100 Scout Launches 1960-1979

Williamsburg – 27 July, 1979

SCOUT PROGRAM HISTORY

The Scout had its beginnings in the early days of this country's space program at the NASA-Langley Research Center, then the NACA. For a number of years, a group of scientists and engineers at Langley Field had been conducting a series of pilotless aircraft research programs investigating supersonic and hypersonic flight from Wallops Island. In 1957, they began looking at an extension of this program with hypersonic multistage rocket models with the goal of extending performance to ICBM and satellite reentry speeds. At the same time, large solid rocket motors were being developed for programs related to the fleet ballistic missiles and other missile developments. It appeared that with the use of these motors, satellite speeds could be obtained.

Further studies in 1958 led to configurations of a solid rocket launch vehicle concept that would have the capability of orbital flight. At the same time, the Air Force was also interested in an advanced solid rocket test vehicle. Discussions between the Air Force and the NACA led to an agreement to pursue a common program. Approval of the Scout program by NASA management for investigation of manned space flight and reentry problems was obtained in 1958. A small group of engineers, which eventually became the NASA Scout Project Office at Langley Field, embarked on making this system a reality. Procurement was initiated on the motors (Aerojet 1st stage, Thiokol second stage, ABL/Hercules — third and fourth stages). Guidance development was placed with Honeywell and Walter Kidde received the contract for the hydrogen peroxide control system. Flight instrumentation was developed at the NASA Langley IRD, and NASA Wallops Flight Station was given the responsibility for range services. The Vought Corporation (then Chance Vought Aircraft) was awarded a contract in April 1959 for the design and development for the structural elements of the launch vehicle and launch tower.

In early 1960 it was decided to launch an unguided vehicle, Scout 'X', with a dummy second stage motor to obtain engineering data on the vehicle. An expedited launch was made in April of 1960 with this vehicle. Although several problems occurred during the flight, significant engineering data was obtained as well as experience on the erection and launch from the new launcher design. Many hours of hard work and dedication by the Scout team, both government and industry, culminated in the first launch of Scout on 1 July 1960. The basic soundness of the launcher design concepts were shown by this launch even though a tracking problem resulted in a false indication of a deviation from the nominal ground track. This caused Wallops range safety to terminate the flight before firing of the fourth stage. The next launch conducted on 4 October 1960 with an AFSWC radiation payload was successful.

During the development phase of the program each launch carried a payload with a specific mission. This was a time of exhilarating successes and heart breaking failures. The space age was in its infancy and the participants were learning about the operation of complex systems in the unforgiving environment of a high speed flight through the atmosphere to the border of space. New concepts in ground testing and quality control were developed for improved reliability. Many of these concepts saw use on this country's manned space program. In order to bring the full resources of industry into the program and permit NASA to concentrate on their prime mission which is research, the Vought Corporation, in 1960, was assigned the role of prime contractor for the Scout Program. It was also during this time that launch vehicle requirements for the Department of Defense were merged into a single configuration which became the standard Scout launch vehicle. The NASA-DOD coordinating committee was organized and established an efficient program structure for management, procurement and operational responsibilities for all the parties involved. This mode of operation was successful and remains in effect today.

Requirements for both NASA and DOD for polar launches resulted in the establishment of a Scout launch site at the Vandenberg Air Force Base in early 1962. The operational experience from the original Wallops Island complex had a significant effect on the design of the launcher and the environmental protection for the assembled vehicle in the development for the Vandenberg site. Assembly methods for ease in handling resulted in the horizontal assembly on a transporter. Vehicle processing on the launcher in an environmentally controlled shelter with vertical erection as a complete assembly resulted in considerably more efficient and reliable operation. This configuration subsequently became the standard for all Scout launch sites.

