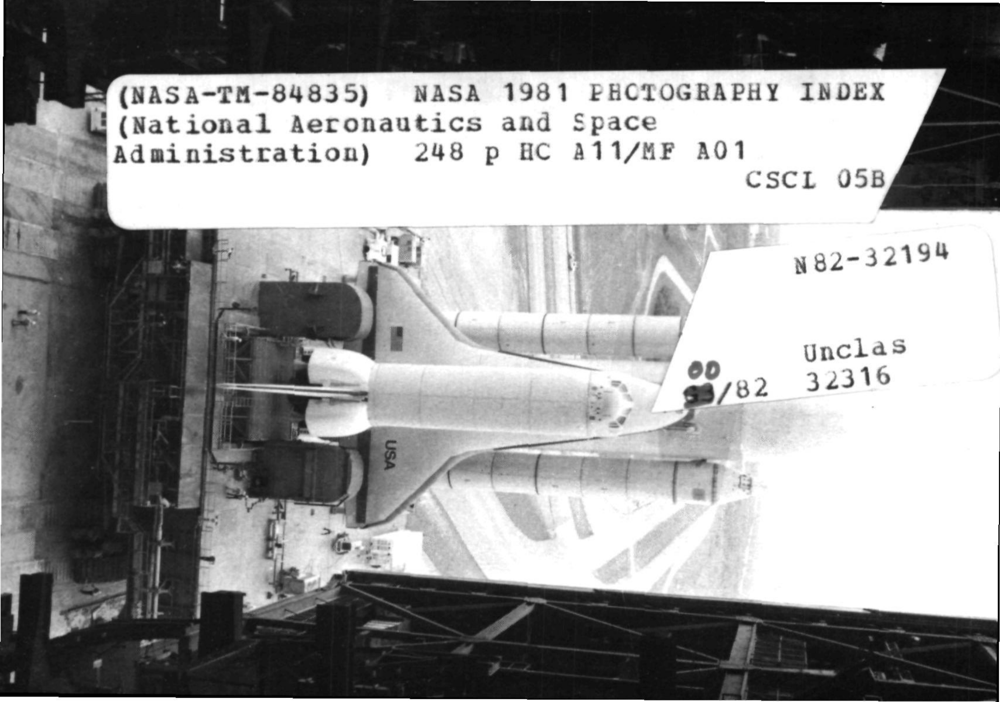

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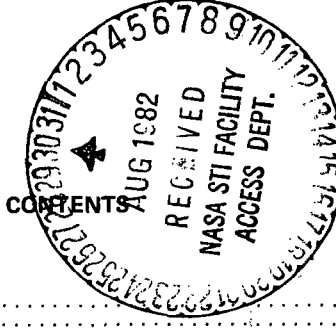

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This book is intended to be an index of representative space photographs available from NASA. Color 4-by-5-inch transparencies and black-and-white 8-by-10-inch glossies are available free to information media. Transparencies are loaned for a limited period and must be returned. Non-information media may obtain identical material at a laboratory service charge through a photographic contractor. For information write: Audio Visual Branch, Public Information Division, Code LFD-10, National Aeronautics and Space Administration, 400 Maryland Avenue, S.W., Washington, D.C. 20546.

Front cover: ARTIST CONCEPT OF VOYAGER II'S TRAVEL THROUGH SPACE 76-H-125

Inside front cover: SATURN WITH MOONS TETHYS AND DIONE 80-H-817/80-HC-635

Inside back cover: SATURN, RINGS WITH MOONS TETHYS, ENCELADUS AND MIMAS 80-H-834/80-HC-635

Back cover: ENTERPRISE ROLLOUT FROM VAB BLDG. 79-H-264

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
	1956		
VANGUARD	Dec. 8, 1956	VAN TV-O	Test Vehicle – Non-NASA
	1957		
VANGUARD	May 1, 1967	VAN TV-1	Test Vehicle – Non-NASA
VANGUARD	Oct. 23, 1957	VAN TV-2	Test Vehicle – Non-NASA
VANGUARD	Dec. 6, 1957	VAN TV-3 (BU) ...	Test Vehicle – Non-NASA
	1958		
EXPLORER I	Feb. 1, 1958	Jupiter - C	Energetic Particles: Discovered Van Allen Belt. (ABMA) Non-NASA
VANGUARD I	Mar. 17, 1958	VAN TV-4	Geodetic Survey: Determined Earth is slightly pear-shaped; signals last acquired May, 1964 (NRL)
VANGUARD	June 26, 1958	VAN SLV-2	Launch Vehicle – Non-NASA
EXPLORER III	Mar. 26, 1958	Jupiter - C	Energetic Particles: Additional Van Allen Belt Data. (ABMA) Non-NASA
EXPLORER IV	July 26, 1958	Jupiter - C	Energetic Particles: Established spatial relationships and some properties of Argus radiation. (ABMA)
PIONEER I	Oct. 11, 1958	Thor-Able 1	Particles and Fields: Radial extent of radiation bands; hydromagnetic oscillation. First NASA Flight.
PIONEER III	Dec. 6, 1958	Juno II	Energetic Particles: Discovered second radiation belt.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	*B&W*	*COLOR*
VAN-1	67-HC-472	VAN-2	N/A*		
VAN-3	67-HC-476	VAN-5	67-HC-477		
VAN-6	67-HC-479	VAN-7	67-HC-480		
VAN-8	67-HC-485	VAN-9A	N/A		
58-Exp. I-2	N/A	Space 12	N/A		
VAN-11	67-HC-491	N/A	67-HC-488		
VAN-20	67-HC-498	VAN-21	N/A		
58-Exp. III-1	N/A	N/A	N/A		
58-Exp. IV-1	N/A	N/A	N/A		
73-H-830	N/A	73-H-787	N/A		
58-P-5	N/A	N/A	N/A		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
	1959		
VANGUARD II	Feb. 17, 1959	VAN SLV-4	Meteorology: Precession of satellite prevented usable cloud cover data.
PIONEER IV	Mar. 3, 1959	Juno II	Cislunar and Lunar Probe: Energetic Particles, passed within 37,300 mi. of the Moon March 4, 1959.
VANGUARD	April 13, 1959	VAN SLV-5	Magnetic Fields and Atmospheric Physics: 30-inch sphere; 2nd stage failure.
VANGUARD	June 22, 1959	VAN SLV-6	Solar-Earth Heating; 2nd-stage failure.
EXPLORER VI (S-2)	Aug. 7, 1959	Thor-Able	Particles and Meteorology: 3 radiation levels; crude cloud cover image; ring of electric current circling Earth.
BIG JOE (Mercury)	Sept. 9, 1959	Atlas-Big Joe	Suborbital Mercury Capsule Test: Capsule successfully recovered after reentry test.
VANGUARD III	Sept. 18, 1959	VAN SLV-7	Particles and Fields: magnetic field survey, lower edge of radiation belt.
LITTLE JOE I	Oct. 4, 1959	Little Joe L/V-6 ...	Suborbital Mercury Capsule Test: Qualified booster for use with Mercury test program. (WI)
EXPLORER VII (S-1a)	Oct. 13, 1959	Juno II(19A)	Energetic Particles; Data on radiation and magnetic storms; first micrometeorite penetration of sensor.
LITTLE JOE II	Nov. 4, 1959	Little Joe L/V-1A ..	Suborbital Mercury Capsule Test: Capsule escape test. *Escape rocket had a delayed thrust buildup.* (WI)
PIONEER (P-3)	Nov. 26, 1959	Atlas-Able	Lunar Orbiter: Shroud failure after 45 seconds.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
VAN-25	67-HC-503	VAN-18	67-HC-501		
58-P-8	Pioneer IV - 10	58-P-12	Pioneer IV - 25		
VAN-23	67-HC-507	VAN-24	67-HC-505		
N/A	67-HC-509	VAN-15	67-HC-510		
59-EXP. VI-12	EXP. VI-1	59-EXP. VI-6	EXP. VI-5		
M-35	N/A	M-41	N/A	67-HC-1278	67-HC-460
VAN-17	67- HC-515	VAN-16	67-HC-514		
MER. L.J.-49	L.J.-4	MERC. L.J.-53	L.J.-8		
59-EXP. VII-22	EXP. VII-7	59-EXP. VII-27	EXP. VII-10		
MER. L.J.-85	N/A	MER. L.J.-60	L.J.-7		
58-P-5	PIONEER 3-4	N/A	N/A		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
LITTLE JOE III	Dec. 4, 1959	Little Joe L/V-2 ...	Suborbital Mercury Capsule Test: Escape system and biomedical tests; Monkey (Sam) used. (Hi. alt. abort demonstration at max. Q), (WI)
	1960		
LITTLE JOE IV	Jan. 21, 1960	Little Joe L/V-1B ..	Suborbital Mercury Capsule Test: Escape system and biomedical test; Monkey (Miss Sam) used. Repeat of Dec. 4, 1959 flight. (WI)
PIONEER V (P-2)	Mar. 11, 1960	Thor-Able IV	Particles and Fields: Ciscytherean space; 1st solar flare date; solar wind.
TIROS I	April 1, 1960	Thor-Able	Meteorology; First global cloud cover pictures.
SCOUT X	April 18, 1960	Scout X	Launch Vehicle Development Test: Structural failure prevented 3rd-stage ignition (dummy 2nd and 4th stages); not a complete test vehicle. (WI)
SCOUT	July 1, 1960	Scout	Launch Vehicle Development Test. (WI).
MERCURY (MA-1)	July 29, 1960	Atlas	Suborbital Mercury Capsule Reentry Test: Atlas exploded.
ECHO I (A-11)	Aug. 12, 1960	Thor-Delta	Communications Earth Satellite: First passive communications satellite 100' sphere used for passive communication and air density experiments.
SCOUT	Oct. 4, 1960	Scout	Launch Vehicle Development Test: Air Force Special Weapons Center radiation experiment payload included. (WI).

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
M-87	L.J.-16	MERC. L.J.-70	L.J.-11		
M-85A	L.J.-3	M-60	L.J.-13	MERC. L.J.-63	L.J.-14
60-P-4V	PIONEER 5-27	60-P2A-V	PIONEER 5-74		
60-TIROS-26	TIROS-1	60-TIROS-33	TIROS-11		
N/A	N/A	N/A	N/A		
N/A	N/A	60-S-35	N/A		
60-MA1-2	MA1-1	60-MA1-7	MA1-3		
60-E-6	ECHO I-38	60-E-1	ECHO I-12		
60-S-37	N/A	60-S-39	N/A		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
EXPLORER VIII (S-30)	Nov. 3, 1960	Juno II.....	Ionosphere: Confirmed existence of helium layer in upper atmosphere.
LITTLE JOE V	Nov. 8, 1960	Little Joe L/V-5 ...	Suborbital Mercury Capsule Test: Mercury capsule system qualification; premature escape-rocket firing. (WI).
TIROS II	Nov. 23, 1960	Thor-Delta	Meteorology: Optical and infrared photos of global cloud cover.
MERCURY (MR-1A)	Dec. 19, 1960	Redstone	Suborbital Mercury Capsule Test: Urmanned 235-mile flight. Successful.
	1961		
MERCURY (MR-2)	Jan. 31, 1961	Redstone	Suborbital Mercury Capsule Test: 16-minute flight of chimpanzee (Ham); booster oversped.
EXPLORER IX (S-56a)	Feb. 16, 1961	Scout	Atmospheric Physics/Vehicle Test: 12-ft. sphere. (WI).
MERCURY (MA-2)	Feb. 21, 1961	Atlas.....	Suborbital Mercury Capsule Test: Unmanned; 1,425 mile flight; successful.
EXPLORER (S-45)	Feb. 24, 1961	Juno II	Ionosphere: 2nd-stage malfunction prevented 3rd-and 4th-stage firing.
MERCURY (MR-BD)	Mar. 24, 1961	Redstone	Vehicle Test for Mercury Flight: Booster development test necessitated by MR-2 flight results.
EXPLORER X (P-14)	Mar. 25, 1961	Thor-Delta.....	Particles and Fields: Interplanetary magnetic field near Earth mainly extension of Sun's magnetic field.
MERCURY (MA-3)	April 25, 1961	Atlas.....	Orbital Mercury Capsule Test: Failure in 1st-stage; abort successful.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
60-EXP. VIII-3	EXP. VIII-12	60-EXP. VIII-6	EXP. VIII-14		
MERC. L.J.-121	N/A	MERC. L.J.-127	N/A		
60-TIROS II-18	TIROS-3	60-TIROS II-12a	TIROS-12		
60-MR1-9	MR1-3	60-MR1-15	MR1-13	60-MR1-14	
61-MR2-28	MR2-18	61-MR2-14	MR2-7	61-MR2-23	MR2-20
61-SIV-4	EXP. IX-15	61-SIV-8	EXP. IX-17		
61-MA2-3	MA2-4	61-MA2-5	N/A		
61-JUNO 11a-11	67-HC-459	61-JUNO 11a-14	N/A		
61-MR-BD—4	N/A	61-MR-BD-5	N/A		
61-DELTA-4-3	EXP. X-20	61-DELTA 4-12a	EXP. X-21		
61-MA3-5	MA3-6	61-MA3-6	MA3-31		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
EXPLORER XI (S-15)	April 27, 1961	Juno II ..... (4 stages)	Gamma Ray Astronomy: Eliminated simultaneous matter-antimatter creation theory of study state cosmology.
LITTLE JOE-5B	April 28, 1961	Little Joe L/V-5B ..	Suborbital Mercury Capsule Test: One booster engine fired late. Repeat of Mercury escape system test. (WI).
FREEDOM 7	May 5, 1961	Mercury-Redstone-3	.Manned Sub-Orbital: Alan B. Shepard, Jr. 15 min.
TIROS III	July 12, 1961	Thor-Delta	Meterology: Good cloud cover picture, infrared data.
LIBERTY BELL-7	July 21, 1961	Mercury-Redstone-4	.Manned Sub-Orbital: Virgil I. Grissom 15 min.
EXPLORER XII (S-3)	Aug. 16, 1961	Thor-Delta	Particles and Fields: Identified Van Allen Belt as a magnetosphere. Silent Dec. 6, 1961.
RANGER I	Aug. 23, 1961	Atlas-Agena	Particles and Fields: Lower Earth orbit than planned.
EXPLORER XIII (S-55a)	Aug. 25, 1961	Scout	Micrometeoroids/Vehicle Test: Premature reentry after three days. (WI).
MERCURY (MA-4)	Sept. 13, 1961	Atlas	Manned Space Systems: All capsule tracking and recovery objectives met.
SATURN TEST (SA-1)	Oct. 27, 1961	Saturn I	Launch Vehicle Development: Test of propulsion system of the booster (S-1); verification of aerodynamic and structural design of entire vehicle.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
61-JUNO II-B-1	EXP. XI-24	61-JUNO II-B-23	EXP. XI-23		
MLJ-46	MLJ-2	MLJ-53	MLJ-9	MLJ-51	MLJ-14
61-MR3-47	MR3-11	61-MR3-72A	MR3-8	61-MR3-96A	MR3-29
61-TIROS III-5	TIROS-2	61-TIROS III-9	TIROS-13		
61-MR4-44	MR4-2	61-MR4-80	MR4-6	61-MR4-100	MR4-11
61-S3-2	EXP. XII-31	61-S3-8	EXP.XII-30		
61-RANGER-3	RANGER I-8	61-RANGER-15	RANGER I-22		
61-S6-9	EXP. XIII-35	61-S6-11	N/A		
61-MA4-4	MA4-8	61-MA4-10	MA4-10	61-MA4-15	
61-SA1-3	SA1-11	61-SA1-14	SA1-13		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
RANGER II	Nov. 18, 1961	Atlas-Agena	Particles and Fields: Agena failed to restart.
MERCURY (MA-5)	Nov. 29, 1961	Atlas	Manned Space Systems: Chimpanzee Enos
RANGER III	1962 Jan. 26, 1962	Atlas-Agena B	Lunar Exploration: TV pictures, hard instrument landing planned; 22,862 miles from Moon on Jan. 28 1962; TV pictures unusable.
TIROS IV	Feb. 8, 1962	Thor-Delta	Meteorology: Supported Friendship 7 flight.
FRIENDSHIP 7 (MA-6)	Feb. 20, 1962	Atlas	Manned: John H. Gleen, Jr.; 3 orbits. First manned orbital launch by U.S. 4 hrs. 55 min.
REENTRY I	March 1, 1962	Scout	Launch Vehicle Development; Reentry: Desired speed not achieved. (WI)
OSO-I	March 7, 1962	Thor-Delta	Solar Physics: Provided data on approx. 75 solar flares.
RANGER IV	April 23, 1962	Atlas-Agena B	Lunar Exploration: TV pictures, hard instrument landing planned; loss of control 2 hours after launch; 1st U.S. lunar impact. (Far side)
SATURN TEST (SA-2)	April 25, 1962	Saturn I	Launch Vehicle Test: Carried 95 tons of ballast water in upper stages released at an altitude of 65 miles in order to observe the effect on the upper region of the atmosphere (Project High Water)

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
61-RANGER 2-2	RANGER 2-34	61-RANGER 2-8	RANGER 2-35		
61-MA5-9	MA5-18	61-MA5-11	MA5-20	61-MA5-27	MA5-26
62-RANGER 3-9	RANGER 3-36	62-RANGER 3-10	RANGER 3-42		
62-TIROS IV-10	TIROS-2	62-TIROS IV-5	TIROS-14		
62-MA6-74	MA6-1	62-MA6-111	MA6-38	62-MA6-137	MA6-47
62-SCOUT REENTRY-4	N/A	62-SCOUT REENTRY-5			
62-OSO-6	OSO-8	62-OSO-12	OSO-6		
62-RANGER 4-4	RANGER 4-51	62-RANGER 4-10	RANGER 4-54		
62-SA2-11	SA2-20	62-SA2-6	SA2-21		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
ARIEL I	April 26, 1962	Thor-Delta	Ionosphere: Investigated solar effects. First International Satellite. (United Kingdom).
AURORA 7 (MA-7)	May 24, 1962	Atlas	Manned: M. Scott Carpenter; 3 orbits, 4 hr. 56 min.
TIROS V	June 19, 1962	Thor-Delta	Meteorology: Infrared system inoperative; good cloud cover pictures.
TELSTAR I	July 10, 1962	Thor-Delta	Communications: First privately built satellite. First TV transmission.
MARINER I	July 22, 1962	Atlas-Agena B	Scientific Venus Probe: Atlas deviated from course and was destroyed by Range Safety Officer.
MARINER II	Aug. 27, 1962	Atlas-Agena B	Planetary Exploration: Vensus; first successful interplanetary probe. Found no magnetic field; high surface temperatures of approximately 800°F. Passed Vensus Dec. 14, 1962 at 21,648 miles, 109 days after launch.
REENTRY II	Aug. 31, 1962	Scout	Reentry Test (28,000 fps): Late 3rd-stage ignition desired speed not achieved. (WI).
TIROS VI	Sept. 18, 1962	Thor-Delta	Meteorology: Infrared sensor omitted. Stopped operating Oct. 11, 1963.
ALOUETTE I	Sept. 29, 1962	Thor-Agena B	Ionosphere: Radiation belt effects. Second International Satellite (Canada). (WTR)
EXPLORER XIV (S-3a)	Oct. 2, 1962	Thor-Delta	Particles and Fields: Data compared with that of Explorer XII. Mission data ceased Aug. 1963.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
62-S51-1	UK-1-6	62-S51-19	UK-1-7		
62-MA7-99	MA7-28	62-MA7-94	MA7-38	62-MA7-107	MA7-65
62-TIROS V-22	TIROS-10	62-TIROS V-17	TIROS V-18		
62-TELSTAR-10	TELSTAR-1	62-TELSTAR-24	TELSTAR-3		
62-MARINER I-3	MARINER I-6	62-MARINER I-14	MARINER I-10		
62-MARINER II-1	MARINER II-18	62-MARINER II-16	MARINER II-20		
63-SCOUT REENTRY-II-1	N/A	63-SCOUT REENTRY-II-3	N/A		
62-TIROS VI-10	TIROS-7	62-TIROS VI-6	TIROS-19		
62-ALOUETTE-12	ALOUETTE-1	62-ALOUETTE-13	ALOUETTE-5		
62-S3A-3	EXP. XIV-36	62-S3A-6	EXP. XIV-42		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
SIGMA 7 (MA-8)	Oct. 3, 1962	Atlas	Manned: Walter A. Schirra; 6 orbits, 9 hr. 13 min.
RANGER V	Oct. 18, 1962	Atlas-Agena B	Lunar Exploration: TV pictures, hard instrument landing planned. Power loss; 450 miles from Moon Oct. 20, 1962; no TV pictures.
EXPLORER XV (S-3b)	Oct. 27, 1962	Thor-Delta	Particles and Fields: De-spin system failed, directional detectors almost unusable. Silent January 1963.
SATURN (SA-3)	Nov. 16, 1962	Saturn I	Launch Vehicle Development: Second "Project High Water" using 95 tons of water released at an altitude 90 nautical miles.
RELAY I	Dec. 13, 1962	Thor-Delta	Communications: Initial power failure overcome. Wide-band transmission; TV capability or 300 channel telephony, one way.
EXPLORER XVI (S-55b)	Dec. 16, 1962	Scout	Micrometeoroids: First statistical sample; flux level found to lie between estimated extremes; 64 penetrations of sample materials over useful life of seven months. Sensor area 30 sq. ft. (WI).
	1963		
SYNCOM I	Feb. 14, 1963	Thor-Delta	Communications: First synchronous orbit. Radio contact lost at insertion into orbit.
SATURN TEST (SA-4)	March 28, 1963	Saturn I	Launch Vehicle Development: Programmed in-flight cut-off of one of eight engines in cluster; successfully demonstrated propellant utilization system function.
EXPLORER XVII (S-6)	April 3, 1963	Thor-Delta	Aeronomy: Discovered belt of neutral helium atoms about Earth, Ceased transmitting experiment data July 10, 1963.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
62-MA8-80	MA8-82	62-MA8-111	MA8-90	62-MA8-117	MA8-77
62-RANGER V-8	RANGER V-60	62-RANGER V-11	RANGER V-61		
63-S3B-11	EXP. XV-44	63-S3B-7	EXP. XV-45		
62-SA3-7	SA3-27	62-SA3-13	SA3-31		
62-RELAY-18	RELAY I-1	62-RELAY-29	RELAY I-4		
62-S55-B-2	EXP. XVI-52	62-S55-B-6	EXP. XVI-51		
63-SYNCOM-19	SYNCOM-I-1	63-SYNCOM-24	SYNCOM I-8		
63-SA4-14	SA4-48	63-SA4-17	SA4-52		
63-S6-1	EXP. XVII-58	63-S6-13	EXP. XVII-59		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
TELSTAR II	May 7, 1963	Thor-Delta	Communications: Higher apogee than Telstar I for longer contacts; radiation resistant.
FAITH 7 (MA-9)	May 15, 1963	Atlas	Manned: L. Gordon Cooper; 22 orbits. Oriented manually for reentry. Flight Time: 34 hrs. 20 min.
TIROS VII	June 19, 1963	Thor-Delta	Meteorology
SYNCOM II	July 26, 1963	Thor-Delta	Communications: First operational satellite in a synchronous-type orbit.
LITTLE JOE II TEST	Aug. 28, 1963	Little Joe II	Suborbital Apollo Launch Vehicle Test: Booster qualification test with dummy payload. (WSR).
EXPLORER XVIII (IMP-A)	Nov. 27, 1963	Thor-Delta	Particles and Fields: Highly elliptical orbit. Apo. 106,635; Peri. 192. Confirmed existence of solar wind shock wave on magnetosphere.
CENTAUR TEST (AC-2)	Nov. 27, 1963	Atlas-Centaur	Vehicle Development: Instrumented with 2,000 lbs. of sensors, equipment and telemetry.
EXPLORER XIX (AD-A)	Dec. 19, 1963	Scout	Atmospheric Physics: 12-ft. diameter sphere (Explorer IX design; polar (78.6°) orbit. Sphere and Beacon: 17.8 lbs. (WTR)
TIROS VIII	Dec. 21, 1963	Thor-Delta	Meteorology: Carries Automatic Picture Tranmissior (APT) System; allows real-time readout of local cloud pictures using an inexpensive portable ground station.
	1964		
RELAY II	Jan. 21, 1964	Thor-Delta	Communications: Wideband transmission; TV capability or 300 channel telephony, one way.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
63-TELSTAR II-6	TELSTAR II-12	63-TELSTAR II-11	66-HC-29		
63-MA9-102	MA9-59	63-MA9-136	MA9-122	63-MA9-161	MA9-95
63-TIROS-VII-8	TIROS-49	63-TIROS-VII-6	TIROS-50		
63-SYNCOM-II-22	SYNCOM-II-20	63-SYNCOM-II-6	SYNCOM-II-24		
63-LJ-II-8	LJ-II-4	63-LJ-II-12	LJ-II-5	63-LJ-II-16	LJ-II-7
63-IMP-19	EXP. XVIII-61	63-IMP-18	EXP. XVIII-69		
63-CENTAUR-21	A/C-11-30	63-CENTAUR-24	A/C-11-32		
63-EXP. XIX-3	EXP. XIX-75	64-EXP. XIX-7	EXP. XIX-77		
63-TIROS-VIII-8	TIROS-53	63-TIROS VII-13	TIROS-65		
64-RELAY II-8	RELAY II-23	64-RELAY II-14	RELAY II-22		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
ECHO II	Jan. 25, 1964	Thor-Agena	Communications: Rigidized 135-ft. sphere; passive Vehicle Development: Fifth flight of Saturn I; First Block II Saturn; First live flight of the LOX/LH_2 fueled second stage (S-IV). 1146 measurements taken.
SATURN I (SA-5)	Jan. 29, 1964	Saturn I	Vehicle Development; Fifth flight of Saturn I; First block II Saturn; First live flight of the LOX/LH_2 fueled second stage (S-IV). 1146 measurements taken.
RANGER VI	Jan. 30, 1964	Atlas-Agena	Lunar Exploration: TV pictures prior to hard landing planned; lunar impact point within 20 statute miles of target on W. edge of Sea of Tranquility; TV system failed to operate.
ARIEL II	March 27, 1964	Scout	Planetary Atmosphere/Radio Astronomy: Continuation of the United Kingdom International Satellite program; first in program to sample global distribution of ozone with an ultra-violet spectrometer. (WI).
GEMINI I	April 8, 1964	Titan II	Space Vehicle Development: Demonstration of the launch vehicle and guidance systems, and structural integrity and compatibility of the spacecraft and launch vehicle. 132 measurements taken. Spacecraft not equipped to separate from second stage. S/C weight: 7,026 lbs. First in Gemini series.
SATURN I (SA-6)	May 28, 1964	Saturn I	Vehicle Development: Sixth flight of Saturn I; 1st flight of unmanned boilerplate model of Apollo 1181 flight measurements taken.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
64-ECHO II-14	*ECHO-II-7*	*64-ECHO II-15*	*ECHO II-19*		
63-SA5-11	SA5-63	64-SA5-27	SA5-75		
64-RANGER-A-28	*RANGER-A-65*	64-RANGER-6-29	RANGER-A-75		
64-UK-C-11	67-HC-570	64-UK-C-9	67-HC-574		
64-GT-1-26	GEM 1-32	64-GT-1-39	GEM I-34		
64-SA6-21	SA6-101	64-SA6-31	SA6-111		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
CENTAUR TEST (AC-3)	June 30, 1964	Atlas-Centaur	Vehicle Development: All 6 primary objectives successful. Hydraulic pump failure casued short Centaur engine burn.
SERT-1A	July 20, 1964	Scout	Ion Engine Test: Ion beam neutralization in space verified. (WI).
RANGER VII	July 28, 1964	Atlas-Agena	Lunar Exploration (Photography): Camera system yielded 4,316 high resolution TV pictures with about 2,000 times better definition than present Earth-based photography: objects less than three feet discernible. Impact occurred in Sea of Clouds region 8-10 miles from the aim point. Elapsed time of flight: 68 hours, 36 minutes.
REENTRY IV	Aug. 18, 1964	Scout	Reentry Test: Demonstrated ability of one type of low density charring ablator material for Apollo to withstand reentry conditions at 27,950 fps. (WI).
SYNCOM III	Aug. 19, 1964	TAD*	Communications: First truly synchronous (stationary) orbit.
EXPLORER XX (IE-A) (S-48)	Aug. 25, 1964	Scout	Ionosphere: Measurement of electron density distribution in the F_2 layer by topside sounding on 6 fixed frequencies. (WTR).
NIMBUS I	Aug. 28, 1964	Thor-Agena	Meteorology: Earth orientation allows complete global cloud cover pictures each 24 hours. Contains APT for local read-out and HRIR for night-time cloud cover. *Operated for about 26 days.*

*TAD-Thrust Augmented Delta

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
64-CENTAUR-III-5	A/C-III-39	64-CENTAUR-III-14	A/C-III-38		
64-SERT-I-11	SERT I-2	64-SERT I-12	67-HC-95		
64-RANGER B-7	RANGER 7-95	64-RANGER B-16	RANGER B-86		
64-SCOUT REENTRY-6	N/A	64-H-2036	N/A		
64-H-2008	SYNCOM-3-30	64-H-2056	SYNCOM-3-41		
64-IE-A-9	EXP. XX-79	64-H-2174	N/A		
64-NIMBUS A-11	NIMBUS 1-5	64-H-2153	NIMBUS 1-10		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
OGO I	Sept. 5, 1964	Atlas-Agena	Interdisciplinary Studies: Earth-Sun interplanetary space interrelationships using a highly elliptical orbit to correlate studies of energetic particles and fields, atmospheric physics, solar and other emissions, interplanetary dust. Operating in a spin-stabilized mode.
SATURN I (SA-7)	Sept. 18, 1964	Saturn I	Vehicle Development: Seventh straight Saturn I success. Successful demonstration of Launch Escape System jettisonning.
EXPLORER XXI (IMP-B)	Oct. 4, 1964	Thor-Delta	Particles and Fields: Detailed study of environment of cislunar space through cosmic ray, solar wind and magnetic field measurements. Apogee lower than planned.
EXPLORER XXII (BE-B)	Oct. 10, 1964	Scout	Ionosphere: Measurement of total electron content of ionosphere by effect on four fixed frequencies transmitted to ground stations. Approximately 80 participating stations in 32 countries. First use of ground based laser tracking for tracking and geodetic studies. (WTR).
MARINER III	Nov. 5, 1964	Atlas-Agena	Planetary Exploration; Mars: Shroud failed to jettison and communications with the spacecraft were lost.
EXPLORER XXIII (S-55c)	Nov. 6, 1964	Scout	Micrometeoroids: Primary sensors are 1- and 2-mil stainless steel pressurized cells; first extended flight test for capacitor detector. (WI).

