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Orbital Anomalies in Goddard Spacecraft for Calendar Year 1996 & 1997

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Foreword

This is the fourteenth in the series of similar Goddard Space Flight Center (GSFC) Anomaly Reports covering spacecraft operations from 1982 through 1997. This report covers 1996 and 1997 and differs from previous reports by including not only orbital anomalies, but also ground system and communication anomalies (for information purposes only). Since this is the first report to include ground system and communication anomalies, it will not include them in the summary statistics. For future reports, ground system and communication anomalies will be included in the analyses and charts.

Data for this report were collected from two primary sources -- the Spacecraft Orbital Anomaly Reporting System (SOARS) database and various GSFC Project and Operations Center databases and records. The data from the project databases and records varies significantly in the type and detail of anomalies and events reported because of differences in reporting requirements. For this reason the project data were analyzed separately. Statistical results and conclusions are based solely on anomaly data extracted from the SOARS.

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Abstract

During 1996 and 1997, GSFC had 31 and 34 orbiting spacecraft, respectively, including 12 launched for the National Oceanic and Atmospheric Administration (GOES and NOAA spacecraft). Three SPARTAN spacecraft are included in this report. SPARTAN spacecraft are "free flyers," launched and retrieved from the Space Shuttle. There were a combined total of 626 (301 in 1996 and 325 in 1997) reported anomalies in the SOARS database, for 1996 and 1997, distributed among 31 and 34 spacecraft, respectively. Of these 626 anomalies, 305 (180 in 1996 and 125 in 1997) are Orbital anomalies, 279 (113 in 1996 and 166 in 1997) are Ground anomalies and 42 (8 in 1996 and 34 in 1997) are Communication anomalies. Of the 305 Orbital anomalies, SAMPEX accounted for 96 of these anomalies, the GOES series of spacecraft accounted for 66 and XTE accounted for another 47. Additional anomalies/events, not reported in the SOARS database, were identified from the HST, SOHO, and UARS projects. These additional anomalies/events are treated separately in this report since they are recorded and classified differently than those reported in the SOARS database, and will be provided in a revision to this report.

Of the 305 SOARS database Orbital anomalies, only 16 (8 in 1996 and 8 in 1997) affected spacecraft missions “substantially” or greater; that is, caused the loss of 33% or more of the mission objectives. The subsystems suffering the greatest frequency of Orbital anomalies in 1996 (180 total anomalies) were attitude control (35.5%), instrument/payload (21.7%), and TC&C (17.8%); and, in 1997 (125 total anomalies) were instrument/payload (24%), TC&C (21.6%), and telemetry/data handling (20.8%). For the two years combined, the most frequent subsystems anomalies (305 total anomalies) were attitude control (23.3%), instrument/payload (22.6.7%), TC&C (19.3%) and telemetry/data handling (15.7%).

For 1996, 27.8% of the Orbital anomalies (50 out of 180) caused component failures (54% of these were SAMPEX and 14% XTE) while 22.8% (41 out of 180) caused subsystem degradation (58.5% of these were XTE and 14.6% GOES-8). In 1997, 44.0% of the Orbital anomalies (55 out of 125) caused component failures (54% of these were SAMPEX and 14% XTE) and 28.8% (36 out of 125) caused subsystem instrument failures (41.7% of these were ERBS and 22.2% HST). For both years, 34.4% of Orbital (105 out of 305) anomalies caused component failures (46.7% of these were SAMPEX and 16.2% GOES-10), 23.3% (71 out of 305) caused subsystem instrument failures (36.6% of these were ERBS and 14.0% XTE), and 18% (55 out of 305) caused subsystem degradation (43.6% of these were XTE and 27.3% GOES-8).

When classified by anomaly type, 37.2% of the 1996 Orbital anomalies (67 out of 180) were identified as “random” (34.3% of these were SAMPEX and 17.9% ERBS), 24.5% (44 out of 180) were “systematic” (29.6% of these were SAMPEX and 29.6% XTE), and 5% (9 out of 180) were not classified. For 1997, 44.0% of the Orbital anomalies (55 out of 125) were identified as “random” (29.1% of these were ERBS and 18.2% HST), 24% (30 out of 125) were “systematic” (56.7% of these were GOES-10 and 23.3% SAMPEX), and 1.6% (2 out of 125) were not classified. For both years (1996 - 97), 40% (122 out of 305) were “random” (23% of these were ERBS, 23% SAMPEX and 10.7% HST), 24.3% (74 out of 305) were “systematic” (27% of these were SAMPEX, 23% GOES-10, and 17.6% XTE) and 3.6% (11 out of 305) were not classified.

In 1996, part problems was the leading cause of Orbital (35%, 63 out of 180) anomalies (of these, 39.7% were SAMPEX and 19.1% ERBS), design problems was the second most frequent cause (26.7%, 48 out of 180) (of these, 70.8% were SAMPEX and 12.5% XTE), and in 8.3% the cause was not known (undetermined). For 1997, part problems caused 51.2% (64 out of 125) of the Orbital anomalies (26.6% were SAMPEX and 25% ERBS), design problems was the second leading cause (27.2%, 34 out of 125) (44.1% were GOES-10 and 35.3% SAMPEX), and 3.2% were unknown (undetermined). For both years (1996 – 97), part problems was the leading cause of Orbital (41.6%, 127 out 305) anomalies (33.1% were SAMPEX, 22% ERBS, and 11.8% GOES-8), design problems was the second leading cause (26.9%, 82 out of 305) (56.1% were SAMPEX, 18.3% GOES-8, and 7.3% XTE), and 6.2% were unknown (undetermined).

Background

At Goddard Space Flight Center each project’s management has recorded performance data for Goddard-managed spacecraft since the center’s beginning. More detailed data, combining all Goddard's spacecraft, began to be collected and analyzed about twenty-five years ago. In 1983, the first detailed report containing performance data for all spacecraft was issued as a contractor report, *Analysis of Spacecraft On-Orbit Anomalies and Lifetimes*, PRC R-3579, February 10, 1983; this report covered the period from 1978 to mid-1983. It contained data for Jet Propulsion Laboratory (JPL) and Goddard Space Flight Center (GSFC) spacecraft. The next report, *Orbital Anomalies in Goddard Spacecraft 1982-1983*, included only GSFC spacecraft. From 1984 through 1995, the Office of Flight Assurance has issued annual Goddard orbital-anomaly reports. These annual reports collectively document GSFC’s spacecraft performance.

In 1996, efforts were begun to expand the SOARS database to include not only orbital, but also ground system and communication anomalies/events. Thus this *1996 – 1997 Orbital Anomalies in Goddard Spacecraft (OAGS) Report* includes ground system and communication anomalies; however, these anomalies are included for informational purposes – they are not included in the summary statistics.

Introduction

This report addresses the calendar year 1996 and 1997 on-orbit performance of spacecraft built or managed by Goddard Space Flight Center. It summarizes the operations and performance of active GSFC spacecraft and catalogues reported anomalies for each spacecraft. To the extent possible, each anomaly is classified according to the subsystem in which it occurred, the time of its occurrence, its effect on the spacecraft's mission (criticality), and the failure causes and corrective actions.

Beginning with the list of active spacecraft, operations are described briefly for each spacecraft in the "Spacecraft Operation Summaries" section. This section includes a short description of each spacecraft and a brief summary of it's 1996 and 1997 performance. The scheme used to classify anomalies is provided in the "Detailed Anomaly Data" section. Also this section provides an anomaly data summary, followed by data tables and charts that further detail anomaly classifications. Finally, Appendices A, A-1, B and B-1 provide classification data regarding the 1996 and 1997 anomalies. Appendices C, C-1,D and D-1 provide a detailed log of all 1996 and 1997 anomalies. GSFC's "Spacecraft Lifetime Data" table is updated and presented in Appendix E.

Data included in this report were derived from GSFC Projects and Flight Operations Team members, NOAA personnel, NASA Internet resources, the Spacecraft Orbital Anomaly Reporting System (SOARS) database, and various project anomaly reports and project-specific databases (such as, SAMPEX, SOHO, HST, TIROS, GOES, etc.).

Data collected and reported herein are current to the end of 1997. Some data regarding open anomalies may change after anomaly investigations are completed.

Summary of Spacecraft Activity during 1996 - 1997

GSFC had 31 and 34 orbiting spacecraft in 1996 and 1997 respectively, which included 12 launched for the National Oceanic and Atmospheric Administration (GOES and NOAA spacecraft) and three SPARTAN spacecraft. SPARTAN spacecraft are "free flyers," launched and retrieved from the Space Shuttle. Goddard spacecraft active in 1996 and 1997 are shown in Table 1.

Three new spacecraft were launched in 1996: FAST, POLAR, and TOMS-EP; and four new spacecraft were launched in 1997: ACE, GOES-10, LEWIS, and TRMM. The SPARTAN 206 was the seventh Shuttle launch of this free flyer and flew on STS-72 in January 1996. It was carried in the Space Shuttle's cargo bay and launched for orbits lasting approximately 50 hours. Then it was retrieved by the Space Shuttle and returned to Earth. SPARTAN 207 was the eighth flight of the SPARTAN project and flew on STS-77 in May of 1996. SPARTAN 201-4 was the ninth flight of the SPARTAN project and flew on STS-87 in November of 1997.

Although the Hubble Space Telescope (HST) was built under contract to Marshall Space Flight Center (MSFC), it is included in this report because management of its flight operations and servicing missions has been assigned to GSFC.

Of the GOES spacecraft still in orbit, GOES-2, GOES-3, and GOES-5 have been deactivated and are serving as transponders. GOES-7, GOES-8, GOES-9 and GOES-10 were operational satellites in 1996 and 1997.

Although LANDSAT was constructed under GSFC management, it is no longer included in this report because anomalies are not reported to GSFC.

Table 1. List of Operational Spacecraft (1996 and 1997)[1]

Spacecraft	Launch Date (MM/DD/YY)	Operating Agency	Notes:
ACE	08/25/97	NASA	NEW
CGRO	04/05/91	NASA	Some references reflect launch as 04/07/91.
ERBS	10/05/84	NASA	
EUVE	06/07/92	NASA	
FAST	08/21/96	NASA	NEW
HST	04/24/90	NASA	
ICE (ISEE-3)	08/12/78	NASA	Deactivated - 5/5/97
IUE	01/26/78	NASA	Deactivated - 9/30/96
IMP-8	10/25/73	NASA	Some references reflect launch as 10/26/73[2]
LEWIS	08/23/97	NASA	NEW - Re-entered atmosphere 9/28/97
POLAR	02/24/96	NASA	NEW
SAMPEX	07/03/92	NASA	Verified launch date.
SOHO	12/2/95	NASA/ESA	NEW – was not included in previous report
SPARTAN 206	01/11/96	NASA	Flown on STS-72
SPARTAN 207	05/19/96	NASA	Flown on STS-77
SPARTAN 201-4	11/19/97	NASA	Flown on STS-87
TDRS-1	04/04/83	NASA	
TDRS-3	09/29/88	NASA	
TDRS-4	03/13/89	NASA	
TDRS-5	08/02/91	NASA	
TDRS-6	01/13/93	NASA	
TDRS-7	07/13/95	NASA	
TOMS-EP	07/02/96	NASA	NEW
TRMM	11/27/97	NASA	NEW
UARS	09/15/91	NASA	
WIND	11/01/94	NASA	GGS
XTE	12/30/95	NASA	
GOES-2	06/16/77	NOAA	Deactivated -serving as a transponder
GOES-3	06/17/78	NOAA	Deactivated - serving as a transponder
GOES-5	05/22/81	NOAA	Deactivated - serving as a transponder
GOES-7	02/26/87	NOAA	Operational - no anomalies reported
GOES-8	04/13/94	NOAA	Operational
GOES-9	05/23/95	NOAA	Operational
GOES-10	04/25/97	NOAA	NEW, Operational
NOAA-9	12/12/84	NOAA	
NOAA-10	09/17/86	NOAA	
NOAA-11	09/24/88	NOAA	
NOAA-12	05/14/91	NOAA	
NOAA-14	12/30/94	NOAA	

[1] LANDSAT spacecraft not included here because anomaly data is no longer reported to GSFC.

[2] ISTP home page reflects IMP-8 with a launch date of September 23, 1972.

Spacecraft Operations Summaries

Advanced Composition Explorer (ACE) / Class - Unknown

General Description

The Advanced Composition Explorer (ACE) spacecraft launched on August 25, 1997, aboard a McDonnell-Douglas Delta II 7920 launch vehicle from the Kennedy Space Center in Florida. Its primary mission to observe energetic particles within the solar system with a mission lifetime of two years and a five-year goal.

The Earth is constantly bombarded with a stream of accelerated particles arriving not only from the Sun, but also from interstellar and galactic sources. Study of these energetic particles will contribute to our understanding of the formation and evolution of the solar system as well as the astrophysical processes involved. The Advanced Composition Explorer (ACE) spacecraft carrying six high-resolution sensors and three monitoring instruments will sample low-energy particles of solar origin and high-energy galactic particles with a collecting power 10 to 1000 times greater than past or planned experiments. The spacecraft is 1.6 meters across and 1 meter high, not including the four solar arrays and the magnetometer booms attached to two of the solar panels. At launch, it weighed 785 kg, which includes 189 kg of hydrazine fuel for orbit insertion and maintenance.

From a vantage point approximately 1/100 of the distance from the Earth to the Sun ACE will perform measurements over a wide range of energy and nuclear mass, under all solar wind flow conditions and during both large and small particle events including solar flares. ACE will provide near-real-time solar wind information over short time periods. When reporting space weather ACE can provide an advance warning (about one hour) of geomagnetic storms that can overload power grids, disrupt communications on Earth, and present a hazard to astronauts.

In order to get away from the effects of the Earth's magnetic field, the ACE spacecraft has travelled almost a million miles (1.5 million km) from the Earth to the Earth-sun libration point (L1). By orbiting the L1 point, ACE will stay in a relatively constant position with respect to the Earth as the Earth revolves around the sun.

Performance

During 1997, ACE had no orbital, ground system or communication anomalies reported. There was no impact to spacecraft or science operations.

Compton Gamma-Ray Observatory (CGRO) / Class B

General Description

Weighing over 35,000 pounds, CGRO was launched by the Space Shuttle Atlantis, on April 5, 1991. CGRO is the largest civilian satellite ever deployed from the Shuttle. Although a variety of smaller satellites, and high-altitude balloons, have carried instruments to study the universe in gamma-ray light during the past thirty years, CGRO represents a dramatic improvement in sensitivity, spectral range, and resolution.

Each of CGRO's four instruments has a unique design, and is specialized for particular types of observations. These instruments are the Burst and Transient Source Experiment (BATSE), the Oriented Scintillation Spectrometer Experiment (OSSE), the Imaging Compton Telescope (COMPTEL), and the Energetic Gamma Ray Experiment Telescope (EGRET).

CGRO has continued to operate well past its design life of two years. CGRO’s mission is to study the sources and astrophysical processes, from the cosmos, that produce the highest energy electromagnetic radiation. Some of the most violent sites in the universe—solar flares, supernova explosions, pulsars, quasars and the mysterious gamma-ray bursts—produce the gamma rays CGRO detects.

Performance

During 1996 and 1997, CGRO had no orbital anomalies reported, 9 ground system anomalies reported in 1996 and 26 in 1997, and 3 communication anomalies reported in 1996 and 12 in 1997. There was no impact to spacecraft or science operations due to orbital anomalies reported.

Earth Radiation Budget Satellite (ERBS) / No class assigned - estimated as Class B

General Description

Designed to study the Earth's climates, ERBS is one of the oldest GSFC operational satellites. Designed for a two year mission life, it was deployed by the Space Shuttle on October 5, 1984, into a low Earth orbit. Its current orbit is 577 x 598 km x 57 degrees inclination.

Earth radiation budget measurements made by the Earth Radiation Budget Experiment (ERBE) instrument, on the ERBS spacecraft, provides a valuable continuous record for long-term studies of global climate, including cloud-radiative forcing and solar variability.

Performance

During 1996 and 1997, ERBS had 12 orbital anomalies reported in 1996 and 16 in 1997, 2 ground system anomalies reported in 1996 and 22 in 1997, and 4 communication anomalies in 1997. No significant science data was lost as a result of the orbital anomalies reported, except for 1 orbital anomaly in 1996, which resulted in lost of one science event (data was not recovered).

Extreme Ultraviolet Explorer (EUVE) / Class B

General Description

This "Explorer" satellite was launched June 7, 1992 from Cape Canaveral Air Station, Fla., aboard a Delta II launch vehicle. It is in a low Earth orbit of 507 by 521 kilometers, and rotates about the Earth every 95 minutes. The launch of this satellite heralds a major step forward in understanding the physics of astronomical objects seen in a newly opened window of the electromagnetic spectrum called the extreme ultraviolet. The study of the universe in the extreme ultraviolet is still in its infancy. EUVE is the first satellite to make both spectroscopic and wide-band observations over the entire extreme ultraviolet region. This unique satellite consists of three scanner telescopes and a dual-purpose survey/spectrometer telescope, weighing 270 and 710 pounds, respectively. EUVE is mapping the entire sky to determine the existence, direction, brightness and temperature of numerous objects that are sources of extreme ultraviolet radiation. Some of the objects EUVE is likely to detect are white dwarf stars, neutron stars, binary star systems and the hot outer atmospheres of red dwarf stars and stars similar to our Sun.

Performance

During 1996 and 1997, EUVE had 2 orbital anomalies reported in 1996 and 3 in 1997. Two ground system anomalies were reported in 1996 and 13 in 1997. No communications anomalies were reported in 1996 and 10 reported in 1997. No significant science data was lost as a result of the orbital anomalies reported. The spacecraft was operating successfully at the end of 1997.

Fast Auroral Snapshot Explorer (FAST) / Class - Unknown

General Description

FAST was launched on August 21, 1996. The FAST satellite is one of NASA's Small-Class Explorer (SMEX) missions. It will investigate the plasma physics of the auroral phenomena which occur around both poles of the Earth. This will be accomplished by taking high data rate snapshots with electric and magnetic fields sensors, and plasma particle instruments, while traversing through the auroral regions. FAST will orbit in a near-polar, highly elliptical orbit. The Orbit altitude will be approximately 350 km x 4200 km at an inclination of 83 degrees. The FAST payload consists of four experiment packages: Electric Field Experiment, Magnetic Field Experiment, Time-of-Flight Energy Angle Mass Spectrograph, and Electrostatic Analyzers.

Performance

During 1996 and 1997, FAST had only 3 orbital anomalies reported in 1997, 16 ground system anomalies in 1997, and no communication anomalies reported in 1996 or 1997. The spacecraft was operating successfully at the end of 1997.

Hubble Space Telescope (HST) / Class B

General Description

HST was launched aboard the Space Shuttle Discovery on April 24, 1990, and deployed into a low Earth orbit. The HST is 2.4 meters in diameter, with optics supporting astronomical observations in the vacuum of space: ultraviolet, visible and near-infrared (wavelengths from 1150 angstroms through several microns). It has a planned 15 year science mission, and will be periodically serviced in-orbit by Space Shuttle crews. The HST is a joint endeavor of NASA and the European Space Agency (ESA). ESA provided the Faint Object Camera and the solar arrays.

HST's two well-known post-launch problems, the aberration in its telescope mirror and a solar array jitter affecting its instruments, were resolved with the first servicing mission in December 1993. The mission installed the Corrective Optics Space Telescope Axial Replacement (COSTAR) and the Wide Field/Planetary Camera 2 (WFPC2). The other science instruments currently on-board are the Faint Object Camera (FOC), the Faint Object Spectrograph (FOS), and the Goddard High Resolution Spectrograph (GHRS). The HST's Fine Guidance Sensors (FGS's) also support astrometric science. The second servicing mission in February 1997 was a nearly flawless 11-day mission to service HST, which included a record-breaking five spacewalks in which astronauts performed a number of tasks designed to improve the telescope and extend its life. During this mission, astronauts replaced the FOS and GHRS with an advanced Space Telescope Imaging Spectrograph (STIS) and the Near Infrared Camera and Multi-Object Spectrometer (NICMOS).

Performance

HST reported 5 orbital anomalies in 1996 and 14 in 1997, 2 ground system anomalies in 1996 and 13 in 1997, and no communications anomalies were reported in 1996 and only 2 in 1997. There was no impact to spacecraft or science operations due to orbital anomalies reported.

International Cometary Explorer (ICE) / No class assigned - estimated as Class B

General Description

ICE was launched on August 12, 1978 to study the composition and physical state of a comet's nucleus, and to investigate interactions between the solar wind and cometary atmosphere. The design life for ICE was 2 years. However, it celebrated almost nineteen years in orbit before operations being terminated on May 5, 1997. ICE was originally called ISEE-3; but after it flew through the tail of the GIACOBINI-ZINNER comet on September 11, 1985, its name was changed to ICE.

The primary mission objectives of the International Cometary Explorer (ICE) were to determine the composition and physical state of the Giacobini-Zinner comet's nucleus; to determine the processes that govern the composition and distribution of neutral and ionized species in the cometary atmosphere; and to investigate the interaction between the solar wind and the cometary atmosphere. The spacecraft was launched into a halo orbit around the Sun-Earth libration point until it was moved June 10, 1982 to the Earth's Geomagnetic Tail (GT). The spacecraft reached the GT in January 1983 and remained there until December 1983, at which time a lunar swing-by placed the spacecraft in a trajectory heliocentric orbit which encountered the comet Giacobini-Zinner in September 1985. The spacecraft provided observations of the solar wind up-stream of comet Halley in 1986. In 1991, NASA headquarters approved update to ICE mission consisting of investigtions of coronal mass ejections in coordination with ground-based observations, continued cosmic ray studies, and special period observations.

The spacecraft was transferred to the Jet Propulsion Laboratory (JPL) for use in the Deep Space Network (DSN) and to collect radio science data while it is located near the sun's horizon.

Performance

During 1996 and 1997, ICE had no orbital, ground system or communication anomalies prior to termination of operations in May of 1997. ICE will not be included in future *Orbital Anomalies in Goddard Spacecraft* reports.

International Ultraviolet Explorer (IUE) / No class assigned - estimated as Class C

General Description

Launched on January 26, 1978, IUE is the oldest operating spacecraft in this report. IUE was launched into an elliptical geosynchronous orbit, and is always visible from Goddard Space Flight Center. When launched, IUE had a stated lifetime

expectancy of three to five years. In 1996, IUE had reached over eighteen years of continued operation (24 hours a day, seven days a week) prior to being terminated on September 30, 1996.

The IUE satellite was a collaborative project between the National Aeronautics and Space Administration (NASA), the European Space Agency (ESA), and the United Kingdom. The satellite carries a telescope and instruments for astronomical research. The instruments are used to obtain ultraviolet (UV) spectra of a wide variety of astronomical objects. UV radiation is light created by processes more energetic than those that produce visible light. For example, the light one sees from the Sun is produced at the solar surface, at a temperature of about 10,340 degrees Fahrenheit (6000 degrees Kelvin). The Sun also produces ultraviolet light, from the much hotter gases that lie above the surface, at temperatures of 17,540 to 179,540 degrees Fahrenheit (10,000 to 100,000 degrees Kelvin).

Performance

In 1996, IUE experienced only two minor orbital anomalies prior to being turned off on September 30, 1996.

Interplanetary Monitoring Platform (IMP-8) / No class assigned - estimated as Class B

General Description

IMP-8, the last of the IMP series, was launched October 25, 1973. It is a drum-shaped spacecraft, 135.6 cm across and 157.4 cm high. It measures magnetic fields, plasmas, and energetic charged particles (e.g., cosmic rays) of the Earth's magnetotail and magnetosheath. It also measures the near-Earth solar wind. IMP-8 had a design life of 2 years; however, it continues to operate and provides important in-situ magnetic field, plasma, and energetic particle data. This data is important for long-term variation studies related to baseline observations relative to deep space measurements (e.g., those from Ulysses and Voyager). It is also important for solar wind-magnetosphere studies in concert with the International Solar Terrestrial Physics Program (ISTP).

Performance

During 1996 and 1997, IMP-8 had no orbital, ground system or communication anomalies reported.

LEWIS / Class - Unknown

General Description

The Lewis satellite was part of NASA’s Small Spacecraft Technology Initiative. It was also part of NASA’s Mission to Planet Earth, a long-term research program designed to study the Earth’s land, oceans, air, and life as a total system. Built by TRW Space & Electronics Group, Redondo Beach, CA, the 890-pound satellite was launched August 23, 1997 from Vandenburg Air Force Base, CA, aboard a Lockheed Martin Launch Vehicle (LMLV-1). The spacecraft was outfitted with advanced Earth-imaging instruments, including a 30-meter-resolution, 384-spectral-channel hyperspectral imager; an Ultraviolet Cosmic Background Radiometer; and a 300-meter-resolution, 256-spectral-channel Linear Etalon Imaging Spectral Array. Lewis was designated to be the world’s first publicly accessible spaceborne hyperspectral sensor.

Performance

Initial operations and check-out proceeded satisfactorily until telemetry received on early August 26, 1997 indicated that spacecraft was spinning at approximately two revolutions per minute. This slow spin caused Lewis’ solar arrays to lose their alignment with the sun and rendering the array unable to generate sufficient power to properly recharge the onboard batteries. The spacecraft’s almost fully discharged batteries prevented access to Lewis’ transmitter and computer for flight anomaly correction and finally resulted in the spacecraft shutting down. The increasing atmospheric drag caused Lewis’ orbit to deteriorate and on September 28, 1997 the spacecraft re-entered the Earth’s atmosphere in a ball of fire.

POLAR / Class - Unknown

General Description

Polar was launched on a Delta II rocket from Vandenberg AFB in California on February 24, 1996 for the start of a planned three-year mission. The Polar spacecraft is the second mission of NASA's Global Geospace Science (GGS) program. It will perform simultaneous, coordinated measurements of the key regions of Earth's geospace, or space environment, with WIND,

which was launched in November 1994 to measure the solar wind properties. A large array of ground-based scientific observatories and mission related theoretical investigations will also be involved. The Polar spacecraft, carrying 11 instruments, which are designed to measure energy input to the Earth's polar regions. It will provide complete coverage of the inner magnetosphere, which is the region around the planet dominated by the Earth's magnetic field. The magnetosphere, the outermost region of geospace, begins some 360 miles above the Earth's surface. NASA is collaborating with the European Space Agency (ESA) and the Japanese Institute of Space and Astronautical Science (ISAS) in three additional solar-terrestrial missions, Geotail, SOHO and Cluster. These missions, together with GGS, make up the International Solar-Terrestrial Physics (ISTP) science initiative. The aim of ISTP is to understand the physical effects of solar activity on interplanetary space and the Earth's space environment.

Polar's orbit around the Earth is inclined 86 degrees from the equator. The furthest point from the Earth on the orbit – the apogee - is nine Earth radii (36,000 miles or 57,000 kilometers), and the closest point to Earth - the perigee - is almost 2 Earth radii (7,100 miles or 11,000 kilometers). Polar is managed by NASA's Goddard Space Flight Center in Greenbelt, Md.

Performance

During 1996 and 1997, POLAR had only one orbital anomaly reported in 1996 and one in 1997, and there were no ground system or communication anomalies in either 1996 and 1997. No significant science data was lost as a result of the anomalies reported.

Solar Anomalous and Magnetospheric Particle Explorer (SAMPEX) / Class C

General Description

Launched on July 3, 1992, SAMPEX is the first spacecraft operated under GSFC's Small Explorer Program. It is designed to study the composition of energetic particles arriving at Earth from the solar atmosphere and interstellar space. It also measures the number of relativistic electrons entering the atmosphere from outer space. Relativistic electrons contribute to ozone destruction.

Designed for a mission life of 3 years, SAMPEX uses several innovative technologies, including an optical fiber buss, powerful on-board computers, and large solid state memories (instead of the usual tape recorders). Also, SAMPEX is the first NASA mission to fully implement a packet switched data network throughout the system.

Performance

During 1996 and 1997, SAMPEX had 65 orbital anomalies reported in 1996 and 31 in 1997, one ground system anomaly reported in 1996 and 2 in 1997, and no communication anomalies reported in either 1996 and 1997. No significant science data was lost as a result of the orbital anomalies reported, except for some minimal data loss in 3 of the reported orbital anomalies in 1997 (due to antenna related problems).

SAMPEX provided full mission service for the entire year of 1996 and 1997. The 1996 and 1997 anomalies were inconsequential, with the exceptions noted above. The SAMPEX Flight Operations Team (FOT) reports all anomalies, even though some are known anomalies with a repair in place that is functioning properly. However classifications, regarding *criticality*, or *mission effect, anomaly effect, anomaly type, and failure category*, reflect this approach to the data collection. Thus, data compilation for this report and trending will not be distorted as a result of this anomaly documentation policy. However, in some cases summary information in this report is presented without SAMPEX included in the totals. When this occurs, it is clearly labeled.

Examples of the SAMPEX policy to collect all anomaly data are illustrated by the anomalies associated with the flagging of the AINTSTAT mnemonic. The AINTSTAT mnemonic is a known anomaly. This problem, at the level that it is occurring, is not serious. It is being reported to ensure that the flagging of the AINTSTAT mnemonic doesn't occur concurrent with the reaction wheels exceeding 200 rpms. This situation would be more serious.

Another known anomaly, "LEICA monitor points 15 and 16 out of limits" is also being reported, even though the Telemetry and Statistics Monitors which were set up to handle this problem executes the planned response "accordingly."

Solar and Heliospheric Observatory (SOHO) / Class - Unknown

General Description

SOHO which is part of NASA's International Solar-Terrestrial Physics program was launched December 2, 1995. The spacecraft was put into orbit on an Atlas-Centaur IIAS rocket which was launched from Cape Canaveral Air Station, FL. The observatory will study the physical processes taking place in the Sun's corona and changes in the Sun's interior by conducting remote sensing observations in visible, ultraviolet and extreme ultraviolet light. Goddard engineers and technicians are providing mission operations and network support for the SOHO spacecraft.

Performance

During 1996 and 1997, SOHO had no orbital, ground system or communication anomalies reported in the SOARS database.

SPARTAN 206/ Class D

General Description

The STS-72 mission, launched January 11, 1996, deployed (for about 50 hours) and then retrieve the Office of Aeronautics and Space Technology Flyer (OAST-Flyer) spacecraft. OAST-Flyer is the seventh in a series of missions aboard reuseable free-flying Spartan carriers. It consists of four experiments: Return Flux Experiment (REFLEX), Global Positioning System Attitude Determination and Control Experiment (GADACS), Solar Exposure to Laser Ordnance Device (SELODE) and the University of Maryland Spartan Packet Radio Experiment (SPRE).

Performance

SPARTAN 206 experienced one anomaly of the SLA, which experienced a low rate telemetry loss after approximately 1 minute of lock-on. It was suspected that the PCM or AIA within the Hitchhiker Avionics failed.

SPARTAN 207/ Class D

General Description

NASA's flight of shuttle Endeavour (STS-77 mission), launched May 19, 1996, was devoted to opening the commercial space frontier. During the flight the crew performed microgravity research aboard the commercially owned and operated SPACEHAB module. The mission also deployed and retrieved the Goddard Space Flight Center’s (GSFC) Spartan-207/IAE (Inflatable Antenna Experiment) satellite, which will lay the groundwork for future technology development in inflatable space structures and also rendezvous with a test satellite. A suite of four technology experiments known as the Technology Experiments for Advancing Missions in Space (TEAMS) was also flown in the Shuttle's payload bay.

Performance

SPARTAN 207 experienced no reported anomalies during is flight in May 1996.

SPARTAN 201-04 / Class D

General Description

Spartan 201-04 (STS-87 mission), launched November 19, 1997, was a Solar Physics Spacecraft designed to perform remote sensing of the hot outer layers of the sun's atmosphere or corona. The objective of the observations are to investigate the mechanisms causing the heating of the solar corona and the acceleration of the solar wind which originates in the corona. Two primary experiments are the Ultraviolet Coronal Spectrometer from the Smithsonian Astrophysical Observatory, and the White Light Coronograph (WLC) from the High Altitude Observatory. Spartan 201 had three secondary experiments. The Technology Experiment Augmenting Spartan (TEXAS) is a Radio Frequency (RF) communications experiment which provided flight experience for components baselined on future Spartan missions, and a real time communications and control link with the primary Spartan 201 experiments. This link was used to provide a fine pointing adjustment to the WLC based on solar images downlinked real time. The Video Guidance Sensor (VGS) Flight Experiment is a laser guidance system which tested a key component of the Automated Rendezvous and Capture (AR&C) system. The Spartan Auxiliary Mounting Plate (SPAM) is a small equipment mounting plate which provided a mounting location for small experiments or auxiliary equipment of the Spartan Flight Support Structure (SFSS). It is a honeycomb plate using a experimental Silicon Carbide Aluminum face sheet material with an aluminum core.

Performance

SPARTAN 201-04 experienced no reported anomalies during is flight in November 1997.

Tracking and Data Relay Satellite (TDRS) / Class A

General Description

The TDRS System is a communication signal relay system that provides tracking and data acquisition services for NASA, other satellites (customers), and the Space Shuttle. The system is capable of transmitting to, and receiving data from, customer spacecraft over at least 85% of the customer's orbit.

The TDRS space segment consists of six on-orbit Tracking and Data Relay Satellites in geosynchronous orbit. Three TDRS's are available for operational support at any given time. The operational spacecraft are located at 41, 174, and 275 degrees west longitude. The other TDRS satellites in the constellation provide backup in the event of a failure of an operational spacecraft and, in some specialized cases, serve as resources for targets of opportunity activities.

Performance

There were six active TDRS satellites in both 1996 and 1997. TDRS-1 had 6 orbital anomalies reported in 1996 and 6 in 1997, only 2 ground system anomalies in 1997, and 1 communication anomaly in 1997. TDRS-3 had only 1 orbital anomaly in 1997, 6 ground system anomalies in 1997, and 2 communication anomalies in 1997. TDRS-4 had no orbital or communication anomalies in either 1996 or 1997, and only 2 ground system anomalies in 1996. TDRS-5 had no orbital or communication anomalies in either 1996 or 1997, and only 1 ground system anomaly in 1997. TDRS-6 had no orbital anomalies in either 1996 or 1997, two ground system anomalies in 1996 and 3 in 1997, and no communication anomalies in 1996 or 1997. TDRS-7 had only 1 orbital anomaly in 1996, one ground system anomaly in 1996, and no communication anomalies in either 1996 or 1997. No significant science data was lost by the orbital anomalies reported, except for one anomaly for TDRS-1 in 1996 when commanding was lost and a spacecraft emergency declared and one anomaly for TDRS-7 in 1997 involving the command processor electronics problem which caused loss of data.

Total Ozone Mapping Spectrometer - Earth Probe (TOMS-EP) / Class - Unknown

General Description

TOMS aboard Nimbus-7 and Meteor-3 provided global measurements of total column ozone on a daily basis and together provided a complete data set of daily ozone from November 1978 - December 1994. After an eighteen month period when the program had no on-orbit capability, ADEOS TOMS was launched on August 17, 1996 and provided data until June 29, 1997. TOMS-EP was launched on July 2, 1996 to provide supplemental measurements, but was boosted to a higher orbit to replace the failed ADEOS. TOMS-EP is continuing NASA's long term daily mapping of the global distribution of the Earth's atmospheric ozone and continues to provide near real-time data. This NASA developed instrument, which measures ozone indirectly by monitoring ultraviolet light, has mapped in detail the Antarctic "ozone hole," which forms September through November of each year, and the distribution of ozone over the globe.

TOMS-EP measures total ozone by observing both incoming solar energy and backscattered ultraviolet (UV) radiation at six wavelengths. "Backscattered" radiation is solar radiation that has penetrated to the Earth's lower atmosphere. There, it is scattered by air molecules and clouds back through the stratosphere to the satellite sensors.
TOMS is part of NASA's Mission to Planet Earth (MTPE) a long term, coordinated research effort to study the Earth as a global environmental system. Using the unique perspective available from space, NASA, will observe, monitor and assess large-scale environmental processes, focusing on climate change. MTPE satellite data, complemented by aircraft and ground data, allows humans to better understand natural environmental changes and to distinguish natural changes from human induced changes. MTPE data, which NASA distributes to researchers worldwide, is essential to humans making informed decisions about their environment.

Performance

During 1996 and 1997, TOMS-EP had 7 orbital anomalies reported in 1996 and 1 in 1997, five ground system anomalies in 1996 and 14 in 1997, and no communication anomalies in either 1996 or 1997. No significant science data was lost as a result of the orbital anomalies reported.

Tropical Rainfall Measuring Mission (TRMM) / Class - Unknown

General Description

TRMM is the first mission dedicated to measuring tropical and subtropical rainfall through microwave and visible infrared sensors, including the first spaceborne rain radar. The TRMM mission was launched from Japan's Tanegashima Space Center, aboard a Japanese H-II rocket.

TRMM is a joint project between the United States and Japan. The National Space Development Agency of Japan (NASDA) provided the Precipitation Radar (PR) and an H-II rocket that launched the TRMM observatory November 27, 1997 for a 3-year mission. NASA's Goddard Space Flight Center (GSFC) in Greenbelt, Maryland, provided the observatory, four instruments, integration and test of the observatory, the science data processing system, and will operator the TRMM satellite via the Tracking and Data Relay Satellite System (TDRSS).

Tropical rainfall comprises more than two thirds of global rainfall and is the primary driver of global atmospheric circulation as a heat source. The knowledge of the tropical rainfall and its variability is crucial to understand and predict the global climate system. Present rainfall knowledge is poor, especially over the oceans where it is uncertain within a factor of two or more. Through use of a low altitude orbit, 217 miles (350 kilometers) and with a complement of state of the art instruments, TRMM will provide more accurate measurements and thereby increased knowledge of how heat energy is released to drive the air circulations. TRMM's orbit is set to range between 35 degrees north and 35 degrees south latitude. As such, it flies over each position on the Earth's surface at a different local time each day, allowing rain variations over the 24-hour period to be calculated. Thus, using these instruments and special orbit, TRMM will yield a data set vastly more informative than any now available.

TRMM's science objectives are as follows: to obtain and study multi-year science data sets of tropical and subtropical rainfall measurements; to understand how interactions between the sea, air and land masses produce changes in global rainfall and climate; to improve modeling of tropical rainfall processes and the influence on global circulation in order to predict rainfall and variability at various time scale intervals; to test, evaluate and improve the performance of satellite rainfall measurement techniques .

At launch, the observatory weighed 7,920 lbs. (3,600 kg) , was 17 feet tall and about 12 feet in diameter with the solar panels undeployed. 1,100 watts of load power is provided by the power subsystem. Data is transmitted to the ground by the communication subsystem through TDRSS.

TRMM has three instruments in its rainfall measurements package. The TRMM Microwave Imager (TMI) and the Precipitation Radar (PR) are the primary instruments for precipitation measurement. The third component of TRMM's three instrument rain package is NASA's five channel Visible Infrared Scanner (VIRS). The Clouds and Earth's Radiant Energy System (CERES) and the Lightning Imaging Sensor (LIS) rounds out the instrument compliment.

Data from the TRMM sensors is processed at GSFC and also at the Earth Observation Center (EOC) in Japan. The data is then distributed to scientists in the fields of climatology, meteorology, hydrology and other disciplines in Japan and the United States.

The TRMM project is part of NASA's Mission to Planet Earth, a long term, coordinated research effort to study the Earth as a global environmental system. It is an essential part of NASA's long range plan to study global change from space. TRMM is managed by the Goddard Space Flight Center for NASA's Office of Mission to Planet Earth, Washington, D.C.

Performance

During 1996 and 1997, TRMM had no orbital or communication anomalies reported in either 1996 or 1997, and only 7 ground system anomalies in 1997. No significant science data was lost as a result of the orbital anomalies, although 1 of the 7 ground system anomalies in 1997 had some data loss.

Upper Atmosphere Research Satellite (UARS) / Class B

General Description

UARS is the first major spacecraft of NASA's Mission to Planet Earth series, a coordinated long-term program for studying the Earth's environmental systems. It was launched on September 15, 1991, from Space Shuttle Discovery. As the first element in NASA's Mission to Planet Earth, UARS is carrying out the first systematic, comprehensive study of the stratosphere. Through this study, it will furnish new data on the mesosphere and thermosphere. UARS chemistry and dynamics sensors are measuring temperature, pressure, wind velocity, and gas species concentrations at various altitudes. The goal of upper atmosphere research is to understand the chemistry, dynamics, and energy balance above the troposphere, as well as to understand the coupling of these processes and atmosphere regions.

Performance

During 1996 and 1997, UARS had 2 orbital anomalies reported in 1996 and 5 in 1997, four ground system anomalies in 1996 and 17 in 1997, and 2 communication anomalies in 1997. No significant science data was lost as a result of the orbital anomalies. Three of the 4 ground system anomalies in 1996 and 2 of the 17 in 1997, did cause some data loss.

WIND (Global Geospace Science - GGS) / Class B

General Description

WIND, launched November 1, 1994, is the first of two missions of NASA's Global Geospace Science (GGS) initiative. GGS is the U.S. portion of the International Solar-Terrestrial Physics (ISTP) program. WIND is designed to observe the Earth's "foreshock region," to monitor the incoming solar wind, and its interaction with the Earth's magnetic field, and measure energetic particles in terms of mass, momentum, and energy. It carries eight science instruments. This launch marks the first time a Russian instrument has flown on an American spacecraft. The KONUS Gamma-Ray Spectrometer, provided by the Ioffe Institute, St. Petersburg, Russia is one of two instruments on WIND that will study cosmic gamma-ray bursts, rather than the solar wind.

WIND data has been used to support rocket launches. Key geophysical parameters derived from real-time telemetry from the Solar Wind Experiment (SWE), Magnetic Field Instrument (MFI), and 3-D Plasma instruments were used to support the launch go/no-go decision. The data were available from the ISTP Central Data Handling Facility (CDHF) at GSFC in near real-time, to be accessed via the Internet from the launch site.

Performance

During 1996 and 1997, WIND had only 1 orbital anomaly reported in 1997 and no ground system or communication anomalies in either 1996 or 1997. No significant science data was lost as a result of the orbital anomaly.

X-Ray Timing Explorer (XTE) / Class C

General Description

The X-Ray Timing Explorer (XTE) was launched from Cape Canaveral Air Station December 30, 1995. With a planned operational lifetime of 2 years, XTE was launched on a Delta II into a low Earth orbit of 362 miles, and a 23 degree inclination.

The purpose of the XTE mission is to provide an understanding of the structure and dynamics of galactic and extragalactic compact X-ray sources. XTE gathers data about X-ray emitting objects within the Milky Way, and beyond. It performs timing studies of X-ray sources, which vary in intensity of their emissions. It also performs spectral studies, which will reveal emission processes and locations emitting X-rays. XTE has three instruments studying the variable X-ray sky: Large Area Proportional Counter Array (GSFC), All Sky Monitor (Massachusetts Institute of Technology), and High Energy X-Ray Timing Experiment (University of California at San Diego).

Performance

During 1996 and 1997, XTE had 42 orbital anomalies reported in 1996 and 5 in 1997, 77 ground system anomalies in 1996 and 23 in 1997, and 5 communication anomalies in 1996 and 1 in 1997. No significant science data was lost from the orbital anomalies reported, except by one orbital anomaly in 1996 (due to mutual interference) and one in 1997 (when the XTE

receiver failed to lock at AOS). XTE reported some data loss in 1 of the 77 ground system anomalies reported in 1996 (caused by faulty patching of a replacement NFE).

Geostationary Operational Environment Satellite (GOES) / Class A

General Description

GOES are a series of geostationary weather and environmental observation satellites and are designed to operate in geosynchronous orbit 22,240 miles above the Earth, thereby appearing to remain stationary. These satellites are developed and launched by NASA for the National Oceanic and Atmospheric Administration (NOAA) and are key elements in the National Weather Service (NWS) operations and modernization program. NOAA is responsible for program funding and the in-orbit operation of the systems and determines the need for satellite replacement. Once the satellite is launched and checked out, NOAA assumes responsibility for the command and control, data receipt and product generation and distribution.

In 1983, NASA signed an agreement with the National Oceanic and Atmospheric Administration (NOAA) to design and build a new generation of weather satellites. These satellites carry instruments that operate as never before—including half hour, or near continuous, Earth observations. The new series of GOES satellites (GOES I-M) provide significant improvements over the previous GOES system in weather and sounding information. This enhanced system improves weather services, particularly the timely forecasting of life and property threatening severe storms. GOES I-M are the first ever three-axis body stabilized spacecraft. This enables the satellite to "stare" at the Earth and provide more frequent images of clouds, the Earth's surface temperature, and water vapor fields. This also enables GOES to “sound” the atmosphere for its vertical thermal and vapor profiles. The new series of GOES satellites provide half hourly radiometric observations, measuring Earth emitted and reflection radiation from which atmospheric temperature, winds, moisture and cloud cover can be derived.

GOES-8, launched on April 13, 1994, was the first of a new generation of GOES I-M, to provide significant improvements. GOES-9, launched on May 23, 1995, was the second of the new series of satellites designed to provide improved imaging. GOES-10, launched April 25, 1997, was the third of the new GOES I-M series, to provide a full capability satellite in an on-orbit storage condition, to assure NOAA continuity in services from a two-satellite constellation. GOES-8, GOES-9, and GOES-10 were referred to as GOES-I, GOES-J, and GOES-K, respectively, before launch (they are renamed upon reaching their orbits).

Performance

During 1996 and 1997, GOES-2, -3, -5 were deactivated and are being used as transponders. GOES-7 was still operational and had no anomalies in either 1996 or 1997. GOES-8 had 16 orbital anomalies in reported 1996 and 11 in 1997, and no ground system or communication anomalies in either 1996 or 1997. GOES-9 had 14 orbital anomalies in 1996 and 5 in 1997, and no ground system or communication anomalies in either 1996 or 1997. GOES-10 had 20 orbital anomalies reported in 1997. No significant science data was lost as a result of any orbital anomalies, except for one for GOES-8 in 1996 (due to INR pointing error) and one for GOES-9 in 1996 (due to INR pointing error).

National Oceanic and Atmospheric Administration (NOAA) / Class B

General Description

Complementing the geostationary satellites are two polar-orbiting satellites, known as the advanced Television Infrared Observing System (TIROS) satellites. Constantly circling the Earth in an almost north-south orbit, passing close to both poles, the polar orbiters monitor the entire Earth. They track atmospheric variables and provide atmospheric data, and cloud images, for weather forecasting and environmental studies. They track weather patterns that affect the climate of the entire United States, providing visible and infrared radiometer data used for imaging purposes, radiation measurements, and temperature profiles.

In addition to weather and environmental data, NOAA spacecraft provide search and rescue capabilities through continuous world-wide monitoring for distress radio beacons. These services are provided through the coordinated and cooperative efforts of many nations.

The NOAA satellites are constructed and launched by NASA for the National Oceanic and Atmospheric Administration (NOAA).

Performance

There were 5 active NOAA satellites in 1996 and 1997 (NOAA-9, NOAA-10, NOAA-11, NOAA-12, and NOAA-14). NOAA-9 had 1 orbital anomaly reported in 1996 and 1 in 1997, and no ground system or communication anomalies in either 1996 or 1997. NOAA-10 had no orbital or communication anomalies in either 1996 or 1997, and only 1 ground system anomaly in 1997. NOAA-11 had only 1 orbital anomaly in 1996. NOAA-12 had only 1 orbital anomaly in 1996 and 1 in 1997. NOAA-14 had only 1 orbital anomaly and 1 ground system anomaly in 1996. No significant science data was lost as a result of any of the orbital anomalies reported.

Detailed Anomaly Data

This section provides detailed information regarding the quantity of anomalies, the impact on the mission, the distribution of the anomalies among spacecraft subsystems, the effect of the anomaly on the spacecraft system levels, the category of the failure (design, workmanship, etc.) and the anomaly type (random, systematic, etc.). This discussion of the classification scheme provides the definitions and coding legends for interpreting the tables and graphs appearing in this section and the appendices.

Following the classification scheme are summaries of anomaly data. These summaries provide significant classifications of the data.

Finally, a series of tables with data totals for the various categories and divisions are included. Graphs depicting the anomaly distributions among the classifications are provided.

Classification Scheme

Anomaly data for this report were classified using the same categories used for previous reports in this series. The anomaly data reported here also corresponds to the categories and classifications used for data in the Spacecraft Orbital Anomaly Report (SOAR) data base. This classification scheme assigns numerical codes to various categories to facilitate anomaly data entry, sorting, and analysis of the data. The classification categories are defined below:

- Spacecraft - The nomenclature of the spacecraft.

- Index - A sequential reference number assigned to each anomaly beginning at the spacecraft's launch. For the year 1996 or 1997 report, the indexed numbers are assigned the prefix "96" or "97." Hence, the number 9624 or 9724 indicates that it is the twenty-fourth anomaly occurring since launch. It also indicates that the anomaly occurred in 1996 or 1997. Note: For Ground and Communication anomalies a "-G" or "-C" designation will appear in the index number after the year to distinguish it from an orbital anomaly (Since this report is the first to distinguish between Orbital, Ground and Communication anomalies). Thus, the number 96-G12 or 97-G12 indicates that it is the twelfth ground anomaly occurring beginning with 1996.

- Date - The date of the anomaly.

- Days - The number of days since launch when the anomaly occurred.

- Subsystem - Spacecraft are divided into the following nine subsystems:

    1. Timing, Control & Command (TC & C)
    2. Telemetry & Data Handling (TLM & DH)
    3. Thermal
    4. Attitude Control Subsystem (ACS)
    5. Power
    6. Propulsion
    7. Instrument (Payload)
    8. Structure
    9. Other (Name to be entered)

- Criticality (Mission Effect) - A number denoting the effect of the anomaly on the spacecraft's mission objectives assigned according to the following classifications:

    1. Negligible (0 - 5%)[3]
    2. Non-negligible but small (Minor) (5 - 33%)
    3. 1/3 - 2/3 Mission Loss (Substantial) (33 - 66%)
    4. 2/3 to Nearly Total Loss (Major) (66 - 95%)
    5. Essentially Total Loss (Catastrophic) (95 - 100%)

- Description - A description of the anomaly and, if known, its probable cause. This description is brief and has been edited for this report; however, every effort has been made to preserve the complete content provided by the original drafter of the anomaly.

- Effect/Action - The anomaly's effect on the mission and corrective action, either for the mission or future missions, if any, and if known. Again, the original anomaly content is preserved in an edited form.

- Reference - The primary information source for the anomaly, e.g, anomaly report number, team member's name, or other document.

- Each anomaly is also classified under the following criteria for sorting and analysis in the Spacecraft Orbital Anomaly Report (SOAR) database:

FOR ORBITAL ANOMALIES

Anomaly Effect:

1 = Spacecraft failure
2 = Subsystem/instrument failure
3 = Component failure
4 = Assembly failure
5 = Part failure
6 = Subsystem/instrument degradation
7 = Indeterminate
8 = Loss of redundancy
9 = None

Failure Category:

1 = Design problem
2 = Workmanship problem
3 = Part problem
4 = Environmental problem
5 = Other (w/explanation)
6 = Unknown

Type of Anomaly:

1 = Systematic (would occur if identical equipment were operated under identical circumstances)
2 = Random
3 = Wearout (a special case of systematic)
4 = Indeterminate
5 = Intermittent
6 = Normal/Expected Operation

[3] The percentages indicate the approximate loss of the mission objectives as a result of the anomaly.

FOR GROUND SYSTEM AND COMMUNICATION ANOMALIES

Criticality (Mission Effect) - A number denoting the effect of the anomaly on the spacecraft's mission is assigned according to the following classifications:

1 = Negligible, or no impact - Example: No data loss
2 = Minor (not negligible, small) - Example: Engineering judgement that the mission was impacted because of the large reconfiguration to re-establish contact with the spacecraft. (Even though there is no data loss)
3 = Substantial - Example: Engineering judgment that the Mission was impacted because of Loss of two printers, or Loss of two front end processors, or Loss of both power sources simultaneously.
4 = Major - Example: Non-Recoverable Data Loss
5 = Catastrophic (Total mission loss) - Example: Loss of both redundant strings for the Ground Communications System.

Anomaly Effect:

1 = Ground system failure - Example: Failure of the entire ground communication system with all it's redundancies.
2 = Ground subsystem failure - Example: Failure of the ground antenna system.
3 = Ground component failure - Example: Front end processor crash.
4 = Ground assembly failure - Example: Failure of the ground antenna structural assembly.
5 = Ground part failure - Example: Failure of the ground antenna gimbal drive gear.
6 = Ground system or instrument degradation - Example:
Ground antenna drive gear teeth are worn and corroded.
Ground antenna drive motor is slower that normal speed.
Ground computer hard drive motors are slower than normal.
Ground computer discs with lots of magnetic errors.
7 = Indeterminate (not known) - Example: Engineering judgement that there is not enough information to correctly identify an anomaly effect.
8 = Loss of redundancy of the ground system - Example: Loss of one of two front end processors.
9 = None - Example: Engineering judgement that there is no anomaly effect.

Failure category:

1 = Design problem - Example: Engineering judgement that there is something wrong with the design of the spacecraft and extra steps must be taken for acquisition of the spacecraft. This means that if the spacecraft were 100% correctly designed that the spacecraft would communicate with the ground station in all flight attitudes.
2 = Scheduling Error or Mutual Interference
3 = Part problem - Example: replace one LTS-1 controller card, software patch problem, Transfer frame errors.
4 = Environmental problem - Example: Loss of electrical equipment because the room temperature and humidity are high and air filters for this room are not filtering out dust particles. Electrostatic discharge because of insufficient grounding. Thunder storms which knock out power.
5 = Other cause (known, with explanation) - No examples given
6 = Unknown - Example: Engineering judgement that there is not enough explanation of the failure to explain the cause of the failure.

Anomaly Type:

1 = Systematic (i.e., anomaly would occur for identical equipment operated under identical conditions) - Example: When a scheduling error occurs the identical electrical equipment will be operated the same way and this will result an expected late acquisition of the satellite.

2 = Random - Example: Electrical spikes or loss of a “bit”.
3 = Wearout (special case of “Systematic”) - Example: Printer heads, computer hard drives, electromechanical devices with swinging arms and rotating discs.
4 = Indeterminate (not known) - Example: Engineering judgement that there is not enough information available to identify a failure.
5 = Intermittent - Example: Engineering judgement that this failure can be classified as intermittent.
6 = Normal or expected operation - Example: Engineering judgement that this failure is part of the normal operations of the Ground Communications Equipment and not a part failure or computer failure.

Summary of Anomaly Data

During 1996 and 1997, Goddard had 31 (3 of these were deactivated but serving as transponders) active orbiting satellites and 3 “SPARTAN” Shuttle-launched and -retrieved "free flyers." There were 626 (301 in 1996 and 325 in 1997) anomalies among 21 satellites (17 in 1996 and 17 in 1997) and 1 SPARTAN launch (1996). Of these 626 anomalies, 305 (180 in 1996 and 125 in 1997) were orbital anomalies. SAMPEX had for 96 of these anomalies, the GOES series had 66 and XTE had another 47 of them. See Figures 1 and 1-1.

The number of anomalies from the additional anomaly/event data not reported in the SOARS database (HST, SOHO, and UARS projects) and the percent (%) to all reported anomalies will be provided in a revision to this report.

The most frequent subsystem orbital anomalies for all spacecraft (for the years 1996 and 1997) were Attitude Control System (71), Instruments (69), TC&C (59), Telemetry and Data Handling (48), Other (30), Power (18), Thermal (5) and Structure (2). See Figure 2.

Of the 305 orbital anomalies, only 16 (8 in 1996 and 8 in 1997) had more than a minor effect (criticality of 2) on mission objectives. There were no 1996 or 1997 anomalies that had a “catastrophic” (criticality 5) mission impact. See Figure 3.
For anomaly effects, 34.4% (105 out of 305) of the 1996 and 1997 orbital anomalies resulted in component failures (46.7% of these were SAMPEX and 16.2% GOES-10), 23.3% (71 out of 305) caused subsystem instrument failures (36.6% of these were ERBS and 14.0% XTE), and 18% (55 out of 305) anomalies caused subsystem degradation (43.6% of these were XTE and 27.3% GOES-8). See Figure 4.

Part problems were the leading cause (41.6% or 127 of 305) of orbital anomalies (of these, 33.1% were SAMPEX, 22% ERBS, and 11.8% GOES-8). The second most frequent cause (26.9% or 82 of 305) was design problems (of these, 56.1% were SAMPEX, 18.3% GOES-8, and 7.3% XTE). The cause of 6.2% of the orbital anomalies were unknown (undetermined). See Figure 5.

For the combined years 1996 and 1997, 40% of the orbital (122 out of 305) anomalies were identified as “random” (23% of these were ERBS, 23% SAMPEX and 10.7% HST) while 24.3% of the orbital (74 out of 305) anomalies were identified as “systematic” (27% of these were SAMPEX, 23% GOES-10, and 17.6% XTE) and 3.6% (11 out of 305) could not be classified as to anomaly type. See Figure 6.

Anomaly Data - Classifications and Distributions[4]

The following tables, Table 2 through Table 8, and Figures 1 through 9 depict the classification and distribution of the anomaly characteristics. Table 8 and Figure 7 and 7-1 are new to this report. Table 8 provides a summary of all SOARS reported Anomalies by Category and Type. Figure 7 and 7-1 provides a trend, or time series, analysis of GSFC spacecraft anomalies.

