD, HIGH CLOUD TOPS (WHITE). ON EACH PAGE ARE TWO POLAR STEREOGRAPHIC PROJECTION MAPS SHOWING BOTH HEMISPHERES. THESE PUBLISHED BOOKLETS MAY BE USEFUL FOR SOME RESEARCH PROJECTS, BUT ARE INTENDED PRIMARILY AS INDEXES TO 35-MM FILM COPIES OF THE DATA. THESE BOOKLETS ARE AVAILABLE FOR USE AT NSSDC, OR MAY BE OBTAINED FROM NTIS, U.S. DEPT OF COMMERCE, SILLS BUILDING, 5285 PORT ROYAL ROAD, SPRINGFIELD, VA 22151. MICROFILM COPY (35 MM) CONTAINING ONE HALF-MONTH PER REEL OF DAILY 09L VISIBLE POLAR, 21LIR POLAR, 09L VISIBLE MERCATOR (TROPICAL FROM EQUATOR TO 40 DEG LAT.), AND 21L IR MERCATOR IMAGES ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, NOAA, ASHEVILLE, NC, 28801. THEY CAN ALSO PROVIDE 8 X 10 GLOSSY PRINTS OF MOSAICS OR INDIVIDUAL SWATHS.

**********NOAA 3 **********

SPACECRAFT COMMON NAME- NOAA 3 NSSDC ID 73-086A
ALTERNATE NAMES- ITOS-F, 6920

LAUNCH DATE- 11/06/73 SPACECRAFT WEIGHT IN ORBIT- 746. KG

SPACECRAFT STATUS OF OPERATION- NORMAL

EPOCH DATE- 11/07/73 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 116.09 MIN
APOAPSIS- 1509.23 KM ALT PERIAPSIS- 1499.99 KM ALT INCLINATION- 102.077 DEG

SPACECRAFT BRIEF DESCRIPTION

THE NOAA 3 (ITOS-F) WAS ONE IN A SERIES OF IMPROVED TIROS-M TYPE SATELLITES THAT WAS LAUNCHED WITH NEW METEOROLOGICAL SENSORS ON BOARD TO EXPAND THE OPERATIONAL CAPABILITY OF THE ITOS SYSTEM. THE PRIMARY OBJECTIVE OF THE ITOS-F METEOROLOGICAL SATELLITE WAS TO PROVIDE GLOBAL DAYTIME AND NIGHTTIME DIRECT READOUT CLOUDCOVER DATA ON A DAILY BASIS. THE SUN-SYNCHRONOUS SPACECRAFT WAS ALSO CAPABLE OF SUPPLYING GLOBAL ATMOSPHERIC TEMPERATURE SOUNDINGS AND VERY HIGH RESOLUTION INFRARED CLOUDCOVER DATA OF SELECTED AREAS IN EITHER A DIRECT READOUT OR A TAPE RECORDER MODE. A SECONDARY OBJECTIVE WAS TO OBTAIN GLOBAL SOLAR PROTON FLUX DATA ON A ROUTINE DAILY BASIS. THE PRIMARY SENSORS CONSISTED OF A VERY HIGH RESOLUTION RADIOMETER (VHRR), A VERTICAL TEMPERATURE PROFILE RADIOMETER (VTPR), AND A SCANNING RADIOMETER (SR). THE VHRR, VTPR, AND SR WERE MOUNTED ON THE SATELLITE BASEPLATE WITH THEIR OPTICAL AXES DIRECTED VERTICALLY EARTHWARD. THE NEARLY CUBICAL SPACECRAFT MEASURED 1 BY 1 BY 1.2 M. THE SATELLITE WAS EQUIPPED WITH THREE CURVED SOLAR PANELS THAT WERE FOLDED DURING LAUNCH AND DEPLOYED AFTER ORBIT WAS ACHIEVED. EACH PANEL MEASURED OVER 4.2 M IN LENGTH WHEN UNFOLDED AND WAS COVERED WITH 3420 SOLAR CELLS MEASURING 2 BY 2 CM. THE ITOS DYNAMICS AND ATTITUDE CONTROL SYSTEM MAINTAINED DESIRED SPACECRAFT ORIENTATION THROUGH GYROSCOPIC PRINCIPLES INCORPORATED INTO THE SATELLITE DESIGN. EARTH ORIENTATION OF THE SATELLITE BODY WAS MAINTAINED BY TAKING ADVANTAGE OF THE PRECESSION INDUCED FROM A MOMENTUM FLYWHEEL SO THAT THE SATELLITE BODY PRECESSION RATE OF ONE REVOLUTION PER ORBIT PROVIDED THE DESIRED 'EARTH LOOKING' ATTITUDE. MINOR ADJUSTMENTS IN ATTITUDE AND

ORIENTATION WERE MADE BY MEANS OF MAGNETIC COILS AND BY VARYING THE SPEED OF THE MOMENTUM FLYWHEEL. THE SPACECRAFT OPERATED SATISFACTORILY UNTIL JUNE 7, 1974, WHEN THE REMAINING VTPR SENSOR WENT OUT OF CALIBRATION. UNCALIBRATED DATA HAVE BEEN OBTAINED SINCE THAT TIME.

**********NOAA 3, NESS STAFF

EXPERIMENT NAME- SCANNING RADIOMETER (SR) NSSDC ID 73-086A-02

ORIGINAL EXPERIMENT INSTITUTION- NOAA-NESS

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- PARTIAL

EXPERIMENT BRIEF DESCRIPTION

THE NOAA 3 (ITOS-F) SCANNING RADIOMETER (SR) SUBSYSTEM CONSISTED OF TWO SCANNING RADIOMETERS, A DUAL SR PROCESSOR, AND TWO SR RECORDERS. THIS SUBSYSTEM PERMITTED THE DETERMINATION OF SURFACE TEMPERATURES OF THE GROUND, THE SEA, OR CLOUD TOPS VIEWED BY THE RADIOMETER. THE RADIOMETER MEASURED REFLECTED RADIATION FROM THE EARTH/ATMOSPHERE SYSTEM IN THE 0.52- TO 0.73-MICRON CHANNEL DURING THE DAY AND EMITTED RADIATION FROM THE EARTH AND ITS ATMOSPHERE IN THE 10.5- TO 12.5-MICRON CHANNEL DURING THE DAY AND NIGHT. UNLIKE A CAMERA, THE SR DID NOT TAKE A PICTURE BUT INSTEAD FORMED AN IMAGE USING A CONTINUOUSLY ROTATING MIRROR. THE MIRROR SCANNED THE EARTH'S SURFACE PERPENDICULAR TO THE SATELLITE'S ORBITAL PATH AT A RATE OF 48 RPM. AS THE SATELLITE PROGRESSED ALONG ITS ORBITAL PATH, EACH ROTATION OF THE MIRROR PROVIDED ONE SCAN LINE OF PICTURE. RADIATION COLLECTED BY THE MIRROR PASSED THROUGH A BEAM SPLITTER AND SPECTRAL FILTER TO PRODUCE THE DESIRED SPECTRAL SEPARATION. UP TO TWO FULL ORBITS OF DATA (145 MIN) WERE STORED ON MAGNETIC TAPE FOR SUBSEQUENT TRANSMISSION (1697.5 MHZ) TO AN ACQUISITION STATION. THE DATA WERE ALSO TRANSMITTED IN REAL TIME TO LOCAL APT STATIONS. ONCE THE SIGNAL WAS RECEIVED BY THE GROUND STATION, A CONTINUOUS PICTURE WAS FORMED BY USING A FACSIMILE RECORDER WHOSE SCAN WAS IN PHASE WITH THE SATELLITE'S FORWARD MOTION. FROM A PLANNED ALTITUDE OF 1460 KM, THE RADIOMETER HAD A GROUND RESOLUTION OF APPROXIMATELY 4 KM AT NADIR AND WAS CAPABLE OF YIELDING RADIANCE TEMPERATURES BETWEEN 185 AND 330 DEG K TO AN ACCURACY OF +4 AND -1 DEG K, RESPECTIVELY. ALL OPERATIONAL DATA FROM THIS EXPERIMENT WAS HANDLED BY NOAA AND WILL EVENTUALLY BE ARCHIVED AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. IDENTICAL EXPERIMENTS WILL BE FLOWN ON ITOS-D, -E, AND -G.

DATA SET NAME- PICTORIAL INDEX TO SR IMAGERY -- 'ENVIRONMENTAL SATELLITE IMAGERY' NSSDC ID 73-086A-02A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 01/01/74 TO 03/31/74 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF BOOKLETS, EACH NOMINALLY CONTAINING ONE MONTH OF DATA. THE DATA ARE ANALYZED, I.E., IMAGES FOR ALL PASSES DURING ONE DAY ARE COMBINED INTO THREE PAGES OF DATA. ONE PAGE CONSISTS OF VISUAL WAVELENGTH IMAGES FOR 900 LOCAL TIME, THE OTHER TWO PAGES ARE IR WAVELENGTH

IMAGES FOR 900 AND 2100 LOCAL TIME. THESE COMPUTER-PRODUCED MOSAIC MAPS HAVE BEEN RECTIFIED, GRIDDED, AND SHOW THE CONTRY OUTLINES. THE IR AND VISUAL RANGE MAPS LOOK LIKE BLACK-AND-WHITE CLOUDCOVER PHOTOS, BUT THE IR SHOWS EMITTER TEMPERATURES SCALED FROM HOT DESERTS AND OCEANS (BLACK) TO COLD, HIGH CLOUD TOPS (WHITE). ON EACH PAGE ARE TWO POLAR STEREOGRAPHIC PROJECTION MAPS SHOWING BOTH HEMISPHERES. THESE PUBLISHED BOOKLETS MAY BE USEFUL FOR SOME RESEARCH PROJECTS, BUT ARE INTENDED PRIMARILY AS INDEXES TO 35-MM FILM COPIES OF THE DATA. THESE BOOKLETS ARE AVAILABLE FOR USE AT NSSDC, OR MAY BE OBTAINED FROM NTIS, U.S. DEPT. OF COMMERCE, SILLS BUILDING, 5285 PORT ROYAL ROAD, SPRINGFIELD, VIRGINIA 22151. MICROFILM COPIES (35 MM) CONTAINING ONE HALF-MONTH PER REEL OF DAILY 09L VISIBLE POLAR, 21LIR POLAR, 09L VISIBLE MERCATOR (TROPICAL FROM EQUATOR TO 40 DEG LAT.), AND 21LIR MERCATOR IMAGES ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, NOAA, ASHEVILLE, NORTH CAROLINA, 28801. THEY CAN ALSO PROVIDE 8 X 10 GLOSSY PRINTS OF MOSAICS OR INDIVIDUAL SWATHS. THERE ARE NO LISTINGS WHICH SHOW WHICH PARTS OF THE MOSAICS WERE OBSERVED BY NOAA 2, OR WHICH WERE OBSERVED BY NOAA 3. HOWEVER, NOAA 2 BECAME A BACKUP SPACECRAFT FOR THIS EXPERIMENT AFTER DECEMBER 1973, SO MOST OF THE SR DATA INDEXED AFTER THAT DATE WILL BE FROM NOAA 3.

**********NOAA 3, NESS STAFF

EXPERIMENT NAME- VERY HIGH RESOLUTION RADIOMETER (VHRR) NSSDC ID 73-086A-03

ORIGINAL EXPERIMENT INSTITUTION- NOAA-NESS

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI -	NESS STAFF	NOAA-NESS	SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

THE NOAA 3 (ITOS-F) VERY HIGH RESOLUTION RADIOMETER (VHRR) EXPERIMENT WAS DESIGNED TO CONTINUOUSLY MEASURE SURFACE TEMPERATURES OF THE EARTH, SEA, AND CLOUD TOPS IN DAYLIGHT AS WELL AS AT NIGHT AND TO TRANSMIT THE TEMPERATURE DATA IN REAL TIME TO COMMAND AND DATA ACQUISITION (CDA) STATIONS THROUGHOUT THE WORLD FOR USE IN LOCAL WEATHER FORECASTING. THE SPACECRAFT WAS PROGRAMMED TO RECORD UP TO 9 MIN OF DATA FOR REMOTE AREAS WHERE NO CDA STATION WAS WITHIN RANGE OF THE SPACECRAFT, WITH THE RECORDED DATA PLAYED BACK TO THE NEXT CDA STATION THAT THE SPACECRAFT PASSED. THE EXPERIMENT INCLUDED TWO SCANNING RADIOMETERS, A MAGNETIC TAPE RECORDER, AND ASSOCIATED ELECTRONICS. THE TWO-CHANNEL VHRR OPERATED SIMILARLY TO THE SCANNING RADIOMETER (SR) BUT WITH MUCH GREATER RESOLUTION (0.9 KM COMPARED TO 4 KM FOR THE SR AT NADIR). ONE VHRR CHANNEL MEASURED REFLECTED VISUAL RADIATION FROM CLOUD TOPS IN THE LIMITED SPECTRAL RANGE BETWEEN 0.6 AND 0.7 MICRON. THIS PROVIDED MORE CONTRAST THAN THE SR BETWEEN THE EARTH AND CLOUDS BY REDUCING THE EFFECT OF HAZE. THE SECOND CHANNEL MEASURED INFRARED RADIATION EMITTED FROM THE EARTH, SEA, AND CLOUD TOPS IN THE 10.5- TO 12.5-MICRON REGION. THIS SPECTRAL REGION PERMITTED BOTH DAYTIME AND NIGHTTIME RADIANCE MEASUREMENTS. THE VHRR FORMED AN IMAGE BY USING A SCANNING MIRROR TECHNIQUE SIMILAR TO THE SR, EXCEPT THAT BOTH RADIOMETERS OPERATED SIMULTANEOUSLY. AS THE SATELLITE PROCEEDED IN ITS ORBIT, THE 400-RPM REVOLVING MIRRORS SCANNED THE EARTH'S SURFACE 180 DEG OUT OF PHASE (ONE MIRROR AT A TIME) AND PERPENDICULAR TO THE ORBIT PATH. THE VISIBLE AND INFRARED DATA WERE TIME-MULTIPLEXED SO THAT THE SCAN OF THE INFRARED CHANNEL WAS TRANSMITTED FIRST, FOLLOWED BY THE EARTH SCAN PORTION OF THE VISIBLE CHANNEL. THIS PROCESS WAS REPEATED 400 TIMES PER MINUTE (EQUIVALENT TO THE SCAN RATE). IF ONE OF THE RADIOMETERS FAILED, THE SYSTEM WAS STILL CAPABLE OF MEASURING BOTH VISIBLE AND INFRARED RADIATION USING ONLY THE REMAINING RADIOMETER.

ALL OPERATIONAL DATA FROM THIS EXPERIMENT WAS HANDLED BY NOAA AND EVENTUALLY WILL BE ARCHIVED AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. IDENTICAL EXPERIMENTS WERE FLOWN ON ITOS-D, -E, AND -G.

DATA SET NAME- PICTORIAL AND TAEULAR INDEX TO VHRR IMAGERY--'ENVIRONMENTAL SATELLITE IMAGERY' NSSDC ID 73-086A-03A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 01/01/74 TO 03/31/74 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET IS AN INDEX TO VERY-HIGH-RESOLUTION RADIOMETER (VHRR) DATA. THE NADIR PATH FOR THESE PICTURES IS THE SAME AS FOR THE SCANNING RADIOMETER (SR) EXPERIMENT, HENCE THIS INDEX IS IN THE SAME BOOKLETS WHICH INDEX THOSE DATA (DATA SET 73-086A-02A). THE SUBSATELLITE TRACK AND LATITUDE RANGE FOR THE EXISTING VHRR DATA ARE LISTED WITH EACH OF THE SR MOSAIC MAPS. THE TRACKS ARE IDENTIFIED INSIDE THE BACK COVER OF THE BOOK. VHRR DATA ARE AVAILABLE FOR EITHER HEMISPHERE, IN EITHER OR BOTH VISUAL AND IR, AND FOR 900 AND 2100 LOCAL TIME. RESOLUTION OF THESE DATA ARE 1 KM, AND DATA ARE LIMITED TO PASSES EXTENDING ABOUT 55 DEGREES ACROSS THREE TELEMETRY STATIONS (GILMORE CREEK ALASKA, SAN FRANCISCO, AND WALLOPS ISLAND, VIRGINIA) AND THERE ARE ALSO SOME TAPE RECORDED DATA. THE IMAGE INCLUDES 1700KM ON EITHER SIDE OF THE NADIR PATH. BOTH IR AND VISUAL IMAGERY LOOK LIKE BLACK-AND-WHITE CLOUDCOVER PHOTOGRAPHY, BUT THE IR SHOWS EMITTER TEMPERATURES RANGING FROM HOT DESERTS AND OCEANS (BLACK) TO COLD ICE FIELDS AND CLOUD TOPS (WHITE).