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
64-H-2052	OGO-A-7	64-H-2227	OGO-A16		
64-SA-7-9	SA-7-142	64-H-2311	SA-7-145		
64-H-2377	EXP. XXI-85	64-H-2468	EXP. XXI-91		
64-H-2373	EXP. XXII-94	64-H-2472	N/A		
64-H-2586	MARINER MARS-26	64-H-2643	MARINER MARS-45		
64-H-2578	EXP. XXIII-101	64-H-2618	EXP. XXIII-100		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
EXPLORER XXIV (AIR DENSITY) EXPLORER XXV (INJUN)	Nov. 21, 1964	Scout	Atmospheric Physics: First NASA dual payload launch. Air Density a 12-ft. sphere (Explorer IX and XIX design). Comparison of charged particle energy injection (Injun) with variations in atmospheric temperature and density. (WTR).
MARINER IV	Nov. 28, 1964	Atlas-Agena	Planetary and Interplanetary Exploration: Mars: Encounter occurred July 14, 1965 with closest approach 6,118 miles. 22 pictures taken.
APOLLO MAX. Q ABORT	Dec. 8, 1964	Little Joe II	Apollo LES Development: First test of Apollo emergency detection system at abort altitude; first test of the Canard subsystem (for turn-around and stabilization of spacecraft after launch escape) and of the spacecraft protective cover. (BP#23) (WSR).
CENTAUR TEST (AC-4)	Dec. 11, 1964	Atlas-Centaur	Vehicle Development: Carried mass-model of Surveyor spacecraft. All primary mission objectives met, test successful; however, secondary test of second burn not accomplished.
SAN MARCO I (SM-A)	Dec. 15, 1964	SCOUT	Atmospheric Physics: Italian payload; Italian launched. (WI).
EXPLORER XXVI (S-3c)	Dec. 21, 1964	Thor-Delta	Particles and Fields: Study of injection, trapping, and loss mechanisms of the trapped radiation belts, both natural and artificial.
	1965		
GEMINI II	Jan. 19, 1965	Titan II	Space Vehicle Development: Unmanned reentry test at maximum heating rate; demonstrated structural integrity and systems performance of the spacecraft throughout flight, reentry, and parachute water landing.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
64-H-2630	EXP. XXIV-V-106	64-H-2795	EXP. XXIV-V-108		
64-H-2604	MARINER MARS-41	64-H-2755	MARINER MARS-47		
64-H-2749	LITTLE JOE II-8	67-H-2805	65-HC-451	64-H-2862	65-HC-452
64-H-2726	A/C-4-43	64-H-2808	A/C-4-44		
64-H-2791	N/A	64-H-2812	SAN MARCO SCOUT-2		
64-H-2780	EXP. XXVI-111	64-H-2823	EXP. XXVI-112		
65-H-2719	GEM 2-11	65-H-38	GEM 2-27	65-H-43	GEM 2-33

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
TIROS IX	Jan. 22, 1965	Thor-Delta	Meteorology: First TIROS "cartwheel" configuration for increased coverage of world cloud cover; elliptical orbit.
OSO II	Feb. 3, 1965	Thor-Delta	Solar Physics: Continuation of OSO-I studies with added ability to scan the solar disc and part of corona.
PEGASUS I	Feb. 16, 1965	Saturn I ..... (SA-9)	Micrometeoroids: First primary use of capacitor-type penetration detector; sensor area 2,000 sq. ft.
RANGER VIII	Feb. 17, 1965	Atlas-Agena	Lunar Photography: 7,137 pictures obtained; impact occurred about 15 miles from target in Sea of Tranquility. Total flight time to impact: 64 hours 53 minutes.
CENTAUR TEST (AC-5)	March 2, 1965	Atlas-Centaur	Vehicle Development: First attempt to place a Surveyor Dynamic Model in a simulated lunar transfer trajectory; Atlas booster failed about one second after lift-off.
RANGER IX	March 21, 1965	Atlas-Agena	Lunar Photography: 5, 814 pictures obtained; impact less than 3 miles from target in eastern floor of crater of Alphonsus. Pictures converted for "live" viewing on commercial TV. Final mission of Ranger series. Total flight time to impact: 64 hours, 31 minutes.
GEMINI III	March 23, 1965	Titan II	First Manned Gemini; first U.S. two-man crew: Virgil I. Grissom and John W. Young; 3 orbits, 4 hours, 53 minutes. First use by crew of orbital maneuvering system. First control of reentry flight path using variable spacecraft lift.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
65-H-30	TIROS-61	65-H-75	TIROS-65		
65-H-72	OSO-B-28	62-OSO-122	OSO-B-32		
65-H-179	SA9-153	65-H-58	SA9-154		
65-H-96	RANGER C-97	65-H-184	RANGER 8-99		
65-H-224	A/C-45	65-H-268	A/C-47		
65-H-334	RANGER-9-96	65-H-576	RANGER-9-102		
65-H-406	GT-3-56	65-H-448	GEM-3-83	65-H-456	GEM-3-120

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
EARLY BIRD I (HS-303)	April 6, 1965	TAD	Communications: First commercial satellite launched by NASA for the COMSAT Corp. on a reimbursable basis; up to 240 voice channels, television or high speed data. Geostationary orbit over about 27.5° west longitude. (NON-NASA).
EXPLORER XXVII (BE-C)	April 29, 1965	Scout	Geodesy: Ultrastable oscillators for precise Doppler tracking of orbital perturbations to obtain description of Earth's gravitational field; further laser tracking experimentation. Continuation of Explorer XXII (BE-B) ionospheric measurements. (WI).
APOLLO HIGH ALT. ABORT	May 19, 1965	Little Joe II	Apollo LES Development (BP-22): Launch vehicle developed a high spin during early powered flight and eventually disintergrated. Launch escape system satisfactorily sensed vehicle malfunction and separated the spacecraft without damage. High altitude abort test objectives not met. (WSR).
PEGASUS II	May 25, 1965	Saturn I ..... (SA-8)	Micrometeoroids: Data system improved for increased data reliability. Spacecraft circuitry altered to decrease loss of area due to shorting. Near-Earth micrometeoroid environment data being obtained.
EXPLORER XXVIII (IMP-C)	May 29, 1965	Thor-Delta	Particles and Fields: Continuation of IMP study of solar-terrestial relationships, expecially magnetosphere boundary, cislunar radiation environment. Orbit somewhat higher than planned.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
66-H-150	66-HC-32	65-H-591	65-HC-139		
65-H-542	EXP. XXVII-143	65-H-675	65-HC-147		
65-H-677	65-HC-146	65-H-823	N/A	65-H-845	
65-H-732	65-HC-313	65-H-824	65-HC-312		
65-H-840	65-HC-261	65-H-881	65-HC-393		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
GEMINI IV	June 3, 1965	Titan II	Manned; Long Duration: James A. McDivitt and Edward H. White; 62 orbits, 97 hours, 59 minutes. First U.S. extravehicular activities (22 minutes duration) and first use of personal propulsion unit (both by White). A program of eleven scientific experiments was successfully conducted. Near-rendezvous with booster not achieved.
TIROS X (OT-1)	July 2, 1965	TAD	Meteorology: First Weather Bureau funded spacecraft; spin-stabilized configuration with two 10^4 TV cameras, similar to TIROS VI. Placed in near-perfect sun-synchronous orbit.
PEGASUS III	July 30, 1965	Saturn I ..... (SA-10)	Micrometeoroids: Last of current Pegasus program. Removable "coupons" added for possible retrieval of thermal coating samples for degradation and cratering study. Last of Saturn I vehicle program with 10 out 10 successes.
CENTAUR TEST (AC-6)	Aug. 11, 1965	Atlas-Centaur	Vehicle Development: 4th successful Atlas-Centaur launch accurately injected Surveyor dynamic model into simulated lunar transfer trajectory; demonstrating capability of guidance system.
GEMINI V	Aug. 21, 1965	Titan II	Manned: L. Gordon Cooper, Jr., and Charles Conrad, Jr.; 120 revs. 190 hours, 56 minutes (8 days). Demonstrated physiological feasibility of lunar mission; evaluated S/C performance. Successful simulated rendezvous and 16 of 17 experiments performed; first Gemini use of fuel cell.
OSO-C	Aug. 25, 1965	Thor-Delta	Solar Physics: Spacecraft similar to OSO-I and II; failed to orbit: premature ignition of 4th stage (X258)

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
65-H-780	65-HC-292	65-H-934	65-HC-305	65-H-943	65-HC-352
65-H-1175	65-HC-464	65-H-1174	65-HC-463		
65-H-1256	65-HC-546	65-H-1340	65-HC-559		
65-H-1277	65-HC-985	65-H-1370	65-HC-571		
65-H-1473	65-HC-657	65-H-1451	65-HC-574	65-H-1504	65-HC-675
65-H-1333	N/A	65-H-1603	65-HC-573		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
OGO-II	Oct. 14, 1965	TAT*	Interdisciplinary Studies: Similar to OGO-I but in nearly polar, low altitude orbit, emphasizing atmospheric studies and World Magnetic Survey. All appendages successfully deployed and three axis stabilization temporarily achieved; now operating in spin mode due to horizon scanner anomaly. (WTR).
GEMINI VI (TARGET VEHICLE)	Oct. 25, 1965	Atlas-Agena	Rendezvous and Dock Capability Development, Manned Space Flight: Gemini 6 spacecraft was not launched. Agena apparently exploded at initiation of first burn.
EXPLORER XXIX (GEOS-A)	Nov. 6, 1965	TAD	Geodesy: Intercomparison of satellite tracking systems accuracies, investigate Earth's gravitational field, improve world-wide geodetic datum accuracies and improve positional accuracies of satellite tracking sites.
EXPLORER XXX (SE-A) NON-NASA	Nov. 19, 1965	Scout	Solar Physics: Monitoring of solar X-rays; to be correlated with optical and radio ground based observations. NRL satellite, part of IQSY program.
ISIS-X ALOUETTE II EXPLORER XXXI (DME-A)	Nov. 29, 1965	TAg-B**	Ionosphere: Dual launch for swept frequency topside sounding (Alouette) and direct compositional measurement (DME) of the ionosphere and for comparable data especailly during proximity of initial orbits. First of ISIS series, continuation of joint Canadian-U.S. program. (WTR).

*TAT=Thrust Augmented Thor

**TAg=Thor Agena

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
65-H-1538	*OGO-A-10*	*65-H-1568*	*65-HC-912*		
65-H-1929	65-HC-888	65-H-1713 65-H-2231	65-HC-911	65-H-2276	
65-H-1561	65-HC-963	65-H-1718	65-HC-857		
65-H-1774	65-HC-969	65-H-1783	65-HC-988		
65-H-1578 65-H-1794	65-HC-965	65-H-2006	65-HC-992		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
GEMINI VII	Dec. 4, 1965	Titan II	Manned: Frank Borman and James A. Lovell, Jr.; 206 revolutions: 330 hrs., 35 min. Extention of physiological testing and spacecraft performance evaluation. Target for first rendezvous (with Gemini VI-A).
FRENCH 1-A (FR-1)	Dec. 6, 1965	Scout	Ionosphere: Study of VLF wavefield in the magnetosphere and irregularities in distribution of the ionosphere. S/C was designed, constructed and tested by the Centre National d'Etudes in France. (WTR).
GEMINI VI-A	Dec. 15, 1965	Titan II	Manned: Walter M. Schirra, Jr. and Thomas P. Stafford; 15 revolution; 25 hrs., 51 mins. Accomplished first rendezvous coming within 6 ft. of Gemini VII; station keeping was maintained for 5 ½ hours.
PIONEER VI (PIONEER A)	Dec. 16, 1965	TAD ..... (DSV-3E)	Particles and Fields: Study of interplanetary phenomena in ciscytherean space to within about 0.814 AU.
	1966		
INTERMEDIATE ALTITUDE ABORT (LJ II-5)	Jan. 20, 1966	Little Joe II L/V-7	Apollo LES Development (CSM 002); Last of unmanned ballistic flights testing Apollo spacecraft atmospheric flight abort capabilities. (WSR).
ESSA I (OT-3)	Feb. 3, 1966	Delta (DSV-3C) ...	Meteorology: Initiated the Tiros Operational Satellite (TOS) system, designated Environmental Survey Satelitte (ESSA) No. 1. (TV sensor system).
REENTRY V	Feb. 9, 1966	Scout	Reentry Heating Test; evaluation of the char integrity of a low density phenolic-nylon ablator at 27,000 fps. (WI).

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
65-H-1860	65-HC-1009	65-H-1853	65-HC-1036	65-H-2323	65-HC-1175
65-H-1820	65-HC-995	65-H-2023	65-HC-999		
65-H-1929	65-HC-937	65-H-1713 65-H-2231	65-HC-1114	65-H-2276	65-HC-1124
65-H-1996	65-HC-1117	65-H-2240	67-HC-383		
65-H-2010	65-HC-991	66-H-24	N/A	66-H-24	66-HC-1
66-H-31	66-HC-2	66-H-65	66-HC-61		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
APOLLO SATURN	Feb. 26, 1966	Uprated Saturn .... (SA-201)	Launch Vehicle Development: Unmanned, suborbital; demonstrated the compatibility and structural integrity of the S/C-L/V configuration; evaluated heatshield performance at high heating rate; command module (009) recovered.
ESSA II (OT-2)	Feb. 28, 1966	Delta (DSV-3E) ...	Operational Meteorological Satellite: Advanced version of cartwheel configuration. Permits local readout of daylight cloud cover by Automatic Picture Transmission (APT) TV system. Polar, Sun synchronous orbit.
GEMINI VIII	March 16, 1966 March 16, 1966	Titan II ..... Atlas-Agena	Manned: Neil A. Armstrong and David R. Scott; 7 revolutions; 10 hrs. 42 mins. First dual launch and docking with Agena. Mission curtailed by short circuit in Orbital Attitude Maneuvering System (OAMS) depleting fuel through thruster # 8. First Pacific landing (in preplanned emergency landing area). Target vehicle exercised through 8 day active life; available for passive rendezvous.
CENTAUR TEST VIII (AC-8)	April 8, 1966	Atlas-Centaur .:...	Vehicle Development: Seventh Atlas-Centaur development flight. Major objective: simulate lunar transfer trajectory using parking orbit, "two burn" indirect ascent. Nominal second burn not achieved. Payload: Surveyor mass model.
OAO-1	April 8, 1966	Atlas-Agena	Astronomy: Capable of accurate long duration pointing for ultraviolet, X-ray and gamma ray observations and mapping anywhere in celestial sphere. Spacecraft lost after two days due to spacecraft systems anomalies.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
66-H-23	65-HC-923	66-H-120	66-HC-53	66-H-188	66-HC-171
66-H-86	66-HC-30	66-H-156	66-HC-199		
66-H-261	66-HC-79	66-H-281 296	66-HC-97 93	66-H-322	66-HC-116
66-H-213	66-HC-149	66-H-441	66-HC-210		
66-H-195	66-HC-176	66-H-426	67-HC-89		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
NIMBUS II	May 15, 1966	TAT-Agena	Meteorology: R&D similar to Earth oriented Nimbus I with AVCS, APT, and HRIR. Added: Medium Resolution IR Radiometer (MRIR) for Earth heat balance, HRIR readout by APT, and orbit data shown on APT. (WTR) Completed one year operation with three-axis stabilization. All four tape recorders aboard now inoperable.
GEMINI IX	May 17, 1966	Atlas-Agena	Manned Flight Development: Rendezvous and docking development and to evaluate docked vehicle maneuvering capability and EVA. Target vehicle failed to orbit due to Atlas malfunction; Gemini 9 spacecraft not launched.
EXPLORER XXXII (AE-B)	May 25, 1966	Delta ..... (DSV-3C-1A)	Aeronomy: Similar to Explorer XVII but with solar cells for extended life. Apogee higher than planned 650 NM but sensors operating to low levels revealing He and H ion distribution in lower exosphere.
SURVEYOR I	May 30, 1966	Atlas-Centaur ..... (AC-10)	Lunar Exploration: Achieved soft lunar landing on first engineering test flight (with closed loop guidance) at 02:17 EDT at 2.41°S, 43.43°W (Ocean of Storms). Selenological data obtained on morphology and lunar origin; bearing strength at Surveyor I site and footpad scale about 5 psi; surface material small cohesive particles with rocks up to 3 ft. in size; no loose dust. 10,338 pictures taken during first lunar day, 899 during second (total: 11,237); last contact Jan. 7, 1967.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
66-H-278	66-HC-148	66-H-582	66-HC-443		
66-H-635	66-HC-156	66-H-622	66-HC-270		
66-H-348	N/A	66-H-601	66-HC-440		
66-H-476	66-HC-899	66-H-680	66-HC-307		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
GEMINI IX-A	June 3, 1966 June 1, 1966	Titan II ..... Atlas	Manned: Thomas P. Stafford and Eugene A. Cernan; 44 revolutions; 72 hrs. 21 min. Unable to dock with ATDA (backup for Gemini Target Vehicle) when shroud failed to clear docking adapter 2 hrs. 2 min of EVA accomplished; use of Astronaut Maneuvering Unit prevented by difficulty of donning unit and fogging of spacesuit faceplate.
OGO-III	June 7, 1966	Atlas Agena-B	Interdisciplinary Studies: First fully successful OGO; first three-axis stabilization in highly elliptical Earth orbit (viewing Earth, space, Sun and orbital plane). Planned apogee reduced to assure Earth tracking throughout orbit. Essentially same experiment complement as OGO-1.
PAGEOS I	June 24, 1966	TAT	Geodesy: Establish world-wide triangulation network by optical sightings of OCHO-I type sphere. (100 ft. dia.).
EXPLORER XXXIII (IMP-D)	July 1, 1966	TAD	Particles and Fields: Planned anchored lunar orbit not obtained. Excess energy orbit produced by launch vehicle precluded lunar capture; consequently S/C was placed in highly elliptical orbit about the Earth.
APOLLO SATURN	July 5, 1966	Uprated Saturn .... (SA-203)	Launch Vehicle Development: Liquid hydrogen evaluation flight of the S-IV-B stage vent and restart capability. Also test of S-IV-B/IU separation and cryogenic storage at zero "G". Flight terminated during liquid hydrogen pressure and structural test.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
66-H-685	66-HC-311	66-H-1200 716	66-HC-319 332	66-H-763	66-HC-453
66-H-538	66-HC-231	67-H-767	66-HC-464		
65-H-1338	65-HC-524	66-H-917	66-HC-1347		
66-H-750	66-HC-533	66-H-951	66-HC-834		
66-H-892	66-HC-888	66-H-946	66-HC-890		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
GEMINI X	July 18, 1966 July 21, 1966	Titan II ..... Atlas Agena	Manned: John W. Young and Michael Collins; 43 rev; 70 hrs., 47 mins. First dual rendezvous (with GTV 10 then with GTV 8); first docked vehicle maneuvers; 3 hatch openings; stand up EVA - 45 mins, terminated due to fumes; umbilical EVA - 27 mins, terminated to conserve maneuvering propellant on S/C; equipment jettisoned before reentry. Micrometeoriod experiment retrieved from GTV-8.
LUNAR ORBITER I	Aug. 10, 1966	Atlas-Agena	Lunar Photography: Total of 207 sets (frames) of medium and a high resolution picture taken; 38 from initial, 169 from low orbit. Areas covered 9 primary and 7 potential Apollo landing sites (incl. Surveyor I site), 11 backside and 2 Earth-Moon. Medium resolution pictures good, high resolution smeared. Readout completed Sept. 13, intentionally impacted to avoid interference with second mission.
PIONEER VII	Aug. 17, 1966	Delta	Particles and Fields: Continued program of measurements over the solar cycle at widely separated points in interplanetary space; about 1.125 A.U. apohelion.
APOLLO SATURN	Aug. 25, 1966	Uprated Saturn AS-202	Apollo L/V and S/C Development: Unmanned, suborbital. Continued test of CSM subsystems and space vehicle structural integrity and compatibility. 1 hour 23 min. flight evaluated heatshield performance at high heat load; CM OII recovered near Wake Island.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
66-H-992	66-HC-705	66-H-998 999	66-HC-708 714	66-H-1030	66-HC-724
65-H-1143	66-HC-563	66-H-1094	66-HC-1352		
66-H-1068	65-HC-961	66-H-1140	65-HC-1430		
66-H-1018	66-HC-1341	66-H-1151	66-HC-1450	66-H-1157	