Table 2. 1996-97 Orbital Anomaly Distribution Among Spacecraft

Spacecraft	Number of Anomalies			Spacecraft	Number of Anomalies		
	Since Launch	1996	1997		Since Launch	1996	1997
ACE	0	--	0	TDRS-6	13	0	0
CGRO	25	0	0	TDRS-7	5	1	0
ERBS	71	12	16	TOMS-EP	8	7	1
EUVE	11	2	3	TRMM	0	--	0
FAST	3	0	3	UARS	26	2	5
HST	116	5	14	WIND	2	0	1
ICE (ISEE-3)	1	0	0	XTE	49	42	5
IUE	49	2	--	GOES-2	Deactivated	0	0
IMP-8	8	0	0	GOES-3	Deactivated	0	0
POLAR	2	1	1	GOES-5	Deactivated	0	0
SAMPEX	492	65	31	GOES-7	22	0	0
SOHO	1	0	0	GOES-8	122	16	11
SPARTAN 206	1	1	--	GOES-9	57	14	5
SPARTAN 207	0	0	--	GOES-10	20	--	20
SPARTAN 201-04	0	--	0	NOAA-9	38	1	1
TDRS-1	85	6	6	NOAA-10	25	0	0
TDRS-3	22	0	1	NOAA-11	29	1	0
TDRS-4	31	0	0	NOAA-12	21	1	1
TDRS-5	12	0	0	NOAA-14	11	1	0
				Total	1377	180	125
				Total excluding SAMPEX	885	115	94

[4] The term *distribution* here refers to the categorizaton of data among spacecraft and anomaly attributes rather than to a statistical distribution.

Table 3. 1996-97 Orbital Anomaly Distribution by Mission Effect (Criticality)

Mission Effect =	1		2		3		4		5		Total		% of	
Spacecraft	(0 – 5%)		(5 - 33%)		(33 - 66%)		(66 - 95%)		(95 - 100%)		Anomalies		Total Anomalies	
YEAR	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997
ACE														
CGRO														
ERBS	11	15		1			1				12	16	6.7	12.8
EUVE	1		1	2				1			2	3	1.1	2.4
FAST				2				1				3		2.4
HST		2	5	12							5	14	2.8	11.2
ICE (ISEE-3)														
IUE			2								2		1.1	
IMP-8														
POLAR	1			1							1	1	0.6	0.8
SAMPEX	64	27		1			1	3			65	31	36.1	24.8
SOHO														
SPARTAN 206	1										1		0.6	
SPARTAN 207														
SPARTAN 201-04														
TDRS-1	1	5	3		1	1	1				6	6	3.3	4.8
TDRS-3		1										1		0.8
TDRS-4														
TDRS-5														
TDRS-6														
TDRS-7							1				1		0.6	
TOMS-EP			7	1							7	1	3.9	0.8
TRMM														
UARS	2	1		4							2	5	1.1	4.0
WIND				1								1		0.8
XTE	22	1	19	3			1	1			42	5	23.3	4.0
GOES-8	11	2	4	8		1	1				16	11	8.9	8.8
GOES-9	11	5	2				1				14	5	7.8	4.0
GOES-10		3		17								20		16.0
NOAA-9	1			1							1	1	0.6	0.8
NOAA-10														
NOAA-11	1										1		0.6	
NOAA-12			1	1							1	1	0.6	0.8
NOAA-14	1										1		0.6	
Total, excluding SAMPEX	64	35	44	54	1	2	6	3	0	0	115	94	63.9	75.2
Total for all Spacecraft	128	62	44	55	1	2	7	6	0	0	180	125	100	100
% of Total Anomalies, all spacecraft	71.1	49.6	24.4	44.0	0.6	1.6	3.9	4.8	0	0	100	100	100	100

Note: Mission Effect denotes the percentage of mission loss attributable to the anomaly.

Table 4. 1996-97 Orbital Anomaly Distribution Among Spacecraft Subsystems

Spacecraft Subsystems = / Spacecraft	100 - TC&C		200 - TLM&DM		300 – Thermal		400 - ACS		500 - Power		600 - Propulsion		700 - Instrument		800 - Structure		900 - Other		Total Anomalies		% of Total Anomalies	
YEAR	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997
ACE																						
CGRO																						
ERBS	11	15		1									1						12	16	6.7	12.8
EUVE	1			3			1												2	3	1.1	2.4
FAST				3																3		2.4
HST	1		1	2			3	1		4				5		2			5	14	2.8	11.2
ICE (ISEE-3)																						
IUE							1				1								2		1.1	
IMP-8																						
POLAR										1	1								1	1	0.6	0.8
SAMPEX	9	9	14	5			20	2	1	1			21	14					65	31	36.1	24.8
SOHO																						
SPARTAN 206			1																1		0.6	
SPARTAN 207																						
SPARTAN 201-04																						
TDRS-1	6			3														3	6	6	3.3	4.8
TDRS-3				1																1		0.8
TDRS-4																						
TDRS-5																						
TDRS-6																						
TDRS-7																	1		1		0.6	
TOMS-EP	3						3	1									1		7	1	3.9	0.8
TRMM																						
UARS				3			1		1									2	2	5	1.1	4.0
WIND				1																1		0.8
XTE			3	3	1		13		5	1			4				16	1	42	5	23.3	4.0
GOES-8	1					1	8	4					7	6					16	11	8.9	8.8
GOES-9			1	1			4	3					6	1			3		14	5	7.8	4.0
GOES-10		3				3		4		3		1		3				3		20		16.0
NOAA-9							1							1					1	1	0.6	0.8
NOAA-10																						
NOAA-11			1																1		0.6	
NOAA-12			1					1											1	1	0.6	0.8
NOAA-14									1										1		0.6	
Total for all Spacecraft	32	27	22	26	1	4	55	16	8	10	2	1	39	30	0	2	21	9	180	125	100	100
% of Total Anomalies, all spacecraft	17.8	21.6	12.2	20.8	0.6	3.2	30.6	12.8	4.4	8.0	1.1	0.8	21.7	24.0	0	1.6	11.7	7.2	100	100	100	100

Subsystems:

1- Timing Control & Command
2 - Telemetry and Data Handling
3 – Thermal
4 - Attitude Control System
5 - Power
6 – Propulsion
7 - Instrument (Payload)
8 - Structure
9 - Other

Table 5. 1996 - 97 Orbital Anomaly Distribution by Anomaly Effect

Anomaly Effects = Spacecraft	1 - Spacecraft Failure		2 - Subsystem/ Instr. Failure		3 -Component Failure		4 – Assembly Failure		5 – Part Failure		6 - Subsys/Instr. Degradation		7 –Indeterminate		8 – Loss of Redundancy		9 - None		Total Anomalies		% of Total Anomalies	
YEAR	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997
ACE																						
CGRO																						
ERBS			11	15	1	1													12	16	6.7	12.8
EUVE				3	1												1		2	3	1.1	2.4
FAST						3														3		2.4
HST				8	3	4	1				1			2					5	14	2.8	11.2
ICE (ISEE-3)																						
IUE									1		1								2		1.1	
IMP-8																						
POLAR						1					1								1	1	0.6	0.8
SAMPEX			9		27	22							21	1	8	8			65	31	36.1	24.8
SOHO																						
SPARTAN 206											1								1		0.6	
SPARTAN 207																						
SPARTAN 201-04																						
TDRS-1			1			4			4	2	1								6	6	3.3	4.8
TDRS-3														1						1		0.8
TDRS-4																						
TDRS-5																						
TDRS-6																						
TDRS-7					1														1		0.6	
TOMS-EP				1	1		2				1		2		1				7	1	3.9	0.8
TRMM																						
UARS			2	4								1		1					2	5	1.1	4.0
WIND				1																1		0.8
XTE			6	4	7						24		4			1	1		42	5	23.3	4.0
GOES-8					6				1	2	6	9	2				1		16	11	8.9	8.8
GOES-9			4		3	1					5	4	1				1		14	5	7.8	4.0
GOES-10						17						1		1				1		20		16.0
NOAA-9			1			1													1	1	0.6	0.8
NOAA-10																						
NOAA-11			1																1		0.6	
NOAA-12						1									1				1	1	0.6	0.8
NOAA-14																	1		1		0.6	
Total for all Spacecraft	0	0	35	36	50	55	3	0	6	4	41	14	30	6	10	9	5	1	180	125	100	100
% of Total Anomalies, all spacecraft	0	0	19.4	28.8	27.8	44.0	1.7	0	3.3	3.2	22.8	11.2	16.7	4.8	5.5	7.2	2.8	0.8	100	100	100	100

Anomaly Effects:

1 - Spacecraft Failure
2 - Subsystem or Instrument Failure
3 - Component Failure
4 - Assembly Failure
5 - Part Failure
6 - Subsystem or Instrument Degradation
7- Unknown (Not Determined)
8 - Loss of Redundancy
9 - None

Table 6. 1996 - 97 Orbital Anomaly Distribution by Failure Category

Failure Category =	1		2		3		4		5		6		Total Anomalies		% of Total Anomalies	
Spacecraft																
YEAR	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997
ACE																
CGRO																
ERBS					12	16							12	16	6.7	12.8
EUVE			1			3			1				2	3	1.1	2.4
FAST		3												3		2.4
HST	1		2	1	1	6		6	1			1	5	14	2.8	11.2
ICE (ISEE-3)																
IUE			1		1								2		1.1	
IMP-8																
POLAR		1									1		1	1	0.6	0.8
SAMPEX	34	12		1	25	17					6	1	65	31	36.1	24.8
SOHO																
SPARTAN 206			1										1			
SPARTAN 207																
SPARTAN 201-04																
TDRS-1	1				5	6							6	6	3.3	4.8
TDRS-3												1		1		0.8
TDRS-4																
TDRS-5																
TDRS-6																
TDRS-7					1								1		0.6	
TOMS-EP			4		1	1			1		1		7	1	3.9	0.8
TRMM																
UARS	2			1		4							2	5	1.1	4.0
WIND						1								1		0.8
XTE	6		26	1		3	5		1		4	1	42	5	23.3	4.0
GOES-8			2		10	5	1	4	1	1	2		16	11	8.9	8.8
GOES-9	2		2		6	1	2	4	1		1		14	5	7.8	4.0
GOES-10		15		2		1		1		1				20		16.0
NOAA-9	1	1											1	1	0.6	0.8
NOAA-10																
NOAA-11	1												1		0.6	
NOAA-12		1			1								1	1	0.6	0.8
NOAA-14									1				1		0.6	
Total for all Spacecraft	48	34	39	6	63	64	8	15	7	2	15	4	180	125	100	100
% of Total Anomalies, all spacecraft	26.7	27.2	21.7	4.8	35.0	51.2	4.4	12.0	3.9	1.6	8.3	3.2	100	100	100	100

Failure Category:

1 - Design Problem
2 - Workmanship Problem
3 - Part Problem
4 - Environmental Problem
5 - Other (Known)
6 - Unknown

Table 7. 1996 - 97 Orbital Anomaly Distribution by Anomaly Type

Anomaly Type =	1		2		3		4		5		6		Total Anomalies		% of Total Anomalies	
Spacecraft																
YEAR	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997
ACE																
CGRO																
ERBS			12	16									12	16	6.7	12.8
EUVE	1		1	1		2							2	3	1.1	2.4
FAST		2		1										3		2.4
HST	1	1	2	10	1	3			1				5	14	2.8	11.2
ICE (ISEE-3)																
IUE	1		1										2		1.1	
IMP-8																
POLAR		1					1						1	1	0.6	0.8
SAMPEX	13	7	23	5		1		1			29	17	65	31	36.1	24.8
SOHO																
SPARTAN 206			1										1		0.6	
SPARTAN 207																
SPARTAN 201-04																
TDRS-1	1		4	5	1	1							6	6	3.3	4.8
TDRS-3								1						1		0.8
TDRS-4																
TDRS-5																
TDRS-6																
TDRS-7			1										1		0.6	
TOMS-EP	1		3	1	1		2						7	1	3.9	0.8
TRMM																
UARS	2			5									2	5	1.1	4.0
WIND				1										1		0.8
XTE	13		8	4	17	1	3		1				42	5	23.3	4.0
GOES-8	3	1	6	3	4	7	2				1		16	11	8.9	8.8
GOES-9	6	1	4		2	4	1				1		14	5	7.8	4.0
GOES-10		17		3										20		16.0
NOAA-9	1					1							1	1	0.6	0.8
NOAA-10																
NOAA-11	1												1		0.6	
NOAA-12					1	1							1	1	0.6	0.8
NOAA-14			1										1		0.6	
Total for all Spacecraft	44	30	67	55	27	21	9	2	2	0	31	17	180	125	100	100
% of Total Anomalies, all spacecraft	24.5	24.0	37.2	44.0	15.0	16.8	5.0	1.6	1.1	0	17.2	13.6	100	100	100	100

Anomaly Type:

1 – Systematic
2 – Random
3 – Wearout
4 - Indeterminate
5 - Intermittent
6 - Expected Operations

Table 8. Summary of all SOARS reported Anomalies by Category and Type

SPACECRAFT	SUBSYSTEM										CRITICALITY (ME)						ANOMALY EFFECT										FAIL CATEGORY							ANOMALY TYPE						
1996 Orbital Anomalies	1-TC &C	2-TL M& DM	3-Thermal	4-ACS	5-Power	6-Propulsion	7-Instrument	8-Structure	9-Other	Total	1-Negligible (0-5%)	2-Minor (5-33%)	3-Substantial (33-66%)	4-Major (66-95%)	5-Catastrophic (95-100%)	Total	1-Spacecraft Failure	2-Subsystem/Instr. Failure	3-Component Failure	4-Assembly Failure	5-Part Failure	6-Subsystem/ Instr. Degradation	7-Indeterminate	8-Loss of Redundancy	9-None	Total	1-Design Problem	2-Workmanship Problem	3-Part Problem	4-Environmental Problem	5-Other (w/explanation)	6-Unknown	Total	1-Systematic	2-Random	3-Wearout	4-Indeterminate	5-Intermittent	6-Normal/ Expected Operation	Total
ERBS	11						1			12	11			1		12		11	1							12			12			12		12					12
EUVE	1			1						2	1	1				2			1						1	2		1		1		2	1	1					2
HST	1	1		3						5		5				5			3	1		1				5	1	2	1		1		5	1	2	1		1		5
IUE				1		1				2		2				2					1	1				2		1	1				2	1	1					2
POLAR						1				1	1					1						1				1					1	1				1				1
SAMPEX	9	14		20	1		21			65	64			1		65		9	27				21	8		65	34		25			6	65	13	23				29	65
SLA		1								1	1					1						1				1		1				1		1					1
TDRS-1	6									6	1	3	1	1		6		1			4	1				6	1		5				6	1	4	1				6
TDRS-7									1	1				1		1			1							1			1				1		1					1
TOMS-EP	3			3					1	7		7				7			1	2		1	2	1		7		4	1		1	1	7	1	3	1	2			7
UARS				1	1					2	2					2		2								2	2						2	2						2
XTE		3	1	13	5		4		16	42	22	19		1		42		6	7			24	4		1	42	6	26		5	1	4	42	13	8	17	3	1		42
GOES-8	1			8			7			16	11	4		1		16			6		1	6	2		1	16		2	10	1	1	2	16	3	6	4	2		1	16
GOES-9		1		4			6		3	14	11	2		1		14		4	3			5	1		1	14	2	2	6	2	1	1	14	6	4	2	1		1	14
NOAA-9				1						1	1					1		1								1	1						1	1						1
NOAA-11		1								1	1					1		1								1	1						1	1						1
NOAA-12		1								1		1				1								1		1			1				1			1				1
NOAA-14					1					1	1					1									1	1					1		1							1
1996 TOTAL	32	22	1	55	8	2	39	0	21	180	128	44	1	7	0	180	0	35	50	3	6	41	30	10	5	180	48	39	63	8	7	15	180	44	67	27	9	2	31	180

1997 Orbital Anomalies	1-	2-	3-	4-	5-	6-	7-	8-	9-	Total	1-	2-	3-	4-	5-	Total	1-	2-	3-	4-	5-	6-	7-	8-	9-	Total	1-	2-	3-	4-	5-	6-	Total	1-	2-	3-	4-	5-	6-	Total
ERBS	15	1								16	15	1				16		15	1							16			16				16		16					16
EUVE		3								3		2		1		3		3								3			3				3		1	2				3
FAST		3								3		2		1		3			3							3	3						3	2	1					3
HST		2		1	4		5	2		14	2	12				14		8	4				2			14		1	6	6		1	14	1	10	3				14
POLAR					1					1		1				1			1							1	1						1	1						1
SAMPEX	9	5		2	1		14			31	27	1		3		31			22				1	8		31	12	1	17			1	31	7	5	1	1		17	31
TDRS-1		3							3	6	5		1			6			4		2					6			6				6		5	1				6
TDRS-3		1								1	1					1							1			1						1	1				1			1
TOMS-EP				1						1		1				1		1								1			1				1		1					1
UARS		3							2	5	1	4				5		4					1			5		1	4				5		5					5
WIND		1								1		1				1		1								1			1				1		1					1
XTE		3			1				1	5	1	3		1		5		4						1		5		1	3			1	5		4	1				5
GOES-8			1	4			6			11	2	8	1			11					2	9				11	1		5	4	1		11	1	3	7				11
GOES-9		1		3			1			5	5					5			1			4				5			1	4			5	1		4				5
GOES-10	3		3	4	3	1	3		3	20	3	17				20			17			1	1		1	20	15	2	1	1	1		20	17	3					20
NOAA-9							1			1		1				1			1							1	1						1			1				1
NOAA-12				1						1		1				1			1							1	1						1			1				1
1997 TOTAL	27	26	4	16	10	1	30	2	9	125	62	55	2	6	0	125	0	36	55	0	4	14	6	9	1	125	34	6	64	15	2	4	125	30	55	21	2	0	17	125

Table 8. Summary of all SOARS reported Anomalies by Category and Type - continued

SPACECRAFT	SUBSYSTEM										CRITICALITY (ME)						ANOMALY EFFECT										FAIL CATEGORY							ANOMALY TYPE						
1996 Ground Anomalies	1-TC &C	2-TL M& DM	3-Thermal	4-ACS	5-Power	6-Propulsion	7-Instrument	8-Structure	9-Other	Total	1-Negligible (0-5%)	2-Minor (5-33%)	3-Substantial (33-66%)	4-Major (66-95%)	5-Catastrophic (95-100%)	Total	1-Spacecraft Failure	2-Subsystem/Instr. Failure	3-Component Failure	4-Assembly Failure	5-Part Failure	6-Subsystem/ Instr. Degradation	7-Indeterminate	8-Loss of Redundancy	9-None	Total	1-Design Problem	2-Workmanship Problem	3-Part Problem	4-Environmental Problem	5-Other (w/explanation)	6-Unknown	Total	1-Systematic	2-Random	3-Wearout	4-Indeterminate	5-Intermittent	6-Normal/ Expected Operation	Total
CGRO	1								8	9	4			5		9			9							9		6	2		1		9	7	2					9
ERBS		1							1	2	1	1				2			1				1			2	1		1				2	1	1					2
EUVE		1							2	3	2	1				3		1	2							3	1		2				3	1	2					3
HST		1							1	2				2		2			2							2		2				2		2					2
NOAA-14	1									1		1				1			1							1		1				1	1						1
SAMPEX		1								1		1				1			1							1		1				1		1					1
TDRS-4									2	2	2					2			2							2		2				2	2						2
TDRS-6		1							1	2	1	1				2		1	1							2	1	1				2	2						2
TDRS-7		1								1				1		1			1							1			1			1		1					1
TOMS-EP									5	5		5				5			5							5			5			5	1	4					5
UARS		3							4	7	4			3		7			7							7		4	3			7	5	2					7
XTE		3							75	78	74	3		1		78			76			1			1	78	3	23	50		2		78	25	50	3				78
1996 TOTAL	2	12	0	0	0	0	0	0	99	113	88	13	0	12	0	113	0	2	108	0	0	1	1	0	1	113	6	40	64	0	3	0	113	45	65	3	0	0	0	113
1997 Ground Anomalies	1-	2-	3-	4-	5-	6-	7-	8-	9-	Total	1-	2-	3-	4-	5-	Total	1-	2-	3-	4-	5-	6-	7-	8-	9-	Total	1-	2-	3-	4-	5-	6-	Total	1-	2-	3-	4-	5-	6-	Total
CGRO	1	10							15	26	1	4		21		26		3	7				16			26		10	8			8	26	8	13		5			26
ERBS		8							14	22	8	13		1		22		4	3				11	4		22		10	10			2	22		21		1			22
EUVE	1	1							11	13	7	5		1		13		2	2				8	1		13		4	5			4	13		9		4			13
HST	1					6			6	13	3	9		1		13		6	2				5			13		4	8			1	13		13					13
SAMPEX	1	1								2		2				2			2							2		2				2		2					2
TDRS-1		2								2	1	1				2		2								2	1		1			2		2					2
TDRS-3	2								4	6	4	1		1		6		1	2				3			6			3			3	6	1	4	1				6
TDRS-5						1				1		1				1							1			1		1				1		1					1
TDRS-6		1							2	3	3					3		1	1				1			3		1	2				3		3					3
TOMS-EP		12			1				1	14	3	11				14		9	2				3			14	1	1	10			2	14		11	1	1	1		14
TRMM	1	4							2	7	2	4		1		7		2					5			7		2	1			4	7		1		5	1		7
UARS		7							10	17	7	8		2		17		6					9	1	1	17	1	7	6		1	2	17		13		4			17
XTE	1	12							10	23	12	11				23		7	1				14	1		23	5	8	8			2	23	5	16		1	1		23
NOAA-10							1			1			1			1		1								1			1			1			1				1
FAST		7				1			8	16	4	12				16		10	5				1			16	2	11		3			16	2	13		1			16
1997 TOTAL	8	65	0	0	1	8	1	0	83	166	55	82	1	28	0	166	0	54	27	0	0	0	77	7	1	166	10	61	63	3	1	28	166	16	122	3	22	3	0	166

Table 8. Summary of all SOARS reported Anomalies by Category and Type - continued

SPACECRAFT	SUBSYSTEM										CRITICALITY (ME)						ANOMALY EFFECT										FAIL CATEGORY							ANOMALY TYPE						
1996 Comm. Anomalies	1-TC &C	2-TL M& DM	3-Thermal	4-ACS	5-Power	6-Propulsion	7-Instrument	8-Structure	9-Other	Total	1-Negligible (0-5%)	2-Minor (5-33%)	3-Substantial (33-66%)	4-Major (66-95%)	5-Catastrophic (95-100%)	Total	1-Spacecraft Failure	2-Subsystem/Instr. Failure	3-Component Failure	4-Assembly Failure	5-Part Failure	6-Subsystem/ Instr. Degradation	7-Indeterminate	8-Loss of Redundancy	9-None	Total	1-Design Problem	2-Workmanship Problem	3-Part Problem	4-Environmental Problem	5-Other (w/explanation)	6-Unknown	Total	1-Systematic	2-Random	3-Wearout	4-Indeterminate	5-Intermittent	6-Normal/ Expected Operation	Total
CGRO		1							2	3	1	1		1		3			3							3			3			3		3					3
XTE									5	5	5					5			5							5		1	4			5	1	4					5
1996 TOTAL	0	1	0	0	0	0	0	0	7	8	6	1	0	1	0	8	0	0	8	0	0	0	0	0	0	8	0	1	7	0	0	0	8	1	7	0	0	0	0	8
1997 Comm. Anomalies	**1-**	**2-**	**3-**	**4-**	**5-**	**6-**	**7-**	**8-**	**9-**	**Total**	**1-**	**2-**	**3-**	**4-**	**5-**	**Total**	**1-**	**2-**	**3-**	**4-**	**5-**	**6-**	**7-**	**8-**	**9-**	**Total**	**1-**	**2-**	**3-**	**4-**	**5-**	**6-**	**Total**	**1-**	**2-**	**3-**	**4-**	**5-**	**6-**	**Total**
CGRO		8							4	12		3	1	8		12			4				7	1		12		4	3			5	12		8		4			12
ERBS		1	2						1	4	2	2				4			3				1			4	1		3				4	1	3					4
EUVE			5						5	10	4	4		2		10		2	6				2			10		2	8				10		9	1				10
HST			1						1	2	1	1				2			1				1			2			1			1	2		1		1			2
TDRS-1									1	1		1				1							1			1						1	1		1					1
TDRS-3		1							1	2	2					2		2								2			2				2		2					2
UARS									2	2	1	1				2		1					1			2			1			1	2		1		1			2
XTE		1								1		1				1		1								1			1			1	1		1					1
1997 TOTAL	0	11	8	0	0	0	0	0	15	34	10	13	1	10	0	34	0	6	14	0	0	0	13	1	0	34	1	6	19	0	0	8	34	1	26	1	6	0	0	34

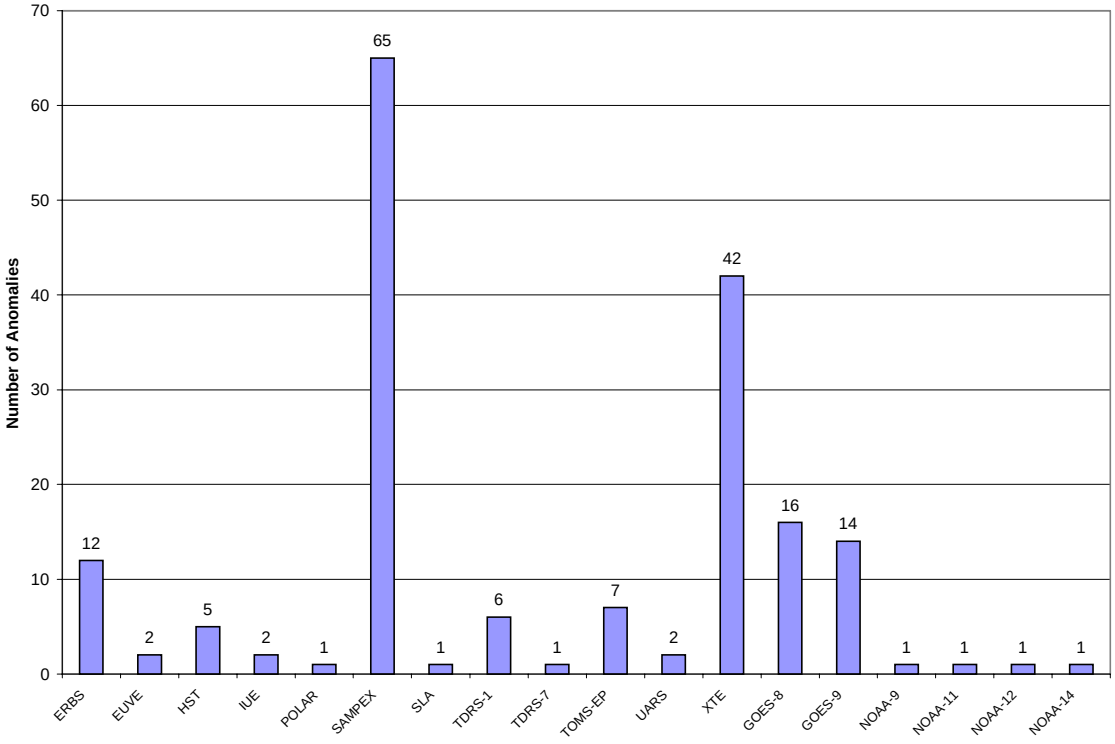


Figure 1. 1996 Orbital Anomaly Distribution Among Spacecraft

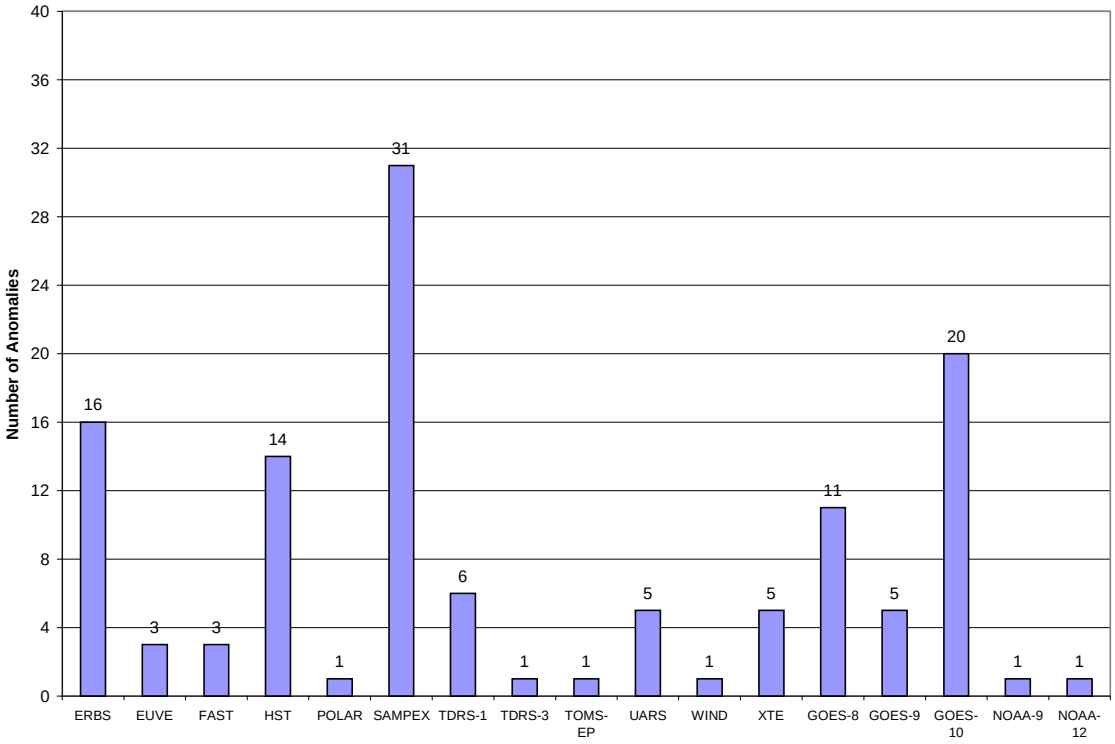


Figure 1-1. 1997 Orbital Anomaly Distribution Among Spacecraft

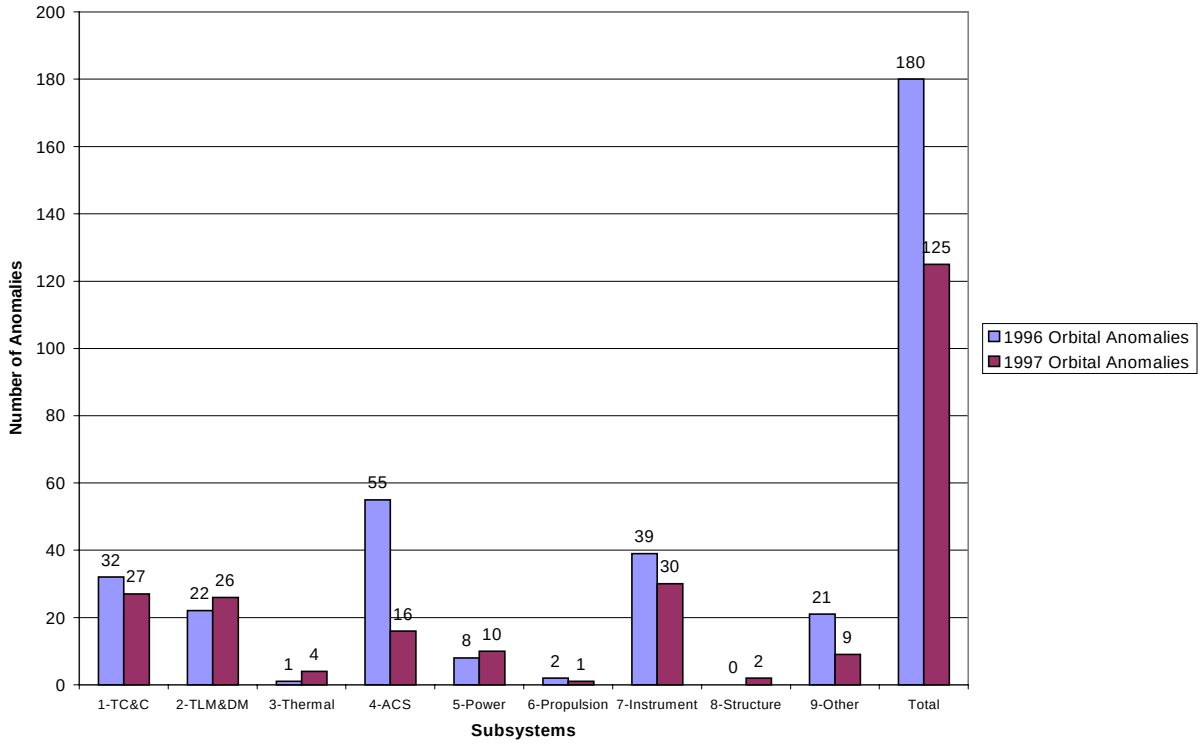


Figure 2. 1996 – 1997 Orbital Anomaly Distribution by Subsystems

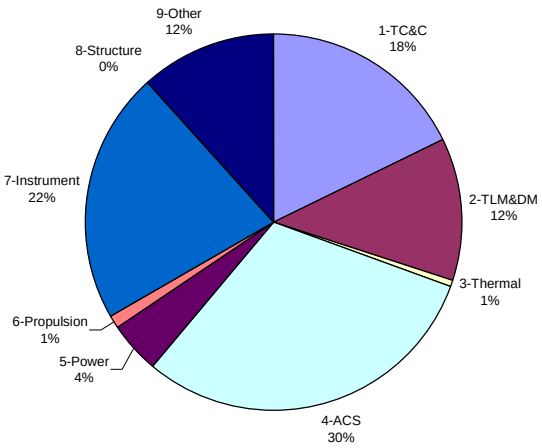


Figure 2-1. Subsystem Percentages of 1996 Orbital Anomalies

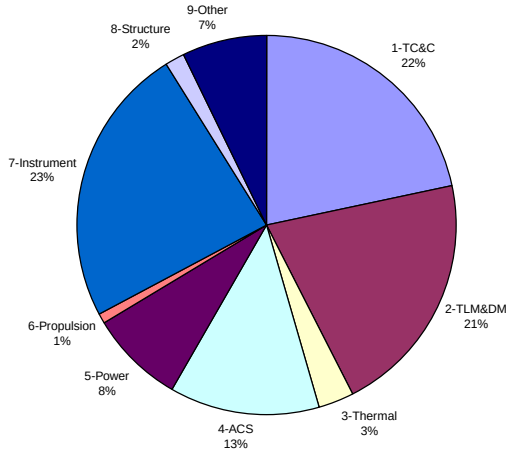


Figure 2-2. Subsystem Percentages of 1997 Orbital Anomalies

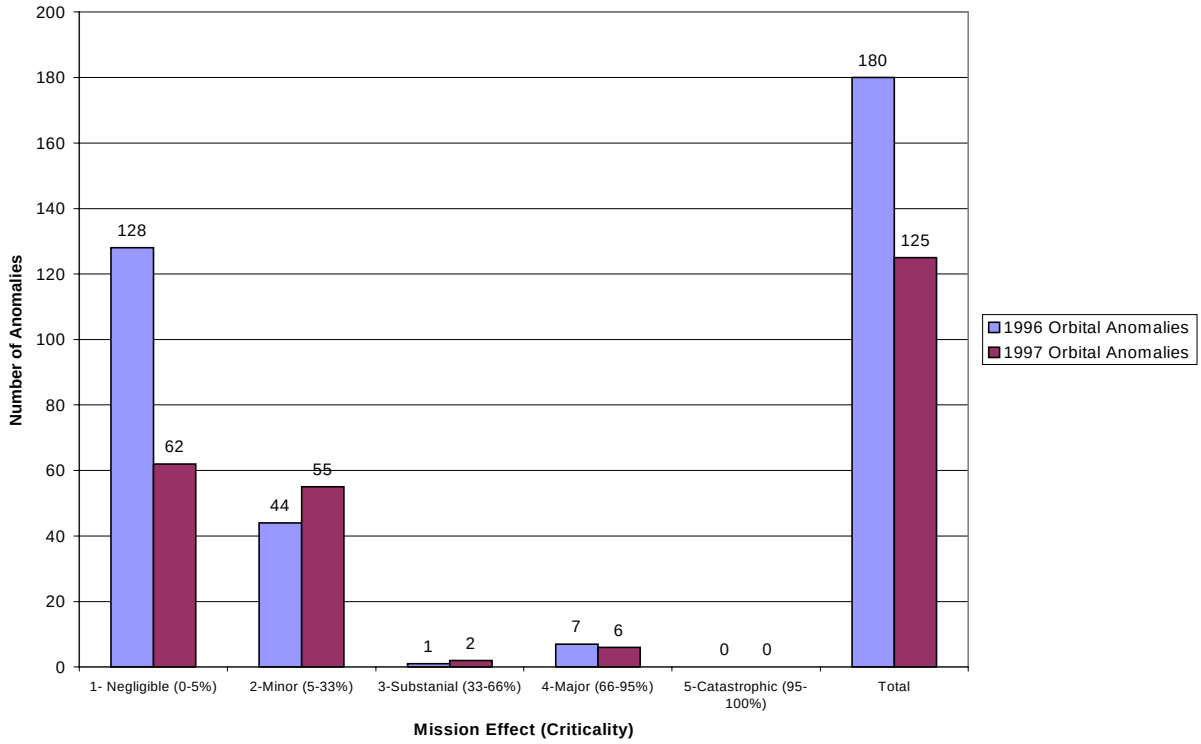


Figure 3. 1996 – 1997 Orbital Anomaly Distribution by Mission Effect (Criticality)

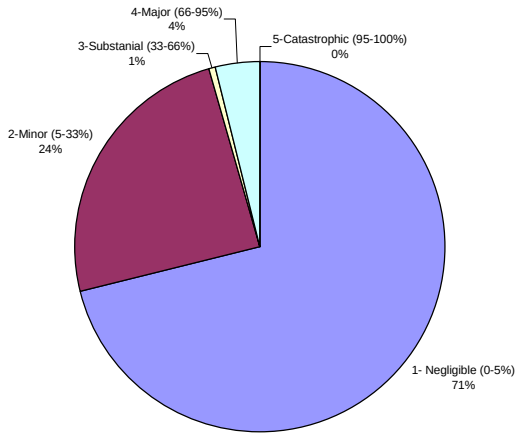


Figure 3-1. Mission Effect (Criticality) Percentages of 1996 Orbital Anomalies

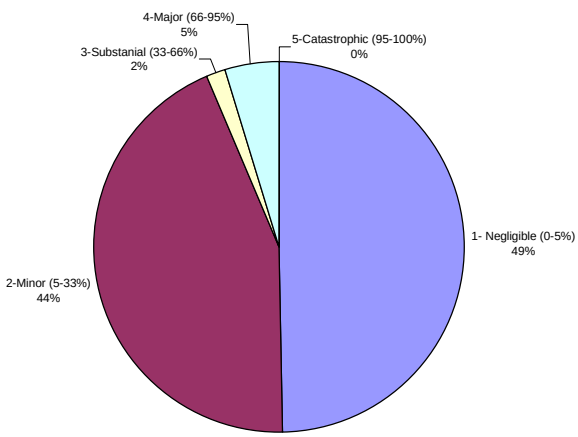


Figure 3-2. Mission Effect (Criticality) Percentages of 1997 Orbital Anomalies

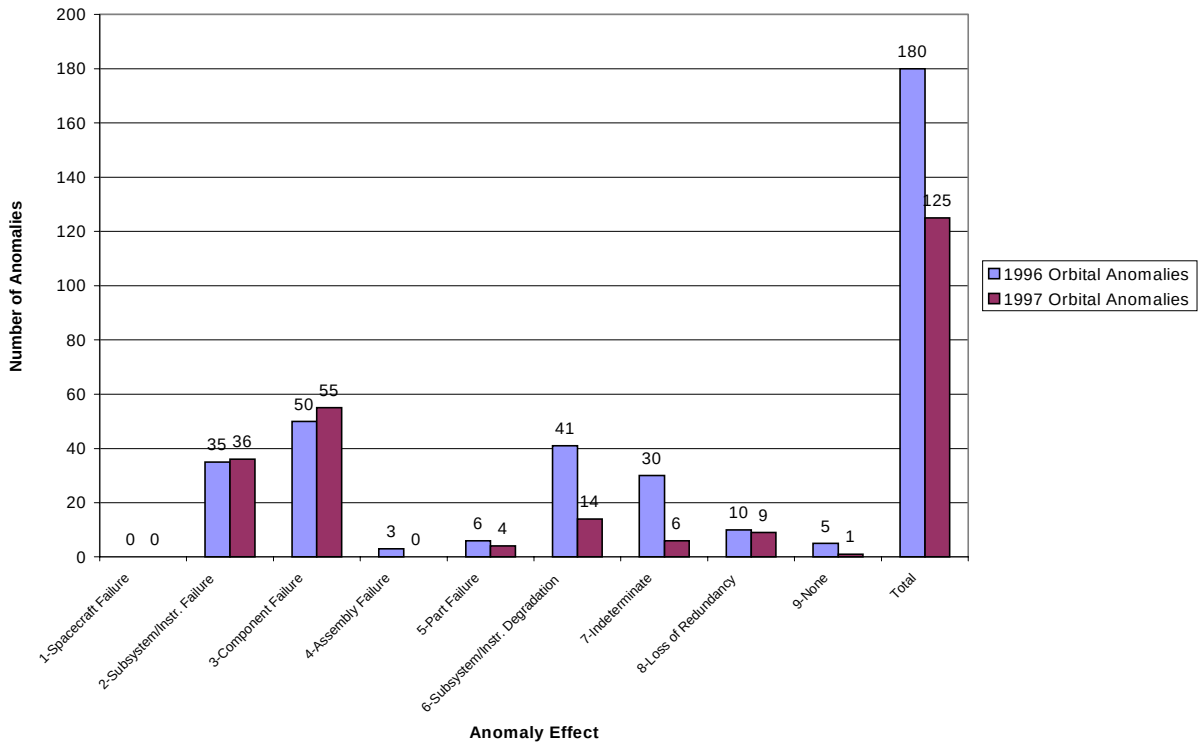


Figure 4. 1996 – 1997 Orbital Anomaly Distribution by Anomaly Effect

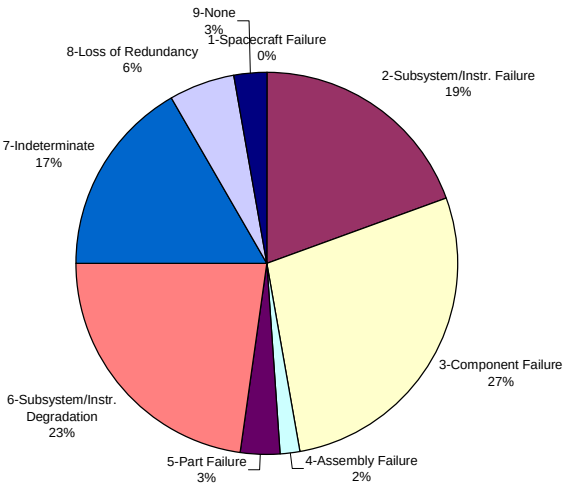


Figure 4-1. Anomaly Effect Percentages of 1996 Orbital Anomalies

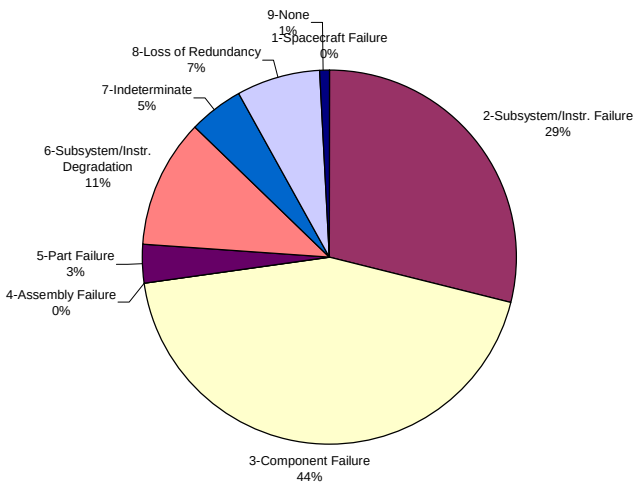


Figure 4-2. Anomaly Effect Percentages of 1997 Orbital Anomalies

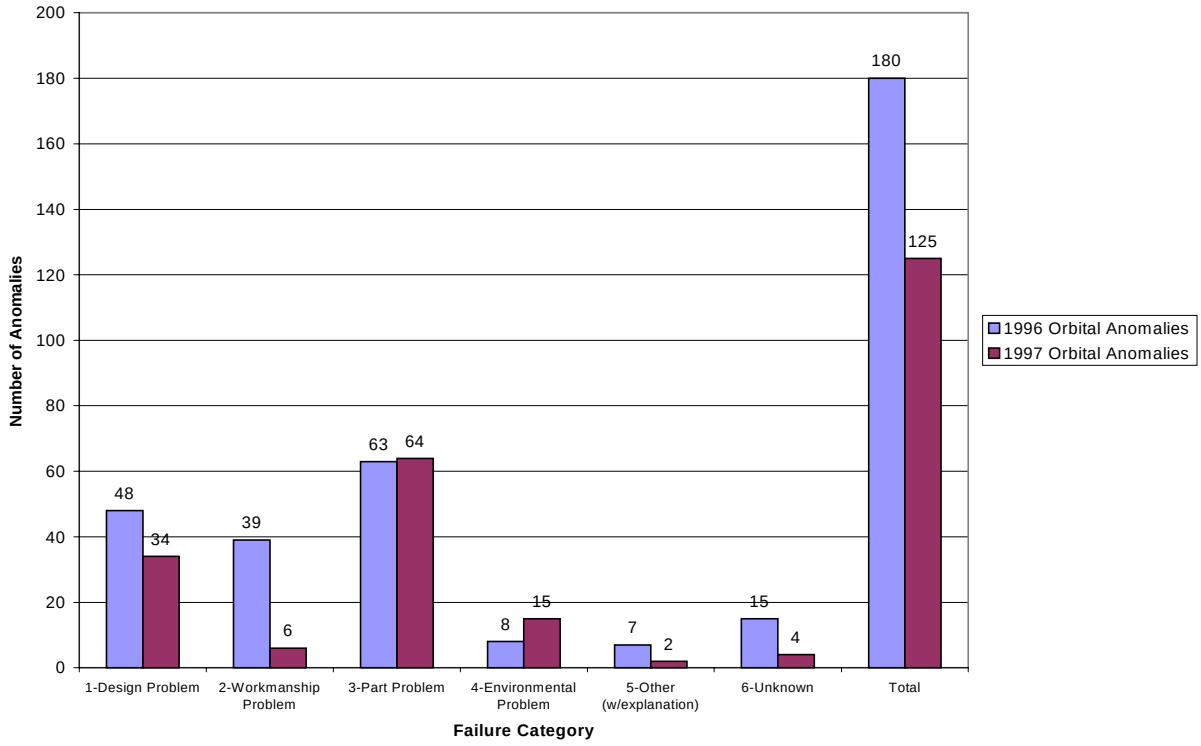


Figure 5. 1996 – 1997 Orbital Anomaly Distribution by Failure Category

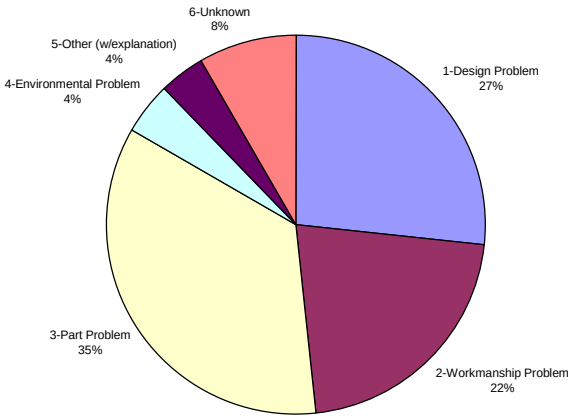


Figure 5-1. Failure Category Percentages of 1996 Orbital Anomalies

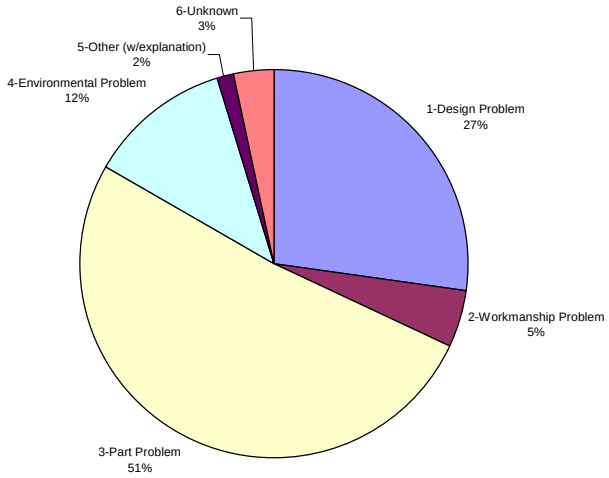


Figure 5-2. Failure Category Percentages of 1997 Orbital Anomalies

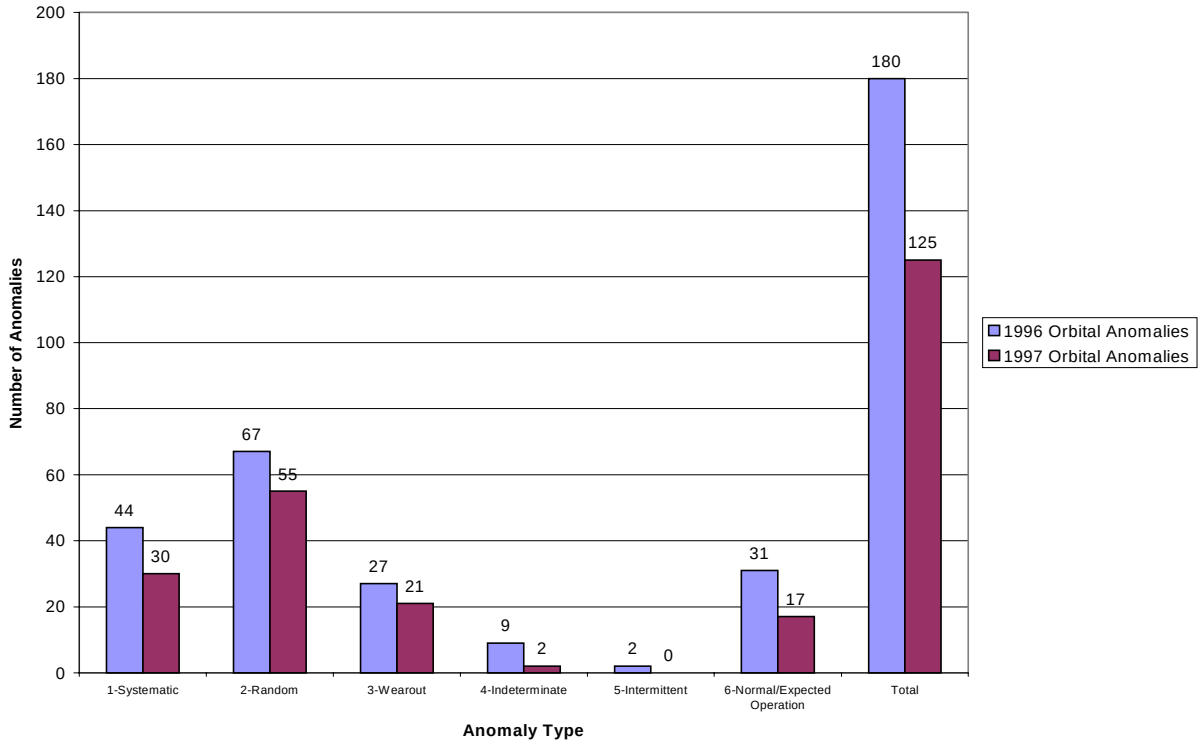


Figure 6. 1996 – 1997 Orbital Anomaly Distribution by Anomaly Type

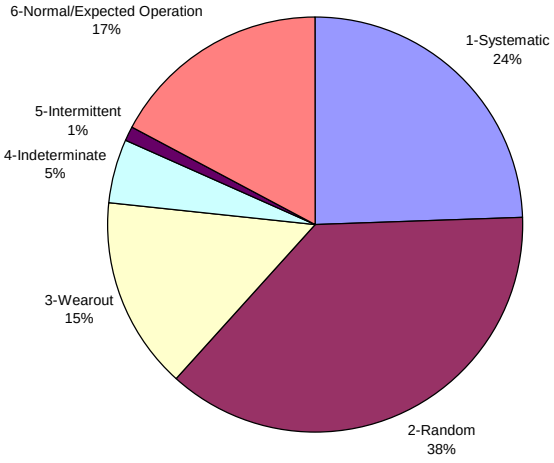


Figure 6-1. Anomaly Type Percentages of 1996 Orbital Anomalies

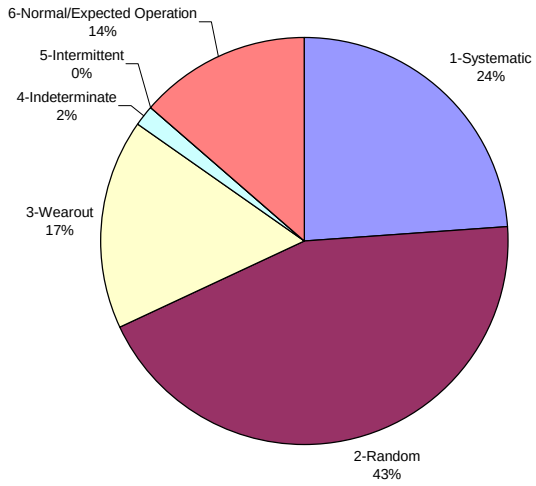


Figure 6-2. Anomaly Type Percentages of 1997 Orbital Anomalies

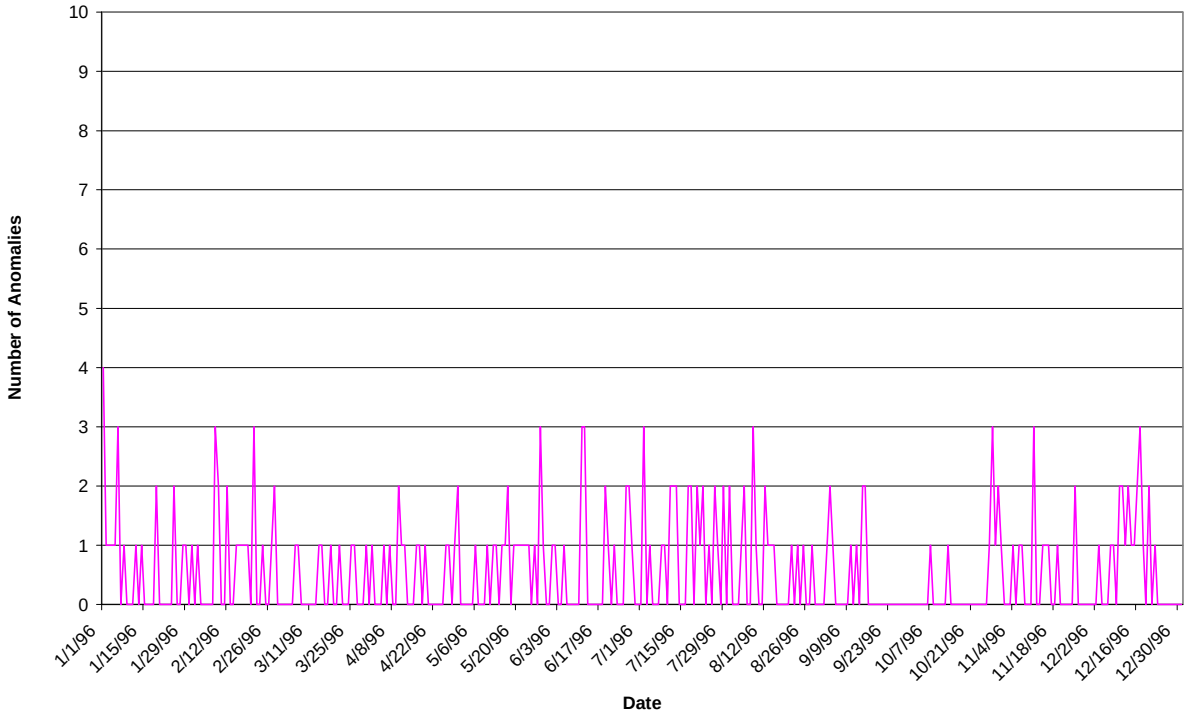


Figure 7. 1996 SOARS Anomaly Distribution by Occurrence Date

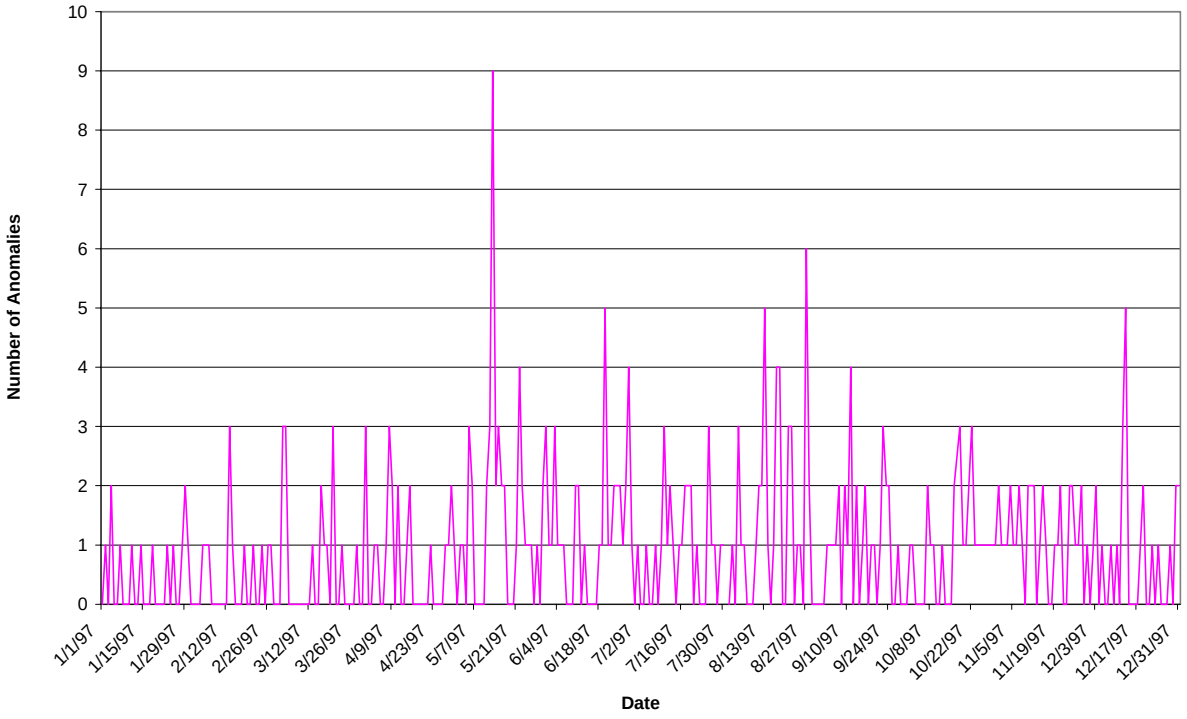


Figure 7-1. 1997 SOARS Anomaly Distribution by Occurrence Date

Note : Figures 7 and 7-1 Number of Anomalies were based on data reported in GSFC SOARS Database prior to June 1998.