**********OGO 4 **********

SPACECRAFT COMMON NAME- OGO 4 NSSDC ID 67-073A
ALTERNATE NAMES- OGO-D, POGO 2, 02895, S 50A

LAUNCH DATE- 07/28/67 SPACECRAFT WEIGHT IN ORBIT- 562.0 KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 03/00/70

EPOCH DATE- 07/28/67 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 98. MIN
APOAPSIS- 908.000 KM ALT PERIAPSIS- 412.000 KM ALT INCLINATION- 86.011 DEG

SPACECRAFT BRIEF DESCRIPTION

OGO 4 WAS A LARGE OBSERVATORY INSTRUMENTED WITH EXPERIMENTS DESIGNED TO STUDY THE INTERRELATIONSHIPS BETWEEN THE AURORA AND AIRGLOW EMISSIONS, ENERGETIC PARTICLE ACTIVITY, GEOMAGNETIC FIELD VARIATION, IONOSPHERIC IONIZATION AND RECOMBINATION, AND ATMOSPHERIC HEATING WHICH TAKE PLACE DURING A PERIOD OF INCREASED SOLAR ACTIVITY. OGO 4 CONSISTED OF A MAIN BODY, GENERALLY PARALLELEPIPED IN FORM, TWO RECTANGULAR SOLAR PANELS EACH INCLUDING A SOLAR-ORIENTED EXPERIMENT PACKAGE (SOEP), AND TWO ORBITAL PLANE EXPERIMENT PACKAGES (OPEP). THE MAIN BODY WAS ATTITUDE CONTROLLED BY USE OF HORIZON SCANNERS AND GAS JETS AND WAS DESIGNED TO BE POINTED TOWARD THE EARTH (Z AXIS). THE AXIS CONNECTING THE TWO SOLAR PANELS (X AXIS) WAS DESIGNED TO OSCILLATE SO AS TO REMAIN PERPENDICULAR TO THE EARTH-SUN-SPACECRAFT PLANE. THE SOLAR PANELS, ACTIVATED BY SUN SENSORS, COULD ROTATE ABOUT THIS X AXIS TO OBTAIN MAXIMUM RADIATION FOR THE SOLAR

CELLS AND, CONCURRENTLY, ORIENT THE SOEP PROPERLY. THE OPEP'S WERE MOUNTED ON EITHER END OF AN AXIS WHICH WAS PARALLEL TO THE Z AXIS AND ATTACHED TO THE FORWARD END OF THE MAIN BODY. THE OPEP SENSORS NORMALLY WERE MAINTAINED LOOKING FORWARD IN THE ORBITAL PLANE OF THE SATELLITE. TO MAINTAIN THIS ORIENTATION, THE OPEP AXIS COULD ROTATE OVER 90 DEG, AND, IN ADDITION, AN ANGULAR DIFFERENCE OF OVER 90 DEG WAS POSSIBLE BETWEEN THE ORIENTATION OF THE UPPER AND LOWER OPEP PACKAGES. THE SOEP CONTAINED FOUR EXPERIMENTS, AND THE OPEP CONTAINED FIVE EXPERIMENTS. AFTER THE SPACECRAFT ACHIEVED ORBIT AND THE EXPERIMENTS WERE DEPLOYED INTO AN OPERATING MODE, AN ATTITUDE CONTROL PROBLEM OCCURRED. THIS CONDITION WAS CORRECTED BY GROUND CONTROL PROCEDURES UNTIL COMPLETE FAILURE OF THE TAPE RECORDING SYSTEMS IN MID-JANUARY 1969. AT THAT TIME, DUE TO THE DIFFICULTY OF MAINTAINING ATTITUDE CONTROL WITHOUT THE TAPE RECORDERS, THE ATTITUDE CONTROL SYSTEM WAS COMMANDED OFF, AND THE SPACECRAFT WAS PLACED INTO A SPIN-STABILIZED MODE ABOUT THE AXIS WHICH WAS PREVIOUSLY MAINTAINED VERTICALLY. INITIAL SPIN PERIOD WAS 202 SEC WITH THE MEAN SPIN AXIS APPROXIMATELY PERPENDICULAR TO THE ORBIT PLANE (SPIN PERIOD AS OF MARCH 12, 1969, WAS 217 SEC). THE PRECESSION PERIOD OF THE MEAN SPIN AXIS WAS ABOUT 5 DAYS. IN THIS MODE, SEVEN OF THE REMAINING EXPERIMENTS WERE TURNED OFF SINCE NO MEANINGFUL DATA COULD BE OBSERVED BY THEM. ON OCTOBER 23, 1969, THE SATELLITE WAS TURNED OFF. IT WAS REACTIVATED AGAIN IN JANUARY 1970 FOR 2 MONTHS TO OBTAIN VLF OBSERVATIONS.

**********OGO 4, BARTH

EXPERIMENT NAME- UV SPECTROMETER 1100-1750A,1750-3400A NSSDC ID 67-073A-14

ORIGINAL EXPERIMENT INSTITUTION- U OF COLORADO

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - C.A.	BARTH	U OF COLORADO	BOULDER, CO
OI - L.J.	WALLACE	KITT PEAK NATL OBS	TUCSON, AZ
OI - E.F.	MACKEY	PACKARD-BELL	NEWBERRY PARK, CA

EXPERIMENT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST EXPERIMENT DATA RECORDED- 03/00/69

EXPERIMENT BRIEF DESCRIPTION

AN EBERT-FASTIE SCANNING SPECTROMETER WAS USED TO MEASURE THE ULTRAVIOLET (UV) SPECTRUM OF THE EARTH IN THE WAVELENGTH RANGE FROM 1100 TO 3400 A, WITH A 20-A RESOLUTION. THE OBJECTIVES OF THIS EXPERIMENT INCLUDED THE MEASUREMENT OF THE INTENSITY OF THE FOLLOWING EMISSIONS -- (A) THE HYDROGEN LYMAN-ALPHA ON BOTH THE DAY AND NIGHT SIDES, (B) THE ATOMIC OXYGEN 1304-A DAY AND TWILIGHT GLOW, AND (C) THE ATOMIC OXYGEN 1356-A LINE, THE ATOMIC NITROGEN 1493-A LINE, AND THE MOLECULAR NITROGEN LYMAN-BIRGE-HOPFIELD BANDS OF THE PHOTOELECTRON-EXCITED DAYGLOW. ANOTHER OBJECTIVE WAS THE DETERMINATION OF THE VERTICAL DISTRIBUTION OF OZONE FROM THE MEASUREMENT OF THE BACK-SCATTERED UV DAYLIGHT IN THE 2000- TO 3400-A RANGE. THE FOCAL LENGTH OF THE EBERT MIRROR WAS 250 MM, AND THE GRATING USED HAD 2160 LINES PER MILLIMETER. THE SPECTRAL SCAN PERIOD WAS ESSENTIALLY 74.5 SEC. HOWEVER, DURING ABOUT 7 PERCENT OF THE TIME, THIS SCAN PERIOD WAS REDUCED TO 18.6 SEC. THE INSTRUMENT WAS MOUNTED LOOKING TO NADIR. THE F CHANNEL WAS THE OUTPUT OF A PHOTOMULTIPLIER TUBE (PMT) WITH A SAPPHIRE WINDOW AND A CESIUM TELLURIDE CATHODE. THE WAVELENGTH INTERVAL MEASURED HERE EXTENDED FROM 1750 TO 3400 A, WITH A DYNAMIC RANGE OF INTENSITIES OF 1.0E6 POWER. THE G DATA CHANNEL WAS THE OUTPUT OF A PMT WITH A LITHIUM FLUORIDE WINDOW AND A CESIUM IODIDE CATHODE. ON THIS CHANNEL THE WAVELENGTH RANGES SCANNED EXTENDED FROM 1100 TO 1750 A, AND THE MEASURED INTENSITY COULD VARY OVER A RANGE FROM 1 TO 1000. THE EXPONENTIAL VOLTAGE GAIN CHARACTERISTICS OF THE PMT RESULTED IN A NEAR-LOGARITHMIC SCALING BETWEEN FLUX AND HIGH-VOLTAGE LEVEL. APPROPRIATE

CIRCUITRY TRANSLATED THE OUTPUT TO 1-TO-5-V ANALOG. AN OUTPUT SIGNAL CONSISTENT WITH THE SPACECRAFT DATA SYSTEM. PREFOCUSED LIGHT SOURCES, SOME OPERATED BY COMMAND, PROVIDED IN-ORBIT CALIBRATIONS. A COMPLETE DESCRIPTION OF THIS EXPERIMENT CAN BE FOUND IN 'OGO-IV ULTRAVIOLET AIRGLOW SPECTROMETER,' BY C. A. BARTH AND E. F. MACKEY, IEEE TRANSACTIONS ON GEOSCIENCE ELECTRONICS, VOL. GE-7, NO. 2, APRIL 1969, PP. 114-119.

DATA SET NAME- OZONE DATA ON MAGNETIC TAPE NSSDC ID 67-073A-14A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 08/30/67 TO 02/29/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET WAS RECEIVED FROM THE EXPERIMENTER AND CONTAINS CALCULATED OZONE PROFILES TAKEN OVER THE 5-MONTH INTERVAL FROM SEPTEMBER 1967 TO JANUARY 1968. SPECIFICALLY, THERE ARE -- 995 PROFILES FOR SEPTEMBER 1967, 1508 PROFILES FOR OCTOBER 1967, 647 PROFILES FOR NOVEMBER 1967, 514 PROFILES FOR DECEMBER 1967, AND 381 PROFILES FOR JANUARY 1968. THIS 7-TRACK TAPE WAS WRITTEN AT 556 BPI, AND IN EVEN PARITY CARD IMAGE FORMAT. EVERY PROFILE CONSISTS OF VALUES AT 16 DIFFERENT PRESSURE LEVELS, AND REQUIRES FIVE RECORDS OF CARD IMAGES. THE FIRST RECORD IN EACH SET GIVES THE TAPE AND RECORD NUMBER, THE DATE AND TIME OF THE MEASUREMENT, THE LOCATION OF THE SATELLITE, AND THE SUN'S AZIMUTH AND ZENITH ANGLES. THE REMAINING FOUR RECORDS EACH CONTAIN FOUR PAIRS OF VALUES. EACH PAIR CONSISTS OF THE PRESSURE (MILLIBARS) AND THE CORRESPONDING MIXING RATIO (GM PER GM).

**********OGO 5 **********

SPACECRAFT COMMON NAME- OGO 5 NSSDC ID 68-014A
ALTERNATE NAMES- OGO-E, EGO 5, EOGO 5, 03138, S 59

LAUNCH DATE- 03/04/68 SPACECRAFT WEIGHT IN ORBIT- 611. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 07/13/72

EPOCH DATE- 03/04/68 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 3796. MIN
APOAPSIS- 148228. KM ALT PERIAPSIS- 232.000 KM ALT INCLINATION- 31.1 DEG

SPACECRAFT BRIEF DESCRIPTION

THE PURPOSE OF THE OGO 5 SPACECRAFT, THE FIFTH OF A SERIES OF SIX ORBITING GEOPHYSICAL OBSERVATORIES, WAS TO CONDUCT MANY DIVERSIFIED GEOPHYSICAL EXPERIMENTS TO OBTAIN A BETTER UNDERSTANDING OF THE EARTH AS A PLANET, AND TO DEVELOP AND OPERATE A STANDARDIZED OBSERVATORY-TYPE SPACECRAFT. OGO 5 CONSISTED OF A MAIN BODY THAT WAS PARALLELEPIPED IN FORM, TWO SOLAR PANELS, EACH WITH A SOLAR-ORIENTED EXPERIMENT PACKAGE (SOEP), AND TWO ORBITAL PLANE EXPERIMENT PACKAGES (OPEP). ONE FACE OF THE MAIN BODY WAS EARTH-POINTING (Z AXIS), AND THE LINE CONNECTING THE TWO SOLAR PANELS (X AXIS) WAS PERPENDICULAR TO THE EARTH-SUN-SPACECRAFT PLANE. THE SOLAR PANELS WERE ABLE TO ROTATE ABOUT THE X AXIS. THE OPEP'S WERE MOUNTED ON AND COULD ROTATE ABOUT AN AXIS THAT WAS PARALLEL TO THE Z AXIS AND THAT WAS ATTACHED TO THE MAIN BODY. AT LAUNCH, THE INITIAL LOCAL TIME OF APOGEE WAS 0944 HR. OGO 5 CARRIED 25 EXPERIMENTS. SEVENTEEN OF THESE WERE PARTICLE STUDIES, AND TWO WERE MAGNETIC FIELD STUDIES. IN ADDITION, THERE WAS ONE EACH OF THE

FOLLOWING TYPES OF EXPERIMENTS -- RADIO ASTRONOMY, UV SPECTRUM, LYMAN-ALPHA, SOLAR X-RAY, PLASMA WAVES, AND ELECTRIC FIELD. REAL-TIME DATA WERE TRANSMITTED AT 1, 8, AND 64 KBS DEPENDING ON THE DISTANCE FROM THE SPACECRAFT TO THE EARTH. PLAYBACK DATA WERE TAPE RECORDED AT 1 KBS AND TRANSMITTED AT 64 KBS. TWO WIDE-BAND TRANSMITTERS, ONE FEEDING INTO AN OMNIDIRECTIONAL ANTENNA AND THE OTHER FEEDING INTO A DIRECTIONAL ANTENNA, WERE USED TO TRANSMIT DATA. A SPECIAL PURPOSE TELEMETRY SYSTEM, FEEDING INTO EITHER ANTENNA, WAS ALSO USED TO TRANSMIT WIDE-BAND DATA IN REAL TIME ONLY. TRACKING WAS ACCOMPLISHED BY USING RADIO BEACONS AND A RANGE AND RANGE-RATE S-BAND TRANSPONDER. THE SPACECRAFT ATTITUDE CONTROL FAILED ON AUGUST 6, 1971, AFTER 41 MONTHS OF NORMAL OPERATION. THE SPACECRAFT WAS PUT IN A LOW-POWER MODE ON SEPTEMBER 27, 1971. THE PLAYBACK MODE BECAME INOPERABLE ON AUGUST 26, 1971, AND THE SPACECRAFT WAS PUT IN AN OPERATIONAL OFF MODE ON OCTOBER 8, 1971. THREE EXPERIMENTS WERE REACTIVATED FOR THE PERIOD FROM JUNE 1 TO JULY 13, 1972 (68-014A-09, 68-014A-22, AND 68-014A-27).

**********OGO 5, BLAMONT

EXPERIMENT NAME- GEOCORONAL LYMAN-ALPHA MEASUREMENT NSSDC ID 68-014A-22

ORIGINAL EXPERIMENT INSTITUTION- CNES

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - J.E. BLAMONT CNES PARIS, FRANCE

EXPERIMENT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST EXPERIMENT DATA RECORDED- 09/00/71

EXPERIMENT BRIEF DESCRIPTION

THE OBJECTIVE OF THIS EXPERIMENT WAS TO DETERMINE THE HYDROGEN (H) DISTRIBUTION IN THE GEOCORONA AND THE GEOCORONA'S TEMPERATURE FROM THE MEASUREMENTS OF THE INTENSITY AND LINE SHAPE OF THE EMERGING LYMAN-ALPHA RADIATION. IN ADDITION, THE EXPERIMENT PROVIDED DATA ON EXTRA TERRESTRIAL SOURCES OF LYMAN-ALPHA, SUCH AS INTERSTELLAR WIND, COMETS, PLANETS, AND NUMEROUS STARS. THE SENSOR WAS A PHOTOMETER WITH A FIELD OF VIEW OF 40 MIN OF ARC AND A BANDWIDTH OF 80 A CENTERED AT LYMAN-ALPHA (1216 A). SPECIFICALLY, A PLANE MIRROR WHICH COULD ROTATE ABOUT A HORIZONTAL AXIS WAS USED TO MOVE THE FIELD OF VIEW IN 1/2 DEG STEPS. LEAVING THIS MIRROR, THE RADIATION STRUCK A SPHERICAL MIRROR THAT FOCUSED IT ONTO A DIAPHRAGM. SUBSEQUENTLY THE IMAGE OF THE DIAPHRAGM WAS FOCUSED ON THE ENTRANCE WINDOW OF A PHOTOMULTIPLIER VIA A SYSTEM CONSISTING OF AN ASPHERICAL MIRROR AND A PLANE GRATING. A HYDROGEN CELL, FILLED WITH HYDROGEN GAS AT A PRESSURE OF 0.5 MM OF MERCURY AND CONTAINING TWO MAGNESIUM FLUORIDE WINDOWS, WAS PLACED IN FRONT OF THE PHOTOMULTIPLIER AND PROVIDED THE MEASUREMENT OF LINE WIDTH. PULSES PRODUCED BY THE PHOTOMULTIPLIER WERE COUNTED FOR 0.432 SEC, A TIME SPAN DURING WHICH THE PLANE MIRROR POSITION DID NOT CHANGE. THE NUMBER OF PULSES IN THIS TIME INTERVAL WAS A MEASUREMENT OF INTENSITY. A SHUTTER WAS CLOSED EVERY THIRD MINUTE TO MEASURE THE DARK CURRENT LEVEL OF THE PHOTOMETER. THE EXPERIMENT WAS MOUNTED IN THE OPEP. INSTRUMENT SCANNING CAUSED THE FIELD-OF-VIEW AXIS TO MOVE INSIDE A CONE OF 16-DEG HALF-ANGLE, WITH THE LOCAL VERTICAL AS AXIS. TWO MODES OF OPERATION WERE POSSIBLE AND THE CHOICE WAS MADE BY GROUND COMMAND. IN THE SCANNING MODE THE PLANE MIRROR WOULD SCAN CONTINUOUSLY. IN THE STEPPING MODE THIS MIRROR WOULD BE PLACED IN A SPECIFIED POSITION. THE EXPERIMENT WAS TURNED OFF WHEN THE SPACECRAFT WAS DEACTIVATED ON OCTOBER 8, 1971, AFTER OPERATING FOR 23,170 HRS. THE EXPERIMENT WAS TURNED ON AGAIN WHEN THE SPACECRAFT WAS REACTIVATED FOR THE PERIOD JUNE 1 TO JULY 13, 1972. MORE EXPERIMENT DETAILS AND SOME DATA APPEAR IN THE PAPER "INTERPRETATION OF OGO 5 LYMAN-ALPHA MEASUREMENTS IN THE UPPER GEOCORONA," J. L. BERTAUX, ET AL., J.G.R., VOL. 78, NO. 1, P. 80 (1973).

DATA SET NAME- LYMAN ALPHA GEOCORONAL DATA ON MAGNETIC TAPES NSSDC ID 68-014A-22A

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 03/05/68 TO 12/31/69 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 32 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF 9-TRACK MAGNETIC TAPES WRITTEN AT 1600 BPI ON A 360/65 IBM COMPUTER IN A FLOATING POINT FORMAT. THE NUMBER OF FILES PER TAPE VARIES FROM 4 TO 25. EACH FILE CONTAINS THE DATA FOR AN ENTIRE ORBIT AND IS ARRANGED WITH A FILE LABEL, FOLLOWED BY A VARIABLE NUMBER OF RECORDS. THE RECORDS ARE OF VARIABLE LENGTH AND CONTAIN ABOUT 3 MIN OF DATA. IN ADDITION TO THE MEASURED LYMAN-ALPHA INTENSITY, SEVERAL OTHER PARAMETERS ARE PRESENTED INCLUDING ALTITUDE, LOCATION, AND TIME.