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
GEMINI XI	Sept. 12, 1966 Sept. 12, 1966	Titan II ..... Atlas-Agena	Manned: Charles Conrad, Jr. and Richard F. Gordon, Jr.; 44 revolutions; 71 hours, 17 min. Rendezvous and dock achieved in 1 hr. 34 min. within first S/C revolution. 2 hours 55 min. EVA by Gordon; umbilical. EVA 44 min. Tethered S/C experiment successful highest apogee; 739 nm; computer controlled recentry.
SURVEYOR II	Sept. 20, 1966	Atlas-Centaur ..... (AC-7)	Lunar Exploration: During midcourse maneuver one of the three spacecraft's vernier engines did not ignite causing incorrectable tumbling. Contact lost 5 1/2 hours prior to predicted impact time.
ESSA III (TOS-A)	Oct. 2, 1966	Delta (DSV-3E)	Meteorology: First Advanced Vidicon Camera System (AVCS) in Tiros/TOS series; also carried IR earth heat balance sensor. Advanced cartwheel design; placed in near polar sun synchronous orbit. First Delta vehicle launch from Western Test Range (WTR). Tape recorder aboard now inoperable.
CENTAUR TEST IX (AC-9)	Oct. 26, 1966	Atlas-Centaur	Vehicle Development: Second "two-burn" test for parking orbit, indirect ascent capability; eight and final Centaur development test planned. Surveyor mass model injected into simulated lunar transfer orbit.
INTELSAT II (HS-303A) NON-NASA Mission	Oct. 26, 1966	Delta (DSV-3E)	Communications: Second ComSat Corp. commercial satellite, NASA providing reimbursable launch support. Apogee motor nozzle blown off shortly after motor ignited. Planned geostationary orbit not achieved; Spacecraft orbit allows about 8 hrs. of use per day.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
66-H-1196	66-HC-1474	66-H-1176 1201	66-HC-1475 1481	66-H-1219	66-HC-1508
67-H-1394	66-HC-1337	66-H-1254	66-HC-1520		
66-H-1303	66-HC-1582	66-H-1365	66-HC-1831		
66-H-1389	66-HC-1844	66-H-1390	66-HC-1845		
66-H-1377	N/A	66-H-1344	66-HC-1843		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
LUNAR ORBITER II	Nov. 6, 1966	Atlas-Agena	Lunar Photography: Spacecraft completed taking 211 Frames (422 medium and high resolution pictures on Nov. 26. Spacecraft has responded to over 2,870 commands and performed over 280 maneuvers. Readout was completed December 6.
GEMINI XII	Nov. 11, 1966 Nov. 11, 1966	Titan II Atlas-Agena	Manned: James A. Lovell, Jr. and Edwin E. Aldrin, Jr.; 59 revs; 94 hrs. 34 min. Final mission of Gemini series emphasized evaluation of EVA (Aldrin: 5 hrs. 37 min.) tasks workload including two "standups" totaling 208 min. and 129 min. of umbilical EVA. Also 14 scientific experiments performed and solar eclipse pictures taken. The target vehicles primary propulsion not usable for high elliptical orbit maneuver.
ATS-I	Dec. 7, 1966	Atlas-Agena	Applications and Technology: Synchronous, circular equatorial orbit over 151 W. long. (near Hawaii) with apogee of 19,627 NM and perigee of 19,561 NM on Dec. 19. The Spin Scan Cloud Camera returned the first photo covering nearly the entire disc of the earth on Dec. 9 and has returned more than 2,500 similar photos since that date. Communications, spacecraft technology and science experiments included in payload.
BIOSATELLITE I	Dec. 14, 1966	Delta (DSV-3G)	Biology: Spacecraft completed three days of operation with good environmental control and attitude control. All biological experiment events occurred. The radiation source functioned as planned. Retro-fire did not occur and recovery was not possible. Spacecraft reentered but was not recovered.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
66-H-435	66-HC-1539	66-H-1398	66-HC-1858		
66-H-1418	66-HC-1871	66-H-1403 1419	66-HC-1868 1875	66-H-1431	66-HC-1884
66-H-1617	66-HC-1551	66-H-1623	66-HC-1944		
66-H-1618	66-HC-1931	66-H-1638	66-HC-1951		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
	1967		
INTELSAT II-B (HS-303A) NON-NASA Mission	Jan. 11, 1967	Delta (DSV-3E)	Communications: Third ComSat commercial satellite; NASA providing reimbursable launch support. Capable of handling T.V. data transmission or up to 240 voice channels; part of capacity to be purchased by NASA for Apollo support. Retromotor fired Jan. 14 to place spacecraft in geostationary orbit about 176° East in the vicinity of the Marshall Islands. One of four traveling wave tubes failed.
ESSA IV (TOS-B)	Jan. 26, 1967	Delta (DSV-3E)	Meteorology: Advanced version of cartwheel configuration. Nearly polar sun synchronous orbit. Good APT pictures returned on Jan. 28. January 29 shutter problem made one (of two redundant) APT cameras aboard inoperative.
APOLLO/SATURN 204			Spacecraft fire at Complex 34, Jan. 27, 1967. Astronauts Grissom, White, and Chaffee died.
LUNAR ORBITER III	Feb. 5, 1967	Atlas-Agena	Lunar Photography: 211 set (frames) of medium and high resolution pictures taken. Last frame not taken to cut biomat early. Picture readout terminated by a transient signal which ended film movement. 72% of photos readout. Readout completed for six primary sites, parts of six other sites. Partial readout returned on 31 secondary sites.
OSO-III (OSO-E)	March 8, 1967	Delta (DSV-3C)	Solar Physics: Spacecraft similar to OSO-I and II; carries experiments identical to OSO-C unsuccessfully launched Aug. 25, 1965. All experiments in the spacecraft have been successfully turned on. Successfully completed second solar cycle.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
N/A	N/A	67-H-48	67-HC-12		
66-H-131	66-HC-43	66-H-151	66-HC-46		
67-H-62	66-HC-1541	Fire Pictures 67-H-134 & 135	67-HC-31 & 33		
66-H-877	66-HC-1539	67-H-164	67-HC-49		
67-H-194	67-HC-91	67-H-247	67-HC-94		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
INTELSAT II-C (HS-303A)	March 23, 1967	Delta	Communications: Fourth ComSat commercial satellite similar to Intelsat II-B. Spacecraft in geostationary orbit about 5° West over the Atlantic Ocean.
ATS-II	April 6, 1967	Atlas-Agena	Gravity Gradient Experimental Spacecraft: Spacecraft: Failure of Agena second burn precluded meaningful evaluation of gravity gradient experiment.
SURVEYOR III (SURVEYOR C)	April 17, 1967	Atlas-Centaur	Lunar Exploration: Achieved soft landing on April 19. Closed loop radar failed during landing and spacecraft landed three times on inertial guidance before its verniers cut off. Surface Sampler experiment discovered pebbles at six inches and 10 psi bearing strength. The spacecraft returned 6,315 pictures.
ESSA V (TOS-C)	April 20, 1967	Delta (DSV-3E)	Meteorology: Carrying Advanced Vidicon Camera System. In sun synchronous orbit with 3:00 p.m. local equator crossing time.
SAN MARCO II NON-NASA Mission	April 26, 1967	Scout	Atmospheric Physics: Italian payload launched from the Platform in the Indian Ocean. Spacecraft carried drag and ionospheric experiments.
LUNAR ORBITER IV (LUNAR ORBITER-D)	May 4, 1967	Atlas-Agena	Lunar Photography: First photos returned May 11. Problems developed with Camera Thermal Door. Readout completed May 27. High resolution photos of over 99% of frontside of Moon returned. Eighty percent of backside has been photographed by Lunar Orbiter I-IV.
ARIEL III (UK-E) NON-NASA Mission	May 5, 1967	Scout	Atmospheric Physics: United Kingdom payload. All five experiments returning data.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
67-H-270	67-HC-100	67-H-293	67-HC-101		
67-H-338	67-HC-99	67-H-391	67-HC-127		
67-H-372	66-HC-1336	67-H-394	67-HC-154		
67-H-337	67-HC-175	67-H-497	67-HC-173		
67-H-494	67-HC-161	67-H-492	67-HC-159		
67-H-489	67-HC-158	67-H-530	67-HC-190		
67-H-522	67-HC-186	67-H-736	67-HC-194		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
EXPLORER XXXIV (IMP-F)	May 24, 1967	Delta	Particles and fields: Fifth IMP spacecraft. Investigating region between the magnetosheath and the shock front. Launched during Class III Bright solar flare.
ESRO II-A NON-NASA Mission	May 29, 1967	Scout	Solar Astronomy and Cosmic Rays: All telemetry lost eight seconds prior to third stage cut-off. No fourth stage burn, Satellite landed in South Pacific.
MARINER V	June 14, 1967	Atlas-Agena	Planetary and Interplanetary Exploration: All experiments operating. Midcourse correction was successful on June 19. Scheduled to arrive at Venus October 19.
SURVEYOR IV	July 14, 1967	Atlas-Centaur	Lunar Exploration: All launch vehicle and spacecraft performance nominal until last two seconds of 42 second retro burn when all communications were lost with spacecraft. Target site: Sinus Medii.
EXPLORER XXXV (IMP-E)	July 19, 1967	Delta (DSV-3E)	Particles and Fields: Lunar orbit achieved July 22 first without mid-course correction capability, permitting more detailed study of Earth's magnetosphere. No lunar magnetic field or "bow shock wave" yet observed. All eight experiments providing good data.
OGO-IV (OGO-D, POGO)	July 28, 1967	TAT-Agena	Interdisciplinary Studies: Similar to OGO-II, to obtain data during increased solar activity to complement near solar minimum OGO-II data. Carries 20 experiments (10 from 9 universities, one foreign; 5-GSFC; 1-JPL; 1-SAO; 2-NRL; 1-CRL) emphasizing atmospheric/ionospheric phenomena of near-Earth environment.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
67-H-527	67-HC-220	71-H-11	71-HC-12		
67-H-453	67-HC-149	67-H-922	67-HC-271		
67-H-753	67-HC-184	67-H-977	67-HC-306		
67-H-1028	67-HC-341	67-H-1029	67-HC-372		
67-H-1012	67-HC-332	67-H-1051	67-HC-362		
67-H-1064	67-HC-336	67-H-1080	67-HC-417		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
LUNAR ORBITER V	Aug. 1, 1967	Atlas-Agena	Lunar Photography: Last, most ambitious project mission completed mapping of entire lunar surface. Specifically provided: detailed coverage of 36 scientific interest sites; 5 Apollo sites; completed high altitude far side coverage; a full view of Earth in near full phase. One hundred percent readout accomplished of all 212 frames taken; continues to provide near-lunar micrometeoroid and radiation data.
BIOSATELLITE II	Sept. 7, 1967	Delta (DSV-3G)	Biology: First successful U.S. satellite exclusively for bioscience; obtained excellent data on specimens of cells, plants, and low order animals; reentered one day early due to adverse weather forecast for recovery (by aircatch) area and problems in commanding the spacecraft.
SURVEYOR V	Sept. 8, 1967	Atlas-Centaur	Lunar Exploration: First alpha scatter data; indicated basaltic character of area sampled in Mare Tranquillitatus, 23.19°E and 1.52°N. Achieved 83 hrs. alpha scatter data and 18,006 photos in first lunar day. Survived first lunar night but, as expected, subsequent data obtained of lower quality.
INTELSAT II-D (HS-303A) Non-NASA Mission	Sept. 28, 1967	Delta (DSV-3E)	Communications: ComSat commercial satellite, similar to Intelsats II-A, B and C with up to 240 voice channels; to supplement and backup B over Pacific about 176°E. Provides test of minimum angular separation of B and D without intersatellite interference, NASA cooperating in planning tests. Reimbursable launch support.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
67-H-1043	67-HC-373	67-H-1079	67-HC-379		
67-H-1131	67-HC-389	67-H-1213	67-HC-448	67-H-1232	67-HC-437
67-H-1183	67-HC-469	67-H-1212	67-HC-438		
67-H-1277	67-HC-458	67-H-1313	67-HC-516		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
OSO-IV (OSO-D)	Oct. 18, 1967	Delta (DSV-3C)	Solar Physics: Continuation and expansion of data obtained by OSO program on high resolution spectral data (within range of 1 A 1350 A) from pointed solar experiments including raster scans of solar disk.
RAM C-1 (RAM C-A)	Oct. 19, 1967	Scout	Reentry Environment: Investigation of plasma flow field for solution of associated communications problems of reentry between 25-27,000 fps. using (apparently successfully) water addition technique. Use of X-band telemetry and plasma and ablation effects on antennas also evaluated. About 25K fps. reentry achieved. (WI)
ATS-III (ATS-C)	Nov. 5, 1967	Atlas-Agena	Applications and Technology: Nine experiments involving communications, meteorology, earth photography in color, navigation, stabilization and pointing, degradation of surfaces in space and ionosphere.
SURVEYOR VI	Nov. 7, 1967	Atlas-Centaur	Lunar Exploration: Second alpha scatter mission similar to Surveyor V; third attempted and first successful landing in Sinus Medii at 0°25'N., 1°21'W.
APOLLO IV (501/017)	Nov. 9, 1967	Saturn V (501)	Launch Vehicle and Spacecraft Development: First launch of Saturn V vehicle (8-1/2 hr. mission) to demonstrate launch vehicle capability and spacecraft development. CSM-017 tested Apollo heat shield and simulation of new hatch at lunar reentry velocity; recovered near Hawaii. First launch from Complex 39.
ESSA VI (TOS-D)	Nov. 10, 1967	Delta (DSV-3E)	Meteorology: Carries two TV systems used for the Automatic Picture Transmission (APT) ground stations. Sun synchronous orbit. Spacecraft and launch costs funded by ESSA. (WTR)

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
67-H-1378	67-HC-557	67-H-1489	67-HC-598		
67-H-1365	67-HC-524	67-H-1236	67-HC-503		
67-H-1496	67-HC-719	67-H-1543	67-HC-721		
67-H-1541	67-HC-718	67-H-1523	67-HC-717		
67-H-1004	67-HC-710	67-H-1526	67-HC-732	67-H-1534	67-HC-748
67-H-1555	67-HC-728	67-H-1553	67-HC-766		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
PIONEER VIII	Dec. 13, 1967	Delta (TTS-1)	Investigate and monitor interplanetary phenomena at widely separated points in space over the solar cycle.
	1968		
SURVEYOR 7 (SURVEYOR G)	Jan. 7, 1968	Atlas Centaur	Lunar Exploration: Achieved soft landing on Jan. 9, 1968. Site - near Crater Tycho.
EXPLORER XXXVI (GEOS II OR B)	Jan. 11, 1968	Delta (DSV-3E)	Geodesy: Nearly identical to GEOS-A with C-Band Transponder and reflector and CW laster detector added. Continued support of the National Geodetic Program objectives. (WTR)
APOLLO V (AS-204/LM-1)	Jan. 22, 1968	Saturn I-B	Lunar Module (LM) Spacecraft Development: First flight test of Apollo LM verified ascent and descent stages propulsion systems, including restart and throttle operations. Also evaluated LM staging and S-IVB/IU orbital performance.
OGO-V (OGO-E)	March 4, 1968	Atlas-Agena D (SLV-3A)	Interdisciplinary Studies: Three axis stabilized in highly elliptical earth orbit. All 24 experiments operating. Countries providing experiments include England, France and the Netherlands.
EXPLORER XXXVII (SOLAR EXPLORER-B)	March 5, 1968	Scout	Second joint Naval Research Laboratory—NASA spacecraft. Monitor sun's energetic x-ray emissions, intensity and time histories and provide real time solar data through COSPAR to scientific community.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
67-H-1599	67-HC-780	67-H-1710	67-HC-812		
67-H-1742	67-HC-830	68-H-10	68-HC-2		
67-H-1759	68-HC-4	68-H-23	68-HC-83		
67-H-1580	67-HC-770	68-H-42	68-HC-24		
68-H-140	68-HC-386	68-H-212	68-HC-144		
68-H-124	68-HC-103	68-H-252	68-HC-153		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
APOLLO VI (AS-502/CSM-020)	April 4, 1968	Saturn V	Launch Vehicle Development Mission: Anomalies experienced with J-2 engine augmented spark ignitors on second and third stages. S-IVB restart not accomplished. F-1 engines on first stage synchronized creating longitudinal vibration of unacceptable amount. Spacecraft performance nominal.
REENTRY F	April 27, 1968	Scout	Reentry Heating Test Designed to support the advancement of atmospheric entry technology. Spacecraft performance nominal.
NIMBUS B	May 18, 1968	TAT	Meteorology: Carried two experiments on Nimbus II and five new ones. Planned 600 NM sun synchronous circular polar orbit. Launch vehicle destroyed by range safety after two minutes. Search for spacecraft has been unsuccessful.
EXPLORER XXXVIII	July 4, 1968	Delta	Radio Astronomy: On Oct. 8, 1968 the four antennas were deployed to their full and final length of 750 ft. (1500 ft. tip-to-tip). On the same date the damper boom was also extended to its full length of 315 ft. (630 ft. tip-to-tip). All antennas and booms are now fully deployed. 2 of 2 experiments on.
EXPLORER XXXIX (AIR DENSITY) EXPLORER XL (INJUN V)	Aug. 8, 1968	Scout	Interdisciplinary project to continue the detailed scientific study of density and radiation characteristics of earth's upper atmosphere at a time of high solar activity. 4 of 4 experiments.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
68-H-210	67-HC-440	68-H-320	68-HC-179	68-H-322	68-HC-188
68-H-103	68-HC-216	68-H-392	68-HC-218		
68-H-330	68-HC-264	68-H-525	68-HC-323		
68-H-600	68-HC-383	68-H-603	68-HC-392		
68-H-669	68-HC-453	68-H-728	N/A		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
ATS-IV (ATS D)	Aug. 10, 1968	Atlas-Centaur	Applications and Technology: To perform communication, meteorological, technology and science experiments. Gravity gradient experiment could not be conducted because spacecraft did not separate from Centaur.
ESSA-VII (TOS-E)	Aug. 16, 1968	Delta	Meteorology: TOS-E an AVCS-type spacecraft in a sun-synchronous orbit having a local equator crossing time between 2:35 p.m. and 2:55 p.m. so that daily AVCS pictures of the entire globe can be obtained. One ABCS operating.
RAM C-II (RAM C-B)	Aug. 22, 1968	Scout	To measure electron and ion concentration in the flow field at discrete spacecraft locations during reentry.
INTELSAT III F-1 NON-NASA Mission	Sept. 19, 1968	Delta	Communications: Third generation Comsat commercial satellite. Improved long-tank Thor Delta destroyed itself one minute, eight seconds into the mission. Control system failure.
AURORAE (ESRO-1) NON-NASA Mission	Oct. 3, 1968	Scout	Carried eight experiments designed to perform an integrated study of the high latitude ionsphere. 7 of 7 experiments on.
APOLLO VII (AS-205/CSM-101)	Oct. 11, 1968	Saturn IB	Manned, CSM Operations: Walter M. Schirra, Donn F. Eisele, and Walter Cunningham. 10.8 days duration. Eight successful Service Propulsion firings. Seven live TV sessions with crew returned. Rendezvous with S-IVB stage to 70 feet performed. Astronauts developed colds in orbit.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
68-H-648	68-HC-373	68-H-733	68-HC-461		
68-H-762	N/A	68-H-763	68-HC-471		
68-H-792	68-HC-517	68-H-735	68-HC-474		
68-H-826	N/A	68-H-851	68-HC-565		
68-H-849	68-HC-566	68-H-1047	68-HC-681		
68-H-716	68-HC-467	68-H-930	68-HC-621	68-H-989	68-HC-654

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
PIONEER IX (PIONEER D) (TEST AND TRAINING SATELLITE)	Nov. 8, 1968	Delta	To collect scientific data on the electromagnetic and plasma properties of the interplanetary medium for a period covering six or more passages of solar activity centers. 6 of 6 experiments on. (TETRS-2, a "piggyback" secondary objective payload for the checkout, training, and development of MSFN stations and techniques.
HEOS-A	Dec. 5, 1968	Delta	First NASA/ESRO reimbursable mission. Scientific satellite for the investigation of interplanetary magnetic fields and the study of solar and cosmic ray particles.
OAO-II (A2)	Dec. 7, 1968	Atlas-Centaur	Astronomy: Carries eleven astronomical instruments developed by the University of Wisconsin and the Smithsonian Astrophysical Observatory to investigate celestial objects in the ultraviolet region of the electromagnetic spectrum. Heaviest most complex US scientific spacecraft built to be unmanned. (Nebular photometer stuck).
ESSA-VIII	Dec. 15, 1968	Delta	Meteorology: Carries two Automatic picture Transmission (APT) Camera Systems to obtain daily cloud photos all over the globe.
INTELSAT III F-2	Dec. 18, 1968	Delta	Communications: Comsat commercial satellite scheduled to be placed in commercial service between the US and Puerto Rico.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
68-H-1038	68-HC-599	68-H-1050	68-HC-675		
68-H-1166	68-HC-740	68-H-1292	68-HC-800		
68-H-795	68-HC-679	68-H-1503	68-HC-572		
68-H-1517	68-HC-878	68-H-1504	69-HC-265		
N/A	N/A	68-H-1507	68-HC-806		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
APOLLO VIII (AS-503/CSM 103)	Dec. 21, 1968	Saturn V	First manned Saturn V flight: Frank Borman, James A. Lovell, Jr., and William A. Anders, demonstrated crew, space vehicle and mission support facilities performance during a manned lunar orbital mission. 147 hours one minute duration. Mission accomplished 10 lunar orbits returning good lunar orbit photography.
	1969		
OSO-V	Jan. 22, 1969	Delta	Solar Physics: The primary objective of OSO-F is to obtain high spectral resolution data (within the 1A - 1250A range) from onboard solar experiments pointed toward the sun. Eight of 8 experiments on.
INTERNATIONAL SATELLITE FOR IONOSPHERIC STUDIES-1 (ISIS-A)	Jan. 30, 1969	Delta	Ionospheric Studies: Third mission in a series of five missions in the cooperative US-Canadian space program. Carries 10 experiments. Ion Mass Spectral Experiment not working.
INTELSAT III F-3	Feb. 5, 1969	Delta	Communications: 1200 - 2-way circuits for voice, TV and other commercial services; geostationary orbit over Pacific at 175° east long.; expected lift time 5 years.
MARINER VI (MARINER-F)	Feb. 24, 1969	Atlas-Centaur	Planetary/Interplanetary Exploration: Mid-Course correction successfully executed to achieve a Mars fly by within 2000 miles on July 31. Designed to perform investigations of atmospheric structures and compositions and to return TV photos of surface topography.
ESSA IX (TOS-G)	Feb. 26, 1969	Delta	Meteorology: Ninth and last mission of TOS series.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
68-H-902	68-HC-577	68-H-1352	68-HC-866	68-H-1451	68-HC-900
69-H-55	69-HC-114	69-H-71	69-HC-117		
69-H-38	69-HC-13	69-H-246	69-HC-133		
69-H-227	69-HC-130	69-H-210	69-HC-128		
69-H-148	69-HC-92	69-H-441	69-HC-308		
69-H-280	69-HC-148	69-H-426	69-HC-147		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
APOLLO IX (AS-504/CSM-104/LM-4)	March 3, 1969	Saturn V	First manned flight of all Manned Lunar hardware in earth orbit. James McDivitt, David Scott and Russell Schweickart. First manned flight of Lunar Module. Successful LM active rendezvous. EVA by Schweickart for 46 min. Atlantic recovery postponed one orbit due to weather. 241 hours 1 minute duration.
MARINER VII (MARINER G)	March 27, 1969	Atlas-Centaur	Planetary/Interplanetary Exploration: Spacecraft identical to Mariner VI. Midcourse correction successful for 1900 NM flyby. Flyby: Aug. 8, 1969.
NIMBUS III (NIMBUS B2)	April 14, 1969	Thorad-Agena	Meteorology: Carries experiments identical to those carried by Nimbus B. One redundant PCM tape recorder failed on orbit 9.
APOLLO X (AS-505/CSM-106/LM-4)	May 18, 1969	Saturn V	Manned lunar mission development flight to evaluate LM performance in the cislunar and lunar environment. E. A. Cernan, J.W. Young, and T. P. Stafford. Major activities: descent of LM to within 50,000 ft. of lunar surface and 19 color television transmissions. Pacific splashdown. 192 hrs. 3 min. duration.
INTELSAT III F-4	May 21, 1969	Thor-Delta	Global telecommunications satellite. 170° east long.; over Pacific Ocean.
OGO-VI (OGO-F)	June 5, 1969	Thorad-Agena-D ...	Interdisciplinary Studies: Observatory appendage deployment, sun acquisition, and earth acquisition were completed successfully. Three-axis stabilization was achieved. Twenty-four of 25 experiments in operation. Two 30-ft. antennas deployed.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
69-H-42	69-HC-49	69-H-409	69-HC-292	69-H-457	69-HC-327
69-H-281	69-HC-149	69-H-551	69-HC-186		
69-H-540	69-HC-233	69-H-699	69-HC-459		
69-H-224	69-HC-126	69-H-814	69-HC-527	69-H-831	69-HC-579
N/A	N/A	69-H-899	69-HC-485		
69-H-1001	69-HC-646	69-H-926	69-HC-932		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
EXPLORER XL (IMP-G)	June 21, 1969	Thor-Delta	Particles and Fields: All 12 experiments are operational. Seven were on at launch. The GSFC Low energy Proton and Alpha Detector is on, but is protected from contact with atmospheric gases by a door. Twenty-five days after launch, or when perigee altitude has increased sufficiently to minimize this effect, the door will be opened.
BIOSATELLITE III (BIOS-D)	June 28, 1969	Delta	Biology: The spacecraft completed 8-1/2 days in orbit with all subsystems performing well with the exception of the visumotor (VM) task logic of the psychomotor test panel and the JPL urine analysis sytem. Monkey onboard expired. Autopsy performed July 8. Information received to date leads to the conclusion that the animal died of a heart attack brought on by problems associated with weightlessness and a lower than normal body temperature.
APOLLO XI (AS-506/CSM-107/LM-5)	July 16, 1969	Saturn V	First manned lunar landing mission: Limited selenological inspection, photography, survey, evaluation and sampling of the lunar soil. Assess the capability and limitations of an astronaut and his equipment in the lunar environment. Astronauts: Neil A. Armstrong, Michael Collins, and Edwin E. Aldrin, Jr.
INTELSAT III F-5	July 26, 1969	Delta	Global telecommunications satellite: To form part of a global communication, commercial satellite system. Spacecraft did not achieve desired orbit due to third stage failure.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
69-H-959	71-HC-427	71-H-537	N/A		
69-H-994	69-HC-486	69-H-999	69-H-659	69-H-1027	69-HC-496
69-H-628	69-HC-440	69-H-1124	69-HC-761	69-H-1193	69-HC-813
69-H-1047	69-HC-674	69-H-1241	69-HC-669		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
OSO-VI (OSO-G)	Aug. 9, 1969	Delta	Solar Physics: The primary objective of OSO-G is to obtain high spectral resolution data (within the 10 to 20 Kev and 1A to 1300A range) from onboard solar experiments pointed toward the sun. Seven experiment instruments on board are fully operational.
ATS-V (ATS-E)	Aug. 12, 1969	Atlas-Centaur	Application and Technology: To conduct a carefully instrumented gravity gradient orientation experiment directed toward providing the basic design information for the stabilization and control of long-lived spacecraft in synchronous orbit.
PIONEER E	Aug. 27, 1969	Delta	To obtain polar plasma, magnetic field, and cosmic-ray measurements near the orbital path of the earth but outside the earth's region of influence. This was the fifth and last launch of current Pioneer series. Launch vehicle destroyed by Range Safety Officer after 8 min. 2 sec. Pioneers VI through IX are still producing useful data from widely scattered positions in their heliocentric orbits.
ESRO-IB NON-NASA Mission	Oct. 1, 1969	Scout	ESRO-IB is the second satellite of the ESRO-I project. The satellites are designed to study ionospheric and auroral phenomena particularly over the northern polar regions in darkness in the winter. Carried eight instruments. One to 2 months lifetime predicted based upon low orbit achieved. (WTR)
GERMAN RESEARCH SATELLITE-A (AZUR) NON-NASA Mission	Nov. 8, 1969	Scout	Particles and Fields: Study of the inner Van Allen belt, the auroral zones of the Northern Hemisphere, and the spectral variations of solar particles versus time during solar flares. 7 of 7 experiments are operating. (WTR)

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
69-H-1274	69-HC-888	69-H-1393	69-HC-912		
69-H-1438	69-HC-938	69-H-1399	69-HC-939		
N/A	N/A	69-H-1443	69-HC-940		
69-H-1544	69-HC-1008	69-H-1622	69-HC-1046		
69-H-1670	69-HC-1072	69-H-1789	69-HC-1140		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
APOLLO XII (AS-507/CSM-108/LM-6)	Nov. 14, 1969	Saturn V	Second manned lunar landing mission: Demonstrated point landing capability, sampled mare area, deployed ALSEP, investigated the Surveyor III spacecraft, and obtained photographs of candidate exploration sites. Astronauts: Charles Conrad, Jr., Richard F. Gordon, Jr., and Alan L. Bean. Touchdown on lunar surface, November 19. Total EVA time was 15 hrs 30 min. Total flight time was 10 days, 4 hrs 36 min.
SKYNET-A NON-NASA Mission	Nov. 22, 1969	Delta	Communications: Equatorial synchronous satellite located over Indian Ocean. All spacecraft systems working as planned.
	1970		
INTELSAT III F-6 NON-NASA Mission	Jan. 14, 1970	Delta	Global telecommunications satellite. To form part of a global communication, commercial satellite system.
ITOS-I (TIROS-M)	Jan. 23, 1970	Delta	Meteorology: Second generation operational met. satellite carries TV automatic picture transmission and scanning radiometers for global cloud data for remote and local readout both day and night. First launch of the Delta with 6 solid strap-ons. (OSCAR ham radio sat. launched from the Delta in orbit.)
SERT-II	Feb. 4, 1970	Thor-Agena	Ion engine test: Demonstrate the capability of an electric ion thruster system to operate 6 months in space. (WTR)
NATOSAT-I (NATO-A) NON-NASA Mission	March 20, 1970	Delta	Communications satellite: To place a military communications satellite into a stationary equatorial orbit.
NIMBUS-IV (NIMBUS-D)	April 8, 1970	Thor-Agena	Meteorology: Fifth in a series of seven advanced research and development weather satellites. Carried nine meteorological satellites—six fully operational.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
69-H-1667	70-HC-308	69-H-1824	69-HC-1232	69-H-1880	69-HC-1277
70-H-374	70-HC-244	70-H-376	70-HC-245		
N/A	N/A	70-H-48	70-HC-40		
69-H-1929	69-HC-1303	70-H-119	70-HC-97		
70-H-133	70-HC-102	70-H-135	70-HC-104		
70-H-373	70-HC-243	70-H-425	70-HC-259		
70-H-577	70-HC-428	70-H-596	70-HC-427		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
APOLLO XIII (AS-508/CSM-109/LM-7)	April 11, 1970	Saturn V	Third manned lunar landing attempt aborted after 56 hours GET due to loss of pressure in liquid oxygen in Service Module and the failure of fuel cells 1 and 3. Astronauts: James A. Lovell, Jr., Fred W. Haise, Jr., and John L. Swigert, Jr. Total flight time was 142 hrs. 54 min. and 44 seconds. Splashdown occurred in Pacific Ocean.