GSFC Spacecraft Lifetime Data

Appendix E contains a performance summary for all GSFC spacecraft from 1960 through December 1997. Five spacecraft were added in 1996: FAST, POLAR, TOM-EP, Spartan 206, and Spartan 207; and five spacecraft were added in 1997: ACE, GOES-10, LEWIS, TRMM, and Spartan 201-04 for this report. The Spartan spacecraft were STS attached payloads which accumulate very little on-orbit time due to their short missions.

Figures 8 and 9 illustrate the historical performance of GSFC spacecraft. Figure 8 compares the actual years of service and the active on-orbit life (in years) with spacecraft designed life ("planned service") over four decades: 1960-1969, 1970-1979, 1980-1989, and 1990-1997. For the first three decades, GSFC spacecraft average lifetimes ranged from 1.3 to 3.9 and 1.75 to 4.7 times the design life for their useful and active lives, respectively. Note that the 1990-1997 data are incomplete at this time since most of these spacecraft are still active and their useful and active lives have not yet been established. Many of the 1980-1989 data are similarly incomplete as are a few data points from the earlier decades.

Figure 9 shows the percentage of GSFC spacecraft attaining 3 years, 4 to 5 years, 6 to 7 years, and 8 to 10 years of useful life versus the year of launch. This is essentially a "reliability growth curve." Early years showed fewer spacecraft attaining 3-year lifetimes, but these improved to 70 to 100 percent by the 1980's. Many of the early spacecraft were designed for only 0.25 to 1 year missions while modern spacecraft are commonly designed for 3 to 5 year missions.

GSFC Spacecraft Data by Science Type (1988 – 1997)

This is a new section from previous reports, providing a look at GSFC spacecraft performance by mission type, Earth or Space Science, over the past 10 years. Earth Science missions study the earth, its environment and the processes affecting global change and the distribution of natural resources; that is, they look "inward" towards the Earth. Space Science missions study the solar system, the galaxy and the universe; looking "outward" from the Earth.

Figure 10 provides summaries of the total number of operating spacecraft from 1988 to 1997 by Earth and Space Science and the Earth : Space Science spacecraft ratio by year. Over the ten year period, on average there were more than twice as many Earth Science Spacecraft as Space Science Spacecraft.

Figure 11 and 12 illustrate the anomaly distribution for Earth and Space Science Spacecraft in proportion to the total number (Earth plus Space Science) of spacecraft; the anomaly distributions were normalized to the total number of spacecraft to account for the greater numbers of Earth spacecraft.

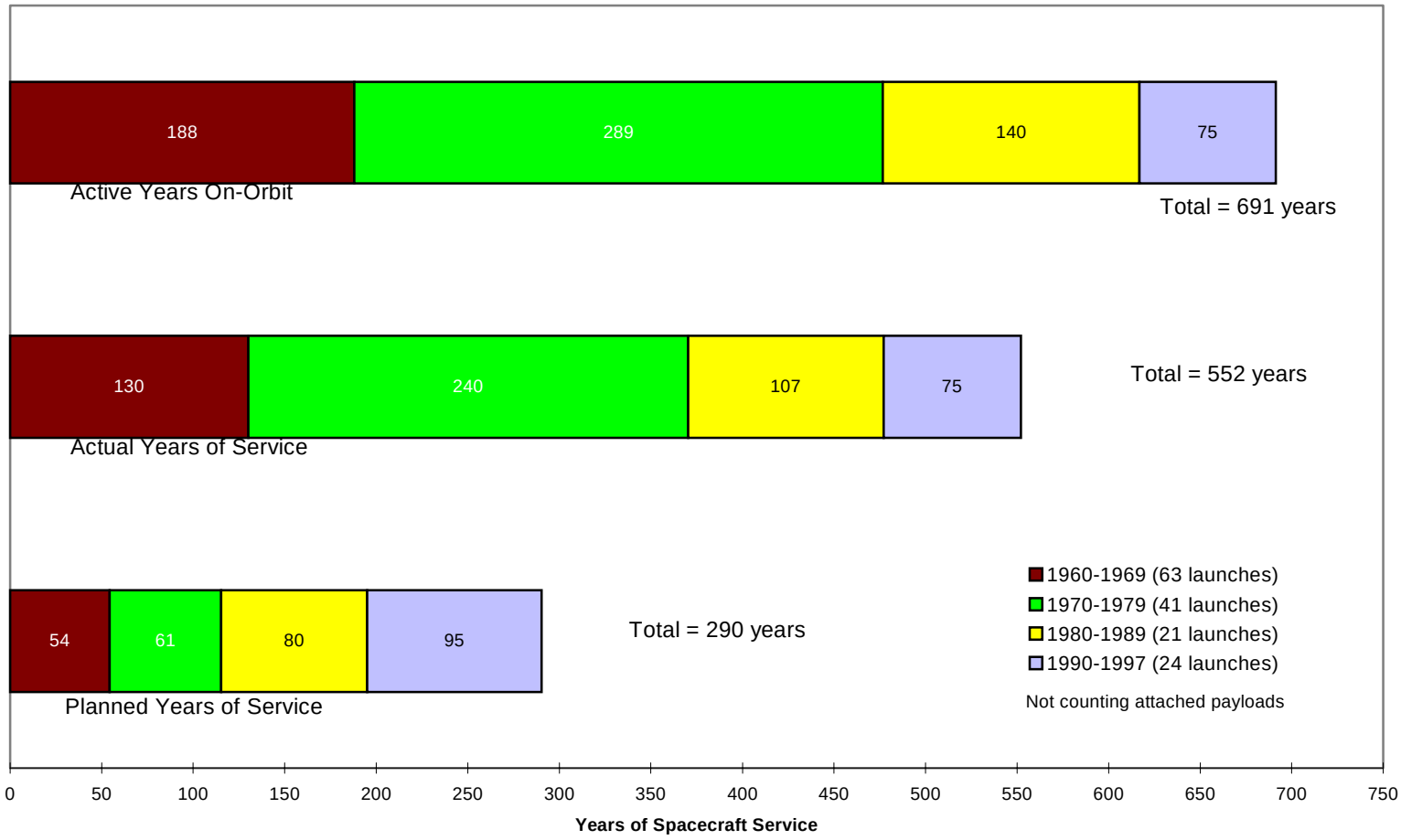


Figure 8. GODDARD SPACECRAFT LONGEVITY THROUGH 1997

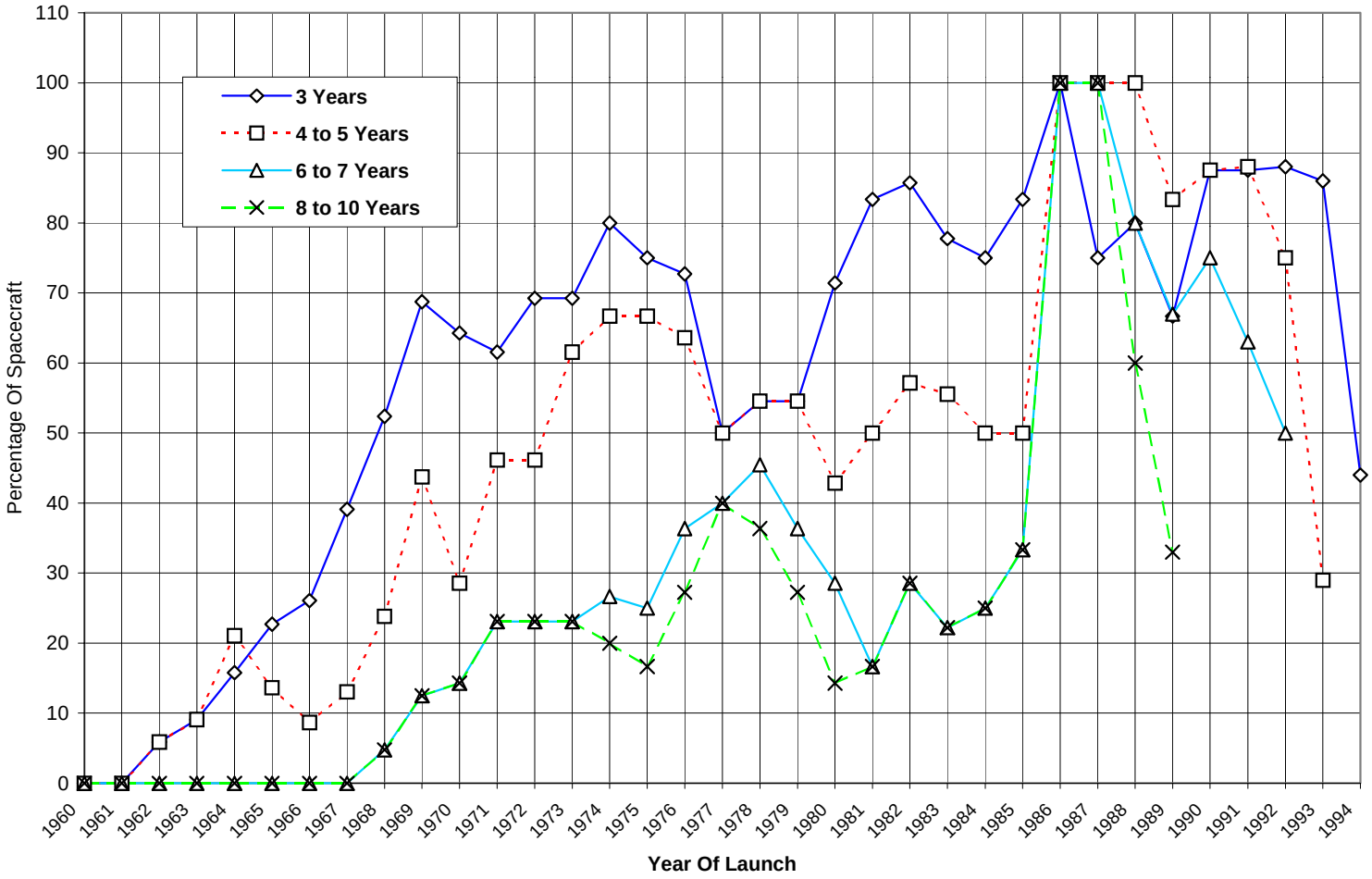
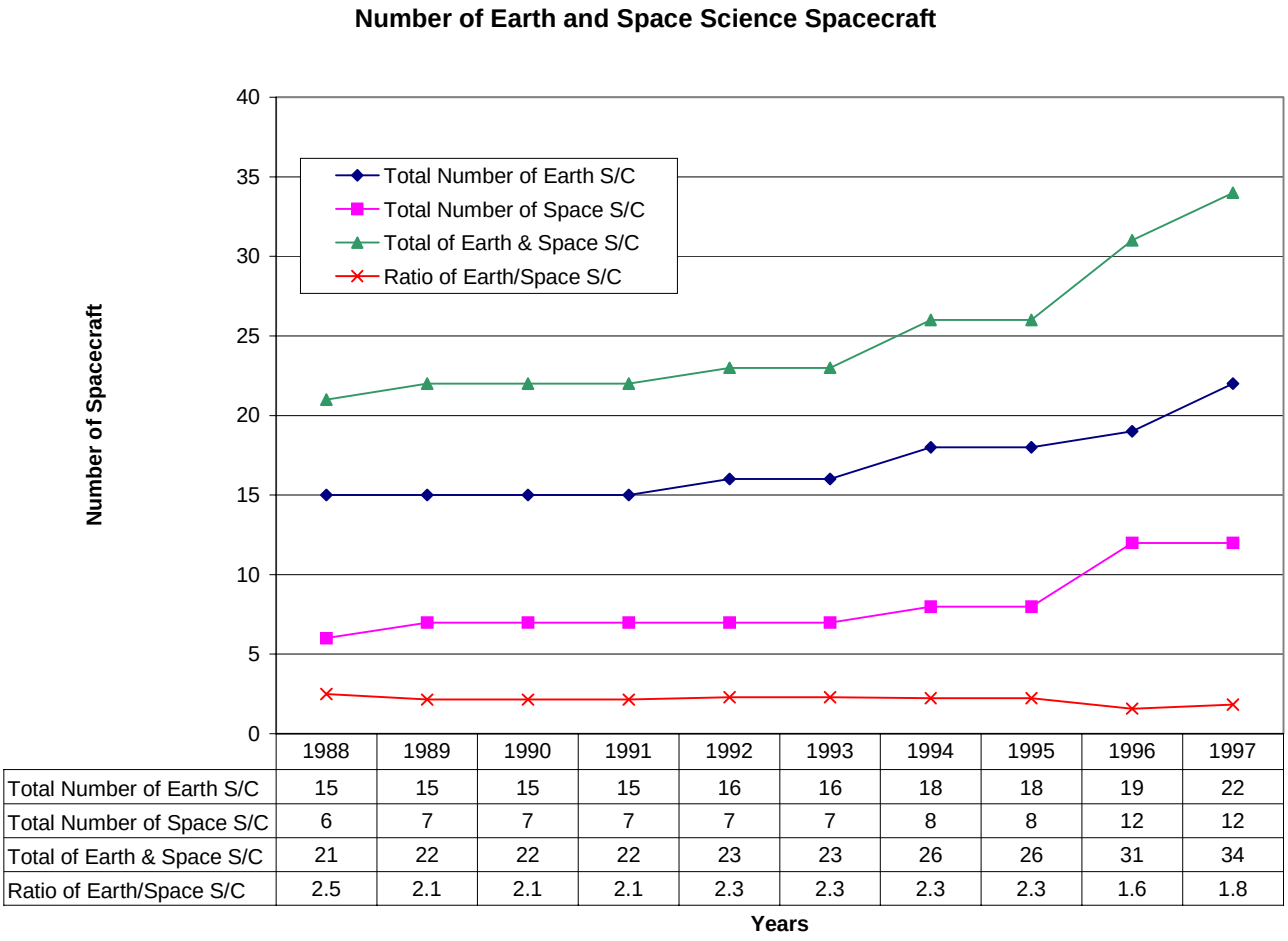
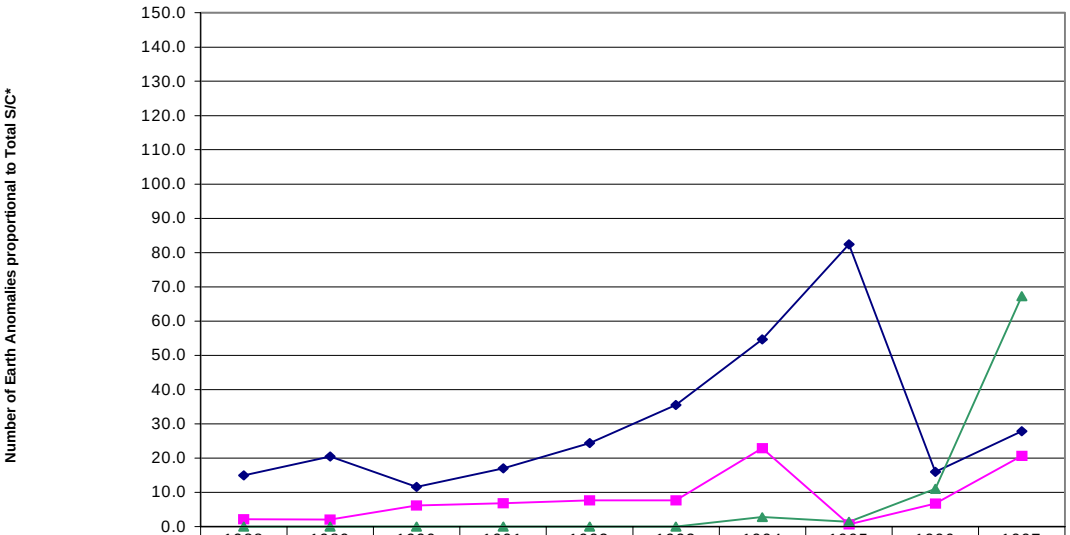


Figure 9. Success Rate For Achieving x Years Of Useful Life On-Orbit For GSFC Spacecraft (Three Year Moving Average Through 1997)



	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total Number of Earth S/C	15	15	15	15	16	16	18	18	19	22
Total Number of Space S/C	6	7	7	7	7	7	8	8	12	12
Total of Earth & Space S/C	21	22	22	22	23	23	26	26	31	34
Ratio of Earth/Space S/C	2.5	2.1	2.1	2.1	2.3	2.3	2.3	2.3	1.6	1.8

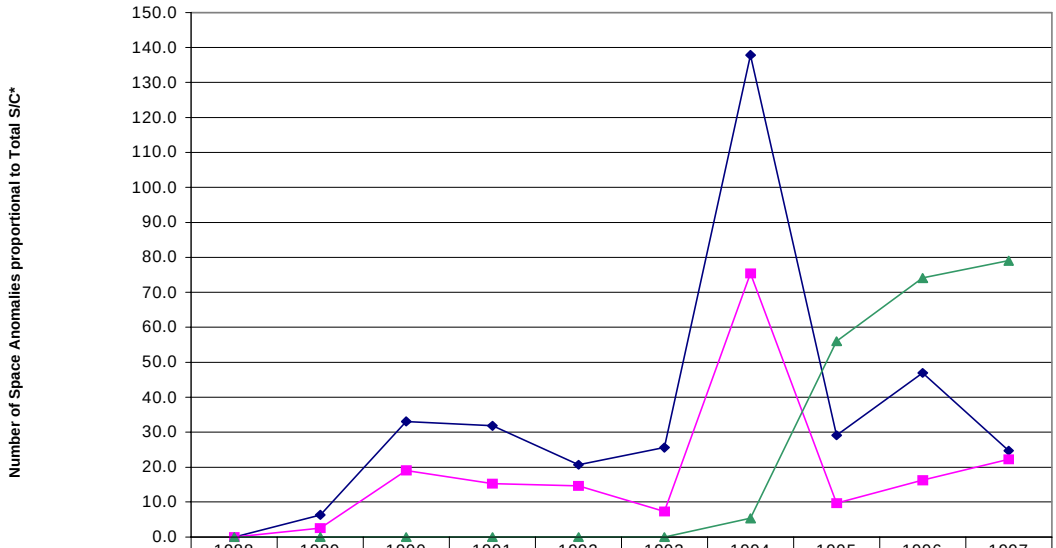
Figure 10. Number of Operating Spacecraft by Science and Years (1988 – 1997)



	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Design/Development	15.0	20.5	11.6	17.0	24.3	35.5	54.7	82.4	15.9	27.8
Operator/Command	2.1	2.0	6.1	6.8	7.7	7.7	22.8	0.7	6.7	20.7
Ground System/Communication	0.0	0.0	0.0	0.0	0.0	0.0	2.8	1.4	11.0	67.3

*Number of Anomalies based on data reported in GSFC SOARS Database prior to June 1998.
** Data for 1994 and after includes Ground System and Communication in addition to Orbital Anomalies.

Figure 11. Earth Science Spacecraft Anomalies proportional to Total Spacecraft by Type and Years (1988 – 1997)



	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Design/Development	0.0	6.4	33.1	31.8	20.7	25.6	137.8	29.1	47.0	24.7
Operator/Command	0.0	2.5	19.1	15.3	14.6	7.3	75.4	9.7	16.3	22.2
Ground System/Communication	0.0	0.0	0.0	0.0	0.0	0.0	5.4	56.0	74.1	79.1

*Number of Anomalies based on data reported in GSFC SOARS Database prior to June 1998.
** Data for 1994 and after includes Ground System and Communication in addition to Orbital Anomalies.

Figure 12. Space Science Spacecraft Anomalies proportional to Total Spacecraft by Type and Years (1988 –1997)

Notes: Design/Development denotes a failure of H/W or S/W on the satellite.
Operator/Command denotes an operator error or an incorrect satellite command
Ground System denotes a failure of H/W or S/W at the ground station.

Acronyms and Abbreviations

ABBREVIATION	MEANING
ACE	Advanced Composition Explorer
ACS	Attitude Control Subsystem
AR&C	Automated Rendezvous and Capture
BATSE	Burst and Transient Source Experiment
CCR	Cloud Cover Radiometer
CDHF	Central Data Handling Facility
CERES	Clouds and the Earth's Radiant Energy System
CGRO	Compton Gamma-Ray Observatory
CLAES	Cryogenic Limb Array Etalon Spectrometer
COMPTEL	Imaging Compton Telescope
COSTAR	Corrective Optics Space Telescope Axial Replacement
CPU	Central Processing Unit
DPU	Digital Processing Unit
DSN	Deep Space Network
EGRET	Energetic Gamma-Ray Experiment Telescope
EOC	Earth Observation Center
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
ESA	European Space Agency
EUVE	Extreme Ultraviolet Explorer
FAST	Fast Auroral Snapshot Explorer
FGS	Fine Guidance Sensors
FOC	Faint Object Camera
FOS	Faint Object Spectrograph
FOT	Flight Operations Team
GADACS	Global Positioning System Attitude Determination and Control Experiment
GGS	Global Geospace Science
GHRS	Goddard High Resolution Spectrograph
GIR	Goes Incident Report
GOES	Geostationary Operational Environment Satellite
GSFC	Goddard Space Flight Center
GT	Geomagnetic Tail
HAO	High Altitude Observatory
HST	Hubble Space Telescope
IAE	Inflatable Antenna Experiment
ICE	International Cometary Explorer
IMP	Interplanetary Monitoring Platform
ISAMS	Improved Stratospheric and Mesospheric Sounder
ISTP	International Solar Terrestrial Physics Program
IUE	International Ultraviolet Explorer
JPL	Jet Propulsion Laboratory
LEICA	Low Energy Ion Composition Analyzer
LIS	Lighting Imaging Sensor

ABBREVIATION	MEANING
MCP	Microchannel Plate
MFI	Magnetic Field Instrument
MSFC	Marshall Space Flight Center
MSU	Microwave Sounding Unit
MTPE	Mission To Planet Earth
NASA	National Aeronautical and Space Administration
NASDA	National Space Development Agency of Japan
NICMOS	Near Infrared Camera and Multi-Object Specrometer
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OAGS	Orbital Anomalies in Goddard Spacecraft
OAST	Office of Aeronautics and Space Technology
OBC	On Board Computer
OSSE	Oriented Scintillation Spectometer Experiment
PR	Precipitation Radar
RCS	Reaction Control System
REFLEX	Return Flux Experiment
RPP	Recorder Packet Processor
SADE	Solar Array Drive Electronics
SAMPEX	Solar Anomalous and Magnetospheric Particle Explorer
SAO	Smithsonian Astrophysical Observatory
SBH	Steinberg Experiment
SBUV	Solar Backscatter Ultraviolet Radiometer
SELODE	Solar Exposure to Laser Ordnance Device
SEU	Single Event Upset
SFSS	Spartan Flight Support Structure
SMEX	Small-Class Explorer
SMS	SWICS/MASS/STICS
SOAR	Spacecraft Orbital Anomaly Report
SOARS	Spacecraft Orbital Anomaly Reporting System
SOHO	Solar and Heliospheric Observatory
SPAM	Spartan Auxiliary Mounting
SPARTAN	Shuttle Pointed Autonomous Research Tool for Astronomy
SPRE	Spartan Packet Radio Experiment
SSU	Stratospheric Sounding Unit
STIS	Space Telescope Imaging Spectrograph
SWE	Solar Wind Experiment
SWICS	Solar Wind Ion Composition Spectrometer
TC & C	Timing, Control & Command
TDRS	Tracking and Data Relay Satellite
TEAMS	Technology Experiments for Advancing Missions in Space
TEXAS	Technology Experiment Augmenting Spartan
TIROS	Television Infrared Observing System
TLM & DH	Telemetry & Data Handling
TMI	TRMM Microwave Imager
TOMS-EP	Total Ozone Mapping Spectrometer – Earth Probe

ABBREVIATION	MEANING
TRMM	Tropical Rainfall Measuring Mission
UARS	Upper Atmosphere Research Satellite
UV	Ultraviolet
UVCS	Ultraviolet Coronal Spectrometer
VAM	Variable Access Memory
VGS	Video Guidance Sensor
VHF	Very High Frequency
VIRS	Visible Infrared Scanner
WFPC2	Wide Field/Planetary Camera 2
WLC	White Line Coronograph
XTE	X-Ray Timing Explorer

Appendix A. Classification of 1996 Anomalies (excluding additional data)

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
G	CGRO	96-G01	10/28/96 (04/05/91)	Other (900)	4	3	3	2
G	CGRO	96-G02	10/28/96 (04/05/91)	Other (900)	4	3	2	1
G	CGRO	96-G03	11/11/96 (04/05/91)	Other (900)	2	3	5	1
G	CGRO	96-G04	11/16/96 (04/05/91)	TC&C (100)	4	3	2	1
G	CGRO	96-G05	11/25/96 (04/05/91)	Other (900)	1	3	2	1
G	CGRO	96-G06	12/07/96 (04/05/91)	Other (900)	4	3	3	2
G	CGRO	96-G07	12/08/96 (04/05/91)	Other (900)	1	3	2	1
G	CGRO	96-G08	12/15/96 (04/05/91)	Other (900)	1	3	2	1
G	CGRO	96-G09	12/15/96 (04/05/91)	Other (900)	1	3	2	1
C	CGRO	96-C01	10/28/96 (04/05/91)	TLM&DH (200)	4	3	3	2
C	CGRO	96-C02	10/29/96 (04/05/91)	Other (900)	1	3	3	2
C	CGRO	96-C03	12/22/96 (04/05/91)	Other (900)	2	3	3	2
O	ERBS	9644	01/07/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9645	01/12/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9646	01/16/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9647	03/28/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9648	05/11/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9649	05/11/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9650	05/11/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9651	07/31/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9652	09/03/96 (10/05/84)	Instruments (700)	4	3	3	2
O	ERBS	9653	09/17/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9654	09/22/96 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9655	10/14/96 (10/05/84)	TC&C (100)	1	2	3	2
G	ERBS	96-G01	12/16/96 (10/05/84)	TLM&DH (200)	1	7	1	1
G	ERBS	96-G02	12/20/96 (10/05/84)	Other (900)	2	3	3	2
O	EUVE	9607	08/05/96 (06/07/92)	TC&C (100)	1	9	5	1
O	EVUE	9608	08/05/96 (06/07/92)	ACS (400)	2	3	2	2
G	EUVE	96-G01	06/11/96 (06/07/92)	TLM&DH (200)	2	2	1	1
G	EUVE	96-G02	12/11/96 (06/07/92)	Other (900)	1	3	3	2
G	EUVE	96-G03	12/11/96 (06/07/92)	Other (900)	1	3	3	2
O	GOES-8	9696	01/11/96 (04/13/94)	Instruments (700)	1	3	3	2
O	GOES-8	9697	01/29/96 (04/13/94)	ACS (400)	1	7	6	4
O	GOES-8	9698	02/15/96 (04/13/94)	ACS (400)	1	3	3	2
O	GOES-8	9699	02/15/96 (04/13/94)	ACS (400)	1	3	3	2
O	GOES-8	96100	02/20/96 (04/13/94)	Instruments (700)	1	6	3	3
O	GOES-8	96101	02/29/96 (04/13/94)	ACS (400)	4	6	3	3
O	GOES-8	96102	03/17/96 (04/13/94)	Instruments (700)	1	6	3	1
O	GOES-8	96103	03/20/96 (04/13/94)	Instruments (700)	1	7	6	4
O	GOES-8	96104	04/01/96 (04/13/94)	Instruments (700)	2	6	3	3
O	GOES-8	96105	04/18/96 (04/13/94)	ACS (400)	2	6	4	2
O	GOES-8	96106	04/26/96 (04/13/94)	ACS (400)	1	3	2	1
O	GOES-8	96107	08/25/96 (04/13/94)	TC&C (100)	1	5	3	2
O	GOES-8	96108	08/30/96 (04/13/94)	ACS (400)	1	9	5	6
O	GOES-8	96109	09/25/96 (04/13/94)	Instruments (700)	1	3	2	1
O	GOES-8	96110	10/01/96 (04/13/94)	ACS (400)	2	3	3	2
O	GOES-8	96111	12/01/96 (04/13/94)	Instruments (700)	2	6	3	3
O	GOES-9	9639	01/04/96 (05/23/95)	Other (900)	1	3	2	1
O	GOES-9	9640	01/11/96 (05/23/95)	Instruments (700)	1	3	3	2
O	GOES-9	9641	02/15/96 (05/23/95)	ACS (400)	1	6	3	2
O	GOES-9	9642	02/15/96 (05/23/95)	ACS (400)	1	6	3	2
O	GOES-9	9643	02/20/96 (05/23/95)	Instruments (700)	1	6	3	3
O	GOES-9	9644	02/29/96 (05/23/95)	ACS (400)	4	6	3	3
O	GOES-9	9645	03/17/96 (05/23/95)	Instruments (700)	1	6	3	1
O	GOES-9	9646	03/20/96 (05/23/95)	Instruments (700)	1	7	6	4
O	GOES-9	9647	04/12/96 (05/23/95)	Other (900)	2	2	4	1
O	GOES-9	9648	04/17/96 (05/23/95)	Other (900)	1	2	1	1

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
O	GOES-9	9649	06/22/96 (05/23/95)	Instruments (700)	2	2	4	2
O	GOES-9	9650	08/30/96 (04/13/94)	ACS (400)	1	9	5	6
O	GOES-9	9651	09/25/96 (05/23/95)	Instruments (700)	1	3	2	1
O	GOES-9	9652	10/13/96 (05/23/95)	TLM&DH (200)	1	2	1	1
O	HST	9698	01/19/96 (04/25/90)	TLM&DH (200)	2	3	5	3
O	HST	9699	07/13/96 (04/25/90)	TC&C (100)	2	6	2	2
O	HST	96100	10/30/96 (04/25/90)	ACS (400)	2	3	1	1
O	HST	96101	10/30/96 (04/25/90)	ACS (400)	2	3	2	2
O	HST	96102	12/14/96 (04/25/90)	ACS (400)	2	4	3	5
G	HST	96-G01	11/04/96 (04/25/90)	TLM&DH (200)	4	3	2	2
G	HST	96-G02	11/11/96 (04/25/90)	Other (900)	2	3	5	1
O	IUE	9648	02/18/96 (01/26/78)	Propulsion (600)	2	5	3	1
O	IUE	9649	03/06/96 (01/26/78)	ACS (400)	2	6	2	2
O	NOAA-9	9637	08/13/96 (12/12/84)	ACS (400)	1	2	1	1
O	NOAA-11	9629	12/17/96 (09/24/88)	TLM&DH (200)	1	2	1	1
O	NOAA-12	9620	06/12/96 (05/14/91)	TLM&DH (200)	2	8	3	3
O	NOAA-14	9611	01/25/96 (09/30/94)	Power (500)	1	9	5	2
G	NOAA-14	96-G01	08/12/96 (09/30/94)	TC&C (100)	2	3	2	1
O	POLAR	9601	02/24/96 (02/24/96)	Propulsion (600)	1	6	6	4
O	SAMPEX	96397	01/07/96 (07/03/92)	ACS (400)	1	7	6	2
O	SAMPEX	96398	01/28/96 (07/03/92)	ACS (400)	1	7	6	2
O	SAMPEX	96399	02/08/96 (07/03/92)	TLM&DH (200)	1	7	6	2
O	SAMPEX	96400	02/21/96 (07/03/92)	TC&C (100)	1	8	1	1
O	SAMPEX	96401	02/27/96 (07/03/92)	Instruments (700)	1	2	1	1
O	SAMPEX	96402	02/27/96 (07/03/92)	Instruments (700)	1	2	1	6
O	SAMPEX	96403	03/05/96 (07/03/92)	TC&C (100)	4	3	1	1
O	SAMPEX	96404	04/02/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96405	04/06/96 (07/03/92)	ACS (400)	1	7	6	1
O	SAMPEX	96406	04/09/96 (07/03/92)	TC&C (100)	1	8	1	6
O	SAMPEX	96407	04/18/96 (07/03/92)	Instruments (700)	1	2	1	6
O	SAMPEX	96408	04/19/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96409	04/24/96 (07/03/92)	ACS (400)	1	3	1	1
O	SAMPEX	96410	04/24/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96411	05/04/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96412	05/19/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96413	05/25/96 (07/03/92)	TC&C (100)	1	8	1	6
O	SAMPEX	96414	05/27/96 (07/03/92)	Instruments (700)	1	2	1	6
O	SAMPEX	96415	05/30/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96416	06/01/96 (07/03/92)	Instruments (700)	1	3	1	1
O	SAMPEX	96417	06/04/96 (07/03/92)	TLM&DH (200)	1	3	3	6
O	SAMPEX	96418	06/12/96 (07/03/92)	ACS (400)	1	7	6	1
O	SAMPEX	96419	06/12/96 (07/03/92)	ACS (400)	1	3	3	2
O	SAMPEX	96420	06/13/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96421	06/13/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96422	06/17/96 (07/03/92)	ACS (400)	1	7	6	1
O	SAMPEX	96423	06/19/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96424	06/21/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96425	06/25/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96426	06/26/96 (07/03/92)	ACS (400)	1	7	1	6
O	SAMPEX	96427	06/29/96 (07/03/92)	ACS (400)	1	7	1	6
O	SAMPEX	96428	06/30/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96429	06/30/96 (07/03/92)	ACS (400)	1	7	1	6
O	SAMPEX	96430	07/03/96 (07/03/92)	Instruments (700)	1	7	1	6
O	SAMPEX	96431	07/04/96 (07/03/92)	ACS (400)	1	3	3	2
O	SAMPEX	96432	07/14/96 (07/03/92)	ACS (400)	1	7	1	6
O	SAMPEX	96433	07/19/96 (07/03/92)	ACS (400)	1	3	3	2
O	SAMPEX	96434	07/23/96 (07/03/92)	TC&C (100)	1	8	1	1
O	SAMPEX	96435	07/29/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96436	08/05/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96437	08/05/96 (07/03/92)	Instruments (700)	1	2	3	2

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
O	SAMPEX	96438	08/05/96 (07/03/92)	TC&C (100)	1	2	3	2
O	SAMPEX	96439	08/05/96 (07/03/92)	TC&C (100)	1	8	1	1
O	SAMPEX	96440	08/08/96 (07/03/92)	Instruments (700)	1	2	3	2
O	SAMPEX	96441	08/17/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96442	08/19/96 (07/03/92)	TLM&DH (200)	1	3	3	6
O	SAMPEX	96443	08/20/96 (07/03/92)	ACS (400)	1	2	3	6
O	SAMPEX	96444	08/26/96 (07/03/92)	ACS (400)	1	2	3	6
O	SAMPEX	96445	09/04/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96446	09/09/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96447	09/13/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96448	09/14/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96449	09/18/96 (07/03/92)	Instruments (700)	1	3	1	6
O	SAMPEX	96450	09/30/96 (07/03/92)	Power (200)	1	3	1	6
O	SAMPEX	96451	10/01/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96452	10/18/96 (07/03/92)	ACS (400)	1	3	1	6
O	SAMPEX	96453	10/28/96 (07/03/92)	TC&C (100)	1	8	1	1
O	SAMPEX	96454	10/29/96 (07/03/92)	ACS (400)	1	3	3	2
O	SAMPEX	96455	11/07/96 (07/03/92)	TC&C (100)	1	8	1	1
O	SAMPEX	96456	11/22/96 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	96457	12/11/96 (07/03/92)	Instruments (700)	1	3	1	6
O	SAMPEX	96458	12/15/96 (07/03/92)	ACS (400)	1	8	1	1
O	SAMPEX	96459	12/25/96 (07/03/92)	ACS (400)	1	3	3	2
O	SAMPEX	96460	12/29/96 (07/03/92)	ACS (400)	1	3	3	2
O	SAMPEX	96461	12/31/96 (07/03/92)	Instruments (700)	1	3	3	6
G	SAMPEX	96-G01	01/19/96 (07/03/92)	TLM&DH (200)	2	3	2	2
O	SPARTAN 206	9601	01/12/96 (01/11/96)	TLM&DH (200)	1	6	2	2
O	TDRS-1	9674	01/29/96 (04/04/83)	TC&C (100)	2	6	3	3
O	TDRS-1	9675	05/20/96 (04/04/83)	TC&C (100)	4	2	1	1
O	TDRS-1	9676	06/04/96 (04/04/83)	TC&C (100)	2	5	3	2
O	TDRS-1	9677	06/07/96 (04/04/83)	TC&C (100)	2	5	3	2
O	TDRS-1	9678	07/29/96 (04/04/83)	TC&C (100)	3	5	3	2
O	TDRS-1	9679	11/07/96 (04/04/83)	TC&C (100)	1	5	3	2
G	TDRS-4	96-G01	12/12/96 (03/13/89)	Other (900)	1	3	2	1
G	TDRS-4	96-G02	12/13/96 (03/13/89)	Other (900)	1	3	2	1
G	TDRS-6	96-G01	10/31/96 (01/13/93)	TLM&DH (200)	1	2	1	1
G	TDRS-6	96-G02	12/10/96 (01/13/93)	Other (900)	2	3	2	1
O	TDRS-7	9605	11/07/96 (07/13/95)	Other (900)	4	3	3	2
G	TDRS-7	96-G01	11/15/96 (07/13/95)	TLM&DH (200)	4	3	3	2
O	TOMS-EP	9601	07/02/96 (07/02/96)	ACS (400)	2	4	2	2
O	TOMS-EP	9602	07/02/96 (07/02/96)	TC&C (100)	2	7	5	4
O	TOMS-EP	9603	07/02/96 (07/02/96)	TC&C (100)	2	7	6	4
O	TOMS-EP	9604	07/12/96 (07/02/96)	ACS (400)	2	4	2	2
O	TOMS-EP	9605	07/17/96 (07/02/96)	TC&C (100)	2	8	2	1
O	TOMS-EP	9606	07/22/96 (07/02/96)	ACS (400)	2	6	2	3
O	TOMS-EP	9607	10/07/96 (07/02/96)	Other (900)	2	3	3	2
G	TOMS-EP	96-G01	07/21/96 (07/02/96)	Other (900)	2	3	3	2
G	TOMS-EP	96-G02	07/27/96 (07/02/96)	Other (900)	2	3	2	1
G	TOMS-EP	96-G03	09/03/96 (07/02/96)	Other (900)	2	3	3	2
G	TOMS-EP	96-G04	11/14/96 (07/02/96)	Other (900)	2	3	3	2
G	TOMS-EP	96-G05	12/17/96 (07/02/96)	Other (900)	2	3	3	2
O	UARS	9620	02/02/96 (09/12/91)	ACS (400)	1	2	1	1
O	UARS	9621	07/20/96 (09/12/91)	Power (500)	1	2	1	1
G	UARS	96-G01	01/01/96 (09/12/91)	TLM&DH (200)	1	3	2	1
G	UARS	96-G02	01/29/96 (09/12/91)	Other (900)	4	3	2	1
G	UARS	96-G03	03/21/96 (09/12/91)	Other (900)	4	3	2	1
G	UARS	96-G04	10/27/96 (09/12/91)	TLM&DH (200)	1	3	3	1
G	UARS	96-G05	11/06/96 (09/12/91)	TLM&DH (200)	1	3	3	2
G	UARS	96-G06	11/19/96 (09/12/91)	Other (900)	1	3	3	2
G	UARS	96-G07	12/03/96 (09/12/91)	Other (900)	4	3	2	1
O	XTE	9603	01/01/96 (12/30/95)	ACS (400)	2	7	6	5

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
O	XTE	9604	01/01/96 (12/30/95)	TLM&DH (200)	2	6	2	3
O	XTE	9605	01/01/96 (12/30/95)	Other (900)	1	6	2	3
O	XTE	9606	01/02/96 (12/30/95)	Other (900)	2	6	2	3
O	XTE	9607	01/03/96 (12/30/95)	Instruments (700)	2	6	6	4
O	XTE	9608	01/05/96 (12/30/95)	Other (900)	2	6	2	3
O	XTE	9609	01/06/96 (12/30/95)	TLM&DH (200)	1	6	2	2
O	XTE	9610	01/06/96 (12/30/95)	Other (900)	2	6	2	3
O	XTE	9611	01/06/96 (12/30/95)	Instruments (700)	2	6	2	3
O	XTE	9612	01/06/96 (12/30/95)	Other (900)	2	3	2	2
O	XTE	9613	01/14/96 (12/30/95)	Instruments (700)	1	3	2	2
O	XTE	9614	01/25/96 (12/30/95)	Other (900)	2	2	1	1
O	XTE	9615	01/28/96 (12/30/95)	ACS (400)	2	6	2	3
O	XTE	9616	02/09/96 (12/30/95)	ACS (400)	2	6	2	3
O	XTE	9617	02/09/96 (12/30/95)	ACS (400)	2	6	2	3
O	XTE	9618	02/12/96 (12/30/95)	Other (900)	4	3	2	1
O	XTE	9619	02/17/96 (12/30/95)	Power (500)	2	3	2	2
O	XTE	9620	02/19/96 (12/30/95)	Instruments (700)	2	6	1	1
O	XTE	9621	02/21/96 (12/30/95)	Other (900)	2	3	2	2
O	XTE	9622	02/21/96 (12/30/95)	Other (900)	2	3	2	2
O	XTE	9623	03/26/96 (12/30/95)	ACS (400)	1	7	4	2
O	XTE	9624	04/05/96 (12/30/95)	ACS (400)	2	7	6	4
O	XTE	9625	04/07/96 (12/30/95)	Thermal (300)	1	9	1	1
O	XTE	9626	04/19/96 (12/30/95)	ACS (400)	1	6	6	4
O	XTE	9627	04/29/96 (12/30/95)	ACS (400)	1	7	1	1
O	XTE	9628	05/15/96 (12/30/95)	ACS (400)	2	6	1	1
O	XTE	9629	05/16/96 (12/30/95)	ACS (400)	1	6	1	1
O	XTE	9630	05/21/96 (12/30/95)	ACS (400)	1	6	2	3
O	XTE	9631	05/28/96 (12/30/95)	Other (900)	1	6	2	3
O	XTE	9632	06/01/96 (12/30/95)	TLM&DH (200)	1	6	2	3
O	XTE	9633	06/02/96 (12/30/95)	ACS (400)	1	2	4	1
O	XTE	9634	06/12/96 (12/30/95)	Other (900)	1	2	4	1
O	XTE	9635	06/12/96 (12/30/95)	Other (900)	1	2	2	1
O	XTE	9636	06/20/96 (12/30/95)	Power (500)	1	6	2	3
O	XTE	9637	06/22/96 (12/30/95)	Power (500)	2	6	5	1
O	XTE	9638	06/28/96 (12/30/95)	Other (900)	1	2	4	1
O	XTE	9639	08/08/96 (12/30/95)	Other (900)	1	2	4	1
O	XTE	9640	08/12/96 (12/30/95)	Other (900)	1	6	2	3
O	XTE	9641	08/21/96 (12/30/95)	Power (500)	1	6	2	3
O	XTE	9642	08/23/96 (12/30/95)	Power (500)	1	6	2	3
O	XTE	9643	09/04/96 (12/30/95)	ACS (400)	1	6	2	3
O	XTE	9644	09/15/96 (12/30/95)	Other (900)	1	3	2	2
G	XTE	96-G01	01/31/96 (12/30/95)	Other (900)	2	3	3	1
G	XTE	96-G02	02/08/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G03	02/08/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G04	02/08/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G05	02/12/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G06	02/16/96 (12/30/95)	Other (900)	2	3	1	3
G	XTE	96-G07	02/21/96 (12/30/95)	Other (900)	1	3	1	2
G	XTE	96-G08	02/21/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G09	02/28/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G10	02/28/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G11	03/07/96 (12/30/95)	Other (900)	1	3	3	3
G	XTE	96-G12	03/14/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G13	03/15/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G14	03/18/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G15	03/25/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G16	03/30/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G17	04/10/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G18	04/10/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G19	04/11/96 (12/30/95)	Other (900)	1	3	3	2

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
G	XTE	96-G20	04/16/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G21	04/26/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G22	04/27/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G23	04/30/96 (12/30/95)	TLM&DH (200)	1	3	3	2
G	XTE	96-G24	04/30/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G25	05/06/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G26	05/10/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G27	05/12/96 (12/30/95)	TLM&DH (200)	1	3	2	1
G	XTE	96-G28	05/17/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G29	05/17/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G30	05/19/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G31	05/22/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G32	05/23/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G33	05/24/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G34	05/26/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G35	05/28/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G36	05/28/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G37	05/29/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G38	06/05/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G39	06/11/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G40	06/11/96 (12/30/95)	Other (900)	1	6	1	3
G	XTE	96-G41	06/26/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G42	06/26/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G43	06/27/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G44	06/27/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G45	07/04/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G46	07/08/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G47	07/09/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G48	07/11/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G49	07/11/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G50	07/12/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G51	07/13/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G52	07/17/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G53	07/18/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G54	07/20/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G55	07/22/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G56	07/24/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G57	07/26/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G58	07/29/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G59	07/31/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G60	07/31/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G61	08/04/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G62	08/04/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G63	08/14/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G64	08/15/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G65	08/25/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G66	08/28/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G67	09/02/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G68	09/03/96 (12/30/95)	Other (900)	1	3	2	1
G	XTE	96-G69	09/10/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G70	09/12/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G71	09/14/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G72	09/14/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G73	09/15/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G74	09/19/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G75	11/11/96 (12/30/95)	Other (900)	4	3	5	1
G	XTE	96-G76	11/25/96 (12/30/95)	Other (900)	1	3	3	2
G	XTE	96-G77	12/16/96 (12/30/95)	Other (900)	1	9	5	2
G	XTE	96-G78	12/17/96 (12/30/95)	TLM&DH (200)	2	3	3	2
C	XTE	96-C01	02/15/96 (12/30/95)	Other (900)	1	3	3	2

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
C	XTE	96-C02	06/19/96 (12/30/95)	Other (900)	1	3	3	2
C	XTE	96-C03	07/18/96 (12/30/95)	Other (900)	1	3	2	1
C	XTE	96-C04	07/26/96 (12/30/95)	Other (900)	1	3	3	2
C	XTE	96-C05	12/18/96 (12/30/95)	Other (900)	1	3	3	2

Appendix A-1. Classification of 1997 Anomalies (excluding additional data)

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
G	CGRO	97-G10	01/25/97 (04/05/91)	Other (900)	4	7	6	4
G	CGRO	97-G11	01/2997 (04/05/91)	Other (900)	4	3	3	1
G	CGRO	97-G12	03/23/97 (04/05/91)	Other (900)	4	3	2	1
G	CGRO	97-G13	04/03/97 (04/05/91)	Other (900)	4	7	2	1
G	CGRO	97-G14	04/08/97 (04/05/91)	Other (900)	4	7	2	1
G	CGRO	97-G15	05/13/97 (04/05/91)	Other (900)	4	3	3	1
G	CGRO	97-G16	05/22/97 (04/05/91)	Other (900)	4	3	3	1
G	CGRO	97-G17	05/22/97 (04/05/91)	Other (900)	4	3	3	1
G	CGRO	97-G18	05/23/97 (04/05/91)	Other (900)	4	7	2	1
G	CGRO	97-G19	05/28/97 (04/05/91)	TLM&DH (200)	4	3	3	2
G	CGRO	97-G20	06/03/97 (04/05/91)	TLM&DH (200)	2	7	6	2
G	CGRO	97-G21	06/27/97 (04/05/91)	TLM&DH (200)	4	7	2	2
G	CGRO	97-G22	06/28/97 (04/05/91)	TLM&DH (200)	4	7	6	2
G	CGRO	97-G23	07/15/97 (04/05/91)	Other (900)	4	7	2	2
G	CGRO	97-G24	07/30/97 (04/05/91)	Other (900)	2	7	6	2
G	CGRO	97-G25	09/07/97 (04/05/91)	Other (900)	2	7	6	4
G	CGRO	97-G26	09/15/97 (04/05/91)	TLM&DH (200)	4	7	6	4
G	CGRO	97-G27	09/18/97 (04/05/91)	TLM&DH (200)	4	2	3	2
G	CGRO	97-G28	10/12/97 (04/05/91)	TLM&DH (200)	4	2	2	2
G	CGRO	97-G29	10/27/97 (04/05/91)	TLM&DH (200)	1	7	2	2
G	CGRO	97-G30	10/31/97 (04/05/91)	TLM&DH (200)	2	7	6	4
G	CGRO	97-G31	11/12/97 (04/05/91)	Other (900)	4	7	2	2
G	CGRO	97-G32	11/27/97 (04/05/91)	Other (900)	4	2	3	2
G	CGRO	97-G33	12/03/97 (04/05/91)	Other (900)	4	7	6	4
G	CGRO	97-G34	12/18/97 (04/05/91)	TLM&DH (200)	4	3	3	2
G	CGRO	97-G35	12/19/97 (04/05/91)	TC&C (100)	4	7	2	2
C	CGRO	97-C04	02/21/97 (04/05/91)	Other (900)	3	7	6	4
C	CGRO	97-C05	03/20/97 (04/05/91)	Other (900)	4	3	6	4
C	CGRO	97-C06	04/07/97 (04/05/91)	TLM&DH (200)	4	7	6	4
C	CGRO	97-C07	05/24/97 (04/05/91)	Other (900)	4	7	6	4
C	CGRO	97-C08	06/25/97 (04/05/91)	TLM&DH (200)	4	7	6	2
C	CGRO	97-C09	08/27/97 (04/05/91)	TLM&DH (200)	2	7	2	2
C	CGRO	97-C10	08/28/97 (04/05/91)	TLM&DH (200)	4	3	3	2
C	CGRO	97-C11	10/22/97 (04/05/91)	TLM&DH (200)	2	8	2	2
C	CGRO	97-C12	11/05/97 (04/05/91)	Other (900)	2	7	2	2
C	CGRO	97-C13	11/30/97 (04/05/91)	TLM&DH (200)	4	3	3	2
C	CGRO	97-C14	12/08/97 (04/05/91)	TLM&DH (200)	4	3	3	2
C	CGRO	97-C15	12/22/97 (04/05/91)	TLM&DH (200)	4	7	2	2
O	ERBS	9756	01/07/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9757	02/19/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9758	03/15/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9759	03/31/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9760	04/11/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9761	04/13/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9762	04/25/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9763	05/23/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9764	05/28/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9765	05/31/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9766	07/18/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9767	09/24/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9768	09/24/97 (10/05/84)	TLM&DH (200)	2	3	3	2
O	ERBS	9769	11/27/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9770	12/23/97 (10/05/84)	TC&C (100)	1	2	3	2
O	ERBS	9771	12/27/97 (10/05/84)	TC&C (100)	1	2	3	2
G	ERBS	97-G03	01/23/97 (10/05/84)	Other (900)	1	2	3	2
G	ERBS	97-G04	02/05/97 (10/05/84)	TLM&DH (200)	2	2	3	2

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
G	ERBS	97-G05	03/28/97 (10/05/84)	TLM&DH (200)	2	7	2	2
G	ERBS	97-G06	05/13/97 (10/05/84)	Other (900)	2	7	2	2
G	ERBS	97-G07	06/20/97 (10/05/84)	Other (900)	2	7	6	2
G	ERBS	97-G08	06/28/97 (10/05/84)	TLM&DH (200)	2	3	3	2
G	ERBS	97-G09	06/21/97 (10/05/84)	TLM&DH (200)	2	8	3	2
G	ERBS	97-G10	08/04/97 (10/05/84)	Other (900)	2	7	2	2
G	ERBS	97-G11	08/04/97 (10/05/84)	Other (900)	1	7	6	4
G	ERBS	97-G12	08/12/97 (10/05/84)	Other (900)	2	7	2	2
G	ERBS	97-G13	08/18/97 (10/05/84)	Other (900)	1	7	2	2
G	ERBS	97-G14	08/18/97 (10/05/84)	Other (900)	1	7	2	2
G	ERBS	97-G15	08/22/97 (10/05/84)	Other (900)	2	7	2	2
G	ERBS	97-G16	08/22/97 (10/05/84)	TLM&DH (200)	1	3	3	2
G	ERBS	97-G17	08/24/97 (10/05/84)	Other (900)	2	2	3	2
G	ERBS	97-G18	09/13/97 (10/05/84)	TLM&DH (200)	2	3	2	2
G	ERBS	97-G19	09/22/97 (10/05/84)	TLM&DH (200)	1	7	2	2
G	ERBS	97-G20	10/09/97 (10/05/84)	Other (900)	4	7	2	2
G	ERBS	97-G21	10/18/97 (10/05/84)	Other (900)	1	8	3	2
G	ERBS	97-G22	10/22/97 (10/05/84)	Other (900)	1	8	3	2
G	ERBS	97-G23	10/23/97 (10/05/84)	TLM&DH (200)	2	2	3	2
G	ERBS	97-G24	10/30/97 (10/05/84)	Other (900)	2	8	3	2
C	ERBS	97-C01	03/16/97 (10/05/84)	TLM&DH (200)	1	7	1	1
C	ERBS	97-C02	06/20/97 (10/05/84)	TC & C (100)	1	3	3	2
C	ERBS	97-C03	06/20/97 (10/05/84)	TLM&DH (200)	2	3	3	2
C	ERBS	97-C04	07/19/97 (10/05/84)	Other (900)	2	3	3	2
O	EUVE	9709	01/07/97 (06/07/92)	TLM&DH (200)	4	2	3	2
O	EUVE	9710	01/11/97 (06/07/92)	TLM&DH (200)	2	2	3	3
O	EUVE	9711	02/27/97 (06/07/92)	TLM&DH (200)	2	2	3	3
G	EUVE	97-G04	03/04/97 (06/07/92)	Other (900)	2	7	2	2
G	EUVE	97-G05	03/31/97 (06/07/92)	Other (900)	1	7	6	4
G	EUVE	97-G06	04/22/97 (06/07/92)	Other (900)	1	7	6	4
G	EUVE	97-G07	05/12/97 (06/07/92)	TC&C (100)	1	8	3	2
G	EUVE	97-G08	05/15/97 (06/07/92)	Other (900)	2	2	3	2
G	EUVE	97-G09	06/22/97 (06/07/92)	TLM&DH (200)	2	3	3	2
G	EUVE	97-G10	07/19/97 (06/07/92)	Other (900)	1	7	6	4
G	EUVE	97-G11	08/11/97 (06/07/92)	Other (900)	1	7	6	4
G	EUVE	97-G12	08/22/97 (06/07/92)	Other (900)	2	3	3	2
G	EUVE	97-G13	09/10/97 (06/07/92)	Other (900)	1	7	2	2
G	EUVE	97-G14	10/18/97 (06/07/92)	Other (900)	4	2	3	2
G	EUVE	97-G15	10/31/97 (06/07/92)	Other (900)	1	7	2	2
G	EUVE	97-G16	11/11/97 (06/07/92)	Other (900)	2	7	2	2
C	EUVE	97-C01	01/30/97 (06/07/92)	Other (900)	4	3	3	2
C	EUVE	97-C02	06/03/97 (06/07/92)	TLM&DH (200)	2	2	3	3
C	EUVE	97-C03	07/04/97 (06/07/92)	TLM&DH (200)	2	2	3	2
C	EUVE	97-C04	08/02/97 (06/07/92)	TLM&DH (200)	1	3	3	2
C	EUVE	97-C05	10/07/97 (06/07/92)	Other (900)	1	3	3	2
C	EUVE	97-C06	10/16/97 (06/07/92)	Other (900)	4	7	2	2
C	EUVE	97-C07	10/22/97 (06/07/92)	TLM&DH (200)	2	3	3	2
C	EUVE	97-C08	11/15/97 (06/07/92)	Other (900)	1	3	3	2
C	EUVE	97-C09	11/20/97 (06/07/92)	Other (900)	1	7	2	2
C	EUVE	97-C10	11/25/97 (06/07/92)	TLM&DH (200)	2	3	3	2
O	FAST	9701	01/02/97 (08/21/96)	TLM&DH (200)	2	3	1	1
O	FAST	9702	05/05/97 (08/21/96)	TLM&DH (200)	2	3	1	1
O	FAST	9703	05/17/97 (08/21/96)	TLM&DH (200)	4	3	1	2
G	FAST	97-G01	04/11/97 (08/21/96)	TLM&DH (200)	2	2	2	2
G	FAST	97-G02	04/18/97 (08/21/96)	TLM&DH (200)	2	2	2	2
G	FAST	97-G03	05/02/97 (08/21/96)	TLM&DH (200)	2	2	2	4
G	FAST	97-G04	05/12/97 (08/21/96)	Other (900)	2	3	1	1
G	FAST	97-G05	05/14/97 (08/21/96)	Other (900)	2	3	1	1
G	FAST	97-G06	05/16/97 (08/21/96)	Other (900)	2	7	2	2
G	FAST	97-G07	05/21/97 (08/21/96)	Propulsion (600)	1	2	2	2
G	FAST	97-G08	06/03/97 (08/21/96)	TLM&DH (200)	2	2	2	2
G	FAST	97-G09	06/19/97 (08/21/96)	Other (900)	2	2	2	2