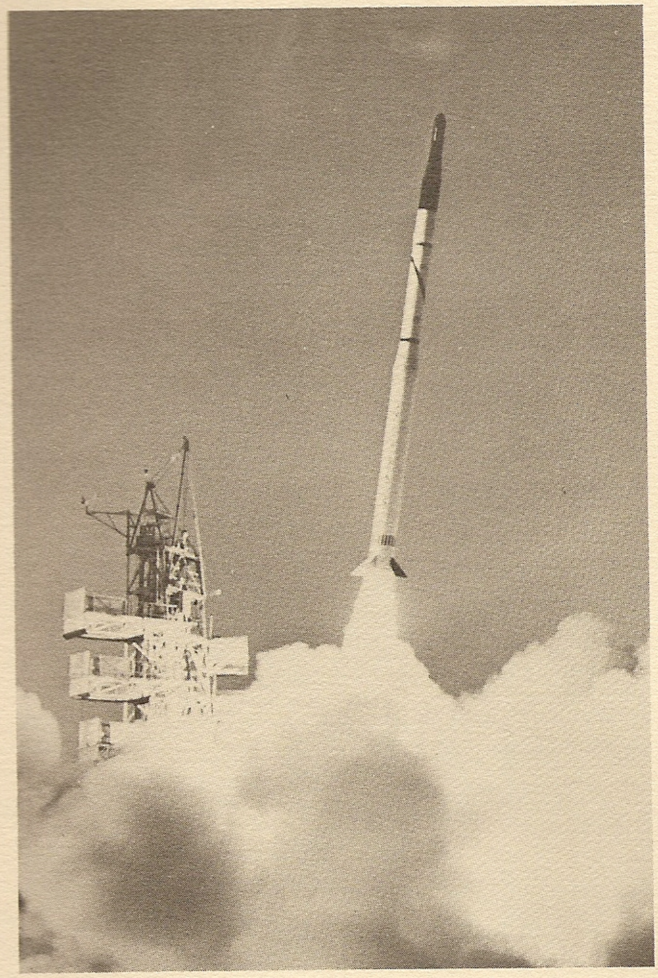
Despite the disappointments during a number of the launches of the early '60's, the Scout program team persevered. With meticulous ground testing, the institution of rigid quality controls and configuration controls and following of very specific operational procedures, the system reliability was improved to a level which has been maintained over the years. The launch of S56-B (Explorer XIX) air density satellite in December 1963 is considered the entrance of the Scout as a totally operational system in the Nation's stable of launch vehicles. Scout's success record of 95% established in the subsequent years verifies the soundness of the original concepts and is a tribute to the dedicated team of government and industry personnel on this program. The outstanding performance of 37 consecutive successful launches within this period has established a record for the space program to be truly proud of.

In addition to the wide variety of NASA research programs that have been conducted in space and in reentry technology, there have been other significant programs and users. The Department of Defense has had a significant program in space research. The U. S. Navy Strategic Systems Projects Office has been a major continuing Scout user for the Transit navigation satellite program. The Transit spacecraft provides navigation data not only for the operational fleet but for commercial shipping worldwide. Cooperative and reimbursable spacecraft launches have been conducted for France, Germany, Italy, the Netherlands, and United Kingdom and the European Space Research Organization making Scout a truly international program.