SPACECRAFT		*LAUNCH VEHICLE*		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
69-H-1791	69-HC-1261	70-H-487	70-HC-355	70-H-644	70-HC-494

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
	1970		
INTELSAT III F-7 (NON-NASA Mission)	April 22, 1970	Delta	Global Telecommunications Satellite: To form part of a global communication, commercial satellite system.
INTELSAT III F-8 (NON-NASA Mission)	July 23, 1970	Delta	Global Telecommunications Satellite: Form part of a global communication, commercial satellite system. Last launch of the Intelsat III series.
SKYNET B (NON-NASA Mission)	Aug. 19, 1970	Delta	Communications: Equatorial synchronous satellite.
RAM-C-C	Sept. 30, 1970	Scout	Compare the effectiveness of a liquid electrophilic (Freon) with water in alleviating radio blackout during a 25,000 fps reentry.
OFO-A	Nov. 9, 1970	Scout	Obtain direct measurements of the (vestibular nerve) activity changes and study the adaptation of the otolith system (in 2 bull frogs) under conditions of weightlessness and accelerations.
OAO-B	Nov. 30, 1970	Atlas-Centaur	To obtain moderate resolution spectrophotometric data in ultraviolet bands between 1100 and 4000A to investigate photometry of peculiar stars, the law of interstellar reddening, magnitude and intensity of Lyman-alpha red shift for nearby galaxies, spectra of emission and reflection nebulae and spectral energy distribution of normal stars, galaxies, and intergalactic media. Mission not accomplished. It did not achieve orbit.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
70-H-685	70-HC-513	70-H-727	70-HC-558		
70-H-1689	70-HC-1168	70-H-1036	70-HC-753		
N/A	N/A	70-H-376	70-HC-246		
70-H-1241	70-HC-892	70-H-1248	70-HC-895		
70-H-1083	70-HC-789	70-H-1412	70-HC-1002		
70-H-1254	70-HC-896	70-H-1616	70-HC-1124		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
ITOS-A (NOAA-1)	Dec. 11, 1970	Delta	To conduct in-orbit engineering evaluation so that the daytime and nighttime cloud-cover observations can be obtained regularly and dependably in both direct readout and stored modes of operation. A Cylindrical Electrostatic Probe Experiment (CEPE) was carried as a piggyback, permanently attached to the Delta second stage.
SAS-A	Dec. 12, 1970	Scout	To develop a catalog of celestial X-ray sources by systematic scanning of the celestial sphere in the energy range 2-20 KEV.
	1971		
INTELSAT IV-F-1	Jan. 25, 1971	Atlas-Centaur	First in a new series of global communications satellites: To form part of a global communication commercial satellite system.
APOLLO 14	Jan. 31, 1971	Saturn V	Manned lunar landing mission: To furnish additional knowledge of Moon and its history. Astronauts: Alan B. Shepard Jr., Stuart Allen Roosa, and Edgar Dean Mitchell.
NATO-B	Feb. 2, 1971	Delta	Communications satellite: To place a military communications satellite into a satisfactory equatorial orbit.
EXPLORER XLIII (IMP-I)	Mar. 12, 1971	Delta	The IMP program consists of a series of spacecraft designed to extend our knowledge of solar-lunar-terrestrial relationships by conducting a continuing study of the radiation environment of the interplanetary magnetic field and its dynamical relationships with solar particles.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
70-H-1611	70-HC-1123	70-H-1667	70-HC-1150		
70-H-1489	70-HC-1068	70-H-1688	70-HC-1166		
71-H-25	71-HC-23	71-H-194	71-HC-177		
70-H-1410	70-HC-1001	71-H-221	71-HC-73	71-H-300	71-HC-253
N/A	N/A	71-H-110	71-HC-64		
71-H-495	71-HC-415	71-H-536	71-HC-426		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
ISIS-B (ISIS-2) (US/Canadian Coop.)	Mar. 31, 1971	Delta	To study electron production and loss and large scale transport of ionization in the ionosphere. Twelve of twelve instruments operational.
San Marco-3(C) (US/Italian Coop.)	Apr. 24, 1971	Scout	To investigate and define the equatorial neutral particle atmosphere in terms of density, composition, and temperature behavior and variations resulting from solar and geomagnetic activities. Vehicle provided by NASA on non-reimbursable basis.
Mariner H (8)	May 8, 1971	A-Centaur	To study the dynamic characteristics of the planet Mars from orbit for a minimum period of 90 days also to map approximately 70% of the planet. Mission was unsuccessful because of vehicle failure.
Mariner I (9) (Eye)	May 30, 1971	A-Centaur	To study the dynamic characteristics of the planet Mars from orbit for a minimum period of 90 days. Mariner entered Mars orbit on 13 Nov. 1971.
Planetary Atmosphere Experiment Test	June 20, 1971	Scout	Demonstrate the ability to determine the structure and composition of the atmosphere through onboard instrumentation from a probe vehicle entering the atmosphere at high speed (25,000 fps.).
SOLRAD-10 NASA/NRL Cooperative (Explorer 44)	July 8, 1971	Scout	To monitor the sun's X-ray and ultraviolet emissions in order to better understand the solar physical processes and to improve the prediction techniques of solar activity and ionospheric disturbances. Vehicle provided by NASA on non-reimbursable basis.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
71-H-538	71-HC-414	71-H-667	71-HC-559		
71-H-1826	71-HC-649	71-H-772	71-HC-654		
71-H-709	71-HC-664	71-H-573	71-HC-392		
71-H-709	71-HC-664	71-H-701	71-HC-703		
71-H-882	71-HC-788	71-H-969	71-HC-810		
71-H-952	71-HC-794	71-H-1067	71-HC-855		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
Apollo 15 (AS-510/CSM-112/LM-10)	July 26, 1971	Saturn V	Fourth manned lunar landing and first of Apollo "J" series missions which carry Lunar Roving Vehicle. Astronauts: David R. Scott, Alfred M. Worden, and James Bensen Irwin Total flight time was 295 hrs, 11 min, 53 sec. Total EVA time was 18 hrs, 34 min. Worden's in-flight EVA was 38 min, 12 sec performed out-of-earth orbit. Splashdown in Pacific about 288 nautical miles due north of Pearl Harbor. Estimated amount of samples returned for scientific study approximately 180 lbs.
Cooperative Applications Sat. CAS-A/EOLE-1	Aug. 16, 1971	Scout	Data Collection: Cooperation of the United States with France in a Space Meteorology Project using instrumented balloons and an earth orbiting satellite to obtain in-situ speed and direction of winds (air masses) at various altitudes.
Barium Ion Cloud (GRS-B)	Sep. 20, 1971	Scout	A joint NASA/German effort to study the broad features of electric and magnetic fields in the outer radiation belt by optical investigation of the behavior of a barium ion cloud released at several earth radii altitude. Vehicle provided by NASA on non-reimbursable basis.
OSO-H (7)	Sep. 29, 1971	Delta	To observe the active physical processes on the sun by which the sun influences the earth and its space environment; and to advance our understanding of the sun's constitution and behavior.
ITOS-B	Oct. 21, 1971	Delta	To provide improved operational infrared and visual observations of earth cloud cover for use in weather analysis and forecasting. NASA reimbursed by NOAA for both spacecraft and launch support. Mission failure due to vehicle second stage malfunction.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
71-H-736	71-HC-676	71-H-1232	71-HC-995	71-H-1235	71-HC-1012
71-H-1407	71-HC-1135	71-H-312	71-HC-1037		
71-H-1341	71-HC-1051	71-H-1551	71-HC-1192		
71-H-1516	71-HC-1208	71-H-1584	71-HC-1238		
71-H-1630	71-HC-1274	71-H-1491	71-HC-1182		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
SSS-A (Explorer 45)	Nov. 15, 1971	Scout	Investigate the ring-current and magnetic storms; relations between auroral phenomena, magnetic storms, and the acceleration of charged particles within the inner magnetosphere; and time variations of the particle population.
UK-4 (United Kingdom)	Dec. 11, 1971	Scout	Investigate interactions among the plasma, charged particle steams and electromagnetic waves in the upper ionosphere.
INTELSAT IV F-4	Jan. 22, 1972	A-Centaur	Global commercial communications satellite system (Comsat).
	1972		
HEOS A-2	Jan. 31, 1973	Delta	Investigation of Interplanetary Space and of the high latitude magnetosphere and its boundary in the region around the northern neutral point.
Pioneer-F (10) 1972 012A*	Mar. 3, 1972	A-Centaur	Investigation of the interplanetary medium; the nature of the asteroid belt; and the exploration of Jupiter and its environment.
TD-1 (ESRO)2	Mar. 12, 1972	T-Delta	NASA responsible for placing satellite in an earth orbit for ESRO. Seven scientific experiments are onboard the spacecraft (Reimbursable)
Apollo 16	Apr. 16, 1972	Saturn V	Fifth manned lunar landing and second of the Apollo "J" series which carry the Lunar Roving Vehicle. Astronauts: J. W. Young, T. K. Mattingly II and C. M. Duke.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
71-H-1651	71-HC-1290	71-H-1768	N/A		
72-H-6	72-HC-4	72-H-42	72-HC-30		
72-H-41	72-HC-29	72-H-75	72-HC-48		
72-H-61	72-HC-35	72-H-134	72-HC-102		
72-H-70	72-HC-43	72-H-275	72-HC-175	*Plaque on spacecraft symbolizing earth people. 72-H-192	
72-H-121	72-HC-239	72-H-348	72-HC-220		
72-H-155	72-HC-111	72-H-412	72-HC-269	72-H-544	72-HC-322

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
	1972		
Intelsat IV-F-5	June 13, 1972	A-Centaur	Global commercial communications satellite system. (Reimbursable)
ERTS-A	July 23, 1972	Delta	Acquire synoptic, multispectral repetitive images to investigate disciplines, i.e., agriculture, forestry, mineral and land resources, land use, water and marine resources, map and chart. (WTR)
MTS (Explorer 46)	Aug. 13, 1972	Scout	To measure the meteoroid penetration rates in a bumper protected target and to obtain meteoroid velocity and impact flux data. (WI)
OAO–3 Copernicus	Aug. 21, 1972	Atlas-Centaur	To obtain precise astronomical observations of celestial objects from above the earth's atmosphere so that new and fundamental knowledge about the universe may be acquired.
IMP-H (Explorer 47)	Sep. 22, 1972	Delta	To study cislunar radiation environment over significant portion of solar cycle, interplanetary magnetic field and earth's magnetosphere.
ITOS-D (NOAA-2) AMSAT-OSCAR-6 (Sub-Sat.)	Oct. 15, 1972	Delta	An operational meteorological satellite based on Tiros research and development experience. A small communications relay satellite (AMSAT-OSCAR-C) designed to operate in the radio amateur frequency bands was carried as a piggyback. Design life of the A-O-C is at least 1 yr. of successful operation in orbit.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	*COLOR*	*B&W*	*COLOR*	*B&W*	*COLOR*
72-H-714	72-HC-283	72-H-824	72-HC-299		
72-H-672	72-HC-338	72-H-1048	72-HC-587		
72-H-1162	72-HC-604	72-H-1175	72-HC-646		
72-H-1142	72-HC-705	72-H-1194	72-HC-673		
72-H-1237	72-HC-709	72-H-1180	72-HC-751		
72-H-1448	72-HC-842				
72-H-1315		72-H-1389	72-HC-787		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
Telesat-A (ANIK)	Nov. 9, 1972	Delta	First of a series of Canadian Domestic Communications Satellites. It has been designed to provide transmission of television, voice, data, etc. throughout Canada. (Reimbursable)
SAS-B (Expl. 48) (Launched by Italy for NASA from San Marco Range Facility.)	Nov. 16, 1972	Scout	To perform a sky survey of high energy gamma radiation from the celestial spheres, to determine the extent of primary galactic gamma radiation and to ascertain the presence of gamma ray point sources.
ESRO-IV	Nov. 21, 1972	Scout	Investigate and measure several phenomena in the polar ionosphere. (Reimbursable) WTR
Apollo 17	Dec. 7, 1972	Saturn V	Sixth and last manned lunar landing; third of the Apollo "J" series which carried the lunar rover. Flight crew E. A. Cernan (CDR), R. E. Evans, (CMP), H. H. Schmitt (LMP) spent 301 hrs. 51 mins. in flight. Cernan and Schmitt during the three EVAs completed a total of 22 hrs. 05 mins. 3 secs. The U.S.S. Ticonderoga recovered the crew and approximately 250 lbs. of samples.
Nimbus E (5)	Dec. 11, 1972	Delta	A stabilized earth-oriented platform for the testing of advanced systems, sensing, and collecting meteorological and geological data.
AEROS (German)	Dec. 16, 1972	Scout	Study the state and behavior of the upper atmosphere and ionospheric F region, especially with regard to the influence of solar ultraviolet radiation. (WTR)

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
72-H-1399	72-HC-834	72-H-1440	72-HC-837		
72-H-1370	72-HC-750	72-H-1453	N/A		
72-H-1450	72-HC-844	72-H-1482	72-HC-680		
72-H-1413	72-HC-789	72-H-1529	72-HC-889	72-H-1560	72-HC-905
72-H-1478	72-HC-899	72-H-1591	72-HC-904		
72-H-1588	72-HC-937	72-H-1649	72-HC-938		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
	1973		
Pioneer G (11)	Apr. 6, 1973	Atlas-Centaur	To obtain precursory scientific information beyond the orbit of Mars with the following emphasis: (a) investigation of the interplanetary medium; (b) investigation of the nature of the asteroid belt; (c) exploration of Jupiter and its environment.
Telesat-B (ANIK-2)	Apr. 20, 1973	Delta	Second of a series of Canadian Domestic Communication Satellites. Designed to transmit TV, voice, data. (Reimbursable)
Workshop SL-1	May 14, 1973	Saturn V	Unmanned - Spacecraft is comprised of an Orbital Workshop (OWS), Airlock Module (AM), Multiple Docking Adapter (MDA), Apollo Telescope Mount (ATM), Instrument Unit (IU), and Payload Shroud (PS).
First Manned Visit SL-2	May 25, 1973	Saturn IB	First Manned Skylab launch. Crew: Charles Conrad, Jr., (CDR); Science Test Pilot, Joseph P. Kerwin; Pilot, Paul J. Weitz. Objectives: Establish the Skylab Orbital Assembly in earth orbit, and conduct a series of medical experiments associated with the extension of manned space flight.
Radio Astronomy Explorer B (RAE-B) (Expl. 49)	June 10, 1973	Delta	To make measurements of galactic and solar radio noise at frequencies below ionospheric cutoffs and external to terrestrial background interference by utilization of the moon for occultation, focusing, or aperture blocking for increased resolution and discrimination.

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
ITOS-E (NOAA)	July 16, 1973	Delta	Operational meteorological satellite to obtain global cloud-cover data both day and night for use in weather analysis and forecasting. NASA reimbursed by NOAA for both spacecraft and launch support. Mission failed due to vehicle second stage malfunction. Launched from Western Test Range.
Second Manned Skylab	July 28, 1973	Saturn IB.....	Second manned Skylab launch crew: Alan L. Bean, Commander; Science Pilot Dr. Owen K. Garriott; Pilot Jack R. Lousma. Objective – Continue the series of medical experiments associated with manned space flights in earth orbit.
Intelsat IV F-7 1973 – 058A	Aug. 23, 1973	Atlas-Centaur	Global commercial communications satellite system. (Reimbursable)
IMP-J	Oct. 25, 1973	Delta	To study cislunar radiation environment over significant portion of solar cycle, interplanetary magnetic field and earth's magnetosphere.
ITOS-F	Nov. 8, 1973	Delta	An operational meteorological satellite based on Tiros research and development experience. A small communications relay satellite (AMSAT-OSCAR-C designed to operate in the radio amateur frequency bands was carried as a piggyback. Design life of the A-O-C is at least 1 yr. of successful operation in orbit.
Mariner 10	Nov. 3, 1973	Atlas-Centaur	To obtain measurements of the planets Venus & Mercury (environment, atmosphere, surface, and body characteristics).

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
73-H-788	73-HC-399	73-H-755	73-HC-613		
73-H-504	73-HC-627	73-H-470	73-HC-638	73-H-911	73-HC-730
73-H-843	73-HC-675	73-H-844	73-HC-676		
73-H-1018	73-HC-826	73-H-1061	73-HC-848		
73-H-1258	73-HC-1044	73-H-1259	73-HC-1045		
73-H-993	73-HC-816	73-H-1074	73-HC-853		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
Third Manned Visit SL-4	Nov. 16, 1973	Saturn IB	Perform unmanned Saturn Workshop operations. Reactivate the Skylab orbital assembly in earth orbit. Obtain medical data on the crew for use in extending duration of manned space flights. Perform inflight experiments.
	1974		
AEC Atmospheric Explorer	Dec. 16, 1973	Delta	Investigate the photochemical processes accompanying the absorption of solar ultraviolet radiation in the earth's atmosphere by making closely coordinated measurements of the reacting constituents from a spacecraft with onboard propulsion to permit variations of perigee.
Skynet II–A (UK)	Jan. 18, 1974	Delta	Reimbursable launch. United Kingdom's communications satellite.
Centaur Proof Flight	Feb. 11, 1974	Titan III-E Centaur	Test flight of booster planned for Viking Mars launch in 1975.
San Marco (SM–C2)	Feb. 18, 1974	Scout	United States/Italy cooperative mission to conduct air density measurements.
UK X–4	Mar. 8, 1974	Scout	Reimbursable launch. United Kingdom technology satellite with experiments related to spacecraft power systems, altitude control and stabilization.
WESTAR–A	April 13, 1974	Delta	Western Union communications satellite. Reimbursable launch.
SMS–I	May 17, 1974	Delta	First prototype/developmental mission for geostationary meteorological operational satellite system; day and night continuous imaging of cloud cover; sophisticated remote-platform data-collection-and weather data relay.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
73-H-792	73-HC-891	73-H-1240	73-HC-900	74-H-50	74-HC-49
73-H-1277	73-HC-1047				
74-H-28	74-HC-12	74-H-47	74-HC-35		
–	–	74-H-91	74-HC-61		
74-H-181	–	74-H-249	–		
74-H-191	74-HC-130	74-H-324	74-HC-193		
74-H-262	74-HC-166	74-H-293	74-HC-186		
74-H-321	74-HC-190	74-H-380	74-HC-225		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
ATS–6	May 30, 1974	Titan III-C	Developmental and demonstrative communications mission using technology applicable to terrestrial and space needs; utilizes 9.15-meter (30-foot) deployable parabolic antenna and communications system with frequencies in several bands; will support public communications experiments in the U.S. and India.
Explorer 52 (Hawkeye I)	June 3, 1974	Scout	To study the topology of the magnetic field at large radial distance over the Earth's dgear caps and the interaction of the solar winds with the geomagnetic field.
AEROS–B (German)	July 16, 1974	Scout	Spin-stabilized, Earth-orbiting satellite designed for upper atmosphere measurements.
Netherlands Sat.–A (ANS–A)	August 27, 1974	Scout	Designed to obtain data from celestial X-ray and ultraviolet sources.
WESTAR–B	Oct. 10, 1974	Delta	Western Union communications satellite. Reimbursable launch.
UK–5 (ARIEL–5)	Oct. 15, 1974	Scout	To investigate galactic and extra galactic X-ray sources.
ITOS–G (NOAA4, AMSAT–Oscar-7, INTASAT)	Oct. 29, 1974	Delta	Polar-orbiting operational meteorological satellite funded by NOAA; day and night cloud cover and temperature sounding. Launch includes two piggyback payloads, Intasat and Oscar.
Skynet II–B (UK)	Nov. 22, 1974	Delta	Reimbursable launch. United Kingdom communications satellite.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
74-H-283	74-HC-183	74-H-411	74-HC-243		
74-H-463	74-HC-285	74-H-922	74-HC-557		
74-H-665	74-HC-409	74-H-663	74-HC-405		
74-H-719	74-HC-442	74-H-889	74-HC-520		
74-H-1093	74-HC-688	74-H-936	74-HC-555		
–	–	74-H-992	74-HC-602		
74-H-1010	74-HC-618	74-H-1075	74-HC-638		
74-H-1049	74-HC-12	74-H-1078	74-HC-641		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS
Helios–A	Dec. 10, 1974	Titan III	To investigate the properties of and processes in interplanetary space in the direction of and close to the Sun by developing, launching and operating automated spacecraft.
Symphonie-A (French/ German)	Dec. 17, 1974	Delta	Experimental communications satellite. Reimbursable.
Intelsat IV F–8	Nov. 21, 1974	A-Centaur	One of a series of communications satellites to form part of a global communication commercial satellite system. Launch for COMSAT.
WESTAR–C	Under Study)	Delta	Western Union communications satellite. Reimbursable launch.
	1975		
LANDSAT-2 (Formerly ERTS) 1975-004A	Jan. 22, 1975	Delta	Second Earth Resources Technology Satellite to locate, map, and measure earth resources parameters from space and demonstrate the applicability of this approach to the management of the worlds resources. WTR
SMS-B (2) 1975-011A	Feb. 6, 1975	Delta	Second developmental meteorological satellite to provide continuous observation of environmental phenomena and help develop an environmental network for routine observations and early warning.
INTELSAT IV F6	Feb. 20, 1975	A-Centaur	Vehicle Failure - COMSAT Communications Satellite
GEOS-C (3) 1975-027A	Apr. 9, 1975	Delta	Oceanographic and geodetic satellite to measure ocean topography, sea state, and other features of the earth. WTR

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
74-H-1002	74-HC-612	74-H-1161	74-HC-672		
74-H-1043	74-HC-634	74-H-1186	74-HC-685		
74-H-1235	74-HC-690	74-H-1076	74-HC-639		
75-H-35	N/A	75-H-62	75-HC-31		
75-H-110	75-HC-51	75-H-68	75-HC-39		
75-H-113	75-HC-53	75-H-115	75-HC-55		
75-H-335	75-HC-211	75-H-332	75-HC-191		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
SAS-C (Expl. 53) 1975-037A	May 7, 1975	Scout	Scientific satellite: To search for source radiating in the X-ray, gamma ray, ultraviolet, and other spectral regions both within and beyond our galaxy. San Marco
Telesat-C(ANIK3) 1975-038A	May 7, 1975	Delta	Canadian Domestic Communications Satellite - Reimbursable
Intelsat IV F-1 1975-042A	May 22, 1975	A-Centaur	Comsat Communications Satellite - Last of the IV series Reimbursable
Nimbus F (6) 1975-052A	June 12, 1975	Delta	Meteorological Satellite - R&D of instruments for expanding capabilities for remote sensing of the atmosphere - WTR
OSO-1 (8) 1975-57A	June 21, 1975	Delta	Scientific satellite to study specific features of the Sun.
Apollo (ASTP) 1975-066A	July 15, 1975	Saturn 1B	Apollo Soyuz Test Project (ASTP) Manned: T. P. Safford, V. Brand and D. K. Slayton — Docked with Soyuz 19 on 17 July Mission duration 217 hrs. 28 minutes
COS-B 1975-072A	Aug. 8, 1975	Delta	Cosmic Ray Satellite to study Extraterrestrial Gamma Radiation — Launched for the European Space Agency (WTR). Reimbursable
Viking-A (1) 1975-075A	Aug. 20, 1975	Titan III Centaur	Scientific Investigation of Mars — United States' first attempt to soft land a spacecraft on another planet.
Symphonie-B 1975-77A	Aug. 26, 1975	Delta	Communications Satellite—French/German Cooperative — Reimbursable

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
75-H-284	75-HC-148	N/A	N/A		
75-H-315	75-HC-171	75-H-374	75-HC-229		
75-H-984	75-HC-573	75-H-426	75-HC-256		
75-H-666	75-HC-278	75-H-717	75-HC-297		
75-H-673	75-HC-174	75-H-683	75-HC-280		
74-H-534	74-HC-336	75-H-768	75-HC-433	75-H-786	75-HC-452
75-H-806	75-HC-461	75-H-833	75-HC-522		
75-H-230	75-HC-111	75-H-818	75-HC-466		
75-H-831	75-HC-474	75-H-901	75-HC-475		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
Viking-B (2) 1975-83A	Sept. 9, 1975	Titan III . . . . . Centaur	.Scientific Investigation of Mars — United States' first attempt to soft land a spacecraft on another planet.
Intelsat IVA F-1 1975-091A	Sept. 25, 1975	A-Centaur	.First in a series of improved COMSAT Communications Satellites — Double the capacity of previous Intelsats. Reimbursable.
AE-D (Expl. 54) 1975-096A	Oct. 6, 1975	Delta	.Scientific satellite to investigate the chemical processes and energy transfer mechanisms which control Earth's atmosphere — WTR
U. S. Navy 1975-099A	Oct. 12, 1975	Scout	.Navy Transit Navigation Satellite — WTR — Reimbursable
SMS-C (GOES-A) 1975-100A	Oct. 16, 1975	Delta	.Geostationary Operational Environmental Satellite — Constructed and launched by NASA — Funded and Reimbursed by NOAA.
AE-E (Expl. 55) 1975-107A	Nov. 20, 1975	Delta	.Scientific satellite to investigate the chemical processes and energy transfer mechanisms which control Earth's atmosphere.
DAD-A/B	Dec. 5, 1975	Scout	.Scientific satellite to measure global density of upper atmosphere and lower exosphere — Vehicle failed — WTR
RCA-A 1975-117A	Dec. 13, 1975	Delta	.Communication Satellite — First RCA Domestic Communications Satellite (Reimbursable)