**********OGO 6 **********

SPACECRAFT COMMON NAME- OGO 6 NSSDC ID 69-051A
ALTERNATE NAMES- PL-6910, OGO-F, S 60, POGO 3, 03986

LAUNCH DATE- 06/05/69 SPACECRAFT WEIGHT IN ORBIT- 632.0 KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 03/00/72

EPOCH DATE- 06/05/69 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 100. MIN
APOAPSIS- 1098.00 KM ALT PERIAPSIS- 396.000 KM ALT INCLINATION- 81.998 DEG

SPACECRAFT BRIEF DESCRIPTION

OGO 6 WAS A LARGE OBSERVATORY INSTRUMENTED WITH 26 EXPERIMENTS DESIGNED TO STUDY THE VARIOUS INTERRELATIONSHIPS BETWEEN, AND LATITUDINAL DISTRIBUTIONS OF, HIGH-ALTITUDE ATMOSPHERIC PARAMETERS DURING A PERIOD OF INCREASED SOLAR ACTIVITY. THE MAIN BODY OF THE SPACECRAFT WAS ATTITUDE CONTROLLED BY MEANS OF HORIZON SCANNERS AND GAS JETS SO THAT ITS ORIENTATION WAS MAINTAINED CONSTANT WITH RESPECT TO THE EARTH AND THE SUN. THE SOLAR PANELS ROTATED ON A HORIZONTAL AXIS EXTENDING TRANSVERSELY THROUGH THE MAIN BODY OF THE SPACECRAFT. THE ROTATION OF THE PANELS WAS ACTIVATED BY SUN SENSORS SO THAT THE PANELS RECEIVED MAXIMUM SUNLIGHT. SEVEN EXPERIMENTS WERE MOUNTED ON THE SOLAR PANELS (THE SOPEP PACKAGE). AN ADDITIONAL AXIS, ORIENTED VERTICALLY ACROSS THE FRONT OF THE MAIN BODY, CARRIED SEVEN EXPERIMENTS (THE OPEP PACKAGE). NOMINALLY, THESE SENSORS OBSERVED IN A FORWARD DIRECTION IN THE ORBITAL PLANE OF THE SATELLITE. THE SENSORS COULD BE ROTATED MORE THAN 90 DEG RELATIVE TO THE NOMINAL OBSERVING POSITION AND MORE THAN 90 DEG BETWEEN THE UPPER AND LOWER OPEP GROUPS MOUNTED ON EITHER END OF THIS AXIS. ON JUNE 22, 1969, THE SPACECRAFT POTENTIAL DROPPED SIGNIFICANTLY DURING SUNLIGHT OPERATION AND REMAINED SO DURING SUBSEQUENT SUNLIGHT OPERATION. THIS UNEXPLAINED SHIFT AFFECTED SEVEN EXPERIMENTS WHICH MADE MEASUREMENTS DEPENDENT UPON KNOWLEDGE OF THE SPACECRAFT PLASMA SHEATH. DURING OCTOBER 1969, A STRING OF SOLAR CELLS FAILED, BUT THE ONLY EFFECT OF THE DECREASED POWER WAS TO CAUSE TWO EXPERIMENTS TO CHANGE THEIR MODE OF OPERATION. ALSO DURING OCTOBER 1969, A COMBINATION OF MANUAL AND AUTOMATIC ATTITUDE CONTROL WAS INITIATED, WHICH EXTENDED THE CONTROL GAS LIFETIME OF THE ATTITUDE CONTROL SYSTEM. IN AUGUST 1970, TAPE RECORDER (TR) NO. 1

OPERATION DEGRADED SO THAT ALL RECORDED DATA WERE SUBSEQUENTLY TAKEN WITH TR NO. 2. BY SEPTEMBER 1970, POWER AND EQUIPMENT DEGRADATION LEFT 14 EXPERIMENTS OPERATING NORMALLY, THREE PARTIALLY, AND NINE OFF. FROM OCTOBER 14, 1970, TR NO. 2 WAS USED ONLY ON WEDNESDAYS (WORLD DAYS) TO CONSERVE POWER AND EXTEND TR OPERATION. IN JUNE 1971 THE NUMBER OF 'ON' EXPERIMENTS DECREASED FROM 13 TO 7, AND ON JUNE 28, 1971, THE SPACECRAFT WAS PLACED IN A SPIN-STABILIZED MODE ABOUT THE YAW (Z) AXIS AND TURNED OFF DUE TO DIFFICULTIES WITH SPACECRAFT POWER. OGO 6 WAS TURNED ON AGAIN FROM OCTOBER 10, 1971, THROUGH MARCH 1972, FOR OPERATION OF EXPERIMENT 25 BY RADIO RESEARCH LABORATORY, JAPAN.

**********OGO 6, BARTH

EXPERIMENT NAME- UV PHOTOMETER NSSDC ID 69-051A-13

ORIGINAL EXPERIMENT INSTITUTION- U OF COLORADO

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - C.A.	BARTH	U OF COLORADO	BOULDER, CO
OI - J.B.	PEARCE	U OF COLORADO	BOULDER, CO
OI - E.F.	MACKEY	PACKARD-BELL	NEWBERRY PARK, CA

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 02/05/71

EXPERIMENT BRIEF DESCRIPTION

THE SCIENTIFIC OBJECTIVES OF THIS EXPERIMENT WERE (1) TO MEASURE THE INTENSITY OF THE HYDROGEN LYMAN-ALPHA EMISSION AT 1216 A AND OF THE ATOMIC OXYGEN EMISSION AT 1304 A IN THE AIRGLOW, (2) TO MEASURE THE COLUMNAR DENSITIES OF THE NEUTRAL ATOMIC HYDROGEN AND OXYGEN SPECIES ABOVE THE ORBIT, AND (3) TO MEASURE THE SPATIAL DISTRIBUTION (IN LOCAL TIME AND LATITUDE) AND THE TEMPORAL CHANGES (WITH SOLAR AND GEOPHYSICAL ACTIVITY) OF THE ABOVE MENTIONED DENSITIES AND EMISSION INTENSITIES. THREE-AXIS EARTH STABILIZATION OF THE MAIN SPACECRAFT BODY DURING NORMAL OPERATION PERMITTED THE PHOTOMETERS TO VIEW THE AIRGLOW IN THE LOCAL ZENITH. THE FIELD OF VIEW WAS 3 DEG AT HALF-MAXIMUM. RADIATION MEASUREMENTS MADE WITH THIS TWO-CHANNEL PHOTOMETER EXPERIMENT COVERED THE WAVELENGTH INTERVAL FROM 1050 TO 1800 A. CHANNEL 'B' DATA, IN THE WAVELENGTH INTERVAL FROM 1250 TO 1800 A, WERE USED TO REMOVE THE CONTRIBUTION OF THE NON-LYMAN-ALPHA RADIATION FROM THE CHANNEL 'A' DATA, WHICH RANGED FROM 1050 TO 1800 A. THUS, THE INTENSITY OF THE AIRGLOW EMISSIONS AT 1216 AND 1304 A COULD BE INFERRED DIRECTLY FROM THE QUANTITIES CHANNEL A OUTPUT MINUS CHANNEL B, AND CHANNEL B OUTPUT, RESPECTIVELY. THE PHOTOMULTIPLIER TUBE ANODE CURRENT WAS DETECTED WITH A DC-COUPLED STABILIZED ELECTROMETER. BOTH CHANNELS HAD A DYNAMIC RANGE FROM 10 RAYLEIGHS TO 100 KILORAYLEIGHS. A COMMANDABLE SHUTTER WAS INCLUDED TO ALLOW MEASUREMENTS OF BACKGROUND. SINCE SCATTERED SUNLIGHT AFFECTED THE MEASUREMENTS WHEN THE SUN WAS WITHIN 34 DEG OF THE -Z AXIS, SUITABLE SHIELDING WAS PROVIDED. THE RADIATION BELT ABOVE 1000 KM (OR IN THE ANOMALY ABOVE 600 KM) CAUSED SPURIOUS SIGNALS THAT WERE PRESENT IN BOTH CHANNELS. THE TELEMETERED DATA WERE APPROXIMATELY PROPORTIONAL TO THE LOGARITHM OF THE ULTRAVIOLET SOURCE INTENSITY. INFLIGHT CALIBRATION CHECKS AND AUTOMATIC DRIFT CORRECTIONS WERE INCORPORATED IN THE EXPERIMENT. REDUCED DATA INCLUDED EXPERIMENT OUTPUTS OF BOTH PHOTOMULTIPLIER CHANNELS AT 1-SEC INTERVALS. SPACECRAFT OPERATIONS WERE TERMINATED ON JUNE 28, 1971. AT THAT TIME, THIS EXPERIMENT WAS STILL OPERATIONAL, HAVING FUNCTIONED FOR MORE THAN 14,000 HR.

DATA SET NAME- CALCOMP PLOTS OF UV AIRGLOW DATA ON MICROFILM — NSSDC ID 69-051A-13B

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 06/08/69 TO 11/05/70 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET OF 35-MM FILM, SUPPLIED BY THE EXPERIMENTER, CONTAINS CALCOMP PLOTS OF SOME OF THE OGO 6 PHOTOMETER DATA CONTAINED ON TAPE (DATA SET 69-051A-13A). EACH FILM FRAME SHOWS ONE ORBIT OF DATA AND IS MADE UP OF TWO GRAPHS PLACED ONE ABOVE THE OTHER. VALUES FOR FOUR PARAMETERS ARE SHOWN ON EACH GRAPH, AND ALL EIGHT CURVES ARE PLOTTED VS TRUE ANOMALY (IN DEG). THE UPPER GRAPH CONTAINS VALUES FOR THE INTENSITIES OF THE 1216-A AND 1304-A EMISSIONS, THE SPACECRAFT HEIGHT (IN KM), AND THE SOLAR ZENITH ANGLE (IN DEG). THE LOWER GRAPH CONTAINS VALUES FOR THE RIGHT ASCENSION AND DECLINATION, GEODETIC LONGITUDE, AND MAGNETIC LATITUDE. THE ORBIT NUMBER IS PRINTED AT THE BOTTOM OF EACH FRAME.

**********OGO 6, REBER

EXPERIMENT NAME- NEUTRAL ATMOSPHERE COMPOSITION — NSSDC ID 69-051A-04

ORIGINAL EXPERIMENT INSTITUTION- NASA-GSFC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - C.A.	REBER	NASA-GSFC	GREENBELT, MD
OI - D.N.	HARPOLD	NASA-GSFC	GREENBELT, MD
OI - G.R.	CARIGNAN	U OF MICHIGAN	ANN ARBOR, MI
OI - D.R.	TAEUSCH	U OF MICHIGAN	ANN ARBOR, MI

EXPERIMENT STATUS OF OPERATION- OPERATIONAL OFF
DATE LAST EXPERIMENT DATA RECORDED- 06/00/71

EXPERIMENT BRIEF DESCRIPTION

THE PRIMARY OBJECTIVE OF THIS EXPERIMENT WAS TO STUDY, BY OBTAINING APPROPRIATE DIRECT IN SITU COMPOSITION MEASUREMENTS, THE VARIATION OF THE CONCENTRATIONS OF THE MAJOR CONSTITUENTS (NITROGEN, OXYGEN, HELIUM, AND HYDROGEN) OF THE EARTH'S NEUTRAL UPPER ATMOSPHERE DURING CHANGING SOLAR AND MAGNETIC ACTIVITY AS A FUNCTION OF TIME AND LOCATION. THE SPECTROMETER SYSTEM CONSISTED OF A QUADRUPOLE ANALYZER, IN WHICH MASS SEPARATION OCCURRED WITHIN A DIRECT CURRENT AND A RADIO FREQUENCY ELECTRIC FIELD, AN ENCLOSED DUAL-FILAMENT ELECTRON BOMBARDMENT ION SOURCE, AN ELECTRON MULTIPLIER, SUPPORTING ELECTRONICS FOR OPERATING THE ANALYZER AND SOURCE, AND A BREAK-OFF DEVICE FOR EXPOSING THE EVACUATED MASS SPECTROMETER TO THE ATMOSPHERE AFTER THE SPACECRAFT ACHIEVED ORBIT. ORIENTED CONTINUALLY INTO THE ORBIT PLANE, THE SPECTROMETER'S ENTRANCE APERTURE NORMALLY FACED INTO THE DIRECTION OF MOTION. ENTERING GAS PARTICLES INTERACTED PHYSICALLY AND CHEMICALLY WITH THE SURFACES OF AN ANTECHAMBER BEFORE BEING IONIZED BY A 90-V ELECTRON BEAM. AFTER PASSING THROUGH ELECTRIC FIELDS, THE SELECTED IONS STRUCK THE FIRST DYNODE OF A MULTIPLIER. THE RESULTING MULTIPLIER OUTPUT PULSES WERE COUNTED, AND THE MEASURED COUNT WAS PROPORTIONAL TO THE NUMBER DENSITY OF THE SELECTED MASS IN THE ANTECHAMBER. THIS VERSATILE EXPERIMENT WAS DESIGNED TO OPERATE IN ANY ONE OF THREE MODES, DEPENDING ON THE COMMAND GIVEN. IN MODE 'C' THE SPECTROMETER WAS TUNED TO A PARTICULAR NEUTRAL SPECIES MASS AND MEASURED ITS CONCENTRATION ONLY. IN THE OTHER TWO MODES OF OPERATION, BOTH PRETUNED STEPPING AND MASS SWEEPING APPROACHES WERE USED.

THE EXPERIMENT WAS AUTOMATICALLY PLACED IN MODE 'A' EACH TIME IT WAS TURNED ON, AND THE BULK OF THE TRANSMITTED DATA WAS OBTAINED IN MODE A. HERE, THE ANALYZER WAS FIXED -- TUNED SEQUENTIALLY TO THE MASSES OF PRINCIPAL INTEREST, 2, 4, 16, 28, AND 32. THERE WERE 28 STEPPING SEQUENCES, EACH LASTING 9.2 SEC. IN ADDITION, THERE WERE TWO SWEEPING SEQUENCES, EACH OF 55.2-SEC DURATION, SO THAT A COMPLETE MEASUREMENT CYCLE LASTED 368 SEC. IN THE SWEEPING MODE, THE ANALYZER WAS TUNED OVER THE MASS RANGES 2 TO 1.2, 4 TO 2.2, 16 TO 9, 28 TO 15.5, 32 TO 18, AND 45 TO 25.3 AMU. A COMPLETE MEASUREMENT CYCLE IN MODE B ALSO TOOK 368 SEC AND CONSISTED OF SIX SWEEPING SEQUENCES AND FOUR STEPPING SEQUENCES. MORE DETAILS CAN BE FOUND IN 'NEUTRAL COMPOSITION VARIATION ABOVE 400 KM DURING A MAGNETIC STORM,' D. R. TAEUSCH, G. R. CARIGNAN, AND C. A. REBER, J. GEOPHYS RES, VOL 76, NO. 34, PP. 8318-8325, 1971.

DATA SET NAME- ATMOSPHERIC COMPOSITION AND TEMPERATURE NSSDC ID 69-051A-04A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 06/27/69 TO 05/13/71 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA-SET BRIEF DESCRIPTION -

THIS ANALYZED DATA SET IS CONTAINED IN THE JGR PAPER, 'EMPIRICAL MODEL OF GLOBAL THERMOSPHERIC TEMPERATURE AND COMPOSITION BASED ON DATA FROM THE OGO 6 QUADRUPOLE MASS SPECTROMETER,' A. E. HEDIN, H. G. MAYR, C. A. REBER, N. W. SPENCER, AND G. R. CARIGNAN, VOL 79, NO. 1, JANUARY, 1974. THE SPECTROMETER MEASUREMENTS PRESENTED HERE WERE OBTAINED WHEN STRONG MAGNETIC ACTIVITY WAS ABSENT. THE PAPER BEGINS WITH AN INTRODUCTION THAT INCLUDES A DESCRIPTION OF THE DATA SELECTION, COVERAGE, AND ACCURACY, FOLLOWED BY A PRESENTATION OF THE MODEL FORMULA AND DATA FITTING. A DISCUSSION OF THE MEASUREMENTS AND OF THE MANY DATA COMPARISONS IS ALSO INCLUDED. TWENTY-SEVEN DATA GRAPHS SHOW THE VARIATIONS WITH MANY PARAMETERS INCLUDING LOCAL TIME, GEOGRAPHIC LATITUDE, AND SOLAR ACTIVITY.

**********OV1-15 **********

SPACECRAFT COMMON NAME- OV1-15 NSSDC ID 68-059A
ALTERNATE NAMES- PL-682F, SPADES 1968-059A, 03318, ARSP 68-1

LAUNCH DATE- 07/11/68 SPACECRAFT WEIGHT IN ORBIT- .215. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST SPACECRAFT DATA RECORDED- 11/06/68

EPOCH DATE- 07/12/68 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 104.8 MIN
APOAPSIS- 1818.00 KM ALT PERIAPSIS- 154.000 KM ALT INCLINATION- 89.90 DEG

SPACECRAFT BRIEF DESCRIPTION

OV1-15, ALSO REFERRED TO AS SPADES (SOLAR PERTURBATION OF ATMOSPHERIC DENSITY EXPERIMENTAL SATELLITE), WAS DESIGNED TO STUDY SYNOPTICALLY THE FLUCTUATIONS OF ATMOSPHERIC DENSITY, COMPOSITION, AND TEMPERATURE IN THE REGION FROM 150 TO 500 KM AS A FUNCTION OF SOLAR MAGNETOSPHERIC DISTURBANCES. THE CYLINDRICAL SPACECRAFT, 27 INCHES IN DIAMETER, WAS 54 INCHES LONG. ELECTRICAL POWER WAS SUPPLIED BY SOLAR CELLS MOUNTED ON MULTIFACETED DOMES ON EACH END OF THE SPACECRAFT. OV1-15 WAS SPIN-STABILIZED. INSTRUMENTATION CONSISTED OF A MICROPHONE DENSITY GAUGE,

ION GAUGE, MASS SPECTROMETERS, ENERGETIC PARTICLE DETECTORS, SOLAR X-RAY AND ULTRAVIOLET FLUX MONITORS, AN IONOSPHERIC MONITOR, AND A TRI-AXIAL ACCELEROMETER. THE SPACECRAFT PERFORMED NORMALLY AFTER LAUNCH, REENTERING THE EARTH'S ATMOSPHERE ON NOVEMBER 6, 1968, AFTER SUCCESSFULLY COMPLETING THE MISSION OBJECTIVES.

**********OV1-15, CHAMPION

EXPERIMENT NAME- TRIAXIAL ACCELEROMETER NSSDC ID 68-059A-01

ORIGINAL EXPERIMENT INSTITUTION- AFCRL

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI -	K.S.W. CHAMPION	AFCRL	BEDFORD, MA
OI -	F.A. MARCOS	AFCRL	BEDFORD, MA

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 11/06/68

EXPERIMENT BRIEF DESCRIPTION

THE ACCELEROMETER EXPERIMENT ON OV1-15 WAS DESIGNED TO OBTAIN ATMOSPHERIC DENSITIES BETWEEN 100 AND 200 KM. THE ACCELEROMETER SYSTEM CONSISTED OF THREE MUTUALLY PERPENDICULAR ELECTROSTATICALLY SUSPENDED AND ELECTROSTATICALLY PULSE-REBALANCED UNITS MOUNTED NEAR THE CENTER OF THE SPACECRAFT AND ALIGNED ALONG ITS NOMINAL SPIN AXIS. THE INSTRUMENT MEASURED THE ELECTROSTATIC FORCE REQUIRED TO RESTORE A HOLLOW CYLINDRICAL MASS UNDER EXTERNAL ACCELERATION. FROM THESE DATA, ATMOSPHERIC DENSITIES WERE CALCULATED. THE EXPERIMENT WAS A SUCCESS, AND GOOD DATA WERE OBTAINED UNTIL VEHICLE REENTRY ON NOVEMBER 6, 1968.