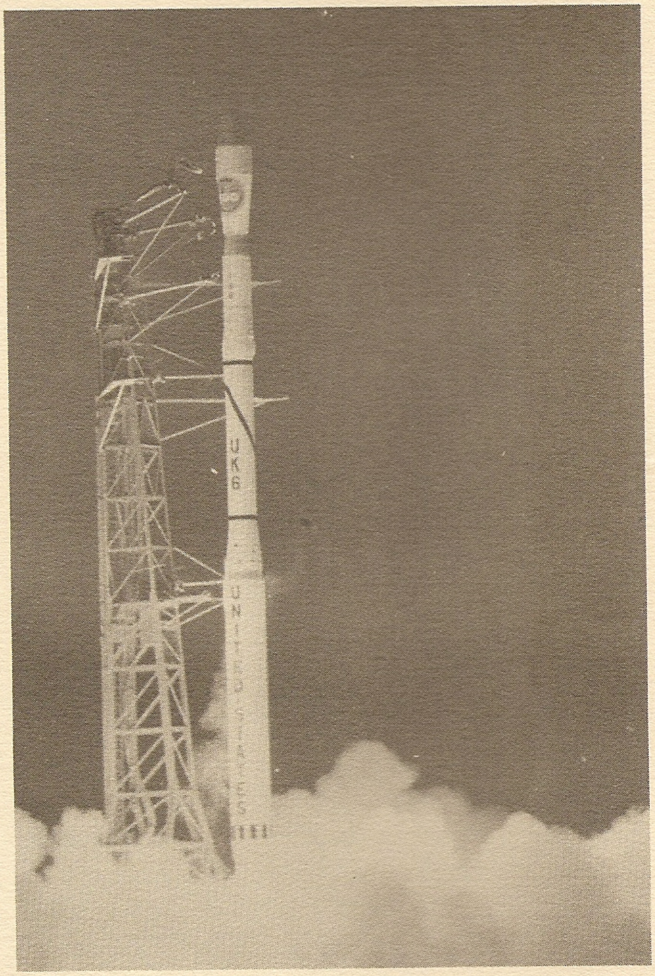
A significant addition to the Scout capability was realized with the establishment of the Scout San Marco launch complex near the equator off the coast of Kenya. The Italian Centro Ricerche Aerospaziali had the bold concept of placing Scout launch and range facilities on 2 mobile platforms off the Kenya coast in Ngwana Bay. On 26 April 1967 with the successful launch of the Italian's atmospheric physics spacecraft, San Marco B, the soundness of this concept was demonstrated. A successful series of eight launches has been conducted at this facility with Italian, United Kingdom and U.S. spacecrafts.

It had been recognized early in the Scout program that no system can rest on its past laurels. The basic philosophy of the Scout program from the very start has been to use only well proven technology. This philosophy has been followed in increasing the capabilities of Scout over the years. Spacecraft requirements became more sophisticated as the space age developed, and more demanding performance requirements rose. The Scout program with a deliberate step-by-step improvement program met these challenges. Changes primarily in the individual rocket motors were introduced over the years which have significantly increased the performance capability of the Scout vehicle. This has culminated in today's Scout with the recent completion of the qualification of the Antares III third stage. The load carrying capability has been increased 4 times that of the first Scout.

The spacecraft that have been launched by Scout have broadened Man's understanding of the Earth, its atmosphere, and the Heavens beyond. They have contributed to the defense of our land, they have expanded our technical expertise and used this modern knowledge in applications for the betterment of the quality of life. The Scout program's history has, after a strenuous and trying start, been blessed with great success. This celebration on the occasion of the 100th launch, is dedicated to the men and women — and their families — of both Government and Industry who have contributed to the program over the years. Their hard, effective work and above all — their dedication — has brought about the success of the Scout Program.



1st launch of Scout
1 July 1960



100th launch of Scout
2 June 1979

SCOUT USERS

National Aeronautics and Space Administration	38
United States Air Force	14
United States Army	1
United States Navy	23
Atomic Energy Commission	2
ESRO (ESA)	5
France	2
Germany	4
Italy	4
Netherlands	1
United Kingdom	6
Total	100

SCOUT SPACECRAFT CONTRIBUTIONS

Navigation
- Navy Transit Series

Astronomy
- Astronomical Netherland Satellite
- Small Astronomy Satellite Series
- UK Series (United Kingdom)

Communications Research
- ESRO-4
- Small Scientific Satellite A
- Radiation Attenuation Measurement Series
- FR-1 (France)

Meteorology
- Dual Air Density
- Cooperative Applications Satellite (France)
- San Marco Series (Italy)
- AEROS Series (Germany)