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
75-H-752	75-HC-416	75-H-975	75-HC-569		
75-H-984	75-HC-573	75-H-1003	75-HC-587		
75-H-1031	75-HC-597	75-H-1030	75-HC-596	Prelaunch (No launch picture due to fog)	
N/A	N/A	N/A	N/A		
75-H-1014	75-HC-26	75-H-1035	75-HC-601		
75-H-1073	75-HC-638	75-H-1069	75-HC-633		
75-H-1107	75-HC-674	75-H-1108	75-HC-675	(Prelaunch — no launch available)	
75-H-1106	75-HC-673	75-H-1113	75-HC-656		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
Helios-B (2) 1976-003A	Jan. 15, 1976	Titan III . . . . . Centaur	Scientific satellite to investigate the properties in interplanetary space close to the Sun — Cooperative with Germany
CTS 1976-004A	Jan. 17, 1976	Delta	Experimental High Powered Communications Satellite — Cooperative with Canada
Intelsat IVA-F2 1976-010A	Jan. 29, 1976	A-Centaur	Comsat Communications Satellite — Reimbursable
Marisat-A (1) 1976-017A	Feb. 19, 1976	Delta	Comsat Maritime Communications Satellite — Reimbursable
RCA-B 1976-029A	Mar. 26, 1976	Delta	Second RCA (Satcom) Domestic Communications Satellite — Reimbursable
NATO-III A 1976-035A	Apr. 22, 1976	Delta	Communications Satellite for the North Atlantic Treaty Organization — Reimbursable
LAGEOS 1976-039A	May 4, 1976	Delta	To demonstrate the feasibility and utility of a ground-to-satellite laser system to contribute to the study of solid-earth dynamics. WTR
Comstar-IA 1976-042A	May 13, 1976	A-Centaur	Comsat's first Domestic Communications Satellite — Reimbursable
Air Force Test 1976-047A	May 22, 1976	Scout	To evaluate certain propagation effects of disturbed plasmas on radar and communications systems. Reimbursable — WTR

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
76-H-5	76-HC-2	76-H-42	76-HC-36		
75-H-1112	75-HC-678	76-H-50	76-HC-38		
75-H-984	75-HC-573	76-H-76	76-HC-59		
76-H-235	N/A	76-H-234	76-HC-93		
76-H-313	N/A	76-H-309	76-HC-525		
76-H-340	N/A	76-H-337	76-HC-541		
76-H-433	76-HC-603	76-H-265	76-HC-589		
76-H-341	76-HC-544	76-H-412	76-HC-506		
N/A	N/A	N/A	N/A		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
Marisat-B 1976-053A	June 9, 1976	Delta	Comsat Maritime Communications Satellite — Reimbursable.
Gravity Probe-A	*June* 18, 1976	Scout	Scientific probe to test Einstein's Theory of Relativity — WI
Palapa-A 1976-066A	July 8, 1976	Delta	Indonesian Communications Satellite — Reimbursable.
Comstar-D-2 1976-073A	July 22, 1976	A-Centaur	Comsat's Second Domestic Communications Satellite — Reimbursable
ITOS-H 1976-077A	July 29, 1976	Delta	Meteorological Satellite — Redesignated NOAA-5 — Reimbursable — WTR
U.S. Navy TIP 3 1976-089A	Sept. 1, 1976	Scout	Transit Improvement Program (TIP) U.S. Navy Navigation Satellite — Reimbursable — WTR
Marisat-C 1976-101A	Oct. 14, 1976	Delta	Comsat Maritime Communications Satellite (Reimbursable)

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
76-H-453	76-HC-613	76-H-447	76-HC-609		
76-H-450	76-HC-612	76-H-462	76-HC-616		
76-H-463	76-HC-622	76-H-530	76-HC-642		
76-H-590	76-HC-664	76-H-591	76-HC-665		
76-H-739	76-HC-766	76-H-723	76-HC-739		
N/A	N/A	N/A	N/A		
76-H-800	76-HC-806	76-H-790	N/A		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
NATO III B 1977 005A	Jan. 27, 1977	Delta	NATO Communications Satellite — Reimbursable
Palapa-B 1977 018A	March 10, 1977	Delta	Indonesian Communications Satellite — Reimbursable
GEOS/ESA 1977 029A	April 20, 1977	Delta	ESA Scientific Satellite to investigate waves and particles in the magnetosphere — Rated unsuccessful by NASA — Reimbursable
Intelsat IVA F-4 1977 041A	May 26, 1977	A-Centaur	Comsat Communications Satellite — Reimbursable PLANNED ORBIT NOT ACHIEVED
GOES/NOAA 1977 048A	June 16, 1977	Delta	Geostationary Operational Environmental Satellite — Second in a series launched for NOAA — Reimbursable
GMS/Japan 1977 065A	July 14, 1977	Delta	Geostationary Meteorological Satellite — First GMS launched for Japan — Reimbursable
HEAO-A 1977 075A	Aug. 12, 1977	A-Centaur	Scientific Satellite — High Energy Astronomy Observatory to study and map x-rays and gamma rays.
Voyager-2 1977 076A	Aug. 20, 1977	T-III Centaur	Scientific Satellite to study Jupiter and Saturn Planetary Systems including their satellites and Saturn's rings.
SIRIO/Italy 1977 080A	Aug. 25, 1977	Delta	Scientific Satellite — Italian project to investigate trapped radiation flux, magnetic field intensity and variation, and the primary electron energy spectrum. Reimbursable

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
77-H-43	77-HC-19	77-H-46	77-HC-25		
77-H-101	77-HC-44	77-H-136	77-HC-90		
77-H-475	77-HC-313	77-H-216	77-HC-122		
77-H-280	77-HC-163	77-H-298	77-HC-180		
77-H-8	77-HC-524	77-H-458	77-HC-527		
77-H-485	77-HC-345	77-H-488	77-HC-326		
77-H-56	77-HC-117	77-H-541	77-HC-376		
77-H-509	77-HC-333	77-H-564	77-HC-367		
77-H-483	77-HC-321	77-H-579	77-HC-526		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
Voyager 1 1977 084A	Sep. 5, 1977	T-III Centaur	Scientific Satellite — Second Voyager launched to investigate Jupiter and Saturn Planetary Systems.
OTS/ESA	Sep. 13, 1977	Delta	Orbital Test Satellite. ESA experimental communications satellite. Vehicle Failure — Reimbursable ORBIT NOT ACHIEVED
Intelsat IV-A D	Sep. 29, 1977	A-Centaur	Comsat Communications Satellite — Vehicle Failure — Reimbursable ORBIT NOT ACHIEVED
ISEE-A/B 1977 102 A&B	Oct. 22, 1977	Delta	International Sun-Earth Explorer. Joint NASA/ESA mission to study the interaction of the interplanetary medium with Earth's immediate environment — Dual Payload — Cooperative
Meteosat (ESA) 1977 108A	Nov. 22, 1977	Delta	ESA Meterological Satellite — Europes contribution to the Global Atmospheric Research Program (GARP) — Reimbursable
CS/Japan	Dec. 14, 1977	Delta	Communications Satellite (CS) — Launched for Japan Reimbursable
Intelsat IVA F-3 1978 002A	Jan. 7, 1978	A-Centaur	Comsat Communications Satellite — Reimbursable
IUE-A 1978 012A	Jan. 26, 1978	Delta	International Ultraviolet Explorer to obtain high resolution data of stars and planets in the ultraviolet region of the spectrum. Cooperative with ESA.
FLTSATCOM-A 1978 016A	Feb. 9, 1978	A-Centaur	Fleet Satellite Communications for the USN and the USAF — Reimbursable

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
77-H-281	77-HC-164	77-H-586	77-HC-381		
77-H-598	77-HC-392	77-H-636	77-HC-414		
78-H-6	78-HC-7	77-H-631	77-HC-411		
77-H-642	77-HC-420	77-H-679	77-HC-454		
77-H-722	77-HC-525	77-H-723	77-HC-473		
77-H-743	77-HC-488	77-H-755	77-HC-491		
78-H-6	78-HC-7	78-H-5	78-HC-4		
77-H-735	77-HC-484	78-H-24	78-HC-17		
78-H-31	78-HC-25	78-H-90	78-HC-90		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
Landsat-C 1978 026A	Mar. 5, 1978	Delta	Third NASA Earth Resources Technology Satellite — WTR
Intelsat IVA F-6 1978 035A	Mar. 31, 1978	A-Centaur	Comsat Communications Satellite — Reimbursable
BSE/Japan 1978 039A	Apr. 7, 1978	Delta	Broadcasting Satellite Experimental — Japanese Communications satellite for conducting TV broadcast experiments — Reimbursable
HCMM/AEM-A 1978 041A	Apr. 26, 1978	Scout	Heat Capacity Mapping Mission to produce thermal maps for discrimination of rock types, mineral resources, plant temperatures, soil moisture, snow fields and water runoff — WTR
OTS-B 1978 044A	May 11, 1978	Delta	Orbital Test Satellite — ESA experimental communications satellite — Reimbursable.
Pioneer/Venus-A 1978 051A	May 20, 1978	A-Centaur	Planetary mission to Venus. Orbiter to measure upper atmosphere and ionosphere, study interaction between solar wind and ionosphere and magnetic field, study atmospheric and surface characteristics, determine gravitational field harmonics.
GOES-C/NOAA 1978 062A	June 16, 1978	Delta	Part of global network of geostationary environmental satellites to provide Earth imaging, monitor the space environment, and relay meteorological data to users. Reimbursable

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
78-H-92	78-HC-20	78-H-218	78-HC-168		
78-H-282	78-HC-220	78-H-181	78-HC-145		
78-H-117	78-HC-96	78-H-214	78-HC-164		
78-H-294	78-HC-230	78-H-298	78-HC-232		
78-H-212	78-HC-162	78-H-248	78-HC-196		
78-H-100	78-HC-41	78-H-297	78-HC-231		
78-H-463	78-HC-391	78-H-453	78-HC-389		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
Seasat-A 1978 064A	June 26, 1978	Atlas-F	Sea Satellite for global monitoring of ocean geoid, wave topography, surface wind speed and direction, ocean surface temperatures, and ice field extent and dynamics — WTR
Comstar D-3 1978 068A	June 29, 1978	A-Centaur	Third in a series of domestic communications satellites for Comsat — Reimbursable
GEOS-B/ESA 1978 071A	July 14, 1978	Delta	ESA spacecraft to conduct scientific investigation of waves and particles in magnetosphere. Reimbursable
Pioneer/Venus-B 1978 078A	Aug. 8, 1978	A-Centaur	Multiprobe — four hard landers — to determine nature and composition structure and general circulation pattern of the atmosphere of Venus from the surface to high altitudes.
ISEE-C 1978 079A	Aug. 12, 1978	Delta	International Sun Earth Explorer. An extension of interplanetary studies with the spacecraft toward the Sun sufficiently outside the Earth's influence for comparison with results of ISEE-A and B missions and of probes to outer planets. Cooperative with ESA
Tiros-N 1978 096A	Oct. 13, 1978	Atlas-F	Polar orbiting operational spacecraft to provide improve meteorological data for NOMSS and provide support to GARP. Oscar-7
Nimbus G 1978 098A	Oct. 24, 1978	Delta	Develop and flight test advanced sensors and technology basic to conducting experiments in the pollution monitoring, oceanographic, and meteorological disciplines. A piggy back payload called CAMEO (Chemically Active Material Ejected in Orbit) was ejected to study the boundary structure between the polar cap and the auroral belt.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
78-H-233	78-HC-185	78-H-504	78-HC-418		
78-H-462	78-HC-390	78-H-464	78-HC-249		
78-H-480	78-HC-399	78-H-479	78-HC-398		
77-H-138	77-HC-95	78-H-529	78-HC-439		
78-H-576	78-HC-454	78-H-543	78-HC-455		
78-H-577	78-HC-396	78-H-624	78-HC-498		
78-H-725	78-HC-565	78-H-656	78-HC-516		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
HEAO-B	Nov. 13, 1978	A-Centaur	Second High Energy Astronomical Observatory to study very energetic radiation from space.
NATO III C	Nov. 18, 1978	Delta	NATO Communication Satellite — Reimbursable
Telesat-D (ANIK-B)	Dec. 15, 1978	Delta	Canadian Domestic Communications Satellite — Reimbursable
SCATHA 1979-007A	Jan. 30, 1979	Delta	USAF Scientific Mission — Spacecraft Charging at High Altitudes (SCATHA) to investigate electrical static discharges that effect satellites. Reimbursable
SAGE 1979-013A	Feb. 18, 1979	Scout	Applications Explorer Mission (AEM-2) — Stratospheric Aerosol Gas Experimental (SAGE) to map vertical profiles of ozone, aerosol, nitrogen dioxide, and rayleight molecular extinction around the globe. WFC
FLTSATCOM-B 1979-038A	May 4, 1979	A-Centaur	Fleet Satellite Communications to provide communications for the USAF and USN. Reimbursable
UK-6 1979-047A	June 2, 1979	Scout	United Kingdon Scientific Satellite to measure ultra-heavy cosmic ray particles and study low energy cosmic x-rays. WFC — Reimbursable
NOAA-6 1979-057A	June 27, 1979	Atlas-F	Meteorological Satellite for the National Oceanographic and Atmospheric Administration. WTR — Reimbursable

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
78-H-661	78-HC-490	78-H-667	78-HC-521		
78-H-662	78-HC-519	78-H-721	N/A		
78-H-740	78-HC-587	78-H-751	78-HC-586		
79-H-30	79-HC-5	79-H-36	79-HC-25		
77-H-753	77-HC-490	79-H-116	79-HC-98		
79-H-244	79-HC-544	79-H-261	79-HC-199		
79-H-272	79-HC-203	79-H-333	79-HC-243		
–	–	79-H-312 (Pre-launch)	79-HC-233		

NAME	LAUNCH	VEHICLE	MISSION/REMARKS (All launches from ETR, unless otherwise noted.)
WESTAR-C 1979-082A	Aug. 9, 1979	Delta	Domestic Communications Satellite for Western Union. Reimbursable
HEAO-3 1979-082A	Sept. 20, 1979	A-Centaur	High Energy Astronomy Observatory to survey cosmic rays and gamma rays.
MAGSAT	Oct. 30, 1979	Scout	Applications Explorer Mission (AEM-3) to map the magnetic field of the Earth. WTR
SATCOM	Dec. 6, 1979	Delta	RCA Communication Satellite. Reimbursable. All contact was lost with spacecraft on December 10, 1979
FLTSATCOM-C	Jan. 17, 1980	Atlas-Centaur	Fleet Satellite Communications to provide communications for the USAF and USN — Reimbursable
SMM-A	Feb. 14, 1980	Delta	Solar Maximum Mission to Study the solar activity during the maximum of solar flares and related phenomena.
NOAA-7	May 29, 1980	Atlas-F	Meteorological Satellite for NOAA — Vehicle failed to place payload into proper orbit — WTR — Reimbursable.
GOES-D	Sept. 9, 1980	Delta	Geostationary Operational Environmental Satellite for NOAA — Reimbursable.
FLTSATCOM-D	Oct. 31, 1980	Atlas-Centaur	Fleet Satellite Communications to provide communications for the USAF and USN — Reimbursable.
SBS-A	Nov. 15, 1980	Delta	Small Business Satellite (SBS) — Domestic Communications Satellite — Reimbursable.
INTELSAT V-A	Dec. 6, 1980	Atlas-Centaur	Comsat Communications Satellite — Reimbursable.

SPACECRAFT		LAUNCH VEHICLE		RECOVERY	
B&W	COLOR	B&W	COLOR	B&W	COLOR
79-H-564	79-HC-409	79-H-554	79-HC-398		
79-H-560	79-HC-417	79-H-595	79-HC-454		
79-H-624	79-HC-473	79-H-654	79-HC-523		
79-H-682	79-HC-542	79-H-684	79-HC-561		
79-H-674	79-HC-544	80-H-37	80-HC-27		
79-H-583	79-HC-448	80-H-80	80-HC-65		
80-H-263	–	80-H-308	80-HC-249		
80-H-777	80-HC-594	80-H-780	80-HC-574		
–	–	80-H-822	80-HC-629		
80-H-873	80-HC-655	80-H-872	80-HC-652		
80-H-877	80-HC-659	80-H-924	80-HC-699		

NASA ASTRONAUTS

GROUP	NAME	PORTRAIT		IN SPACESUIT	
		B&W	COLOR	B&W	COLOR
3	**ALDRIN, Edwin E., Jr.	63-A.T.-180	A.T.-440	69-H-969	69-HC-640
6	**ALLEN, Joseph P. (Dr.)	71-H-1683	71-HC-1303	71-H-1682	71-HC-1302
3	**ANDERS, William A.	63-A.T.-181	A.T.-441	68-H-840	68-HC-559
2	ARMSTRONG, Neil A.	62-A.T.-1	A.T.-442	69-H-968	69-HC-639
3	**BASSETT, Charles A.	63-A.T.-182	A.T.-443	–	–
3	**BEAN, Alan L.*	71-H-1684	71-HC-1304	69-H-1494	69-HC-966
8	BLUFORD, Guion S.	78-H-46	78-HC-46	80-H-371	80-HC-303
7	BOBKO, Karol J.	71-H-1722	71-HC-1342	71-H-1721	71-HC-1341
2	**BORMAN, Frank	62-A.T.-2	A.T.-445	68-H-836	68-HC-846
5	**BRAND, Vance D.*	71-H-1686	71-HC-1306	71-H-1685	71-HC-1305
8	BRANDENSTEIN, Daniel C.	78-H-47	78-HC-47	80-H-369	80-HC-109
8	BUCHLI, James F.	78-H-48	78-HC-48	80-H-379	80-HC-311
5	**BULL, John S.	66-H-935	66-HC-571	–	–
1	**CARPENTER, M. Scott	M-15	A.T.-471	62-MA6-78	A.T.-2
5	**CARR, Gerald P.*	71-H-1688	71-HC-1308	71-H-1687	71-HC-1307
3	**CERNAN, Eugene A.	71-H-1690	71-H-1310	71-H-1689	71-HC-1309
3	**CHAFFEE, Roger B.	63-A.T.-185	A.T.-447	67-H-106	–
6	CHAPMAN, Philip K. (Dr.)	71-H-1692	71-HC-1312	71-H-1691	71-HC-1311

NASA ASTRONAUTS

GROUP	NAME	PORTRAIT		IN SPACESUIT	
		B&W	COLOR	B&W	COLOR
8	COATS, Michael L.	78-H-49	78-HC-49	80-H-387	80-HC-319
3	COLLINS, Michael	63-A.T.-175	A.T.-448	69-H-970	69-HC-641
2	**CONRAD, Charles, Jr.*	71-H-1693	71-HC-1313	69-H-1492	69-HC-964
1	**COOPER, L. Gordon, Jr.	M-14	A.T.-450	62-MA9-4	A.T.-5
8	COVEY, Richard O.	78-H-50	78-HC-50	80-H-382	80-HC-314
8	CREIGHTON, John O.	78-H-51	78-HC-51	80-H-381	80-HC-313
7	CRIPPEN, Robert L.	71-H-1724	71-HC-1344	71-H-1723	71-HC-1343
3	CUNNINGHAM, Walter	63-A.T.-176	A.T.-451	68-H-937	68-HC-631
5	**DUKE, Charles M., Jr.	71-H-1695	71-HC-1315	71-H-1694	71-HC-1314
3	**EISELE, Donn F.	71-H-1597	–	68-H-675	68-HC-630
6	ENGLAND, Anthony W. (Dr.)	71-H-1697	71-HC-1317	71-H-1696	71-HC-1316
5	**ENGLE, Joe H.	71-H-1881	71-HC-1478	71-H-1882	71-HC-1479
5	**EVANS, Ronald E.	71-H-1908	71-HC-1493	71-H-1698	71-HC-1318
8	FABIAN, John M.	78-H-52	78-HC-52	80-H-391	80-HC-323
8	FISHER, Anna L.	78-H-53	78-HC-53	80-H-365	80-HC-297
3	**FREEMAN, Theodore C.	63-A.T.-186	A.T.-212	–	–
7	FULLERTON, Charles G.	71-H-1911	71-HC-1496	71-H-1725	71-HC-1345
8	GARDNER, Dale A.	78-H-54	78-HC-54	80-H-370	80-HC-302

NASA ASTRONAUTS

GROUP	NAME	PORTRAIT		IN SPACESUIT	
		B&W	COLOR	B&W	COLOR
4	**GARRIOTT, Owen K. (Dr.)*	71-H-1700	71-HC-1320	71-H-1699	71-HC-1319
4	**GIBSON, Edward G. (Dr.)*	71-H-1879	71-HC-1476	71-H-1880	71-HC-1477
8	GIBSON, Robert L.	78-H-55	78-HC-55	80-H-373	80-HC-305
5	**GIVENS, Edward G.	66-H-895	66-HC-548	–	–
1	**GLENN, John H.	M-16	A.T.-472	62-MA6-77	MA6-48
3	**GORDON, Richard F., Jr.	71-H-1909	71-HC-1494	69-H-1493	69-HC-965
8	GREGORY, Frederick D.	78-H-56	78-HC-56	80-H-380	80-HC-312
8	GRIGGS, Stanley D.	78-H-57	78-HC-57	80-H-393	80-HC-325
1	**GRISSOM, Virgil I.	M-17	A.T.-455	64-H-2321	A.T.-11
5	**HAISE, Fred W., Jr.	71-H-1701	71-HC-1321	70-H-26	70-HC-31
8	HART, Terry J.	78-H-58	78-HC-58	80-H-392	80-HC-324
7	HARTSFIELD, Henry W.	71-H-1728	71-HC-1348	71-H-1727	71-HC-1347
8	HAUCK, Frederick H.	78-H-59	78-HC-59	80-H-389	80-HC-321
8	HAWLEY, Steven A.	78-H-60	78-HC-60	80-H-364	80-HC-296
6	HENIZE, Karl G. (Dr.)	71-H-1877	71-HC-1474	71-H-1878	71-HC-1475
8	HOFFMAN, Jeffrey A.	78-H-61	78-HC-61	80-H-385	80-HC-317
6	HOLMQUEST, Donald L. (Dr.)	71-H-1875	71-HC-1472	71-H-1876	71-HC-1473
5	IRWIN, James B.	71-H-1702	71-HC-1322	71-H-1059	71-HC-851

NASA ASTRONAUTS

GROUP	NAME	PORTRAIT		IN SPACESUIT	
		B&W	COLOR	B&W	COLOR
4	**KERWIN, Joseph P.*	71-H-1873	71-HC-1470	71-H-1874	71-HC-1471
6	LENOIR, William B. (Dr.)*	71-H-1704	71-HC-1324	71-H-1703	71-HC-1323
5	**LIND, Don L.*	71-H-1706	71-HC-1326	71-H-1705	71-HC-1325
6	**LLEWELLYN, John A. (Dr.)	67-H-1716	67-HC-816	—	—
5	**LOUSMA, Jack R.*	72-H-11	72-HC-8	71-H-1883	71-HC-1480
2	**LOVELL, James A., Jr.	62-A.T.-8	A.T.-456	70-H-25	70-HC-30
8	LUCID, Shannon W.	78-H-62	78-HC-62	80-H-394	80-HC-326
5	**MATTINGLY, Thomas K. II	71-H-1709	71-HC-1329	71-H-1708	71-HC-1328
8	MCBRIDE, Jon A.	78-H-63	78-HC-63	80-H-375	80-HC-307
5	MCCANDLESS, Bruce II*	71-H-1711	71-HC-1331	71-H-1710	71-HC-1330
2	**MCDIVITT, James A.	72-H-14	72-HC-11	72-H-15	72-HC-12
8	MCNAIR, Ronald E.	78-H-64	78-HC-64	80-H-390	80-HC-322
4	**MICHEL, F. Curtis	65-H-2040	65-HC-1254	—	—
5	**MITCHELL, Edgar D.	71-H-1712	71-HC-1332	70-H-1539	70-HC-1113
8	MULLANE, Richard M.	78-H-65	78-HC-65	80-H-383	80-HC-315
6	MUSGRAVE, F. Story (Dr.)*	71-H-1910	71-HC-1495	72-H-9	72-HC-6
8	NAGEL, Steven R.	78-H-66	78-HC-66	80-H-374	80-HC-306
8	NELSON, George D.	78-H-67	78-HC-67	80-H-360	80-HC-292

NASA ASTRONAUTS

GROUP	NAME	PORTRAIT B&W	PORTRAIT COLOR	IN SPACESUIT B&W	IN SPACESUIT COLOR
6	**O'LEARY, Brian T. (Dr.)	67-H-1721	67-HC-821	–	–
8	ONIZUKA, Ellison S.	78-H-68	78-HC-68	80-H-362	80-HC-294
7	OVERMYER, Robert F.	71-H-1730	71-HC-1350	71-H-1729	71-HC-1349
6	**PARKER, Robert A. (Dr.)	71-H-1863	71-HC-1460	71-H-1864	71-HC-1461
7	PETERSON, Donald H.	71-H-1732	71-HC-1352	71-H-1731	71-HC-1351
5	**POGUE, William R.*	71-H-1865	71-HC-1462	71-H-1866	71-HC-1463
8	RESNIK, Judith A.	78-H-69	78-HC-69	80-H-384	80-HC-108
8	RIDE, Sally K.	78-H-70	78-HC-70	80-H-368	80-HC-300
5	ROOSA, Stuart A.	72-H-10	72-HC-7	70-H-1540	70-HC-1114
1	**SCHIRRA, Walter M., Jr.	M-18	A.T.-459	68-H-674	68-HC-428
4	**SCHMITT, Harrison H.	65-H-1116	66-HC-193	71-H-1895	71-HC-1483
3	**SCHWEICKART, Russell L.*	71-H-1714	71-HC-1334	71-H-1713	71-HC-1333
8	SCOBEE, Francis R.	78-H-71	78-HC-71	80-H-376	80-HC-308
3	**SCOTT, David R.	71-H-1867	71-HC-1464	71-H-1868	71-HC-1465
8	SEDDON, Margaret R.	78-H-72	78-HC-72	80-H-366	80-HC-298
2	**SEE, Elliott J.	62-A.T.-5	A.T.-461	–	–
8	SHAW, Brewster H., Jr.	78-H-73	78-HC-73	80-H-388	80-HC-320
1	**SHEPARD, Alan B., Jr.	71-H-1715	71-HC-1335	70-H-1538	70-HC-1112