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
G	FAST	97-G10	06/26/97 (08/21/96)	TLM&DH (200)	1	3	4	2
G	FAST	97-G11	07/25/97 (08/21/96)	TLM&DH (200)	2	2	2	2
G	FAST	97-G12	08/04/97 (08/21/96)	Other (900)	1	3	4	2
G	FAST	97-G13	08/12/97 (08/21/96)	Other (900)	1	3	4	2
G	FAST	97-G14	08/14/97 (08/21/96)	Other (900)	2	2	2	2
G	FAST	97-G15	08/18/97 (08/21/96)	Other (900)	2	2	2	2
G	FAST	97-G16	11/11/97 (08/21/96)	TLM&DH (200)	2	2	2	2
O	GOES-8	97112	01/09/97 (04/13/94)	ACS (400)	2	5	3	2
O	GOES-8	97113	01/11/97 (04/13/94)	ACS (400)	3	6	3	3
O	GOES-8	97114	02/21/97 (04/13/94)	Thermal (300)	1	6	4	3
O	GOES-8	97115	02/25/97 (04/13/94)	ACS (400)	2	6	5	1
O	GOES-8	97116	03/05/97 (04/13/94)	ACS (400)	2	6	4	2
O	GOES-8	97117	05/02/97 (04/13/94)	Instruments (700)	2	5	1	2
O	GOES-8	97118	07/14/97 (04/13/94)	Instruments (700)	2	6	3	3
O	GOES-8	97119	10/15/97 (04/13/94)	Instruments (700)	2	6	4	3
O	GOES-8	97120	10/29/97 (04/13/94)	Instruments (700)	2	6	4	3
O	GOES-8	97121	11/02/97 (04/13/94)	Instruments (700)	2	6	3	3
O	GOES-8	97122	12/16/97 (04/13/94)	Instruments (700)	1	6	3	3
O	GOES-9	9753	03/18/97 (05/23/95)	TLM&DH (200)	1	6	4	1
O	GOES-9	9754	03/20/97 (05/23/95)	ACS (400)	1	6	4	3
O	GOES-9	9755	09/26/97 (05/23/95)	ACS (400)	1	3	3	3
O	GOES-9	9756	11/06/97 (05/23/95)	ACS (400)	1	6	4	3
O	GOES-9	9757	12/16/97 (05/23/95)	Instruments (700)	1	6	4	3
O	GOES-10	9701	04/27/97 (04/25/97)	Thermal (300)	2	3	1	1
O	GOES-10	9702	04/29/97 (04/25/97)	Propulsion (600)	2	3	4	1
O	GOES-10	9703	05/06/97 (04/25/97)	ACS (400)	2	3	1	1
O	GOES-10	9704	05/11/97 (04/25/97)	Other (900)	2	3	1	1
O	GOES-10	9705	05/11/97 (04/25/97)	Thermal (300)	2	3	1	1
O	GOES-10	9706	05/13/97 (04/25/97)	Power (500)	2	3	1	1
O	GOES-10	9707	05/13/97 (04/25/97)	Other (900)	2	3	1	1
O	GOES-10	9708	05/13/97 (04/25/97)	Thermal (300)	2	3	1	1
O	GOES-10	9709	05/13/97 (04/25/97)	ACS (400)	2	7	1	1
O	GOES-10	9710	05/14/97 (04/25/97)	Other (900)	2	3	1	1
O	GOES-10	9711	05/15/97 (04/25/97)	ACS (400)	1	6	5	1
O	GOES-10	9712	05/22/97 (04/25/97)	TC&C (100)	1	3	2	2
O	GOES-10	9713	06/06/97 (04/25/97)	ACS (400)	2	3	1	1
O	GOES-10	9714	07/01/97 (04/25/97)	Power (500)	2	3	1	1
O	GOES-10	9715	08/27/97 (04/25/97)	Instruments (700)	2	3	1	1
O	GOES-10	9716	08/27/97 (04/25/97)	Instruments (700)	2	3	1	1
O	GOES-10	9717	08/28/97 (04/25/97)	TC&C (100)	2	3	2	2
O	GOES-10	9718	09/03/97 (04/25/97)	Instruments (700)	2	3	1	1
O	GOES-10	9719	09/05/97 (04/25/97)	Power (500)	1	9	3	2
O	GOES-10	9720	10/07/97 (04/25/97)	TC&C (100)	2	3	1	1
O	HST	97103	01/28/97 (04/25/90)	TLM&DH (200)	1	7	6	2
O	HST	97104	02/06/97 (04/25/90)	Instruments (700)	2	3	3	2
O	HST	97105	02/13/97 (04/25/90)	Power (500)	2	2	4	2
O	HST	97106	02/13/97 (04/25/90)	Structure (800)	2	7	2	3
O	HST	97107	02/13/97 (04/25/90)	Power (500)	2	3	3	2
O	HST	97108	02/14/97 (04/25/90)	Structure (800)	2	2	4	2
O	HST	97109	02/18/97 (04/25/90)	TLM&DH (200)	2	2	4	2
O	HST	97110	02/24/97 (04/25/90)	Instruments (700)	2	3	3	1
O	HST	97111	03/04/97 (04/25/90)	Instruments (700)	2	2	4	2
O	HST	97112	03/31/97 (04/25/90)	Power (500)	2	2	3	2
O	HST	97113	04/09/97 (04/25/90)	ACS (400)	2	3	4	3
O	HST	97114	07/17/97 (04/25/90)	Power (500)	2	2	4	3
O	HST	97115	09/27/97 (04/25/90)	Instruments (700)	2	2	3	2
O	HST	97116	11/02/97 (04/25/90)	Instruments (700)	1	2	3	2
G	HST	97-G03	01/04/97 (04/25/90)	TLM&DH (200)	2	3	3	2
G	HST	97-G04	02/04/97 (04/25/90)	Other (900)	1	7	2	2
G	HST	97-G05	05/05/97 (04/25/90)	TLM&DH (200)	2	7	2	2
G	HST	97-G06	05/22/97 (04/25/90)	Other (900)	2	3	3	2
G	HST	97-G07	08/17/97 (04/25/90)	TC&C (100)	2	2	3	2

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
G	HST	97-G08	09/13/97 (04/25/90)	TLM&DH (200)	2	2	3	2
G	HST	97-G09	09/21/97 (04/25/90)	Other (900)	2	2	3	2
G	HST	97-G10	09/22/97 (04/25/90)	TLM&DH (200)	2	2	3	2
G	HST	97-G11	09/23/97 (04/25/90)	Other (900)	4	7	2	2
G	HST	97-G12	10/02/97 (04/25/90)	TLM&DH (200)	1	2	3	2
G	HST	97-G13	10/16/97 (04/25/90)	Other (900)	2	7	6	2
G	HST	97-G14	11/10/97 (04/25/90)	TLM&DH (200)	2	2	3	2
G	HST	97-G15	11/15/97 (04/25/90)	Other (900)	1	7	2	2
C	HST	97-C01	01/29/97 (04/25/90)	Other (900)	2	3	3	2
C	HST	97-C02	06/11/97 (04/25/90)	TLM&DH (200)	1	7	6	4
O	NOAA-9	9738	05/05/97 (12/12/84)	Instruments (700)	2	3	1	3
G	NOAA-10	97-G01	01/14/97 (09/17/86)	Instruments (700)	3	2	3	3
O	NOAA-12	9721	05/31/97 (05/14/91)	ACS (400)	2	3	1	3
O	POLAR	9702	09/16/97 (02/24/96)	Power (500)	2	3	1	1
O	SAMPEX	97462	01/04/97 (07/03/92)	TLM&DH (200)	4	3	1	1
O	SAMPEX	97463	01/05/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97464	01/06/97 (07/03/92)	ACS (400)	1	3	3	2
O	SAMPEX	97465	01/08/97 (07/03/92)	ACS (400)	1	3	3	2
O	SAMPEX	97466	01/10/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97467	01/10/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97468	01/15/97 (07/03/92)	TC&C (100)	1	8	1	1
O	SAMPEX	97469	01/18/97 (07/03/92)	TLM&DH (200)	4	3	1	3
O	SAMPEX	97470	01/29/97 (07/03/92)	Instruments (700)	1	3	3	2
O	SAMPEX	97471	01/30/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97472	02/23/97 (07/03/92)	TLM&DH (200)	1	3	3	2
O	SAMPEX	97473	02/26/97 (07/03/92)	Instruments (700)	1	7	6	4
O	SAMPEX	97474	02/28/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97475	02/28/97 (07/03/92)	Instruments (700)	1	3	3	2
O	SAMPEX	97476	03/10/97 (07/03/92)	TC&C (100)	1	8	1	1
O	SAMPEX	97477	03/20/97 (07/03/92)	TLM&DH (200)	4	3	1	1
O	SAMPEX	97478	04/04/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97479	04/11/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97480	04/13/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97481	04/18/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97482	04/19/97 (07/03/92)	TC&C (100)	1	8	1	1
O	SAMPEX	97483	04/25/97 (07/03/92)	TC&C (100)	1	8	1	1
O	SAMPEX	97484	05/02/97 (07/03/92)	TC&C (100)	1	8	1	6
O	SAMPEX	97485	06/09/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97486	09/18/97 (07/03/92)	Power (500)	1	3	3	6
O	SAMPEX	97487	09/24/97 (07/03/92)	Instruments (700)	1	3	3	6
O	SAMPEX	97488	10/02/97 (07/03/92)	TC&C (100)	1	8	1	6
O	SAMPEX	97489	11/04/97 (07/03/92)	TC&C (100)	1	3	2	6
O	SAMPEX	97490	11/08/97 (07/03/92)	TLM&DH (200)	2	3	1	1
O	SAMPEX	97491	12/22/97 (07/03/92)	TC&C (100)	1	8	1	6
O	SAMPEX	97492	12/29/97 (07/03/92)	TC&C (100)	1	8	1	6
G	SAMPEX	97-G02	03/16/97 (07/03/92)	TLM&DH (200)	2	3	2	2
G	SAMPEX	97-G03	08/17/97 (07/03/92)	TC&C (100)	2	3	2	2
O	TDRSS-1	9780	02/04/97 (04/03/83)	Other (900)	1	5	3	2
O	TDRSS-1	9781	03/20/97 (04/03/83)	Other (900)	1	3	3	2
O	TDRSS-1	9782	03/31/97 (04/03/83)	Other (900)	1	3	3	2
O	TDRSS-1	9783	06/16/97 (04/03/83)	TLM&DH (200)	1	3	3	3
O	TDRSS-1	9784	07/07/97 (04/03/83)	TLM&DH (200)	3	5	3	2
O	TDRSS-1	9785	08/05/97 (04/03/83)	TLM&DH (200)	1	3	3	2
G	TDRSS-1	97-G01	06/13/97 (04/03/83)	TLM&DH (200)	1	2	3	2
G	TDRSS-1	97-G02	09/23/97 (04/03/83)	TLM&DH (200)	2	2	1	2
C	TDRSS-1	97-C01	06/11/97 (04/03/83)	Other (900)	2	7	6	2
O	TDRSS-3	9722	09/09/97 (09/29/88)	TLM&DH (200)	1	7	6	4
G	TDRSS-3	97-G01	06/24/97 (09/29/88)	TC&C (100)	1	7	6	4
G	TDRSS-3	97-G02	06/25/97 (09/29/88)	TC&C (100)	1	2	3	2
G	TDRSS-3	97-G03	07/07/97 (09/29/88)	Other (900)	1	3	3	2
G	TDRSS-3	97-G04	09/11/97 (09/29/88)	Other (900)	2	3	3	1
G	TDRSS-3	97-G05	10/26/97 (09/29/88)	Other (900)	4	7	6	2

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
G	TDRSS-3	97-G06	10/26/97 (09/29/88)	Other (900)	1	7	6	2
C	TDRSS-3	97-C01	06/23/97 (09/29/88)	TLM&DH (200)	1	2	3	2
C	TDRSS-3	97-C02	07/27/97 (09/29/88)	Other (900)	1	2	3	2
G	TDRSS-5	97-G01	05/13/97 (08/02/91)	Propulsion (600)	2	7	2	2
G	TDRSS-6	97-G03	03/03/97 (01/13/93)	Other (900)	1	7	2	2
G	TDRSS-6	97-G04	05/12/97 (01/13/93)	Other (900)	1	2	3	2
G	TDRSS-6	97-G05	09/11/97 (01/13/93)	TLM&DH (200)	1	3	3	2
O	TOMS-EP	9708	11/16/97 (07/02/96)	ACS (400)	2	2	3	2
G	TOMS-EP	97-G06	03/13/97 (07/02/96)	TLM&DH (200)	2	7	6	2
G	TOMS-EP	97-G07	04/15/97 (07/02/96)	TLM&DH (200)	1	7	2	2
G	TOMS-EP	97-G08	04/30/97 (07/02/96)	TLM&DH (200)	1	3	3	2
G	TOMS-EP	97-G09	05/03/97 (07/02/96)	TLM&DH (200)	2	3	3	2
G	TOMS-EP	97-G10	05/06/97 (07/02/96)	TLM&DH (200)	1	7	6	4
G	TOMS-EP	97-G11	05/23/97 (07/02/96)	TLM&DH (200)	2	2	3	2
G	TOMS-EP	97-G12	06/04/97 (07/02/96)	TLM&DH (200)	2	2	3	2
G	TOMS-EP	97-G13	06/05/97 (07/02/96)	TLM&DH (200)	2	2	3	2
G	TOMS-EP	97-G14	08/10/97 (07/02/96)	TLM&DH (200)	2	2	3	5
G	TOMS-EP	97-G15	08/25/97 (07/02/96)	TLM&DH (200)	2	2	3	3
G	TOMS-EP	97-G16	10/01/97 (07/02/96)	Other (900)	2	2	1	2
G	TOMS-EP	97-G17	12/03/97 (07/02/96)	Power (500)	2	2	3	2
G	TOMS-EP	97-G18	12/10/97 (07/02/96)	TLM&DH (200)	2	2	3	2
G	TOMS-EP	97-G19	12/12/97 (07/02/96)	TLM&DH (200)	2	2	3	2
G	TRMM	97-G01	11/28/97 (11/27/97)	TLM&DH (200)	2	7	6	4
G	TRMM	97-G02	12/05/97 (11/27/97)	TLM&DH (200)	2	2	2	5
G	TRMM	97-G03	12/12/97 (11/27/97)	TC&C (100)	4	2	3	2
G	TRMM	97-G04	12/13/97 (11/27/97)	Other (900)	2	7	6	4
G	TRMM	97-G05	12/13/97 (11/27/97)	TLM&DH (200)	1	7	6	4
G	TRMM	97-G06	12/19/97 (11/27/97)	Other (900)	2	7	6	4
G	TRMM	97-G07	12/24/97 (11/27/97)	TLM&DH (200)	1	7	2	4
O	UARS	9722	04/15/97 (09/15/91)	TLM&DH (200)	2	2	3	2
O	UARS	9723	05/30/97 (09/15/91)	Other (900)	2	2	3	2
O	UARS	9724	05/31/97 (09/15/91)	TLM&DH (200)	2	2	3	2
O	UARS	9725	06/01/97 (09/15/91)	TLM&DH (200)	2	2	3	2
O	UARS	9726	09/11/97 (09/15/91)	Other (900)	1	7	2	2
G	UARS	97-G08	01/01/97 (09/15/91)	Other (900)	1	7	2	2
G	UARS	97-G09	03/03/97 (09/15/91)	Other (900)	1	7	6	4
G	UARS	97-G10	04/14/97 (09/15/91)	TLM&DH (200)	1	7	2	4
G	UARS	97-G11	04/28/97 (09/15/91)	Other (900)	2	2	3	2
G	UARS	97-G12	05/13/97 (09/15/91)	Other (900)	2	7	6	4
G	UARS	97-G13	05/26/97 (09/15/91)	Other (900)	1	7	2	4
G	UARS	97-G14	05/30/97 (09/15/91)	TLM&DH (200)	2	2	3	2
G	UARS	97-G15	06/10/97 (09/15/91)	TLM&DH (200)	1	7	2	2
G	UARS	97-G16	06/20/97 (09/15/91)	Other (900)	2	2	1	2
G	UARS	97-G17	07/09/97 (09/15/91)	Other (900)	2	2	3	2
G	UARS	97-G18	07/10/97 (09/15/91)	Other (900)	2	2	3	2
G	UARS	97-G19	07/29/97 (09/15/91)	Other (900)	1	7	2	2
G	UARS	97-G20	08/27/97 (09/15/91)	TLM&DH (200)	2	7	2	2
G	UARS	97-G21	09/16/97 (09/15/91)	TLM&DH (200)	4	7	2	2
G	UARS	97-G22	10/19/97 (09/15/91)	Other (900)	4	8	3	2
G	UARS	97-G23	10/29/97 (09/15/91)	TLM&DH (200)	2	2	3	2
G	UARS	97-G24	12/31/97 (09/15/91)	TLM&DH (200)	1	9	5	2
C	UARS	97-C01	06/20/97 (09/15/91)	Other (900)	2	7	6	4
C	UARS	97-C02	06/29/97 (09/15/91)	Other (900)	1	2	3	2
O	WIND	9702	12/13/97 (11/01/94)	TLM&DH (200)	2	2	3	2
O	XTE	9745	02/26/97 (12/30/95)	TLM&DH (200)	2	2	3	3
O	XTE	9746	05/31/97 (12/30/95)	Power (500)	1	8	6	2
O	XTE	9747	08/27/97 (12/30/95)	TLM&DH (200)	2	2	2	2
O	XTE	9748	09/22/97 (12/30/95)	Other (900)	2	2	3	2
O	XTE	9749	11/12/97 (12/30/95)	TLM&DH (200)	4	2	3	2
G	XTE	97-G79	03/03/97 (12/30/95)	TLM&DH (200)	1	7	1	1
G	XTE	97-G80	03/04/97 (12/30/95)	TLM&DH (200)	2	7	2	2
G	XTE	97-G81	04/08/97 (12/30/95)	Other (900)	1	8	3	2

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	SUBSYSTEM	CRITICALITY (ME)	ANOMALY EFFECT	FAIL CATEGORY	ANOMALY TYPE
G	XTE	97-G82	04/29/97 (12/30/95)	TC&C (100)	1	2	3	2
G	XTE	97-G83	05/25/97 (12/30/95)	TLM&DH (200)	1	7	1	1
G	XTE	97-G84	06/02/97 (12/30/95)	TLM&DH (200)	1	2	3	2
G	XTE	97-G85	06/23/97 (12/30/95)	TLM&DH (200)	2	2	3	2
G	XTE	97-G86	07/16/97 (12/30/95)	Other (900)	2	7	2	2
G	XTE	97-G87	08/18/97 (12/30/95)	Other (900)	1	7	2	2
G	XTE	97-G88	08/21/97 (12/30/95)	TLM&DH (200)	1	7	2	2
G	XTE	97-G89	08/21/97 (12/30/95)	TLM&DH (200)	1	7	2	2
G	XTE	97-G90	09/06/97 (12/30/95)	Other (900)	2	7	1	1
G	XTE	97-G91	09/09/97 (12/30/95)	Other (900)	2	7	6	2
G	XTE	97-G92	10/18/97 (12/30/95)	Other (900)	2	7	1	1
G	XTE	97-G93	10/20/97 (12/30/95)	Other (900)	2	7	6	4
G	XTE	97-G94	10/21/97 (12/30/95)	TLM&DH (200)	2	2	3	2
G	XTE	97-G95	10/21/97 (12/30/95)	Other (900)	1	7	2	2
G	XTE	97-G96	10/25/97 (12/30/95)	TLM&DH (200)	1	7	1	1
G	XTE	97-G97	10/25/97 (12/30/95)	Other (900)	1	2	3	2
G	XTE	97-G98	11/10/97 (12/30/95)	Other (900)	2	2	3	2
G	XTE	97-G99	11/21/97 (12/30/95)	TLM&DH (200)	2	7	2	2
G	XTE	97-G100	11/24/97 (12/30/95)	TLM&DH (200)	2	3	3	2
G	XTE	97-G101	12/28/97 (12/30/95)	TLM&DH (200)	1	2	2	5
C	XTE	97-C06	07/18/97 (12/30/95)	TLM&DH (200)	2	2	3	2

Appendix B. Classification of 1996 and 1997 Additional (HST, SOHO, UARS) Anomalies

--- To Be Provided ---

Appendix C. Log of 1996 Orbital Spacecraft Anomalies (excluding Additional data)

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	CGRO	96-G01	10/28/96 (04/05/91)	2031	Other (900)	4	Project reported data service loss.	3 minutes of 32 KB data loss due to a disk problem in the computer. This data was not recovered.	SOAR-C-885 TTR 19022 DR 33276
G	CGRO	96-G02	10/28/96 (04/05/91)	2031	Other (900)	4	Project reported data service loss.	11 minutes and 30 seconds of data lost due to an NCC operator error. This data was not recovered.	SOAR-C-886 TTR 19029
G	CGRO	96-G03	11/11/96 (04/05/91)	2945	Other (900)	2	The project reported service and data loss while bringing up a backup unit to allow release of a faulty NFE for repair.	NCC inadvertently mispatched the replacement NFE interrupting data flow between the NCC and WSGT. The faulty patching was corrected. 15 minutes and 38 seconds of data loss. This data was not recovered .	SOAR-C-870 TTR 19047 DSPR 840
G	CGRO	96-G04	11/16/96 (04/05/91)	2050	TC&C (100)	4	Late acquisition and data loss.	SATOON reported the software was not generating Solar Array pointing commands. 25 minutes and 23 seconds lost. This data was not recovered .	SOAR-C-873 TTR 19053 DR 33484
G	CGRO	96-G05	11/25/96 (04/05/91)	327	Other (900)	1	Project reported data service loss.	5 minutes 10 seconds of 32 KB data loss due to an operator error. The operator assigned SAT-A to TDRSS-1 data base vice SAT-C TDRSS-3. This data was recovered at another time.	SOAR-C-877 TTR 19069 DR 35545
G	CGRO	96-G06	12/07/96 (04/05/91)	2071	Other (900)	4	Project reported data service loss.	27 minutes and 30 seconds data lost due to area wide power outage at Canberra. This data was not recovered.	SOAR-C-883 TTR 19082
G	CGRO	96-G07	12/08/96 (04/05/91)	2072	Other (900)	1	Project reported data service loss.	2 minutes and 14 seconds of data lost due to operator error. This data was not recovered.	SOAR-C-884 TTR 19804
G	CGRO	96-G08	12/15/96 (04/05/91)	2079	Other (900)	1	Late acquisition and data loss.	1 minute and 45 seconds lost due to TDRSS-3 scheduler using an outdated schedule. This data was recovered at another time.	SOAR-C-892 TTR 19101
C	CGRO	96-C01	10/28/96 (04/05/91)	2031	TLM&DH (200)	4	POCC reported that they did not receive data and no console capability for the OMCS.	25 minutes of 32 KB data lost. This data was not recovered	SOAR-C-866 TTR 19033
C	CGRO	96-C02	10/29/96 (04/05/91)	2032	Other (900)	1	Project reported data service loss.	This data loss was due to a Bit mapping problem with the NASCOM computer. This data was recovered at another time.	SOAR-C-887
C	CGRO	96-C03	12/22/96 (04/05/91)	2086	Other (900)	2	Data loss due to a DMS (Digital Matrix Switch) problem at NASCOM.	14 minutes and 55 seconds loss. NASCOM disconnected and reconnected the path which cleared	SOAR-C-905

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								problem. This data was recovered at another time.	
O	ERBS	9644	01/07/96 (10/05/84)	4052	TC&C (100)	1	Bit upsets corrupted the time fields of two locations in the C&DH Command Storage Memory (CSM) block memory.	No impact to operations or science data. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2666 ERBS Report 523
O	ERBS	9645	01/12/96 (10/05/84)	4057	TC&C (100)	1	Bit upsets corrupted the time fields of nine locations in the C&DH Command Storage Memory (CSM) normal memory.	No impact to operations or science data. No action was required because the locations had already executed. This data was recovered at another time.	SOAR-C-2667 ERBS Report 524
O	ERBS	9646	01/16/96 (10/05/84)	4061	TC&C (100)	1	Bit upsets corrupted the time field of one location in the C&DH Command Storage Memory (CSM) block memory.	No impact to operations or science data. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2668 ERBS Report 525
O	ERBS	9647	03/28/96 (10/05/84)	4125	TC&C (100)	1	Bit upsets corrupted the time field of one unused location in the C&DH Command Storage Memory (CSM) normal memory.	No impact to operations or science data. The FOT immediately corrected the anomaly. This data was recovered at another time.	SOAR-C-2672 ERBS Report 526
O	ERBS	9648	05/11/96 (10/05/84)	4176	TC&C (100)	1	Bit upsets corrupted the serial digital fields of eight locations in the C&DH Command Storage Memory (CSM) normal memory.	No science data was lost. The FOT corrected the anomaly. This data was recovered at another time.	SOAR-C-2673 ERBS Report 527
O	ERBS	9649	05/11/96 (10/05/84)	4176	TC&C (100)	1	Bit upsets corrupted the serial digital field of one location in the C&DH Command Storage Memory (CSM) normal memory.	No science data was lost. The FOT corrected the anomaly. This data was recovered at another time.	SOAR-C-2674 ERBS Report 528
O	ERBS	9650	05/11/96 (10/05/84)	4176	TC&C (100)	1	Bit upsets corrupted the serial digital field of one location in the C&DH Command Storage Memory (CSM) normal memory.	No science data was lost. The FOT corrected the anomaly. This data was recovered at another time.	SOAR-C-2675 ERBS Report 529
O	ERBS	9651	07/31/96 (10/05/84)	4256	TC&C (100)	1	Bit upsets corrupted the time field of one location in the C&DH Command Storage Memory (CSM) block memory.	No impact to operations or science data. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2676 ERBS Report 530
O	ERBS	9652	09/03/96 (10/05/84)	4288	Instruments (700) (Mission Unique)	4	One SAGE-II sunset event did not lock on the sun. Investigation revealed a high azimuth motor current. This is a recurring anomaly.	One science event was lost. This data was not recovered.	SOAR-C-2677 ERBS Report 531
O	ERBS	9653	09/17/96 (10/05/84)	4302	TC&C (100)	1	Bit upsets corrupted the time fields of two locations in the C&DH Command Storage Memory (CSM) block memory.	The anomaly affected five SAGE-II events, but no science data was lost. This data was recovered at another time.	SOAR-C-2678 ERBS Report 532
O	ERBS	9654	09/22/96	4307	TC&C	1	Bit upsets corrupted the time fields	One SAGE-II event was missed. Also,	SOAR-C-2679

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
			(10/05/84)		(100)		of seventeen locations in the C&DH Command Storage Memory (CSM) normal memory.	the Spacecraft power was degraded one orbit due to the transmitter on command executing in darkness. This data was recovered at another time.	ERBS Report 533
O	ERBS	9655	10/14/96 (10/05/84)	4329	TC&C (100)	1	Bit upsets corrupted the time field of one location in the C&DH Command Storage Memory (CSM) block memory.	Two SAGE-II sunset events were lost. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2680 ERBS Report 534
G	ERBS	96-G01	12/16/96 (10/05/84)	4390	TLM&DH (200)	1	ERBS SSA-1 service data loss.	1 minute 50 seconds of data loss due to a mutual interference problem. This data was recovered at another time.	SOAR-C-891 TTR 19103 ERBS Event 4777
G	ERBS	96-G02	12/20/96 (10/05/84)	4821	Other (900)	2	A faulty emergency interlock relay K5 in the 9 meter system resulted in service loss. At AOS, the servo console was in program “A” waiting to come out of the prelimits. Just after AOS, had an AC power interlock, cause unknown. Reset safety and warning breaker in the PA shack which did not clear the anomaly.	After some checking we found a bad emergency interlock relay K5. Once the relay was replaced, the system came back up and there were no other problems. This data was recovered at another time.	SOAR-C-907 ERBS Event 4778
O	EUVE	9607	08/05/96 (06/07/92)	1498	TC&C (100)	1	On August 5, the OBC (a NSSC-I) flight computer halted on board the EP/EUVE spacecraft. At this time, the SHM hardware logic detected the loss of the ôIÆm Okö signal from the OBC and the Computer Status Monitor (CSM) timed out causing the SHM hardware to take control of the spacecraft. The OBC halted due to an error in the FSW code.	Coded, tested, and uplinked a Flight Software Patch to correct the temporary variable name that was uploaded in error. Refer to SOAR records C-727 and C-728, for two related anomalies in the ACS subsystem. UARS, TOPEX, GRO will upload the same flight software patch used to correct the EUVE bug.	SOAR-C-726
O	EVUE	9608	08/05/96 (06/07/92)	1498	ACS (400)	2	Misconfiguration of the Power Switching Unit (PSU). EP has an auto shed enable switch which allows data flow through the PSU. This switch must be enabled to allow inputs from the Attitude Control Electronics (ACE) to the Solar Array Drive Electronics (SADE). This switch was not enabled at the time of SHM entrance. The FOT enabled the auto shed	Enabled auto shed switch then change to PSU-B. Solar Arrays moved to Index-1. Refer to SOAR #’s C-726 and C-728 for entire history of anomaly.	SOAR-C-727

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							switch on PSU-A and expected the SHE to begin to respond to CSS inputs. This did not occur due to the second problem. See Soar C-728. Failure of PSU-A was then discovered.		
G	EUVE	96-G01	06/11/96 (06/07/92)	1464	TLM & DH (200)	2	TDRSS-5 KSA composite is showing a 3-4 DB degradation indicating eminent failure.	To reduce the user data loss that would be experienced by this failure a down time is required to swap the composite helix tube. WSC performed the swap, and all the data was recovered at another time.	SOAR-C-1025
G	EUVE	96-G02	12/11/96 (06/07/92)	1647	Other (900)	1	Loss of I & Q-Channel data due to a late acquisition.	This data was recovered at another time.	SOAR-C-879 TTR 19092 DR 33629
G	EUVE	96-G03	12/11/96 (06/07/92)	1647	Other (900)	1	Loss of I & Q-Channel data due to a late acquisition.	This data was recovered at another time.	SOAR-C-880 TTR 19091 DR 33632
O	GOES-8	9696	01/11/96 (04/13/94)	628	Instruments (700) (Mission Unique)	1	HEPAD PMT incorrect voltage	This data was recovered at another time.	SOAR-C-2814 OPS-215
O	GOES-8	9697	01/29/96 (04/13/94)	646	ACS (400)	1	Increase of 0.08 mA in the daily average Momentum Wheel current.	Current dropped again. This data was recovered at another time.	SOAR C-1826 IOPS-399
O	GOES-8	9698	02/15/96 (04/13/94)	662	ACS (400)	1	Navigation errors in roll and yaw have been observed following ES mode switch-back to dual chord. Transients are observed in the yaw momentum data for up to 6 hours following the mode switch, indicating a possible spacecraft yaw attitude error buildup during single chord.	Both the simulation and operational data indicate that there in no significant systematic yaw error associated with ES single chord operations.	SOAR-C-2806 OPS-278
O	GOES-8	9699	02/15/96 (04/13/94)	662	ACS (400)	1	AOCE single Chord Correction function terminating about 12 minutes prior to the end of the Roll transient experienced when Dual Chord is commanded.	This data was recovered at another time.	SOAR-C-2807 OPS-279
O	GOES-8	96100	02/20/96 (04/13/94)	667	Instruments (700) (Mission Unique)	1	Observable differences in the calibrated outputs of Imager detectors.	This data was recovered at another time.	SOAR-C-2815 OPS-281
O	GOES-8	96101	02/29/96 (04/13/94)	676	ACS (400)	4	Large spacecraft transients in pointing when leaving eclipse.	Image Navigation and Registration (INR) pointing error of up to 15 km for as much as two hours post eclipse.	SOAR-C-2816 OPS-295

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								This data was not recovered.	
O	GOES-8	96102	03/17/96 (04/13/94)	694	Instruments (700) (Mission Unique)	1	The magnetometer sensor temperature telemetry (for both magnetometers, for both GOES 8 and 9) shows a strong tendency to skip over certain raw values. These values are 15, 31 and 63. Note that these values are of form 2 to the power of n-1.	This problem has been noted and verified and is probably due to some behavior of the A/D converter. The effect of this problem on the data used for magnetic field determination is very small, so no fix is necessary at this time.	SOAR-C-2817 OPS-318
O	GOES-8	96103	03/20/96 (04/13/94)	697	Instruments (700) (Mission Unique)	1	Starting about 20 March 1996, a daily negative 5 to 10 minutes change in S-band RCVR-A AGC occurs. The time of day has gradually shifted from 1040Z (23 Mar) to 1145Z (10 Apr) for GOES-8 A daily positive 3 to 10 minutes change is seen in GOES-9, from 1535Z (20 Mar) to 1415Z (10 Apr) for GOES-9.		SOAR-C-2807 OPS-345
O	GOES-8	96104	04/01/96 (04/13/94)	708	Instruments (700) (Mission Unique)	2	GOES-8 Sounder trend plots has shown that the noise in the midwave channels is increasing faster than the 2.5% at EOL predicted by worst case analysis.	Channels 8 and 12 NENs increased 5 to 11% over the last 15 months. At these rates the midwaves will surpass the NEDN specification on detector 3 in 2.3 more years. Other rates of degradation shows the midwave responsively decreasing and the noise counts increasing.	SOAR-C-1829 IOPS-405
O	GOES-8	96105	04/18/96 (04/13/94)	725	ACS (400)	2	GOES-8 reprogram function was disabled by the automatic safety feature. The reprogram disable was immediately preceeded by an illegal instruction indicator. A dump of the entire reprogram area showed 5 RAM address values in error. Commands were then generated to restore the corrupted addresses. At the time of the last address load command, a pitch transient occurred in the control loop. A dump then showed that the value of the last address was not correct, and that 17 different addresses were now in error. Subsequent dumps of the entire reprogram error indicated many corrupted addresses in	The AOCE 1 unit is operable only with reprogramming disabled or reduced to avoid the damaged address space. The reprogrammed action is to switch to AOCE 2. The swap to AOCE 2 was performed on Day 115 and reprogramming was enabled the following day.	SOAR-C-1827 IOPS-402

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							locations ranging from 3071 to 3742. The problem was attributed to an ESO event that damaged a chip used for the reprogram RAM. Subsequent analysis indicated damage to an I/D circuit that address that area of RAM.		
O	GOES-8	96106	04/26/96 (04/13/94)	733	ACS (400)	1	High N/S pointing errors in landmarks were noticed soon after the failover to AOCE2. It was determined that the error signal in the landmarks was identical to the IMC N/S signal. AOCE telemetry showed a proper N/S signal. An IMCCAL star test for the Imager showed that the N/S IMC signal was not getting to the mirror. SOCC verified that the N/S signal is OK in "LO" range, but will not work in "HI" range.	Swap from AOCE#1 to AOCE#2 occurred 115/22:15Z. Toggled IMC ranges from AOCE, Imager, and Sounder as part of AOCE swap procedures. Imager IMC working correctly following toggling of the IMC range relay. Retest at 18:30Z to confirm. Review AOCE swap procedure to eliminate IMC range relay toggles. Keep GOES-8 in high range.	SOAR-C-1828 IOPS-403
O	GOES-8	96107	08/25/96 (04/13/94)	852	TC&C (100)	1	Command unit 2 experienced an autonomous power reset, in which the command unit was recycled into clear mode. This event was similar to the command unit 1 event on 11/25/95.	Investigation into the construction and circuitry of the command unit does not point to a definitive cause. The most likely cause is an ESD event, most probably as a result of charging due to openings in the anti-earth panel. Noise or a momentary load short are now considered unlikely causes. Note that the cutouts in the anti-earth panel are covered on GOES-9 and no similar events have been experienced on that spacecraft.	SOAR-C-1830 IOPS-409
O	GOES-8	96108	08/30/96 (04/13/94)	857	ACS (400)	1	During Earth Sensor biasing maneuvers for E/W winding special operations, it was observed that the ES pitch data was non-linear past biases of 0.5 deg. Spec calls for it to be linear out to 3.5 deg. Also, for a pitch bias there was a coincidental roll error that was most prevalent when the sensor was in scan inhibit.	Analysis concludes that Earth Sensor performance is within the +/- 3.5 deg specification described in Spec. No. 572331. Rev. A para 3.2.1.1.1 – Normal mode. The SOH will be updated with the next CCR release to clarify the definition of Earth Sensor linearity. An errata sheet will be published for Spec. No. 572331 to correct the typographical error.	SOAR-C-2798 OPS-470
O	GOES-8	96109	09/25/96 (04/13/94)	882	Instruments (700) (Mission	1	E/W single chord correction software in the AOCER2 patch in not consistently correcting E/W	New SCC pitch coefficients were uploaded (to GOES-8 and 9). Analysis indicates that most systematic error	SOAR-C-2819 OPS-498

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
					Unique)		pointing error.	have been eliminated except for those caused by noise in the estimation process and consistent with errors predicted at AOCE2R2 CDR.	
O	GOES-8	96110	10/01/96 (04/13/94)	888	ACS (400)	2	An unexpected pitch error was observed in telemetry. Max error was -0.04 deg.	All checksums remained in OK state, momentum wheel speeds converged -5 rpm, then diverged -12 rpm in response. E/W SAS data showed a -0.032 deg. change.	SOAR-C-1831 IOPS-410
O	GOES-8	96111	12/01/96 (04/13/94)	948	Instruments (700) (Mission Unique)	2	Noise, as computed by the standard deviation of the space-look data, is increasing rapidly, especially in the mid-wave channels, specifically detector 3. See also IOPS-405 (Sounder IR Noise Increase).		SOAR-C-1834 IOPS-416
O	GOES-9	9639	01/04/96 (05/23/95)	194	Other (900)	1	GOES-9 Imager E/W servo errors after upload of the AOCE2 R2 showed during CONUS scans more frequently than during 0.1 seconds scans. This phenomenon is the result of large steps in the IMC input to imager servo. Performance prior to the upload is clearly better than the day after the upload. While servo spikes are known to exist when IMC changes, these spikes are narrow and may not move the mirror at that rate; but they are undesirable.	Evaluated normal GOES-9 on-orbit images, analyzed and evaluated AOCE2 R2 performance, and updated the GIR based on those results. Re-examined original AOCE2 R2 engineering model test setups for the same signature, and recommended corrections to reduce or eliminate erratic IMC input to the imager servo.	SOAR-C-1416 JOPS-017
O	GOES-9	9640	01/11/96 (05/23/95)	228	Instruments (700) (Mission Unique)	1	HEPAD PMT incorrect voltage	This data was recovered at another time.	SOAR-C-2789 OPS-215
O	GOES-9	9641	02/15/96 (05/23/95)	262	ACS (400)	1	Navigation errors in Roll and Yaw data after the Earth Sensor is commanded from Single Chord to Dual Chord.	This data was recovered at another time.	SOAR-C-2790 OPS-278
O	GOES-9	9642	02/15/96 (05/23/95)	262	ACS (400)	1	Single Chord Correction function terminating about 12 minutes prior to the end off the Roll transient experienced when Dual Chord is commanded.	This data was recovered at another time.	SOAR-C-2791 OPS-279
O	GOES-9	9643	02/20/96 (05/23/95)	267	Instruments (700) (Mission	1	Observable differences in the calibrated outputs of Imager detectors.	This data was recovered at another time.	SOAR-C-2792 OPS-281

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
					Unique)				
O	GOES-9	9644	02/29/96 (05/23/95)	272	ACS (400)	4	Large spacecraft transients in pointing when leaving eclipse.	Image Navigation and Registration (INR) pointing error of up to 15 km for as much as two hours post eclipse. This data was not recovered.	SOAR-C-2793 OPS-295
O	GOES-9	9645	03/17/96 (05/23/95)		Instruments (700) (Mission Unique)	1	The magnetometer sensor temperature telemetry (for both magnetometers, for both GOES 8 and 9) shows a strong tendency to skip over certain raw values. These values are 15, 31 and 63. Note that these values are of form 2 to the power of n-1.	This problem has been noted and verified and is probably due to some behavior of the A/D converter. The effect of this problem on the data used for magnetic field determination is very small, so no fix is necessary at this time.	SOAR-C-2794 OPS-318
O	GOES-9	9646	03/20/96 (05/23/95)		Instruments (700) (Mission Unique)	1	Starting about 20 March 1996, a daily negative 5 to 10 minutes change in S-band RCVR-A AGC occurs. The time of day has gradually shifted from 1040Z (23 Mar) to 1145Z (10 Apr) for GOES-8 A daily positive 3 to 10 minutes change is seen in GOES-9, from 1535Z (20 Mar) to 1415Z (10 Apr) for GOES-9.		SOAR-C-2795 OPS-345
O	GOES-9	9647	04/12/96 (05/23/95)	291	Other (900)	2	The GOES-9 imager E/W servo current telemetry was about half the normal values. The drop on GOES-9 E/S servo motor current is indicative of one failed motor winding. A similar anomaly occurred on GOES-8. It was concluded that the failure mechanism for both was thermally induced. Two approaches exist for decreasing the temperature excursions which are identified in attachment b of GOES-PCC-TM-7437. Both approaches result in loss of imaging and sounding products for a portion of the day.	The imager and sounder scan motor stators were redesigned for GOES-K and up to prevent winding failures due to thermal cycling. The design modification included improving the impregnate materials for the windings and increasing the wire gauge of the winding wires.	SOAR-C-1417 JOPS-018
O	GOES-9	9648	04/17/96- (05/23/95)	296	Other (900)	1	When GOES-9 was configured for eclipse (moon shadow), since that eclipse configuration, a daily trend on the FW Channel 1 period monitor has been noticed that was not present before.	Review of the data has concluded that the changes seen are within the normal range of filter wheel performance to be expected on reconfiguration for eclipse entry. The daily trend in the FW CH 1 period is an artifact of the way this 1-digit	SOAR-C-1418 JOPS-019

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								parameter is plotted. No corrective action needed.	
O	GOES-9	9649	06/22/96 (05/23/95)		Instruments (700) (Mission Unique)	2	Suspected downlink noise interference at Wallops CDA has caused a series of Imager priority 1 and 2 frame breaks to occur at approx. the same time during several recent evening watches.	Investigating the possibility of arching in the “A” antenna waveguide as the cause of the anomalous behavior.	SOAR-C-2796 OPS-409
O	GOES-9	9650	08/30/96 (04/13/94)		ACS (400)	1	During Earth Sensor biasing maneuvers for E/W winding special operations, it was observed that the ES pitch data was non-linear past biases of 0.5 deg. Spec calls for it to be linear out to 3.5 deg. Also, for a pitch bias there was a coincidental roll error that was most prevalent when the sensor was in scan inhibit.	Analysis concludes that Earth Sensor performance is within the +/- 3.5 deg specification described in Spec. No. 572331. Rev. A para 3.2.1.1.1 – Normal mode. The SOH will be updated with the next CCR release to clarify the definition of Earth Sensor linearity. An errata sheet will be published for Spec. No. 572331 to correct the typographical error.	SOAR-C-2799 OPS-470
O	GOES-9	9651	09/25/96 (05/23/95)		Instruments (700) (Mission Unique)	1	E/W single chord correction software in the AOCER2 patch in not consistently correcting E/W pointing error.	New SCC pitch coefficients were uploaded (to GOES-8 and 9). Analysis indicates that most systematic error have been eliminated except for those caused by noise in the estimation process and consistent with errors predicted at AOCE2R2 CDR.	SOAR-C-2797 OPS-498
O	GOES-9	9652	10/13/96 (05/23/95)	476	TLM&DH (200)	1	Evidence recorded during the daily S/C pitch maneuvers indicate the S-band receive antenna beam is not aligned with the S/C Z- axis.	None - This GIR is closed. Details in the GIR Screening Board meeting minutes dated November 5, 1996.	SOAR-C-1419 JOPS-029
O	HST	9698	01/19/96 (04/25/90)	2286	TLM&DH (200)	2	Tape reorder #2 indicated a jam during "playback" of the engineering data. No tape motion occurred and higher than normal current was indicated.	Service Mission # 2, plan is to replace ESTR # 2 with the existing (refurbished) spare tape recorder.	SOAR-C-126
O	HST	9699	07/13/96 (04/25/90)	2365	TC&C (100)	2	HST entered Inertial Hold 'Safemode' after failing Earth / Moon Bright Object Test.	Test failed as a result of bit flip(s) in flight computer attitude word' that caused attitude change of 7 degrees.	SOAR-C-716 HSTAR 4218 HSTAR 5282
O	HST	96100	10/30/96 (04/25/90)	2474	ACS (400)	2	HST spacecraft entered a software sunpoint safe mode. Due to a failure of one of the on-board gyros.	It was discovered that the HST gyros had suffered a failure. After a period of time the HST exited safemode and returned to taking science data.	SOAR-C-860
O	HST	96101	10/30/96 (04/25/90)	2474	ACS (400)	2	HST spacecraft entered a software sunpoint safe mode.	HST project planned a diagnostic test to reveal a problem with the RWA #1. A flight spare RWA will be readied for on HST service Mission 2.	SOAR-C-863 HST 093

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
O	HST	96102	12/14/96 (04/25/90)	2517	ACS (400)	2	HST spacecraft entered a software sunpoint safe mode.	Loss of 1 reaction wheel. The NCC scheduling was performed to reflect SSA events. After a period of time the HST exited safemode and returned to taking science data. The data was not recovered.	SOAR-C-890
G	HST	96-G01	11/04/96 (04/25/90)	2479	TLM&DH (200)	4	POCCs high gain antenna slewed off of the TDRSS.	11 minutes of data loss. This data was not recovered.	SOAR-C-864 TTR 19038
G	HST	96-G02	11/11/96 (04/25/90)	2486	Other (900)	2	Project reported service data loss.	While bringing up a backup unit to allow release of a faulty NFE for repair, NCC inadvertently mispatched the replacement NFE interrupting data flow between the NCC and WSGT. The faulty patching was corrected. 15 minutes and 38 seconds of service loss. This data was recovered at another time.	SOAR-C-869
O	IUE	9648	02/18/96 (01/26/78)	6502	Propulsion (600)	2	A pressure sensor telemetry point changed from a valid reading of approximately 217 psi to a value of 14 psi. The value of 14 psi corresponds to a raw data value of zero. The failure may be either within the pressure sensor or in the link from the sensor to the data multiplexer.	No action required. The pressure reading from tanks D & H is sufficient to monitor the status of the Hydrazine Auxiliary Propulsion System (HAPS) in its current configuration.	SOAR-C-262
O	IUE	9649	03/06/96 (01/26/78)	6520	ACS (400)	2	Gyro #5 inadvertently powered off - when powered back on the gyro would not spin up. Apparent open winding in the gyro motor.	Change onboard software control to a system previously prepared in case of a gyro failure, the 1-gyro fine sun sensor control system. Adapt operations to this control system and resume science operations.	SOAR-C-263
O	NOAA-9	9637	08/13/96 (12/12/84)	4624	ACS (400)	1	Roll momentum changed by more than 20 inch-pound seconds in less than 40 seconds. Yaw Momentum changed by more then 10 inch-pound seconds in the same time.	Investigate momentum anomaly and determine cause and report results and recommendations. Investigate Momentum anomaly, determine most probable cause, and report results and recommendations.	SOAR-C-862
O	NOAA-11	9629	12/17/96 (09/24/88)	3369	TLM&DH (200)	1	NOAA-11 S-Band transmitter #3 RF power dropped from 8.4 Watts to 5.2 Watts.	Data N/A for the time of failure (NOAA-11 is scheduled for one pass per week with 4 hours of data recovered from a DTR)	SOAR-C-910
O	NOAA-12	9620	06/12/96 (05/14/91)	1828	TLM&DH (200)	2	No head playback voltage burning GAC playback resulting in loss of data, for DTR #5A. DTR 5-A also	DTR #5 removed from operational use on June 17, 1996.	SOAR-C-721

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							experienced intermittent servo error and servo lock. DTR-5A was taken out of service. Suspect this is a permanent failure.		
O	NOAA-14	9611	01/25/96 (09/30/94)	475	Power (500)	1	Solar array patch current telemetry erratic for 3.5 minutes following each eclipse period. On March 20, 1996- this anomaly caused abnormal PMS charge state indications. To correct the PMS indications, the Day-Night/Night-Day transition detection was commanded to FECLIP (GEODAT) mode. Intermittent short in patch circuit that is thermal related.	There are three areas in the flight software code where the patch currently is utilized.	SOAR-C-720
G	NOAA-14	96-G01	08/12/96 (09/30/94)	681	TC&C (100)	2	Late acquisition and data loss.	Spacecraft was not in YAW update window, ESA had solid earthlock. The spacecraft was being commanded from the ground at the time of the control mode switch. This data was recovered at another time.	SOAR-C-894
O	POLAR	9601	02/24/96 (02/24/96)	1	Propulsion (600)	1	Shortly after maneuver (Sun angle safing maneuver) initiation the RCS Engineer observed that REA 9 catalytic bed temperature failed to respond normally to engine actuation, indicating no thruster firing. REA 10 performance appeared to be nominal. Dynamics analysis of rate of sun angle change confirmed that the spacecraft response was consistent with only one thruster actually operating, confirming the anomalous RCS performance.	The maneuver was aborted. Upon completion of the maneuver abort, the preplanned backup thruster combination (REAs 10,11) was selected, and the Sun Safing Maneuver was completed nominally and without further incident.	SOAR-C-133
O	SAMPEX	96397	01/07/96 (07/03/92)	1	ACS (400)	1	The following mnemonics flagged during subsetting on DAY 95/006: AAPTRTER (Pitch angle error)=RL ACPTRTER (Pitch rate error) =RL The spacecraft was in eclipse for 27 minutes when they flagged and had gone in to coast mode.	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2695 S-411
O	SAMPEX	96398	01/28/96 (07/03/92)	1	ACS (400)	1	SAMPEX entered Coast Mode @ 028/05:35. At that time the ACS was transitioning from Normal ORR	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being	SOAR-C-2696 S-412

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							to Patch Mode ORR. At entry into coast mode, the pitch angle error changed instantly from approximately 0 to 3.14(180 degrees). SAMPEX was in eclipse @coast mode entry and exited coast mode due to eclipse exit. This discontinuity causes the rate error to break limits at 3.14/(0.5sec) = 6.283 rad/sec. The large attitude error at some entries into coast mode isn't fully understood.	taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	
O	SAMPEX	96399	02/08/96 (07/03/92)	1	TLM&DH (200)	1	At AOS, the POCC performed negative acquisition. The station reported seeing RF but no modulation. POCC sent telemetry on command and started to receive telemetry. After AOS, FOT noticed that ATS state was idle, due to the load from previous day not being committed to the buffer.	Sent the transmitter command and telemetry command; Closed and dumped ACS; Schedule additional support to investigate ATS problem. The negative acquisition was from an idle ATS. Schedule additional Wallops support and FOT was able to dump all data. No data loss throughout this problem.	SOAR-C-2697 S-413
O	SAMPEX	96400	02/21/96 (07/03/92)	1	TC&C (100)	1	The DPU clock error detected flag tripped at a value of 1 when it was looking for a 0. This also caused the DPU Status to trip at a value of 200 when it was looking for 192. This condition was last documented in AR#S-342	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with the validity of the SEDS time.	SOAR-C-2698 S-414
O	SAMPEX	96401	02/27/96 (07/03/92)	1	Instruments (700)	1	The mnemonic MLVP7P5V flagged YH during the pass. This represents a monitor on the MAST low voltage power supply. The spacecraft was in full sun at the time.	This is characteristic of full sun season.	SOAR-C-2699 S-415
O	SAMPEX	96402	02/27/96 (07/03/92)	1	Instruments (700)	1	The mnemonic MLVP7P5V flagged YH during the pass. This represents a monitor on the MAST low voltage power supply. The spacecraft was in full sun at the time.	This is characteristic of full sun season.	SOAR-C-2700 S-416
O	SAMPEX	96403	03/05/96 (07/03/92)	1	TC&C (100)	4	At AOS of the Poker Flats pass, it was noticed that the science partition had filled up at 065/14:29:12, resulting in about one hour of uncollected science data.	The science partition overflow was due to the HILT instrument being configured for High Energy Mode on the previous day. The PI had not taken into account the effects on data	SOAR-C-2701 S-417

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							During the pass, both data sets of VC2 were closed and dump with no errors. Both science data sets were then freed on board the spacecraft.	output with the instrument in this mode of operation. Additional Poker Flat supports were scheduled to increase recorder dump opportunities until the PI could track where the increased data was originating from. A few days later, the command to change the HILT one second quota was sent which slowed down the instrument data output to an acceptable level.	
O	SAMPEX	96404	04/02/96 (07/03/92)	1	Instruments (700)	1	At AOS the analyst noticed that the HILT mnemonic "HFLWRVOF" shows hilt flow regulator open valve as true and flow regulator close valve as true. This anomaly was last seen on 11/15/95. S-408.	This is a known anomaly that clearly indicates an impossible condition (a valve open and closed at the same time). It is believed that the problem lies in the telemetry since the PI's do not show any other indications that the Flow Valve may have actually been in an open state. Sending the "Flow Regulator Valve Close" command seems to reset the telemetry so that the valve position reads as expected. The exact reason for this problem is a mystery at this time.	SOAR-C-2702 S-418
O	SAMPEX	96405	04/06/96 (07/03/92)	1	ACS (400)	1	The above mnemonic, pitch error rate (normal mode) flagged during subsetting on day 097. At the time, the spacecraft had been in eclipse for 30 minutes. MAG Model Magnitude was almost exactly 0.3, right at threshold value; spacecraft was in ORR at 21:31:22, and changed to ORR on the next update. Coast mode was entered at 21:25:44 and exited at 21:34:54.	Performed subsetting on ACS data and checked eclipse times in PSAT. This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2703 S-419
O	SAMPEX	96406	04/09/96 (07/03/92)	1	TC&C (100)	1	The DPU clock error detected flag tripped at a value of 1 when it was looking for a 0. This also caused the DPU Status to trip at a value of 200 when it was looking for 192. This condition was last documented in AR#S-414.	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with the validity of the SEDS time.	SOAR-C-2704 S-420
O	SAMPEX	96407	04/18/96 (07/03/92)	1	Instruments (700)	1	LEICA monitor point 15 went out of limits for one minute and then returned to normal. The time was	This is a known anomaly. The Telemetry and Statistic Monitors which were set up to handle this	SOAR-C-2705 S-421

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							06:03:54 and no emergency sequence was needed.	problem executed the planned response accordingly. No further resolution was needed at this time.	
O	SAMPEX	96408	04/19/96 (07/03/92)	1	Instruments (700)	1	The above two mnemonics flagged in the LOS Configuration Monitor during realtime. 14:22:25z - HINITCNT = The count HILT XINIT Pulses. 14:22:25z - HXPROFCT = The count of HILT XPWROFF Pulses.	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2707 S-422
O	SAMPEX	96409	04/24/96 (07/03/92)	1	ACS (400)	1	The above mnemonic, representing the ACS command status message packet lost count, flagged yellow high during the RID pass. The spacecraft was in coast mode at the time.	This counter had incremented on 7/31/92 also. It was then reset back to zero. Why the counter's YH limit was not reset to 1 is a mystery (it remained at 3.5). When the counter incremented this time, SAMPEX was supporting a TOTS 4k telemetry pass. During the support, two /ADUMP commands were passed from the SEDS to the ACS via the ATP. Since SEDS does not support packets produced from these commands in 4k telemetry mode, the ACMPLCNT incremented by 2 (one for each /ADUMP command). Since the YH limit was set at 3.5, the error was not flagged by our database (since the counter was at 2 now). However, when this same scenario was repeated on a subsequent TOTS 4k telemetry pass, ACMPLCNT broke the YH limit when it reached 4.	SOAR-C-2706 S-423
O	SAMPEX	96410	04/24/96 (07/03/92)	1	Instruments (700)	1	LEICA high voltage monitor points 15 and 16 went out of limits once, at 111/03:53:56 and stayed out for one minute; no safing sequence was initiated.	This is a known anomaly. The Telemetry and Statistic Monitors which were set up to handle this problem executed the planned response accordingly. No further resolution was needed at this time.	SOAR-C-2708 S-424
O	SAMPEX	96411	05/04/96 (07/03/92)	1	Instruments (700)	1	The above two mnemonics flagged in the LOS Configuration Monitor during realtime. HINITCNT = The count HILT XINIT Pulses HXPROFCT = The count of HILT XPWROFF Pulses	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2709 S-425