Geodesy
- Sequential Correlation of Range (Army SECOR-5)
- Beacon Explorer Series

Meteoroid Environment
- Micrometeoroid Measurements Satellite Series
- Meteoroid Technology Satellite

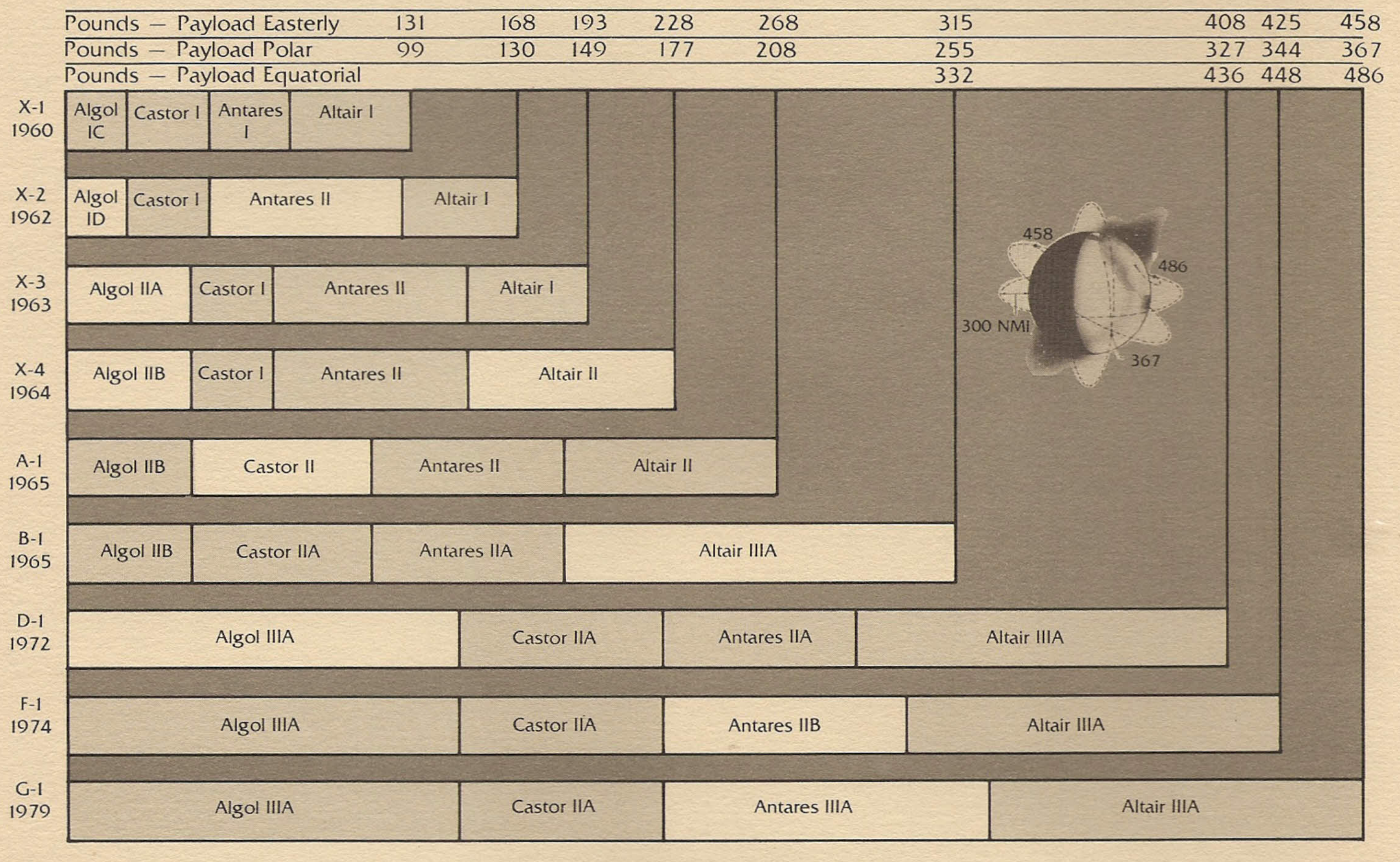
Reentry Materials
- Reentry Series
- RFD Series