NASA ASTRONAUTS

GROUP	NAME	PORTRAIT B&W	PORTRAIT COLOR	IN SPACESUIT B&W	IN SPACESUIT COLOR
8	SHRIVER, Loren J.	78-H-74	78-HC-74	80-H-378	80-HC-310
1	SLAYTON, Donald K.	71-H-1717	71-HC-1337	71-H-1716	71-HC-1336
2	**STAFFORD, Thomas P.	62-A.T.-6	A.T.-464	69-H-644	72-HC-655
8	**STEWART, Robert L.	78-H-75	78-HC-75	80-H-363	80-HC-295
8	SULLIVAN, Kathryn D.	78-H-76	78-HC-76	80-H-386	80-HC-318
5	SWIGERT, John L., Jr.	71-H-1869	71-HC-1466	71-H-1870	71-HC-1467
8	THAGARD, Norman E.	78-H-77	78-HC-77	80-H-367	80-HC-299
6	**THORNTON, William E. (Dr.)	72-H-12	72-HC-9	72-H-13	72-HC-10
7	TRULY, Richard H.	71-H-1734	71-HC-1354	71-H-1733	71-HC-1353
8	VAN HOFTEN, James D.	78-H-78	78-HC-78	80-H-377	80-HC-309
8	WALKER, David M.	78-H-79	78-HC-79	80-H-364	80-HC-293
5	WEITZ, Paul J.*	71-H-1892	71-HC-1327	71-H-1718	71-HC-1338
2	**WHITE, Edward H. II	62-A.T.-7	A.T.-33	64-H-2670	A.T.-465
3	**WILLIAMS, Clifton C., Jr.	63-A.T.-177	A.T.-466	—	66-HC-556
8	WILLIAMS, Donald E.	78-H-80	78-HC-80	80-H-372	80-HC-304
5	**WORDEN, Alfred M.	71-H-1871	71-HC-1468	71-H-1872	71-HC-1469
2	**YOUNG, John W.	71-H-1720	71-HC-1340	71-H-1719	71-HC-1339

*Skylab Astronauts

**Former Boy Scouts

ASTRONAUT TEAMS

GROUP	DATE SELECTED	BLACK-AND-WHITE	COLOR
1	April 9, 1959	61-MR-4-1	Astro. Traan.-17
2	Sept. 17, 1962	62-Astro. Train.-10	Astro. Train.-223
3	Oct. 18, 1963	63-Astro. Train.-188	Astro. Train.-199
4	June 28, 1965	66-H-1473	66-HC-1940
5	April 5, 1966	66-H-569	66-HC-1828
6	August 2, 1967	68-H-358	68-HC-203
7	August 1969	70-H-250	70-HC-170
8	January 16, 1978	78-H-45	78-HC-92

ASTRONAUT CANDIDATES

NAME	PORTRAIT B&W	PORTRAIT COLOR
BAGIAN, James P.	80-H-697	80-HC-548
BLAHA, John E.	80-H-698	80-HC-549
BOLDEN, Charles F. (Jr.)	80-H-699	80-HC-550
BRIDGES, Roy D. (Jr.)	80-H-700	80-HC-551
CHANG, Franklin R.	80-H-701	80-HC-552
CLEAVE, Mary L.	80-H-702	80-HC-553
DUNBAR, Bonnie J.	80-H-703	80-HC-554
FISHER, William F.	80-H-756	80-HC-579
GARDNER, Guy S.	80-H-704	80-HC-555
GRABE, Ronald J.	80-H-705	80-HC-556
HILMERS, David C.	80-H-706	80-HC-557
LEESTMA, David C.	80-H-707	80-HC-558
LOUNGE, John M.	80-H-708	80-HC-559
O'CONNOR, Bryan D.	80-H-711	80-HC-562
RICHARDS, Richard N.	80-H-712	80-HC-563
ROSS, Jerry L.	80-H-713	80-HC-564
SMITH, Michael J.	80-H-714	80-HC-565
SPRING, Sherwood C.	80-H-715	80-HC-566
SPRINGER, Robert C.	80-H-716	80-HC-567

SELECTED
LUNAR SURFACE PHOTOS

MISSION	DESCRIPTION	NUMBER
Ranger VII	Crater Guericke: Altitude 470 miles	64-Ranger B-25
Ranger VIII	Crater Delambre: Altitude 470 miles	65-H-188
Ranger VIII	Craters Sabinet & Ritter: Altitude 151 miles	65-H-190
Ranger IX	Crater Alphonsus Area: Altitude 775 miles	65-H-525
Ranger IX	Crater Alphonsus: Altitude 258 miles	65-H-529
Ranger IX	Crater Alphonsus: Altitude 58 miles	65-H-532
Surveyor I	First photo of footpad	66-H-584
Surveyor I	Large rock	67-H-1711
Surveyor III	Claw digger	67-H-794
Surveyor V	Alpha scattering device	67-H-1224
Surveyor VI	Mosaic, rocky ridge	67-H-1551
Surveyor VI	Footpad: Before and after vernier firing	67-H-1570
Lunar Orbiter I	Earth and Moon	67-H-218
Lunar Orbiter II	Oblique of Copernicus	66-H-1470
Lunar Orbiter III	Craters Hyginus and Rille	67-H-197
Lunar Orbiter III	Crater Kepler - oblique	67-H-201
Lunar Orbiter III	Hidden side: Altitude 900 miles	67-H-328

SELECTED
LUNAR SURFACE PHOTOS

MISSION	DESCRIPTION		NUMBER
Lunar Orbiter IV	Alpine Valley		67-H-897
Lunar Orbiter IV	Orientale Basin		67-H-934
Lunar Orbiter V	Earth as disk		67-H-1109
Lunar Orbiter V	Tycho Crater		67-H-1179
Lunar Orbiter V	Hidden side, Mare Moscoviense		67-H-1404
Lunar Orbiter V	Crater Aristarchus		67-H-1413
Lunar Orbiter V	Rolling stones		67-H-1135
Mariner Mars	Frame 9	(Selected frames from Mariner	67-H-1144
Mariner Mars	Frame 10	Mars IV fly-by of Mars)	67-H-1145
Mariner Mars	Frame 11		67-H-1146
Mariner Mars	Frame 12		67-H-1147
Mariner Mars	Frame 13		67-H-1148
Mariner Mars	Frame 14		67-H-1149

MARINER VI

Photo Number	Description
69-H-441	Launch
69-H-1280	Mars from 771,500 statute miles
69-H-1281	Mars from 751,600 statute miles
69-H-1282	Mars from 691,950 statute miles
69-H-1283	Mars from 632,300 statute miles
69-H-1284	Mars from 572,650 statute miles
69-H-1285	Mars from 503,050 statute miles
69-H-1286	Mars from 463,250 statute miles
69-H-1287	Mars from 333,700 statute miles
69-H-1289	Mars from 201,900 statute miles
69-H-1290	Mars from 156,700 statute miles
69-H-1291	Mars from 126,500 statute miles
69-H-1292	Mars from 2,300 statute miles
69-H-1288	Mars from 282,100 statute miles
69-H-1293	Mars from 2,245 statute miles
69-H-1295	Mars from 2,150 statute miles
69-H-1296	Mars from 2,150 statute miles
69-H-1297	Enlarged view of south polar cap
69-H-1294	View of Deucalionis Region
69-H-1298	Re-enhanced view of Mars
69-H-1404	Near encounter view (4 wide angle mosiac)
69-H-1445	Re-enhanced view of Mars
69-H-1448	Three full disk views of Mars
69-H-1453	Re-enhanced view of Mars

MARINER VII

Photo Number	Description
69-H-551	Launch
69-H-427	Spacecraft
69-H-1391	Mars from 630,700 statute miles
69-H-1390	Mars from 535,650 statute miles
69-H-1388	Mars from 716,250 statute miles
69-H-1389	Mars from more than one million miles
69-H-1381	View of "Giant Footprint" two adjacent craters foreshortened by oblique viewing
69-H-1386	Mars from 293,200 statute miles
69-H-1385	Mars from 293,200 statute miles
69-H-1384	Mars from 181,500 statute miles
69-H-1383	Mars from 81,700 statute miles
69-H-1382	View of south polar cap region
69-H-1387	Mars from one million statute miles

Photo Number	Description
69-H-1407	Hellespontus and Hellas regions
69-H-1408	Hellespontus and Hellas regions
69-H-1409	Hellespontus and Hellas regions
69-H-1410	Border of Hellespontus and Hellas
69-H-1411	"Giant's Footprint" two adjacent craters foreshortened by oblique viewing of the south polar cap
69-H-1405	Edge of Mars south polar cap
69-H-1406	Mars south polar cap
69-H-1279	Mars from 3,300 miles
69-H-1448	Three full disk pictures of Mars
69-H-1446	View of south polar cap (re-enchanced)
69-H-1447	Floor of circular "desert" Hellas (re-enhanced)
69-H-1451	Four views of limb of Mars

MARINER IX

Photo No.	Description
71-H-1752	Mars south polar cap from 716,139 km (445,000 miles).
71-H-1753	Mars from 656,880 km (408,000 miles).
71-H-1756	Mars from 104,650 km (65,000 miles).
71-H-1757	Mars (2 pictures) Top - Mariner 9 mosaic, Bottom - Mariner 7 photo of same area.
71-H-1758	Mars - mosaic of frames before orbit insertion.
71-H-1771	Mars entire south polar cap (mosaic).
71-H-1809	Disc of Martian moon Deimos.
71-H-1831	Close-up views of Phobos from 5,543 km (3,444 mi.) and 14,683 km (9,123 mi.).
71-H-1832	Computer-enhanced photo of Phobos from 5,543 km (3,444 mi.).
71-H-1833	Mars atmospheric wave cloud seen near terminator.
71-H-1834	Mars - oblique view of crater complex near Ascraeus Lacus in Tharsis region.
71-H-1835	Mars - mountain near Nodus Gordii (the Gordian Knot).
71-H-1836	Computer-processed version of 71-H-1809.
71-H-1837	Phobos computer-processed version.
71-H-1838	Mars south polar cap (4 pictures).
71-H-1839	Mars - Nix Olympica (Snows of Olympus).
71-H-1840	Mars - south polar cap views.
71-H-1841	Mars - narrow-angle picture shows gradual roll-off in the brightness in top of atmospheric dust and detached layer above Martian limb (taken with violet filter).
71-H-1842	Mars - Same as above (taken minus blue filter).
71-H-1929	Surface of Mars (67th orbit).
72-H-16	Martian Cantonlands.
72-H-21	Pits and hollows on Mars about 800 km (500 miles) from Martian south pole.

MARINER IX

B&W Photo No.	Color Photo No.	Description
72-H-22	–	Rilles in Martian crust taken at a distance of 1,730 km (1,072 miles).
72-H-23	–	Mars' Nix Olympica Region.
72-H-24	–	Dark splotches on Mars - south temperate zone of Mars.
72-H-43	–	Vast chasm with branching canyons eroding the adjacent plateaulands in Tithonius Lacus area.
72-H-44	–	Martian crater 69 km (43 miles) located near Mars' Pavonis Lacus.
72-H-55	–	Erosional processes on the fractured volcanic table lands of Mars' Noctis Lacus.
72-H-85	–	A probable Martian shield volcano.
72-H-98	–	Extremely irregular jumbled Martian area.
72-H-106	–	Novus Mons area.
72-H-107	–	Mars' South Polar Region.
72-H-108	–	Sinuous Valley in Rasena Region.
72-H-109	–	Sinuous Valley on Martian surface.

MARINER X

B&W Photo No.	Color Photo No.	Description
73-H-993	73-HC-816	In flight configuration of Mariner 10 spacecraft.
73-H-1074	73-HC-853	Mariner launched by an Atlas-Centaur from Cape Kennedy on November 3, 1973.
		VENUS
74-H-83	–	Lighted cusp of North Pole taken from 5,000 miles.
74-H-88	–	Haze layers on limb, photographed in orange light.
74-H-84	–	Mosaic picture of nearly full planet, taken from a distance of 440,000 miles.
74-H-82	–	Southern hemisphere, spiral-like markings seen only through UV filters taken from a range of about 450,000 miles on February 6, 1974.
74-H-87	–	Ultraviolet television camera picture taken on February 6, 1974 from a range of 490,000 miles show dark features toward top—part of dark belt in Venus clouds over equatorial region.
74-H-86	–	UV picture taken on February 6, 1974 from range of 490,000 miles.
74-H-85	–	Mosaic of pictures taken February 6, 1974 from range of 525,000 miles—cloud pattern seen only in UV light show general circulation of upper atmosphere of Venus.
74-H-150	–	Venus, 85 percent illuminated, taken February 9, 1974 from a distance of 1,725,000 miles.

MARINER X

B&W Photo No.	Color Photo No.	Description
74-H-185	74-HC-133	Individual Venus TV frames were computer-enhanced, mosaicked and retouched, taken February 6, 1974 from a distance of 450,000 miles.
74-H-186	–	Series of photomosaics taken at seven-hour intervals February 7, 1974—show rapid rotation of light and dark markings at top of Venus' thick cloud deck.
		MERCURY
74-H-217	–	Partially illuminated disc taken March 24, 1974 from a distance of 2,700,000 miles.
74-H-219	–	Computer-enhanced and enlarged picture taken March 25, 1974 from a distance of 2,190,000 miles.
74-H-223	–	Two pictures—"real time" and enhanced photos taken March 26, 1974 from a distance of 1,705,000 miles.
74-H-222	–	Computer-enhanced view taken on March 27, 1974 from a distance of 1,141,000 miles—craters as small as 100 miles across can be made out along right edge of crescent.
74-H-227	–	Computer-enhanced view taken on March 28, 1974 from 590,240 miles—abundance of craters near evening terminator seen.
74-H-226	–	Computer-enhanced view taken on March 29, 1974 from 310,000 miles—120 mile craters and 6.8 mile craters detected.
74-H-229	–	Southwestern quadrant taken March 29, 1974 from 122,000 miles—largest crater seen 62 miles in diameter.

MARINER X

B&W Photo No.	Color Photo No.	Description
74-H-239	–	Mosaic of about two-thirds of Mercury's southern hemisphere taken March 29, 1974 from 124,000 miles—cratered surface is similar to cratered highlands on the Moon—largest craters are 124 miles in diameter.
74-H-240	–	Conspicuous bright crater on rim of larger older crater taken March 29, 1974 from a distance of 55,000 miles—bright-floored crater is 25 miles in diameter.
74-H-230	–	Heavily-cratered surface with many low hills taken March 29, 1974 from an altitude of 21,700 miles—shows large valley 4 1/2 miles wide and 62 miles long.
74-H-231	–	Cratered terrain similar to that on the Moon taken March 29, 1974 from 19,300 miles—shows large flat-floored crater 62 miles in diameter.
74-H-233	–	Fresh new crater 7 1/2 miles across in center of older crater basin taken March 29, 1974 from 12,860 miles—picture covers an area 90 by 105 miles.
74-H-232	–	Densely cratered surface taken March 29, 1974 from 8,085 miles—portion of 38 mile crater shows flow front extending across crater floor and filling more than half of crater—smaller fres crater at center is about 15 miles in diameter—craters as small as one-half mile across are visible.
74-H-241	–	Taken only minutes after Mariner 10 made its closest approach on March 29, 1974 from a distance of 3,700 miles—craters as small as 500 feet can be seen—relatively level surface contrasts with abundant relief seen in some closeup view on opposite side of planet.

APOLLO 7 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 7 crew portrait	68-H-616	68-HC-388
Schirra	68-H-674	AT-459
Eisele	68-H-675	AT-452
Cunningham	63-AT-176	AT-451
Apollo 7 Patch	68-H-602	68-HC-385
Launch	68-H-920	68-HC-619
Spacecraft in water	68-H-1037	68-HC-654
Crew on deck of carrier	68-H-989	68-HC-659
Hurricane Gladys		68-HC-667
Southern California		68-HC-666
New Orleans area		68-HC-664
Florida, Cape Kennedy area		68-HC-694
Sudan, White and Blue Nile		68-HC-705
Lake Chad area		68-HC-693
Brazil coastal area		68-HC-694

APOLLO 8 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 8 crew	68-H-1159	68-HC-730
Launch	68-H-1352	68-HC-866
Astronaut being hoisted into helicopter, spacecraft in water	68-H-1451	68-HC-900
Earth—nearly entire western hemisphere and small portion of West Africa bulge.	68-H-1396	68-HC-871
Earth (center) above lunar horizon	68-H-1401	68-HC-870
Earth (right) above lunar horizon	69-H-2	69-HC-2
Nearly full Moon		69-HC-6
Oblique shot looking generally NW from spacecraft into Sea of Tranquility	68-H-1400	
Looking south at the large Goclenius, also craters Magelhaens, Magelhaens A and Columbo A	68-H-1399	
Oblique shot looking south on lunar a farside	68-H-1397	
Near vertical picture of lunar farside	69-H-9	69-HC-9
Crater Langrenus		68-HC-872
Apollo 8 Patch	68-H-1291	68-HC-799

APOLLO 9 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 9 Crew	69-H-73	69-HC-123
Launch	69-H-409	69-HC-292
Recovery	69-H-457	69-HC-327
In-flight Photos:		
Lunar Module as viewed from Command Module	69-H-307	69-HC-169
Lunar Module as viewed from Command Module	69-H-308	69-HC-170
Lunar Module as viewed from Command Module	69-H-309	69-HC-171
Lunar Module as viewed from Command Module	69-H-310	69-HC-172
Command Module as viewed from Lunar Module	69-H-311	69-HC-173
Command Module as viewed from Lunar Module	69-H-312	69-HC-174
Calif.; Sierra Nevada San Joaquin Valley, Majave Desert	69-H-322	69-HC-175
Nevada; Calif.; Arizona; Utah: Las Vegas Colorado River, Lake Mead	69-H-323	69-HC-176
Apollo 9 Patch	69-H-160	69-HC-99

APOLLO 9 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Ut.; Ariz.: Colorado Plateau, Lake Powell, cloudy	69-H 324	69-HC-177
Ariz,; Ut.: Colorado River, Grand Canyon, Humphrey's Peak, Meteor Crater	69-H-325	69-HC-178
Colo.; N.M.; Ut.: Stereo view north, Albuquerque, Salt Lake	69-H-326	69-HC-179
N.M.; Colo.: Albuquerque, Santa Fe; Redondo Park, Sangre de Cristo Mts.	69-H-327	69-HC-180
Okla.: Quachita Mts., McAlester to Ft. Smith	69-H-328	69-HC-181
Texas: Austin to Waco	69-H-329	69-HC-182
Ill.; Mo.; Ark.; Miss.: View north Memphis to St. Louis; snow in Ill. and Mo.	69-H-330	69-HC-183
Ark.; Okla.: Quachita Mts., Dardanelle Reservoir-Little Rock	69-H-331	69-HC-184
La.; Miss.: Monroe, Vicksburgh; Miss. River, Quachita River	69-H-332	69-HC-185
N.C.; Kentucky and East Tenn.; Va: View north from Georgia	69-H-334	69-HC-187
Miss.; Ark.: Greenville, Greenwood; Mississippi River	69-H-335	69-HC-188
Ala.; Birmingham, Gadsden; Coosa River, So. Appalachian Mts.	69-H-336	69-HC-189

APOLLO 9 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Fla. peninsula; view south from Jacksonville-Cross City	69-H-337	69-HC-190
Ga.: Atlanta, Marietta, Griffin, Cartersville, Newman	69-H-338	69-HC-191
S.C.: Charleston, Beaufort; Lake Moultrie	69-H-339	69-HC-192
Va.; Md.; Del.; N.J.: (Long Island visible)	69-H-340	69-HC-193
Docked CM and LM during Scott's EVA	69-H-492	69-HC-194
Astronaut Scott during EVA	69-H-493	69-HC-195
LM/S-IVB stage as viewed from CM	69-H-494	69-HC-196
View of Morocco, Spain and Portugal	69-H-495	69-HC-197
CM as viewed from LM	69-H-496	69-HC-198
Cyclonic storm north of Hawaii	69-H-497	69-HC-199
CM as viewed from LM	69-H-498	69-HC-200
CM over Rio Grande River, Gulf of California	69-H-499	69-HC-201
Bahamas	69-H-502	69-HC-204

APOLLO 10 SELECTED PICTURES

DECSRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 10 Crew	69-H-757	69-HC-503
Launch	69-H-814	69-HC-527
Recovery	69-H-831	69-HC-579
Lunar surface (Site #2)	69-H-734	69-HC-604
Apollo Command Module—Moon farside	69-H-878	69-HC-609
Lunar farside	69-H-868	69-HC-600
Crater Schmidt	69-H-871	69-HC-602
Landing Site #3	69-H-804	69-HC-472
Crater Godin	69-H-870	69-HC-601
Earth from lunar distance showing Africa and Far East	69-H-866	69-HC-598
Moon as a disk	69-H-863	69-HC-471
Lunar Module over lunar surface	69-H-862	69-HC-597
Full Earth (Western Hemisphere)	69-H-922	69-HC-487
Apollo 10 Patch	69-H-719	69-HC-519

APOLLO 11 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 11 Crew portrait	69-H-730	69-HC-469
Armstrong	69-H-968	69-HC-639
Aldrin	69-H-969	69-HC-640
Collins	69-H-970	69-HC-641
Launch	69-H-1124	69-HC-761
Recovery	69-H-1193	69-HC-813
Astronauts in Mobile Quarantine Facility meet the President	69-H-1196	69-HC-809
Astronaut Aldrin egresses Lunar Module	69-H-1264	69-HC-693
Aldrin deploys Solar Wind Composition experiment	69-H-1266	69-HC-695
Aldrin stands by deployed Solar Wind Composition	69-H-1260	69-HC-689
Good view of astronaut footprint in lunar soil	69-H-1258	69-HC-687
Astronaut's leg and foot, footprint, lunar soil	69-H-1259	69-HC-688
Closeup of Apollo 11 lunar landing commemorative plaque mounted on LM ladder	69-H-1261	69-HC-690

APOLLO 11 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Aldrin prepares to deploy two Early Apollo Science Experiments Package components	69-H-1268	69-HC-697
Aldrin prepares to deploy two Early Apollo Science Experiments Package components	69-H-1257	69-HC-686
Aldrin prepares to deploy two Early Apollo Science Experiments Package components	69-H-1265	69-HC-694
Aldrin deploys Early Apollo Science Experiments Package Passive Seismic Experiments Package	69-H-1269	69-HC-698
Passive Seismic Experiment Package deployed, Aldrin walks toward Laser Reflector-3 and Lunar Module	69-H-1267	69-HC-696
Aldrin deploys PSEP	69-H-1263	69-HC-692
Lunar terrain near LM, lunar crater and wall, shadows	69-H-1262	69-HC-691
American flag planted on Moon	69-H-1039	69-HC-662
Armstrong and Aldrin pose with American flag (taken from 16mm film—camera was operated automatically one frame per second from the LM window)	69-H-1256	69-HC-685
LM in lunar orbit with Earth in background	69-H-1271	69-HC-861

APOLLO 11 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Crater International Astronomical Union #308 as seen from from lunar orbit	69-H-1270	69-HC-860
Astronaut Aldrin full front view standing on lunar surface with visor reflecting Astronaut Armstrong	69-H-1255	69-HC-684
Astronaut Aldrin poses with American flag	69-H-1253	69-HC-682
Tranquillity Base with Aldrin, LM and experiments	69-H-1254	69-HC-683
Earth (showing most of Africa and portions of Asia and Europe)	69-H-1041	69-HC-664
Apollo 11 Patch	69-H-958	69-HC-498

APOLLO 12 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 12 crew portrait	69-H-1542	69-HC-1007
Conrad	69-H-1492	69-HC-964
Bean	69-H-1494	69-HC-966
Gordon	69-H-1493	69-HC-965
Apollo 12 patch	69-H-1596	69-HC-1012
Roll out Saturn V	69-H-1456	69-HC-977
Launch	69-H-1824	69-HC-1232
Recovery (on parachute)	69-H-1880	69-HC-1277
Crew in Mobile Quarantine Facility on carrier	69-H-1886	69-HC-1289
Astronaut with Surveyor III, LM in background	69-H-1986	
Surveyor III footpad taken by Apollo 12 astronaut	69-H-1982	
Astronaut closeup standing on Moon—reflected in his face visor is astronaut taking picture	69-H-1988	
Portrait of Surveyor III sitting on Moon	69-H-1983	
Earthrise over lunar horizon		69-HC-1321

APOLLO 12 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Lunar horizon view from Command Service Module		69-HC-1322
CSM during rendezvous		69-HC-1323
Astronaut with U.S. Flag		69-HC-1324
Astronaut with ALSEP (Apollo Lunar Surface Experiments Package		69-HC-1325
ALSEP deployment		69-HC-1326
Lunar Module, astronaut, and S-Band antenna		69-HC-1327
Astronaut on porch of Lunar Module		69-HC-1328
Astronaut on Lunar Module ladder		69-HC-1329
Lunar surface view		69-HC-1330
Lunar Module with sunglare in background		69-HC-1331
Full view of LM with astronaut at work station		69-HC-1332
Side view of Lunar Module with astronaut and TV camera		69-HC-1333
Astronaut with TV camera		69-HC-1334
Astronaut with ALSEP		69-HC-1335
Astronaut at Quadrant II on descent stage		69-HC-1336
Astronaut at Quadrant II on descent stage		69-HC-1337

APOLLO 12 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Astronaut at Quadrant II on descent stage		69-HC-1338
Astronaut carrying ALSEP		69-HC-1339
Lunar "mound"		69-HC-1340
Astronaut with LM in background and sunglare		69-HC-1341
Astronaut carrying ALSEP		69-HC-1342
Solar Wind Experiment		69-HC-1343
Astronaut with ALSEP		69-HC-1344
Central Station of ALSEP		69-HC-1345
Close up of lunar rock		69-HC-1346
Wide angle view of lunar surface with astronaut		69-HC-1347
Close up of lunar soil		69-HC-1348
Wide angle view of lunar surface and horizon		69-HC-1349

APOLLO 13 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 13 crew portrait	70-H-724	70-HC-541
Lovell	70-H-25	70-HC-30
Haise	70-H-26	70-HC-31
Swigert	70-H-475	70-HC-333
Apollo 13 patch	70-H-54	70-HC-20
Apollo 13 plaque	70-H-592	
Roll out of Saturn V	69-H-1908	69-HC-1267
Apollo 13 on launch pad	69-H-1910	69-HC-1269
Command and Service Modules mating	69-H-1791	69-HC-1261
Apollo 13 launch	70-H-487	70-HC-355
Earth (view of U.S. from Alaska to Baja, California)	70-H-691	70-HC-462
Service Module damage	70-H-512	70-HC-490
Lithium Hydroxide Canister (labeled "mailbox") cleansed the air in CM and LM	70-H-695	70-HC-464
LM jettison	70-H-661	
Full view of Moon (front side)	70-H-689	70-HC-460

APOLLO 13 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Farside Moon Crater 302	70-H-690	70-HC-463
Farside Moon Crater 302		70-HC-461
Farside Moon Crater 302		70-HC-459
Spacecraft on parachutes	70-H-658	70-HC-474
Astronauts in raft	70-H-644	70-HC-494
Astronauts on carrier deck, U.S.S. Iwo Jima	70-H-647	70-HC-467
President Nixon with Apollo 13 crew in Hawaii	70-H-711	70-HC-528