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
O	SAMPEX	96412	05/19/96 (07/03/92)	1	Instruments (700)	1	There was apparently a HILT XILINX reset realtime during the Poker Flats pass. This is the first time HXLXCERC and HXSINERR have flagged, possibly because it is the first time a reset has occurred realtime.	The assumption was correct. The HXLXCERC and HXSINERR mnemonics went out of limits due to the XILINK reset occurring in realtime. They both read values of 0 (their normal readings) during subsequent supports. The reason why XILINK resets occur is still unknown.	SOAR-C-2710 S-426
O	SAMPEX	96413	05/25/96 (07/03/92)	1	TC&C (100)	1	The DPU clock error detected flag tripped at a value of 1 when it was looking for a 0. This also caused the DPU Status to trip at a value of 200 when it was looking for 192. This condition was last documented in AR#S-420.	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with the validity of the SEDS time.	SOAR-C-2711 S-427
O	SAMPEX	96414	05/27/96 (07/03/92)	1	Instruments (700)	1	The mnemonic MLVP7P5V flagged YH during the pass. This represents a monitor on the MAST low voltage power supply. The spacecraft was in full sun at the time.	This is characteristic of full sun season.	SOAR-C-2712 S-428
O	SAMPEX	96415	05/30/96 (07/03/92)	1	Instruments (700)	1	HILT flow regulator valve telemetry indicates open=true and close=true. Nominal condition: open=false and close=true This anomaly was last seen on: 96/093 (AR#418)	This is a known anomaly that clearly indicates an impossible condition (a valve open and closed at the same time). It is believed that the problem lies in the telemetry since the PI's do not show any other indications that the Flow Valve may have actually been in an open state. Sending the "Flow Regulator Valve Close" command seems to reset the telemetry so that the valve position reads as expected. The exact reason for this problem is a mystery at this time.	SOAR-C-2713 S-429
O	SAMPEX	96416	06/01/96 (07/03/92)	1	Instruments (700)	1	On the above pass, HILT was not in its hi-energy mode configuration. It stayed in this configuration for the entire pass. No other telemetry points flagged during this pass.	HILT was taken out of High Energy Mode by the execution of the monthly instrument calibrations. The calibration sequence was not updated after the switch to High Energy Mode. A copy of the calibration sequence was sent to Berndt Klecker for updated.	SOAR-C-2714 S-430
O	SAMPEX	96417	06/04/96 (07/03/92)	1	TLM&DH (200)	1	The above mnemonic flagged during subset of VC1 data. This mnemonic is the Transponder	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being	SOAR-C-2715 S-431

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							Receiver Static Phase Error. Its normal limits are -150,-120,120,150. This mnemonic went back into limits at 08:18:56. These times correspond to Blind WPS support.	taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	
O	SAMPEX	96418	06/12/96 (07/03/92)	1	ACS (400)	1	The above mnemonics went red low during VC1 playback. The rate error was out of limits for 6 minutes from 14:20:17 to 14:26:39 on DOY 163. The S/C was in eclipse at the time: entered eclipse at 14:16:34 and exited at 14:46:28. Also, the S/C was not in the SAA.	The following equation is used to compute the Pitch Error Rate: Pitch Error Rate = (Pitch Error Angle - Previous Pitch Error Angle)/Sample Period. The PEA ranges from - pi to + pi during one complete s/c revolution. It is possible to get a PEA difference of 2 pi during one revolution. Therefore, the PER will be 4 pi (since the Sample Period = 2 Hz). For this condition to actually flag on the ground, perfect timing is required. First, a PER of 4 pi needs to occur. Next, the spacecraft has to enter coast mode right at that time. Since the PER is not calculated in coast mode, consecutive packets will be stored with PER's equal to 4 pi until ORR resumes. Thus, during subsetting, the system will extract two consecutive out-of-limit conditions causing it to flag on our alarm page.	SOAR-C-2717 S-432
O	SAMPEX	96419	06/12/96 (07/03/92)	1	ACS (400)	1	This counter indicates the number of Attitude Determination (Quaternion) Telemetry packets assumed lost, because the SEDS Software Bus returned an error code during output to the Software Bus. The Attitude Determination Packet Lost Count mnemonic incremented from 699 to 1199.	Why the AAPLCNT incremented by 500 was due to a TOTS-3 4k bps support. Quaternion telemetry is not supported during real-time at this data rate. SEDS rejected theses packets that were sent from the ACE, thus incrementing the packet lost counter.	SOAR-C-2719 S-434
O	SAMPEX	96420	06/13/96 (07/03/92)	1	Instruments (700)	1	The MLVP37V mnemonic flagged during the realtime support and remained out of limits for the remainder of the pass (5 minutes). This condition occurred 22 minutes prior to a scheduled MAST/PET Power Cycle. This condition has previously been seen. It was attributed to system degradation and the limit was lowered to	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2718 S-433

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							accommodate this value. It is possible that this out of limits is due to further degradation.		
O	SAMPEX	96421	06/13/96 (07/03/92)	1	TLM&DH (200)	1	The SCICDUDO mnemonic flagged during the loading of the ATS. This caused a problem with the uplink. The load was stopped and the table op reset command was sent several times. We were unable to reset table ops before LOS. No commands (/SRS386TO or /SNOOPCMD) were accepted by the spacecraft after the SCICDUDO mnemonic flag was set. The telemetry showed good two-way during the entire pass and no problems with CDU lock.	The uplink card receives command data from the transponder's command receiver. The uplink interface searches the incoming bit stream until it finds a 16 bit synchronization patter or "barker code" with a value of EB90 (hex), shifts the data in as 64 bit codeblocks, verifies that the 64 bit codeblock has a modified BCH checksum, and stores the data in a FIFO for transmission to the bus. The CDU Dropout bit indicates that the Command Detector Unit portion of the transponder lost lock on the subcarrier after the uplink card has detected the barker code. This signal is latched by uplink hardware. This error is cleared by resetting the uplink card (/scttulrt)." So says the CTT CDR.	SOAR-C-2724 S-439
O	SAMPEX	96422	06/17/96 (07/03/92)	1	ACS (400)	1	The AAPTRTER and ACPTRTER mnemonics flagged during the daily subsetting of VC1 data. The pitch rate errors were out of limits for approx. 6 minutes from 168/23:05:14 to 168/23:11:36. SAMPEX entered Coast Mode at 168-23:02:20 exited Coast Mode at 168-23:08:58. This packet is generated and stored every 2:07	The following equation is used to compute the Pitch Error Rate: Pitch Error Rate = (Pitch Error Angle - Previous Pitch Error Angle)/Sample Period. The PEA ranges from - pi to + pi during one complete s/c revolution. It is possible to get a PEA difference of 2 pi during one revolution. Therefore, the PER will be 4 pi (since the Sample Period = 2 Hz). For this condition to actually flag on the ground, perfect timing is required. First, a PER of 4 pi needs to occur. Next, the spacecraft has to enter coast mode right at that time. Since the PER is not calculated in coast mode, consecutive packets will be stored with PER's equal to 4 pi until ORR resumes. Thus, during subsetting, the system will extract two consecutive out-of-limit conditions causing it to flag on our alarm page.	SOAR-C-2720 S-435
O	SAMPEX	96423	06/19/96 (07/03/92)	1	Instruments (700)	1	The MLVP37V mnemonic flagged during the realtime support and	This anomaly was changed to Inactive due to the 6 month time limit and	SOAR-C-2721 S-436

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							remained out of limits for the remainder of the pass (3 minutes). This condition occurred 20 minutes prior to the next scheduled MAST/PET power cycle. The same mnemonic went out of limits on day 165 and flagged at the same value.	there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	
O	SAMPEX	96424	06/21/96 (07/03/92)	1	Instruments (700)	1	The MLVP37V mnemonic flagged during the realtime support and returned within limits after two minutes. The mnemonic went out of limits again and remained out for the remainder of the pass(2 minutes). This condition occurred 25 minutes prior to a scheduled MAST/PET Power Cycle.	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2722 S-437
O	SAMPEX	96425	06/25/96 (07/03/92)	1	Instruments (700)	1	The MLVP37V mnemonic flagged during the realtime support and returned within limits after two minutes. This condition occurred 19 minutes prior to a scheduled MAST/PET Power Cycle.	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2723 S-438
O	SAMPEX	96426	06/26/96 (07/03/92)	1	ACS (400)	1	The SNACERT mnemonics flagged during the daily subsetting of VC1 data. The Pitch Error Rate was out of limits for approx. 10 minutes from 178/12:30:02 to 178/12:40:02. SAMPEX entered coast at 178-12:32:52 exited coast at 178-12:34:24.	This out of limit condition is similar to but not exactly the same as the previous Pitch Error Rate anomalies (S-432 and S-435). The difference is that SNACERT went out of limits while the spacecraft was in ORR and not in Coast Mode. This being the case, two consecutive valid RL readings were taken where the Pitch Error Angle difference was equal to 4 pi, giving the Pitch Error Rate of -12.45 (as opposed to one valid reading prior to entering Coast Mode and then static readings being output until the return to ORR).	SOAR-C-2725 S-440
O	SAMPEX	96427	06/29/96 (07/03/92)	1	ACS (400)	1	The ACPTRTER mnemonics flagged during the daily subsetting of VC1 data. The pitch rate errors were out of limits for approx. 4 minutes from 181/00:20:59 to 181/00:25:14. SAMPEX entered ORR Mode at 180-23:44:40 exited	The following equation is used to compute the Pitch Error Rate: Pitch Error Rate = (Pitch Error Angle - Previous Pitch Error Angle)/Sample Period. The PEA ranges from - pi to + pi during one complete s/c revolution. It is possible to get a PEA difference	SOAR-C-2726 S-441

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							ORR Mode at 180-00:47:48. This packet is generated and stored every 2:07.	of 2 pi during one revolution. Therefore, the PER will be 4 pi (since the Sample Period = 2 Hz). For this condition to actually flag on the ground, perfect timing is required. First, a PER of 4 pi needs to occur. Next, the spacecraft has to enter coast mode right at that time. Since the PER is not calculated in coast mode, consecutive packets will be stored with PER's equal to 4 pi until ORR resumes. Thus, during subsetting, the system will extract two consecutive out-of-limit conditions causing it to flag on our alarm page.	
O	SAMPEX	96428	06/30/96 (07/03/92)	1	TLM&DH (200)	1	The SCICDUDO mnemonic flagged on the attempt to select table 59 for dumping. This caused a problem with the uplink. The table ops select command was sent several times. No commands were accepted by the spacecraft after the SCICDUDO mnemonic flag was set. The telemetry showed good two-way during the entire pass and no problems with CDU lock.	The uplink card receives command data from the transponder's command receiver. The uplink interface searches the incoming bit stream until it finds a 16 bit synchronization patter or "barker code" with a value of EB90 (hex), shifts the data in as 64 bit codeblocks, verifies that the 64 bit codeblock has a modified BCH checksum, and stores the data in a FIFO for transmission to the bus. The CDU Dropout bit indicates that the Command Detector Unit portion of the transponder lost lock on the subcarrier after the uplink card has detected the barker code. This signal is latched by uplink hardware. This error is cleared by resetting the uplink card (/scttulrt)." So says the CTT CDR.	SOAR-C-2727 S-442
O	SAMPEX	96429	06/30/96 (07/03/92)	1	ACS (400)	1	The AAPTRRTER, ACPTRTER, and SNACERT mnemonics flagged on two different occassions during the daily subsetting of VC1 data. The pitch rate errors were out of limits for approx. 14 minutes from 182/02:56:05 - 182/03:10:57 & for approx.9 minutes from 182/12:16:30 - 182/12:25:00. SAMPEX entered ORR Mode at 182-02:42:04 | 182-03:07:01 | 182-	The following equation is used to compute the Pitch Error Rate: Pitch Error Rate = (Pitch Error Angle - Previous Pitch Error Angle)/Sample Period. The PEA ranges from - pi to + pi during one complete s/c revolution. It is possible to get a PEA difference of 2 pi during one revolution. Therefore, the PER will be 4 pi (since the Sample Period = 2 Hz). For this condition to actually flag on the ground, perfect timing is required.	SOAR-C-2728 S-443

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							11:18:17 | 182-12:21:58 exited ORR Mode at 182-02:52:08 | 182-03:29:12 | 182-11:32:31 | 182-12:31:55. This packet is generated and stored every 2:07.	First, a PER of 4 pi needs to occur. Next, the spacecraft has to enter coast mode right at that time. Since the PER is not calculated in coast mode, consecutive packets will be stored with PER's equal to 4 pi until ORR resumes. Thus, during subsetting, the system will extract two consecutive out-of-limit conditions causing it to flag on our alarm page.	
O	SAMPEX	96430	07/03/96 (07/03/92)	1	Instruments (700)	1	LEICA high voltage monitor points 15 and 16 went out of limits once, at 185/08:23:20 and stayed out for one minute; no safing sequence was initiated.	This is a known anomaly. The Telemetry and Statistic Monitors which were set up to handle this problem executed the planned response accordingly. No further resolution was needed at this time.	SOAR-C-2729 S-444
O	SAMPEX	96431	07/04/96 (07/03/92)	1	ACS (400)	1	The AADMXE11, AADMXE13, AALVELVY, ACPTRTER, and AAPTRTER mnemonics flagged realtime at 186/14:45:30 during the CAN support and came back within limits at 186/14:56:32 (from subsetting). The spacecraft entered eclipse at 14:25:06, 20 minutes prior to going out of limits. The spacecraft was not in the SAA; it exited the SAA at 13:53:14 and reentered at 15:12:28. The s/c position at the time was approximately: -29.6269 LAT 141.5170 LONG This anomaly was seen before on 3/23/95 (see S-316). The spacecraft entered coast mode at 186/14:42:37 and transitioned back to ORR at 186/14:54:11 (after LOS).	All of these mnemonics are only updated during ORR control mode. When the spacecraft enters coast mode the values remain static until ORR is resumed, although their current value continues to be output. The mnemonics where in an out of limit condition when coast mode was entered. Up until entry back into ORR, these values continued being output by the ACS software. Therefore, the ground system saw two consecutive out of limit conditions and flagged it as an anomalous condition. It is not abnormal for single readings to be such during one spacecraft revolution cycle. The fact that the spacecraft is spinning at 1 RPM vice 1 RPO obviously produces a greater number of spin cycles. With the increase in spin cycles coupled with eclipse season the chances of entering coast mode at the time one of these readings was output is greatly increased.	SOAR-C-2730 S-445
O	SAMPEX	96432	07/14/96 (07/03/92)	1	ACS (400)	1	The AADMXE13, AADMXE31, AAPTRTER, AALVELVY, and ACPTRTER mnemonics flagged during subsetting at 196/01:49:09 and came back within limits at	All of these mnemonics are only updated during ORR control mode. When the spacecraft enters coast mode the values remain static until ORR is resumed, although their	SOAR-C-2731 S-446

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							196/02:04:02. The spacecraft was in both eclipse and the SAA at the time; it entered eclipse at 01:25:55, 24 minutes prior to going out of limits, and entered the SAA at 01:34:19, 15 minutes prior. The spacecraft's approximate position at the time was: -41.2355 LAT 319.0534 LONG. The spacecraft entered coast mode at 196/01:46:19 and transitioned back to ORR at 196/01:59:55.	current value continues to be output. The mnemonics where in an out of limit condition when coast mode was entered. Up until entry back into ORR, these values continued being output by the ACS software. Therefore, the ground system saw two consecutive out of limit conditions and flagged it as an anomalous condition. It is not abnormal for single readings to be such during one spacecraft revolution cycle. The fact that the spacecraft is spinning at 1 RPM vice 1 RPO obviously produces a greater number of spin cycles. With the increase in spin cycles coupled with eclipse season the chances of entering coast mode at the time one of these readings was output is greatly increased.	
O	SAMPEX	96433	07/19/96 (07/03/92)	1	ACS (400)	1	The SNACERT mnemonics flagged during the daily subsetting of VC1 data. The Pitch Error Rate was out of limits for approx. 10 minutes from 201-00:43:02 to 201-00:53:02. During this period the spacecraft transitioned to ORR at 201-00:43:04 and back to Coast at 201-00:55:23.	The following equation is used to compute the Pitch Error Rate: Pitch Error Rate = (Pitch Error Angle - Previous Pitch Error Angle)/Sample Period. The PEA ranges from - pi to + pi during one complete s/c revolution. It is possible to get a PEA difference of 2 pi during one revolution. Therefore, the PER will be 4 pi (since the Sample Period = 2 Hz). For this condition to actually flag on the ground, perfect timing is required. First, a PER of 4 pi needs to occur. Next, the spacecraft has to enter coast mode right at that time. Since the PER is not calculated in coast mode, consecutive packets will be stored with PER's equal to 4 pi until ORR resumes. Thus, during subsetting, the system will extract two consecutive out-of-limit conditions causing it to flag on our alarm page.	SOAR-C-2732 S-447
O	SAMPEX	96434	07/23/96 (07/03/92)	1	TC&C (100)	1	The DPU clock error detected flag tripped at a value of 1 when it was looking for a 0. This also caused the DPU Status to trip at a value of	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with	SOAR-C-2733 S-448

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							200 when it was looking for 192. This condition was last documented in AR#S-427.	the validity of the SEDS time.	
O	SAMPEX	96435	07/29/96 (07/03/92)	1	TLM&DH (200)	1	SNDSCECT incremented from 7 to 8, flagging during background and los configmon checks.	The ATS significant events close command had been edited and was not at its expected time. Because of this, the FOT manually closed the dataset. Since dataset 0 was empty when the ATS tried to close it, the error was generated.	SOAR-C-2734 S-449
O	SAMPEX	96436	08/05/96 (07/03/92)	1	TLM&DH (200)	1	The SCICDUDO mnemonic flagged during the attempt to reset table operations after receiving table 58. The reset table operations command was sent several times, but was rejected by the S/C. No commands were accepted by SAMPEX after this flag was set. The anomaly seems to correlate with a drop in AGC during the pass which can be seen on the attached realtime plots. It has been proven that the /scttulrt command does not clear the Command Dropout Flag, however, having the ground station resweep the uplink does.	The uplink card receives command data from the transponder's command receiver. The uplink interface searches the incoming bit stream until it finds a 16 bit synchronization patter or "barker code" with a value of EB90 (hex), shifts the data in as 64 bit codeblocks, verifies that the 64 bit codeblock has a modified BCH checksum, and stores the data in a FIFO for transmission to the bus. The CDU Dropout bit indicates that the Command Detector Unit portion of the transponder lost lock on the subcarrier after the uplink card has detected the barker code. This signal is latched by uplink hardware. This error is cleared by resetting the uplink card (/scttulrt)." So says the CTT CDR.	SOAR-C-2735 S-450
O	SAMPEX	96437	08/05/96 (07/03/92)	1	Instruments (700)	1	During the support it was noticed that LEICA was off. It appeared that the instrument had not completed its 15 minute power cycling at 1200z. Spacecraft events showed that RTS 29 was being chained to RTS 28 (usually vise versa). Also, these events were continuing to be generated every 15 minutes (instead of once). Post-pass it was discovered that RTS 29 actually contained the LEICA disable sequence instead of the re-enable sequence. What was happening on board was that RTS 28 and 29 were caught in a loop causing the instrument to remain in an off state.	On day 214 the LEICA 15 minute turn-off activity sequence was updated on the CMS. The sequence itself disables the instrument for 15 minutes, then re-enables it. This update set the Start MCP high voltage level to 206, per PI request, during the re-enabling of the instrument. When the update was complete, the CMS prompted the user to select the two RTS's in which the activity would be incorporated. The user selected 29 and 28 (in that order). Thus RTS 29 contained the disable commands and RTS 28 contained the enable commands. The FOT procedure is to only uplink table 29 which normally	SOAR-C-2738 S-451

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								contains the sequence edits. Therefore, after this table was loaded, the spacecraft contained two RTS's which disabled the instrument, each calling out the other every 15 minutes. Thus, the instrument could not be re-enabled without FOT intervention. The instrument had remained off for approximately 5 hours. Also effected were four MAST/PET power cycles. They were unable to execute due to RTP #3 being	
O	SAMPEX	96438	08/05/96 (07/03/92)	1	TC&C (100)	1	The mnemonic DCMDERC incremented to from 0 to 1 during the support. This mnemonic represents the DPU general error count. The error occurred at 219-17:42:58.6. This packet(pkt 38) is downlinked every 66 seconds.	The problem occurred when instrument history was dumped manually to avoid missing the upcoming history dump because of an antenna keyhole. An instrument history dump was executing when the ATS command to dump Instruments history was sent to the DPU. The upocclimchg and spinupocclimchg procedures were modified to reflect the new error count.	SOAR-C-2739 S-452
O	SAMPEX	96439	08/05/96 (07/03/92)	1	TC&C (100)	1	The DPU clock error detected flag tripped at a value of 1 when it was looking for a 0. This also caused the DPU Status to trip at a value of 200 when it was looking for 192. This condition was last documented in AR#S-448.	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with the validity of the SEDS time.	SOAR-C-2744 S-457
O	SAMPEX	96440	08/08/96 (07/03/92)	1	Instruments (700)	1	HM10V (HILT Minus 10V Monitor) and HP5V (HILT Plus 5V Monitor) went out of limits after uplinking a DPU patch via TSTOL proc HSUBDIS. (The DPU patch halts the HILT subcom word to get higher resolution on the readout of the SSD bias voltage.)	When the HILT subcom is disabled, the +10V, +5V, and -10V monitor telemetry slots are used for the SSD bias readings. The SSD bias readings (digital values) are being interpreted as each of the +10V, +5V, -5V readings at the POCC. This is because the HILT subcom is locked on State 3 (SSD bias output) while the Housekeeping portion of the DPU software does not patch around the mission HK monitors mentioned above.	SOAR-C-2740 S-453
O	SAMPEX	96441	08/17/96	1	TLM&DH	1	After the spacecraft events were	On the 229/15:34z PKF (scheduled	SOAR-C-2741

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
			(07/03/92)		(200)		dumped, it was noticed that no events were recorded since 229/15:34:52z. After the close data set commands executed out of the ATP for this support, events started being recorded again at 229/22:24:03.	as a FAST ORT 4k bps blind acquisition), spacecraft events were closed manually and then dumped. At the time the events were closed, DS #0 contained 22 events. Since this support was a blind acquisition, TS Monitor ID #22 was not enabled. Whenever the active ssr evt dataset contains 22 pkts/messages, when a close cmd is issued to that partition, the task will hang up since there are only 2 bytes left in the xfer frame. When it creates another xfer frame it is apparently incorrectly assigned and can cause problems.	S-454
O	SAMPEX	96442	08/19/96 (07/03/92)	1	TLM&DH (200)	1	During this support, shortly after AOS, lightning struck near their nine meter antenna, disabling it, resulting in a loss of telemetry to the POCC. After the station switched to their backup antenna (6.0/7.5 pair), telemetry to the POCC was reestablished. However, when the FOT tried uplinking no-op commands to the spacecraft only the uplink/downlink card acknowledged receipt of commands (Barker Code updated); none of the appropriate software counters ever incremented. For the next seven passes using Poker, Wallops, Canberrra and Madrid, the FOT was unable to acquire the spacecraft via blind acquisitions (see G-700 through G-703). A spacecraft emergency was declared.	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2745 S-458
O	SAMPEX	96443	08/20/96 (07/03/92)	1	ACS (400)	1	At AOS it was noticed that the ACS Partition had filled. The spacecraft was in Digital Sunpoint Mode at the time due to the recent safehold entry (see S-458).	In Digital Sunpoint Mode the goal is to remove any excess spacecraft body rates and to precess the spacecraft pitch axis to within 15 degrees of sun line (in ORR 5 degrees is desired). The relaxed constraints on the pitch axis resulted in greater spacecraft movement (as seen in the attached DSS Error plots). This movement caused additional quaternion packets	SOAR-C-2746 S-459

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								to be generated, thus filling the ACS Partition of the recorder. In addition to the extra quaternion packets, numerous ACS Status Messages were being generated (see attached documentation for a better explanation). Whether these were due to being in Digital Sunpoint Mode has not been determined at this time.	
O	SAMPEX	96444	08/26/96 (07/03/92)	1	ACS (400)	1	While examining spacecraft events, it was noticed that the ACS partition had filled at 238/10:03:04z. This was the first 24 hours of data after the switch to the modified ORR control mode while reconfiguring from the day 232 safehold.	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2742 S-455
O	SAMPEX	96445	09/04/96 (07/03/92)	1	TLM&DH (200)	1	SHSTCRF miscompared during the pass. When zero, this mnemonic indicates that the time code task status data was not refreshed. 0 = OLD DATA according to the T&C. There were no sig events (a 1553 error would make sense) that occurred simultaneously (18:47:40z).	The Time Code task is one of several tasks that report housekeeping data to the health and safety task each cycle. On this occasion, an updated Time Code was not received. An overload of the processor (highly unlikely) or a quirk in the Time Code task itself are possible reasons for the error. There is no reaction by the software when this error occurs (a Warm Restart is initiated for some tasks that do not report in after a specified time period). Since this is the first documented occurrence of this problem and the Time Code was refreshed during the next cycle, this error is not a concern at this time.	SOAR-C-2743 S-456
O	SAMPEX	96446	09/09/96 (07/03/92)	1	TLM&DH (200)	1	During the R/T WPS support the SNDSUCER mnemonic flagged, it is described as the SEDS data set total number of uncorrected memory errors detected. Also an event message was generated "EDAC multiple bit error at 09D8A352" at 19:20:00. The S/C was not in eclipse or the SAA.	This error occurred when it was being read from a memory location in the SSR. Single bit errors can be detected and corrected without notification (i.e. no spacecraft event messages generated or error counters incremented). In this instance, more than one error was detected. No correction can be performed in this case. Statistically, this should be a rare occurrence unless the actual memory location is corrupted. If this error were to occur again at the same	SOAR-C-2747 S-460

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								location, a scheme to map around this location would be looked into.	
O	SAMPEX	96447	09/13/96 (07/03/92)	1	TLM&DH (200)	1	Approximately 3 minutes into the Wallops support, the command detector unit dropout flag went to "ERROR", and the remaining load commands in the buffer failed to get into the spacecraft. At the same time, the data playback of VC1 and VC2 contained about 10% CRC errors. Wallops reported no change in their signal throughout the pass.	The uplink card receives command data from the transponder's command receiver. The uplink interface searches the incoming bit stream until it finds a 16 bit synchronization patter or "barker code" with a value of EB90 (hex), shifts the data in as 64 bit codeblocks, verifies that the 64 bit codeblock has a modified BCH checksum, and stores the data in a FIFO for transmission to the bus. The CDU Dropout bit indicates that the Command Detector Unit portion of the transponder lost lock on the subcarrier after the uplink card has detected the barker code. This signal is latched by uplink hardware. This error is cleared by resetting the uplink card (/scttulrt)." So says the CTT CDR.	SOAR-C-2748 S-461
O	SAMPEX	96448	09/14/96 (07/03/92)	1	TLM&DH (200)	1	At AOS on the realtime WPS the STODPINP and SNDSCECT mnemonics flagged in the AOS configmon. When the command to dump sig events out the ATS load occurred, sig events were generated in realtime. The messages (10) "INVALID PKT SIZE during Send: Stream=0805x Task=14" were received followed by the event "Attempt To Start Dump While Dump In Progress". The daily ATS load was underway and was committed with no problems while the event problem was investigated. The attempt was made while the recorder was dumping partitions to try to redump the sig events. The dump was not initiated and the event "Attempt To Start Dump While Dump In Progress" was received in realtime. The SSR SCI, ACS, and HSK partitions were received 100% and were freed during the support. No recorded	On the 257/19:53z PKTupport (scheduled as a blind acquisition due to S-461), spacecraft events were closed manually in an attempt to dump them prior to LOS. At the time the events were closed, DS #0 contained 22 events. Since this support was a blind acquisition, TS Monitor ID #22 was not enabled. Whenever the active ssr evt dataset contains 22 pkts/messages, when a close cmd is issued to that partition, the task will hang up since there are only 2 bytes left in the xfer frame. When it creates another xfer frame it is apparently incorrectly assigned and can cause problems (as it did here).	SOAR-C-2749 S-462

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							events were received in Pkt '05' during this support and the event.		
O	SAMPEX	96449	09/18/96 (07/03/92)	1	Instruments (700)	1	LEICA High Voltage emergency sequence fired at 262/09:16:19 after monitor point 16 went out of limits for three minutes. The sequence ran completely and returned LEICA to normal operation.	This is a known anomaly the Telemetry and Statistic Monitors which were set up to handle this problem executed the planned response accordingly. No further resolution was needed at this time.	SOAR-C-2750 S-463
O	SAMPEX	96450	09/30/96 (07/03/92)	1	Power (200)	1	The RPP current mnemonic flagged YH during routine subsetting at 273-05:59:26 and returned to normal at 273-06:01:26. The blind Wallops support was during this period (AOS-05:48, LOS-06:05). Sunlight Entry 05:29:10 Sunlight Exit 06:05:08 Eclipse length 36min. (Deepest eclipse in current cycle). The sequence of events during this anomaly was similar to anomaly S-146 (Feb. 9,1994).	This limit exceedance was due to a deep eclipse coupled with transmitter power output. The Instruments were also on during the eclipse. When a r/t pass occurs into the tail end of a deep discharge (35 minutes or so), the system will be at it's peek discharge level. The PRPPI went slightly out of limits since it was requesting more current to accomodate the drop in main bus voltage due to the eclipse.	SOAR-C-2751 S-464
O	SAMPEX	96451	10/01/96 (07/03/92)	1	TLM&DH (200)	1	The Command Dropout Flag went to ERROR during the ATS load on the realtime Wallops support, and command capability was lost for approximately four minutes. The recorder dump continued without any problems during this time, and all data was received. It has been proven that the /scttulrt command does not clear the Command Dropout Flag, however, having the ground station resweep the uplink does.	The uplink card receives command data from the transponder's command receiver. The uplink interface searches the incoming bit stream until it finds a 16 bit synchronization patter or "barker code" with a value of EB90 (hex), shifts the data in as 64 bit codeblocks, verifies that the 64 bit codeblock has a modified BCH checksum, and stores the data in a FIFO for transmission to the bus. The CDU Dropout bit indicates that the Command Detector Unit portion of the transponder lost lock on the subcarrier after the uplink card has detected the barker code. This signal is latched by uplink hardware. This error is cleared by resetting the uplink card (/scttulrt)." So says the CTT CDR.	SOAR-C-2752 S-465
O	SAMPEX	96452	10/18/96 (07/03/92)	1	ACS (400)	1	The AAPTRTER and ACPTRTER pitch rate error mnemonics flagged during subsetting of VC1 at 291/21:29:38z and remained out for 7 seconds. The spacecraft entered eclipse at 21:07:04 and exited	The following equation is used to compute the Pitch Error Rate: Pitch Error Rate = (Pitch Error Angle - Previous Pitch Error Angle)/Sample Period. The PEA ranges from - pi to + pi during one complete s/c revolution.	SOAR-C-2753 S-466

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							eclipse at 21:40:15. The limits violation coincides exactly with the spacecraft entering coast mode.	It is possible to get a PEA difference of 2 pi during one revolution. Therefore, the PER will be 4 pi (since the Sample Period = 2 Hz). For this condition to actually flag on the ground, perfect timing is required. First, a PER of 4 pi needs to occur. Next, the spacecraft has to enter coast mode right at that time. Since the PER is not calculated in coast mode, consecutive packets will be stored with PER's equal to 4 pi until ORR resumes. Thus, during subsetting, the system will extract two consecutive out-of-limit conditions causing it to flag on our alarm page.	
O	SAMPEX	96453	10/28/96 (07/03/92)	1	TC&C (100)	1	The DPU clock error detected flag tripped at a value of 1 when it was looking for a 0. This also caused the DPU Status to trip at a value of 200 when it was looking for 192. This condition was last documented in AR#S-448.	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with the validity of the SEDS time.	SOAR-C-2754 S-467
O	SAMPEX	96454	10/29/96 (07/03/92)	1	ACS (400)	1	The ACS SSR partition filled up at 303/13:38:38z resulting in approximately two-hour loss of ACS data on board the spacecraft.	The real-time WPS support on 303/1222z was deleted due to SAC-B launching. A 303/1703z PKF support was added to compensate for the lost WPS in which the SSR would be dumped and freed. However, the recorder needed to be dumped and freed on the 302/1654z PKF support to ensure that the ACS partition would no fill up prior to the 303/1703z PKF support. This did not occur.	SOAR-C-2755 S-468
O	SAMPEX	96455	11/07/96 (07/03/92)	1	TC&C (100)	1	The DPU clock error detected flag tripped at a value of 1 when it was looking for a 0. This also caused the DPU Status to trip at a value of 200 when it was looking for 192. This condition was last documented in AR#S-467.	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with the validity of the SEDS time.	SOAR-C-2756 S-469
O	SAMPEX	96456	11/22/96 (07/03/92)	1	TLM&DH (200)	1	While loading the ATS, the commands were not verified by the spacecraft. Also the mnemonic SCICDUDO flagged an ERROR.	The uplink card receives command data from the transponder's command receiver. The uplink interface searches the incoming bit stream until	SOAR-C-2757 S-470

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							The commands in the buffer (a portion of the ATS load for the next day) were sent twice, but were not verified by the spacecraft and timed out. No further commanding was possible with the spacecraft, the load had to be stopped, and Wallops was asked to drop carrier after receiving all the SSR data and attempt to reacquire the spacecraft. It has been proven that the /scttulrt command does not clear the Command Dropout Flag, however, having the ground station resweep the uplink does.	it finds a 16 bit synchronization patter or "barker code" with a value of EB90 (hex), shifts the data in as 64 bit codeblocks, verifies that the 64 bit codeblock has a modified BCH checksum, and stores the data in a FIFO for transmission to the bus. The CDU Dropout bit indicates that the Command Detector Unit portion of the transponder lost lock on the subcarrier after the uplink card has detected the barker code. This signal is latched by uplink hardware. This error is cleared by resetting the uplink card (/scttulrt)." So says the CTT CDR.	
O	SAMPEX	96457	12/11/96 (07/03/92)	1	Instruments (700)	1	On 96/346/11:15:45 limits 15 and 16, the LEICA start and stop high voltage plates exceeded the safety limits, and the emergency sequence started at 11:17:45, and the instrument returned to normal operation at 96/346/11:35:49.	This is a known anomaly. The Telemetry and Statistic Monitors which were set up to handle this problem executed the planned response accordingly. No further resolution was needed at this time.	SOAR-C-2758 S-471
O	SAMPEX	96458	12/15/96 (07/03/92)	1	ACS (400)	1	This is a known anomaly. The Telemetry and Statistic Monitors which were set up to handle this problem executed the planned response accordingly. No further resolution was needed at this time.	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2759 S-472
O	SAMPEX	96459	12/25/96 (07/03/92)	1	ACS (400)	1	The AADMXE11, AADMXE12, AADMXE13, AALVELV, and AAPTRTER mnemonics flagged during subsetting at 360-11:01:54 and came back within limits at 360/11:14:39. The spacecraft entered coast mode at 360/10:59:31 and transitioned back to ORR at 360/11:11:24.	All of the above mnemonics are only updated during ORR control mode. When the spacecraft enters coast mode the values remain static until ORR is resumed, although their current value continues to be output. The mnemonics where in an out of limit condition when coast mode was entered. Up until entry back into ORR, these values continued being output by the ACS software. Therefore, the ground system saw two consecutive out of limit conditions and flagged it as an anomalous condition. It is not abnormal for single readings to be such during one spacecraft	SOAR-C-2760 S-473

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								revolution cycle. The fact that the spacecraft is spinning at 1 RPM vice 1 RPO obviously produces a greater number of spin cycles. With the increase in spin cycles coupled with eclipse season the chances of entering coast mode at the time one of these readings was output is greatly increased.	
O	SAMPEX	96460	12/29/96 (07/03/92)	1	ACS (400)	1	The AADMXE11, AADMXE12, AADMXE13, AADMXE31, and AADMXE32 mnemonics flagged during subsetting at 363-19:33:13 and came back within limits at 363/19:43:51. The spacecraft entered coast mode at 363/19:29:55 and transitioned back to ORR at 363/19:40:34.	All of these mnemonics are only updated during ORR control mode. When the spacecraft enters coast mode the values remain static until ORR is resumed, although their current value continues to be output. The mnemonics where in an out of limit condition when coast mode was entered. Up until entry back into ORR, these values continued being output by the ACS software. Therefore, the ground system saw two consecutive out of limit conditions and flagged it as an anomalous condition. It is not abnormal for single readings to be such during one spacecraft revolution cycle. The fact that the spacecraft is spinning at 1 RPM vice 1 RPO obviously produces a greater number of spin cycles. With the increase in spin cycles coupled with eclipse season the chances of entering coast mode at the time one of these readings was output is greatly increased.	SOAR-C-2761 S-474
O	SAMPEX	96461	12/31/96 (07/03/92)	1	Instruments (700)	1	HILT flow regulator valve telemetry indicates open=true and close=true. Nominal condition: open=false and close=true. This anomaly was last seen on: 96/151 (AR#429)	This is a known anomaly that clearly indicates an impossible condition (a valve open and closed at the same time). It is believed that the problem lies in the telemetry since the PI's do not show any other indications that the Flow Valve may have actually been in an open state. Sending the "Flow Regulator Valve Close" command seems to reset the telemetry so that the valve position reads as expected. The exact reason for this problem is a	SOAR-C-2762 S-475 AR # 429

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								mystery at this time.	
G	SAMPEX	96-G01	01/19/96 (07/03/92)	1276	TLM&DH (200)	2	SAMPEX received 20 blocks of CRC (Cyclical Redundancy Check) errors, test were conducted on SAMPEX NASCOM line DSN station: PKF.	No data loss.	SOAR-C-596
O	SPARTAN 206	9601	01/12/96 (01/11/96)		TLM&DH (200)	1	SLA experienced a low-rate telemetry loss after approximately 1 minute of lock-on.	Suspect failure of PCM or AIA within the Hitchhiker Avionics.	SOAR-C-132
O	TDRS-1	9674	01/29/96 (04/04/83)	4616	TC&C (100)	2	Return Processor-B SSA2R Degradation.	Degradation effectively caused loss of SSA2R services. This data was recovered at another time.	SOAR 172-1 DR 30870
O	TDRS-1	9675	05/20/96 (04/04/83)	5156	TC & C (100)	4	During a TDRSS maneuver, commanding was lost.	A No. 1 spacecraft emergency was declared. STGT is investigating the problem.	SOAR-C-1023
O	TDRS-1	9676	06/04/96 (04/04/83)	4741	TC&C (100)	2	SSA1W TWTA Failure.	This data was recovered at another time.	SOAR 173-3 DR 32206
O	TDRS-1	9677	06/07/96 (04/04/83)	4744	TC&C (100)	2	TWT5 Failure.	This data was recovered at another time.	SOAR 174-5 DR 32253
O	TDRS-1	9678	07/29/96 (04/04/83)	4796	TC&C (100)	3	KSA2R C/No Degradation.	The noise loaded plot of TWTA-6 and the last TWTA-5 (for comparison) with EIRPs/PDA settings that document the IM products caused by the TLM carrier at 0 PDA counts. It appears that U/C #6 TWTA #6 are more sensitive to IMs.	SOAR 175-5 DR 32716
O	TDRS-1	9679	11/07/96 (04/04/83)	4894	TC&C (100)	1	CTE/CPE Loss of Sync.	This data was recovered at another time.	SOAR 176-G DR 33437
G	TDRS-4	96-G01	12/12/96 (03/13/89)	2829	Other (900)	1	TDRSS-4 SGLT-4 STTC hand over anomaly.	The SGLT-4 SHOs were not cancelled prior to hand over to SGLT-4. This caused a data loss. This data was recovered at another time.	SOAR-C-889
G	TDRS-4	96-G02	12/13/96 (03/13/89)	2830	Other (900)	1	TDRSS-4 reconfiguration anomaly.	This data loss was due to inaccurate MA calibration. This data was recovered at another time.	SOAR-C-888 TTR 19094 DR 33643
G	TDRS-6	96-G01	10/31/96 (01/13/93)	1386	TLM&DH (200)	1	Late acquisition and data loss.	40 minute service loss. Failure of the antenna system during acquisition. This data was recovered at another time	SOAR-C-861 TTR 19037
G	TDRS-6	96-G02	12/10/96 (01/13/93)	1427	Other (900)	2	Project reported data service loss.	Data loss due to operator error at STGT. This data was recovered at another time.	SOAR-C-882 TTR 19088
O	TDRS-7	9605	11/07/96 07/13/95	487	Other (900)	4	Just after going to earth mode for an EAST maneuver, an anomaly	Early analysis indicates a possible problem with the command processor	SOAR-C-871

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							occurred involving the command processor.	electronics. This data was not recovered .	
G	TDRS-7	96-G01	11/15/96 07/13/95	485	TLM&DH (200)	4	Guidance and navigation anomalies from the TDRSS-7 satellite.	24 minutes of data loss due to a scheduling error. This data was recovered at another time.	SOAR-C-872 TTR 19052 DR 00759
O	TOMS-EP	9601	07/02/96 (07/02/96)	1	ACS (400)	2	Coarse sun sensors #3 and #4 cross wired unable to perform initial CSS test or enter sun-point mode. Program verified and flight software code patch loaded to correct problem.	Software patch added to adapt to the cross wired condition. The patch was successful.	SOAR-C-722
O	TOMS-EP	9602	07/02/96 (07/02/96)	1	TC&C (100)	2	Spacecraft failed-over to the redundant spacecraft processor at time of uplink of transfer CIBW/CRC command. With no commands in CIB, a transfer command causes the FSW to go into a infinite loop, spacecraft watchdog timer times out, causing fail over to redundant spacecraft processor.		SOAR-C-723
O	TOMS-EP	9603	07/02/96 (07/02/96)	1	TC&C (100)	2	Spacecraft failed over to redundant spacecraft processor at time of uplink of transfer CIB W/CRC command.	See SOAR Number C-723	SOAR-C-724
O	TOMS-EP	9604	07/12/96 ((07/02/96)	10	ACS (400)	2	All three torque rods X,Y,Z had polarity reversed. Torque rods wired incorrectly.	Corrected by changing the flight software use of polarities via keypad table load.	SOAR-C-725
O	TOMS-EP	9605	07/17/96 (07/02/96)	15	TC&C (100)	2	S/C processor failed over to redundant at time of uplink of 2nd "XFR CIB W/CRC" command. Assumed 1st cmd did not get in - it did - then 2nd cmd transferred the empty buffer.	Variation on previous 2 CIB transfer problems.	SOAR-C-739
O	TOMS-EP	9606	07/22/96 (7/02/96)	10	ACS (400)	2	Sporadic noise bursts in ESA #1 processing affects training edge scan information causing processing logic to believe a large roll or pitch error exists, and failing over.	Uplinked RDD load to modify loss of NADIR trigger levels; dynamic and real errors of more than 17 in roll/27 on pitch would still cause failover - to be used and evaluated.	SOAR-C-740
O	TOMS-EP	9607	10/07/96 (07/02/96)	97	Other (900)	2	APRESMOD count stopped updating on day 281.	Investigation of the problem continues. The spacecraft continues to function normally.	SOAR-C-896
G	TOMS-EP	96-G01	07/21/96 (07/02/96)	19	Other (900)	2	MD ISTSAN executed 47 minutes and 22 seconds early.	It was discovered that the execution of ISTSAN out of the CSA was skewed. This data was recovered at	SOAR-C-916

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								another time.	
G	TOMS-EP	96-G02	07/27/96 (07/02/96)	25	Other (900)	2	Negative acquisition and data loss.	Available data indicates that the problem is because a single command was not sent at the correct time. This data was recovered at another time.	SOAR-C-908
G	TOMS-EP	96-G03	09/03/96 (07/02/96)	63	Other (900)	2	Loss of telemetry and downlink at Wallops pass.	It was discovered that the execution of RTCS 21 out of the CSA was skewed. This data was recovered at another time.	SOAR-C-898
G	TOMS-EP	96-G04	11/14/96 (07/02/96)	134	Other (900)	2	Loss of telemetry and downlink at Wallops pass.	It was discovered that the execution of RTCS 21 out of the CSA was skewed. This data was recovered at another time.	SOAR-C-895
G	TOMS-EP	96-G05	12/17/96 (07/02/96)	167	Other (900)	2	Loss of telemetry and downlink at Wollops pass.	It was discovered that the execution of RTCS 21 out of the CSA was skewed. This data was recovered at another time.	SOAR-C-897
O	UARS	9620	02/02/96 (09/12/91)	1968	ACS (400)	1	The spacecraft was in safehold mode resulting from flight software clean up to match the on-board flight software memory image with the ground baseline memory image.	A bad branch instruction within the acs software which was executed upon entry into yaw acquisition mode. Modified ground image to reflect AXEL (i.e., "failed" valve to skew will prevent safehold entry; to prevent OBC off-line condition patch the bad branch instruction. UARS Anomaly Investigation Report #96--015/A.	SOAR-C-941
O	UARS	9621	07/20/96 (09/12/91)	2136	Power (500)	1	Battery 1 differential voltage anomaly: a significant change in the battery 1 differential voltage from +44 MV to -700 MV was observed at the end of its charge cycle in orbit 26545. Preliminary analysis indicates that the large differential spike and subsequent temperature increase of battery 1 are indications of a possible cell failure (hard short) in battery 1. This condition is causing battery 1 to acquire most of the charge during the charge cycle while causing battery 2 and battery 3 to undercharge. Anomaly investigation team (Codes	The RTS was modified to take battery 1 off the charge relay, configure the MPS to VT level 4 and inhibit battery 1 from the feedback loop.	SOAR-C-938

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							513, 734, and the UARS FOT) discussed options for reducing the overcharge condition on battery 1 while allowing the other two batteries to reach full charge. If battery 2 and battery 3 are not fully charged by the start of the maneuver, the end of night load bus voltage could drop below the acceptable limit. It was decided to test the use of the charge relay switch on battery 1 to permit additional charging of battery 2 and battery 3.		
G	UARS	96-G01	01/01/96 (09/12/91)	1936	TLM&DH (200)	1	Negative acquisition and data loss.	This data was recovered at another time.	SOAR-C-937
G	UARS	96-G02	01/29/96 (09/12/91)	1964	Other (900)	4	TR-B improperly configured to record data.	TR-B was improperly configured for data acquisition. The tape recorder should have been placed in record and the proper speed selected. 1 hour and 1 minute of data was lost. This data was not recovered.	SOAR-C-970
G	UARS	96-G03	03/21/96 (09/12/91)	2015	Other (900)	4	RTS 54 placed recorder into record and prematurely terminated the playback of data.	Stopped TR-B and cleaned of the rest of the playback. 8 seconds of 32 KB data was lost. This data was not recovered.	SOAR-C-971
G	UARS	96-G04	10/27/96 (09/12/91)	1662	TLM&DH (200)	1	Late acquisition and data loss.	4 minutes and 41 seconds of 32 KB data loss. This data was recovered at another time.	SOAR-C-865 TTR 19028
G	UARS	96-G05	11/06/96 (09/12/91)	1672	TLM&DH (200)	1	UARS CDM/GCMR capability loss.	UARS performed a total system reboot. This data was recovered at another time.	SOAR-C-867 TTR 19044
G	UARS	96-G06	11/19/96 (09/12/91)	2021	Other (900)	1	Project reported data service loss.	1 minute of 1 KB data loss due to an equipment problem in house. The project had to reboot and reconfigure the front end processor. This data was recovered at another time.	SOAR-C-874 TTR 19055
G	UARS	96-G07	12/03/96 (09/12/91)	2038	Other (900)	4	Project reported data service loss.	4 minutes and 6 seconds of data lost due to mismanagement by the POCC operator. This data was not recovered .	SOAR-C-875 TTR 19077
O	XTE	9603	01/01/96 (12/30/95)	2	ACS (400)	2	Star Tracker - Early on orbit experiences with the star tracker occasionally losing inertial lock. With the Telemetry Status Monitor (TSM) automated resets	On 1/4/96, a TSM/RTS Sequence was developed and uplinked to the spacecraft to automatically reissue directed search commands to a star tracker in the event that the star	SOAR-C-127

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							implemented earlier, the trackers are now fully meeting mission requirements.	tracker lost track of stars in its first four slots.	
O	XTE	9604	01/01/96 (12/30/95)	2	TLM&DH (200)	2	TO task would restart telemetry near the end of each 32 KB/sec event (approx 2 minutes until Loss Of Signal). Problem traced to the fact that the AM task was functioning but the Flight Operations Team was manually controlling the recorders.	AM will restart telemetry if playback is manually turned off before the 2 minute guard time at LOS. This is a feature of the AM task and is expected not to be a problem once the +High Gain Antenna is operational.	SOAR-C-742
O	XTE	9605	01/01/96 (12/30/95)	2	Other (900)	1	Dropout due to Doppler Compensation Inhibit (DCI) – Second TDRSS Ground Terminal (STGT) integrated receiver cannot maintain lock on the XTE return link when a DCI Ground Control Message Request (GCMR) is sent on a 32/1024 return rate support.	Report transferred to Anomaly Report (AR) (RE: AR#4). Send the doppler compensation enable GCMR if the problem occurs following a DCI or wait for STGT system to send AUTO REACQ.	SOAR-C-779
O	XTE	9606	01/02/96 (12/30/95)	3	Other (900)	2	PCA did not configured correctly at the end of SAA. Suspect S/C RTS 132 Failed to execute. Science patch to the DAP inadvertently overwrote the RTS 132 call.	PCA Team reconfigured PCA in real time. S/C RTS 132 executed via ground command successfully.	SOAR-C-743
O	XTE	9607	01/03/96 (12/30/95)	14	Instruments (700) (Mission Unique)	2	All Sky Monitor - The ASM detectors have spontaneously shut off high voltage on several occasions. Most of the shut downs are believed to be self-triggered by apparent anode wire arc events in one or more detectors.	A MIT telemetry study led to conclude that a single anode wire arc had triggered it off. MIT is expected to provide an operating plan that will carefully explore the possibilities, to minimize the chances for catastrophic detector failures.	SOAR-C-131
O	XTE	9608	01/05/96 (12/30/95)	6	Other (900)	2	AM CES Patch Load/ Playback anomaly - The AM task failed to re-start data storage playback after patching the contact entry schedule.	This is a feature of the AM task. The recommendation is to command playback as it was before the patch load.	SOAR-C-744
O	XTE	9609	01/06/96 (12/30/95)	8	TLM&DH (200)	1	Transponder Coherent Mode - Doppler tracking with transponder #2 does not work and is no longer used. Downlink signal to noise ratio is 3-4 DB below that of the other transponder.	The vendor is working with the Code 700 anomaly team to assess the probability of any more serious degradation that could result in loss of coherent mode. Results are expected in mid to late February.	SOAR-C-129
O	XTE	9610	01/06/96 (12/30/95)	7	Other (900)	2	S/C _P warm restart occurred after a S/C RTS was loaded. The Checksum Task code expects the table checksum to be unique, in this	FSW CCR-010 is open and recommends a code change to fix this problem as well as other CS problems.	SOAR-C-745

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							case the checksum was the same for both RTS.		
O	XTE	9611	01/06/96 (12/30/95)	7	Instruments (700) (Mission Unique)	2	During the first few days of the mission two of the three Shadow Cameras developed high-voltage breakdown.	All Shadow camera low voltage relays were disabled at DOY006-09:40. FSW CCR-007, ADD new S/C TSM #62 to Monitor ASM. Upon detection of an event in the EDS status word, the TSM will turn off the high voltages of all SSCs. This fix was loaded to the spacecraft on 22 FEB 1996.	SOAR-C-746
O	XTE	9612	01/06/96 (12/30/95)	7	Other (900)	2	The Flight Data System (FDS) AM Task commanded +High Gain Antenna to track TDRS East and -HGA to track TDRS West. Status message that TDRS East was occulted was received. At the same time that event went Loss Of Signal. AM failed the park the +HGA. The AM task will not park the HGA in the event of TDRS occultation.	AM is waiting for occultation to end in order to resume tracking. This condition will correct itself at the end of the next contact on the occulted HGA or the FOT can command the occulted HGA to park. To minimize the possibility of this happening again, a modification to the scheduling guard time was changed from LOS-1:00 to LOS-3:00.	SOAR-C-747
O	XTE	9613	01/14/96 (12/30/95)	14	Instruments (700) (Mission Unique)	1	HEXTE Photo Switch Turn-On Anomaly – a spacecraft reduced power level occurred during orbit night, each time the instruments were commanded off. There is a strong belief that this anomaly was a “start-up” problem only.	Except for the brief reset periods associated with these two incidents, HEXTE has operated continuously since turn on.	SOAR-C-130
O	XTE	9614	01/25/96 (12/30/95)	25	Other (900)	2	Load generation problem - The XTE mission planner was unable to run load generation for the Science Operations Facility (SOF) input. Seems that a file in the continuity directory - LG_VERSION' corrupted itself after it accumulated ~6 MBYTES of data. Load generation requires this file in order to complete processing.	The developers deleted LG_VERSION and a 'FAKE DAP' of one no op cmd was preprocessed and load gen'ed to create a new LG_VERSION file. Once this was done the input was processed into a daily load suitable for uplink.	SOAR-C-786
O	XTE	9615	01/28/96 (12/30/95)	28	ACS (400)	2	Large slew (70deg) produced 40 asec position errors. Large drift rate excursion occurred. Biases was in process of converging when another large slew (120deg) occurred. At end of slew, 50-60 asec positions errors were noticed. Large drift rate excursion again occurred. At peak	Slew were disabled, ACS RTSs and TSMs were disabled, and ITH was commanded. Quatrain was updated using an RTADS solution and guide stars were identified. All RTSs reenabled. TSM (occulted TSMs) were reset (this activates the TSM/RTS sequence). Slews were enabled.	SOAR-C-748

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							of excursion, Star Tracker became occulted and biases stopped updating. At the end of occultation , errors of 80-90 asec were found. The rate of change of the position error was greater than the D12 rate of change. At end of slew, trackers could not find guide stars (attitude knowledge lost).	Resolution: Enable Post-Slew Covariance Initialization Flag.	
O	XTE	9616	02/09/96 (12/30/95)	39	ACS (400)	2	Approximately once per day, each Star Tracker losses its synchronization with the Attitude Control System bus. Loss of synchronization is unknown at this time. Several sync losses are during South Atlantic Anomaly (SAA) passages.	None. Star Tracker automatically adjusts its 0.1 sec sync window until synchronization is reestablished (takes up to 25 minutes).	SOAR-C-749
O	XTE	9617	02/09/96 (12/30/95)	39	ACS (400)	2	Gyro channel - C motor current profile tends to oscillate (at times) in a very different manner then Channels A and B. Anomalous profile is non-cyclic and deviates markedly from that of Channels A and B.	None. Currently trending inertial reference unit channel C signature. No known resolution possible at this time.	SOAR-C-750
O	XTE	9618	02/12/96 (12/30/95)	42	Other (900)	4	Science data loss stemming from mutual interference. During an S-band Single Access (SSA) event, 295 Virtual Channel Data Unit (VCDU)'s of science data were lost, non-recoverable, when a period of mutual interference occurred at the end of the event.	The incident was logged in the daily summary.	SOAR-C-783
O	XTE	9619	02/17/96 (12/30/95)	47	Power (500)	2	Main bus voltage fell below 26.8V, which is the threshold 0 limit of TSM 25. All occurrences were just prior to S/C eclipse exit.	Disabled S/C RTS 8 (instrument load shed RTS) Flight Software CCR-015 modified the limits on S/C TSM #. Message Threshold 1 – Load Shed Instruments (S/C RTS 8) Threshold 2 - ACE Safe hold (S/C RTS7) Implemented on 08 March 96.	SOAR-C-751
O	XTE	9620	02/19/96 (12/30/95)	49	Instruments (700) (Mission Unique)	2	Yellow High Current Violation for all sky monitor Shadow Camera-2 (SCC-2). After further investigation, SSC-2 has been violating the yellow high limit of 0.410 amps with an average current	The Science Operations Facility was notified by Flight Operations Team (FOT) console analysts. The FOT was advised that the SSC-2 YH and RH limits should be raised. This has been done via the ULIMDEF procedure, and	SOAR-C-752

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							of 0.423 amps. This phenomenon occurs at the end of orbit night.	these changes will be incorporated into the XTE database during the next database generation.	
O	XTE	9621	02/21/96 (12/30/95)	51	Other (900)	2	S/C TSM #62 - All sky monitor Scanning Shadow Cameras Monitor failed to execute. The Science Operations Facility (SOF) observed that the Experiment Data System set the MEDS1BYT4 to 1 which indicates that Scanning Shadow Camera-1 was in a breakdown state. This should have resulted in S/C TSM #62 threshold 2 to fail and turn off Scanning shadow Camera-1. All S/C at this time indicates that S/C TSM #62 failed to execute.	The FOT commanded all sky monitor high voltage on RTSs to the disabled position. Thus preventing further unprotected operation of Scanning Shadow Camera -1.	SOAR-C-753
O	XTE	9622	02/21/96 (12/30/95)	51	Other (900)	2	TO detected a bad Downlink Card Status.	Upon detection of either an underflow condition or an out of sync condition, To autonomously restarts telemetry to correct the condition. This problem does not have any implications as far as hardware degradation.	SOAR-C-754
O	XTE	9623	03/26/96 ((12/30/95)	86	ACS (400)	1	Attitude control electronics (ACE)-A/ACE-B Analog-to-Digital FDC Violations, FDC Element 40 (ACE-B A/D Not Ready) counter incremented from 0 to 1. No FDC action was taken since 3 consecutive violations are required for Action 1 to be taken (i.e. to disable switch to ACE-B), FDC Element 41 (ACE-A A/D Not Ready) counter incremented form 0 to 1. Again, no FDC action was taken since 3 consecutive violations are required for Action 1 to be taken (i.e. switch to ACE-B control).	Both anomalies are attributed to single event upsets during South Atlantic Anomaly (SAA) passage. Data was replayed during ACE-A/ACE-B violation events.: 1. No ACE messages were transmitted which would indicate a real A/D failure. 2. Spacecraft was in the SAA during each event. 3. With spacecraft in a "warm" attitude (to heat PCA), ACE temps are approximately 1 degree warmer than a week ago. ACE H/W engineer stated this should be no problem.	SOAR-C-755
O	XTE	9624	04/05/96 (12/30/95)	96	ACS (400)	2	Reaction Wheel Anomaly - During a slew, (slew angle = 66 deg), the XFETOT noticed a very large excursion of reaction wheel speeds. After analysis of replay data, it was determined that the Inertial Hold Momentum Bias was changed for the wheel spin-up but the Slew	After concurrence with Attitude control system engineer, the XTEFOT proceeded to reconfigure the spacecraft back to its nominal configuration, and then regain XTE'S attitude knowledge. Full recovery was declared, subsequent slews were observed to execute with no problems.	SOAR-C-756