Biology
- Orbiting Frog Otolith
- OV3-4

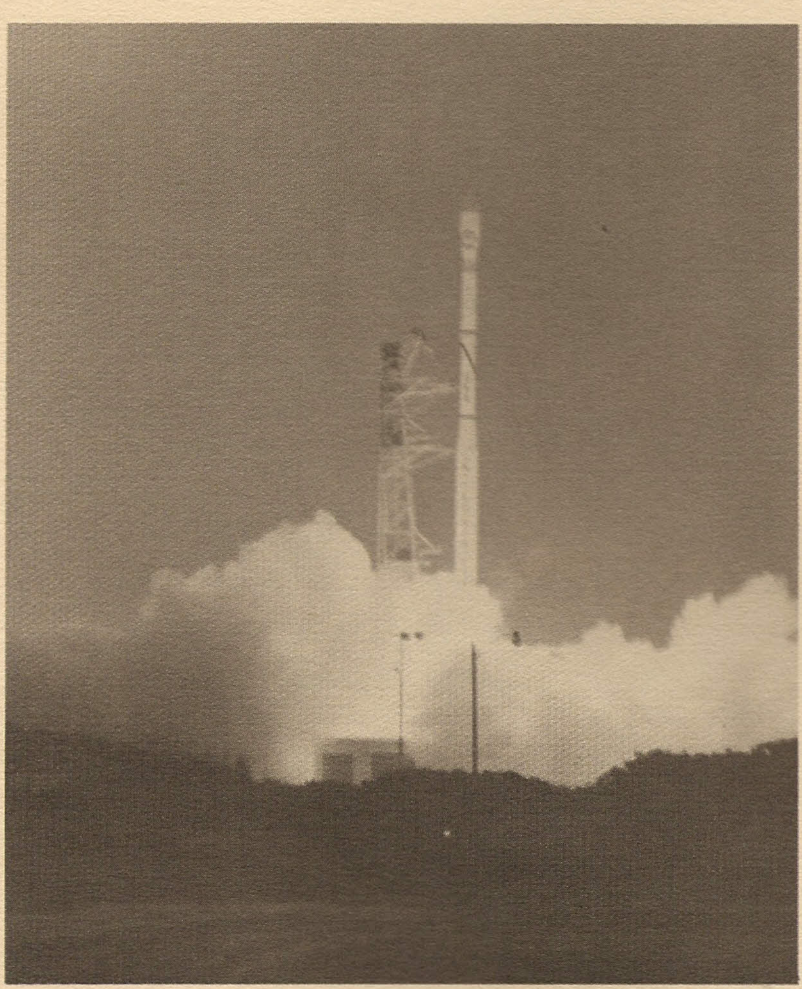
Spacecraft Technology
- X-4 (United Kingdom)
- SERT-1

Earth and Atmospheric Sensing
- Heat Capacity Mapping Mission
- Stratospheric Aerosol and Gas Experiment

SCOUT ORBITAL CAPABILITIES
300-Nautical Mile Circular Orbit



Scout Vehicle Growth



PRIME CONTRACTOR

Vought Corporation

MAJOR SUBCONTRACTORS

Aerojet Solid Propulsion Company
Chemical Systems Division/United Technology Corporation
Hercules, Incorporated
Avionics Division Honeywell /Incorporated
Marotta Scientific Controls, Incorporated
Texas Instruments, Incorporated
Thiokol Corporation
Walter Kidde & Company, Incorporated