APOLLO 14 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 14 crew portrait	70-H-1537	70-HC-1115
Shepard	70-H-1538	70-HC-1112
Mitchell	70-H-1539	70-HC-1113
Roosa	70-H-1540	70-HC-1114
Launch	71-H-221	71-HC-241
Apollo 14 plaque	71-H-162	71-HC-153
Apollo 14 patch	70-H-1211	70-HC-867
Apollo 14 crew at breakfast	71-H-224	71-HC-196
Apollo 14 astronauts suiting in spacesuits	71-H-237	
Astronaut Shepard suiting in spacesuit	71-H-240	71-HC-209
Astronaut Roosa suiting in spacesuit	71-H-235	71-HC-204
Astronaut Mitchell suiting in spacesuit	71-H-239	71-HC-206
Astronauts leaving hallway of Manned Spacecraft Operations Building prior to launch	71-H-232	
Astronaut Shepard leaving van at base of gantry	71-H-284	71-HC-230
Astronaut wives, Mrs. Shepard, Mrs. Mitchell and Mrs. Roosa at press conference	71-H-229	
View of Firing Room at the Kennedy Space Center	71-H-256	71-HC-220
Prince Juan Carlos of Spain in Firing Room	71-H-262	71-HC-226

APOLLO 14 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Vice President Agnew at viewing site for launch	71-H-276	71-HC-243
Command Module Kitty Hawk with three parachutes deployed prior to splashdown in the Pacific	71-H-299	71-HC-249
Command Module Kitty Hawk floats in Pacific	71-H-300	71-HC-253
Command Module Kitty Hawk as it splashes down	71-H-307	71-HC-250
Apollo 14 crew onboard carrier U.S.S. New Orleans	71-H-315	71-HC-255
Apollo 14 crew waving inside Mobile Quarantine Facility	71-H-320	71-HC-251
Astronaut Shepard with Modular Equipment Transporter (MET) on lunar surface	71-H-357	
Astronaut Shepard standing near large rock	71-H-358	
Lunar surface, Lunar Module and tire tracks	71-H-366	71-HC-277
Astronaut Shepard standing by U.S. flag	71-H-369	71-HC-280
Lunar Module on lunar surface	71-H-371	71-HC-282
Astronaut Mitchell on lunar surface	71-H-350	
Lunar panorama	71-H-351	
Lunar panorama	71-H-352	
Lunar panorama	71-H-353	
Color chart	71-H-354	
Closeup of large boulder	71-H-355	
Large boulder	71-H-359	
Large boulder	71-H-360	

APOLLO 14 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Hammer and collection bag to show size of rocks	71-H-361	
Lunar Module on lunar surface	71-H-363	
Astronaut Mitchell with ALSEP array	71-H-364	71-HC-275
ALSEP array	71-H-365	71-HC-276
Lunar surface with MET, shadows	71-H-367	71-HC-278
Lunar surface with Lunar Module ascent	71-H-368	71-HC-279
Astronaut Shepard by base of Lunar Module	71-H-370	71-HC-281
Astronaut Shepard and Mitchell with ALSEP (16mm)	71-H-373	71-HC-284
Astronaut Shepard and Mitchell with ALSEP (16mm)	71-H-374	71-HC-285

APOLLO 15 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 15 crew portrait	71-H-1126	71-HC-905
Individual Portraits:		
Scott	71-H-1058	71-HC-850
Irwin	71-H-1059	71-HC-851
Worden	71-H-1060	71-HC-852
Plaque on lunar module	71-H-1133	
Astronaut suiting activities	71-H-1186	71-HC-942
Astronauts enter transfer van	71-H-1187	71-HC-980
Firing Room, KSC Fla.	71-H-1201	71-HC-967
Mission Operations Control Room, JSC Houston, Tex.	71-H-1153	71-HC-1114
Saturn V leaves VAB on crawler	71-H-853	71-HC-733
Apollo 15 launch July 26, 1971	71-H-1196	71-HC-992
Recovery:		
Command module with parachutes deployed prior to splashdown	71-H-1260	71-HC-1004
Command module splashdown August 7, 1971	71-H-1264	71-HC-1002
Astronauts in life raft	71-H-1237	71-HC-1009
Apollo 15 crew leave helicopter on board USS Okinawa	71-H-1238	71-HC-1010
Onboard Photography:		
Astronaut Worden EVA	71-H-1406	71-HC-1145
Irwin, Lunar Rover and part of lunar module	71-H-1412	71-HC-1139
Irwin at Rover—Mt. Hadley in background	71-H-1413	71-HC-1140

APOLLO 15 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Onboard Photography cont'd:		
Lunar module, rover, Irwin saluting beside flag and Hadley Delta in background	71-H-1414	71-HC-1141
Scott saluting beside flag, part of LM	71-H-1415	71-HC-1142
Rover alone and west edge of Mt. Hadley	71-H-1416	71-HC-1143
Command and service modules in lunar orbit	71-H-1417	71-HC-1144
Irwin walking away from rover	71-H-1418	
Irwin at rover, Hadley Delta in background	71-H-1420	
LM, Flag, Solar Wind Composition experiment	71-H-1421	
Irwin making trench with scoop—Mt. Hadley in background	71-H-1422	
Scott with tongs and gnomon at boulder on slope of Hadley Delta—Rover in right foreground	71-H-1424	
Scott with 70mm camera on Hadley Delta slope	71-H-1425	
Scott and Rover on edge of Hadley Rille	71-H-1426	
Irwin holding rover	71-H-1283	71-HC-1147
Apollo Lunar Surface Experiments Package *deployment*	71-H-1285	71-HC-1149
Irwin, Rover and LM—Hadley Delta background	71-H-1287	71-HC-1151
Lower part of LM—Apennine front in background	71-H-1289	71-HC-1153
VHF and Docking Antenna—St. George crater in background taken during SEVA	71-H-1292	71-HC-1156
Scott using lunar drill—solar wind experiment in foreground	71-H-1295	71-HC-1159
Rover and lunar module—mountains in background	71-H-1296	71-HC-1160
Command and service modules above lunar horizon	71-H-1298	71-HC-1162

APOLLO 15 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Lunar surface as viewed from command module in orbit	71-H-1299	71-HC-1163
Lunar surface as viewed from command module in orbit	71-H-1300	71-HC-1164
Lunar surface features with sun flares and reflection caused by glares as photographed from command module	71-H-1302	71-HC-1166
Memorial plaque and small figure representing fallen astronaut placed in small crater	71-H-1430	71-HC-1148
Apollo 15 Patch	71-H-810	71-HC-691

APOLLO 16 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
John Young in spacesuit	71-H-1719	71-HC-1339
Charles Duke in spacesuit	71-H-1694	71-HC-1314
Thomas K. Mattingly in spacesuit	71-H-1708	71-HC-1328
Apollo 16 flight crew portrait	72-H-50	72-HC-31
Apollo 16 mission insignia	71-H-1751	71-HC-1414
Apollo 16 launch	72-H-464	72-HC-319
Apollo 16 plaque	72-H-425	72-HC-320
Apollo 16 pre-launch on complex 39-A	72-H-398	72-HC-262
Apollo 16 flight crew readiness	72-H-444	72-HC-305
Lunar module lift-off from Moon(TV)	72-H-534	72-HC-274
Apollo 16 recovery - splashdown	72-H-474	72-HC-323
Onboard Photography:		
Young walks on the lunar surface. Rover parked in left background	72-H-611	72-HC-412
Young uses lunar surface rake. Gnomon is at his left foot	72-H-612	72-HC-413
Young uses lunar surface rake. Gnomon is at his right foot	72-H-613	72-HC-414
Duke family photograph in protective covering lying on lunar surface.	72-H-614	72-HC-415
Distant view of Lunar Module (center background) taken from the Lunar Roving Vehicle. TV camera on right. High gain antenna on left	72-H-615	72-HC-416
Duke examines closely a large boulder	72-H-616	72-HC-417

APOLLO 16 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Duke examines large boulder. Lunar surface rake leans against rock	72-H-617	72-HC-418
Onboard Photography cont'd:		
Closeup view of boulder being examined by Duke.	72-H-618	72-HC-419
Duke works at Lunar Roving Vehicle in center background. Small rocks and boulders scattered about	72-H-619	72-HC-420
Young works at Lunar Roving vehicle on left. Lunar Module at right.	72-H-620	72-HC-421
Closeup view of boulder and depression shown at its former position (prior to being rolled over by the astronauts)	72-H-621	72-HC-422
View looking into small crater with rocks strewn around the edge	72-H-622	72-HC-423
Lunar Module leg and footpad with deployed Cosmic Ray Detector experiment. Small boulder near footpad.	72-H-623	72-HC-424
Lunar Module on left. Rover on right with Young behind Rover	72-H-606	72-HC-400
Duke near Ultraviolet Camera/Spectrograph in shade of Lunar Module. Rover and U.S. flag in background	72-H-624	72-HC-425
Duke walking. Stone Mountain in background	72-H-625	72-HC-426
View looking toward Plum Crater. Rover parked on far rim of crater	72-H-626	72-HC-427
Young working with lunar surface drill at site of Apollo Lunar Surface Experiment Package (ALSEP) deployment. The Lunar Surface Magnetometer (LSM) is in the foreground	72-H-627 72-H-628	72-HC-428 72-HC-429

APOLLO 16 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Rover in center background. Stone Mountain far background as viewed from ALSEP site. Note Heat Flow Experiment in right foreground.	72-H-628	72-HC-429
ALSEP components deployed. Passive Seismic Experiment in foreground. Central Station (C/S) for ALSEP is in center background	72-H-629	72-HC-430
Young leaps up from the lunar surface to salute the U.S. flag during the first Apollo 16 extravehicular activity. Lunar Module and Rover are on the left. Stone Mountain in background	72-H-601	72-HC-405

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Onboard Photography cont'd:		
Command and Service Modules are viewed from Lunar Module above the lunar surface	72-H-630	72-HC-431
Earth rising above the lunar horizon	72-H-631	72-HC-432
Command and Service Modules viewed from Lunar Module. Lunar surface in background	72-H-632	72-HC-433
Lunar Module in lunar landing configuration as viewed from Command and Service Modules	72-H-633	72-HC-434
Lunar Module in lunar landing configuration as viewed from Command and Service Modules	72-H-634	72-HC-435
Good view of the earth. Much cloud cover. Mexico and	72-H-635	72-HC-436
much of southwestern United States clearly visible	72-H-636	72-HC-437
Lunar surface viewed from spacecraft in lunar orbit	72-H-639	72-HC-440
Full moon as viewed from Command and Service Modules	72-H-640	72-HC-441
during transearth coast	72-H-641	72-HC-442
Lunar Module ascent stage as viewed from the Command	72-H-642	72-HC-443
and Service Modules prior to docking. Sea of	72-H-643	72-HC-444
Fertility is below. Note damaged panels.	72-H-644	72-HC-445
Lunar Module ascent stage as viewed from the Command	72-H-645	72-HC-446
and Service Modules prior to docking. Sea of Fertility is below.	72-H-646	72-HC-447
Distant view of Lunar Module ascent stage returning from lunar surface as viewed from the Command and Service Modules.	72-H-647	72-HC-448
Vertical view of mound features on lunar nearside	72-H-648	72-HC-449

APOLLO 17 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Apollo 17 Crew Portrait	72-H-1209	72-HC-872
Individual Portraits:		
Eugene A. Cernan	71-H-1689	71-HC-1309
Harrison H. Schmitt	71-H-1895	71-HC-1483
Ronald E. Evans	71-H-1698	71-HC-1318
Apollo 17 Mission Emblem	72-H-1264	72-HC-721
Saturn V on the pad	72-H-1206	72-HC-869
Night shot of Saturn V on the pad	72-H-1454	72-HC-847
Prelaunch dinner	72-H-1514	72-HC-877
Astronaut suiting activities	72-H-1519	72-HC-878
Cernan in white room prior to entering spacecraft	72-H-1530	72-HC-891
Apollo 17 launch December 7, 1972	72-H-1529	72-HC-889
Firing room, Kennedy Space Center, FL.	72-H-1524	72-HC-888

APOLLO 17 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Replica of the plaque left on the Moon	72-H-1541	–
Recovery:		
Command Module with parachutes deployed, splashdown in Pacific December 19, 1972.	72-H-1552	72-HC-918
Command Module in water with helicopter above and USS Ticonderoga in background.	72-H-1560	72-HC-905
Apollo 17 crew leave helicopter onboard USS Ticonderoga.	72-H-1557	72-HC-907
Onboard Photography:		
Cernan stands near overhanging rock with Gnomon just outside shaded area.	72-H-1586	–
Close-up view of orange soil.	72-H-1585	72-HC-935
Cernan behind LRV's high gain antenna with Earth in distant background.	72-H-1584	72-HC-934
View of orange soil at Shorty Crater and Gnomon.	72-H-1583	72-HC-933
Close-up of Lunar Roving vehicle's makeshift repair arrangement on right rear fender.	72-H-1582	72-HC-932
Schmitt standing next to huge, split lunar boulder.	72-H-1581	72-HC-931
Schmitt next to U.S. flag with Earth in far distant background.	72-H-1580	72-HC-930
Wide-angle view showing Schmitt working at LRV—orange soil visible on either side of Rover.	72-H-1579	72-HC-929
Earth: Mediterranean Sea area to Antartica South Polar ice cap, African coastline, Arabian Peninsula, Malagasy Republic	72-H-1578	72-HC-928
Schmitt working beside huge boulder at base of North Massif—LRV front visible on left.	72-H-1576	72-HC-927

APOLLO 17 SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Command Service Module viewed from Lunar Module during rendezvous & docking maneuvers.	72-H-1575	72-HC-926
Evans performing EVA during transearth coast.	72-H-1574	72-HC-925
Cernan making short checkout of "stripped down" LRV, east end of South Massif in background.	72-H-1573	72-HC-924
Schmitt seated in LRV at Van Serg Crater.	72-H-1572	72-HC-923
Schmitt collects lunar rake samples at station 1.	72-H-1571	72-HC-922
Full Moon after TEI, 1/3rd of surface visible is lunar farside.	72-H-1633	72-HC-978
Cernan walking toward Rover, deployed U.S. flag behind him.	72-H-1596	72-HC-941
Crescent earthrise prior to TEI, lunar farside in foreground.	72-H-1631	72-HC-976
Expended S-IVB after LM extraction as seen from CSM, black sky.	72-H-1628	72-HC-973
Cernan drives Rover beside LM, south Massif in background.	72-H-1614	72-HC-959
Cernan unveiling commemorative plaque at Lunar Module ladder.	72-H-1605	72-HC-950
Large boulder with multiple cracks which Schmitt described in detail.	72-H-1598	72-HC-943
Lunar Module ascent stage against black sky, seen from CSM during rendezvous	72-H-1636	72-HC-981
Reproduction taken from color TV transmission of the Lunar Module liftoff from the Lunar surface.	72-H-1543	72-HC-903

SKYLAB I SELECTED PICTURES*

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Skylab Patch (Mission Emblem)	73-H-237	73-HC-228
Skylab I Prelaunch	73-H-416	73-HC-425
Skylab I Launch	73-H-431	73-HC-422

*Skylab I launched May 14, 1973 (space station unmanned)

SKYLAB II SELECTED PICTURES*

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Skylab II Crew Portrait (Conrad-Weitz-Kerwin)	73-H-338	73-HC-301
Individual Portraits:		
Charles Conrad Jr.	69-H-1492	69-HC-964
Paul J. Weitz	71-H-1718	71-HC-1338
Joseph P. Kerwin	71-H-1874	71-HC-1471
Skylab II Patch	73-H-107	73-HC-94
Skylab II Prelaunch	73-H-103	73-HC-92
Skylab II Launch	73-H-433	73-HC-459
Parachute Deployment	73-H-526	73-HC-476
Parachute Impact	73-H-527	73-HC-477
Astronauts leave spacecraft	73-H-535	73-HC-486
Skylab space station taken from Command Module showing parasol deployed and solar panel.	73-H-578	73-HC-463
Skylab space station taken from Command Module	73-H-580	73-HC-465
Astronaut Kerwin gives oral exam to Conrad	73-H-584	73-HC-469
Astronaut Conrad takes a shower in space	73-H-585	73-HC-470
Astronaut Kerwin EVA	73-H-587	73-HC-523
Astronaut Weitz gets haircut from Conrad	73-H-588	73-HC-524

*Skylab II launched May 25, 1973, recovery June 22, 1973

SKYLAB II SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Space station cluster	73-H-589	73-HC-525
Astronaut Weitz gets physical exam from Kerwin	73-H-590	73-HC-526
Astronaut Weitz mans control and display panel	73-H-591	73-HC-527
View of OWS showing micrometeoroid shield missing where parasol solar shield was later deployed	73-H-582	73-HC-467
O'Neill, Nebraska area	73-H-622	73-HC-509
St. Louis, Missouri area: Mississippi River, Mouth of Missouri River, East St. Louis, Illinois	73-H-623	73-HC-510
Paducah, Kentucky area: Ohio River, Illinois, Kentucky Lake on Tennessee River, Lake Barkley on Cumberland River, Ohio River flows into Mississippi River	73-H-624	73-HC-511
Western area of Puerto Rico, City of Mayaguez	73-H-625	73-HC-512
Southeastern Utah: San Rafael Swell and Capital Reef	73-H-626	73-HC-513

SKYLAB III SELECTED PICTURES*

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Skylab III Crew Portrait (Bean-Garriott-Lousma)	73-H-679	73-HC-592
Individual Portraits:		
Alan L. Bean	69-H-1494	69-HC-966
Owen K. Garriott	71-H-1699	71-HC-1319
Jack R. Lousma	71-H-1883	71-HC-1480
Skylab III Patch	73-H-108	73-HC-95
Suiting	73-H-746	73-HC-629
Skylab III Launch	73-H-740	73-HC-638
Recovery Skylab III - CMS in water	73-H-911	73-HC-730
Astronauts on carrier after recovery	73-H-920	73-HC-737
Parachutes reefing from CMS	*73-H-930*	73-HC-746
Skylab space station in orbit	73-H-928	73-HC-744
Garriott during EVA	73-H-934	73-HC-750
Space spider - Arabella	73-H-926	73-HC-742
Lousma - EVA	73-H-925	73-HC-741
Skylab III Roll-out	73-H-501	73-HC-363
Skylab III S-IVB stage expended	73-H-971	73-HC-784

*Skylab III launched July 29, 1973, recovery September 25, 1973

SKYLAB III SELECTED PICTURES*

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Skylab III crewman - EVA	73-H-979	73-HC-792
Lousma - EVA - AM Experiment	73-H-975	73-HC-788
Bean - OWS - M172 Experiment	73-H-974	73-HC-787
Garriott eating in quarters (OWS)	73-H-972	73-HC-785
Night time undocking	73-H-970	73-HC-783
View of Chicago	73-H-941	73-HC-754
View of New York City	73-H-943	73-HC-756
View of California	73-H-967	73-HC-780
View of Chile-Argentina	73-H-966	73-HC-779
View of Hurricane Ellen	73-H-962	73-HC-775

*Skylab III launched July 29, 1973, recovery September 25, 1973

SKYLAB IV SELECTED PICTURES*

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Skylab IV Crew Portrait (Pogue-Carr-Gibson)	73-H-882	73-HC-705
Individual Portraits:		
William R. Pogue	71-H-1865	71-HC-1462
Gerald P. Carr	71-H-1688	71-HC-1308
Edward G. Gibson	71-H-1879	71-HC-1476
Skylab IV Patch	73-H-109	73-HC-96
Skylab IV Prelaunch	73-H-792	73-HC-642
Skylab IV Launch	73-H-1240	73-HC-897
Recovery Skylab IV CMS in water	74-H-50	74-HC-49
Astronauts on carrier	74-H-101	74-HC-71
Two Skylab IV crewmen, Pogue & Carr, are seen passing trash bags through the trash airlock of the Orbital Workshop of the Skylab space station.	74-H-93	74-HC-73
An overhead view of the Skylab space station cluster in Earth orbit as photographed from the Skylab 4 Command and Service Modules.	74-H-98	74-HC-78
Astronaut Gerald P. Carr, commander of the Skylab 4 mission, flies the Astronaut Maneuvering Equipment M509 Experiment.	74-H-94	74-HC-74

*Skylab IV launched November 16, 1973, recovered February 8, 1974.

SKYLAB IV SELECTED PICTURES*

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Astronaut Gibson, Skylab 4 science pilot, stands at the Apollo Telescope Mount (ATM) console in the Multiple Docking Adapter (MDA) of the Skylab space station cluster in Earth orbit.	74-H-95	74-HC-75
A near vertical view of the snow-covered northwest corner of Wyoming as seen from the Skylab.	74-H-97	74-HC-77
A vertical view of the Gulf of St. Lawrence area of Canada as seen from the Skylab.	74-H-99	74-HC-79
View of the Skylab space station cluster in Earth orbit was taken from the Skylab 4 Command and Service Modules.	74-H-96	74-HC-76

ASTP SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
PRE-LAUNCH		
ASTP Crew Portrait (Astronauts and Cosmonauts)	75-H-193	75-HC-88
ASTP Crew Patch	75-H-114	75-HC-50
ASTP Emblem	74-H-162	74-HC-121
ASTP Crewmen shown at the Baykonur launch complex	75-H-421	NC
ASTP Crewmen visits White House	74-H-807	74-HC-472
ASTP Crewmen visits Moscow	74-H-748	NC
Artist concept of the ASTP docking Project	75-H-423	75-HC-253
Artist concept of the ASTP historic meeting in space	75-H-249	75-HC-133

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
LAUNCH DAY CAPE KENNEDY		
ASTP Crewmen enjoy pre-launch breakfast in the crew headquarters at KSC	75-H-760	75-HC-425
ASTP astronauts have their pressure suits checked out	75-H-766	75-HC-431
ASTP astronauts enter the van for the trip to the launch pad.	75-H-762	75-HC-426
Liftoff from KSC	75-H-768	75-HC-433
Soviet Ambassador to the U. S. and NASA Administrator watch the ASTP launch	75-H-778	75-HC-435
Russian Cosmonauts prepare for trip to launch pad.*	75-H-865	NC
Liftoff from USSR*	75-H-869	NC

*From TV Monitor

ASTP SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
RECOVERY		
ASTP Apollo Command Module landed into the Pacific Ocean west of Hawaii.	75-H-788	75-HC-451
ASTP Apollo's three main parachutes collapse as spacecraft touches down in the Pacific Ocean	75-H-790	75-HC-455
Members of the Pacific Recovery Task Force secure the ASTP Apollo spacecraft	75-H-789	75-HC-454
ASTP astronauts speak via telephone to President Ford from aboard the recovery ship	75-H-779	NC
ONBOARD PHOTOS		
Soviet Soyuz spacecraft photographed from window of the American Apollo spacecraft	75-H-890 75-H-892 75-H-894	75-HC-490 75-HC-492 75-HC-494
Astronaut Vance D. Brand, command module pilot	75-H-887	75-HC-487
Stafford and Leonov shake hands in Earth orbit.	75-H-889	75-HC-489

ASTP SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Astronaut Stafford and Cosmonaut Leonov are photographed at the hatchway leading between the two spacecrafts.	75-H-896	75-HC-496
Slayton and Leonov in Orbital Module	75-H-880	75-HC-480
Astronauts Stafford and Slayton visit the Soviet Soyuz spacecraft during the joint phase	75-H-897	75-HC-497
Cosmonauts Kubasov and Leonov in Orbital Module	75-H-883	75-HC-483
Cosmonaut Kubasov in Orbital Module	75-H-881	75-HC-481

ASTP SELECTED PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Astronaut Stafford and Cosmonaut Leonov are shown in Soviet Soyuz spacecraft	75-H-878	75-H-478
RUSSIAN ONBOARD		
View of Apollo from Soyuz (front view)	75-H-1078	75-HC-647
View of Apollo from Soyuz (side view)	75-H-1079	75-HC-648
RUSSIAN LAUNCH DAY & RECOVERY		
Soyuz on Launch Pad	75-H-844	75-HC-606
Cosmonaut Leonov & Kubasov suited up	75-H-842	NC
Launch	75-H-1081	75-HC-650
Recovery of Soyuz	75-H-846	NC

SELECTED PIONEER 10 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Pioneer F Plaque	72-H-192	
Jupiter's Red Spot, and a shadow of the Moon, Io.	73-H-1164	73-HC-964
Artist's concept of Pioneer over Jupiter's Red Spot.	72-H-140	72-HC-110
Jupiter's Great Red Spot	73-H-1278	73-HC-864
Jupiter's Red Spot, and a shadow of the Moon, Io.	73-H-1281	
Images taken of Jupiter in red light (left) and blue light increase in detail as Pioneer approaches Jupiter.	73-H-1286	
Image of Jupiter showing the Great Red Spot.	73-H-1161	
Technicians make final adjustments to Pioneer F spacecraft.	72-H-69	72-HC-42

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Pioneer 11 spacecraft during checkout with mockup of launch vehicle's third stage.	73-H-206	73-HC-185
Pioneer 11 launch by an Atlas/Centaur from Kennedy Space Center, Fla. on 4/6/73.	73-H-241	73-HC-232
Pioneer 11 Photos of Jupiter:		
Jupiter series of images from 4.9 million miles taken 11/26/74.	74-H-1088	74-HC-646
Jupiter's Great Red Spot from 4 million miles, series taken 11/27/74.	74-H-1089	74-HC-650
Jupiter images taken 11/28/74	74-H-1102	–
Jupiter images from 2.9 million miles taken 11/29/74.	74-H-1105	74-HC-651
Jupiter's brightly banded weather zones are well defined in this image made 12/1/74 from 1.4 million miles.	74-H-1111	74-HC-652
Computer-rectified images of Jupiter received 11/24/74 from 6 million miles.	74-H-1107	74-HC-653
Jupiter taken 12/2/74.	74-H-1108	–
Jupiter's belts and zones and relatively featureless north polar regions taken 12/3/74 from 26,000 miles.	74-H-1136	74-HC-656
Jupiter's Great Red Spot taken from 238,000 miles on 12/2/74.	74-H-1135	74-HC-655

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Rectified images of Jupiter taken in red and blue light on 11/30/74 from 2.2 million miles, shows Great Red Spot and much of zone-and-belt marking.	74-H-1152	–
Rectified images of Jupiter taken in red and blue light on 11/30/74 from 2.3 million miles.	74-H-1153	–
Rectified images of Jupiter taken in red and blue light on 11/30/74 from 2 million miles.	74-H-1151	–
Rectified images of Jupiter taken in red and blue light on 11/30/74 from 2.1 million miles.	74-H-1150	–
Jupiter and its large moon Callisto taken on 12/1/74 from 1.1 million miles.	74-H-1149	–
Rectified images of Jupiter and moon Io faintly seen over north pole from over a million miles away taken 12/1/74.	74-H-1158	–
Rectified images of Jupiter taken 12/1/74 from 1,428,000 miles away.	74-H-1157	–
Rectified image of Jupiter's Great Red Spot made from 660,000 miles out on 12/2/74.	74-H-1160	–
Jupiter and Ganymede taken on 12/2/74 from 463,000 miles.	74-H-1155	–
Jupiter's Great Red Spot taken on 12/2/74 from 238,000 miles.	74-H-1154	–
Two pictures taken of Jupiter's north pole on 12/4/74 from 1.3 million miles.	74-H-1159	74-HC-667