DATA SET NAME- TRIAXIAL ACCELEROMETER ATMOSPHERIC DENSITY PLOTS NSSDC ID 68-059A-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 07/14/68 TO 09/28/68 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF NEUTRAL ATMOSPHERIC DENSITY PROFILES IN HARDCOPY DETERMINED FROM ACCELEROMETER MEASUREMENTS OF SATELLITE DECELERATION INDUCED BY AERODYNAMIC DRAG. EACH PROFILE REPRESENTS ONE ORBIT AND CONSISTS OF NUMEROUS MEASUREMENTS TAKEN BETWEEN SATELLITE PERIGEE (150 KM) UP TO A HEIGHT OF 250 KM ABOVE THE EARTH'S SURFACE. THE DATA ARE FOR SELECTED ORBITS BETWEEN JULY 14 AND SEPTEMBER 28, 1968. THERE IS ONE SIGNIFICANT GAP IN DATA FROM AUGUST 9 TO AUGUST 28 WHEN THE ACCELEROMETER WAS NOT FUNCTIONING PROPERLY. THE GEOGRAPHIC LATITUDE AND LONGITUDE AND TIME OF PERIGEE IN BOTH LOCAL AND UNIVERSAL TIME IS GIVEN FOR EACH PROFILE. THE DATA CAN BE FOUND IN APPENDIX A OF AFCRL-72-0608, "ATMOSPHERIC DENSITY RESULTS DERIVED FROM THE SPADES SATELLITE ACCELEROMETER DATA," OCTOBER 1972. ALSO PRESENTED IN THE DOCUMENT IS A DESCRIPTION OF THE SPACECRAFT OPERATION, THE INSTRUMENTATION, AND THE DATA REDUCTION PROCEDURE. IN ADDITION, THESE DATA INCLUDE DENSITY VALUES COMPARED WITH THOSE CALCULATED USING "JACCHIA'S 1971 MODEL ATMOSPHERE".

**********PIONEER 8 **********

SPACECRAFT COMMON NAME- PIONEER 8
ALTERNATE NAMES- PIONEER-C, 03066 NSSDC ID 67-123A

LAUNCH DATE- 12/13/67 SPACECRAFT WEIGHT IN ORBIT- 146. KG

SPACECRAFT STATUS OF OPERATION- PARTIAL

EPOCH DATE- 12/13/67 ORBIT TYPE- HELIOCENTRIC ORBIT PERIOD- 386.6 DAYS
APOAPSIS- 1.0880 AU RAD PERIAPSIS- .9692 AU RAD INCLINATION- .0578 DEG

SPACECRAFT BRIEF DESCRIPTION

PIONEER 8 WAS THE THIRD IN A SERIES OF SOLAR-ORBITING, SPIN-STABILIZED, SOLAR CELL, AND BATTERY-POWERED SATELLITES DESIGNED TO OBTAIN MEASUREMENTS OF INTERPLANETARY PHENOMENA FROM WIDELY SEPARATED POINTS IN SPACE ON A CONTINUING BASIS. THE SPACECRAFT CARRIED EXPERIMENTS TO STUDY THE POSITIVE IONS AND ELECTRONS IN THE SOLAR WIND, THE INTERPLANETARY ELECTRON DENSITY (RADIO PROPAGATION EXPERIMENT), SOLAR AND GALACTIC COSMIC RAYS, THE INTERPLANETARY MAGNETIC FIELD, COSMIC DUST, AND ELECTRIC FIELDS. ITS MAIN ANTENNA WAS A HIGH-GAIN DIRECTIONAL ANTENNA. THE SPACECRAFT WAS SPIN-STABILIZED AT ABOUT 60 RPM, AND THE SPIN AXIS WAS PERPENDICULAR TO THE ECLIPTIC PLANE AND POINTED TOWARD THE SOUTH ECLIPTIC POLE. BY GROUND COMMAND, ONE OF FIVE BIT RATES, ONE OF FOUR DATA FORMATS, AND ONE OF FOUR OPERATING MODES COULD BE SELECTED. THE FIVE BIT RATES WERE 512, 256, 64, 16, AND 8 BPS. THREE OF THE FOUR DATA FORMATS WERE USED PRIMARILY FOR SCIENTIFIC DATA AND CONSISTED OF THIRTY-TWO 7-BIT WORDS PER FRAME. ONE SCIENTIFIC DATA FORMAT WAS USED AT THE TWO HIGHEST BIT RATES, ANOTHER WAS USED AT THE THREE LOWEST BIT RATES. THE THIRD WAS USED FOR DATA FROM ONLY THE RADIO PROPAGATION EXPERIMENT. THE FOURTH DATA FORMAT WAS USED MAINLY FOR ENGINEERING DATA. THE FOUR OPERATING MODES WERE (1) REAL TIME, (2) TELEMETRY STORE, (3) DUTY CYCLE STORE, AND (4) MEMORY READOUT. IN THE REAL-TIME MODE, DATA WERE SAMPLED AND TRANSMITTED DIRECTLY (WITHOUT STORAGE) AS SPECIFIED BY THE DATA FORMAT AND BIT RATE SELECTED. IN THE TELEMETRY STORE MODE, DATA WERE STORED AND TRANSMITTED SIMULTANEOUSLY IN THE FORMAT AND AT THE BIT RATE SELECTED. IN THE DUTY CYCLE STORE MODE, A SINGLE FRAME OF SCIENTIFIC DATA WAS COLLECTED AND STORED AT A RATE OF 512 BPS. THE TIME INTERVAL BETWEEN THE COLLECTION AND STORAGE OF SUCCESSIVE FRAMES COULD BE VARIED BY GROUND COMMAND BETWEEN 2 AND 17 MIN TO PROVIDE PARTIAL DATA COVERAGE FOR PERIODS UP TO 19 HR, AS LIMITED BY THE BIT STORAGE CAPACITY. IN THE MEMORY READOUT MODE, DATA WERE READ OUT AT WHATEVER BIT RATE WAS APPROPRIATE TO THE SATELLITE DISTANCE FROM THE EARTH. THE BIT RATE FOR THE MAJORITY OF THE DATA WAS 512 BPS FROM DECEMBER 13, 1967 TO MARCH 20, 1968, 256 BPS FROM MARCH 20, 1968 TO MAY 6, 1968, 64 BPS FROM MAY 6, 1968 TO AUGUST 29, 1968, AND 16 OR 8 BPS THEREAFTER. HIGHER BIT RATES WERE USED WHEN THE SPACECRAFT WAS TRACKED BY THE 64-M ANTENNA, BUT THE DATA COVERAGE BY THIS ANTENNA WAS LOW. DATA COVERAGE AVERAGED CLOSE TO 100 PERCENT FOR THE FIRST YEAR AFTER LAUNCH. AFTER THAT, THE DATA COVERAGE AVERAGED BETWEEN 50 AND 80 PERCENT UNTIL NOVEMBER 1970 WHEN COVERAGE DROPPED TO BETWEEN 50 AND 0 PERCENT. ALMOST NO DATA HAVE BEEN ACQUIRED SINCE MAY, 1971. DURING A REORIENTATION MANEUVER IN MARCH 1968, ONE OF THE FOUR SUN SENSORS (WHICH WAS CONNECTED TO THE ATTITUDE GAS SYSTEM USED TO KEEP THE SPIN AXIS POINTED) WAS FOUND TO BE INOPERATIVE. IT WAS NOTED AT THIS TIME THAT THE SPACECRAFT ATTITUDE WAS OFF 4 DEG. ANOTHER ORIENTATION WAS ATTEMPTED IN JUNE 1968, AND IT WAS FOUND THAT THREE OF THE FOUR ATTITUDE SUN SENSORS WERE INOPERATIVE.

**********PIONEER 8, ESHLEMAN

EXPERIMENT NAME- TWO-FREQUENCY BEACON RECEIVER NSSDC ID 67-123A-03

ORIGINAL EXPERIMENT INSTITUTION- STANFORD U

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)

PI - V.R.	ESHLEMAN	STANFORD U	STANFORD, CA
OI - T.A.	CROFT	STANFORD U	STANFORD, CA
OI - H.T.	HOWARD	STANFORD RSCH INST	MENLO PARK, CA
OI - R.L.	LEADABRAND	STANFORD RSCH INST	MENLO PARK, CA
OI - R.A.	LONG	STANFORD RSCH INST	MENLO PARK, CA
OI - A.M.	PETERSON	STANFORD U	STANFORD, CA
OI - F.L.	SCARF	TRW SYSTEMS GROUP	REDONDO BEACH, CA

EXPERIMENT STATUS OF OPERATION- NORMAL

EXPERIMENT BRIEF DESCRIPTION

BOTH 423.3-MHZ AND ITS 2/17 SUBHARMONIC 49.8-MHZ SIGNALS WERE TRANSMITTED FROM A 4.6-M STEERABLE PARABOLIC ANTENNA AT STANFORD UNIVERSITY TO THE TWO-FREQUENCY RADIO RECEIVER ON THE SPACECRAFT. THE HIGH-FREQUENCY SIGNAL SERVED AS A REFERENCE SIGNAL SINCE ITS PROPAGATION TIME WAS NOT APPRECIABLY DELAYED. THE LOW-FREQUENCY SIGNAL WAS DELAYED IN PROPORTION TO THE TOTAL ELECTRON CONTENT IN THE PROPAGATION PATH. ON THE SPACECRAFT, A PHASE-LOCKED RECEIVER COUNTED THE BEAT FREQUENCY ZERO CROSSINGS OF THE RECEIVED SIGNALS TO OBTAIN MEASUREMENTS OF PHASE-PATH DIFFERENCES. DIFFERENTIAL DELAY OF THE GROUP VELOCITY WAS ALSO OBSERVED, AND THESE VALUES WERE TELEMETERED TO THE GROUND STATION. FROM CALCULATED TOTAL ELECTRON CONTENT VALUES, THE IONOSPHERIC EFFECT (UP TO A SELECTED ALTITUDE OBTAINED FROM OTHER EXPERIMENTAL TECHNIQUES) COULD BE SUBTRACTED TO PRODUCE DATA DESCRIBING THE INTERPLANETARY ELECTRON CONTENT OF THE SOLAR WIND AND ITS VARIATIONS. FOR SIMILAR EXPERIMENTS COVERING OTHER TIME PERIODS, SEE 68-100A-03, 66-075A-04, 65-105A-04, AND 67-060A-02. A MORE DETAILED DESCRIPTION OF THE EXPERIMENT CAN BE FOUND IN JOURNAL OF GEOPHYSICAL RESEARCH, VOL 17, PP 3325-3327, AND IN RADIO SCIENCE, VOL 6, PP 55-63.

DATA SET NAME- DIGITAL VALUES OF SOLAR WIND ELECTRON DENSITY VS TIME NORMALIZED TO 1 AU ON TAPE NSSDC ID 67-123A-03C

AVAILABILITY OF DATA SET- DATA AT NSSDC

TIME PERIOD COVERED- 12/19/67 TO 03/07/71 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 REEL(S) OF MAGNETIC TAPE

DATA SET BRIEF DESCRIPTION

THESE DATA WERE PREPARED FROM THE ORIGINAL ANALOG RECORDS BY THE EXPERIMENTER'S STAFF. THE PRIMARY DATA CONSIST OF HOURLY VALUES OF NORMALIZED ELECTRON NUMBER DENSITY IN THE SOLAR WIND. TO OBTAIN THESE DATA, THE IONOSPHERIC TOTAL CONTENT WAS REMOVED FROM THE OBSERVED TOTAL CONTENT VALUES, AND THE TOTAL CONTENT PATH LENGTH WAS USED TO CONVERT TOTAL CONTENT TO DENSITY. THE RESULTING VALUES WERE THEN NORMALIZED TO 1 AU ASSUMING DENSITY TO BE PROPORTIONAL TO THE INVERSE SQUARE OF THE DISTANCE OF THE SATELLITE FROM THE SUN. VALUES RESULTING FROM INTERPOLATION ARE FLAGGED. NO INTERPOLATED VALUES WERE RECORDED WHEN DATA GAPS EXCEEDED 4 DAYS. THIS DATA SET IS ON 800-BPI, 7-TRACK, ODD PARITY, BINARY MAGNETIC TAPE CREATED ON A XEROX SIGMA 5 COMPUTER. AUXILIARY DATA ON THE TAPE INCLUDE UT AND CARRINGTON ROTATION NUMBER. DATA ARE AVAILABLE FOR ABOUT 12 HR PER DAY WHEN THE SPACECRAFT WAS IN VIEW FROM THE STANFORD TRANSMITTER. IDENTICAL DATA FOR

OTHER TIME PERIODS FROM PIONEERS 6 (65-105A-04D), 7 (66-075A-04D), 9 (68-100A-03C), AND MARINER 5 (67-060A-02C) ALSO APPEAR ON THIS TAPE.

**********TIROS 1 **********

SPACECRAFT COMMON NAME- TIROS 1 NSSDC ID 60-002B
ALTERNATE NAMES- 1960 BETA 2, 00029

LAUNCH DATE- 04/01/60 SPACECRAFT WEIGHT IN ORBIT- 120. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 06/15/60

EPOCH DATE- 04/01/60 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 99.16 MIN
APOAPSIS- 750.000 KM ALT PERIAPSIS- 693.000 KM ALT INCLINATION- 48.4 DEG

SPACECRAFT BRIEF DESCRIPTION

TIROS 1 (TELEVISION AND INFRARED OBSERVATION SATELLITE), THE FIRST WEATHER SATELLITE, WAS DESIGNED TO TEST THE FEASIBILITY OF OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE SPIN-STABILIZED SATELLITE WAS IN THE FORM OF AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARRYING MOST OF THE SUBSYSTEMS, AND A COVER ASSEMBLY (HAT). ELECTRICAL POWER WAS SUPPLIED TO THE SPACECRAFT BY APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. A SINGLE MONOPOLE ANTENNA FOR RECEPTION OF GROUND COMMANDS EXTENDED OUT FROM THE TOP OF THE COVER ASSEMBLY. A PAIR OF CROSSED-DIPOLE TELEMETRY ANTENNAS (235 MHZ) PROJECTED DOWN AND DIAGONALLY OUT FROM THE BASEPLATE. MOUNTED AROUND THE EDGE OF THE BASEPLATE WERE FIVE DIAMETRICALLY OPPOSED PAIRS OF SMALL, SOLID-FUEL THRUSTERS THAT MAINTAINED THE SATELLITE SPIN RATE BETWEEN 8 AND 12 RPM. THE SATELLITE WAS EQUIPPED WITH TWO 1.27-CM-DIAMETER VIDICON TV CAMERAS, ONE WIDE ANGLE AND ONE NARROW ANGLE, FOR TAKING EARTH CLOUDCOVER PICTURES. THE PICTURES WERE TRANSMITTED DIRECTLY TO A GROUND RECEIVING STATION OR WERE STORED IN A TAPE RECORDER ON BOARD FOR LATER PLAYBACK, DEPENDING ON WHETHER THE SATELLITE WAS WITHIN OR BEYOND THE COMMUNICATION RANGE OF THE STATION. THE SATELLITE PERFORMED NORMALLY FROM LAUNCH UNTIL JUNE 15, 1960, WHEN AN ELECTRICAL POWER FAILURE PREVENTED FURTHER USEFUL TV TRANSMISSION.

**********TIROS 1, BUTLER

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 60-002B-01

ORIGINAL EXPERIMENT INSTITUTION- NASA-GSFC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - H.I. BUTLER NASA-GSFC GREENBELT, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 06/15/60

EXPERIMENT BRIEF DESCRIPTION

THE TIROS 1 TV SYSTEM WAS DESIGNED TO TEST THE FEASIBILITY OF OBTAINING CLOUDCOVER PICTURES FROM AN ORBITING SPACECRAFT. THE EXPERIMENT CONSISTED OF TWO INDEPENDENT TV CAMERAS, MAGNETIC TAPE RECORDERS, AND TV TRANSMITTERS. THE TWO SENSOR UNITS WERE CAPABLE OF EITHER CONCURRENT OR INDEPENDENT OPERATION. THE CAMERAS, ONE WIDE-ANGLE (104 DEG) AND ONE NARROW-ANGLE (12 DEG), WERE MOUNTED ON THE BASEPLATE OF THE SPACECRAFT WITH

THEIR OPTICAL AXES PARALLEL TO THE SPIN AXIS OF THE SPACECRAFT, WHICH WAS IN THE ORBITAL PLANE. THE CAMERAS WERE AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN THEY CAME IN VIEW OF THE EARTH. THE SPACECRAFT COULD TRANSMIT PICTURES IN REAL TIME WHEN IT WAS WITHIN RANGE OF A COMMAND AND DATA ACQUISITION (CDA) STATION, OR COULD RECORD THE PICTURES ON MAGNETIC TAPE FOR SUBSEQUENT TRANSMISSION TO A CDA STATION. THE TV CAMERAS USED 500-SCAN-LINE, 1.27-CM-VIDICONS. THE RECORDERS COULD STORE UP TO 32 FRAMES OF EARTH CLOUDCOVER PICTURES. TRANSMISSION OF THE 32-FRAME SEQUENCE WAS ACCOMPLISHED IN 100 SEC BY A 2-W FM TRANSMITTER OPERATING AT A NOMINAL FREQUENCY OF 235 MHZ. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 700 KM), A PICTURE TAKEN BY THE WIDE-ANGLE CAMERA COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. THE NARROW-ANGLE CAMERA COVERED A 120- BY 120-KM SQUARE AND HAD A RESOLUTION OF 0.3 TO 0.8 KM. THE EXPERIMENT WAS CAPABLE OF PRODUCING DAYTIME CLOUDCOVER PICTURES FOR THE REGION FROM 55 DEG SOUTH TO 55 DEG NORTH LATITUDE. THE EXPERIMENT WAS A SUCCESS, WITH OVER 19,000 OF THE TRANSMITTED TV PICTURES BEING USED FOR OPERATIONAL WEATHER ANALYSIS AND FORECASTING PURPOSES. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR A COMPLETE INDEX OF THESE DATA, SEE 'CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 1 TELEVISION CLOUD PHOTOGRAPHY' FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS, OR SEE DATA SET 60-0028-01A. AN ADDITIONAL SET OF PHOTOGRAPHS IS RETAINED AT THE NASA-GSFC LIBRARY FOR REFERENCE PURPOSES. AN INDEX OF THESE PHOTOGRAPHS IS AVAILABLE THROUGH NSSDC.

DATA SET NAME- INDEX OF METEOROLOGICAL SATELLITE DATA - TIROS 1 TELEVISION CLOUD PHOTOGRAPHY NSSDC ID 60-0028-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 04/01/60 TO 06/15/60 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS GEOGRAPHICAL AREAS (CODED BY LATITUDE/LONGITUDE RECTANGLES) START TIME OF PHOTOGRAPHY, AND INDICATION OF A FEW METEOROLOGICAL FEATURES WHICH ARE FOUND IN THE PICTURES. A MAP INDEX IS INCLUDED (TWO MAPS FOR MOST DAYS, TO KEEP THE MAP FROM BEING TOO CROWDED) WHICH GRAPHICALLY SHOWS AREAS COVERED BY PICTURES. ALL AREAS ARE KEYED TO ORBIT NUMBER IN THE DIGITAL INDEX. NO DATA OCCUR POLEWARD OF 65 DEG LATITUDE. THIS INDEX AND THE BASIC DATA INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NORTH CAROLINA. THE INDEX IS ON FILE AND AVAILABLE FOR USE AT NSSDC. IT MAY BE AVAILABLE AT SOME LARGER (OR SPECIALIZED) LIBRARIES AS U.S. DEPT. OF COMMERCE, WEATHER BUREAU, 'CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 1 TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.31).'