SCOUT LAUNCH VEHICLE HISTORY
Development Phase

Flight No.	Vehicle No.	Launch Site	Date	Mission	Vehicle Performance	Spacecraft	Experiment
1	ST-1	Wallops	7-1-60	Probe	Success	Sim Probe	Environmental instrumentation
2	ST-2	Wallops	10-4-60	Probe	Success	Sim Probe	Environmental instrumentation plus radiation
3	ST-3	Wallops	12-4-60	Orbital	Failure	S-56	Air density
4	ST-4	Wallops	2-16-61	Orbital	Success	S-56A	Air density
5	ST-5	Wallops	6-30-61	Orbital	Failure	S-55	Micrometeoroid
6	ST-6	Wallops	8-25-61	Orbital	Failure	S-55A	Micrometeoroid
7	ST-7	Wallops	10-19-61	Probe	Success	P-21	Ionosphere
8	ST-8	Wallops	3-1-62	Reentry	Success	RE-1	Reentry heating plus RAM camera pod
9	ST-9	Wallops	3-29-62	Probe	Success	P-21A	Ionosphere
10	S-111	Vandenberg	4-26-62	Orbital	Failure	SOLRAD-IVB	Radiation
11	S-112	Vandenberg	5-23-62	Orbital	Failure	AF-1	Special Air Force
12	S-117	Vandenberg	8-23-62	Orbital	Success	AF-2	Special Air Force
13	S-114	Wallops	8-31-62	Reentry	Failure	RE-2	Reentry heating plus boundary layer noise secondary
14	S-115	Wallops	12-16-62	Orbital	Success	S-55B	Micrometeoroid plus boundary layer noise secondary
15	S-118	Vandenberg	12-18-62	Orbital	Success	Transit-1	Navigation
16	S-126	Vandenberg	2-19-63	Orbital	Success	AF-3	Special Air Force
17	S-119	Vandenberg	4-5-63	Orbital	Failure	Transit-2	Navigation
18	S-121	Vandenberg	4-26-63	Orbital	Failure	AF-4	Special Air Force
19	S-116	Wallops	5-22-63	Reentry	Success	RFD-1	Reentry evaluation
20	S-120	Vandenberg	6-15-63	Orbital	Success	Transit-3	Navigation
21	S-113	Wallops	6-28-63	Orbital	Success	CRL-1	Geophysics
22	S-110	Wallops	7-20-63	Reentry	Failure	RE-3	Reentry heating, RAM pods and ablative materials
23	S-132	Vandenberg	9-27-63	Orbital	Failure	AF-5	Special Air Force

SCOUT LAUNCH VEHICLE HISTORY
Operational Phase

Flight No.	Vehicle No.	Launch Site	Date	Mission	Vehicle Performance	Spacecraft	Experiment
24	S-122R	Vandenberg	12-19-63	Orbital	Success	S-56B	Air density
25	S-127R	Wallops	3-27-64	Orbital	Success	UK-2	Radio astronomy, global ozone and galactic noise
26	S125-R	Vandenberg	6-3-64	Orbital	Success	Transit-4	Navigation
27	S-128R	Vandenberg	6-25-64	Orbital	Failure	CRL-2	Cambridge Research Laboratory
28	S-124R	Wallops	7-20-64	Probe	Success	SERT	Ion engine experiment
29	S-129R	Wallops	8-18-64	Reentry	Success	RE-4	Ablative material, reentry to support Apollo
30	S-134R	Vandenberg	8-25-64	Orbital	Success	S-48	Meteorological experiment
31	S-130R	Wallops	10-9-64	Reentry	Success	RFD-2	Reentry evaluation
32	S-123RR	Vandenberg	10-9-64	Orbital	Success	BE-B	Electron content of ionosphere and laser tracking
33	S-133R	Wallops	11-6-64	Orbital	Success	S-55C	Micrometeoroid
34	S-135R	Vandenberg	11-21-64	Orbital	Success	AD/I-B	Atmospheric charged particle and air density
35	S-137R	Wallops	12-15-64	Orbital	Success	SM-A	Atmospheric density and drag
36	S-136R	Wallops	4-29-65	Orbital	Success	BE-C	Ionospheric and gravitation
37	S-131R	Wallops	8-10-65	Orbital	Success	SECOR	Geodetic measurements
38	S-138R	Wallops	11-18-65	Orbital	Success	SOLRAD-A	Solar radiation
39	S-139R	Vandenberg	12-6-65	Orbital	Success	FR-1	Study VLF in magnetosphere
40	S-140C	Vandenberg	12-21-65	Orbital	Success	Transit-5	Navigation
41	S-142C	Vandenberg	1-28-66	Orbital	Success	Transit-6	Navigation
42	S-141C	Wallops	2-9-66	Reentry	Success	RE-E	Reentry materials
43	S-143C	Vandenberg	3-25-66	Orbital	Success	Transit-7	Navigation
44	S-145C	Vandenberg	4-22-66	Orbital	Success	OV3-1	Radiation research
45	S-146C	Vandenberg	5-18-66	Orbital	Success	Transit-8	Navigation
46	S-147C	Wallops	6-10-66	Orbital	Success	OV3-4	Radiation research