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							Momentum Bias remained unchanged. In this undesirable configuration the attitude control system control system attempts to spin the wheels down during slews. After concurrence with ACS engineer, the XFEFOT created a new ACS table 66 correcting the Slew Momentum Bias. However, the slew occurred before the table was verified for uplink. As the slew ended the wheels spun back up causing high position errors in the Y and Z axis. This in turn tripped FDC item 36 which switched to the redundant gyros. Saturation of the controller, along with the redundant gyros being in the control loop caused XTE to lose its attitude knowledge.		
O	XTE	9625	04/07/96 (12/30/95)	97	Thermal (300)	1	Transponder and SPSDU2-B temperature excursions - Several telemetry points were affected all were yellow high. After discussions with the thermal engineer, the limit violations are a result of heating the PCUs.	The YH limits will be increased 5 degrees C with no impact to Spacecraft Health and Safety. This has been done via the ULIMDEF Procedure and these changes will be incorporated into the XTE database during the next database generation.	SOAR-C-757
O	XTE	9626	04/19/96 (12/30/95)	109	ACS (400)	1	Inertial reference unit channel B current anomaly - Gyro channel B current was observed to jump by 2.5 milliamps. This is the first occurrence seen by this channel. Numerous jumps have been observed in channel C since launch.	No degradation in spacecraft control or performance has been detected by these current jumps. Gyro currents continue to be closely monitored.	SOAR-C-758
O	XTE	9627	04/29/96 (12/30/95)	119	ACS (400)	1	No Kalman filter updates. Tracker 1 lost track on 3 of 4 guide star. This anomaly is due to errors in the onboard star catalog.	Correct onboard star catalog.	SOAR-C-759
O	XTE	9628	05/15/96 (12/30/95)	135	ACS (400)	2	Large intermittent mage/position residuals observed in Tracker 2 Slot 2. Large excursion of X-Gyro drift bias noticed. On board catalog Star ID = 360 is being interfered with by another star not in the On board catalog .	Errors eventually become constant and tracker tracked interference. Flight Dynamics Facility (FDF) will check to see if Star 360 can be removed and another put in its place.	SOAR-C-761

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							Attitude knowledge maintained.		
O	XTE	9629	05/16/96 (12/30/95)	136	ACS (400)	1	Star Catalog Hole - The On board catalog Filter was not updated using star data from either tracker for thirty minutes. A hole in the OBC star catalog was discovered.	Flight Dynamics Facility (FDF) is currently updating the star catalog. FDF will verify CAT ID has been corrected and will attempt to add new stars to the catalog to fill in this hole.	SOAR-C-760
O	XTE	9630	05/21/96 (12/30/95)	152	ACS (400)	1	Star catalog anomaly - high position error Failure Detection and Correction (FDC) Element #54 incremented to 10. No FDC action executed. Attitude knowledge maintained. OBC Star ID=188 contains both position and magnitude errors.	All stars in Tracker 2 were lost except for this star, causing a very large jump in the X-gyro bias. Flight Dynamics Facility (FDF) will verify catalog corrections to both magnitude/position for OBC Star = 188.	SOAR-C-762
O	XTE	9631	05/28/96 (12/30/95)	148	Other (900)	1	IFOG initialization failure. IFOG did not go from NORMAL to IBIT mode when issued the /FAIBIT command. (via the FOGIBIT2 proc). ICNT did not increment from the previous value of 141 in reaction to either the /FABIT or the /FOGINIT commands. Subsequent attempts to run the FOGIBIT2 proc resulted in the same reaction form IFOG (i.e. did not go to IBIT or increment the ICNT from a value of 141).	The IFOG command counter has been incrementing so it could be assumed that IFOG is receiving ground commands.	SOAR-C-763
O	XTE	9632	06/01/96 (12/30/95)	151	TLM&DH (200)	1	High Gain Potentiometer Telemetry out of limits. This anomaly was observed during a slew.	No loss of communications or any other anomalies were noted during this time.	SOAR-C-764
O	XTE	9633	06/02/96 (12/30/95)	152	ACS (400)	1	Attitude Control Subsystem (ACS) 1 Hz deviation anomaly - During the South Atlantic Anomaly (SAA),, ACS 1-Hz Deviation jumped to a value of -373 millisecs. At the same time, several other limit violations occurred including GSACE-A RT error, both Star Trackers lost sync, and ACE A/B Conflict Counters incremented.	ACS Bus Schedule autonomously adjusted its schedule to resync itself to the 1 Hz Pulse at a rate of 1 millisec/sec. ACS 1 Hz Deviation became nominal. Yellow Limits adjusted for the ACE conflict counters and FDC element counters.	SOAR-C-765
O	XTE	9634	06/12/96 (12/30/95)	162	Other (900)	1	Absolute Time-tagged Sequence (ATS) Load failure – when began loading ATS B, command errors began incrementing. Telecommand stopped loading the ATS B load. The only abnormality noted was the	When attempted to load ATS B again, saw SCIBFEC error again but the load was successfully loaded, i.e., the checksums matched and end item verification was provided.	SOAR-C-766

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							time while in South Atlantic Anomaly (SAA).		
O	XTE	9635	06/12/96 (12/30/95)	162	Other (900)	1	Lost 4 sec of realtime 32 KB/sec (I-Channel) telemetry data due to a drop out. Lost while loading ATS-B. ATS-B loaded successfully with GRI updated and computed checksum. Command was retransmitted successfully after the drop out. Error counter (SCIATFA=3) incremented (SCIBTFA did not increment.) Note: Antenna Manager went into Handover mode (+HGA to -HGA). Pass plan does not show an antenna handover, Slew was scheduled.	CSC-5 called and notified that Antenna Handover had occurred.	SOAR-C-767
O	XTE	9636	06/20/96 (12/30/95)	170	Power (500)	1	Spacecraft data system - a power amplifier current spike. SDS-A power amp current failed yellow high (YH) for a duration of one sec.	YH limit is set too tight. New limit to be determined.	SOAR-C-768
O	XTE	9637	06/22/96 (12/30/95)	172	Power (500)	2	Low battery SOC- On GMT day 172 it was noticed from the daily trending that the battery SOC on day 171 never reached 100%. Further investigation revealed that there had been a downward trend in both the battery SOC and battery voltage over the previous several days due to increasing eclipse periods and a large number of slews (greater than 30). On day 173 SOC was down to 81% and action was taken.	Slews were disabled to allow battery to recover. After confirming with code 700 engineer, it was determined that the AHI had lost track of where 100% SOC was. No current data was available to reset AHI so the VT level was changed from 5 to 6. After three orbits battery SOC was up to 100% and slews were enabled.	SOAR-C-769
O	XTE	9638	06/28/96 (12/30/95)	178	Other (900)	1	Multiple Invalid Stream XI – South Atlantic Anomaly (SAA). The s/c events filled maximum available memory for VR2. The primary s/c SB Send Error Counter incremented from 0 to 39 and the s/c XI HEXTE RT Retries (8 bit counter) continuously increment. HEXTE 1 cluster remained in the SAA configuration after SAA exit and did not respond to ground commands from the SOF or ATS commands.	Notified SOF. Added a FWD TDRS Service for upcoming event. On that event, redumped S/C events and released event data sets to free up memory for event logging. S/C XI HEXTE RT retries continue to increment but no further bus errors have occurred. SOF was unable to command the HEXTE1 cluster to its nominal configuration.	SOAR-C-770

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
O	XTE	9639	08/08/96 (12/30/95)	218	Other (900)	1	Absolute Time-tagged Sequence (ATS) Load failure – when began loading ATS B, command errors began incrementing. Telecommand stopped loading the ATS B load. The only abnormality noted was the time while in South Atlantic Anomaly (SAA).	After exited SAA, the ATS B was reloaded nominally. ULIMDEF proc was edited to reflect changes.	SOAR-C-771 See SOAR-C-766
O	XTE	9640	08/12/96 (12/30/95)	222	Other (900)	1	Instrument Specification (IS) Throughput Miscalculation, Science Operations Facility (SOF) personnel notified the Mission Operations Center (MOC) that Instrument Support throughput was not corresponding to what was expected based on their target calculations. Initial predictions were for 10 KB/sec throughput and the telemetry (SISTHRUPUT) was showing 185 KB/sec.	No immediate action necessary. The recorders were not receiving an abundant amount of data so the nominal 32/64 events were able to keep up with playbacks.	SOAR-C-772
O	XTE	9641	08/21/96 (12/30/95)	231	Power (500)	1	Spacecraft Data System (SDS) A power amp current failed Yellow High and returned within limits.	Yellow high limit set low. Yellow High limit needs to be raised.	SOAR-C-773
O	XTE	9642	08/23/96 (12/30/95)	233	Power (500)	1	Primary and Redundant +28V power mnemonics tripped YL just prior to eclipse exit.	Primary +28v power returned within limits 47 seconds after tripping. The Spacecraft was not in South Atlantic Anomaly (SAA) at that time.	SOAR-C-774
O	XTE	9643	09/04/96 (12/30/95)	244	ACS (400)	1	Inertial Reference Unit (IRU) Channel C Motor Current Jump - the Attitude Control Electronics (ACE)-A IRU channel C motor current began jumping above the yellow limit. The average minimum IRU channel C motor current jumped and the average maximum began to cross the yellow high limit much more frequently.	Temporarily increased the AEAIRUCI & AEBIRUCI yellow high limit and the red high limit under the ACS engineers direction.	SOAR-C-775
O	XTE	9644	09/15/96 (12/30/95)	268	Other (900)	1	Flight Data System (FDS) Framer task (FR) detected bad checksum in frame packet.	This causes a sequence gap.	SOAR-C-776
G	XTE	96-G01	01/31/96 (12/30/95)	30	Other (900)	2	Contact Entry Schedule (CES) patch load problem - A Space Network (SN) real time support was missed as the onboard Antenna Manager (AM) did not account for a	The event was lost. Subsequent events were taken without occurrences of this mishap.	SOAR-C-787

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							scheduled event. It was later determined that there were two patch loads to the CES which overlapped. Both of these contained add events. The 2nd patch overwrote the 1st patch before that ones add event had executed effectively wiping out that add.		
G	XTE	96-G02	02/08/96 (12/30/95)	38	Other (900)	1	Late acquisition: Space Network (SN) support loss 04:02 minutes of service/data due to late acquisition. Per the Flight Operations Team (FOT) pass plan sheet for this support the late acquisition was due to Radio Frequency Interference (RFI).	Data was acquired without further mishap. All data loss was recovered by subsequent recorder mgmt.	SOAR-C-780 TRR 18724
G	XTE	96-G03	02/08/96 (12/30/95)	38	Other (900)	1	Mission Operations Center (MOC) telecommanding problem – The Flight Operations Team (FOT) experienced another telecommanding error during the Space Network (SN) event. The FOT was unable to load the daily Absolute Time-tagged Sequence (ATS) load into the command buffer which has to be postponed until the TDRS West (TDE) event. Note: this event report shall be the master in which to log the time of any additional occurrence.	The Front End Processor (FEP) was rebooted and an ATS load loaded into the CMD buffer. Once accomplished the system, then, is free of the telecommanding problem.	SOAR-C-781
G	XTE	96-G04	02/08/96 (12/30/95)	38	Other (900)	1	Ground Control Message Request (GCMR) mismanagement - 05:54 minutes of I-CHNL (32 KB/sec) data loss due to GCMR mismanagement. During this South Atlantic Anomaly (SSA) coherent event the Doppler Compensation Inhibit (DCI) to inhibit doppler compensation was transmitted about 05 seconds too early.	Due to transponder anomaly (AR#004) DCI's are no longer required. Mission Operations Center (MOC) procedures have been updated to reflect new procedure (ref: MOCR #3). Instructed all console analysts to observe data lock before transmission of the DCI GCMR, to avoid future dropouts of this nature.	SOAR-C-782
G	XTE	96-G05	02/12/96 (12/30/95)	42	Other (900)	1	Possible Generic Trend and Analysis System (GTAS) problem relating to pseudos and data gaps - after running Inertial reference unit (IRU) test plots over a 24 hour	Suggest having GTAS developers check to see if this is a correctable GTAS problem or if it is the nature of pseudos.	SOAR-C-784

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							duration, it was noted that a 4 minute data dropout occurred. The psuedos in the plot file ceased plotting at the time of the data dropout and did not resume for the remainder of the 24 hour time span.		
G	XTE	96-G06	02/16/96 (12/30/95)	46	Other (900)	2	Crippled disk on RAID - RAID displayed error message: Replaced crippled disk 4A, then hit B to reconstruct. Because the RAID is fully redundant, operations was not impacted by this type of RAID failure.	Called maintenance to correct raid error. Maintenance hit the B button on the RAID and the RAID software proceeded to reconstruct disk 4A.	SOAR-C-788
G	XTE	96-G07	02/21/96 (12/30/95)	51	Other (900)	1	FE1 problem - During the event, the front end acquired normally and after a few minutes the data went static without the FE losing lock. Frame overflow messages were issued continuously. Upon examination of the FE windows, the only problem noted was a history logger suspension. The Science Operations Facility (SOF) was still receiving data normally from PACORII and data accounting/ continuity appeared to be updating. This problem occurred following a fresh reboot.	The decision was made to ride out the event in the blind and switch to Front End Processor (FEP) 2 to allow for a reboot of FEP 1.	SOAR-C-789
G	XTE	96-G08	02/21/96 (12/30/95)	51	Other (900)	1	Ground Control Message Request (GCMR) mismanagement - lost (32 KB/sec I-Channel) real-time telemetry data after an XTE antenna handover from transponder-1 to transponder-2 while doppler was inhibit. Data drop out.	Notified Performance Analyst (PA) and developer. Re-enable doppler to lock back onto data. Data was locked. Data is recoverable.	SOAR-C-790
G	XTE	96-G09	02/28/96 (12/30/95)	58	Other (900)	1	TNIF load failure - Experienced TNIF load failure upon running UXTEUP. Received error messages, return link 1 unable to load the hardware with setup information. Problem could have been caused by dust accumulation.	Per the advice of developer: have Transportable Project Operations Control Center (TPOCC) maintenance reseat the FEPX cards to clear this problem.	SOAR-C-791
G	XTE	96-G10	02/28/96 (12/30/95)	58	Other (900)	1	GENSSR, retransmit problem - During the PASS Acquisition of Signal (AOS), a Loss of Signal	Retransmits were sent until all of the data reached the ground and was accounted for. The error counters were	SOAR-C-792

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							(LOS) occurred, multiple MI's were experienced causing numerous data gaps in Virtual Recorder (VR)1 data. Upon retransmitting, not everything was sent to the ground.	reset at the end of PASS.	
G	XTE	96-G11	03/07/96 (12/30/95)	67	Other (900)	1	Front end reboot problem - At various times front ends 1 and 2 are from 2 to 4 reboots before operating properly.	Continue reboot until it works. Run on back-up during reboot process.	SOAR-C-793
G	XTE	96-G12	03/14/96 (12/30/95)	74	Other (900)	1	Unable to command, due to hardware failure at STGT. Attempted no op Star Tracker (ST) start of forward service. Commands reached STGT but were not forwarded to the spacecraft.	Notified Test Operations Center (TOC) switch and Performance Analyst (PA). Problem was isolated to STGT hardware failure at the low rate switch.	SOAR-C-794 TTR 18802
G	XTE	96-G13	03/15/96 (12/30/95)	75	Other (900)	1	Ground NES and s/c CLCW report value out of sync. The CI transfer frame errors were caused by the ground NES being ahead of the s/c CLCW report value of one.	The resync alone effectively corrected the condition and allowed normal commanding to the s/c to resume.	SOAR-C-795
G	XTE	96-G14	03/18/96 (12/30/95)	78	Other (900)	1	Mission Operation Center (MOC) system shutdown. The XTE MOC sustained a power hit which brought down our prime real time string hard minutes before Acquisition of Signal (AOS) of an S-band Single Access (SSA) high rate event. Flight Operations Team (FOT) R/T personnel failed over to backup R/T string, rebooted Front End Processor (FEP)2, and established command control.	All data loss was recovered during subsequent events. For offline personnel rescheduled the subsequent Multiple Access (MA) event (added FED link) and added an SSA high rate event building a patch to the Contact Entry Schedule (CES) in the process.. During this event R/T was able to retransmit all missing VCDU's, accounting for all data.	SOAR-C-796
G	XTE	96-G15	03/25/96 (12/30/95)	85	Other (900)	1	Acquisition failure of an added S-band Single Access (SSA) event. Could not acquire telemetry on an added SSA event. Telemetry was not acquired during the event because the transponder was configured to mode 2 (non coherent) and TDRSS was expecting mode 3 (coherent).	Telemetry should have been acquired if the mode was changed. Attempted manual blind acquisition.	SOAR-C-797
G	XTE	96-G16	03/30/96 (12/30/95)	90	Other (900)	1	Late acquisition – Loss of 32 KB/sec (I-Channel) data due to late acquisition.	Send forward reacquisition Ground Control Message Request (GCMR). Data is recoverable.	SOAR-C-798 TTR 18826

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	XTE	96-G17	04/10/96 (12/30/95)	100	Other (900)	1	Loss lock on data – Loss of 32 KB/sec (I-Channel) data due to a drop lock. Loss lock on data. Send return reacquisition Ground Control Message Request (GCMR) (3X). Second TDRS Ground Terminal (STGT) failover from Mission Analysis Room (MAR) link channel-6 to MAR link channel-2. Lock on data.	Data is recoverable. Multiple Access (MA) return link support. Antenna handover from transponder-A (HGA+) to transponder-B (HGA-). Lock on data after STGT failover.	SOAR-C-799 TTR 18837
G	XTE	96-G18	04/10/96 (12/30/95)	100	Other (900)	1	Late acquisition –Loss of real time Virtual Channel (VC)0 data due to late acquisition S-Band Single Access (SSA)-2 antenna being idled at event start. Just about to send fwd REACQ when Mission Operations Center (MOC) received good lock on data.	Performance Analyst (PA) reported that there was an operational problem at Second TDRS Ground Terminal (STGT).	SOAR-C-800 TTR 18838
G	XTE	96-G19	04/11/96 (12/30/95)	101	Other (900)	1	Front End Processor (FEP)-1 Crash - FEP-1 crashed about 2 minutes after Acquisition of Signal (AOS). Failover to FEP-2. Switched Laser Tracking Subnet (LTS) line from FEP-1 to FEP-2 (Command and Network Control Center (NCC) line).	Retransmit data set-1 on Virtual Recorder (VR)-1.	SOAR-C-801
G	XTE	96-G20	04/16/96 (12/30/95)	106	Other (900)	1	Late acquisition – Loss of 32 KB/sec (I-Channel) data due to late acquisition. Data is recoverable.	Send Ground Control Message Request (GCMR) forward reacquisition. Data lock.	SOAR-C-802 TTR 18847
G	XTE	96-G21	04/26/96 (12/30/95)	116	Other (900)	1	Relative Time-tagged Sequence (RTS) load generation incident - The XTE Flight Operations Team (FOT) experienced a problem generating the instrument daily load. Nominal Science Operations Facility (SOF) input was successfully preprocessed by the offline system but failed during the following process - load generation. An ambiguous error message indicated that the system was unable to start an RTS. It was determined that RTS slot assignments had incorrect values for the SOF slots which	The SOF slot assignments were corrected and the modified input was Successful and the load generated and uplinked to the spacecraft prior to the change of GMT day.	SOAR-C-803

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							effectively precluded any SOF RTS execution out of the load input.		
G	XTE	96-G22	04/27/96 (12/30/95)	117	Other (900)	1	Bumped command ingest error counter – S/C NO OP was sent at Acquisition of Signal (AOS), prior to Completion of the return frequency Ground Control Message Request (GCMR). Mission Operations Center (MOC) had not yet locked back up on telemetry causing a retransmit of the S/C NO OP which in turn bumped the 1SCIAFEC and SCIBFEC.		SOAR-C-804
G	XTE	96-G23	04/30/96 (12/30/95)	120	TLM & DH (200)	1	No UPD received at XTE POCC and TOPEX POCC from start of event. NCC successfully transmitted test blocks and deselected and selected UPD to both XTE and TOPEX. POCC's still did not receive UPD. Advised NCC that they were seeing ODM's leaving site and NASCOM advised no problems were seen. No impact to support and no TLM loss. Note: STGT was running an end-to-end test. When this ETE was cancelled at 160324z, valid UPD was observed at the POCC and the NCC.	This item will be closed at STGT as non-reproducible. Item under investigation by NCC TNAS and NASA test. The NCC must schedule a normal service for every EET service. The NCC will still receive "ODMS for inactive service" messages every 3 minutes as long as the EET service is active, but will not prevent CCS from creating UPD or forwarding it to the MOCS. STGT DR open a request for software change will be submitted.	SOAR-C-1055 TTR 18859
G	XTE	96-G24	04/30/96 (12/30/95)	120	Other (900)	1	Mission Operations Center (MOC) Front End Processor (FEP) crashes - MOC experienced multiple FEP problems during PREPASS and real-time of a high rate support. REAL-TIME (VCO) frame data was corrupted and unable to open. Event files was also corrupted.	Shutdown workstation 1 and rebooted FEP1. Bumped the CI frame error counter by 3 while sending NO OP while attempting to establish a command link.	SOAR-C-805
G	XTE	96-G25	05/06/96 (12/30/95)	126	Other (900)	1	UPS1 login problem - during an attempt to add a forward to an ma event, an unsuccessful attempt was made at logging into UPS1. During the attempt to delete the existing ma event, the SDR was transmitted but remained yellow . The NCC scheduler deleted the event and added a new one.	None - the NCC scheduler said that all other ground elements saw the updates.	SOAR-C-806

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	XTE	96-G26	05/10/96 (12/30/95)	130	Other (900)	1	Front End Processor (FEP) crash/history logger suspended - following a fresh reboot FEP-1. Not history directives were successful. When failing over to FEP-2 it was revealed that the FEP-2 history logger was suspended as well. A second reboot of FEP -1 resulted in another suspended history logger. The third reboot of FEP -1 was successful. History files were opened successfully (on FEP -1) midway through the ongoing support.	Failover to FEP -2 to take upcoming support and reboot FEP -1. Kept rebooting FEP -1 until successful, then failed back over from FEP -2 to FEP -1.	SOAR-C-807
G	XTE	96-G27	05/12/96 (12/30/95)	132	TLM&DH (200)	1	Data loss due to mutual interference during a science observation while data was being burst into Virtual Recorder (VR)6. Due to numerous drop-outs much of the VR6 data was not received. Also FEP-1 crashed approximately half way through the support, preventing the ability to command any DS retransmits. It is possible that the numerous dropouts, data gaps and return link 2 overflows killed the FEP.	The lost Virtual Channel Data Unit (VCDU) file maintained by data accounting was corrupted during the data recovery period. Accounting task seems to be working correctly following the anomaly.	SOAR-C-808
G	XTE	96-G28	05/17/96 (12/30/95)	137	Other (900)	1	Backup oracle hard disk crash (/app-disk2) – This HOT backs up the prime oracle disk and updates the backup oracle disk. The HOT backup never completed, and MOPSS would not come up the next morning. It was determined that the app disk on the backup Oracle WS had crashed. Since the prime Oracle server is constantly writing to the backup server, the database was "frozen" and could not be accessed.	The prime Oracle WS was shutdown and brought back up in single instance mode. The bad disk was replaced,. The directory structure was checked out to be ok on the backup disk. Then a make backup script was executed on the prime server to bring the backup server up to date. Backups to tape were made of both the prime Oracle server and the backup Oracle server.	SOAR-C-809
G	XTE	96-G29	05/17/96 (12/30/95)	137	Other (900)	1	WS1 shutdown anomaly - POSTPASS of a nominal MA support, ran UXTEDOWN, pass term, killed the workstation and closed the Front End Processor (FEP) windows, then logged out of	Notified TSM. It was determined that root was in single user mode. With super user, re initiated and re-ran shutdown. The auto script then worked. Investigation ongoing as to why root went to single user mode.	SOAR-C-810

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							XT1XT1. With a 29 minute break between operations, we ran a shutdown on ws1, the auto shutdown script did not run properly and halted. Since the FEP1 was still up, we just brought up XT2WS2 and XT2XT2 and took the next support without incident.		
G	XTE	96-G30	05/19/96 (12/30/95)	139	Other (900)	1	AM Occultation status at event AOS - the antenna management system occulted at event AOS of the SN (TDW) event at 140/001900z. Telemetry lock was achieved at 002348z although AM recognized the current entry as the subsequent support at 0100z (also a TDW event). I-CHNL telemetry without mishap although the Q-CHNL downlink only had VC63. Science recorders were not played back since am did not command them on due to the occultation.	This late acquisition was the result of the event being scheduled outside of the XTE-TDRS support window. In the effort to fill realtime support gaps this timeframe was inadvertently scheduled by the XTE scheduler. None. No forward for commanding on this event. Vc0 telemetry only Received. There was no data loss. Science data was played back on subsequent events with no problems.	SOAR-C-811
G	XTE	96-G31	05/22/96 (12/30/95)	142	Other (900)	1	Corruption of SSR continuity file - during event 23:38-00:20, the SSR continuity File was corrupted. Accounting shows the oldest VCDU as being about 2 Million VCDUs higher than was actually recorded on the VR since launch. This problem caused the LOST_VCDU_HISTORY file to show the 2 million as lost VCDU's.	Copied recent continuity file from back-up raid and retransmitted the most recent data set to clear missing VCDU's from the file. This occurred after an antenna handover. The data hits probably caused bad packets to get through and corrupt the file.	SOAR-C-812
G	XTE	96-G32	05/23/96 (12/30/95)	143	Other (900)	1	LATE ACQUISITION – Loss of 32 KB/sec real-time data (I-Channel). data is recoverable.	Send GCMR forward re-acquisition. slew was scheduled and event actual AOS.	SOAR-C-813 TTR 18852
G	XTE	96-G33	05/24/96 (12/30/95)	144	Other (900)	1	Command ingest transfer frame error counter (SCIAFEC & SCIBFEC) went up, command ingest transfer frame abort counter (SCIATFA & SCIBTFA) went up. Error was caused by a retransmit command while an ATS load was being uplinked and the receiver AGC went into YL. Transfer frame	Stopped (/stop) command and clear the command buffer.	SOAR-C-814

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							abort counter was increment by one due to ATS load was stopped and aborted while being uplinked.		
G	XTE	96-G34	05/26/96 (12/30/95)	146	Other (900)	1	Lost lock during a high rate support - lost real-time 32 KB/sec (I-Channel) support. Network control center (NCC) loaded an old vector for the TDE. Lost and never regained lock thru the rest of the support. Data is recoverable. Note: missing Virtual Channel Data Unit (VCDU)'s were retransmitted.	Sent total of 3 forward reacquisition, one frequency re-specification and one forward link sweep.	SOAR-C-815 TTR 18893
G	XTE	96-G35	05/28/96 (12/30/95)	148	Other (900)	1	Lost Virtual Channel Data Unit (VCDU)'s on Virtual Recorder (VR-6). During two separate time periods a large number of new VCDU's from (VR-6) were overwritten (and thus lost) due to a sustained high input rate from the instruments.	The Science Operations Facility (SOF) was made aware of the situation. An attempt to add a forward to an Multiple Access (MA) event to let the SOF command the input rate into VR6 to a lower rate was not successful due to time constraints.	SOAR-C-816
G	XTE	96-G36	05/28/96 (12/30/95)	148	Other (900)	1	Front End Processor (FEP-1) crashed while running UXTEDOWN, received no response from state manager. The processor window showed trapped to un-initialized Vector Number 0, Program Counter, Status Register, Task, and MEMPARTALLOC. The event logger task and the packet extractor task (T2 & T8) were suspended.	Failed over to FEP-2, reboot FEP-1.	SOAR-C-817
G	XTE	96-G37	05/29/96 (12/30/95)	149	Other (900)	1	Front End Processor (FEP-1) crashed prior to loss of an added high rate support, which was specifically added to take care of data storage management of Virtual Recorder (VR-6) Mission Operations Center (MOC) received the message "continuity task could not open primary Front End File/HOME/XTE/OPS/ Continuity/PARMS/Primary_ FEP. At that time, the TSTOL windows froze and FEP-1 crashed hard. All real-time spacecraft operations	Rebooted FEP-1 and brought TSTOL up with no further problems. PACOR confirmed all data was successfully captured.	SOAR-C-818

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							went nominal leading up to this crash. Impact: event, VC0 and VC1 files during this event could not be closed because UXTEDOWN could not be run and were lost during FEP-1 reboot.		
G	XTE	96-G38	06/05/96 (12/30/95)	155	Other (900)	1	TSTOL/Front End Processor (FEP-1) crash started with a display freeze minutes into a Mission Analysis Room (MAR) event. Menu termed by TSTOL processes would not come up. FEP-1 indicated hard crash. Laser Tracking Subnet (LTS) terminal Allocated Configuration Identification (ACI) key stayed depressed when attempting to reconfigure Network Control Center (NCC) line during fail-over to FEP-2, causing the LTS to crash.	Notified Science Operations Facility (SOF) and hardware maintenance. Verified no gaps in data at PACOR. Hardware maintenance reset the LTS-1 controller card and replace the LTS keyboard. FEP-1 rebooted successfully. Re-transmitted missing Virtual Channel Data Unit (VCDU)'s that were dropped during transition to backup. No data loss.	SOAR-C-819
G	XTE	96-G39	06/11/96 (12/30/95)	161	Other (900)	1	Event message showed corruption of Solid State Recorder (SSR) DATA accounting. The Virtual Channel Data Unit (VCDU) telemetry reset on Virtual Recorder (VR-3), cause the Lost_VCDU_History File to show lost VCDU's.	Edited SSR continuity file and retransmitted the whole data set.	SOAR-C-820
G	XTE	96-G40	06/11/96 (12/30/95)	161	Other (900)	1	TDW support deletion - Network Coordinator (NC) advice XTE controller and other users that TDW will be down several hours due to composite degradation of 3-4 DB. Three XTE support was deleted (2-MA and 1-SA).	Added a forward on TDE (MA) support. Scheduled a TDE high rate (SA) support. Build a CES patch load and uplinked on the support. Retransmitted all missing VCDU's support. Received all VC-1 support.	SOAR-C-821
G	XTE	96-G41	06/26/96 (12/30/95)	176	Other (900)	1	Communications and Tracking System (CTS) 343 failure - UPD messages were no longer being received on both Front End Processor (FEP) 1&2. CTMS (AND CGMRS) originating from the Mission Operations Center (MOC) were not being received by Network Control Center (NCC). Communication with NCC was restored after several hours of	The clock generator for the CTS 343 was replaced. Communications Manager had tech control check the CTS 343 and configured CTS 344 for NCC/MOC communication. The MOC was not able to communicate with NCC over the CTS 344. Eventually tech control discovered the problem with the CTS 343 and it was reconfigured to its nominal configuration.	SOAR-C-823

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							service loss.		
G	XTE	96-G42	06/26/96 (12/30/95)	176	Other (900)	1	Event logger disconnected from event windows - event window stopped displaying new event messages. UXTEDOWN did not produce delogs of events. Noticed FEP-1 crash when bringing up new "main menu".	Attempted reconnects to TSTOL and "all" to reconnect to the event logger. Following event, delogs were performed. Delogs of events and FSMS successfully recovered messages up to several minutes prior to LOS, after that messages were not recovered.	SOAR-C-824
G	XTE	96-G43	06/27/96 (12/30/95)	177	Other (900)	1	Early Loss of Signal (LOS) and late acquisition due to extreme weather at white sands. Events: TDE and TDW were impacted. (MA events) PA logged 10 minute outage. Also processor generation task failed on prime string.	Reported loss of lock and an extreme weather cell over White sands at that time. Other projects also reported outages. Re-dumped S/C events to ensure all were received on the ground and retransmitted missing Virtual Channel Data Units (VCDU)s. Verified the PACOR had no data gaps.	SOAR-C-825 TTR 18196
G	XTE	96-G44	06/27/96 (12/30/95)	177	Other (900)	1	Front End Processor (FEP)1 crash and FEP-2 Q TNIF crash. TDE event and TDW event impacted (MA events). First event "continuity task could not open primary front end file. Check to see if its running." FEP-2 Q-Channel TNIF crashed during fail over. Unable to close any files on first event crash due to loss of connection with FEP-1. Verified with PACOR that there were no data gaps. 2nd event all files closed nominally.	Failed over to FEP-2 and Q-Channel TNIF load failed while running UXTEUP. Reset the RS, FS and DC cards on FEP-2 and successfully rebooted FEP-2. Powered off FEP 1 and rebooted successfully. Re-dumped all missing Virtual Channel Data Units (VCDU)s and S/C events missed during the crash.	SOAR-C-826
G	XTE	96-G45	07/04/96 (12/30/95)	184	Other (900)	1	No commanding capability due to disk fail over at White Sands Complex (WSC) (Command System Controller (CSC-5). WSC did a disk fail over and subsystem failed to initialize properly. Note: tried to uplink an ATS-A load and tried retransmitting missing Virtual Channel Data Units (VCDU)s but both failed. Also added a forward in case further trouble-shooting was needed.	NOTIFIED CSC, PA and Test Operations Center (TOC) Switch. The twenty minute loss of command capability had no impact on XTE operations.	SOAR-C-827 TTR 18925
G	XTE	96-G46	07/08/96 (12/30/95)	188	Other (900)	1	Oracle cold backup failure - A weekly cold backup was being run by the Flight Operations Team	Transportable Project Operations Control Center (POCC) maintenance removed the entire tape and a	SOAR-C-828

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							(FOT) when it appeared to have been in an unexpected halt state. After consideration, the run was aborted via CTRL C. At this time tape could not be extracted from the tape drive. Real-time operations were able to be conducted however it was doubtful that necessary front end reboots could be done. The script was terminated in response to warning messages that occurred.	hardware reboot was done. Per the LOP, several SQLDBA one-liners were issued which appeared to bring oracle back online. The FOT was able to reboot Front End Processor (FEP)'s as needed. However, the tape could not be dismounted from the tape drive and 'TAR' and 'MT' statements could not be recognized. Later, it was discovered that GTAS and other print requests to the string 3 printer could not be honored. Another Oracle cold backup should be done ASAP to ensure the validity of this operational script.	
G	XTE	96-G47	07/09/96 (12/30/95)	189	Other (900)	1	Prime RAID Workstation crash hard after the hard drive power on/off button was inadvertently activated. This forced the Flight Operations Team (FOT) to failover to the backup RAID and operate at a reduced capacity using only the xt2ws3 and Front End Processor (FEP-3). At this time the Science Operations Facility (SOF) X-Terminal was rebooted. All terminals functioned without mishap. Later, command activity was performed nominally.	The Prime RAID Workstation was restored to operational status. A Contact Entry Schedule (CES) was generated successfully from the offline system not long after the prime raid was restored to operational status. After the FOT established operational communications with the backup RAID, a call for support was made to the TSM's and hardware maintenance. It was determined that a software reboot was necessary; that it was not a hardware problem. It appears that the backup files are not set up properly. A review of the set up files is needed.	SOAR-C-829
G	XTE	96-G48	07/11/96 (12/30/95)	191	Other (900)	1	Second TDRS Ground Terminal (STGT) loss of lock due to severe weather during the Multiple Access (MA) return event. Loss of power caused a problem with the link MA CAL and all users dropped lock. Real-time data was lost for several minutes. This dropout caused no loss of recorded data.	STGT reset their systems and telemetry was reacquired without sending a GCMR. Called and alerted White Sands Complex (WSC to the situation.	SOAR-C-830 TTR 18933
G	XTE	96-G49	07/11/96 (12/30/95)	191	Other (900)	1	Front End Processor (FEP-1) crash during Multiple Access (MA) EVENT - FEP-1 crashed minutes prior to loss of a MA event. Received pop up window with "error: front end XT1FE1 is not responding. Check to see if it's running." Unable to log event and real-time data	Took SNAPS of error messages. Successfully rebooted FEP-1. Verified PACOR II had no data gaps during the event.	SOAR-C-831

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							during this event.		
G	XTE	96-G50	07/12/96 (12/30/95)	192	Other (900)	1	Prime RAID crashed, the warning alarm sounded. The LCD display showed a failure message for drive A3. MULTISAT was called to open a work order and hardware maintenance began trying to recover the disk. Maintenance removed and replaced faulty drive it with a new one. During this procedure, the entire RAID was inaccessible. Since the failure occurred during Loss of Signal (LOS), data accounting files had already been moved to the backup RAID at UXTEDOWN. No data was shown as missing and retransmits were not necessary.	The faulty drive was replaced and rebuilt. TSM's were alerted to the situation. Hardware maintenance was called and recovery of the Raid was begun. FEP-3 was rebooted and TSTOL was brought up in case fail over was necessary. Upon total raid failure the backup system was brought up as primary. The Science Operations Facility (SOF) X-Terminal and 2 Flight Operations Team (FOT) terminals were attached to the workstation to perform nominal ops.	SOAR-C-832
G	XTE	96-G51	07/13/96 (12/30/95)	193	Other (900)	1	RAID crashed and backup RAID is being used as prime failed. All associated workstations and X-Terminals lost connection to "/home". "Continuity task could not open primary front end file" message was the first indication of the crash. The primary Front End Processor (FEP-2) did not go down and all files remained open throughout the 2 Multiple Access (MA) events that were effected continuity also remained up. When the raid was restored, block and frame files were successfully closed and captured at the Mission Operations Center (MOC). PACOR II also verified no data gaps. Complete system recovery occurred.	Went to SOTA 2 for realtime ops to verify Spacecraft health and safety during RAD/XT2WS3 reboot. Came back down to the MOC 20 minutes later and completed ground system recovery on the workstations and X-Terminals. Re-transmitted all uncollected spacecraft events and missing VCDUs.	SOAR-C-833
G	XTE	96-G52	07/17/96	197	Other	1	Began the process of falling back to	The reboot of the GTAS workstation	SOAR-C-834

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
			(12/30/95)		(900)		the PRIME RAID. This effort was accomplished without much out delay and the FOT was locked onto telemetry. Next we were unable to bring up the MP window needed to process the load.	worked as XT2 was then able to receive data sets from PACOR II. However, the high speed subsetting task would not work automatically. function. Manual intervention to pass PACOR files from the POLL-SDPF to the N/SDPF directory was not needed.	
G	XTE	96-G53	07/18/96 (12/30/95)	198	Other (900)	1	Late acquisition of satellite. Loss of I-Channel data.	2 minutes and 21 seconds of 32 KB data loss. This data was recovered at another time.	SOAR-C-836 TTR 18852
G	XTE	96-G54	07/20/96 (12/30/95)	200	Other (900)	1	Could not bring up TSTOL on the primary workstation.	Gave privileges to X-Terminal and ran UXTEDOWN-NEW. Failed to close frame files during the event. This data was recovered at another time.	SOAR-C-837
G	XTE	96-G55	07/22/96 (12/30/95)	202	Other (900)	1	FEP-1 Logging task was suspended.	Failed over to backup commuters. This data was recovered at another time.	SOAR-C-838
G	XTE	96-G56	07/24/96 (12/30/95)	204	Other (900)	1	2 minutes 52 second loss of MA due to severe weather at WSC.	All data was recovered on following high rate event. No impact.	SOAR-C-839 TTR 18944
G	XTE	96-G57	07/26/96 (12/30/95)	206	Other (900)	1	Received two ground messages that continuity task could not open front end processor.	FEP-2 was brought up as primary and FEP1 was rebooted. This data was recovered at another time.	SOAR-C-841
G	XTE	96-G58	07/29/96 (12/30/95)	209	Other (900)	1	VODUS were overwritten due to a sustained high rate on VR-6.	Rescheduled forward times, released data set 1 and closed the event. This data was recovered at another time.	SOAR-C-842
G	XTE	96-G59	07/31/96 (12/30/95)	210	Other (900)	1	The MOC and X-Terminal was non-responsive to any TSLOL directives had completely frozen.	The problem appears to be the result of an excessive load on the server prior to the high rate event. This data was recovered at another time.	SOAR-C-843
G	XTE	96-G60	07/31/96 (12/30/95)	210	Other (900)	1	FEP-1 & FEP-2 history logger suspended.	Rebooted both FEPs. This data was recovered at another time.	SOAR-C-844
G	XTE	96-G61	08/04/96 (12/30/95)	214	Other (900)	1	FEP-2 event logger failure. Since history is not normally maintained on FEP-2 the problem went unreported.	Switched to FEP-2 as backup and notified Maintenance. This data was recovered at another time.	SOAR-C-845
G	XTE	96-G62	08/04/96 (12/30/95)	214	Other (900)	1	Lost real time data during the pass.	53 minutes of data loss. This data was recovered at another time.	SOAR-C-846 TTR 186-1
G	XTE	96-G63	08/14/96 (12/30/95)	224	Other (900)	1	The CES patch test load failed.	Mission planning was informed of the problem and should be able to build another CES. This data was recovered at another time.	SOAR-C-847
G	XTE	96-G64	08/15/96 (12/30/95)	225	Other (900)	1	Negative acquisition of TDRSS at AOS.	30 minutes of data loss. This data was recovered at another time.	SOAR-C-848
G	XTE	96-G65	08/25/96 (12/30/95)	235	Other (900)	1	Missing VODUS VR1 during the SSA1 support	It was noticed that there was some missing VODUS in VR1. This data was	SOAR-C-849

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								not recovered.	
G	XTE	96-G66	08/28/96 (12/30/95)	238	Other (900)	1	Late acquisition of I & Q-Channel data at WSC.	Due to thunderstorms at WSC the data was lost. This data was recovered at another time.	SOAR-C-850 TTR 18977
G	XTE	96-G67	09/02/96 (12/30/95)	242	Other (900)	1	Loss of I & Q-Channel data due to a late acquisition.	Retransmitted all missing VCDUs. This data was recovered at another time.	SOAR-C-851 TTR 18852
G	XTE	96-G68	09/03/96 (12/30/95)	243	Other (900)	1	Near the beginning of a SSA event, it appeared TSTOL crashed.	NCC scheduling made a mistake by cutting our MA event in half. This data was not recovered.	SOAR-C-852
G	XTE	96-G69	09/10/96 (12/30/95)	250	Other (900)	1	Loss of lock at WSC and missing VCDUs.	Due to thunderstorms at WSC the data was lost. This data was recovered at another time.	SOAR-C-853
G	XTE	96-G70	09/12/96 (12/30/95)	252	Other (900)	1	Loss of lock at WSC and missing VCDUs.	Due to thunderstorms at WSC the data was lost. This data was recovered at another time.	SOAR-C-854
G	XTE	96-G71	09/14/96 (12/30/95)	254	Other (900)	1	Loss of I & Q-Channel data due to a late acquisition.	2 minutes and 38 seconds of data loss. This data was recovered at another time.	SOAR-C-855 TTR 18990
G	XTE	96-G72	09/14/96 (12/30/95)	254	Other (900)	1	CSC-4 reported a 25 DB signal loss.	1 minute and 34 seconds of data loss. Due to thunderstorms at WSC the data was lost. This data was recovered at another time.	SOAR-C-856 TTR 18991
G	XTE	96-G73	09/15/96 (12/30/95)	255	Other (900)	1	Loss of lock at WSC and missing VCDUs.	28 minutes and 59 seconds of 32 KB and 64 KB data loss. Due to thunderstorms at WSC the data was lost. This data was recovered at another time.	SOAR-C-857 TTR 18992
G	XTE	96-G74	09/19/96 (12/30/95)	259	Other (900)	1	No telemetry was received on the Q-Channel.	It was concluded that the problem was the LTS # 2. This data was recovered at another time.	SOAR-C-858
G	XTE	96-G75	11/11/96 (12/30/95)	313	Other (900)	4	The project reported service and data loss while bringing up a backup unit to allow release of a faulty NFE for repair.	NCC inadvertently mispatched the replacement NFE interrupting data flow between the NCC and WSGT. The faulty patching was corrected. 15 minutes and 38 seconds of data loss. This data was not recovered .	SOAR-C-868 DSPR 840 TTR 19047
G	XTE	96-G76	11/25/96 (12/30/95)	327	Other (900)	1	Late acquisition and data loss.	1 minute and 51 seconds of 32 KB data loss. This data was recovered at another time.	SOAR-C-876 TTR 19067 DR 33542

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	XTE	96-G77	12/16/96 (12/30/95)	318	Other (900)	1	WSGT Low Rate Black Switch (LRBS) anomaly. Loss of service/data due to a loss of clock from LRBS to the cross-strap MUX. During scheduled install (EC-8145), a loose connector cable became disengaged and had to be reseated to restore clock.	Re-mated connector. Note: Other affected spacecraft include TOPEX, HST, EUVE.	SOAR-C-909 TTR 19097 DR 33654
G	XTE	96-G78	12/17/96 (12/30/95)	319	TLM&DH (200)	2	Loss of I-Channel data due to a late acquisition.	9 minutes and 12 seconds of 32 KB data loss. POCC switched to Q-Channel to recover this data. This data was recovered at another time.	SOAR-C-893
C	XTE	96-C01	02/15/96 (12/30/95)	47	Other (900)	1	Loss of command capability – On a Multiple Access (MA) TDRS West (TDW) support, an attempt to send a command to the spacecraft was unsuccessful. The command could be seen leaving the Mission Operations Center (MOC).	Laser Tracking Subnet (LTS)-1 line driver was replaced and lines were restored to their nominal configuration. Command capability was restored.	SOAR-C-785
C	XTE	96-C02	06/19/96 (12/30/95)	169	Other (900)	1	Laser Tracking Subnet (LTS) #2 failure, at Acquisition of Signal (AOS) of the event, no telemetry was received on the Q-Channel.	Test Operations Center (TOC) AND NASCOM Tech Control are investigating the LTS failure. Second TDRS Ground Terminal (STGT) was contacted to verify data was received at ground station. TOC was contacted to verify Communications and Tracking System (CTS) line 342 was ok. PACORII was contacted to verify data was being received. It was concluded that the problem was with the LTS #2. CTS was reconnected to LTS #5 and the Q-Channel was reconfigured for LTS #5. Data lock was reestablished and after commands were sent to retransmit the data accounting showed no missing data. It appeared that the line driver on LTS2 (at the TOC) failed. It was replaced and the data interface was restored successfully. LTS2 was re-installed as part of out nominal Q-channel interface with LTS5 back to its backup status.	SOAR-C-822
C	XTE	96-C03	07/18/96 (12/30/95)	198	Other (900)	1	Negative acquisition of I & Q-Channel data in the MOC and at PACOR II.	PA called COMM- MGR who reported that the CTS was not configured at NASCOM. This data was recovered at	SOAR-C-835 TTR 18940

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE (LAUNCH DATE)	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								another time.	
C	XTE	96-C04	07/26/96 (12/30/95)	206	Other (900)	1	Line problems with NASCOM and CTS. Telemetry was not being received on the I-Channel. After verifying with NASCOM and PACORII that they were receiving data, TOC switch was called. The communication manager informed us that a bad patch cable caused the loss of data. Once it was replaced, both lines were functioning nominally. All data retransmissions from previous events were performed and data was released without any data loss.	The communication manager saw no clock coming from the MOC. The TOC switch operator checked lines and verified that they were correct. TPOCC hardware maintenance replaced the LTS clock receiver/driver card. Valid outgoing clock from the MOC was attained and commanding was successful.	SOAR-C-840
C	XTE	96-C05	12/18/96 (12/30/95)	320	Other (900)	1	POCC was unable to receive data.	The line was switched from LTS #1 to LTS #5 and this cleared the problem. NASCOM suspects a bad junction box. This data was recovered at another time.	SOAR-C-906

Appendix C-1. Log of 1997 Orbital Spacecraft Anomalies (excluding Additional Data)

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	CGRO	97-G10	01/25/97 (04/05/91)	2092	Other (900)	4	GRO event scheduled on TDZ failed to acquire at scheduled AOS. Reason unknown.	2 minutes and 15 seconds of GRO service/data loss (non-recoverable). This data was not recovered.	SOAR-C-912 TTR 19172
G	CGRO	97-G11	01/29/97 (04/05/91)	2096	Other (900)	4	GRO POCC reported non-recoverable service/data loss. Post event investigation revealed that the data loss resulted when a technician at the JPL earth station performed a reset of a local control unit that was malfunctioning.	1 minute of 32 KB non-recoverable service/data loss. This data was not recovered.	SOAR-C-914 TTR 19175
G	CGRO	97-G12	03/23/97 (04/05/91)	2148	Other (900)	4	GRO experienced a late acquisition, a return service dropout, and a total loss of lock/data. A software hang up caused a slowdown and an SA2 antenna pointing problem.	7 minutes and 51 seconds of 1 KB data lost (non-recoverable). This data was not recovered.	SOAR-C-930 TTR 19234
G	CGRO	97-G13	04/03/97 (04/05/91)	2158	Other (900)	4	Spacecraft misconfiguration. Spacecraft was configured for 1 KB vice 32 KB.	38 minutes and 30 seconds of 32 KB non-recoverable data loss. This data was not recovered.	SOAR-C-932 TTR 19247 TTR 19346
G	CGRO	97-G14	04/08/97 (04/05/91)	2163	Other (900)	4	Auto MA chain failover from "2 to 4". Due to operator error at WSGT. While trying to configure an XTE event manually, this [GRO] event was erroneously de-configured.	1 minute and 40 seconds of non-recoverable data loss. This data was not recovered.	SOAR-C-973 TTR 19255
G	CGRO	97-G15	05/13/9 (04/05/91)	2198	Other (900)	4	At WSGT; an azimuth servo fault was not responded to on the 18.3 meter antenna until the TDRSS spacecraft had flown out of the beam.	13 minutes and 30 seconds of 1 KB non-recoverable service/data loss. This data was not recovered.	SOAR-C-956 TTR 19298
G	CGRO	97-G16	05/22/97 (04/05/91)	2207	Other (900)	4	STGT MA Element Separator anomaly	10 minutes and 20 seconds of service and data loss (non-recoverable)	SOAR-C-962 TTR 19313
G	CGRO	97-G17	05/22/97 (04/05/91)	2207	Other (900)	4	An ADPE failover caused by a DRB32 device failure was not successful. The command chain failed to allocate a system switch to the remote command/telemetry system (RCTS), while ADPE "a" was being brought online. Also, a keyboard entry to activate the command line was delayed due to an operator oversight.	Twelve (12) minute data/service loss. This data was not recovered.	SOAR-C- 963 TTR 19314
G	CGRO	97-G18	05/23/97 (04/05/91)	2208	Other (900)	4	Spacecraft misconfiguration by the POCC.	33 minutes of non-recoverable 32 KB data lost. This data was not	SOAR-C-966 TTR 19315

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								recovered.	
G	CGRO	97-G19	05/28/97 (04/05/91)	2213	TLM & DH (200)	4	The TDRS-3 control processor electronics and command telemetry electronics (CPE/CTE) lost sync resulting in spacecraft attitude divergence and acs failsafe. WSGT hardware problem	212 minutes of service and data loss non-recoverable. This data was not recovered.	SOAR-C-1008 TTR 19322
G	CGRO	97-G20	06/03/97 (04/05/91)	2218	TLM & DH (200)	2	Unable to obtain lock in mode 1.reconfigured to mode 2 and obtained lock.	All data was recovered at another time.	SOAR-C-1021 TTR 19333
G	CGRO	97-G21	06/27/97 (04/05/91)	2242	TLM & DH (200)	4	Late acquisition due to COMM processor (CP-A) misconfiguration. Operator error.	2 minutes and 32 seconds loss of 32 KB data (non-recoverable). This data was not recovered.	SOAR-C-1010 TTR 19373
G	CGRO	97-G22	06/28/97 (04/05/91)	2243	TLM & DH (200)	4	Following a configuration change, the spacecraft lost lock. An STGT failover from MAR-3 to MAR-2 reestablished lock. No problem found with MAR-3.	3 minutes and 21 seconds of 32 KB data loss. This data was not recovered.	SOAR-C-1011 TTR 19374
G	CGRO	97-G23	07/15/97 (04/05/91)	2260	Other (900)	4	Spacecraft misconfiguration. POCC scheduled the event as 1 KB and the spacecraft was configured for 32 KB.	33 minutes of 1 KB data loss non-recoverable. This data was not recovered.	SOAR-C-1044 TTR 19423
G	CGRO	97-G24	07/30/97 (04/05/91)	2275	Other (900)	2	STGT was in a phase one weather advisory when the downlink was degraded to the point of loss of signal.	5 minutes and 37 seconds of 32 KB data loss, non-recoverable. All data was recovered at another time.	SOAR-C-1076 TTR 19448
G	CGRO	97-G25	09/07/97 (04/05/91)	2312	Other (900)	2	Return service dropout, reason unknown	1 minute and 52 seconds of 32 KB data loss. This data was not recovered.	SOAR-C-1125 TTR 19504
G	CGRO	97-G26	09/15/97 (04/05/91)	2320	TLM & DH (200)	4	WSGT lost lock on the GRO spacecraft prior to the end of an event. The spacecraft went out of TDS field of view	32 seconds of 1 KB data lost . This data was not recovered.	SOAR-C-1139 TTR 19518
G	CGRO	97-G27	09/18/97 (04/05/91)	2323	TLM & DH (200)	4	Late acquisitions due to a MA link 3 problem at STGT and a bad integrated receiver (IR).	15 minutes of service and data lost (non-recoverable). This data was not recovered.	SOAR-C-1169 TTR 19520
G	CGRO	97-G28	10/12/97 (04/05/91)	2347	TLM & DH (200)	4	An acquisition failure occurred due to an end-of-day rebooting of AP-8 at the POCC.	7 minutes and 47 seconds of 32 KB non-recoverable data loss. This data was not recovered.	SOAR-C-1188 TTR 19542
G	CGRO	97-G29	10/27/97 (04/05/91)	2362	TLM & DH (200)	1	PACOR did not see data. NCC OPS suspects a GRO POCC misconfiguration switch anomaly.	13 minutes of 1 KB recoverable data loss. All data was recovered at another time.	SOAR -C-1168 TTR 19563
G	CGRO	97-G30	10/31/97 (04/05/91)	2366	TLM & DH (200)	2	GRO experienced a late initial acquisition, reason unknown	2 minutes of data loss. This data was not recovered. All data was recovered at another time.	SOAR-C-1204 TTR 19569
G	CGRO	97-G31	11/12/97	2377	Other	4	Late acquisition: RGRT reported no	51 minutes and 40 seconds non-	SOAR-C-1190

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
			(04/05/91)		(900)		RF at event start. Data was eventually acquired with no operator intervention. Scheduling error.	recoverable of 32 KB data/service loss. This data was not recovered.	TTR 19590
G	CGRO	97-G32	(11/27/97) (04/05/91)	2392	Other (900)	4	Bad weather at RGRT caused SATCON to lose master frequency generator (MFG) lock. A manual resweep was accomplished to clear the anomaly.	11 minutes of service and data lost. (non-recoverable). This data was not recovered.	SOAR-C-1212 TTR 19611
G	CGRO	97-G33	12/03/97 (04/05/91)	2398	Other (900)	4	GRO POCC experienced a negative acquisition, reason unknown. STGT reported no RF throughout the event and no system problems were noted at their site. Possible GRO scheduling error.	11 minutes of 32 KB non-recoverable data loss. This data was not recovered.	SOAR-C-1217 TTR 19621
G	CGRO	97-G34	12/18/97 (04/05/91)	2413	TLM & DH (200)	4	Late acquisition. Immediately prior to the event, the NCC PA OMCS terminal failed. WSGT noted at event start that TDRS User RF Test Set (TURFTS)-A (prime) was in TURFTS mode vice SSA2 mode. TURFTS-B had locked at AOS and was configured on-line to allow POCC to receive data.	1 minute of 32 KB non-recoverable data loss. This data was not recovered.	SOAR-C-1231 TTR 19634
G	CGRO	97-G35	12/19/97 (04/05/91)	2414	TC & C (100)	4	An outdated scheduled start time was used.	15 minutes and 48 seconds of 32 KB data lost. This data was not recovered.	SOAR-C-1233 TTR 19635
C	CGRO	97-C04	02/21/97 (04/05/91)	2116	Other (900)	3	GRO POCC reported data loss recoverable due to a hit on the timeplex line. Reason unknown. NASCOM stated the timeplex line came back on-line without any intervention.	2 minutes and 25 seconds of 32 KB recoverable data loss. All data was recovered at another time.	SOAR -C-920 TTR 19195
C	CGRO	97-C05	03/20/97 (04/05/91)	2145	Other (900)	4	GRO experienced a non-recoverable data loss due to a GRTS-1 circuit failover. GRTS-1 automatically failed over due to the GRTS-3 circuit. Reason unknown.	33 second s of 32 KB non-recoverable data loss. This data was not recovered.	SOAR-C-929 TTR 19229
C	CGRO	97-C06	04/07/97 (04/05/91)	2162	TL&DH (200)	4	GRTS-1 line was lost. Reason unknown. However, GRTS-3 was brought up and dropped out 10 minutes into the event.	1 minute and 26 seconds of 32 KB data loss (non-recoverable). This data was not recovered.	SOAR-C-934 TTR 19252
C	CGRO	97-C07	05/24/97 (04/05/91)	2209	Other (900)	4	Hit on the GRTS-3 line.	1 minute and 45 seconds dropout of non-recoverable data. This data was not recovered.	SOAR-C-967 TTR 19318
C	CGRO	97-C08	06/25/97 (04/05/91)	2240	TLM & DH (200)	4	When NASCOM attempted to add a port to the NCC router it took the message switch line down and	9 minutes and 26 seconds of service and data loss. This data was not recovered.	SOAR-C-1073 TTR 19370