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY NSSDC ID 60-0028-01B

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 04/01/60 TO 06/15/60 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 50 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF WIDE-ANGLE AND NARROW-ANGLE CLOUD PHOTOGRAPHY CHRONOLOGICALLY ORDERED ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY THE UNITED STATES WEATHER BUREAU (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER AT ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 60-002B-01A.

**********TIROS 2 **********

SPACECRAFT COMMON NAME- TIROS 2 NSSDC ID 60-016A
ALTERNATE NAMES- 1960 PI 1, A 2, 00063

LAUNCH DATE- 11/23/60 SPACECRAFT WEIGHT IN ORBIT- 277. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 09/27/61

EPOCH DATE- 11/27/60 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 98.27 MIN
APOAPSIS- 626.000 KM ALT PERIAPSIS- 533.000 KM ALT INCLINATION- 48.534 DEG

SPACECRAFT BRIEF DESCRIPTION

TIROS 2 (TELEVISION AND INFRARED OBSERVATION SATELLITE) WAS A SPIN-STABILIZED METEOROLOGICAL SPACECRAFT DESIGNED TO TEST EXPERIMENTAL TELEVISION TECHNIQUES AND INFRARED EQUIPMENT. THE SATELLITE WAS IN THE FORM OF AN 18-SIDED RIGHT PRISM, 107 CM IN DIAMETER AND 56 CM HIGH. THE TOP AND SIDES OF THE SPACECRAFT WERE COVERED WITH APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS. TIROS 2 WAS EQUIPPED WITH TWO INDEPENDENT TELEVISION CAMERA SUBSYSTEMS FOR TAKING CLOUDCOVER PICTURES, PLUS A FIVE-CHANNEL MEDIUM-RESOLUTION SCANNING RADIOMETER AND A TWO-CHANNEL NONSCANNING LOW-RESOLUTION RADIOMETER FOR MEASURING RADIATION FROM THE EARTH AND ITS ATMOSPHERE. THE SATELLITE SPIN RATE WAS MAINTAINED BETWEEN 8 AND 12 RPM BY THE USE OF FIVE DIAMETRICALLY OPPOSED PAIRS OF SMALL, SOLID-FUEL THRUSTERS. THE SATELLITE SPIN AXIS COULD BE ORIENTED TO WITHIN 1- TO 2-DEG ACCURACY BY USE OF A MAGNETIC ATTITUDE CONTROL DEVICE CONSISTING OF 260 CORES OF WIRE WOUND AROUND THE OUTER SURFACE OF THE SPACECRAFT. THE INTERACTION BETWEEN THE INDUCED MAGNETIC FIELD IN THE SPACECRAFT AND THE EARTH'S MAGNETIC FIELD PROVIDED THE NECESSARY TORQUE FOR ATTITUDE CONTROL. THE SPACECRAFT PERFORMED NORMALLY FROM LAUNCH UNTIL SEPTEMBER 27, 1961, WHEN THE LAST EXPERIMENT FAILED. A MORE COMPLETE DESCRIPTION AND PERFORMANCE SUMMARY OF TIROS 2 IS PRESENTED IN THE JOURNAL OF THE BRITISH INTERPLANETARY SOCIETY, VOL. 19, PAGES 386-409, 1963-64.

**********TIROS 2, BUTLER

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 60-016A-03

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - H.I. BUTLER NASA-GSFC GREENBELT, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 09/27/61

EXPERIMENT BRIEF DESCRIPTION

THE TIROS 2 TV SYSTEM WAS DESIGNED TO FURTHER RESEARCH IN OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE EXPERIMENT CONSISTED OF TWO INDEPENDENT PAIRS OF TV CAMERAS, MAGNETIC TAPE RECORDERS, AND TV TRANSMITTERS. THE TWO SENSOR UNITS WERE CAPABLE OF CONCURRENT OR INDEPENDENT OPERATION. THE CAMERAS, ONE WIDE ANGLE (104 DEG) AND ONE NARROW ANGLE (12 DEG), WERE MOUNTED ON THE BASEPLATE OF THE SPACECRAFT WITH THEIR OPTICAL AXES PARALLEL TO THE SPIN AXIS, WHICH WAS IN THE ORBITAL PLANE. THE CAMERAS WERE AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN THEY CAME IN VIEW OF THE EARTH. THE PICTURES WERE TRANSMITTED DIRECTLY TO EITHER OF TWO GROUND RECEIVING STATIONS OR STORED ON MAGNETIC TAPE FOR LATER PLAYBACK, DEPENDING ON WHETHER THE SATELLITE WAS WITHIN OR BEYOND THE COMMUNICATION RANGE OF THE STATION. THE TV CAMERAS USED 500-SCAN-LINE, 1.27-CM VIDICONS. THE RECORDERS COULD STORE UP TO 32 FRAMES OF PICTURES. TRANSMISSION OF THE 32-FRAME SEQUENCE WAS ACCOMPLISHED IN 100 SEC BY A 3-W FM TRANSMITTER OPERATING AT A NOMINAL FREQUENCY OF 237 MHZ. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 700 KM), A PICTURE TAKEN BY THE WIDE-ANGLE CAMERA COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. THE NARROW-ANGLE CAMERA COVERED A 120- BY 120-KM SQUARE AND HAD A RESOLUTION OF 0.3 TO 0.8 KM. THE EXPERIMENT WAS CAPABLE OF PRODUCING DAYTIME CLOUDCOVER PICTURES FOR THE REGION 55 DEG S TO 55 DEG N LAT. DEPOSITS ON THE LENS OF THE WIDE-ANGLE CAMERA CAUSED ALL ITS PICTURES TO BE UNUSABLE. THE REMAINING CAMERA OPERATED NORMALLY UNTIL FEBRUARY 1, 1961, AND SPORADICALLY THEREAFTER UNTIL SEPTEMBER 27, 1961. THE EXPERIMENT WAS A SUCCESS, WITH OVER 25,000 USABLE PICTURES TRANSMITTED. DATA FROM THE EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR AN INDEX OF THESE DATA, SEE "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 2, TELEVISION CLOUD PHOTOGRAPHY," FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 61-016A-03A.

DATA SET NAME- INDEX OF METEOROLOGICAL SATELLITE DATA - TIROS 2 TELEVISION CLOUD PHOTOGRAPHY NSSDC ID 60-016A-03A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 11/23/60 TO 09/27/61 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS GEOGRAPHICAL AREAS (CODED BY RECTANGLES OF LATITUDE AND LONGITUDE), START TIME OF PHOTOGRAPHY AND INDICATIONS OF A FEW METEOROLOGICAL FEATURES WHICH WERE FOUND IN THE PICTURES. DUE TO POOR OPERATION OF THE WIDE-ANGLE CAMERA AND RESULTING UNCERTAINTIES OF THE NARROW-ANGLE PHOTOGRAPH LOCATION, A MAP INDEX IS NOT INCLUDED. NO DATA OCCUR POLEWARD OF 55 DEG LAT. THESE INDEXES AND THE BASIC DATA INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME LARGER (OR SPECIALIZED) LIBRARIES LISTED AS U.S. DEPT OF COMMERCE, WEATHER BUREAU, "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 2 TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.32)."

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY NSSDC ID 60-016A-03B

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 11/23/60 TO 09/27/61 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 56 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF WIDE-ANGLE AND NARROW-ANGLE CLOUD PHOTOGRAPHY ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY THE UNITED STATES WEATHER BUREAU (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER IN ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 60-016A-03A. DATA ARE RATHER SPORADIC AFTER FEBRUARY 1, 1961.

**********TIROS 3 **********

SPACECRAFT COMMON NAME- TIROS 3 NSSDC ID 61-017A
ALTERNATE NAMES- 1961 RHO 1, A 3, 00162

LAUNCH DATE- 07/12/61 SPACECRAFT WEIGHT IN ORBIT- 285. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 01/23/62

EPOCH DATE- 07/12/61 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 100.4 MIN
APOAPSIS- 702.000 KM ALT PERIAPSIS- 631.000 KM ALT INCLINATION- 47.898 DEG

SPACECRAFT BRIEF DESCRIPTION

TIROS 3 (TELEVISION AND INFRARED OBSERVATION SATELLITE) WAS A SPIN-STABILIZED METEOROLOGICAL SPACECRAFT DESIGNED TO TEST EXPERIMENTAL TELEVISION TECHNIQUES AND INFRARED EQUIPMENT. THE SATELLITE WAS IN THE FORM OF AN 18-SIDED RIGHT PRISM, 107 CM IN DIAMETER AND 56 CM HIGH. THE TOP AND SIDES OF THE SPACECRAFT WERE COVERED WITH APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS. TIROS 3 WAS EQUIPPED WITH TWO INDEPENDENT TELEVISION CAMERA SUBSYSTEMS FOR TAKING CLOUDCOVER PICTURES, PLUS A TWO-CHANNEL LOW-RESOLUTION RADIOMETER, AN OMNIDIRECTIONAL RADIOMETER, AND A FIVE-CHANNEL INFRARED SCANNING RADIOMETER. ALL THREE RADIOMETERS WERE USED FOR MEASURING RADIATION FROM THE EARTH AND ITS ATMOSPHERE. THE SATELLITE SPIN RATE WAS MAINTAINED BETWEEN 8 AND 12 RPM BY THE USE OF FIVE DIAMETRICALLY OPPOSED PAIRS OF SMALL, SOLID-FUEL THRUSTERS. THE SATELLITE SPIN AXIS COULD BE ORIENTED TO WITHIN 1- TO 2-DEG ACCURACY BY USE OF A MAGNETIC CONTROL DEVICE CONSISTING OF 250 CORES OF WIRE WOUND AROUND THE OUTER SURFACE OF THE SPACECRAFT. THE INTERACTION BETWEEN THE INDUCED MAGNETIC FIELD IN THE SPACECRAFT AND THE EARTH'S MAGNETIC FIELD PROVIDED THE NECESSARY TORQUE FOR ATTITUDE CONTROL. THE FLIGHT CONTROL SYSTEM ALSO OPTIMIZED THE PERFORMANCE OF THE SOLAR CELLS AND TV CAMERAS AND PROTECTED THE FIVE-CHANNEL INFRARED RADIOMETER FROM PROLONGED EXPOSURE TO DIRECT SUNLIGHT. THE SPACECRAFT PERFORMED NORMALLY UNTIL NOVEMBER 30, 1961, AND SPORADICALLY UNTIL JANUARY 23, 1962. IT WAS DEACTIVATED ON FEBRUARY 28, 1962. A MORE COMPLETE DESCRIPTION AND PERFORMANCE SUMMARY OF TIROS 3 IS PRESENTED IN THE JOURNAL OF THE BRITISH INTERPLANETARY SOCIETY, VOL. 19, 386-409, 1963-64.

**********TIROS 3, NESS STAFF

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 61-017A-04

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 01/23/62

EXPERIMENT BRIEF DESCRIPTION
THE TIROS 3 TV SYSTEM WAS DESIGNED TO OBTAIN DATA FOR OPERATIONAL METEOROLOGICAL USE AND TO FURTHER RESEARCH IN OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE EXPERIMENT CONSISTED OF TWO REDUNDANT PAIRS OF TV CAMERAS, MAGNETIC TAPE RECORDERS, AND TV TRANSMITTERS. THE TWO SENSOR UNITS WERE CAPABLE OF CONCURRENT OR INDEPENDENT OPERATION. THE TWO WIDE-ANGLE (104 DEG) VIDICON CAMERAS WERE MOUNTED ON THE BASEPLATE OF THE SPACECRAFT WITH THEIR OPTICAL AXES PARALLEL TO THE SPACECRAFT SPIN AXIS, WHICH WAS IN THE ORBITAL PLANE. THE CAMERAS WERE AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN THEY CAME IN VIEW OF THE EARTH. THE PICTURES WERE TRANSMITTED DIRECTLY TO EITHER OF TWO GROUND RECEIVING STATIONS OR STORED ON MAGNETIC TAPE FOR LATER PLAYBACK, DEPENDING ON WHETHER THE SATELLITE WAS WITHIN OR BEYOND THE COMMUNICATION RANGE OF THE STATION. THE TV CAMERAS USED 500-SCAN-LINE, 1.27-CM VIDICONS. THE RECORDERS COULD STORE UP TO 32 FRAMES OF PICTURES. TRANSMISSION OF THE 32-FRAME SEQUENCE WAS ACCOMPLISHED IN 100 SEC BY A 3-W FM TRANSMITTER OPERATING AT A NOMINAL FREQUENCY OF 237 MHZ. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 700 KM), A PICTURE COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. THE EXPERIMENT WAS CAPABLE OF PRODUCING DAYTIME CLOUDCOVER PICTURES FOR THE REGION BETWEEN 55 DEG S TO 55 DEG N LAT. ONE OF THE WIDE-ANGLE CAMERAS FAILED 13 DAYS AFTER LAUNCH. THE REMAINING CAMERA PRODUCED USEFUL OPERATIONAL DATA UNTIL JANUARY 23, 1962. THE EXPERIMENT WAS HIGHLY SUCCESSFUL. LAUNCHED AT THE START OF THE HURRICANE SEASON, THE EXPERIMENT WAS CREDITED WITH OBSERVING ALL SIX MAJOR HURRICANES OF THE 1961 SEASON. DURING THE OPERATIONAL LIFETIME OF THE EXPERIMENT, OVER 24,000 USABLE PICTURES WERE OBTAINED. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR A COMPLETE INDEX OF THESE DATA, SEE "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 3, TELEVISION CLOUD PHOTOGRAPHY," FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 61-017A-04A.

DATA SET NAME- INDEX OF METEOROLOGICAL SATELLITE DATA - TIROS 3 TELEVISION CLOUD PHOTOGRAPHY NSSDC ID 61-017A-04A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 07/12/61 TO 01/23/62 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS GEOGRAPHICAL AREAS (CODED BY LATITUDE/ LONGITUDE RECTANGLES), START TIME OF PHOTOGRAPHY, AND AN INDICATION OF METEOROLOGICAL FEATURES WHICH WERE IDENTIFIED IN THE PICTURES. A MAP INDEX IS INCLUDED (ONE MAP PER DAY IN MOST CASES) WHICH GRAPHICALLY SHOWS AREAS COVERED BY PICTURES. ALL AREAS ARE KEYED TO ORBIT NUMBER IN THE DIGITAL INDEX. NO DATA OCCUR POLEWARD OF 55 DEG LAT. THESE INDEXES AND THE PHOTOGRAPHY INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED OR LARGER LIBRARIES, LISTED AS U.S. DEPT OF COMMERCE, WEATHER BUREAU "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 3 TV CLOUD

PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.33).*

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY NSSDC ID 61-017A-04B

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 07/12/61 TO 01/23/62 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 70 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF WIDE-ANGLE CLOUD PHOTOGRAPHY ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY THE UNITED STATES WEATHER BUREAU (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER AT ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 61-017A-04A. OVERLAY GRIDS FOR THESE DATA ARE AVAILABLE SEPARATELY ON 35-MM MICROFILM.

**********TIROS 4 **********

SPACECRAFT COMMON NAME- TIROS 4 NSSDC ID 62-002A
ALTERNATE NAMES- 1962 BETA 1, A 9, 00226

LAUNCH DATE- 02/08/62 SPACECRAFT WEIGHT IN ORBIT- 285. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 06/30/62

EPOCH DATE- 02/08/62 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 100.4 MIN
APOAPSIS- 724.000 KM ALT PERIAPSIS- 609.000 KM ALT INCLINATION- 48.297 DEG

SPACECRAFT BRIEF DESCRIPTION

TIROS 4 (TELEVISION AND INFRARED OBSERVATION SATELLITE) WAS A SPIN-STABILIZED METEOROLOGICAL SPACECRAFT DESIGNED TO TEST EXPERIMENTAL TELEVISION TECHNIQUES AND INFRARED EQUIPMENT. THE SATELLITE WAS IN THE FORM OF AN 19-SIDED RIGHT PRISM, 107 CM IN DIAMETER AND 56 CM HIGH. THE TOP AND SIDES OF THE SPACECRAFT WERE COVERED WITH APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS. IT WAS EQUIPPED WITH TWO INDEPENDENT TELEVISION CAMERA SUBSYSTEMS FOR TAKING CLOUDCOVER PICTURES AND THREE RADIOMETERS (TWO-CHANNEL LOW-RESOLUTION, OMNIDIRECTIONAL, AND FIVE-CHANNEL SCANNING) FOR MEASURING RADIATION FROM THE EARTH AND ITS ATMOSPHERE. THE SATELLITE SPIN RATE WAS MAINTAINED BETWEEN 8 AND 12 RPM BY THE USE OF FIVE DIAMETRICALLY OPPOSED PAIRS OF SMALL SOLID-FUEL THRUSTERS. THE SATELLITE SPIN AXIS COULD BE ORIENTED TO WITHIN 1- TO 2-DEG ACCURACY BY USE OF A MAGNETIC CONTROL DEVICE CONSISTING OF 250 CORES OF WIRE WOUND AROUND THE OUTER SURFACE OF THE SPACECRAFT. THE INTERACTION BETWEEN THE INDUCED MAGNETIC FIELD IN THE SPACECRAFT AND THE EARTH'S MAGNETIC FIELD PROVIDED THE NECESSARY TORQUE FOR ATTITUDE CONTROL. THE FLIGHT CONTROL SYSTEM ALSO OPTIMIZED THE PERFORMANCE OF THE SOLAR CELLS AND TV CAMERAS AND PROTECTED THE FIVE-CHANNEL INFRARED RADIOMETER FROM PROLONGED EXPOSURE TO DIRECT SUNLIGHT. THE SPACECRAFT PERFORMED NORMALLY UNTIL MAY 3, 1962, WHEN ONE CAMERA FAILED. ON JUNE 10, 1962, THE OTHER CAMERA'S TAPE RECORDER FAILED. THE SCANNING RADIOMETER PROVIDED USABLE DATA UNTIL JUNE 30, 1962. A COMPLETE DESCRIPTION AND PERFORMANCE SUMMARY FOR TIROS 4 IS PRESENTED IN THE JOURNAL OF THE BRITISH INTERPLANETARY SOCIETY, VOL. 19, 386-409, 1963-64.