Flight No.	Vehicle No.	Launch Site	Date	Mission	Vehicle Performance	Spacecraft	Experiment
47	S-148C	Vandenberg	8-4-66	Orbital	Success	OV3-3	Radiation research
48	S-149C	Vandenberg	8-17-66	Orbital	Success	Transit-9	Navigation
49	S-150C	Vandenberg	10-28-66	Orbital	Success	OV3-2	Environmental science
50	S-151C	Vandenberg	1-31-67	Orbital	Failure	OV3-5	Atmospheric measurements
51	S-154C	Vandenberg	4-13-67	Orbital	Success	Transit-10	Navigation
52	S-153C	San Marco	4-26-67	Orbital	Success	SM-B	Air density, drag and ionospheric
53	S-155C	Vandenberg	5-5-67	Orbital	Success	UK-3	Atmospheric and radio noise
54	S-156C	Vandenberg	5-18-67	Orbital	Success	Transit-11	Navigation
55	S-152C	Vandenberg	5-29-67	Orbital	Failure	ESRO-II	Radiation, charged particle and cosmic ray
56	S-157C	Vandenberg	9-25-67	Orbital	Success	Transit-12	Navigation
57	S-159C	Wallops	10-19-67	Reentry	Success	RAM C-A	Communications
58	S-158C	Vandenberg	12-4-67	Orbital	Success	OV3-6	Radiation research
59	S-162C	Vandenberg	3-1-68	Orbital	Success	Transit-13	Navigation
60	S-160C	Wallops	3-5-68	Orbital	Success	SOLRAD-B	Solar radiation
61	S-164C	Wallops	4-27-68	Reentry	Success	RE-F	Atmospheric entry heating
62	S-161C	Vandenberg	5-16-68	Orbital	Success	ESRO-IIB	Charged particle, solar and cosmic X-ray
63	S-165C	Vandenberg	8-8-68	Orbital	Success	AD/I-C	Air density and charged particle
64	S-168C	Wallops	8-22-68	Reentry	Success	RAM C-B	Communications measurements
65	S-167C	Vandenberg	10-3-68	Orbital	Success	ESRO-I	Ionospheric and auroral phenomena
66	S-172C	Vandenberg	10-1-69	Orbital	Success	ESRO-IB	Ionospheric and auroral phenomena
67	S-169C	Vandenberg	11-7-69	Orbital	Success	GRS-A	Van Allen belt, auroral and solar particle
68	S-176C	Vandenberg	8-27-70	Orbital	Success	Transit-14	Navigation
69	S-171C	Wallops	9-30-70	Reentry	Success	RAM C-C	Communications measurements