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							caused loss of ODM/GCMR capability. A switch was made to the legacy system to get the line back up.		
C	CGRO	97-C09	08/27/97 (04/05/91)	2302	TLM & DH (200)	2	PACOR was not configured to receive GRO POCC's data during GRO's unmanned period	9 minute 30 seconds of data loss recoverable. All data was recovered at another time.	SOAR-C-1118 TTR 19491
C	CGRO	97-C10	08/28/97 (04/05/91)	2303	TLM & DH (200)	4	POCC experienced numerous dropouts due to a GRTS line failover (3 to 1) that was performed by NASCOM.	4 minutes and 27 seconds of data loss (non-recoverable). This data was not recovered.	SOAR-C-1119 TTR 19495
C	CGRO	97-C11	10/22/97 (04/05/91)	2357	TLM & DH (200)	2	NCC IP failure which prohibited the POCC's transmission of a MODE-3 GCMR. NCC personnel failed over to their redundant "legacy" system to clear the problem.	15 minutes and 35 seconds of data loss. All data was recovered at another time.	SOAR-C-1191 TTR 19555
C	CGRO	97-C12	11/05/97 (04/05/91)	2370	Other (900)	2	POCC experienced a data loss due to a NASCOM operator error. NASCOM failed to perform a broadcast failover at the coordinated time prior to WSGT transmitting an initialization command to the DIS.	56 second s of service and data loss recoverable. All data was recovered at another time.	SOAR-C-1183 TTR 19577
C	CGRO	97-C13	11/30/97 (04/05/91)	2395	TLM & DH (200)	4	POCC's experienced no odm/gcmr capability due to a bad receiver driver card between NASCOM and the NCC. Both sites replaced their transmit/receiver cards to restore service.	24 minutes and 53 seconds of service lost. This data was not recovered.	SOAR-C-1215 TTR 19616
C	CGRO	97-C14	12/08/97 (04/05/91)	2403	TLM & DH (200)	4	WSC lost all NASCOM 2000 circuits. Investigation revealed that in the event of a complete T-1 land-line failure, the NASCOM 2000 MUX does not appear to have a secondary master clock source.	109 minutes of service loss and 8 minutes and 30 seconds of 32 KB non-recoverable data loss. This data was not recovered.	SOAR-C-1220 TTR 19624
C	CGRO	97-C15	12/22/97 (04/05/91)	2417	TLM & DH (200)	4	NASCOM was trying to update the routers on the IP. The NCC performed a failover to LEGACY. Once the routers were updated the NCC QE tried unsuccessfully to failback over to the IP.	56 seconds of service lost; 09 minute and 6 seconds of 32 KB data lost. This data was not recovered.	SOAR-C-1234 TTR 19641
O	ERBS	9756	01/07/97 (10/05/84)	4412	TC & C (100)	1	Bit upsets corrupted the time fields of seventeen locations in the C&DH Command Storage Memory (CSM) normal memory.	The spacecraft experienced no adverse conditions due to the anomaly. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2681 ERBS Report 535
O	ERBS	9757	02/19/97	4454	TC & C	1	Bit upset. The serial-digital field of	One SAGE-II science event was lost.	SOAR-C-2682

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
			(10/05/84)		(100)		eight CSM's normal memory was corrupted.	A corrective load was uplinked. This data was recovered at another time.	ERBS Report 536
O	ERBS	9758	03/15/97 (10/05/84)	4480	TC & C (100)	1	Bit upsets. The time field of one location in the CSM's block memory was corrupted.	Two SAGE-II sunset science events were lost. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2694 ERBS Report 537
O	ERBS	9759	03/31/97 (10/05/84)	4496	TC & C (100)	1	Bit upsets corrupted the time fields of four locations in the CSM memory block.	Two SAGE-II sunset science events were lost. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2683 ERBS Report 538
O	ERBS	9760	04/11/97 (10/05/84)	4506	TC & C (100)	1	Bit upsets corrupted the time fields of one location in the CSM memory block.	The spacecraft experienced no adverse conditions due to the anomaly. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2684 ERBS Report 539
O	ERBS	9761	04/13/97 (10/05/84)	4508	TC & C (100)	1	Bit upsets corrupted the time fields of one location in the CSM memory block.	One SAGE-II science event was lost. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2685 ERBS Report 540
O	ERBS	9762	04/25/97 (10/05/84)	4520	TC & C (100)	1	Bit upsets corrupted the time fields of two locations in the CSM memory block.	Two SAGE-II science events were lost. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2686 ERBS Report 541
O	ERBS	9763	05/23/97 (10/05/84)	4548	TC & C (100)	1	Bit upsets corrupted the time fields of twenty locations in the CSM memory block.	Four SAGE-II science events were affected, but no science data was lost. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2687 ERBS Report 542
O	ERBS	9764	05/28/97 (10/05/84)	4553	TC & C (100)	1	Bit upsets corrupted the time fields of one location in the CSM memory block.	One SAGE-II science event was lost. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2688 ERBS Report 543
O	ERBS	9765	05/31/97 (10/05/84)	4556	TC & C (100)	1	Bit upsets corrupted the time fields of one location in the CSM memory block.	Three SAGE-II science events were lost. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2689 ERBS Report 544
O	ERBS	9766	07/18/97 (10/05/84)	4603	TC & C (100)	1	Bit upset. The serial-digital field of five locations in the CSM's normal memory was corrupted.	No data was lost. A corrective load was uplinked. This data was recovered at another time.	SOAR-C-2690 ERBS Report 545
O	ERBS	9767	09/24/97 (10/05/84)	4669	TC & C (100)	1	Bit upset. The serial-digital field of fourteen locations in the CSM's normal memory was corrupted.	Four SAGE-II science events were lost and the power system drained. A corrective load was uplinked. This datawas recovered at another time.	SOAR-C-2691 ERBS Report 546
O	ERBS	9768	09/24/97 (10/05/84)	4670	TLM & DH (200)	2	Spacecraft memory hit. 14 locations changed in spacecraft memory. This resulted in WFF seeing a signal from the spacecraft but not having valid data.	All data was recovered at another time.	SOAR-C-1177 TTR 19530
O	ERBS	9769	11/27/97 (10/05/84)	4732	TC & C (100)	1	Bit upset. The serial-digital field of one locations in the CSM's block	No data was lost. A corrective load was uplinked.	SOAR-C-2692 ERBS

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							memory was corrupted.		Report 547
O	ERBS	9770	12/23/97 (10/05/84)		TC & C (100)	1	15 locations failed in CSM-1 Normal memory.	Three SAGE events were affected, but there was no impact on science data. All other affected commands had no impact due to the small change in time. A corrective load was uplinked.	SOAR-C-2170 ERBS Report 549
O	ERBS	9771	12/27/97 (10/05/84)	4762	TC & C (100)	1	Bit upsets corrupted the time fields of two locations in the CSM memory block.	Two SAGE Sunrise events were affected, but no science data was lost. A corrective load was uplinked.	SOAR-C-2693 ERBS Report 550
G	ERBS	97-G03	01/23/97 (10/05/84)	4429	Other (900)	1	Brief power outage at the WPS/ERBS station. Station electricians inadvertently tripped the main breaker panel providing power to the NASCOM section and station timing system.	5 minutes and 5 seconds of service and data loss. All data was recovered at another time.	SOAR-C-911 TTR 19171
G	ERBS	97-G04	02/05/97 (10/05/84)	4441	TLM & DH (200)	2	At AOS, there was no F/S lock. Demod showed lock indication. Operator did a cal on the demod and everything locked up. However, switching to another demod apparently caused an error on the front end processor which caused the time in the data to be erratic.	All data was recovered at another time.	SOAR-C-989 TTR 19184
G	ERBS	97-G05	03/28/97 (10/05/84)	4494	TLM & DH (200)	2	During the pass all commands coming through MIL were showing a pep error message and an illegal format input.	Project was unable to get commands up to the spacecraft.	SOAR-C-993 TTR 19238
G	ERBS	97-G06	05/13/97 (10/05/84)	4539	Other (900)	2	A negative acquisition. State vector sent from NCC to WSC was 10 days in the future, causing the s/c to off point.	6 minutes and 2 seconds of 1.6 KB recoverable data lost. All data was recovered at another time.	SOAR-C-984 TTR 19345
G	ERBS	97-G07	06/20/97 (10/05/84)	4576	Other (900)	2	At event start, data was not reaching the ERBS POCC but was reported good into TPF. The POCC started receiving data without intervention. The reason for the anomaly is unknown.	3 minutes and 30 seconds of data loss. All data was recovered at another time.	SOAR-C-1005 TTR 19358
G	ERBS	97-G08	06/21/97 (10/05/84)	4577	TLM & DH (200)	2	Loss of commercial power to the GE earth station and interruption of prime broadcast. NASCOM failed over to the alternate broadcast to restore service.	2 minutes and 59 seconds of data loss. All data was recovered at another time.	SOAR-C-1078 TTR 19360
G	ERBS	97-G09	06/28/97 (10/05/84)	4584	TLM & DH (200)	2	During the real time support the PSK demod dropped out for approximately 2 seconds on the FMT-A data. The demod was reset	All data was recovered at another time.	SOAR-C-1014 TTR 19377

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							to bring data back on line.		
G	ERBS	97-G10	08/04/97 (10/05/84)	4620	Other (900)	2	Late acquisition caused by suspected mutual Interference.	2 minutes and 46 seconds of 1.6 KB recoverable data loss. All data was recovered at another time.	SOAR-C-1082 TTR 19453
G	ERBS	97-G11	08/04/97 (10/05/84)	4620	Other (900)	1	Primary MFR lost lock reason unknown. WPS re-established lock to restore service.	All data was recovered at another time.	SOAR-C-1084 TTR 19456
G	ERBS	97-G12	08/12/97 (10/05/84)	4628	Other (900)	2	Late acquisition due to mutual interference with another user.	3 minutes and 10 seconds of service and data loss (recoverable). All data was recovered at another time.	SOAR-C- 1097 TTR 19462
G	ERBS	97-G13	08/18/97 (10/05/84)	4634	Other (900)	1	ERBS had problems with three consecutive events characterized by dropouts/weak RF/late acquisitions. All were due to a bad ephemeris load	Three minutes of 128 KB data and 7 minutes and 47 seconds of 1.6 KB data were lost (both recoverable). All data was recovered at another time.	SOAR-C-1108 TTR 19478
G	ERBS	97-G14	08/18/97 (10/05/84)	4634	Other (900)	1	ERBS had problems with three consecutive events characterized by dropouts/weak RF/late acquisitions. All were due to a bad ephemeris load	5 minutes and 54 seconds of service and data loss (recoverable). All data was recovered at another time.	SOAR-C-1109 TTR 19479
G	ERBS	97-G15	08/22/97 (10/05/84)	4638	Other (900)	2	Negative acquisition. Bad acquisition data resident on WSC system	11 minutes and 30 seconds of 1.6 KB recoverable data loss. All data was recovered at another time.	SOAR-C-1114 TTR 19487
G	ERBS	97-G16	08/22/97 (10/05/84)	4638	TLM & DH (200)	1	The prime dump MBR bit sync did not achieve lock on the dump downlink. BDA manually reselected to acquire lock several seconds after the start of the dump.	All data was recovered at another time.	SOAR-C-1116 TTR 19486
G	ERBS	97-G17	08/24/97 (10/05/84)	4640	Other (900)	2	Late acquisition. Numerous re acquisitions were required to obtain lock. Possible vector problem	2 minutes and 53 seconds of recoverable service/data loss. All data was recovered at another time.	SOAR-C-1117 TTR 19489
G	ERBS	97-G18	09/13/97 (10/05/84)	4659	TLM & DH (200)	2	Late acquisition due to a forward reacquisition being transmitted prior to the return service start, resulting in the forward and return service being out of sync.	7 minutes and 16 seconds of 1.6 KB recoverable data loss. All data was recovered at another time.	SOAR-C-1138 TTR 19515
G	ERBS	97-G19	09/22/97 (10/05/84)	4668	TLM & DH (200)	1	Project was unable to transmit commands into the satellite. Ground system was configured for mode DCRA. This caused the commands to be sent to the incorrect spacecraft command decoder.	All data was recovered at another time.	SOAR-C-1143 TTR 19525
G	ERBS	97-G20	10/09/97 (10/05/84)	4685	Other (900)	4	Loss of ODM/GCMR capability due to improper EPROM's loaded into NFE's. NCC procedural problem	84 minutes of service loss. This data was not recovered.	SOAR-C-1152 TTR 19541

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	ERBS	97-G21	10/18/97 (10/05/84)	4694	Other (900)	1	Auto-failover of the forward chain A to chain B which caused the return service to drop lock and reacquire.	13 seconds of 16 KB/128 KB data loss. This data was not recovered.	SOAR-C-1158 TTR 19549
G	ERBS	97-G22	10/22/97 (10/05/84)	4698	Other (900)	1	POCC experienced missing minor frames throughout two events. STGT performed a chain failover from b to a to clear the anomaly.	All data was recovered at another time.	SOAR-C-1164 TTR 19558
G	ERBS	97-G23	10/23/97 (10/05/84)	4699	TLM & DH (200)	2	Minor frame dropouts; STGT hardware problem.	2 minutes and 17 seconds of 1.6 KB data loss recoverable. All data was recovered at another time.	SOAR-C-1166 TTR 19560
G	ERBS	97-G24	10/30/97 (10/05/84)	4706	Other (900)	2	POCC reported minor frame dropouts during this event utilizing the SSA2R-B equipment chain. The problem cleared after the CSC performed a manual chain failover from SSA2R-B to SSA2R-A.	All data was recovered at another time.	SOAR-C-1172 TTR 19567
C	ERBS	97-C01	03/16/97 (10/05/84)	4482	TLM & DH (200)	1	Suspected mutual interference with TOPEX. Mutual interference was not predicted by NCC ACRS program.	12 minutes of 1.6 KB data loss. All data was recovered at another time.	SOAR-C-927 TTR 19224.
C	ERBS	97-C02	06/20/97 (10/05/84)	4576	TC & C (100)	1	A bad DMS path in NASCOM caused a loss of command capability for two events	POCC was unable to perform a spacecraft recorder playback during either event.	SOAR-C-1003 TTR 19356
C	ERBS	97-C03	06/20/97 (10/05/84)	4576	TLM & DH (200)	2	Multiple line problems due to a bad receiver/driver card in MS-443	ERBS was prevented from performing a tape dump. All data was recovered at another time.	SOAR-C-1006 TTR 19355
C	ERBS	97-C04	07/19/97 (10/05/84)	4605	Other (900)	2	POCC reported a service loss due to a router problem at NASCOM. after failing over to LEGACY, ERBS came back on-line.	2 minutes and 30 seconds of data loss. All data was recovered at another time.	SOAR-C-1046 TTR 19432
O	EUVE	9709	01/07/97 (06/07/92)	1650	TLM & DH (200)	4	Negative acquisition. HGA tracking software turned off which resulted in the S/C's HGA not pointing at TDRSS.	20 minutes of 32 KB data loss of which 7 minutes is recoverable. All data was recovered at another time.	SOAR-C-904
O	EUVE	9710	01/11/97 (06/07/92)	1654	TLM & DH (200)	2	Problems with HG antenna. HS antenna limits were reached which caused antenna to halt. Gimbells heated and antenna could not be pointed. POCC went to omni and waited until gimbells cooled before resuming commands.	60 minutes of non-recoverable data loss and 20 minutes was recoverable. All data was recovered at another time.	SOAR-C-982 TTR 19148
O	EUVE	9711	02/27/97 (06/07/92)	1700	TLM & DH (200)	2	Negative acquisition due to spacecraft HGA problem. POCC reconfigured the HGA hardware and software, switched back to the HGA and locked up successfully.	All data was recovered at another time.	SOAR-C-983 TTR 19204

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	EUVE	97-G04	03/04/97 (06/07/92)	1707	Other (900)	2	Negative acquisition. The S/C was configured non-coherent, but the SHO was scheduled coherent. WSGT transmitted a non-coherent GCM to acquire lock.	6 minutes and 48 seconds of 32 KB data loss recoverable. All data was recovered at another time.	SOAR-C-926 TTR 19213
G	EUVE	97-G05	03/31/97 (06/07/92)	1734	Other (900)	1	Negative acquisition. POCC unable to send a fwd reacquisition. Reason unknown	2 minutes and 46 seconds of 32 KB data loss, recoverable. All data was recovered at another time.	SOAR-C-978 TTR 19241
G	EUVE	97-G06	04/22/97 (06/07/92)	1755	Other (900)	1	Late acquisition, reason unknown.	2 minutes and 53 seconds of 32 KB recoverable data loss. All data was recovered at another time.	SOAR-C974 TTR 19277
G	EUVE	97-G07	05/12/97 (06/07/92)	1776	TC&C (100)	1	POCC and associated processing facilities received empty data blocks. STGT performed a manual ITU switchover and the problem cleared.	20 minutes of recoverable data loss. This data was not recovered.	SOAR-C-955 TTR 19294
G	EUVE	97-G08	05/15/97 (06/07/92)	1778	Other (900)	2	Events and vectors resident in the NCCDS were lost during a failover.	140 minutes of data/service loss. All data was recovered at another time.	SOAR-C-1075 TTR 19304
G	EUVE	97-G09	06/22/97 (06/07/92)	1815	TLM & DH (200)	2	Faulty card in the NCC CF caused intermittent hits on the STGT line.	Card was replaced to restore service. All data was recovered at another time.	SOAR-C-1080 TTR 19361
G	EUVE	97-G10	07/19/97 (06/07/92)	1842	Other (900)	1	Late acquisition. Reason unknown.	2 minutes and 42 seconds of data (recoverable). All data was recovered at another time.	SOAR-C-1047 TTR 19433
G	EUVE	97-G11	08/11/97 (06/07/92)	1864	Other (900)	1	Late acquisition; reason unknown.	39 seconds of 32 KB data loss (recoverable). Auto failover established lock. All data was recovered at another time.	SOAR-C-1095 TTR 19459
G	EUVE	97-G12	08/22/97 (06/07/92)	1875	Other (900)	2	Acquisition problem. Bad acquisition data for 2 hours resident on WSC system.	4 minutes 56 seconds service loss. All data was recovered at another time.	SOAR-C-1115 TTR 19488
G	EUVE	97-G13	09/10/97 (06/07/92)	1893	Other (900)	1	Late acquisition. STGT was late reconfiguring the event.	2 minutes 35 seconds late. All data was recovered at another time.	SOAR-C-1133 TTR 19508
G	EUVE	97-G14	10/18/97 (06/07/92)	1931	Other (900)	4	Negative acquisition. STGT confirmed that RF was present throughout the event. Numerous re-acquisitions were attempted to no avail. Later, another user locked nominally with the same chain of equipment.	30 minutes of no command capability and 34 minutes of 32 KB data loss (non-recoverable). This data was not recovered.	SOAR-C-1159 TTR 19550
G	EUVE	97-G15	10/31/97 (06/07/92)	1944	Other (900)	1	Negative I-Channel data at acquisition. POCC received the data 9 minutes into the support without SN intervention.	9 minutes of 32 KB data loss (recoverable). All data was recovered at another time.	SOAR-C-1176 TTR 19568
G	EUVE	97-G16	11/11/97 (06/07/92)	1954	Other (900	2	Late acquisition. Spacecraft was configured non-coherent while the scheduling order (SHO) specified	4 minutes and 30 seconds recoverable 32 KB data loss. All data was recovered at another time.	SOAR C-1187 TTR 19587

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							coherent.		
C	EUVE	97-C01	01/30/97 (06/07/92)	1673	Other (900)	4	Berkley experienced intermittent commands and telemetry capability as a result of a LAN problem at NASCOM. NASCOM has to disconnect the backup router from the hub.	22 minutes and 30 seconds of service loss. This data was not recovered.	SOAR-C-917 TTR 19178
C	EUVE	97-C02	06/03/97 (06/07/92)	1796	TLM & DH (200)	2	Berkeley was not in receipt of the Q-Channel dump data due to a problem at NASCOM with their programmable telemetry processor (PTP). Problem cleared after NASCOM replaced a bad patch cord/a bad DMS path/and reconfigured the PTP from burst mode to continuous.	19 minutes and 30 seconds of service loss. All data was recovered at another time.	SOAR-C-1020 TTR 19332
C	EUVE	97-C03	07/04/97 (06/07/92)	1827	TLM & DH (200)	2	POCC received CRC errors on Q-Channel data line during tape dumps. Possible link card problem at NASCOM.	All data was recovered at another time.	SOAR-C-1063 TTR 19388
C	EUVE	97-C04	08/02/97 (06/07/92)	1855	TLM & DH (200)	1	Berkeley reported receiving errors on the Q-Channel. Possible link card problem at NASCOM	All data was recovered at another time.	SOAR-C-1079 TTR 19452
C	EUVE	97-C05	10/07/97 (06/07/92)	1920	Other (900)	1	Dropouts on the Q-Channel due to a bad aggregate card in the MUX at NASCOM. Tech control replaced the card to correct the anomaly.	28 minutes of recoverable service/data loss. This data was not recovered.	SOAR-C-1148 TTR 19537
C	EUVE	97-C06	10/16/97 (06/07/92)	1929	Other (900)	4	Data loss due to a line misconfiguration. POCC requested a reconfiguration of their lines to a simulator but never asked for a release from the simulator.	6 minutes and 43 seconds of data loss. This data was not recovered.	SOAR-C-1154 TTR 19544
C	EUVE	97-C07	10/22/97 (06/07/92)	1935	TLM & DH (200)	2	Cycle redundancy check (CRC) errors and bad frames. NASCOM switched the aggregate card to clear the anomaly.	10 minutes and 30 seconds of 512 KB data loss recoverable by playback. All data was recovered at another time.	SOAR-C-1165 TTR 19559
C	EUVE	97-C08	11/15/97 (06/07/92)	1958	Other (900)	1	CRC errors in Q-Channel data. NASCOM switched the aggregate link card to clear the anomaly.	5 minutes and 19 seconds of service and data loss. This data was not recovered.	SOAR-C-1193 TTR 19594
C	EUVE	97-C09	11/20/97 (06/07/92)	1963	Other (900	1	Data loss due to a patch cord that was not fully seated at NASCOM.	3 minutes and 30 seconds of 32 KB recoverable data loss. All data was recovered at another time.	SOAR-C-1197 TTR 19599
C	EUVE	97-C10	11/25/97 (06/07/92)	1968	TLM & DH (200)	2	Bursts of cycle redundancy check (CRC) errors received at the POCC. Nominal data noted at STGT and tech control. Possible link card	17 minutes of 512 KB recoverable data loss. All data was recovered at another time.	SOAR-C-1210 TTR 19608

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							switched in NASCOM 2000.		
O	FAST	9701	01/02/97 (08/21/96)	131	TLM&DH (200)	2	During PRT PPS and FAST operations PRT did not see data.	Post pass tech control did a new patch to add PACOR # 2. All data was recovered at another time.	SOAR-C-903
O	FAST	9702	05/05/97 (08/21/96)	254	TLM&DH (200)	2	At AOS had solid lock with a good antenna , shortly afterward the signal dropped below noise level on the tracking receivers causing the telemetry receivers to drop lock.	The antenna operator moved the antenna up 30 seconds and used beam intercept to acquire a signal. This data was recovered at another time.	SOAR-C-1000 TTR 19286
O	FAST	9703	05/17/97 (08/21/96)	266	TLM&DH (200)	4	At AOS, WPS had modulation but no downlink from the spacecraft.	This was a spacecraft problem. This data was not recovered.	SOAR-C-1029 TTR 19307
G	FAST	97-G01	04/11/97 (08/21/96)	230	TLM&DH (200)	2	MIL was unable to acquire lock on the downlink.	Post pass checks indicated al equipment was configured correctly. This data was recovered at another time.	SOAR-C-1030 TTR 19265
G	FAST	97-G02	04/18/97 (08/21/96)	237	TLM&DH (200)	2	Minutes into the pass the WPS front end processor number 2 halted.	Switched to the other front end processor and cleared the anomaly. 2 minutes of data loss. This data was recovered at another time.	SOAR-C-994 TTR 19275
G	FAST	97-G03	05/02/97 (08/21/96)	251	TLM&DH (200)	2	Unable to get test data to come on line. So the equipment could be checked out.	System check out indicates that the main buss was hung up. This data was recovered at another time.	SOAR-C-999 TTR 19285
G	FAST	97-G04	05/12/97 (08/21/96)	261	Other (900)	2	WPS 6 meter antenna stopped tracking at 80 degrees.	A limit switch had to be activated to enable the antenna. This data was recovered at another time.	SOAR-C_959 TTR 19296
G	FAST	97-G05	05/14/97 (08/21/96)	263	Other (900)	2	Data loss due to an antenna keyhole.	2 minutes of data loss. WPS took the support through the keyhole. This data was recovered another time.	SOAR-C-960 TTR 19301
G	FAST	97-G06	05/16/97 (08/21/96)	265	Other (900)	2	The SHO was resident in the NCCDS but the NCC failed to check to see if a vector was in our system for the support, which it was not.	52 minutes of data loss. This data was recovered at another time.	SOAR-C-1028 TTR 19306
G	FAST	97-G07	05/21/97 (08/21/96)	270	Propulsion (600)	1	A bad vector was sent. The “Z” component of the position did not contain a negative sign at STGT.	1 hour and 2 minutes of data loss. This data was recovered at another time.	SOAR-C-961 TTR 19311
G	FAST	97-G08	06/03/97 (08/21/96)	282	TLM&DH (200)	2	POCC reported receiving empty blocks of data.	WPS front end processor hanging up at AOS. The operator was unable to change to a backup processor. All data was recovered at another site.	SOAR-C-1022 TTR 19334
G	FAST	97-G09	06/19/97 (08/21/96)	298	Other (900)	2	POCC reported data loss.	HP computer clock was reset and problem is cleared. 11 minutes of data loss. This data was recovered at another time.	SOAR-C-998 TTR 19352
G	FAST	97-G10	06/26/97 (08/21/96)	305	TLM&DH (200)	1	WPS experienced a large lightning hit due to adverse weather in the area. This resulted in the 9 meter	The back up system was brought on line and the pass completed . No data was lost.	SOAR-C-1074 TTR 19372

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							antenna being into the limits.		
G	FAST	97-G11	07/25/97 (08/21/96)	334	TLM&DH (200)	2	During FAST support Wallops received degraded data.	The cause of the degraded data was Radio frequency interference from an F-18 aircraft flying in the area.	SOAR-C-1067 TTR 19441
G	FAST	97-G12	08/04/97 (08/21/96)	343	Other (900)	1	A severe thunder storm caused the WPS antenna t slew off the FAST spacecraft.	This data was recovered at another time.	SOAR-C-1083 TTR 19455
G	FAST	97-G13	08/12/97 (08/21/96)	351	Other (900)	1	Due to a severe thunderstorms at WPS, power hits to the 9 meter antenna caused the X-axis encoder to fault.	4 minutes and 15 seconds of data loss. This data was not recovered.	SOAR-C-1098 TTR 19463
G	FAST	97-G14	08/14/97 (08/21/96)	353	Other (900)	2	Loss of data during a real time pass.	15 minutes of data loss due to a scheduling error. This data was not recovered.	SOAR-C-1102 TTR 19470
G	FAST	97-G15	08/18/97 (08/21/96)	357	Other (900)	2	Loss of data during a real time pass.	WPS front end processor crash. 30 minutes of data loss. This data was recovered at another time.	SOAR-C-111 TTR 19477
G	FAST	97-G16	11/11/97 (08/21/96)	440	TLM&DH (200)	2	Loss of data during a real time pass.	10 minutes of data loss due to commercial power failure. This data was recovered at another time.	SOAR-C-1224 TTR 19591
O	GOES-8	97112	01/09/97 (04/13/94)	986	ACS (400)	2	Tachometer data from the Momentum Wheel (MW) #1 to Attitude Control Electronics (AOCE) stopped. AOCE spun up MW #2 – auto roll/yaw decouple disabled – safe mode resulted.	Analysis have to the conclusion that a failure a part in one phase of the momentum wheel motor commutation circuit resulted in this anomaly.	SOAR-C-1832 IOPS-413
O	GOES-8	97113	01/11/97 (04/13/94)	988	ACS (400)	3	Momentum Wheel #2 and Earth Sensor #2 exhibit interaction signatures 2 times a day.	This data was recovered at another time.	SOAR-C-1833 IOPS-414
O	GOES-8	97114	02/21/97 (04/13/94)	1028	THERMAL (300)	1	The Sun Analog Sensor (SAS) temperature exceeded the maximum telemetry value.	This data was recovered at another time.	SOAR-C-2802 IOPS-420
O	GOES-8	97115	02/25/97 (04/13/94)	1032	ACS (400)	2	Following a failure of the wheel drive electronics for momentum wheel #1, GOES-8 has been operating in L2 mode with nominal speed of momentum wheel #2 at 4500 RPMs without changing operating gains. The change of the operating pitch momentum bias impacts stability and transient response in normal on-orbit mode as well as transition mode.	In response, NOAA has produced a procedure memo, which documents the changes to the single chord, housekeeping, and station keeping maneuver schedules. Changes to eclipse operations will be incorporated for the fall eclipse season.	SOAR-C-1835 IOPS-419
O	GOES-8	97116	03/05/97 (04/13/94)	1042	ACS (400)	2	Reprogram branch disabled itself after the reprogram checksum went from OK to error.	Dumped RAM and found 5 locations bad. Most probable cause is a Single Event	SOAR-C-1836 IOPS-422

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								Upset (SEU). Reset certain RAM locations, verifying accuracy of other RAM locations and reloading RAM locations as required.	
O	GOES-8	97117	05/02/97 (04/13/94)	1080	Instruments (700)	2	SOCC PM operators noticed one or two scan line shifts in GOES-8 image data. Also seem to have duplication in the VIS. Problem been noticed on both SPS3 and SPS4 and occurs in both VIS and IR image data.	The IMC glitching seen in flight data is caused by a interface timing problem which is seen when the leading edge/trailing edge detection circuit card in the AOCE I/F unit is read coincident with the SLEW transition at the end of a scan line. S/W for all satellites will be modified to remove the IMC glitch.	SOAR-C-2803 OPS-97-107
O	GOES-8	97118	07/14/97 (04/13/94)	1171	Instruments (700)	2	An abnormal signature (specifically a momentary increase) of the GOES-8 Sounder filter wheel current telemetry was observed.	The current increase is believed to be caused by an increase in filter wheel motor torque, which in turn was caused by "lubricant migration within the bearing." Filter wheel performance has been unaffected, thus far, by this incident. Sounder telemetry will be closely monitored.	SOAR-C-1837 IOPS-423
O	GOES-8	97119	10/15/97 (04/13/94)	1262	Instruments (700)	2	The scan mirror temperatures of the GOES-8 I/S increased (gradually) and peaked at 65.02 (Imager) and 63.05 (Sounder) about an hour after S/C midnight.	These temperature increases were a result of the nightly “bulk” heating that reach their maximum at the beginning and end of each eclipse season. Scan mirror temperatures limits have been adjusted to allow for increasing temperatures.	SOAR-C-2804 OPS-97-193
O	GOES-8	97120	10/29/97 (04/13/94)	1276	Instruments (700)	2	The GOES-8 Sounder filter wheel slowed and stopped.	Later this motor was restarted using both coils. As a result of operating the GOES-8 Sounder Filter Wheel with both windings powered the daily Temperature profile of the filter wheel motor has increased by 13 degrees. Limit adjustments were made to the voltage and current telemetry of coil #2 and the filter wheel motor temperature limits have been changed to YH=62.0 and RH=63.0 to allow for the expected increase. All data was recovered at another time.	SOAR-C-1838 IOPS-424
O	GOES-8	97121	11/02/97 (04/13/94)	1279	Instruments (700)	2	We have noticed a dramatic noise increase in the GOES-8 Sounder shortwave channels the past few days. On November 2 and 3, we saw in excess of 17 counts when	We are wondering if there is any relationship between these observations and the filter wheel Anomaly. In any event, we will continue to monitor this anomaly and	SOAR-C-1839 IOPS-425

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							noise values are usually under three counts.	provide data and information as it becomes available.	
O	GOES-8	97122	12/16/97 (04/13/94)	1323	Instruments (700)	1	The responsiveness of the visable channels of the Imagers on both GOES-8 and 9 have been decreasing steadily since launch. The responsivities of the star channels of the Sounders on both spacecraft have also been decreasing steadily.	This data is still be recovered on time for each event.	SOAR-C-1840 IOPS-426
O	GOES-9	9753	03/18/97 (05/23/95)		TLM & DH (200)	1	The seasonal command receiver signal level fluctuation documented in GIR JSPOT-033 (closed) caused both receivers to lose lock. This was, by far, the most severe occurrence seen on either spacecraft.	Seasonal event perhaps related to sun-spare craft geometry. This happens on both S/C within a few days either side of equinox.	SOAR-C-1420 JOPS-033
O	GOES-9	9754	03/20/97 (05/23/95)	657	ACS (400)	1	Increased current on Momentum Wheel motor caused by Momentum Wheel bearing drag.	This data was recovered at another time.	SOAR-C-1421 JOPS-034
O	GOES-9	9755	09/26/97 (05/23/95)	843	ACS (400)	1	A simultaneous current spike was seen in both momentum wheels. It is believed that an anomalous Earth Sensor input for one update was the cause. The magnitude of the erroneous data was below the threshold for the Earth Sensor Glitch monitor and did not trip the monitor.	This data was recovered at another time.	SOAR-C-2800 OPS97-188
O	GOES-9	9756	11/06/97 (05/23/95)	883	ACS (400)	1	Earth Sensor error. Earth Sensor/Momentum Wheel interaction was observed at a wheel speed not seen before. No attitude control response was seen in wheel speeds or currents. Additional interactions of smaller duration were observed on Nov. 17 & Nov. 20.	This data was recovered at another time.	SOAR-C-1422 JOPS-035
O	GOES-9	9757	12/16/97 (05/23/95)	923	INST. (700)	1	Star Channel degradation. Slight degradation of the visible detectors for the Imager and the Sounder.	This data was recovered at another time.	SOAR-C-2801 JOPS-036
O	GOES-10	9701	04/27/97 (04/25/97)	2	Thermal (300)	2	Propulsion temperature data had numbers with spikes in it around the time of AMF # 1 .	Possible real thermal problem with the spacecraft.	SOAR-C-1334 KACT-004
O	GOES-10	9702	04/29/97 (04/25/97)	4	Propulsion (600)	2	More data spikes (as per GIR KACT-004) were seen around the time of AMF # 2.	Possible real thermal problem with the spacecraft.	SOAR-C-1335 KACT-008

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
O	GOES-10	9703	05/06/97 (04/25/97)	11	ACS (400)	2	The GOES-10 reaction wheel turn-on command was commanded to a value of zero. The motor current telemetry indicated a value of 0.6 Amps. But no change in the reaction wheel tachometer speed.	Later a commanded speed of 3000 rpms was loaded and the reaction wheel responded normally.	SOAR-C-1336 KACT-011
O	GOES-10	9704	05/11/97 (04/25/97)	16	Other (900)	2	ES interaction during XRP slew.	This data was recovered at another time.	SOAR-C-1337 KACT-016
O	GOES-10	9705	05/11/97 (04/25/97)	16	Thermal (300)	2	Fuel . Oxidant and Helium tank temperatures (liquid and Gas) dropped 1-2 degrees for 3 hours.	No space craft actions can explain this. No other temperatures show similar characteristics.	SOAR-C-1338 KACT-017
O	GOES-10	9706	05/13/97 (04/25/97)	18	Electrical power (500)	2	The GOES-10 EW was abruptly changed by about –0.5 degrees.	This indicated a problem with the solar array stepping motor.	SOAR-C-980
O	GOES-10	9707	05/13/97 (04/25/97)	18	Other (900)	2	The GOES-10 EW solar array stepping motor abruptly changed by –0.5 degrees over a 2 minute time period.	This indicates a problem with the Solar array stepping motor.	SOAR-C-1339 KACT-017
O	GOES-10	9708	05/13/97 (04/25/97)	18	Thermal (300)	2	The XRP heater is supposed to turn on at –19.0 degrees Celsius and turn off at +13.5 degrees Celsius.	This heater was turning off at 0 degrees Celsius . This is a malfunction of the heater.	SOAR-C-1340 KACT-023
O	GOES-10	9709	05/13/97 (04/25/97)	18	ACS (400)	2	GOES-10 CASS sensors exhibit anomalous signal near the sun presence Field Of View edges.	The GOES-10 pitch CASS signal is corrupted response (at –45 Degrees sun angle) and this changes the Safe Hold Mode for the satellite.	SOAR-C-1344 KACT-032
O	GOES-10	9710	05/14/97 (04/25/97)	19	Other (900)	2	The four scan-line IMC glitch is observed repeatedly on GOES-10.	This Glitch is a known software response to an erroneous flag set by the imager.	SOAR-C-1341 KACT-024
O	GOES-10	9711	05/15/97 (04/25/97)	20	ACS (400)	1	During GOES-10 ESMW dynamic interaction (PLT Phase) testing, large oscillations in momentum wheel #1 were observed . As a result, large pitch errors were observed.	The resulting action was to increase the gain and disable the reprogram function which corrected the problem.	SOAR-C-1343 KACT-028
O	GOES-10	9712	05/22/97 (04/25/97)	27	TC & C (100)	1	The GOES-10 DCPI did not immediately turn on when commanded.	After 5 minutes and 37 seconds the DCPI-A status bit flipped to the “on” state without any further commanding.	SOAR-C-1342 KACT-027
O	GOES-10	9713	06/06/97 (04/25/97)	41	ACS (400)	2	When the magnetic torquers were turned on, an attitude transient was observed.	Interactions between the magnetic torquers and the wheel are understood and documented, but the interaction between the SHM and the electronics is not.	SOAR-C-1346 KACT-036
O	GOES-10	9714	07/01/97 (04/25/97)	66	Electrical power (500)	2	Over the following 3 hours after the trim tabs slews, the trim tab motor temperature increased from 38 degrees Celsius to 65 degrees	After consultation with engineers the solar drive motor array electronics as commanded to off and the temperature decreased gradually.	SOAR-C-1347 KACT-040

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							Celsius , exceeding the yellow high limit.		
O	GOES-10	9715	08/27/97 (04/25/97)	122	Instruments (700)	2	The GOES-10 sounder filter wheel control heater voltage saturates at its maximum capacity of 18.8 Volts for about two hours a day. This allows the filter wheel to cool slightly below its temperature set point.	The heater is requiring more power than Pre-launch analysis and testing predicted.	SOAR-C-1345 KACT-042
O	GOES-10	9716	08/27/97 (04/25/97)	122	Instruments (700)	2	FW radiator temperature violated low limit of 205 degrees Celsius.	FW outgas heater was turned on and off briefly.	SOAR-C-1349 KACT-045
O	GOES-10	9717	08/28/97 (04/25/97)	123	TC & C (100)	2	DCPI output power dropped to 26.342 DHM.	This is indicative of DCPI being in the OFF state.	SOAR-C-1348 KACT-044
O	GOES-10	9718	09/03/97 (04/25/97)	128	Instruments (700)	2	The GOES-10 instruments were allowed to idle for some time in order to collect noise data from the PM. The resulting data showed that preclamp spacelook data is corrupted when spaceloook side is on the EAST	The spacelooks associated with BBs were normal, however, during the spacelooks which were not associated BBs all the IR preclamp data was “1023”.	SOAR-C-1350 KACT-046
O	GOES-10	9719	09/05/97 (04/25/97)	130	Electrical Power (500)	1	The CP suspends when the voltage is greater than 1.7 Volts. WSADPLYS is currently –3.78 Volts.	Examination of the data suggests that the outboard panel switch #2 toggled from “1” (deployed) to “0” (stowed) as the satellite exited from eclipse	SOAR-C-1351 KACT-050
O	GOES-10	9720	10/07/97 (04/25/97)	162	TC & C (100)	2	Spikes in the format #2 data and spikes in Bi-level earth sensors and wheel speed data were observed.	Analysis of the anomaly revealed that one AOCE telemetry frame sync bit was missing. The missed bit sequence confused the ground system which unpacked the telemetry incorrectly.	SOAR-C-1352 KACT-052
O	HST	97103	01/28/97 (04/25/90)	2433	TLM & DH (200)	1	Unable to lock after going to coherent mode, reason unknown. WSGT did not observe any anomalies with the ground equipment.	No data or service loss declared. A failover from MAR03 to MAR02 did not result in lock	SOAR-C-913 TTR 19173
O	HST	97104	02/06/97 (04/25/90)	2441	INST. (700)	2	GHRS instrument 'safed' from an input current limit violation. Fault in low volt power supply # 2 / DC –DC converter. Digicon deflection circuit current suspected.	Instrument was shut-down for service mission # 2 replacement.	SOAR-C-918 PN 094
O	HST	97105	02/13/97 (04/25/90)	2448	POWER (500)	2	Short between ' - D ' SPA string power line and ' - E ' SPA return .. Solar array blanket peppered with micrometeorite holes or possible thermal stress-induced failure of Kapton insulation layer.		SOAR-C-1150 PN 94 HSTAR 5896
O	HST	97106	02/13/97	2448	STRUCTURE	2	During second servicing mission it		SOAR-C-1208

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
			(04/25/90)		(800)		was noted that the stop bolt and washer were missing from the threaded end of the aft shroud latch bolt and that two latch bolts could not be disengaged or engaged at nominal torque values. Bolts were probably damaged during first servicing mission.		PN 094D
O	HST	97107	02/13/97 (04/25/90)	2448	POWER (500)	2	In service mission 2, a trim relay (K74) in the PCU failed in the 'open' position, shorting the '+ EE' solar panel assembly (SPA).	Five percent of the available power was lost.	SOAR-C-939 HSTAR 5909 PN 097
O	HST	97108	02/14/97 (04/25/90)	2449	STRUCTURE (800)	2	Multi-layer insulation (MLI) blanket degradation. During a service mission it was noted that blankets across side of HST facing sun had widespread cracking, peeling, and some separation of blankets.	Partial repair was made during servicing mission (tape etc.)	SOAR-C-1207 PN 094E
O	HST	97109	02/18/97 (04/25/90)	2453	TLM & DH (200)	2	Parameter (DSDMM1) for the SSR '1773 i/o bus' transaction counter incremented for retry failures. Counter indicates retries (0,1,2) that failed on both SSR busses. Correlation exists between bus retries/ failures with HST passage through South Atlantic anomaly region.	Flight software patch was made to dump counter log for better monitoring.	SOAR-C-1151 PN 94B HSTAR 5918
O	HST	97110	02/24/97 (04/25/90)	2459	INST. (700)	2	Three STIS MAMA detector (MCE) event upsets occurred in South Atlantic Anomaly (SAA) region. Opto-coupler resets suspected.	Flight control changes made for SAA operations; flight software changes made and part selection for opto-couplers being examined.	SOAR-C-1157 PN 94C
O	HST	97111	03/04/97 (04/25/90)	2469	INST. (700)	2	Anomalous warming of NICMOS dewar. Most likely source of increased heat flow is a "thermalshort" between vapor cooled shield (VCS) and cryogen tank in area of cold bench baffles and VCS baffles on forward end of dewar.	Useful cryogen life at current heat rate would end in December 1998.	SOAR-C-1206 PN 094F
O	HST	97112	03/31/97 (04/25/90)	2496	POWER (500)	2	HST entered software sunpoint 'SAFEMODE'. Using SADE-2R the (-) Wing was accelerating and tripped the Solar Array Torque limit test. This anomaly is consistent with a significant bit flip in the controller register..	SADE - 2 R was reactivated as primary after successful testing. GN events were added as well as several SN events were rescheduled. All data was recovered at another time.	SOAR-C-931 SOAR-C- 933 TTR 19241

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
O	HST	97113	04/09/97 (04/25/90)	2504	ACS (400)	2	HST GYRO 4 motor current dropped to zero, MOTOR 'SYNC' was lost and temperature increased. During subsequent HST slew, gyro 4 rate output caused disparity counts for gyro # 5, # 6 and HST entered SAFEMODE	Powered Gyro # 4 - 'OFF' and brought Gyro # 3 on-line. Ran HST recovery procedures and returned to Science Collection. Events were rescheduled on the omni antenna and some events were supported on TDS.	SOAR-C-935 SOAR-C-936 TTR 19260.
O	HST	97114	07/17/97 (04/25/90)	2602	POWER (500)	2	All six batteries showed increase in temperature. Battery 1 broke 5 degree C. Limit over a 5 hour period. Batteries 2, 3 followed trend. Battery 1 reached 8.6 degree C.	Commanded charge relay CCC 1 K1 from level 1 to level 4. Lowered the charge level for battery 1. This also disconnected the ' + DD ' SPA from charge circuit for battery 1.	SOAR-C-1094 PN 098 HSTAR 6125
O	HST	97115	09/27/97 (04/25/90)	2672	INST. (700)	2	NICMOS suspended giving intel exception, debug exception error code. A transfer complete interrupt vector was corrupted.	STIS similar circuit changed in software. New instruments ACS and COS will get circuit redesign.	SOAR-C-1178 PN 099 HSTAR 6174
O	HST	97116	11/02/97 (04/25/90)	2707	INST. (700)	1	STIS MAMA electronics (MCE) reset occurred with low voltage 'on'. More resets are occurring than predicted for STIS. Resets are occurring outside SAA region.	Recovery is manpower intensive and an automated procedure is in place If detector high voltage is 'on', manual recovery is required.	SOAR-C-1179 PN 100 HSTAR 6229.
G	HST	97-G03	01/04/97 (04/25/90)	2409	TLM & DH (200)	2	Service drop-out following a mode change.	Good lock was achieved after HST POCC implemented the Doppler Comp Enable (DCE) Frequency Respecification procedure	SOAR-C-899
G	HST	97-G04	02/04/97 (04/25/90)	2439	Other (900)	1	POCC scheduled a TDE event with no visibility.	10 minutes and 30 seconds of 32 KB non-recoverable data loss. This data was not recovered.	SOAR-C-919 TTR 19182
G	HST	97-G05	05/05/97 (04/25/90)	2530	TLM & DH (200)	2	During a HST deletion of 4 events, an NCC LAN failover occurred. This ultimately resulted in 2 HST events being scheduled at STGT on the same TDRS, causing the data loss.	10 minutes and 15 seconds of 32 KB data lost (recoverable). STGT manually deleted the original event and data was restored. All data was recovered at another time.	SOAR-C-1027 TTR 19287
G	HST	97-G06	05/22/97 (04/25/90)	2547	Other (900)	2	STGT MA element separator anomaly. The "A" element separator was power reset during a GRO event to clear the anomaly. Commanding to the "A" side and failing down the "B" side were accomplished near the end of the HST event	19 minutes and 25 seconds of service and data loss (recoverable). All data was recovered at another time.	SOAR-C-964 TTR 19313
G	HST	97-G07	08/17/97 (04/25/90)	2632	TC&C (100)	2	Following a restricted access processor (RAP)-failover, the RAP was inadvertently taken down causing a loss of ODM/GCM	5 minutes and 19 seconds of service loss. All data was recovered at another time.	SOAR-C-1105 TTR 19476

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							capability to HST.		
G	HST	97-G08	09/13/97 (04/25/90)	2658	TLM & DH (200)	2	NCC's CCS VAX computer crashed; reason unknown. The project's ODM and GCMR capability were impacted.	22 minutes of service loss. STGT provided the necessary GCM's for the POCC. A CCS failover was performed to restore service. CCS CPU boards were replaced.	SOAR-C-1174 TTR 19514
G	HST	97-G09	09/21/97 (04/25/90)	2666	Other (900)	2	Prime broadcast modem failure at the GE earth station	26 seconds of service/data loss recoverable. A manual failover to the alternate broadcast was accomplished to restore service. All data was recovered at another time.	SOAR-C-1141 TTR 19523
G	HST	97-G10	09/22/97 (04/25/90)	2667	TLM & DH (200)	2	An AGIPA2 fault resulted in a dropout. STGT h/w problem unable to duplicate. AGIPA2 has operated nominally since this occurrence.	3 second dropout. All data was recovered at another time.	SOAR-C-1170 TTR 19529
G	HST	97-G11	09/23/97 (04/25/90)	2308	Other (900)	4	Space network (SN) had no ODM/GCMR capability due to a planned NCCDS CCS switchover.	10 minute service loss. This data was not recovered.	SOAR-C-1144 TTR 19527
G	HST	97-G12	10/02/97 (04/25/90)	2677	TLM & DH (200)	1	POCC received unrecognizable words on their Q-Channel data.	A MAR failover was performed and the problem cleared. A MAR output card was replaced. No data loss.	SOAR-C-1149 TTR 19535
G	HST	97-G13	10/16/97 (04/25/90)	2691	Other (900)	2	Dropouts occurred over several weeks in SSAR 1mbps services. Reason unknown.		SOAR-C-1155 TTR 19545
G	HST	97-G14	11/10/97 (04/25/90)	2715	TLM & DH (200)	2	During transmission of a reconfigurable ground control message, STGT's data interface system (DIS) experienced a ADPE processing (SW) anomaly.	11 minutes and 40 seconds of data loss (recovered). SW delivery end of year. All data was recovered at another time.	SOAR-C-1185 TTR 19584
G	HST	97-G15	11/15/97 (04/25/90)	2720	Other (900)	1	NCC scheduling error. An ongoing HST event was inadvertently deleted while deleting the GRTS supports for the day.	11 minutes and 48 seconds 32 KB service/data loss (recoverable). All data was recovered at another time.	SOAR-C- 1192 TTR 19595
C	HST	97-C01	01/29/97 (04/25/90)	2434	Other (900)	2	NASCOM service losses (no ODM/GCMR capability) .	46 minutes of service loss. NASCOM failed over to a spare message switch conversion device to clear the anomaly.	SOAR-C- 915 TTR 19174
C	HST	97-C02	06/11/97 (04/25/90)	2206	TLM & DH (200)	1	NASCOM output terminal units (OTUs) were disabled. Reason unknown.	26 minutes and 20 seconds of service and data loss. NASCOM manually enabled all the OTU's then entered the parameters for active events to restore service. All data was recovered at another time.	SOAR-C-1033 TTR 19342
O	NOAA-9	9738	05/05/97 (12/12/84)	4463	Instruments (700)	2	SBUV grating drive motor stuck at position + 1027 during sweep mode used for wave length calibration.		SOAR-C-1043

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	NOAA-10	97-G01	01/14/97 (09/17/86)	3717	Instruments (700)	3	MSU scanner positions on CRT page MSU3 displayed anomalous scanner angle(both analog and digital-A) values and all mnemonics were flagging High Yellow limit violations.		SOAR-C-1042
O	NOAA-12	9721	05/31/97 (0514/91)	2177	ACS (400)	2	The filter wheel in the subject instrument was observed to have stopped on May 31,1997.	It has been restarted and the instrument has been switched to “High Power” mode. It is believed this anomaly indicates the bearings are starved for lubricant.. We are approaching end of life for this instrument. This instrument has been operational for 6 years.	SOAR-C-981
O	POLAR	9702	09/16/97 (02/24/96)	562	Power (500)	2	POLAR PWI instrument exhibited an under voltage condition on the digital power monitor and lost all digital telemetry.	The assumption at this time is that a chip in the DPU had experienced a latch-up condition and was pulling down the + 5 Volts power supply.	SOAR-C-1273
O	SAMPEX	97462	01/04/97 (07/03/92)	1621	TLM&DH (200)	4	STPS NR 1 halted. This was the slave source for the command antenna.	3 minutes of command service loss. 6 minutes of tracking data loss. This data was not recovered.	SOAR-C-900
O	SAMPEX	97463	01/05/97 (07/03/92)	1622	Instruments (700)	1	HILT flow regulator valve telemetry indicates open = true and close = true. Nominal condition: open = false and close = true. This anomaly was last seen on: 96/366 (AR#475) Ran HFLVLFIX procedure which sends correct HILT valve and cover commands to reset HILT valve settings.	This is a known anomaly that clearly indicates an impossible condition (a valve open and closed at the same time). It is believed that the problem lies in the telemetry since the PI's do not show any other indications that the Flow Valve may have actually been in an open state. Sending the "Flow Regulator Valve Close" command seems to reset the telemetry so that the valve position reads as expected. The exact reason for this problem is a mystery at this time.	SOAR-C-2763 S 476
O	SAMPEX	97464	01/06/97 (07/03/92)	1623	ACS (400)	1	ADOT Matrix out of limits. The AADMEXE11, AADMEXE13, AADMEXE31, AADMEXE32, AND AADMXI3 mnemonics flagged during subsetting at 007-03:22:54 and came back within limits at 077/03:31:24.	All of these mnemonics are only updated during ORR control mode. When the spacecraft enters coast mode the values remain static until ORR is resumed, although their current value continues to be output. The mnemonics where in an out of limit condition when coast mode was entered. Up until entry back into ORR, these values continued being output by the ACS software. Therefore, the ground system saw two consecutive out of limit conditions and flagged it as	SOAR-C-2764 S-477

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								an anomalous condition. It is not abnormal for single readings to be such during one spacecraft revolution cycle. The fact that the spacecraft is spinning at 1 RPM vice 1 RPO obviously produces a greater number of spin cycles. With the increase in spin cycles coupled with eclipse season the chances of entering coast mode at the time one of these readings was output is greatly increased.	
O	SAMPEX	97465	01/08/97 (07/03/92)	1625	ACS (400)	1	During real-time support the mnemonic AAPLCNT flagged YH with a value of 700. Current limits for AAPLCNT are 3.5 YH and 100.5 RH. Mnemonic did not return within limits during real-time support. Mnemonic described in T&C as ACS Attitude Diagnostic Packet Lost Count (Software Bus Error)	These lost packets are a known condition of the current spin operations. AAPLCNT will continue to rise slowly (a few counts/day) while SAMPEX in spinning at 1 RPM. Any passes taken at 4k downlink rate will cause the AAPLCNT to increase dramatically (150-250). Quaternion telemetry is not supported during real-time at this data rate. SEDS rejected theses packets that were sent from the ACE, thus incrementing the packet lost counter.	SOAR-C-2765 S-478
O	SAMPEX	97466	01/10/97 (07/03/92)	1627	Instruments (700)	1	The LEICA emergency sequence executed and returned the instrument to a nominal condition.	This is a known anomaly. The Telemetry and Statistic Monitors which were set up to handle this problem executed the planned response accordingly. No further resolution was needed at this time.	SOAR-C-2766 S-479
O	SAMPEX	97467	01/10/97 (07/03/92)	1627	Instruments (700)	1	HILT flow regulator valve telemetry indicates open = true and close = true. Nominal condition: open = false and close = true. This anomaly was last seen on: 97/005 (AR#476). Ran HFLVLFIX procedure which sends correct HILT valve and cover commands to reset HILT valve settings.	This is a known anomaly that clearly indicates an impossible condition (a valve open and closed at the same time). It is believed that the problem lies in the telemetry since the PI's do not show any other indications that the Flow Valve may have actually been in an open state. Sending the "Flow Regulator Valve Close" command seems to reset the telemetry so that the valve position reads as expected. The exact reason for this problem is a mystery at this time.	SOAR-C-2767 S-480
O	SAMPEX	97468	01/15/97 (07/03/92)	1632	TC&C (100)	1	The DPU clock error detected flag tripped at a value of 1 when it was looking for a 0. This also caused the	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own	SOAR-C-2768 S-481

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							DPU Status to trip at a value of 200 when it was looking for 192. This condition was last documented in AR#S-469.	internal clock until it is satisfied with the validity of the SEDS time.	
O	SAMPEX	97469	01/18/97 (07/03/92)	1635	TLM&DH (200)	4	After initial AOS, the antenna started to oscillate.	The operator went to program mode with no further problems. This caused a few CRC errors. This data was not recovered.	SOAR-C-988
O	SAMPEX	97470	01/29/97 (07/03/92)	1646	Instruments (700)	1	During the R/T support mnemonic HP10V (HILT plus 10 volt monitor) flagged at 10.53278 which exceeded the YH limit of 10.5. Mnemonic was out from 12:31:34z - 12:37:35z then returned within normal threshold. This occurred 1 minute after the HILT subcom disable operation was complete.	When the HILT subcom is disabled, the +10V, +5V, and -10V monitor telemetry slots are used for the SSD bias readings. The SSD bias readings (digital values) are being interpreted as each of the +10V, +5V, -5V readings at the POCC. This is because the HILT subcom is locked on State 3 (SSD bias output) while the Housekeeping portion of the DPU software does not patch around the mission HK monitors mentioned above.	SOAR-C-2769 S-482
O	SAMPEX	97471	01/30/97 (07/03/92)	1647	Instruments (700)	1	The HINITCNT and HXPROFCT mnemonics flagged in the LOS Configuration Monitor during realtime. HINITCNT = The count HILT XINIT Pulses HXPROFCT = The count of HILT XPWROFF Pulses	This anomaly was changed to Inactive due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	SOAR-C-2770 S-483
O	SAMPEX	97472	02/23/97 (07/03/92)	1670	TLM&DH (200)	1	The mnemonic SCICDUDO flagged approximately 1 1/2 minutes after AOS. This caused the inability to command during the next 6 minutes. There was no apparent drop in the AGC level that would have caused this anomaly. This anomaly was last seen in S-470, S-465, and S-461. It has been proven that the /scttulrt command does not clear the Command Dropout Flag, however, having the ground station resweep the uplink does.	The uplink card receives command data from the transponder's command receiver. The uplink interface searches the incoming bit stream until it finds a 16 bit synchronization patter or "barker code" with a value of EB90 (hex), shifts the data in as 64 bit code blocks, verifies that the 64 bit code block has a modified BCH checksum, and stores the data in a FIFO for transmission to the bus. The CDU Dropout bit indicates that the Command Detector Unit portion of the transponder lost lock on the subcarrier after the uplink card has detected the barker code. This signal is latched by uplink hardware. This error is cleared by resetting the uplink card (/scttulrt)." So says the CTT CDR.	SOAR-C-2771 S-484