**********TIROS 4, NESS STAFF

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 62-002A-04

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 06/18/62

EXPERIMENT BRIEF DESCRIPTION
THE TIROS 4 TV SYSTEM WAS DESIGNED TO OBTAIN DATA FOR OPERATIONAL METEOROLOGICAL USE AND TO FURTHER RESEARCH IN OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE EXPERIMENT CONSISTED OF TWO INDEPENDENT PAIRS OF TV CAMERAS, MAGNETIC TAPE RECORDERS, AND TV TRANSMITTERS. THE TWO SENSOR UNITS WERE CAPABLE OF CONCURRENT OR INDEPENDENT OPERATION. THE CAMERAS, ONE WIDE ANGLE (104 DEG) AND ONE MEDIUM ANGLE (80 DEG), WERE MOUNTED ON THE BASEPLATE OF THE SPACECRAFT WITH THEIR OPTICAL AXES PARALLEL TO THE SPACECRAFT SPIN AXIS, WHICH WAS IN THE ORBITAL PLANE. THE CAMERAS WERE AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN THEY CAME IN VIEW OF THE EARTH. THE PICTURES WERE TRANSMITTED DIRECTLY TO EITHER OF TWO GROUND RECEIVING STATIONS OR STORED ON MAGNETIC TAPE FOR LATER PLAYBACK, DEPENDING ON WHETHER THE SATELLITE WAS WITHIN OR BEYOND THE COMMUNICATION RANGE OF THE STATION. THE TV CAMERAS USED 500-SCAN-LINE, 1.27-CM VIDICONS. THE RECORDERS COULD STORE UP TO 32 FRAMES OF PICTURES. TRANSMISSION OF THE 32-FRAME SEQUENCE WAS ACCOMPLISHED IN 100 SEC BY A 3-W FM TRANSMITTER OPERATING AT A NOMINAL FREQUENCY OF 237 MHZ. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 700 KM), A PICTURE TAKEN BY THE WIDE-ANGLE CAMERA COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. THE MEDIUM-ANGLE CAMERA COVERED A 725- BY 725-KM SQUARE AND HAD A RESOLUTION OF 2 KM. THE EXPERIMENT WAS CAPABLE OF PRODUCING DAYTIME CLOUDCOVER PICTURES FOR THE REGION BETWEEN 55 DEG S TO 55 DEG N LAT. THE EXPERIMENT PERFORMED NORMALLY UNTIL MAY 3, 1962, WHEN THE WIDE-ANGLE CAMERA FAILED. THE TAPE RECORDER ON THE REMAINING CAMERA FAILED ON JUNE 10, 1962. HOWEVER, LIMITED REAL-TIME TV PICTURES WERE AVAILABLE UP TO JUNE 18, 1962, AT WHICH TIME THE SYSTEM WAS DEACTIVATED. THE EXPERIMENT WAS HIGHLY SUCCESSFUL, WITH OVER 23,000 USABLE TV PICTURES TRANSMITTED. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR A COMPLETE INDEX OF THESE DATA, SEE "CATALOG OF METEOROLOGICAL DATA - TIROS 4 TELEVISION CLOUD PHOTOGRAPHY," FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 62-002A-04A.

DATA SET NAME- GLOBAL DAILY NEPHANALYSIS OF SATELLITE CLOUD OBSERVATIONS NSSDC ID 62-002A-04A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 02/08/62 TO 06/18/62 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS GEOGRAPHIC AREAS (CODED BY LATITUDE/LONGITUDE RECTANGLES), DATA PASS MIDPOINT TIME, AND AN

INDICATION OF SOME METEOROLOGICAL FEATURES WHICH WERE IDENTIFIED IN THE PICTURES. A MAP INDEX IS INCLUDED (USUALLY ONE MAP PER DAY) WHICH GRAPHICALLY OUTLINES AREAS PHOTOGRAPHED. CONTAINED WITHIN EACH OUTLINE IS A STANDARD NEPHANALYSIS PREPARED FROM THE PHOTOGRAPHY. WHICH MAY HAVE LIMITED USEFULNESS FOR RESEARCH. ALL AREAS ARE KEYED TO ORBIT NUMBER IN THE DIGITAL INDEX. NO DATA OCCUR POLEWARD OF 55 DEG LAT. POLAR AND MERCATOR PROJECTIONS ARE USED, WHERE APPROPRIATE. THESE INDEXES AND THE PHOTOGRAPHY INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED OR LARGER LIBRARIES, LISTED AS U.S. DEPT OF COMMERCE, WEATHER BUREAU, 'CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 4 TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.34).'

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY NSSDC ID 62-002A-04B

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 02/08/62 TO 06/18/62 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 72 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF WIDE-ANGLE AND MEDIUM-ANGLE CLOUD PHOTOGRAPHY ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY THE UNITED STATES WEATHER BUREAU (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER IN ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 62-002A-04A. OVERLAY GRIDS FOR THESE DATA ARE AVAILABLE SEPARATELY ON 35-MM MICROFILM.

**********TIROS 5 **********

SPACECRAFT COMMON NAME- TIROS 5 NSSDC ID 62-025A
ALTERNATE NAMES- 1962 ALPHA ALPHA 1, A 50, 00309

LAUNCH DATE- 06/19/62 SPACECRAFT WEIGHT IN ORBIT- 286. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 05/14/63

EPOCH DATE- 07/13/62 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 100.4 MIN
APOAPSIS- 974.000 KM ALT PERIAPSIS- 588.000 KM ALT INCLINATION- 58. DEG

SPACECRAFT BRIEF DESCRIPTION

TIROS 5 (TELEVISION AND INFRARED OBSERVATION SATELLITE) WAS DESIGNED TO FURTHER DEMONSTRATE THE CAPABILITY OF A SPACECRAFT TO OBSERVE, RECORD, AND TRANSMIT TV CLOUDCOVER PICTURES FOR USE IN OPERATIONAL WEATHER ANALYSIS AND FORECASTING. THE SPIN-STABILIZED SATELLITE WAS IN THE FORM OF AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARRYING MOST OF THE SUBSYSTEMS AND A COVER ASSEMBLY (HAT). ELECTRICAL POWER WAS SUPPLIED TO THE SPACECRAFT BY APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. A SINGLE MONOPOLE ANTENNA FOR RECEPTION OF GROUND COMMANDS EXTENDED FROM THE TOP OF THE COVER ASSEMBLY. A PAIR OF CROSSED-DIPOLE TELEMETRY ANTENNAS (235 MHZ) PROJECTED DOWN AND DIAGONALLY OUT FROM THE BASEPLATE. THE SATELLITE SPIN RATE WAS MAINTAINED BETWEEN 8 AND 12 RPM BY THE USE OF FIVE DIAMETRICALLY OPPOSED PAIRS OF SMALL SOLID-FUEL THRUSTERS MOUNTED AROUND THE EDGE OF THE BASEPLATE. PROPER ATTITUDE WAS

MAINTAINED TO WITHIN A 1- TO 2-DEG ACCURACY BY USE OF A MAGNETIC CONTROL DEVICE CONSISTING OF 250 CORES OF WIRE WOUND AROUND THE OUTER SURFACE OF THE SPACECRAFT. THE INTERACTION BETWEEN THE INDUCED MAGNETIC FIELD IN THE SPACECRAFT AND THE EARTH'S MAGNETIC FIELD PROVIDED THE NECESSARY TORQUE FOR ATTITUDE CONTROL. THE SATELLITE WAS EQUIPPED WITH TWO 1.27-CM VIDICON TV CAMERAS, ONE MEDIUM ANGLE AND ONE WIDE ANGLE, FOR TAKING EARTH CLOUDCOVER PICTURES. THE PICTURES WERE TRANSMITTED DIRECTLY TO EITHER OF TWO GROUND RECEIVING STATIONS OR WERE STORED IN A TAPE RECORDER ON BOARD FOR SUBSEQUENT PLAYBACK DEPENDING ON WHETHER THE SATELLITE WAS WITHIN OR BEYOND THE COMMUNICATION RANGE OF THE STATION. THE GREATER ORBITAL INCLINATION OF TIROS 5 (58 DEG VS 48 DEG FOR PREVIOUS TIROS SPACECRAFT) EXTENDED THE EFFECTIVE TV COVERAGE FROM 65 DEG N TO 65 DEG S LAT. WITH THE EXCEPTION OF THE FAILURE OF THE MEDIUM-ANGLE CAMERA 17 DAYS AFTER LAUNCH, THE SATELLITE PERFORMED NORMALLY UNTIL MAY 14, 1963, WHEN IT WAS DEACTIVATED AFTER THE SHUTTER ELECTRONICS FAILED ON THE WIDE-ANGLE CAMERA.

**********TIROS 5, NESS STAFF

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 62-025A-01

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 05/14/63

EXPERIMENT BRIEF DESCRIPTION

THE TIROS 5 TV SYSTEM WAS DESIGNED TO PROVIDE DATA FOR OPERATIONAL METEOROLOGICAL USE AND TO FURTHER RESEARCH IN OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE EXPERIMENT CONSISTED OF TWO INDEPENDENT PAIRS OF TV CAMERAS, MAGNETIC TAPE RECORDERS, AND TV TRANSMITTERS. THE TWO SENSOR UNITS WERE CAPABLE OF CONCURRENT OR INDEPENDENT OPERATION. THE CAMERAS, ONE WIDE ANGLE (104 DEG) AND ONE MEDIUM ANGLE (80 DEG), WERE MOUNTED ON THE BASEPLATE OF THE SPACECRAFT WITH THEIR OPTICAL AXES PARALLEL TO THE SPACECRAFT SPIN AXIS, WHICH WAS IN THE ORBITAL PLANE. THE CAMERAS WERE AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN THEY CAME IN VIEW OF THE EARTH. THE TV CAMERA SYSTEM COULD OPERATE IN EITHER REAL-TIME OR TAPE RECORDER MODE, DEPENDING ON WHETHER THE SPACECRAFT WAS WITHIN OR BEYOND COMMUNICATION RANGE OF EITHER OF TWO GROUND RECEIVING STATIONS. THE TV CAMERAS USED 500-SCAN-LINE, 1.27-CM VIDICONS. THE RECORDERS COULD STORE UP TO 32 FRAMES OF PICTURES. TRANSMISSION OF THE 32-FRAME SEQUENCE WAS ACCOMPLISHED IN 100 SEC BY A 2-W FM TRANSMITTER OPERATING AT A NOMINAL FREQUENCY OF 235 MHZ. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 700 KM), A PICTURE TAKEN BY THE WIDE-ANGLE CAMERA COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. A PICTURE FROM THE MEDIUM-ANGLE CAMERA COVERED A 725- BY 725-KM SQUARE AND HAD A RESOLUTION OF 2 KM. THE TV COVERAGE ON TIROS 5 WAS INCREASED TO COVER THE REGION BETWEEN 65 DEG S TO 65 N, THE RESULT OF A 10-DEG INCREASE IN THE SPACECRAFT'S ORBITAL INCLINATION OVER PREVIOUS TIROS SATELLITES. THE MEDIUM-ANGLE CAMERA FAILED SOON AFTER LAUNCH. THE REMAINING WIDE-ANGLE CAMERA PERFORMED NORMALLY UNTIL MAY 14, 1963, WHEN THE SHUTTER ELECTRONICS FAILED. THE TV EXPERIMENT PRODUCED OVER 48,000 METEOROLOGICALLY USEFUL PICTURES. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR A COMPLETE INDEX OF THESE DATA, SEE "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 5 TELEVISION CLOUD PHOTOGRAPHY," FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 62-025A-01A.

DATA SET NAME- GLOBAL DAILY NEPHANALYSIS OF SATELLITE CLOUD OBSERVATIONS — NSSDC ID 62-025A-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 06/19/62 TO 05/14/63 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS GEOGRAPHIC AREAS CODED BY OCEAN OR CONTINENT AREAS. DATA PASS MID-POINT TIME. AND AN INDICATION OF SOME METEOROLOGICAL FEATURES WHICH WERE IDENTIFIED IN THE PICTURES. A MAP INDEX IS INCLUDED (USUALLY ONE MAP PER DAY) WHICH GRAPHICALLY OUTLINES AREAS PHOTOGRAPHED. CONTAINED WITHIN EACH OUTLINE IS A STANDARD NEPHANALYSIS PREPARED FROM THE PHOTOGRAPHY, WHICH MAY HAVE LIMITED USEFULNESS FOR RESEARCH. ALL AREAS ARE KEYED TO ORBIT NUMBER IN THE DIGITAL INDEX. NO DATA OCCUR POLEWARD OF 65 DEG LATITUDE. POLAR AND MERCATOR PROJECTIONS ARE USED, WHERE APPROPRIATE. THESE INDEXES AND THE PHOTOGRAPHY INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED OR LARGER LIBRARIES, LISTED AS U.S. DEPT OF COMMERCE, WEATHER BUREAU "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 5 TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.35)."

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY — NSSDC ID 62-025A-01B

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 06/19/62 TO 05/14/63 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 113 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF WIDE-ANGLE AND MEDIUM-ANGLE CLOUD PHOTOGRAPHY ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY THE UNITED STATES WEATHER BUREAU (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER IN ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 62-025A-01A. OVERLAY GRIDS FOR THESE DATA ARE AVAILABLE SEPARATELY ON 35-MM MICROFILM.

**********TIROS 6 **********

SPACECRAFT COMMON NAME- TIROS 6 — NSSDC ID 62-047A
ALTERNATE NAMES- 1962 ALPHA PSI 1, A 51, 00397

LAUNCH DATE- 09/18/62 SPACECRAFT WEIGHT IN ORBIT- 280. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 10/21/63

EPOCH DATE- 09/19/62 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 98.73 MIN

APOAPSIS- 713.000 KM ALT PERIAPSIS- 686.000 KM ALT INCLINATION- 58.32 DEG

SPACECRAFT BRIEF DESCRIPTION
TIROS 6 (TELEVISION AND INFRARED OBSERVATION SATELLITE) WAS DESIGNED TO FURTHER DEMONSTRATE THE CAPABILITY OF A SATELLITE TO OBSERVE, RECORD, AND TRANSMIT TV CLOUDCOVER PICTURES FOR USE IN OPERATIONAL WEATHER ANALYSIS AND FORECASTING. THE SPIN-STABILIZED SATELLITE WAS IN THE FORM OF AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARRYING MOST OF THE SUBSYSTEMS AND A COVER ASSEMBLY (HAT). ELECTRICAL POWER WAS PROVIDED BY APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. A SINGLE MONOPOLE ANTENNA FOR RECEPTION OF GROUND COMMANDS EXTENDED FROM THE TOP OF THE COVER ASSEMBLY. A PAIR OF CROSSED-DIPOLE TELEMETRY ANTENNAS (235 MHZ) PROJECTED DOWN AND DIAGONALLY OUT FROM THE BASEPLATE. THE SATELLITE SPIN RATE WAS MAINTAINED BETWEEN 8 AND 12 RPM BY THE USE OF FIVE DIAMETRICALLY OPPOSED PAIRS OF SMALL SOLID-FUEL THRUSTERS MOUNTED AROUND THE EDGE OF THE BASEPLATE. PROPER ATTITUDE WAS MAINTAINED TO WITHIN A 1- TO 2-DEG ACCURACY BY USE OF A MAGNETIC CONTROL DEVICE CONSISTING OF 250 COILS OF WIRE WOUND AROUND THE OUTER SURFACE OF THE SPACECRAFT. THE INTERACTION BETWEEN THE INDUCED MAGNETIC FIELD IN THE SPACECRAFT AND THE EARTH'S MAGNETIC FIELD PROVIDED THE TORQUE NECESSARY FOR ATTITUDE CONTROL. THE SATELLITE WAS EQUIPPED WITH TWO 1.27-CM VIDICON TV CAMERAS, ONE MEDIUM ANGLE AND ONE WIDE ANGLE, FOR TAKING EARTH CLOUDCOVER PICTURES. THE PICTURES WERE TRANSMITTED DIRECTLY TO EITHER OF TWO GROUND RECEIVING STATIONS OR WERE STORED IN A TAPE RECORDER ON BOARD FOR SUBSEQUENT PLAYBACK, DEPENDING ON WHETHER THE SATELLITE WAS WITHIN OR BEYOND THE COMMUNICATION RANGE OF THE STATION. THE SATELLITE PERFORMED NORMALLY FROM LAUNCH UNTIL NOVEMBER 29, 1962, WHEN THE MEDIUM-ANGLE CAMERA VIDICON FAILED. THE WIDE-ANGLE CAMERA VIDICON SYSTEM FAILED ON OCTOBER 21, 1963, AND THE SPACECRAFT WAS DEACTIVATED SHORTLY THEREAFTER.

**********TIROS 6, NESS STAFF

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 62-047A-01

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 10/21/63

EXPERIMENT BRIEF DESCRIPTION
THE TIROS 6 TV SYSTEM WAS DESIGNED TO OBTAIN DATA FOR OPERATIONAL METEOROLOGICAL USE AND TO FURTHER RESEARCH IN OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE EXPERIMENT CONSISTED OF TWO INDEPENDENT PAIRS OF TV CAMERAS, MAGNETIC TAPE RECORDERS, AND TV TRANSMITTERS. THE TWO SENSOR UNITS WERE CAPABLE OF CONCURRENT OR INDEPENDENT OPERATION. THE CAMERAS, ONE WIDE ANGLE (104 DEG) AND ONE MEDIUM ANGLE (80 DEG), WERE MOUNTED ON THE BASEPLATE OF THE SPACECRAFT WITH THEIR OPTICAL AXES PARALLEL TO THE SPACECRAFT SPIN AXIS, WHICH WAS IN THE ORBITAL PLANE. THE CAMERAS WERE AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN THEY CAME IN VIEW OF THE EARTH. THE TV CAMERA SYSTEM COULD OPERATE IN EITHER REAL-TIME OR TAPE RECORDER MODE, DEPENDING ON WHETHER THE SPACECRAFT WAS WITHIN OR BEYOND COMMUNICATION RANGE OF EITHER OF TWO GROUND RECEIVING STATIONS. THE TV CAMERAS USED 500-SCAN-LINE, 1.27-CM VIDICONS. THE RECORDERS COULD STORE UP TO 32 FRAMES OF PICTURES. TRANSMISSION OF THE 32-FRAME SEQUENCE WAS ACCOMPLISHED IN 100 SEC BY A 2-W FM TRANSMITTER OPERATING AT A NOMINAL

FREQUENCY OF 235 MHZ. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 700 KM). A PICTURE TAKEN BY THE WIDE-ANGLE CAMERA COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. THE MEDIUM-ANGLE CAMERA COVERED A 725- BY 725-KM SQUARE AND HAD A RESOLUTION OF 2 KM. THE EXPERIMENT WAS CAPABLE OF PRODUCING DAYTIME CLOUDCOVER PICTURES FOR THE REGION 65 DEG S TO 65 DEG N LAT. THE CAMERA SYSTEMS PERFORMED NORMALLY AFTER LAUNCH UNTIL NOVEMBER 29, 1962, WHEN THE MEDIUM-ANGLE CAMERA VIDICON FAILED. THE REMAINING CAMERA SYSTEM FAILED ON OCTOBER 21, 1963. THE EXPERIMENT TRANSMITTED APPROXIMATELY 60,000 METEOROLOGICALLY USEFUL PICTURES AND FURNISHED INFORMATION LEADING TO MANY STORM ADVISORIES IN BOTH THE U.S. AND ABROAD. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR A COMPLETE INDEX OF THESE DATA, SEE "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 6 TELEVISION CLOUD PHOTOGRAPHY," FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 62-047A-01A.