Flight No.	Vehicle No.	Launch Site	Date	Mission	Vehicle Performance	Spacecraft	Experiment
70	S-174C	Wallops	11-9-70	Orbital	Success	OFO/RMS	Otolith, trapped radiation and micrometeoroid
71	S-175C	San Marco	12-12-70	Orbital	Success	SAS-A	Identification of galactic sources of radiation
72	S-173C	San Marco	4-24-71	Orbital	Success	SM-C	Describe equatorial neutral particle atmosphere and neutral density
73	S-144CR	Wallops	6-20-71	Reentry	Success	PAET	Determination of unknown planetary atmosphere
74	S-177C	Wallops	7-8-71	Orbital	Success	SOLRAD-C	Solar and celestial radiation
75	S-180C	Wallops	8-16-71	Orbital	Success	CAS-A	Mapping of winds in southern hemisphere
76	S-166 CR	Wallops	9-20-71	Probe	Success	GRP-A	Features of electric and magnetic fields
77	S-163CR	San Marco	11-15-71	Orbital	Success	SSS-A	Charged particles of magnetosphere
78	S-183C	Vandenberg	12-11-71	Orbital	Success	UK-4	Interaction of charged particles in ionosphere
79	S-184C	Wallops	8-13-72	Orbital	Success	MTS	Multisheet bumper configurations for micrometeoroid protection
80	S-182C	Vandenberg	9-2-72	Orbital	Success	TIP-1	Navigation
81	S-170CR	San Marco	11-15-72	Orbital	Success	SAS-B	Radiation sources in celestial sphere
82	S-185C	Vandenberg	11-21-72	Orbital	Success	ESRO-IV	Auroral phenomena in polar regions; galactic and non-solar energetic particles
83	S-181C	Vandenberg	12-16-72	Orbital	Success	AEROS-A	State and behavior of upper atmosphere and ionosphere "F" Region
84	S-178C	Vandenberg	10-29-73	Orbital	Success	Transit-15	Navigation
85	S-190C	San Marco	2-18-74	Orbital	Success	SM-C2	Describe equatorial neutral particle atmosphere and neutral density
86	S-188C	Vandenberg	3-8-74	Orbital	Success	X-4	Technology for 3-axis stabilization platform

Flight No.	Vehicle No.	Launch Site	Date	Mission	Vehicle Performance	Spacecraft	Experiment
87	S-191C	Vandenberg	6-3-74	Orbital	Success	Hawkeye	Neutral point region of magnetosphere
88	S-186C	Vandenberg	7-16-74	Orbital	Success	AEROS-B	State and behavior of upper atmosphere and ionosphere "F" region
89	S-189C	Vandenberg	8-30-74	Orbital	Success	ANS-A	Celestial X-ray and ultraviolet sources
90	S-187C	San Marco	10-15-74	Orbital	Success	UK-5	Locate X-ray sources in celestial sphere
91	S-194C	San Marco	5-8-75	Orbital	Success	SAS-C	Identify sources of galactic radiation
92	S-195C	Vandenberg	10-11-75	Orbital	Success	TIP-II	Navigation
93	S-196C	Vandenberg	12-5-75	Orbital	Failure	DAD	Air density studies
94	S-179CR	Vandenberg	5-22-76	Orbital	Success	P76-5	Effects of ionosphere on satellite
95	S-193C	Wallops	6-18-76	Probe	Success	GP-A	Test Einstein's gravitational and relativity theories
96	S-197C	Vandenberg	9-1-76	Orbital	Success	TIP-III	Navigation
97	S-200C	Vandenberg	10-27-77	Orbital	Success	TRANSAT	Navigation and evaluation of features of missile tracking
98	S-201C	Vandenberg	4-26-78	Orbital	Success	HCMM	Provide thermal maps of earth's surface
99	S-202C	Wallops	2-18-79	Orbital	Success	SAGE	Measure stratospheric aerosols and ozone
100	S-198C	Wallops	6-2-79	Orbital	Success	UK-6	Study high-energy astrophysics