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
O	SAMPEX	97473	02/26/97 (07/03/92)	1673	Instruments (700)	1	The MLVPSACM mnemonic (MAST Low Voltage Power Supply PSA current monitor) flagged yellow high during real-time. The point went yellow high at 057-08:40:08 and remained yellow high for the rest of the pass (approx. 2 minutes). Just before this mnemonic went yellow high, the S/C exited eclipse. The next MAST/PET cycle was scheduled to occur 08:58z.	This anomaly is currently being investigated by the OE and is still within the 6 month time limit.	SOAR-C-2772 S-485
O	SAMPEX	97474	02/28/97 (07/03/92)	1675	Instruments (700)	1	Limits 15/16 went out of limits at 058-22:51:10 and returned to normal 1 minute later. At 97/058/23:24:10 the LEICA emergency sequence executed and returned the instrument to a nominal condition. Limits 15/16 went out of limits two more times at 059-05:08:10 and 059-05:10:10 and returned to normal with no safing sequence being initiated.	This is a known anomaly. The Telemetry and Statistic Monitors which were set up to handle this problem. The planned response was executed accordingly. No further resolution was needed at this time.	SOAR-C-2773 S-486
O	SAMPEX	97475	02/28/97 (07/03/92)	1675	Instruments (700)	1	The MLVPSACM mnemonic (MAST Low Voltage Power Supply PSA current monitor) flagged yellow high during real-time. The point went yellow high at 058-08:57:10 and remained yellow high for the rest of the pass (approx. 1 minutes). Just before this mnemonic went yellow high, the S/C exited eclipse. The next MAST/PET cycle was scheduled to occur 059/09:15:31z. Under similar circumstances the mnemonic went YH Value=249 during the R/T pass on 060-08:57 and remained out for the remainder of the pass.	Notified Operations Engineer. Subsetting and trending of all occurrences of this limit violation is being performed. This anomaly is currently being investigated by the OE and is still within the 6 month time limit.	SOAR-C-2774 S-487
O	SAMPEX	97476	03/10/97 (07/03/92)	1687	TC&C (100)	1	DSTATUSF flagged at 17:13:33 while configuration monitor was running. Value was 200. Nominal is 192. The change in value was due to the DPU clock error detect flag.	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with the validity of the SEDS time.	SOAR-C-2775 S-488
O	SAMPEX	97477	03/20/97 (07/03/92)	1697	TLM&DH (200)	4	WPS RF video monitoring equipment indicated the downlink had a jitter not normally seen.	10 minutes of data and tracking loss. This data was not recovered.	SOAR-C-992 TTR 19231
O	SAMPEX	97478	04/04/97	1711	Instruments	1	The HINITCNT and HXPROFCT	This anomaly was changed to Inactive	SOAR-C-2776

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
			(07/03/92)		(700)		mnemonics flagged in the LOS Configuration Monitor during realtime. HINITCNT = The count HILT XINIT Pulses HXPROFCT = The count of HILT XPWROFF Pulses This has occurred in the past, see S-483.	due to the 6 month time limit and there is no active investigation being taken by the FOT. This does not mean that the anomaly is not being investigated by the subsystem leads or Principle Investigator.	S-489
O	SAMPEX	97479	04/11/97 (07/03/92)	1718	Instruments (700)	1	Limits 15 and 16 were out of limits for 3 minutes causing the emergency safing sequence to fire. LEICA returned to a nominal state after the finish of the safing RTS's. The anomaly occurred at 101-02:33:51. TS Monitors 15 and 16 went out of limits for one minute prior to the safing action at 101-02:26:51.	This is a known anomaly. The Telemetry and Statistic Monitors which were set up to handle this problem. The planned response was executed accordingly. No further resolution was needed at this time.	SOAR-C-2777 S-490
O	SAMPEX	97480	04/13/97 (07/03/92)	1720	Instruments (700)	1	Limits 15 and 16 were out of limits for 3 minutes causing the emergency safing sequence to fire. LEICA returned to a nominal state after the finish of the safing RTS's. The anomaly occurred at 103-04:35:53. Prior to the safing action Lim 15 and 16 were out of limit several times. 103-04:18:53 for 1 min. 103-04:22:53 for 2 min. 103-04:27:53 for 1 min.	This is a known anomaly. The Telemetry and Statistic Monitors which were set up to handle this problem. The planned response was executed accordingly. No further resolution was needed at this time.	SOAR-C-2778 S-491
O	SAMPEX	97481	04/18/97 (07/03/92)	1725	Instruments (700)	1	HILT flow regulator valve telemetry indicates open=true and close=true. Nominal condition: open=false and close=true. This anomaly was last seen on: 97/011 (AR#480)	This is a known anomaly that clearly indicates an impossible condition (a valve open and closed at the same time). It is believed that the problem lies in the telemetry since the PI's do not show any other indications that the Flow Valve may have actually been in an open state. Sending the "Flow Regulator Valve Close" command seems to reset the telemetry so that the valve position reads as expected. The exact reason for this problem is a mystery at this time.	SOAR-C-2779 S-492
O	SAMPEX	97482	04/19/97 (07/03/92)	1726	TC&C (100)	1	While doing the clock check, it was noticed that the clock error was -1.287s. This is a high error even for Full Sun conditions. On following day's PKF pass (DOY	No valid reason could be found for the unusual clock drift for that day.	SOAR-C-2780 S-493

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							110) clock off by -0.632 sec. FOT adjusted +0.999 sec. Previous days clock checks showed s/c clock behind by -.152, -.147, and -.148.		
O	SAMPEX	97483	04/25/97 (07/03/92)	1732	TC&C (100)	1	During a blind acquisition with Poker Flat, RTS#27 was started (114-18:47) to dump the ACS diagnostics packets. RTS#27 was mistakenly started on RTP#3, instead of RTP#1, which is reserved for ground use. This RTS takes 10 minutes to run and did not complete until 18:57. At 18:52:34 RTP#3 was called out of the ATS for RTS#30(MAST/PET turnoff) execution. RTP#3 was busy and did not execute the called RTS#30. The MAST/PET turnoffs continued at the next scheduled time, with no other interruptions. Two SEDS counters incremented as a result of the error.	This was a blind acquisition and RTS#27 was mistakenly started on a busy RTP (#3) in realtime. The ACS RTS should have been started on RTP#1, which is reserved for ground use.	SOAR-C-2781 S-494
O	SAMPEX	97484	05/02/97 (07/03/92)	1739	TC&C (100)	1	DSTATUSF flagged at 16:44:59 while configuration monitor was running. Value was 200. Nominal is 192. The change in value was due to the DPU clock error detect flag.	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with the validity of the SEDS time.	SOAR-C-2782 S-495
O	SAMPEX	97485	06/09/97 (07/03/92)	1776	Instruments (700)	1	A Leica emergency sequence was initiated. Limit ID's 15 and 16 failed simultaneously, causing the sequence to start. Note: In this particular instance, limits 15 and 16 tripped leading to an event "Limit ID 16 failed: SCP busy" This is a normal event during this sequence, as both limit 15 and 16 failing causes RTS 35 to fire. This same event also occurs in S-470.	This is a known anomaly. The Telemetry and Statistic Monitors were set up to handle this problem. The planned response was executed accordingly. No further resolution was needed at this time.	SOAR-C-2783 S-496
O	SAMPEX	97486	09/18/97 (07/03/92)	1875	Power (500)	1	LEICA HV monitor emergency sequence.	This is a known anomaly. The Telemetry and Statistic Monitors were set up to handle this problem. The planned response was executed accordingly. No further resolution was needed at this time.	SOAR-C-2784 BS-509
O	SAMPEX	97487	09/24/97 (07/03/92)	1881	Instruments (700)	1	HILT flow regulator valve telemetry indicates open=true and close=true. Nominal condition: open=false and close=true. This anomaly was last	This is a known anomaly that clearly indicates an impossible condition (a valve open and closed at the same time). It is believed that the problem	SOAR-C-2785 BS-510

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							seen on: 97/011 (AR#480)	lies in the telemetry since the PI's do not show any other indications that the Flow Valve may have actually been in an open state. Sending the "Flow Regulator Valve Close" command seems to reset the telemetry so that the valve position reads as expected. The exact reason for this problem is a mystery at this time.	
O	SAMPEX	97488	10/02/97 (07/03/92)	1889	TC&C (100)	1	DSTATUSF flagged at 14:41:35 while configuration monitor was running. Value was 200. Nominal is 192. The change in value was due to the DPU clock error detect flag.	This is a known anomaly. The DPU thinks it's receiving a bad update time from SEDS, so it runs on its own internal clock until it is satisfied with the validity of the SEDS time.	SOAR-C-2786 BS-512
O	SAMPEX	97489	11/04/97 (07/03/92)	1921	TC&C (100)	1	During the R/T PKF support the above mnemonic flagged, it is described as the SEDS data set total number of uncorrected memory errors detected. Also 2 event messages were generated "EDAC multiple bit error at 0A342C4E" at 308-04:44:13. The S/C was not in eclipse or the SAA. This anomaly was unique from the other two occurrences in that the event message was generated twice and the SNDSUCER mnemonic incremented 2X.	This error occurred when data was being read from a memory location in the SSR. Single bit errors can be detected and corrected without notification (i.e. no spacecraft event messages generated or error counters incremented). In this instance, more than one error was detected. No correction can be performed in this case. Statistically, this should be a rare occurrence unless the actual memory location is corrupted. If this error were to occur again at the same location, a scheme to map around this location would be looked into.	SOAR-C-2787 BS-513
O	SAMPEX	97490	11/08/97 (07/03/92)	1925	TLM&DH (200)	2	Commanding was nearly two thirds complete , then the signal strength dropped from –90 DBM to –120 DBM.	Later both receivers were again at –90 DBM. It is suspected that the antenna was not positioned properly. This data was recovered at another time.	SOAR-C-1184 TTR 19582
O	SAMPEX	97491	12/22/97 (07/03/92)	1969	TC&C (100)	1	Two /paramdmp commands were sent to the DPU at the same second. One was sent from the ATS as part of the normal AOS sequence and 1 was sent from an RTS as part of the normal operations RTS. This was noticed by both analysts checking the ATS load and a decision was reached not to regenerate the load.	The reason for this anomaly is understood.	SOAR-C-BS-514
O	SAMPEX	97492	12/29/97 (07/03/92)	1976	TC&C (100)	1	The LOS configmon flagged the above two mnemonics. These two mnemonics indicate a DPU clock	The DPU thinks it is receiving a bad time from the SEDS and runs on its own internal time until satisfied with the	SOAR-C-2788 BS-515

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							error.	validity of the SEDS time.	
G	SAMPEX	97-G02	03/16/97 (07/03/92)	1693	TLM&DH (200)	2	Project reported sequence and CRC errors during real time support and playback.	This data was recovered at another time.	SOAR-C-991 TTR 19225
G	SAMPEX	97-G03	08/17/97 (07/03/92)	1844	TC & C (100)	2	Unable to receive data during real time passes a WPS due to a T1 problem.	WPS performed all necessary local commanding and recorded all data for both passes and later playback. This data was recovered at another time.	SOAR-C-1106 TTR 19475
O	TDRSS-1	9780	02/04/97 (04/03/83)	4981	Other (900)	1	CTE/CPE Out of Sync.	This data was recovered at another time.	SOAR 177-1 DR 34054
O	TDRSS-1	9781	03/20/97 (04/03/83)	5027	Other (900)	1	CPE Re-Initialization.	This data was recovered at another time.	SOAR 178-5 DR 34392
O	TDRSS-1	9782	03/31/97 (04/03/83)	4678	Other (900)	1	Disturbance torque compensation did not kick in until 25 seconds after the burn start.	This is a spacecraft problem . Possibly something in correct with the thruster controllers. This data was recovered at another time.	SOAR 179-1 DR 34600
O	TDRSS-1	9783	06/16/97 (04/03/83)	4753	TLM&DH (200)	1	RXA SIGS Degradation.	Self resolving problem. This data was recovered at another time.	SOAR 180-1 DR 34924
O	TDRSS-1	9784	07/07/97 (04/03/83)	5134	TLM&DH (200)	3	RCTU-P2 Row 14 Failure.	Data base change recommended. This data was recovered at another time.	SOAR 181-3 DR 3506
O	TDRSS-1	9785	08/05/97 (04/03/83)	5162	TLM&DH (200)	1	Command Anomaly.	This data was recovered at another time.	SOAR 182-3 DR 35202
G	TDRSS-1	97-G01	06/13/97 (04/03/83)	5110	TLM&DH (200)	1	Following an STTC cold start, ASIC 1373 ground station vector was requested due to a lack of adequate NCC procedures, the NCC PA transmitted a series of 18 SIC 1373 type 8 vectors with epochs from 6/12 2000Z with all epochs but one in the future since the last vector received is the last vector utilized, this transmission caused TDRSS-1 SGL antenna to OFF point resulting an a LOSS of TDRSS-1 telemetry at 1738Z. The NCC PA should have only transmitted one 1373 vector with an epoch of the day 163/2000Z. At 1936Z A TDRSS-1 ETO is attributed to the same root cause.	TDRSS-1 was recovered and supported at STGT/STIC until return to WSGT/SGLT-1 ATK BAND.	SOAR-C-1036 TTR 19347
G	TDRSS-1	97-G02	09/23/97 (04/03/83)	5210	TLM&DH (200)	2	As a result of the maneuver vectors received in the NCC from FDF with epochs of 40 minutes after each hour instead of epochs on the hour, old vectors were not overwritten and 70 vectors were	There was no impact to support, but this could have resulted in a TDRSS-1 ETO if not corrected. All data was recovered at another time.	SOAR-C-1171 TTR 19526

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							transmitted to WSGT instead of 47 during the daily vector transmission at 1300Z caused to vector limit of 72 at WSGT to be exceeded, which resulted in a vector wrap around that overwrote the current TDRSS vectors NCC retransmitted the vectors for DOY 266 beginning with the 2000Z epoch as single vectors vice bulk vectors and this corrected the problem		
C	TDRSS-1	97-C01	06/11/97 (04/03/83)	5108	Other (900)	2	NASCOMS OTU were disabled which impacted the TTR 19342 event. The reason for the anomaly is under investigation by the NASCOM OTUs that were affected. Th e TDRS-1 TTC events were missed when the OTU problem was corrected for the other projects. (See TTR 19342 and 19343)		SOAR-C-1034 TTR 19344
O	TDRSS-3	9722	09/09/97 (09/29/88)	3220	TLM&DH (200)	1	TDRSS-3 switched to secure mode for some unknown reason. This onboard configuration prevented commands from being received, resulting in an ETO.	TDRSS-3 was reconfigured to receive clear commands and was available for user service again. No interruption to user service.	SOAR-C-1092 TTR 19457
G	TDRSS-3	97-G01	06/24/97 (09/29/88)	3145	TC & C	1	FDF still not receiving TDRSS-3 tracking data. Reason unknown.	Note: TTR # 19367 closed out at the end of the day and new TTR # 19368 opened for new day.	SOAR-C-1088 TTR 19367
G	TDRSS-3	97-G02	6/25/97 (09/29/88)	3186	TC & C	1	FDF was not receiving TDRSS-3 tracking data.	NASCOM failover to another TDS system to correct the problem. REF TTR 19365.	SOAR-C-1089 TTR 19368
G	TDRSS-3	97-G03	07/07/97 (09/29/88)	3158	Other (900)	1	A lightning strike at WSGT resulted in a waveguide switching and a CARP ADPE failover. The waveguide switching resulted in a temporary TDRSS-1 telemetry outage. The low rate switch was not reconfigured for TDRSS-3 commanding after the CARP ADPE failover, resulting in a TDRSS-3 ETO..	TDRSS-3 was recovered prior to any STS-94 or GRO supports.	SOAR-C-1032 TTR 19392
G	TDRSS-3	97-G04	09/11/97 (09/29/88)	3222	Other (900)	2	TDRSS-3 supporting circuits GRTS-1/GRTS-3 with their respective earth stations were affected by the fall equinox solar interference.	Thirty three minutes of service data outage. However, no customers were being supported at this time.	SOAR-C-1130 TTR 19506

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	TDRSS-3	97-G05	10/26/97 (09/29/88)	3267	Other (900)	4	FDF was not in receipt of TDRSS-3 tracking data.	NASCOM reboot to restore service. One hour of service data lost. This data was not recovered.	SOAR-C-1137 TTR 19512
G	TDRSS-3	97-G06	10/26/97 (09/29/88)	3267	Other (900)	1	FDF reported no tracking data for TDRSS-3 received.	NASCOM nor WSGT could not find any problems.	SOAR-C-1194 TTR 19562
C	TDRSS-3	97-C01	06/23/97 (09/29/88)	3144	TLM&DH (200)	1	FDF reported not receiving any TDRSS-3 tracking data since 1300Z.	While troubleshooting was going on NASCOM failed over to the tracking system –1 (TDS-1) and the anomaly was corrected.	SOAR-C-1007 TTR 19365
C	TDRSS-3	97-C02	07/27/97 (09/29/88)	3178	Other (900)	1	FDF reported that they had not received TDRSS-3 tracking data . NASCOM reported that the tracking data system (TDS) faulted. A failover from RAS to RBS cleared the anomaly.	FDF advises that they only check the TDRSS tracking every 12 hours , which is why they took so long to report the anomaly (30 hours and 1 minute of tracking data service loss.) This data was not recovered.	SOAR-C-1069 TTR 19444
G	TDRSS-5	97-G01	05/13/97 (08/02/91)	2081	Propulsion (600)	2	FDF received predicted post maneuver vectors from WSC which they use to generate TDRSS-5 vectors using the 4 hour solution based on 12 post maneuver BRTS events, which were transmitted to WSC via the NCC. FDF noticed a 14.6 KM merge value in the maneuver window.	The 4 hour solution based on the 12 passes (post north maneuver) was good. ACQ data based on this solution was generated and transmitted to WSC.	SOAR-C-957
G	TDRSS-6	97-G03	03/03/97 (01/13/93)	1490	Other (900)	1	During the payload deactivation , the C-Band receiver power was turned off and it was not powered back up as it should have been.	This operator error resulted in a 4 hour 10 minutes of service lost .	SOAR-C-924
G	TDRSS-6	97-G04	05/12/97 (01/13/93)	1559	Other (900)	1	Electrical Equipment problem at the AGO.	This resulted in 1 minute 17 seconds of service data lost. Also, 27 seconds of VHF service data lost. This data was not recovered.	SOAR-C-958
G	TDRSS-6	97-G05	09/11/97 (01/13/93)	1678	TLM&DH (200)	1	The Timeplex link went out.	Command and ranging were re-established within minutes. All data was recovered at another time.	SOAR-C-1136
O	TOMS-EP	9708	11/16/97 (07/02/96)	494	ACS (400)	2	Both earth sensors apparently saw noise of sufficient magnitude and duration to cause failover to loss of nadir triggers.	Began recovery to normal science mode under Spacecraft emergency conditions.	SOAR-C-1196 TMOC 97-001
G	TOMS-EP	97-G06	03/13/97 (07/02/96)	251	TLM&DH (200)	2	Project reported CRC errors in 202 KB data during real time and subsequent playback of the data.	The data for this support was successfully recovered during the event.	SOAR-C-990 TTR 19223
G	TOMS-EP	97-G07	04/15/97 (07/02/96)	283	TLM&DH (200)	1	At go for command, Wallops received a good command from	This resulted in the loss of 4 minutes and 31 seconds of service data.	SOAR-C-995 TTR 19271

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							TOMS. Immediately following the command, the station started to receive constant valid command blocks that were not being sent by TOMS that were uplinked to the spacecraft.		
G	TOMS-EP	97-G08	04/30/97 (07/02/96)	298	TLM&DH (200)	1	During PRT WPS had problems with commands from TOMS-EP. They got a message of a bad header on NPSS..	TOMS-EP did not declare any data loss. Dump was recoverable at another site.	SOAR-C-1031 TTR 19283
G	TOMS-EP	97-G09	05/03/97 (07/02/96)	301	TLM&DH (200)	2	Project asked for 202 KB data on line and the POCC reported receiving empty blocks. At TOTS appeared to be a bad bit sync.	All data was recovered at another time.	SOAR-C-996 TTR 19284
G	TOMS-EP	97-G10	05/06/97 (07/02/96)	304	TLM&DH (200)	1	At scheduled AOS station had negative acquisition , went to program track still not able to acquire downlink.	Reason for Blank acquisition and loss of downlink unknown.	SOAR-C-1001 TTR 19288
G	TOMS-EP	97-G11	05/23/97 (07/02/96)	321	TLM&DH (200)	2	WPS 9 meter antenna lost tracking capability when the low-speed tracking data was initialized from the S-band tracking processor (STPS) NR # 2.	WPS configured to the backup system and resumed tracking operation. POCC reported All data was recovered at another time.	SOAR-C-965 TTR 19316
G	TOMS-EP	97-G12	06/04/97 (07/02/96)	332	TLM&DH (200)	2	The TOTS-3 exciter did not automatically sweep.	This required an operator to go to a pedestal, reset several pieces of equipment, then place the system in manual mode. The POCC received their KB house keeping data, but the 202 KB data was delayed until next contact. All data was recovered at another time.	SOAR-C-1086 TTR 19335
G	TOMS-EP	97-G13	06/05/97 (07/02/96)	333	TLM&DH (200)	2	POCC was in receipt of CRC errors on their 202 KB data.	Fault isolation revealed that the bit sync had developed a problem in the de-coder. The data was recovered with the subsequent pass. All data was recovered at another time.	SOAR-C-1087 TTR 19337
G	TOMS-EP	97-G14	08/10/97 (07/02/96)	398	TLM&DH (200)	2	Intermittent data flowed to TMOC due to communications system dropping lock from time to time.	Post-Pass checks revealed that the problem was caused by a clock malfunction at the Santiago international tower maintenance (TMC).	SOAR-C-1099 TTR 19461
G	TOMS-EP	97-G15	08/25/97 (07/02/96)	413	TLM&DH (200)	2	During post-pass inspection of data by TOMS-EP dropouts were noted separately throughout the data dump. WPS attempted three times to play back the data.	The reason for the dropouts appears to have been in the downlink. The dropouts were on both the metrum and analog. TOMS-EP is going to get the data re-dumped at another station.	SOAR-C-1132 TTR 19490

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
G	TOMS-EP	97-G16	10/01/97 (07/02/96)	449	Other (900)	2	WPS had a high elevation pass (89.6 degrees) which caused the 7.3 meter antenna to lose downlink signal.	The downlink dropped out for 15 seconds and then re-acquired. POCC claimed 4 minutes and 22 seconds of 202 KB data lost.	SOAR-C-1147 TTR 19533
G	TOMS-EP	97-G17	12/03/97 (07/02/96)	511	EPS (500)	2	WPS reported an S-Band power amplifier failure during the TOMS-EP support.	WPS shifted to the standby mode and continued to support without incident. All data was recovered at another time.	SOAR-C-1218 TTR 19622
G	TOMS-EP	97-G18	12/10/97 (07/02/96)	518	TLM&DH (200)	2	POCC reported a AOS discrepancy of 6 to 7 minutes with WPS.	WPS investigated the problem and found that the STPS-2 had been disabled which impeded the receipt of accurate IIRVS data from the FDF. This resulted in WPS having faulty data in their system since the spacecraft had recently undergone a maneuver. WPS enabled the STPS-2 and had re-transmission of all necessary IIRVS. All data was recovered at another time.	SOAR-C-1222 TTR 19625
G	TOMS-EP	97-G19	12/12/97 (07/02/96)	520	TLM&DH (200)	2	At AOS Wallops found that the predict data in their tracking computer was corrupted.	Post-Pass the station received new predictions from FDF which corrected the anomaly. 6minute FMT-A Data service lost. 1 minute FMT-C Data service lost. 6 minutes Command data lost. 4 minutes ranging data lost.	SOAR-C-1226 TTR 19626
G	TRMM	97-G01	11/28/97 (11/27/97)	1	TLM&DH (200)	2	TRMM MOC was unable to transmit a GCMR to change the Command rate from 500 KB/sec to 1 KB/sec.	NCC PA transmitted the GCMR to 1 KB for the POCC. All data was recovered at another time	SOAR-C-1213 TTR 19612
G	TRMM	97-G02	12/05/97 (11/27/97)	8	TLM&DH (200)	2	TRMM experienced intermittent return channel lock and false lock on the SSAR service. NCC sent a GCMR to change the forward link frequency and forward link acquisition to acquire.	The reason for the anomaly was a FDF operator error.	SOAR-C-1219 TTR 19623
G	TRMM	97-G03	12/12/97 (11/27/97)	15	TC & C (100)	4	Negative acquisition of the TRMM spacecraft.	PST analysis at STGT indicated a suspected problem with the ADPE not correctly setting up the MDP. 12 minutes of 1 KB service data lost. This data was not recovered.	SOAR-C-1225 TTR 19627
G	TRMM	97-G04	12/13/97 (11/27/97)	16	Other (900)	2	Negative acquisition of the TRMM spacecraft.	All data was recovered at another time.	SOAR-C-1227 TTR 19628
G	TRMM	97-G05	12/13/97 (11/27/97)	16	TLM&DH (200)	1	Negative acquisition of the TRMM spacecraft.	All data was recovered at another time.	SOAR-C-1230 TTR 19630
G	TRMM	97-G06	12/19/97 (11/27/97)	22	Other (900)	2	Late acquisition of the TRMM spacecraft.	POCC sent one forward re-acquisition to achieve lock. All data was recovered at another time.	SOAR-C-1232 TTR 19637
G	TRMM	97-G07	12/24/97	27	TLM&DH	1	POCC reported dropouts on their	Investigation showed that the data	SOAR-C-1235

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
			(11/27/97)		(200)		Q-Channel.	loss was due to mutual interference. All data was recovered at another time.	TTR 19642
O	UARS	9722	04/15/97 (09/15/91)	2010	TLM&DH (200)	2	The onboard commands did not execute.	The high gain antenna did not slew from the previous TDW pass. Loss of data. This data was not recovered.	SOAR-C-976 TTR 19270
O	UARS	9723	05/30/97 (09/15/91)	2055	Other (900)	2	An onboard computer halt during a stored command load activity.	Satellite entered sun pointing safe hold. A hard disk corruption is suspected.	SOAR-C-979
O	UARS	9724	05/31/97 (09/15/91)	2056	TLM&DH (200)	2	UARS spacecraft emergency.	25 UARS events were supported on this day. All the data was recovered another time.	SOAR-C-1017 TTR 19324
O	UARS	9725	06/01/97 (09/15/91)	2057	TLM&DH (200)	2	UARS spacecraft emergency.	25 UARS events were supported on this day. All the data was recovered another time.	SOAR-C-1018 TTR 19326
O	UARS	9726	09/11/97 (09/15/91)	2156	Other (900)	1	Data loss due to spacecraft misconfiguration.	27 minutes and 30 seconds of service lost. This data was not recovered .	SOAR-C-1135 TTR 19511
G	UARS	97-G08	01/01/97 (09/15/91)	1906	Other (900)	1	Loss of data because the POCC failed to send a “Transmitter On” command.	1 minute and 34 seconds of data loss. This data was recovered at another time.	SOAR-C-1040 TTR 19403
G	UARS	97-G09	03/03/97 (09/15/91)	1968	Other (900)	1	POCC reported data dropout on the I-Channel.	All data was recovered at another time.	SOAR-C-922 TTR 19208
G	UARS	97-G10	04/14/97 (09/15/91)	2009	TLM&DH (200)	1	The telemetry and the command computer was inadvertently misconfigured for 32 KB vice 1 KB data.	All data was recovered at another time.	SOAR-C-975 TTR 19269
G	UARS	97-G11	04/28/97 (09/15/91)	2023	Other (900)	2	Data loss due to command panel lockup.	3 minutes and 35 seconds of 32 KB data lost. This data was recovered at a later time.	SOAR-C-977 TTR 19280
G	UARS	97-G12	05/13/97 (09/15/91)	2038	Other (900)	2	Data loss due to an equipment anomaly at STGT.	2 minutes and 50 seconds of 32 KB data loss. All data was recovered at another time..	SOAR-C-985 TTR 19346
G	UARS	97-G13	05/26/97 (09/15/91)	2051	Other (900)	1	POCC inadvertently sent the procedure to bring the system up twice.	13 minutes and 26 seconds of 32 KB data loss due to a POCC error. All data was recovered at a later time.	SOAR-C-969 TTR 19320
G	UARS	97-G14	05/30/97 (09/15/91)	2055	TLM&DH (200)	2	Late acquisition.	The High Gain Antenna had stopped. All data was recovered at another time.	SOAR-C-1016 TTR 19323
G	UARS	97-G15	06/10/97 (09/15/91)	2065	TLM&DH (200)	1	DATA loss because POCC sent the wrong forward GCMR.	23 seconds of 32 KB data loss. This data was recovered at another time.	SOAR-C-1062 TTR 19338
G	UARS	97-G16	06/20/97 (09/15/91)	2075	Other (900)	2	UARS late acquisition due the fact that the satellite was coming out of a Yaw maneuver.	All data was recovered at another time.	SOAR-C-1004 TTR 19357
G	UARS	97-G17	07/09/97 (09/15/91)	2094	Other (900)	2	POCC experienced an electrical equipment problem.	15 minutes of 32 KB data loss. This data was recovered at another time.	SOAR-C-1035 TTR 19397
G	UARS	97-G18	07/10/97 (09/15/91)	2095	Other (900)	2	POCC did not receive data	12 minutes and 21 seconds of 32 KB data. The POCC rebooted and this	SOAR-C-1039 TTR 19402

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
							due to a POCC TAC problem.	cleared the problem. Al data was recovered at another time.	
G	UARS	97-G19	07/29/97 (09/15/91)	2114	Other (900)	1	Data loss due to misconfiguration at the POCC.	9 minutes and 30 seconds of data loss. This data was recovered at another time.	SOAR-C-1072 TTR 19447
G	UARS	97-G20	08/27/97 (09/15/91)	2142	TLM&DH (200)	2	Data loss due to a late acquisition.	The POCC had transmitted 3 GCMR's along with a forward service failover by the CSC before acquiring the satellite. 2 minutes and 38 second s of forward service loss and 2 minutes and 48 seconds of data loss. This data was recovered at another time.	SOAR-C-1122 TTR 19494
G	UARS	97-G21	09/16/97 (09/15/91)	2161	TLM&DH (200)	4	An inadvertent command was sent from a console at STGT which caused a failover of the forward link.	32 seconds of 32 KB data loss. This data was not recovered.	SOAR-C-1140 TTR 19519
G	UARS	97-G22	10/19/97 (09/15/91)	2194	Other (900)	4	UARS return service dropout due to an SSA-1 forward auto failover from A to B channel at the STGT.	24 seconds of 512 KB data loss. This data was not recovered.	SOAR-C-1160 TTR 19551
G	UARS	97-G23	10/29/97 (09/15/91)	2204	TLM&DH (200)	2	A POCC automatic processor failure eliminated visibility of the data.	15 minutes of 512 KB data loss. This data was recovered at another time.	SOAR-C-1198 TTR 19566
G	UARS	97-G24	12/31/97 (09/15/91)	2266	TLM&DH (200)	1	Late acquisition due to a POCC equipment problem.	The POCC rebooted the TAC equipment, instituted a blind acquisition procedure and acquired lock. 4 minutes and 2 seconds of data loss. This data was not recovered.	SOAR-C-1239 TTR 19647
C	UARS	97-C01	06/20/97 (09/15/91)	2075	Other (900)	2	NASCOM was no able to configure for a UARS real time event.	All data was recovered at another time.	SOAR-C-1002 TTR 10354
C	UARS	97-C02	06/29/97 (09/15/91)	2084	Other (900)	1	Failed to bring up the POCC COMM line.	NASCOM isolated the problem to a transmit RF card and replaced it. All the data was recovered at another time.	SOAR-C-1015 TTR 19378
O	WIND	9702	12/13/97 (11/01/94)	1122	TLM&DH (200)	2	WIND digital recorder (DTR2) went into a failure mode where all digital telemetry was reading 0 counts and all commanding was lost to the recorder.	New procedures for rewind and replay of the Tape recorder were written down so not to cause extra wear on the tape recorder.	SOAR-C-1274
O	XTE	9745	02/26/97 (12/30/95)	416	TLM&DH (200)	2	The project reported a late acquisition due to a software problem.	All data was recovered at another time.	SOAR-C-921
O	XTE	9746	05/31/97 (12/30/95)	510	Electrical Power (500)	1	Array motor moved the array but, the digital output did not change.	Redundant detector had correct output. All data was recovered at another time.	SOAR-C-1037
O	XTE	9747	08/27/97 (12/30/95)	597	TLM&DH (200)	2	This event was deleted due to the Lewis spacecraft emergency.	2 minutes of service loss was declared. This data was not	SOAR-C-1121 TTR 19493

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								recovered.	
O	XTE	9748	09/22/97 (12/30/95)	622	Other (900)	2	WSC was unable to detect RF from XTE.	The spacecraft went into safe mode.	SOAR-C-1142 TTR 19524
O	XTE	9749	11/12/97 (12/30/95)	672	TLM&DH (200)	4	XTE receiver #1 failed to lock at AOS.	All range data was lost. This data was not recovered.	SOAR-C-1189 TTR 19592
G	XTE	97-G79	03/03/97 (12/30/95)	423	TLM&DH (200)	1	POCC reported a data loss due to a predicted mutual interference .	2 minutes and 59 seconds of 32 KB and 1024 KB data loss. This data was recovered at another time.	SOAR-C-923
G	XTE	97-G80	03/04/97 (12/30/95)	424	TLM&DH (200)	2	POCC reported loss of data due to a predicted mutual interference problem.	2 minutes and 16 seconds of 32 KB data loss. This data was recovered at another time.	SOAR-C-925
G	XTE	97-G81	04/08/97 (12/30/95)	458	Other (900)	1	WSGT DIS ADPE auto failover from “B” channel to “A” channel. .	WSGT had to manually establish lock. 6 minutes and 18 seconds of data loss. This data was recovered at another time.	SOAR-C-972 TTR 19254
G	XTE	97-G82	04/29/97 (12/30/95)	479	TC & C (100)	1	Experienced a command hit.	Service data loss. This data was not recovered.	SOAR-C-1024 TTR 19282
G	XTE	97-G83	05/25/97 (12/30/95)	505	TLM&DH (200)	1	POCC reported loss of data due to a predicted mutual interference problem.	2 minutes and 6 seconds of 32 KB data loss. This data was recovered at another time.	SOAR-C-968 TTR 19319
G	XTE	97-G84	06/02/97 (12/30/95)	512	TLM&DH (200)	1	POCC reported intermittent lock on the I & Q-Channels at AOS.	POCC sent a forward re-acquisition to establish solid lock. 6 minutes and 21 seconds of data loss. This data was recovered at another time.	SOAR-C-1019 TTR 19328
G	XTE	97-G85	06/23/97 (12/30/95)	533	TLM&DH (200)	2	The prime broadcast failed.	It was found that the WSC had lost sync between their MUX and the GE earth station causing the loss of data. This data was recovered at another time.	SOAR-C-1058 TTR 19364
G	XTE	97-G86	07/16/97 (12/30/95)	556	Other (900)	2	Data loss due to mutual interference with another user.	This data was recovered at another time.	SOAR-C-1045 TTR 19425
G	XTE	97-G87	08/18/97 (12/30/95)	588	Other (900)	1	POCC sent two wrong forward re-acquisitions for the wrong TDRSS.	5 minutes and 15 seconds of 32 KB data loss. This data was recovered at another time.	SOAR-C-1110 TTR 19480
G	XTE	97-G88	08/21/97 (12/30/95)	591	TLM&DH (200)	1	The NCC PA typed in the wrong date.	After correcting the date vector transmission was started again. 7 minutes and 36 seconds of data loss. This data was recovered at another time.	SOAR-C-1112
G	XTE	97-G89	08/21/97 (12/30/95)	591	TLM&DH (200)	1	FDF transmitted TDRSS-5 post burn vectors incorrectly to the NCC.	7 minutes and 30 seconds of data loss. This data was recovered at another time.	SOAR-C-1128 TTR 19482
G	XTE	97-G90	09/06/97 (12/30/95)	606	Other (900)	2	Data loss due to a mutual interference with another customer.	13 minutes and 28 seconds of 32 KB data loss. This data was recovered at	SOAR-C-1124 TTR 19502

CATEGORY	SPACECRAFT	INDEX	ANOMALY DATE	DAYS	SUBSYSTEM	CRITICALITY (ME)	DESCRIPTION	EFFECT/ACTION	REFERENCE
								another time.	
G	XTE	97-G91	09/09/97 (12/30/95)	609	Other (900)	2	The POCC experienced a data loss due to a late acquisition.	2 minutes and 32 seconds of 32 KB data loss. This data was recovered at another time.	SOAR-C-1129 TTR 19507
G	XTE	97-G92	10/18/97 (12/30/95)	648	Other (900)	2	XTE reported mutual interference during this event.	STGT and NCCACRS confirmed the mutual interference. All data was recovered at another time.	SOAR-C-1156 TTR 19548
G	XTE	97-G93	10/20/97 (12/30/95)	650	Other (900)	2	XTE late acquisition.	2 minutes and 45 seconds of 32 KB data loss. This data was recovered at another time.	SOAR-C-1161 TTR 19552
G	XTE	97-G94	10/21/97 (12/30/95)	651	TLM&DH (200)	2	POCC reported that they were not receiving data	CSC2 examined their equipment and found that the data interface system was not automatically configuring. 13 minutes and 12 seconds of data loss. This data was recovered at another time.	SOAR-C-1162 TTR 19556
G	XTE	97-G95	10/21/97 (12/30/95)	651	Other (900)	1	Data loss due to the POCC not informing the STGT in a timely manner.	6 minutes and 48 seconds of data loss. This data was recovered at another time.	SOAR-C-1163 TTR 19557
G	XTE	97-G96	10/25/97 (12/30/95)	655	TLM&DH (200)	1	Data loss due to mutual interference with HST.	3 minutes of 32 KB data loss. This data was recovered at another time.	SOAR-C-1066 TTR 19440
G	XTE	97-G97	10/25/97 (12/30/95)	655	Other (900)	1	POCC was unable to receive Q-Channel data during real time.	POCC found the problem to be the center POCC lines LTS2 a switch to local line LTS 4 cleared the anomaly. 20 minutes of data loss. This data was recovered at another time.	SOAR-C-1167 TTR 19561
G	XTE	97-G98	11/10/97 (12/30/95)	670	Other (900)	2	PPCC's re-acquisition was not recognized by the NCC or the STGT systems.	2 minutes and 8 seconds of data loss. This data was recovered at another time.	SOAR-C-1186 TTR 19585
G	XTE	97-G99	11/21/97 (12/30/95)	681	TLM&DH (200)	2	Late acquisition caused by predicted Mutual interference.	3 minutes and 30 seconds of 1024 KB data loss. This data was recovered at another time.	SOAR-C-1200 TTR 19600
G	XTE	97-G100	11/24/97 (12/30/95)	684	TLM&DH (200)	2	Due to a C-1 exec problem at STGT the XTE SHO never downloaded.	14 minutes and 8 seconds of data loss. This data is recovered at another time.	SOAR-C-1202 TTR 19605
G	XTE	97-G101	12/28/97 (12/30/95)	688	TLM&DH (200)	1	POCC a negative acquisition.	All data was recovered at another time.	SOAR-C-1236 TTR 19644
C	XTE	97-C06	07/18/97 (12/30/95)	558	TLM&DH (200)	2	Voice control distribution went down.	NASACOM Maintenance brought the system on-line. All data was recovered at another time.	SOAR-C-1070 TTR 19430

Appendix D. Log of 1996 and 1997 Additional (HST, SOHO, UARS) Anomalies

--- To Be Provided ---

Appendix E. Spacecraft Lifetime Data

In the following table, the term, "useful life" refers to the time during which the major mission objectives were met. Active life is the total lifetime during which the satellite remained in service. Design, useful life and active lives are given in years. A blank space means the information was not available. This chart is updated here through December 31, 1997. Notes are provided at the end of this table.

Spacecraft	Launch Date	Design Life	Useful Life	Active Life	Remarks
TIROS	04/01/60	0.25	0.24	0.24	TV system useful for 77 days.
Explorer VIII (S-30)	11/03/60	0.25	0.15	0.15	Last transmission 12/28/60.
TIROS-II	11/23/60		0.63	1.03	TV data useful to 07/12/61.
Explorer XI (S-15)	04/27/61		0.61	0.61	Last transmission 12/7/61.
TIROS-III	07/12/61	0.25	0.40	0.63	TV data useful to 12/04/61. Lost tape recorders.
Explorer XII (S-3)	08/15/61	1.00	0.31	0.31	Transmission ceased abruptly.
TIROS-IV	02/08/62	0.25	0.36	0.44	TV useful to 06/09/62. Lost tape recorders.
OSO-I	03/07/62	0.50	1.40	1.40	Lost tape recorder @ 2 months. Starfish incident degraded power system.
Ariel-I (S-51)	04/26/62	1.00	0.88	0.88	Degraded by Starfish incident of 07/09/62.
TIROS-V	06/19/62	0.50	0.88	0.88	TV useful to 05/04/63. Camera filaments failed.
TIROS-VI	09/18/62	0.50	1.06	1.06	TV useful to 10/11/63. Filaments and focus out.
Explorer XIV (S-3a)	10/02/62		0.85	1.20	Last transmission 02/17/64.
Explorer XV (S-3b)	10/27/62	0.17	0.26	0.55	Despin system failed. Last transmission 05/19/63.
Relay I	12/13/62	2.00	2.53	2.53	
Syncom I	02/14/63	2.00	0.00	0.00	Lost power: mission failure.
Explorer XVII (S-6)	04/03/63	0.25	0.27	0.27	Batteries degraded: no solar array.
TIROS-VII	06/19/63	0.50	4.33	4.96	Deactivated: camera focus out 12/65.
Syncom II	07/26/63	2.00	N/A	N/A	
IMP-A	11/26/63	1.00	0.82		
TIROS-VIII	12/21/63	0.50	3.53	3.53	Deactivated.
Relay II	01/21/64	1.00	1.68	3.50	
Ariel-II (S-52)	03/27/64	1.00	0.53		Had spin rate and attitude control problems.
Syncom III	08/19/64	3.00	N/A	N/A	
Explorer XX (S-48)	08/25/64		1.60	1.60	Based on last transmission 03/30/66.
Nimbus-I	08/28/64	0.50	0.07	0.07	Solar array drive failed.

Spacecraft	Launch Date	Design Life	Useful Life	Active Life	Remarks
OGO-1(A)	09/04/64	1.00	5.23	5.23	Mission failure: 3-axis stabilization not achieved.
IMP-B	10/03/64	1.00	0.50	1.25	Reentered: placed in wrong orbit.
Explorer XXVI (S-3c)	12/21/64	1.00	2.10	2.10	Last transmission 01/21/67.
TIROS-IX	01/22/65	0.50	2.73	3.40	Deactivated: camera contrast out 10/66.
OSO-II	02/03/65	0.50	0.75	0.75	Used up control gas.
IMP-1(C)	05/29/65	1.00	1.92	1.92	Reentered.
TIROS-X	07/02/65	1.00	1.16	2.00	Deactivated.
OGO-2(C)	10/14/65	1.00	3.48		Mission failure: horizon scanners did not maintain earth lock.
ESSA-I	02/03/66	1.00	2.36	2.36	Deactivated.
ESSA-II	02/28/66	1.00	4.64	4.64	Deactivated.
OAO-I	04/08/66	1.00	0.00	0.00	Mission failure: lost power.
Nimbus-II	05/16/66	0.50	2.67	2.67	ACS scanner failed.
AE-B	05/25/66	0.50	0.82		Higher than planned orbit. Two sensors did not work.
OGO-3(B)	06/06/66	1.00	2.04	3.50	Boom oscillation problem.
AIMP-2(D)	07/01/66	0.50	4.92		Failed to achieve lunar orbit.
ESSA-III	10/02/66	1.00	2.02	2.02	Deactivated: cameras failed.
ATS-I	12/06/66	3.00		***ACTIVE***	Gas expended: limited service.
ESSA-IV	01/26/67	1.00	0.41	1.27	Deactivated: one camera failed, one degraded.
OSO-III	03/08/67	0.50	3.00	3.00	Tape recorder failure at 18 months. ACS controlled manually.
ESSA-V	04/20/67	1.00	2.83	2.83	Deactivated: IR failed, cameras gradually degraded.
IMP-3(F)	05/24/67	1.00	1.95	1.95	Reentered.
AIMP-4(E)	07/19/67		3.50	3.50	Lunar orbit. Subsequent period of intermittent operation.
OGO-4(D)	07/28/67	1.00	2.24	2.75	Thermal bending of antenna caused stabilization control problem.
OSO-IV	10/18/67	0.50	0.90		Tape recorder failure at 6 months.
ATS-III	11/05/67	3.00		***ACTIVE***	Instruments no longer in use.
ESSA-VI	11/10/67	1.00	2.09	2.09	Deactivated: cameras degraded.
OGO-5(E)	03/04/68	1.00	3.60	3.60	Deactivated: data glut.
RAE-A	07/04/68	1.00	4.50	4.50	Deactivated: data quality had become marginal.
ESSA-VII	08/16/68	1.00	0.92	1.56	Deactivated: early camera and tape recorder failures.
OAO-II	12/07/68	1.00	4.20	4.20	Prime instrument (WEP) failed.
ESSA-VIII	12/15/68	1.00	4.95	6.75	Deactivated: camera problems.
OSO-V	01/22/69	0.50	3.90	3.90	

Spacecraft	Launch Date	Design Life	Useful Life	Active Life	Remarks
ESSA-IX	02/26/69		4.10	4.10	Deactivated: standby after 04/71.
Nimbus-3	04/19/69	0.50	2.67		ACS Scanner failed 01/72.
OGO-6 (F)	06/05/69	1.00	2.06	2.25	Deactivated: data glut.
IMP-5(G)	06/21/69		3.51	3.51	Reentered.
OSO-VI	08/09/69	0.50	3.30	3.30	
ATS V	08/12/69	3.00	14.84	14.84	Mission officially unsuccessful: stabilization not achieved. Deorbited 03/20/84.
TIROS-M	01/23/70	1.00	1.40	1.40	Momentum wheel assembly failed.
Nimbus-4	04/08/70	1.00	10.00	10.00	Deactivated.
NOAA-1 (ITOS-A)	12/11/70	1.00	0.56	0.75	Deactivated: momentum wheel assembly problems.
SAS-A	12/12/70	0.50	4.00	4.00	Transmitter failure: terminated mission.
IMP-6(I)	03/13/71	1.00	3.56	3.56	Reentered.
OSO-VII	09/29/71	0.50	3.17	3.17	Reentered due to bad orbit.
SSS-A	11/15/71	1.00	2.87	2.87	Deactivated: battery unusable, *as expected*, after one year.
Landsat-1 (ERTS-A)	07/23/72	1.00	5.58	5.58	Deactivated: funding withdrawn.
OAO-C	08/21/72	1.00	8.50	8.50	Deactivated: funding withdrawn.
IMP-7(H)	09/22/72	2.00	6.10	6.10	Power system failed.
NOAA-2 (ITOS-D)	10/15/72	1.00	2.25	2.40	Standby after 03/74. Some experiments failed.
SAS-B	11/16/72	0.50	0.54	0.54	Experiment low voltage power supply failed.
Nimbus-5	12/12/72	1.00	10.30	10.30	Second HDRSS failed 07/27/82. Deactivated 03/31/83.
RAE-B	06/10/73	1.00	3.75	3.75	Deactivated: mission objectives achieved.
IMP-8(J)	10/25/73	2.00	***ACTIVE***	***ACTIVE***	All instruments operating, except Electron Isotopes Experiment: turned off 09/02/95.
NOAA-3 (ITOS-F)	11/06/73	1.00	2.84	2.84	Deactivated: radiometer, VTPR, VHRR out.
AE-C	12/16/73	1.00	5.00	5.00	Reentered.
SMS-1	05/17/74	2.00	1.60	6.70	Standby after 01/76. Deactivated 01/31/81.
ATS-6(F)	05/30/74	5.00	5.17	5.17	Deactivated.
NOAA-4 (ITOS-G)	11/15/74	1.00	4.00	4.00	Deactivated: radiometer, VHRR out.
Landsat-2	01/22/75	1.00	8.51	8.51	Yaw flywheel stopped 11/79, recovered 05/80. Deactivated 07/27/83.
SMS-2(B)	02/06/75	2.00	6.50	7.50	Second encoder failed on 08/05/81.
SAS-C	05/07/75	1.00	4.92	4.92	Reentered.
Nimbus-6(F)	06/12/75	1.00	7.18	8.28	Yaw flywheel failed 08/14/82.
OSO-8(I)	06/21/75	1.00	3.40	3.40	Funding withdrawn.
AE-D	10/06/75	1.00	0.42	0.42	Shorted diode in power supply electronics.

Spacecraft	Launch Date	Design Life	Useful Life	Active Life	Remarks
GOES-1(A)	10/16/75	3.00	9.30	9.40	VISSR failed 02/85.
AE-E	11/20/75	1.00	5.56	5.56	Reentered 06/10/81.
NOAA-5 (ITOS-H)	07/29/76	1.00	2.96	2.96	Failed 07/79.
GOES-2 (B)	06/16/77	3.00	1.55	***ACTIVE***	VISSR failed 01/79, batteries degraded; made semi-operational as WEST DCS spacecraft 09/92.
ISEE-1(A)	10/22/77	2.00	9.93	9.93	Spacecraft reentered 09/26/87.
IUE	01/26/78	3.00	***ACTIVE***	***ACTIVE***	Fully operational. Some problems with computer "halts".
Landsat-3(C)	03/05/78	3.00	5.07	5.51	Problems with MSS instrument.
AEM-A (HCMM)	04/26/78	1.00	2.40	2.40	Deactivated: battery degraded 09/14/80.
GOES-3(C)	06/17/78	3.00	2.21	***ACTIVE***	VISSR degraded 09/80 & failed 05/06/81. Spacecraft to standby 04/28/87. PEACESAT, only for S-band communication 04/90.
ISEE-3 (C) [ICE]	08/12/78	2.00	***ACTIVE***	***ACTIVE***	Some instrument losses. JPL funding science 10/92. Telemetry turned off on 12/19/95. JPL will use for DSN.
TIROS-N	10/13/78	2.00	2.38	2.38	ACS failed 02/27/81.
Nimbus-7(G)	10/24/78	1.00	15.18	15.46	Ceased its science mission 12/93: spacecraft degraded. Lost spacecraft acquisition 04/94.
AEM-B (SAGE)	02/18/79	1.00	2.75	2.75	Battery degraded: failed 11/18/81.
NOAA-6(A)	06/27/79	2.00	7.39	7.75	Spacecraft turned off 03/31/87.
Magsat	10/30/79	0.40	0.61	0.61	Reentered as planned 06/11/80.
SMM*	02/14/80	2.00	0.83+5.62	9.78	Lost fine pointing control 12/12/80: repaired. Mission terminated 11/24/89; reentered 12/02/89.
GOES-4(D)	09/09/80	7.00	2.21	6.66	VAS failed 11/25/82.
GOES-5(E)	05/22/81	7.00	3.19	9.20	VAS failed 07/30/84. Loss of station keeping 12/89. Deactivated 07/18/90: out of fuel.
NOAA-7(C)	06/23/81	2.00	3.62	4.92	Failed HIRS, degraded SSU, disabled power system.
DE-1(A)	08/03/81	1.00	9.57	9.57	Mission terminated 02/28/91: can't command spacecraft.
DE-2(B)	08/03/81	1.00	1.54	1.54	Reentered as expected 02/19/83.
OSS-1	03/22/82				Shuttle attached payload mission.
Landsat-4(D)	07/16/82	3.00			***No longer monitored nor reported herein.***
NOAA-8(E)	03/28/83	2.00	1.25	1.25	Failed 07/01/84. Recovered 05/85. Failed again 01/86.
TDRS-1(A)	04/04/83	10.0**	***ACTIVE***	***ACTIVE***	Some loss of capability. Activated in 1993 for GRO data via Australia.
GOES-6(F)	04/28/83	7.00	5.73	***ACTIVE***	VAS failed 01/21/89. Loss of station keeping 05/92. West DCS ops terminated 09/92. Provides SEM data.

Spacecraft	Launch Date	Design Life	Useful Life	Active Life	Remarks
Landsat-5(D)	03/01/84	3.00			***No longer monitored nor reported herein.***
SPARTAN-1	06/20/84				STS attached payload mission.
AMPTE/CCE	08/16/84	1.00	4.92	4.92	Some solar array degradation. Mission terminated 07/14/89.
ERBS	10/05/84	2.00	***ACTIVE***	***ACTIVE***	All gyros except IRU-I/Z failed. ERBE-S failed 02/90. Battery #1 disconnected 08/92 (2 shorted cells). Battery #2 lost 2 cells 06/07/93. ERBE-NS is temporarily off.
NOAA-9(F)	12/12/84	2.00	3.92	***ACTIVE***	MSU & ERBE-S failure. Into standby 11/08/88.
SPOC/HITCHHIKER	01/12/86				STS attached payload mission.
NOAA-10(G) Class B	09/17/86	2.00	***ACTIVE***	***ACTIVE***	Array shunts degraded. ERBE-S & SARP failed. Roll gyro failed. AVHRR degraded 11/92: in standby ops.
GOES-7(H) Class B	02/26/87	7.00	***ACTIVE***	***ACTIVE***	
NOAA-11(H) Class B	09/24/88	2.0	***ACTIVE***	***ACTIVE***	Y-Gyro & DTR-5 A&B failed in late 1989. DTR-1B failed 02/92.
TDRS-3(C) Class A	09/29/88	10.0**	***ACTIVE***	***ACTIVE***	Standby status 08/91.
TDRS-4(D) Class A	03/13/89	10.0**	***ACTIVE***	***ACTIVE***	
COBE	11/18/89	0.83	4.10	4.10	Gyro-B failed 11/89, ESA-A failed 04/91, BX gyro failed 09/91 & gyro A&C failed 1993. Science mission ended 12/23/93. No longer monitored nor reported herein.
PEGSAT	04/05/90	0.25	0.75	0.75	PEGASUS launched. Limited life mission.
HST Class B	04/24/90	15.0***	***ACTIVE***	***ACTIVE***	Spherical aberration in primary mirror. Gyros 4&5 failed. Gyros 1&6 failed 10/11/92. 1st service mission 12/93.
SSBUV	10/06/90				STS attached payload mission.
BBXRT	12/02/90				STS attached payload mission.
CGRO	04/07/91	2.25	***ACTIVE***	***ACTIVE***	Propulsion system damaged/degraded. DTR ops stopped 04/92 due to high error rate. MPS bad 07/92. Orbit reboosted to 450 km late 1993.
NOAA-12(D) Class B	05/14/91	2.00	***ACTIVE***	***ACTIVE***	
TDRS-5(E) Class A	08/02/91	10.0**	***ACTIVE***	***ACTIVE***	

Spacecraft	Launch Date	Design Life	Useful Life	Active Life	Remarks
UARS Class B (Spacecraft) Class C (Instruments)	09/15/91	3.00	***ACTIVE***	***ACTIVE***	ISAMS instrument failed 07/92. Cryogens depleted in CLAES instrument 05/93: science ended.
SSBUV	03/24/92				STS attached payload mission.
EUVE Class B	06/07/92	1.13	***ACTIVE***	***ACTIVE***	2 out of 4 transponders lost. 1 out of 2 transmitters lost.
SAMPEX (SMEX-1) Class C	07/03/92	3.00	***ACTIVE***	***ACTIVE***	Extended operations.
TDRS-6(F) Class A	01/13/93	10.0**	***ACTIVE***	***ACTIVE***	Put in on-orbit storage 06/93.
NOAA-13(I) Class B	08/09/93	2.00	0.03	0.03	Anomaly in power subsystem caused loss of spacecraft 08/21/93.
Landsat-6(E)	10/05/93				***No longer monitored nor reported herein.***
HST[SM-01]	12/02/93				HST servicing mission: WF/PC II, 2RSUs, S.A.s installed. HST entry above.
GOES-8(I) Class A	04/13/94	5.00	***ACTIVE***	***ACTIVE***	
SPARTAN 201-02 Class D	09/00/94				STS attached payload mission.
Wind (GGS) Class B	11/01/94	3.00	***ACTIVE***	***ACTIVE***	
NOAA-14(J) Class B	12/30/94	2.00	***ACTIVE***	***ACTIVE***	
Spartan 204 Class D	02/04/95				STS attached payload mission.
GOES-9 (J) Class A	05/23/95	7.00	***ACTIVE***	***ACTIVE***	
TDRS-7 Class A	07/13/95	10.0	***ACTIVE***	***ACTIVE***	
Spartan 201-03 Class D	09/06/95				STS attached payload mission.
SOHO	12/2/95	2.00	***ACTIVE***	***ACTIVE***	
XTE Class C	12/30/95	2.00+	***ACTIVE***	***ACTIVE***	Possible cracked solar array cells noticed shortly after launch.

Spacecraft	Launch Date	Design Life	Useful Life	Active Life	Remarks
SPARTAN 206	01/11/96				STS attached payload mission (STS-72).
Class D					
POLAR	02/24/96	3.00	***ACTIVE***	***ACTIVE***	
SPARTAN 207	05/19/96				STS attached payload mission (STS-77).
Class D					
TOMS-EP	07/02/96	2.00	***ACTIVE***	***ACTIVE***	
FAST	08/21/96	1.00	***ACTIVE***	***ACTIVE***	
GOES-10	04/25/97	5.00	***ACTIVE***	***ACTIVE***	
Class A					
LEWIS	08/23/97	1.00	0.00	0.10	Re-entered Atmosphere 9/28/97
ACE	08/25/97	2.00	***ACTIVE***	***ACTIVE***	
SPARTAN 201-4	11/19/97				STS attached payload mission (STS-87).
TRMM	11/27/97	3.50	***ACTIVE***	***ACTIVE***	

Notes:
*Repaired by crew of shuttle flight 41-C on April 12, 1984.
**Complex warranty provisions call for 10 year service from TDRS system.
***Based on periodic servicing in orbit. MSFC launched spacecraft; GSFC manages operational phase.