DATA SET NAME- GLOBAL DAILY NEPHANALYSIS OF SATELLITE CLOUD OBSERVATIONS — NSSDC ID 62-047A-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 09/18/62 TO 10/21/63 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS GEOGRAPHIC AREAS CODED BY OCEAN OR CONTINENT AREAS, DATA PASS MID-POINT TIME, AND AN INDICATION OF SOME METEOROLOGICAL FEATURES WHICH WERE IDENTIFIED IN THE PICTURES. A MAP INDEX IS INCLUDED (USUALLY ONE MAP PER DAY) WHICH GRAPHICALLY OUTLINES AREAS PHOTOGRAPHED. CONTAINED WITHIN EACH OUTLINE IS A STANDARD NEPHANALYSIS PREPARED FROM THE PHOTOGRAPHY, WHICH MAY HAVE LIMITED USEFULNESS FOR RESEARCH. ALL AREAS ARE KEYED TO ORBIT NUMBER IN THE DIGITAL INDEX. NO DATA OCCUR POLEWARD OF 65 DEG LAT. POLAR AND MERCATOR PROJECTIONS ARE USED, WHERE APPROPRIATE. THIS INDEX AND THE PHOTOGRAPHY INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED OR LARGER LIBRARIES, LISTED AS U.S. DEPT OF COMMERCE, WEATHER BUREAU "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 6 TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.36)."

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY — NSSDC ID 62-047A-01B

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 09/18/62 TO 05/14/63 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 125 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF WIDE-ANGLE AND MEDIUM-ANGLE CLOUD PHOTOGRAPHY ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY THE UNITED STATES WEATHER BUREAU (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER IN ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 62-047A-01A. OVERLAY GRIDS FOR THESE DATA ARE AVAILABLE SEPARATELY ON 35-MM MICROFILM.

**********TIROS 7 **********

SPACECRAFT COMMON NAME- TIROS 7 NSSDC ID 63-024A
ALTERNATE NAMES- A 52. 00604

LAUNCH DATE- 06/19/63 SPACECRAFT WEIGHT IN ORBIT- 296. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 12/31/65

EPOCH DATE- 08/19/63 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 97.42 MIN
APOAPSIS- 649.000 KM ALT PERIAPSIS- 621.000 KM ALT INCLINATION- 58.236 DEG

SPACECRAFT BRIEF DESCRIPTION
TIROS 7 (TELEVISION AND INFRARED OBSERVATION SATELLITE) WAS A SPIN-STABILIZED METEOROLOGICAL SPACECRAFT DESIGNED TO TEST EXPERIMENTAL TELEVISION TECHNIQUES AND INFRARED EQUIPMENT. THE SATELLITE WAS IN THE FORM OF AN 18-SIDED RIGHT PRISM, 107 CM IN DIAMETER AND 56 CM HIGH. THE TOP AND SIDES OF THE SPACECRAFT WERE COVERED WITH APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS. IT WAS EQUIPPED WITH TWO INDEPENDENT TELEVISION CAMERA SUBSYSTEMS FOR TAKING CLOUDCOVER PICTURES, PLUS AN OMNIDIRECTIONAL RADIOMETER AND A FIVE-CHANNEL SCANNING RADIOMETER FOR MEASURING RADIATION FROM THE EARTH AND ITS ATMOSPHERE. THE SATELLITE SPIN RATE WAS MAINTAINED BETWEEN 8 AND 12 RPM BY THE USE OF FIVE DIAMETRICALLY OPPOSED PAIRS OF SMALL, SOLID-FUEL THRUSTERS. A MAGNETIC ATTITUDE CONTROL DEVICE PERMITTED THE SATELLITE SPIN AXIS TO BE ORIENTED TO WITHIN 1 TO 2 DEG OF A PREDETERMINED ATTITUDE. THE FLIGHT CONTROL SYSTEM ALSO OPTIMIZED THE PERFORMANCE OF THE SOLAR CELLS AND TV CAMERAS AND PROTECTED THE FIVE-CHANNEL INFRARED RADIOMETER FROM PROLONGED EXPOSURE TO DIRECT SUNLIGHT. THE SPACECRAFT PERFORMED NORMALLY UNTIL DECEMBER 31, 1965, AND SPORADICALLY UNTIL FEBRUARY 3, 1967. THE SPACECRAFT WAS OPERATED FOR AN ADDITIONAL 1.5 YEARS TO COLLECT ENGINEERING DATA. IT WAS DEACTIVATED ON JUNE 3, 1968. A MORE COMPLETE DESCRIPTION OF THE SPACECRAFT AND EXPERIMENT CONFIGURATIONS ARE PRESENTED IN THE JOURNAL OF THE BRITISH INTERPLANETARY SOCIETY, VOL. 19, 386-409, 1963-64.

**********TIROS 7, NESS STAFF

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 63-024A-04

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 12/31/65

EXPERIMENT BRIEF DESCRIPTION
THE TIROS 7 TV SYSTEM WAS DESIGNED TO OBTAIN DATA FOR OPERATIONAL METEOROLOGICAL USE AND TO FURTHER RESEARCH IN OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE EXPERIMENT CONSISTED OF TWO REDUNDANT PAIRS OF TV CAMERAS, MAGNETIC TAPE RECORDERS, AND TV TRANSMITTERS. THE TWO SENSOR UNITS WERE CAPABLE OF CONCURRENT OR INDEPENDENT OPERATION. THE TWO WIDE-ANGLE (104 DEG) VIDICON CAMERAS WERE MOUNTED ON THE BASEPLATE OF THE SPACECRAFT WITH THEIR OPTICAL AXES PARALLEL TO THE SPACECRAFT SPIN

AXIS. WHICH WAS IN THE ORBITAL PLANE. THE CAMERAS WERE AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN THEY CAME IN VIEW OF THE EARTH. THE TV CAMERA SYSTEM COULD OPERATE IN EITHER REAL-TIME OR TAPE RECORDER MODE, DEPENDING ON WHETHER THE SPACECRAFT WAS WITHIN OR BEYOND COMMUNICATION RANGE OF EITHER OF TWO GROUND RECEIVING STATIONS. THE TV CAMERA USED 500-SCAN-LINE, 1.27-CM VIDICONS. THE RECORDERS COULD STORE UP TO 32 FRAMES OF PICTURES. TRANSMISSION OF THE 32-FRAME SEQUENCE WAS ACCOMPLISHED IN 100 SEC BY A 2-W FM TRANSMITTER OPERATING AT A NOMINAL FREQUENCY OF 235 MHZ. AT NOMINAL ATTIUDE AND ALTITUDE (APPROXIMATELY 700 KM), A PICTURE COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. THE EXPERIMENT WAS CAPABLE OF PRODUCING DAYTIME CLOUDCOVER PICTURES FOR THE REGION BETWEEN 65 DEG S TO 65 DEG N LAT. THE EXPERIMENT YIELDED NUMEROUS METEOROLOGICALLY USEFUL PICTURES AND PROVIDED ALMOST CONTINUOUS HURRICANE COVERAGE DURING ITS APPROXIMATELY 2.5-YR OPERATIONAL LIFETIME. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR A COMPLETE INDEX OF THESE DATA, SEE "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 7 TELEVISION CLOUD PHOTOGRAPHY," PARTS 1 THROUGH 4, FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 63-024A-04A.

DATA SET NAME- GLOBAL DAILY NEPHANALYSIS OF SATELLITE CLOUD OBSERVATIONS — NSSDC ID 63-024A-04A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 06/19/63 TO 12/31/65 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 4 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS GEOGRAPHIC AREAS CODED BY OCEAN OR CONTINENT AREAS, DATA PASS MID-POINT TIME, AND AN INDICATION OF SOME METEOROLOGICAL FEATURES WHICH WERE IDENTIFIED IN THE PICTURES. A MAP INDEX IS INCLUDED (USUALLY ONE MAP PER DAY) WHICH GRAPHICALLY OUTLINES AREAS PHOTOGRAPHED. CONTAINED WITHIN EACH OUTLINE IS A STANDARD NEPHANALYSIS PREPARED FROM THE PHOTOGRAPHY, WHICH MAY HAVE LIMITED USEFULNESS FOR RESEARCH. ALL AREAS ARE KEYED TO ORBIT NUMBER IN THE DIGITAL INDEX. NO DATA OCCUR POLEWARD OF 65 DEG LAT. POLAR AND MERCATOR PROJECTIONS ARE USED, WHERE APPROPRIATE. THESE INDEXES AND THE PHOTOGRAPHY INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED OR LARGER LIBRARIES, LISTED AS U.S. DEPT OF COMMERCE, WEATHER BUREAU "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 7 TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.37, PARTS 1,2,3 AND 4)."

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY — NSSDC ID 63-024A-04B

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 06/19/63 TO 02/26/66 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 213 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF WIDE-ANGLE CLOUD PHOTOGRAPHY ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY THE UNITED STATES

WEATHER BUREAU AND ESSA (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER IN ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 63-024A-04A. OVERLAY GRIDS FOR THESE DATA ARE AVAILABLE SEPARATELY ON 35-MM MICROFILM.

**********TIROS 8 **********

SPACECRAFT COMMON NAME- TIROS 8 NSSDC ID 63-054A
ALTERNATE NAMES- A 63, 00716

LAUNCH DATE- 12/21/63 SPACECRAFT WEIGHT IN ORBIT- 265. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 08/31/65

EPOCH DATE- 12/21/63 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 99.33 MIN
APOAPSIS- 765.000 KM ALT PERIAPSIS- 691.000 KM ALT INCLINATION- 58.48 DEG

SPACECRAFT BRIEF DESCRIPTION

TIROS 8 (TELEVISION AND INFRARED OBSERVATION SATELLITE) WAS DESIGNED TO DEVELOP IMPROVED CAPABILITIES FOR OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE SPIN-STABILIZED SPACECRAFT WAS IN THE FORM OF AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARRYING MOST OF THE SUBSYSTEMS AND A COVER ASSEMBLY (HAT). ELECTRICAL POWER WAS SUPPLIED TO THE SPACECRAFT BY APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. A SINGLE MONOPOLE ANTENNA FOR RECEPTION OF GROUND COMMANDS EXTENDED FROM THE TOP OF THE COVER ASSEMBLY. A PAIR OF CROSSED-DIPOLE TELEMETRY ANTENNAS (235 MHZ) PROJECTED DOWN AND DIAGONALLY OUT FROM THE BASEPLATE. MOUNTED AROUND THE EDGE OF THE BASEPLATE WERE FIVE DIAMETRICALLY OPPOSED PAIRS OF SMALL SOLID-FUEL THRUSTERS THAT MAINTAINED THE SATELLITE SPIN RATE BETWEEN 8 AND 12 RPM. PROPER ATTITUDE WAS MAINTAINED TO WITHIN A 1- TO 2-DEG ACCURACY BY USE OF A MAGNETIC CONTROL DEVICE CONSISTING OF 250 COILS OF WIRE WOUND AROUND THE OUTER SURFACE OF THE SPACECRAFT. THE INTERACTION BY THE INDUCED MAGNETIC FIELD IN THE SPACECRAFT AND THE EARTH'S MAGNETIC FIELD PROVIDED THE TORQUE NECESSARY FOR ATTITUDE CONTROL. TIROS 8 WAS THE FIRST SATELLITE TO BE EQUIPPED WITH AUTOMATIC PICTURE TRANSMISSION (APT) CAPABILITIES. THE APT EXPERIMENT PROVIDED REAL-TIME EARTH-CLOUD PICTURES TAKEN BY THE SATELLITE TO ANY PROPERLY EQUIPPED GROUND RECEIVING STATION. IN ADDITION TO AN APT CAMERA SYSTEM, THE SATELLITE CARRIED ONE WIDE-ANGLE (104 DEG) TV CAMERA. PICTURES TAKEN BY THE TV CAMERA WERE TRANSMITTED DIRECTLY OR WERE STORED IN A TAPE RECORDER ON BOARD FOR SUBSEQUENT PLAYBACK, DEPENDING ON WHETHER THE SPACECRAFT WAS WITHIN OR BEYOND COMMUNICATION RANGE OF EITHER OF TWO GROUND RECEIVING STATIONS. THE SPACECRAFT PERFORMED NORMALLY AFTER LAUNCH. OVER 50 GROUND STATIONS PARTICIPATED IN THE APT EXPERIMENT, WHICH WAS TERMINATED APPROXIMATELY FOUR MONTHS AFTER LAUNCH OWING TO DEGRADATION OF THE APT CAMERA. THE WIDE-ANGLE TV CAMERA TRANSMITTED USEFUL DATA UNTIL AUGUST 31, 1965. THE SATELLITE WAS DEACTIVATED ON JULY 1, 1967, AFTER BEING LEFT ON FOR AN ADDITIONAL TIME PERIOD FOR ENGINEERING PURPOSES.

**********TIROS 8, NESS STAFF

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 63-054A-01

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 08/31/65

EXPERIMENT BRIEF DESCRIPTION

THE TIROS 8 TV SYSTEM WAS DESIGNED TO FURTHER RESEARCH IN OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE EXPERIMENT INSTRUMENTATION CONSISTED OF A SINGLE WIDE-ANGLE (104 DEG) LENS TV CAMERA, A TWO-TRACK MAGNETIC TAPE RECORDER, AND A TRANSMITTER. THE CAMERA WAS MOUNTED ON THE BASEPLATE OF THE SPACECRAFT, WITH ITS OPTICAL AXIS PARALLEL TO THE SATELLITE SPIN AXIS. THE CAMERA SYSTEM COULD OPERATE IN EITHER REAL-TIME OR TAPE RECORDER MODE, DEPENDING ON WHETHER THE SPACECRAFT WAS WITHIN OR BEYOND COMMUNICATION RANGE OF EITHER OF TWO GROUND RECEIVING STATIONS. THE CAMERA WAS AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN IT CAME IN VIEW OF THE EARTH. THE TV TUBE WAS A 500-SCAN-LINE, 1.27-CM VIDICON. THE RECORDER COULD STORE UP TO 32 FRAMES OF PICTURES. THE PICTURE FRAMES WERE TRANSMITTED IN 100 SEC BY A 2-W FM TRANSMITTER OPERATING AT A NOMINAL FREQUENCY OF 235 MHZ. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 700 KM), A PICTURE COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. THE EXPERIMENT WAS CAPABLE OF PRODUCING CLOUDCOVER PICTURES FOR THE REGION BETWEEN 65 DEG S AND 65 DEG N. THE EXPERIMENT PERFORMED NORMALLY AFTER LAUNCH, AND GOOD DATA WERE OBTAINED UNTIL AUGUST 31, 1965. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR AN INDEX OF THESE DATA, SEE "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 8 TELEVISION CLOUD PHOTOGRAPHY," PARTS 1 THROUGH 3, SOLD BY THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 63-054A-01A.

DATA SET NAME- GLOBAL DAILY NEPHANALYSIS OF SATELLITE CLOUD OBSERVATIONS NSSDC ID 63-054A-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 12/21/63 TO 08/31/65 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 3 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS GEOGRAPHIC AREAS CODED BY OCEAN OR CONTINENT AREAS, DATA PASS MID-POINT TIME, AND AN INDICATION OF SOME METEOROLOGICAL FEATURES WHICH WERE IDENTIFIED IN THE PICTURES. A MAP INDEX IS INCLUDED (USUALLY ONE MAP PER DAY) WHICH GRAPHICALLY OUTLINES AREAS PHOTOGRAPHED. CONTAINED WITHIN EACH OUTLINE IS A STANDARD NEPHANALYSIS PREPARED FROM THE PHOTOGRAPHY, WHICH MAY HAVE LIMITED USEFULNESS FOR RESEARCH. ALL AREAS ARE KEYED TO ORBIT NUMBER IN THE DIGITAL INDEX. NO DATA OCCUR POLEWARD OF 65 DEG LATITUDE. POLAR AND MERCATOR PROJECTIONS ARE USED, AS APPROPRIATE. THIS INDEX AND THE PHOTOGRAPHY INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NORTH CAROLINA. THE INDEX IS ON FILE AND AVAILABLE FOR USE AT NSSDC. IT MAY BE AVAILABLE AT SOME SPECIALIZED OR LARGER LIBRARIES AS U. S. DEPT. OF COMMERCE, WEATHER BUREAU "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS VIII TV CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.38, PARTS 1,2, AND 3)."

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY NSSDC ID 63-054A-018

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 12/21/63 TO 02/12/66 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 163 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF WIDE-ANGLE CLOUD PHOTOGRAPHY ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY THE UNITED STATES WEATHER BUREAU AND ESSA (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER AT ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 63-054A-01A. OVERLAY GRIDS FOR THESE DATA ARE AVAILABLE SEPARATELY ON 35-MM MICROFILM.

**********TIROS 9 **********

SPACECRAFT COMMON NAME- TIROS 9 NSSDC ID 65-004A
ALTERNATE NAMES- A 54, 00978

LAUNCH DATE- 01/22/65 SPACECRAFT WEIGHT IN ORBIT- 301. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 07/26/65

EPOCH DATE- 01/31/65 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 119.2 MIN
APOAPSIS- 2582.00 KM ALT PERIAPSIS- 705.000 KM ALT INCLINATION- 96.40 DEG

SPACECRAFT BRIEF DESCRIPTION
TIROS 9 (TELEVISION AND INFRARED OBSERVATION SATELLITE) WAS A SUN-SYNCHRONOUS METEOROLOGICAL SPACECRAFT DESIGNED TO DEVELOP IMPROVED CAPABILITIES FOR OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITIES TO TEST THE TOS (TIROS OPERATIONAL SYSTEM) CONCEPT. THE SPIN-STABILIZED SPACECRAFT WAS IN THE FORM OF AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARRYING MOST OF THE SUBSYSTEMS AND A COVER ASSEMBLY (HAT). ELECTRICAL POWER WAS SUPPLIED TO THE SPACECRAFT FROM APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. A SINGLE MONOPOLE ANTENNA FOR RECEPTION OF GROUND COMMANDS EXTENDED FROM THE TOP OF THE COVER ASSEMELY. A PAIR OF CROSSED-DIPOLE TELEMETRY ANTENNAS (235 MHZ) PROJECTED DOWN AND DIAGONALLY OUT FROM THE BASEPLATE. TIROS 9 WAS THE FIRST OF THE SO-CALLED 'CARTWHEEL' METEOROLOGICAL TV SATELLITES. THAT IS, THE SPACECRAFT SPIN AXIS WAS MAINTAINED NORMAL TO THE ORBITAL PLANE. THE SATELLITE WAS STILL EQUIPPED WITH SMALL SOLID-FUEL THRUSTERS AS IN THE CASE OF PREVIOUS TIROS SPACECRAFT. HOWEVER, THE SYSTEM WAS USED ONLY AS A BACKUP. THE SATELLITE SPIN RATE AND ATTITUDE WERE PRIMARILY DETERMINED BY A QUARTER-ORBIT MAGNETIC ATTITUDE CONTROL (QUMAC) SYSTEM. FIRST INSTALLED ON TIROS 9, THE SYSTEM USED THE TORQUE DEVELOPED BY INTERACTION OF THE EARTH'S MAGNETIC FIELD WITH A CURRENT-CARRYING LOOP MOUNTED IN THE SATELLITE. THE SPACECRAFT CARRIED TWO IDENTICAL WIDE-ANGLE TV CAMERAS WITH 1.27-CM VIDICONS FOR TAKING EARTH CLOUDCOVER PICTURES. THE PICTURES WERE TRANSMITTED DIRECTLY TO EITHER OF TWO GROUND RECEIVING STATIONS OR STORED IN A TAPE RECORDER ON BOARD FOR SUBSEQUENT PLAYBACK IF THE SPACECRAFT WAS BEYOND COMMUNICATION RANGE. A FAILURE IN THE SPACECRAFT GUIDANCE SYSTEM PLACED THE SPACECRAFT IN AN UNPLANNED ELLIPTICAL (700 TO 2500 KM) ORBIT. THE TV SYSTEM OPERATED NORMALLY UNTIL JULY 26, 1965, AND SPORADICALLY UNTIL FEBRUARY 15, 1967. TIROS 9 WAS THE FIRST SATELLITE IN THE TIROS SERIES TO BE PLACED IN A NEAR-POLAR ORBIT, THEREBY INCREASING TV COVERAGE TO THE ENTIRE DAYLIGHT

PORTION OF THE GLOBE.

**********TIROS 9, NESS STAFF

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 65-004A-01

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 07/26/65

EXPERIMENT BRIEF DESCRIPTION

THE TIROS 9 TV SYSTEM WAS DESIGNED TO OBTAIN DATA FOR OPERATIONAL METEOROLOGICAL USE AND TO FURTHER RESEARCH IN OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE CAMERA SYSTEM WAS IDENTICAL TO THAT FLOWN ON ALL PREVIOUS TIROS MISSIONS AND ESSA 1, I.E., TWO WIDE-ANGLE 104-DEG TV CAMERAS EQUIPPED WITH 1.27-CM VIDICONS. UNLIKE PREVIOUS TIROS TV CAMERAS, HOWEVER, THE CAMERAS ON TIROS 9 WERE MOUNTED 180 DEG APART ON THE SIDE OF THE SPACECRAFT AND CANTED 64 DEG FROM THE SPACECRAFT SPIN AXIS. THE CAMERAS WERE AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN THEY CAME IN VIEW OF THE EARTH. THE TV SYSTEM COULD OPERATE IN EITHER REAL-TIME OR TAPE RECORDER MODE, DEPENDING ON WHETHER THE SPACECRAFT WAS WITHIN OR BEYOND COMMUNICATION RANGE OF EITHER OF TWO GROUND RECEIVING STATIONS. THE RECORDER COULD STORE UP TO 48 FRAMES OF PICTURES. TRANSMISSION OF THE 48-FRAME SEQUENCE WAS ACCOMPLISHED IN 120 SEC USING A 5-W FM TRANSMITTER OPERATING AT A NOMINAL FREQUENCY OF 235 MHZ. AT A PLANNED ALTITUDE OF 700 KM, A PICTURE COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. FROM A NEAR-POLAR ORBIT, THE CAMERA SYSTEM COULD PROVIDE COMPLETE TV COVERAGE OF THE ENTIRE DAYLIGHT PORTION OF THE GLOBE. IN SPITE OF AN UNPLANNED ELLIPTICAL ORBIT, THE EXPERIMENT PRODUCED OVER 70,000 METEOROLOGICALLY USEFUL PICTURES. THE EXPERIMENT PERFORMED NORMALLY UNTIL JULY 26, 1965, AND OPERATED SPORADICALLY THEREAFTER UNTIL FEBRUARY 15, 1967, WHEN ALL DATA ACQUISITION CEASED. DATA FROM THIS EXPERIMENT CAN BE OBTAINED FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR AN INDEX OF THESE DATA, SEE THE 'CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 9 TELEVISION CLOUD PHOTOGRAPHY,' PARTS 1 AND 2, FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 65-004A-01A.

DATA SET NAME- GLOBAL DAILY NEPHANALYSIS OF SATELLITE CLOUD OBSERVATIONS NSSDC ID 65-004A-01A

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 01/23/65 TO 07/26/65 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 2 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS ORBIT NUMBER AND TRACK OR SWATH NUMBER (A FUNCTION OF EQUATORIAL CROSSING LONGITUDE), TIME OF EQUATOR CROSSING (OR PICTURE SEQUENCE MIDPOINT), AND AN INDICATION OF SOME METEOROLOGICAL FEATURES WHICH WERE IDENTIFIED IN THE PICTURES. A MAP INDEX IS INCLUDED (USUALLY ONE MAP PER DAY) WHICH GRAPHICALLY OUTLINES AREAS

PHOTOGRAPHED. CONTAINED WITHIN EACH OUTLINE IS A STANDARD NEPHANALYSIS PREPARED FROM THE PHOTOGRAPHY, WHICH MAY HAVE LIMITED USEFULNESS FOR RESEARCH. ALL AREAS ARE KEYED TO ORBIT NUMBER IN THE DIGITAL INDEX. DATA OCCUR UP TO 80 DEG LAT. POLAR AND MERCATOR PROJECTIONS ARE USED WHERE APPROPRIATE. THESE INDEXES AND THE PHOTOGRAPHY INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED OR LARGER LIBRARIES, LISTED AS U.S. DEPT OF COMMERCE, WEATHER BUREAU "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 9 TELEVISION CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.39, PARTS 1 AND 2)."

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY NSSDC ID 65-004A-01B

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 01/23/65 TO 09/08/66 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 133 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF WIDE-ANGLE CLOUD PHOTOGRAPHY ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY ESSA (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER AT ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 65-004A-01A. OVERLAY GRIDS FOR THESE DATA ARE AVAILABLE SEPARATELY ON 35-MM MICROFILM.

**********TIROS 10 **********

SPACECRAFT COMMON NAME- TIROS 10 NSSDC ID 65-051A
ALTERNATE NAMES- OT 1, 01430

LAUNCH DATE- 07/02/65 SPACECRAFT WEIGHT IN ORBIT- 280. KG

SPACECRAFT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE SPACECRAFT DATA RECORDED- 07/31/66

EPOCH DATE- 07/02/65 ORBIT TYPE- GEOCENTRIC ORBIT PERIOD- 100.7 MIN
APOAPSIS- 837.000 KM ALT PERIAPSIS- 751.000 KM ALT INCLINATION- 98.65 DEG

SPACECRAFT BRIEF DESCRIPTION
TIROS 10 (TELEVISION AND INFRARED OBSERVATION SATELLITE) WAS A SUN-SYNCHRONOUS METEOROLOGICAL SPACECRAFT DESIGNED TO DEVELOP IMPROVED CAPABILITIES FOR OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES AND OPERATED AS AN INTERIM OPERATIONAL SATELLITE. THE SPIN-STABILIZED SPACECRAFT WAS IN THE FORM OF AN 18-SIDED RIGHT PRISM, 107 CM ACROSS OPPOSITE CORNERS AND 56 CM HIGH, WITH A REINFORCED BASEPLATE CARRYING MOST OF THE SUBSYSTEMS AND A COVER ASSEMBLY (HAT). ELECTRICAL POWER WAS SUPPLIED TO THE SPACECRAFT BY APPROXIMATELY 9000 1- BY 2-CM SILICON SOLAR CELLS THAT WERE MOUNTED ON THE COVER ASSEMBLY AND BY 21 NICKEL-CADMIUM BATTERIES. A SINGLE MONOPOLE ANTENNA FOR RECEPTION OF GROUND COMMANDS EXTENDED FROM THE TOP OF THE COVER ASSEMBLY. A PAIR OF CROSSED-DIPOLE TELEMETRY ANTENNAS (235 MHZ) PROJECTED DOWN AND DIAGONALLY OUT FROM THE BASEPLATE. MOUNTED AROUND THE EDGE OF THE BASEPLATE WERE FIVE DIAMETRICALLY OPPOSED PAIRS OF SMALL SOLID-FUEL THRUSTERS THAT MAINTAINED THE SATELLITE SPIN RATE BETWEEN 8 AND 12 RPM. PROPER ATTITUDE WAS MAINTAINED TO WITHIN A 1- TO 2-DEG ACCURACY BY USE OF A MAGNETIC CONTROL DEVICE CONSISTING OF 250 COILS OF WIRE WOUND

AROUND THE OUTER SURFACE OF THE SPACECRAFT. THE INTERACTION BY THE INDUCED MAGNETIC FIELD IN THE SPACECRAFT AND THE EARTH'S MAGNETIC FIELD PROVIDED THE TORQUE NECESSARY FOR ATTITUDE CONTROL. THE SATELLITE SPIN AXIS COULD THUS BE VARIED WHILE THE SATELLITE REMAINED IN THE CONVENTIONAL TIROS 'AXIAL' MODE. THE SATELLITE WAS EQUIPPED WITH TWO IDENTICAL WIDE-ANGLE TV CAMERAS WITH 1.27-CM VIDICONS FOR TAKING EARTH CLOUDCOVER PICTURES. THE PICTURES COULD BE TRANSMITTED DIRECTLY TO EITHER OF TWO GROUND RECEIVING STATIONS OR STORED IN A TAPE RECORDER ON BOARD FOR SUBSEQUENT PLAYBACK IF THE SPACECRAFT WAS BEYOND THE COMMUNICATION RANGE OF THE STATION. THE SATELLITE WAS LAUNCHED INTO A NEAR-POLAR ORBIT AND SUCCESSFULLY PROVIDED TV COVERAGE OF THE ENTIRE DAYLIGHT PORTION OF THE GLOBE. THE TV SYSTEM OPERATED NORMALLY UNTIL SEPTEMBER 1965 AND SPORADICALLY UNTIL JULY 1966.

**********TIROS 10, NESS STAFF

EXPERIMENT NAME- TELEVISION CAMERA SYSTEM NSSDC ID 65-051A-01

ORIGINAL EXPERIMENT INSTITUTION- ESSA-NESC

EXPERIMENT PERSONNEL (PI=PRINCIPAL INVESTIGATOR, OI=OTHER INVESTIGATOR)
PI - NESS STAFF NOAA-NESS SUITLAND, MD

EXPERIMENT STATUS OF OPERATION- INOPERABLE
DATE LAST USABLE EXPERIMENT DATA RECORDED- 07/31/68

EXPERIMENT BRIEF DESCRIPTION

THE TIROS 10 TV SYSTEM WAS DESIGNED TO OBTAIN DATA FOR OPERATIONAL METEOROLOGICAL USE AND TO FURTHER RESEARCH IN OBTAINING AND USING TV CLOUDCOVER PICTURES FROM SATELLITES. THE EXPERIMENT CONSISTED OF TWO REDUNDANT PAIRS OF TV CAMERAS, MAGNETIC TAPE RECORDERS, AND TV TRANSMITTERS. THE TWO SENSOR UNITS WERE CAPABLE OF CONCURRENT OR INDEPENDENT OPERATION. THE TWO WIDE-ANGLE (104 DEG) VIDICON CAMERAS WERE MOUNTED ON THE BASEPLATE OF THE SPACECRAFT WITH THEIR OPTICAL AXES PARALLEL TO THE SPACECRAFT SPIN AXIS. THE ABILITY OF THE MAGNETIC ATTITUDE CONTROL SYSTEM TO VARY THE SPACECRAFT SPIN AXIS ALLOWED THE CAMERAS TO VIEW THE EARTH AT VARIOUS ANGLES FROM NADIR. IN THIS RESPECT THE CAMERA SYSTEM WAS SIMILAR TO THAT FLOWN ON THE TIROS 9 'CARTWHEEL' SATELLITE. THE CAMERAS WERE AUTOMATICALLY TRIGGERED INTO ACTION ONLY WHEN THEY CAME IN VIEW OF THE EARTH, DEPENDING ON WHETHER OR NOT THE SATELLITE WAS WITHIN COMMUNICATION RANGE OF EITHER OF TWO GROUND RECEIVING STATIONS. THE TV CAMERA SYSTEM COULD OPERATE IN EITHER REAL-TIME OR TAPE RECORDER MODE. THE TV CAMERAS USED 500-SCAN-LINE, 1.27-CM VIDICONS. THE RECORDER COULD STORE UP TO 32 FRAMES OF PICTURES. TRANSMISSION OF THE 32-FRAME SEQUENCE WAS ACCOMPLISHED IN 100 SEC BY A 2-W FM TRANSMITTER OPERATING AT A NOMINAL FREQUENCY OF 235 MHZ. AT NOMINAL ATTITUDE AND ALTITUDE (APPROXIMATELY 700 KM), A PICTURE COVERED A 1200- BY 1200-KM SQUARE WITH A SPATIAL RESOLUTION OF 2.5 TO 3.0 KM AT NADIR. FROM A NEAR POLAR ORBIT, THE CAMERA SYSTEM COULD PROVIDE COMPLETE PICTORIAL COVERAGE OF THE ENTIRE DAYLIGHT PORTION OF THE GLOBE. OVER 50,000 METEOROLOGICALLY USEFUL PICTURES WERE OBTAINED FROM LAUNCH UNTIL THE EXPERIMENT WAS TERMINATED ON JULY 31, 1966. DATA FROM THIS EXPERIMENT ARE AVAILABLE FROM THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NC. FOR AN INDEX OF THESE DATA, SEE 'CATALOG OF METEOROLOGICAL SATELLITE DATA -- TIROS 10, TELEVISION CLOUD PHOTOGRAPHY.' FOR SALE FROM THE U.S. SUPERINTENDENT OF DOCUMENTS -- OR SEE DATA SET 65-051A-01A.

DATA SET NAME- GLOBAL DAILY NEPHANALYSIS OF SATELLITE NSSDC ID 65-051A-01A

CLOUD OBSERVATIONS

AVAILABILITY OF DATA SET- DATA IN PUBLISHED REPORT(S)

TIME PERIOD COVERED- 07/04/65 TO 09/30/65 (AS VERIFIED BY NSSDC)

QUANTITY OF DATA IN THIS DATA SET- 1 BOOK(S) OR BOUND VOLUME(S)

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF PUBLISHED INDEXES TO THE AVAILABLE CLOUD PICTURES. A DIGITAL INDEX ARRANGED CHRONOLOGICALLY LISTS CREIT NUMBER AND TRACK OR SWATH NUMBER (A FUNCTION OF EQUATORIAL CROSSING LONGITUDE), TIME OF EQUATOR CROSSING (OR PICTURE SEQUENCE MIDPOINT), AND AN INDICATION OF SOME METEOROLOGICAL FEATURES WHICH WERE IDENTIFIED IN THE PICTURES. A MAP INDEX IS INCLUDED (USUALLY ONE MAP PER DAY) WHICH GRAPHICALLY OUTLINES AREAS PHOTOGRAPHED. CONTAINED WITHIN EACH OUTLINE IS A STANDARD NEPHANALYSIS PREPARED FROM THE PHOTOGRAPHY, WHICH MAY HAVE LIMITED USEFULNESS FOR RESEARCH. ALL AREAS ARE KEYED TO ORBIT NUMBER IN THE DIGITAL INDEX. DATA OCCUR UP TO 80 DEG LAT. POLAR AND MERCATOR PROJECTIONS ARE USED AS APPROPRIATE. THESE INDEXES AND THE PHOTOGRAPHY INDEXED MAY BE OBTAINED FROM NOAA-NRC, ASHEVILLE, NC. THE INDEXES ARE ON FILE AND AVAILABLE FOR USE AT NSSDC. THEY MAY BE AVAILABLE AT SOME SPECIALIZED OR LARGER LIBRARIES, LISTED AS U.S. DEPT OF COMMERCE, WEATHER BUREAU "CATALOG OF METEOROLOGICAL SATELLITE DATA - TIROS 10 TELEVISION CLOUD PHOTOGRAPHY (KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. S.310, PART 1)."

DATA SET NAME- 35-MM DAYTIME TV CLOUD PHOTOGRAPHY NSSDC ID 65-051A-01B

AVAILABILITY OF DATA SET- DATA AT ANOTHER CENTER

TIME PERIOD COVERED- 07/02/65 TO 04/20/66 (AS REPORTED BY THE EXPERIMENTER)

QUANTITY OF DATA IN THIS DATA SET- 56 REEL(S) OF MICROFILM

DATA SET BRIEF DESCRIPTION

THIS DATA SET CONSISTS OF WIDE-ANGLE CLOUD PHOTOGRAPHY ON REELS OF 35-MM POSITIVE OR NEGATIVE FILM. THEY WERE PREPARED BY ESSA (LATER NOAA) AND ARE AVAILABLE FROM THE METEOROLOGICAL DATA CENTER IN ASHEVILLE, NC. THESE PHOTOGRAPHS ARE CONVENIENTLY INDEXED AND FURTHER DESCRIBED IN DATA SET 65-051A-01A. OVERLAY GRIDS FOR THESE DATA ARE AVAILABLE ON 35-MM MICROFILM.

NSSDC DATA REQUEST FORM*

Scientists OUTSIDE the United States send order to:	Requesters WITHIN the United States send order to:
WORLD DATA CENTER A ROCKETS AND SATELLITES CODE 601 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771, USA	NATIONAL SPACE SCIENCE DATA CENTER CODE 601.4 GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771

REQUESTER INFORMATION (Please print)

NAME	TITLE/POSITION
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)
- ☐ Preparation of Master's thesis
- ☐ Preparation of Doctoral thesis
- ☐ Other:
- ☐ Exhibit or display
- ☐ Reference material
- ☐ Use in publication

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.

*NSSDC has available special forms for ordering photographic data from the Surveyor, Lunar Orbiter, Apollo, and Mariner missions. These forms will be provided on request.

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 (WDC–A) for Rockets and Satellites. (The addresses for both NSSDC and WDC–A 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 and local governments; and (5) non–profit organizations.

DATA REQUESTED

NSSDC DATA SET ID NUMBER	Spacecraft, Experiment, and Data Set Names	Form of Data* (e.g., 16mm microfilm) Refer to data set brief descriptions.	Timespan Needed

Additional Specifications

*If requesting data on magnetic tape, please supply the necessary information below.

Density
- ☐ 556 bpi
- ☐ 800 bpi
- ☐ 1600 bpi

Mode
- ☐ BIN
- ☐ BCD

No. of Tracks
- ☐ 7
- ☐ 9

Computer _____

- ☐ New tapes will be supplied prior to processing.
- ☐ Original NSSDC tapes will be returned.
- ☐ I shall pay for new tapes.