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Rectified image of Jupiter and moon Io seen over Jupiter's north pole from over a million miles away.	–	74-HC-668
Rectified image of Jupiter and moon Io seen above and to right of Jupiter's north pole from 1,428,000 miles away 12/1/74.	–	74-HC-669
Rectified image of Jupiter and satellite Europa taken 11/30/74 from more than 2 million miles.	–	74-HC-665
Rectified image of Jupiter and moon Io taken on 11/30/74 from more than 2 million miles.	–	74-HC-666
Jupiter's Great Red Spot made from 660,000 miles on 12/2/74.	–	74-HC-673
Rectified image of Jupiter's south polar region.	–	74-HC-674
Jupiter's north pole from 750,000 miles.	74-H-1167	74-HC-680
Jupiter's north pole from about 750,000 miles.	74-H-1166	74-HC-679
Jupiter's north pole from about 750,000 miles.	–	74-HC-675
VENUS Pioneer Orbiter & Multiprobe—engineers perform final work	78-H-215	78-HC-165
Pioneer Venus I/Orbiter—technicians at Kennedy Space Center prepare spacecraft for launch	78-H-247	78-HC-195
Pioneer Venus 2/Multiprobe—shortly before encapsulation in payload fairing	78-H-499	78-HC-411

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Pioneer Venus 1 launch May 20, 1978 by an Atlas-Centaur from Kennedy Space Center	78-H-297	78-HC-231
Pioneer Venus 2 launch August 8, 1978 by an Atlas-Centaur from KSC	78-H-529	78-HC-439
First image of Venus' N. hemisphere by Infrared Radiometer, Dec. 1978	78-H-733	78-HC-573
Computer enhancement of 78-HC-573/78-H-733	78-H-734	78-HC-574
Pioneer Venus Orbiter Ultraviolet spectrometer showing atomic hydrogen cloud surrounding Venus	78-H-735	78-HC-575
Sunrise on Venus—First picture taken by the Orbiter's Cloud Photopolarimeter, constructed from measurements Dec. 5.	78-H-731	78-HC-576
Second view of crescent Venus in UV taken by the Cloud Photopolarimeter Dec. 7.	78-H-737	78-HC-577
Crescent Venus seen in light emitted by atomic oxygen in the planet's upper atmosphere taken by UV spectrometer experiment.	78-H-744	78-HC-582
Polar view of Venus by the Infrared Radiometer aboard the Orbiter during orbit 1 on Dec. 5.	78-H-745	78-HC-583

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Cloud map of Venus from data returned by the Infrared Radiometer during orbit 1, Dec. 5.	78-H-747	78-HC-585
Third view of crescent Venus taken in UV light by the Cloud Photopolarimeter by Orbiter on Dec. 10	78-H-746	78-HC-584
Venus — Two views by imaging experiment:	79-H-21	78-HC-24
Left — Dec. 25, area is within the arms of a dark horizontal Y-shaped feature, clouds in this region form cellular patterns suggestive of convective activity in the atmosphere.		
Right — Data acquired 16 days later, again show dark, horizontal Y feature.		
Venus taken by Cloud Photopolarimeter Dec. 25, showing S. hemisphere with the south pole near the bottom of the picture, bright "polar ring" feature and circumpolar features poleward of the bright ring.	79-H-52	79-HC-43
Venus taken by Cloud Photopolarimeter Dec. 30 from an altitude of 43,000 km, showing both hemispheres, brightness of the polar ring regions.	79-H-53	79-HC-44
Venus taken by Cloud Photopolarimeter Jan. 10, 1979 from an altitude of 48,000 km, showing dark, horizontal Y feature as viewed from a point nearly above the equator.	79-H-54	79-HC-45

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Venus taken by Cloud Photopolarimeter Jan. 14, 1979 from 65,000 km, showing clouds at a phase angle, bright polar rings, numerous bow-like waves in the subpolar region, and the northern arm of the Y.	79-H-55	79-HC-46
First close-up full-disc picture of Venus taken by a spacecraft. Orbiter image taken at 65,000 km on Feb. 19, showing turbulent, cloudy, atmosphere with bright cloud areas wrapping around both polar regions; clouds moving rapidly around planet from East to West; mottled, small features near center of the image; and characteristic Y feature faintly visible, covering most of central part of disc.	79-H-142	79-HC-106
Venus, false-color image by University of Colorado's UV Spectrometer experiment January 4, 1979	79-H-278	79-HC-207
Full-disc image of Venus taken Feb. 14, 1979 from 59,000 km, showing the terminator at the bottom of the picture. Prominent features are a series of circumequatorial belts. Bright polar cloud in the southern hemisphere shows a disturbance extending equatorward near terminator. Arms of the dark Y appears on disc.	79-H-300	79-HC-221
Full-disc image of Venus taken Feb. 11, 1979 from 65,000 km. This image shows what appears to be the dark tail of the Y near the middle of the disc with a faint indication of the arms of the Y extending beyond the limb.	79-H-299	79-HC-222

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
False-color infrared map of Venus obtained from Mt. Hopkins Observatory in Arizona at the time the Pioneer Venus probes entered the atmosphere	79-H-284	79-HC-216
Full-disc picture of Venus taken on Feb. 10, 1979, from 65,000 km. It perhaps shows an arm, in the S. hemisphere, of the Y with little indication of a N. hemisphere counterpart. This image shows very irregular versions of the dark Y.	79-H-298	79-HC-223
Full-disc image of Venus taken on Mar. 3, 1979 from 66,000 km. The dominant feature in this image is a family of bow shapes extending from the west to the center of the disc.	79-H-297	79-HC-224
Venus Rift Valley—Artist's impression of the newly-discovered rift valley. Measurements were made by the radar mapping instrument on the Orbiter.	79-H-222	79-HC-163
Crescent earth taken about 24 hours after launch	78-H-573	–
Venus polar view-an infrared cloud map of the region seen at high resolution	79-H-57	–
The first high resolution infrared image of Venus clouds polar view	79-H-56	–
Venus taken on 12/25/78 (l) and 16 days later (r) showing the dark, horizontal Y feature	79-H-21	79-HC-24

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Entry sites of the Pioneers are marked on this false color map of Venus	79-H-286	79-HC-218
False color infrared map of Venus with the entry sites of the Pioneers marked	79-H-285	79-HC-217
Lowland of Venus northern hemisphere	79-H-291	–
These images show the variation of illumination of Venus from 12/25/78 to 3/24/79	79-H-294	–
These images show the evolution of the dark, horizontal Y shaped feature	79-H-295	–
These 4 images of Venus were taken between 2/2/79 and 3/3/79	79-H-296	–
Venus' clouds as viewed from above the north pole	79-H-364	–
SATURN Saturn, its satellite Tethys from 4,232,000 km, taken 8/28/79, frame #48.	–	79-HC-429
Saturn's rings and its Cassini and French Divisions, Frame F-6.	–	79-HC-437
Four photos of Saturn as Pioneer approached it.	79-H-581	–

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Saturn and Titan taken in blue light (top) and red light (bottom)	79-H-572	–
Saturn as seen by Pioneer as it was outbound, Frame G-8.	–	79-HC-440
Saturn and its rings taken from a distance of 2,500,000 km.	79-H-677	–
Saturn's equatorial region taken Sept. 1, at 3:15 a.m., PDT from 309,200 miles.	–	79-HC-436
Saturn's rings and moon Tethys taken August 31, at 4 p.m., PDT from 585,950 miles.	–	79-HC-434
Saturn's rings system and its shadow taken August 31, at 7:32 a.m., PDT from 971,200 miles.	–	79-HC-435
Saturn's rings and Rhea taken Sept. 1, at 11:00 p.m., PDT from 2,579,000 km.	–	79-HC-433
Saturn and its satellite Titan taken August 31, from 1,768,422 miles.	–	79-HC-432
Saturn and its rings taken August 27 at 7:15 a.m., PDT, from 2,600,000 miles.	–	79-HC-427
Saturn and its rings taken August 25, from 3,425,000 miles	–	79-HC-424

SELECTED PIONEER 11 PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Saturn's rings seen for the first time taken August 22, at 4:06 p.m., PDT from 5,183,000 miles.	–	79-HC-423
Saturn, mosiac of four pictures as they approach the planet	79-H-581	–
Saturn's Moon		
Saturn's moon Titan seen for the first time by Pioneer on Sept. 2, at 11:30 a.m., PDT from 230,000 miles.	79-H-584	79-HC-439

GENERAL INTEREST PICTURES ON THE NASA SPACE PROGRAM

SUBJECT	DATE	DESCRIPTION	B&W	COLOR
Original 7 astronauts			61-MR4-1	Astro. Train-17
Vanguard I	3/17/58	Launch	N/A	67-HC-488
Explorer I	2/1/58	Launch	Space-12	N/A
TIROS I	4/1/60	Launch	60-TIROS-33	TIROS-12
Freedom 7	5/5/61	Spacecraft	61-MR3-27	MR3-10
Mercury-Redstone 3	5/5/61	Launch	61-MR3-72A	MR-3-8
Ranger I	8/23/61	Launch	61-Ranger-15	Ranger I-22
Friendship 7	2/20/62	Spacecraft	62-MA6-74	MA6-1
Atlas	2/20/62	Launch	62-MA6-111	MA6-36
Mariner II	8/27/62	Launch	62-Mariner II-16	Mariner-Mars II-20
Gemini III	3/23/65	Spacecraft	65-H-406	65-HC-141
Gemini III	3/23/65	Launch	65-H-448	Gemini 3-83
Sureyor I	5/30/66	Launch	66-H-1094	66-HC-307
Lunar Orbiter I	8/10/66	Launch	66-H-1094	66-HC-1352
Lunar Orbiter I	8/10/66	First view of Earth	67-H-218	N/A
Lunar Orbiter I	8/10/66	First view of Moon	66-H-1379	N/A

GENERAL INTEREST PICTURES ON THE NASA SPACE PROGRAM

SUBJECT	DATE	DESCRIPTION	B&W	COLOR
Advanced Technology Satellite	11/5/67	Launch	67-H-1543	67-HC-721
Advanced Technology Satellite	11/5/67	Full Earth	67-H-1552	67-HC-723
Mercury Redstone II	1/31/61	Chimp Ham	61-H-MR2-18	MR2-17
Mercury Atlas V	11/29/61	Chimp Enos	61-MA5-17	MA5-16
Surveyor I	6/16/66	Lunar rock	66-H-794	66-HC-531
Surveyor III	4/26/67	Footpad	67-H-491	67-HC-217

SELECTED PICTURES OF PLANETS AND OTHER SPACE PHENOMENA

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Aurora	68-H-51	68-HC-18
Solar Eclipse taken in 1966		67-HC-375
Artist Concept of our Solar System	67-H-970	67-HC-153
Solar Eclipse taken in 1966		67-HC-374
Saturn	67-H-1539	69-HC-1005
Solar Eclipse taken in 1970	70-H-459	70-HC-309
Aurora Borealis	69-H-1796	69-HC-1141

SELECTED PICTURES OF PLANETS

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Earth from Apollo 17	72-H-1578	72-HC-928
Mars (telescope view)	70-H-1651	71-HC-812
Mars (Mariner fly by mosaic)	74-H-650	NC
Venus (Telescope view)	72-H-914	67-HC-466
Venus (Mariner fly by)	74-H-185	74-HC-133
Saturn (telescope view)	73-H-224	73-HC-219
Jupiter (telescope view)	71-H-1660	70-HC-1143
Jupiter (Pioneer fly by)	74-H-255	74-HC-151
Mercury (telescope view)	70-H-1657	NC
Mercury (Mariner fly by mosaic)	75-H-1085	NC
Uranus	70-H-784	NC

SELECTED VIKING PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Mating of first Viking Orbiter and Lander	75-H-230	75-HC-111
Mating of second Viking Orbiter and Lander	75-H-752	NC
Launch of Viking I	75-H-818	75-HC-466
Launch of Viking II	75-H-975	75-HC-569
Landing site (map of Mars)	75-H-979	75-HC-570
Theme art-on the way to Mars	75-H-724	75-HC-503
Artist concept of Lander on the surface of Mars	73-H-329	73-HC-293
Viking emblem	75-H-277	75-HC-146

VIKING I ORBITER PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
First view of Mars from 9½ million miles	76-H-398	
Mars from 7 million miles	76-H-420	
Mars (½) from 425,000 miles	76-H-457	
Mars from 348,000 miles	76-H-458	
Mars from 350,000 miles	76-H-459	
Mars from 225,000 showing "Grand Canyon"	76-H-465	
Photo while in orbit of Chryse Region	76-H-469	
Orbit photo of crater on an "Island"	76-H-470	
"Island" in the Chryse Region	76-H-471	
Crater Yuty from 1165 miles	76-H-474	
"Island" in the Ares Valley	76-H-475	
Pre-selected landing site for Viking I	76-H-476	
Mars from 560,000 km	76-H-477	76-HC-618
12 overlapping photos showing pre-selected site	76-H-478	
5 overlapping photos of Chryse Region	76-H-479	
Alternate landing site in Chryse Region	76-H-485	
Plateau in the Chryse Region	76-H-491	

VIKING I ORBITER PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Pre-selected landing area V-II Cydonia area	76-H-492	
Chryse Planitia (mosaic)	76-H-497	
Mosaic of Viking II prime landing site	76-H-498	
Mosaic of Chryse Planitia	76-H-499	
Gangis Chasma (Ganges Canyon)	76-H-513	
Martian volcano	76-H-628	
Mars, showing Argyre Basin and south pole area		76-HC-624
Stero coverage of Mars looking southeast from the spacecraft	76-H-752	76-HC-774
New landing site for Viking I (23. N. Lat; 43.4 W. Long)	76-H-514	
Crater near landing site for Viking II	76-H-515	
Valles Marineris	76-H-517	
Capri (C-1) potential landing site for Viking II	76-H-522	
Fault zones 2° south of equator	76-H-523	
Mosaic of western part of Chryse Planitia	76-H-524	
Western part of Chryse Planitia	76-H-526	
Mosaic of wester Chryse Planitia	76-H-527	
Area W-NW of original Viking I landing site	76-H-528	

VIKING I ORBITER PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Western Chryse Planitia	76-H-529	
Crater in Lunae Planitia	76-H-535	
Landing site for Viking I in Chryse Planitia	76-H-536	
Oblique view of Argyre Planitia	76-H-543	
Aiming point for Viking I landing	76-H-551	
Phobos by Viking Oribiter	76-H-575	
Mars area west of Argyre	76-H-576	
Huge rock formation looks like human head	76-H-593	
Volcanoes in the Tharsis Region near the Equator	76-H-592	
Mariner 9 "South Spot"	76-H-702	
Mars tiny moon, Deimos	76-H-717	
Canyon Valles Marineris	76-H-718	
Equatorial Canyon	76-H-719	
Mariner Valleys	76-H-726	
Color bar	76-H-630	
Martian craters	76-H-642	
Geometric markings	76-H-653	

VIKING I ORBITER PICTURES

DESCRIPTION	*B&W PHOTO NO.*	*COLOR PHOTO NO.*
Mosaic of 15 photos of the "Grand Canyon of Mars"	76-H-751	76-HC-773
Composite of the Noctis Labyrinthus with bright clouds of water ice during sun rise	76-H-781	76-HC-791
Mosaic of Phobos	77-H-97	
Close up of Phobos	77-H-100	

VIKING I LANDER PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
First photo taken of Mars surface	76-H-556	
First panoramic view of Mars surface	76-H-557	
High resolution photo of Martian surface	76-H-559	
Foot pad and debris on surface	76-H-560	
Crater Arandas	76-H-569	
Computerized overlay for digging purposes	76-H-570	
Etched figure "8" on rock	76-H-571	
U.S. Flag and insignias on spacecraft	76-H-572	
Area N.E. of spacecraft	76-H-573	
Boom latch pin ejected	76-H-574	
Stereo coverage of Mars looking southeast from the spacecraft	76-H-752	76-HC-774
Martian sunset over Chryse Planitia on 8/20/76 (same as 76-HC-742)	76-H-749	
Sand dunes and large rocks	76-H-624	
Viking I's meteorology instrument	76-H-625	
Viking's footpad	76-H-616	
Trench dug by sampler	76-H-580	

VIKING I LANDER PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Viking landscape showing dune field	76-H-620	
Viking I's collector head	76-H-638	
First color photo taken on surface (Blue Sky)	78-H-558	76-HC-655
Corrected version of 76-HC-655		76-HC-660
Surface of Mars, portion of spacecraft showing		76-HC-661
Mars surface; portion of Viking I; U.S. Flag; and Bicentennial logo		76-HC-663
Martian sunset over Chryse Planitia	76-H-749	76-HC-742
Color bars	76-H-630	76-HC-700
Mariner Valley	76-H-662	76-HC-691
Chryse area	76-H-686	76-HC-735
Same as 76-HC-615; exaggerated		76-HC-618
A summer day on Mars	76-H-657	76-HC-706
Mars from 560,000 km		76-HC-615
Computer enhanced Martian sunset over Chryse Planitia (enhancement of 76-H-749 & 76-HC-742)		76-HC-803

VIKING II ORBITER PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Phobos	76-H-729	
North polar cap	76-H-687	
Utopia Planitia	76-H-658	
Target point for Viking II	76-H-659	
Western flank of Alba Patera	76-H-644	
White Saucer	76-H-643	
Huge volcanoes of the Tharsis Region	76-H-627	
Soil samples being taken from Bonneville Salt Flats	76-H-746	
Frosty scene near Mar's north pole shows the region in mid-summer	76-H-915	76-HC-881
Deimos taken from 30 miles	77-H-675	

VIKING II LANDER PICTURES

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
High resolution photo of the Martian surface	76-H-691	
A shallow 12 inch-long trench dug by Viking II surface sampler	76-H-701	
Aluminum shroud	76-H-720	
White circles show where Viking II will dig first trench	76-H-700	
Utopia region	76-H-690	
Utopia Planitia	76-H-689	
Martian plain surrounding Viking II	76-H-692	
A clear day on Mars	76-H-696	
First picture on surface of Mars after touch down September 3, 1976	76-H-688	
First color photo taken by Viking II – Martian surface	76-H-802	76-HC-736
The Martian horizon as seen by Viking II		76-HC-759
A Utopian bright summer afternoon on Mars		76-HC-737
Latest winter frost on Mars		77-HC-415
Ice on mars taken on June 7, 1979	79-H-551	79-HC-400

AVIATION

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
AGRICULTURAL RESEARCH AIRCRAFT	78-H-277	78-HC-212
AIR SAFETY-SIMULATED CRASH TEST	74-H-366	74-HC-217
ANTI-SYMMETRICAL WING	74-H-666	74-HC-464
AUGMENTOR-WING C-8A BUFFALO AIRCRAFT	73-H-340	73-HC-303
BOEING 707	67-H-538	67-HC-531
F-111 AIRPLANE	67-H-271	74-HC-178
HiMAT	78-H-306	78-HC-253
HYPERSONIC TRANSPORT CONCEPT	71-H-730	71-HC-632
LIFTING BODY AIRCRAFT M2-F1, M2-F2	66-H-496	66-HC-1947
LIFTING BODY AIRCRAFT HL-10	69-H-193	66-HC-1952
LIFTING BODY AIRCRAFT X-24	69-H-197	73-HC-699
LIFTING BODY AIRCRAFT X24, M-2, HL-10	70-H-4	70-HC-3
LOCKHEED 990	66-H-514	65-HC-265
MINI-SNIFFER	78-H-477	78-HC-434
NACA COWLING	28-RES AIR-1	–

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
NOISE REDUCTION	72-H-376	–
PARAGLIDER	62-RES AIR-6	GEMINI-6
PARAWING	68-H-476	68-HC-278
PREGNANT GUPPY	63-RES AIR-51	RES AIR-33
RESEARCH AIRPLANES	LANG. FAC-56	–
RPRV-REMOTELY PILOTED RESEARCH VEHICLE	73-H-1032	73-HC-120
ROTOR SYSTEMS RESEARCH AIRCRAFT	78-H-188	78-HC-152
RUNWAY FRICTION TEST	68-H-541	68-HC-239
RUNWAY RESEARCH	68-H-471	68-HC-274
STOL RESEARCH OV-10A BRONCO	71-H-1606	71-HC-1411
SUPER GUPPY	66-H-232	–
SUPER-CRITICAL WING F-8 AIRPLANE	72-H-216	71-HC-607
SUPER-CRITICAL WING DR. WHITCOMB	74-H-397	74-HC-234
SST ADVANCED CONCEPT	72-H-84	–
TILT ROTOR CONCEPT	78-H-189	78-HC-152

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
V/STOL TEST BEDS	RA66-855	72-HC-3
WAKE VORTEX	74-H-585	74-HC-604
X-1 FLIGHT	LANG. FAC-49	–
X-14A RESEARCH VTOL	65-H-155	71-HC-1099
X-15 IN FLIGHT	62-X15-13	X15-11
X-15 AIRPLANE-NEIL ARMSTRONG	60-X-35	–
X-15 AND B-70	67-H-1123	X15-26
X-15 PILOTS (6) IN FRONT OF X-15	–	65-HC-1272
XB-70 AIRPLANE	68-H-182	68-HC-124
XV-15 (TILTROTOR RESEARCH AIRCRAFT)	77-H-270	77-HC-154
YF-12 AIRPLANE	71-H-949	73-HC-567

SPACE SHUTTLE

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Approach and Landing Test first crew: Fred W. Haise, Jr. and C. Gordon Fullerton	76-H-705	76-HC-745
Approach and Landing Test second crew: Joe H. Engle and Richard H. Truly	76-H-708	76-HC-748
Space Shuttle Pressure Suit	76-H-646	
Space Suit & Rescue System	76-H-274	76-HC-502
Artist Concept:		
Space Shuttle Orbiter Mating/Demating Facility with an Orbiter model atop a 747 airplane	76-H-778	76-HC-788
Space Shuttle Orbiter rides "piggyback" atop Boeing 747 carrier aircraft	76-H-758	76-HC-778
Space Shuttle Orbiter shortly after separating from the Boeing 747 carrier aircraft	76-H-327	76-HC-537
Space Shuttle Orbiter shortly after separating from Boeing 747 carrier aircraft at start of approach and landing test	76-H-777	76-HC-787
Space Shuttle Orbiter being refurbished after space flight	76-H-760	76-HC-780
Space Shuttle launch with all engines burning	76-H-606	76-HC-683
Space Shuttle solid rocket boosters are jettisoned	76-H-604	76-HC-681

SPACE SHUTTLE

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Separation of external tank from Space Shuttle's Orbiter spacecraft	76-H-603	76-HC-680
Orbiter firing retrorockets to slow and position the Orbiter in space	76-H-765	76-HC-784
Orbiter with manipulator arms extended prepares to recover orbiting satellite	76-H-762	76-HC-782
Orbiter places a Space Tug and payload in Earth orbit	76-H-600	76-HC-677
Space Shuttle placement of Large Space Telescope in space	76-H-904	76-HC-870
Orbiter with manipulator arms extended prepares to retrieve a satellite	76-H-602	76-HC-679
Space Shuttle placement of satellite in Earth Orbit	76-H-907	76-HC-873
Space Shuttle Orbiter approaches a landing field following a flight in space	76-H-610	76-HC-687
Landing of the Space Shuttle's Orbiter spacecraft	76-H-597	76-HC-674
Spacelab in the payload bay of the Space Shuttle in *earth orbit*	76-H-615	76-HC-692
Space Shuttle Orbiter cut-away view	76-H-779	76-HC-789
Space Shuttle cut-away view	76-H-596	76-HC-673

SPACE SHUTTLE

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Interior view of the flight deck of Space Shuttle Orbiter 101	76-H-323	76-HC-533
Orbiter Vehicle 101 roll-out Sept. 17, 1976 at Palmdale, Calif.	76-H-854	76-HC-840
Shuttle Mission Profile	78-H-450	78-HC-385
Orbiter in VAB at KSC	78-H-486	78-HC-404
Shuttle Mobile Launcher Platform (Outside VAB)	78-H-485	78-HC-403
Shuttle Launch Complex (Cape Kennedy)	78-H-487	78-HC-405
Shuttle Launch (Vandenberg)	78-H-483	78-HC-401
Shuttle lifts off pad at KSC	76-H-607	76-HC-684
Launch Sites	78-H-489	78-HC-407
Shuttle Climb/Solid Rocket Booster Separation	77-H-556	77-HC-362
Orbiter & Tank Insertion	77-H-555	77-HC-361
Orbiter & External Tank Separation	76-H-603	76-HC-680
Orbiter with bay closed in orbit	78-H-510	78-HC-425
Orbiter & Technology Demonstration Research Satellite (TDRS)	76-H-762	76-HC-782
Orbiter with Large Space Telescope in Cargo Bay	77-H-546	77-HC-353

SPACE SHUTTLE

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Orbiter & Spacelab with Crew	76-H-615	76-HC-692
Orbiter & Multiple Payloads	77-H-547	77-HC-354
Orbiter Terminating Reentry	76-H-599	76-HC-676
Orbiter approach to Vandenberg	76-H-610	76-HC-687
Orbiter & Reentry Heating	76-H-757	76-HC-777
Orbiter/Landing Approach/KSC	76-H-612	76-HC-689
Orbiter Landing at KSC	77-H-550	77-HC-357
Orbiter/Landing Approach Dryden FRC/EAFB	78-H-507	78-HC-422
Shuttle/External Configuration	77-H-560	77-HC-366
Orbiter Crew Positions	78-H-491	78-HC-409
Rollout of Shuttle Orbiter on mobile launcher platform framed by vegetation	79-H-263	79-HC-193
Long shot view of Shuttle on launch pad framed by clouds and vegetation	79-H-514	79-HC-290
Night shot of shuttle and the full moon	–	80-HC-583

SPACE SHUTTLE

Description	B&W PHOTO NO.	COLOR PHOTO NO.
COLUMBIA—Space Transportation System-1 (STS-1)		
Crew Portrait	79-H-275	79-HC-206
Crew inside cockpit of Columbia	80-H-784	80-HC-599
Individual Portraits:		
John Young, Crew Commander, STS-1	79-H-274	79-HC-205
Robert Crippen, Pilot, STS-1	79-H-273	79-HC-204
Crew patch	79-H-200	79-HC-142
Columbia flight deck	80-H-52	80-HC-39
Columbia rollout as viewed from inside the VAB	81-H-9	81-HC-8
Columbia stands framed in vegetation lining the crawlerway	81-H-1	81-HC-1
Aerial view of Columbia just outside the VAB	81-H-7	81-HC-6

ALT SHUTTLE SELECTED PICTURE LIST

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
First Crew of 747 aircraft used to carry space shuttle orbiter	77-H-80	NA
Space Shuttle Orbiter successfully complete taxi test	77-H-83	77-HC-48
Space Shuttle Orbiter mated to 747 carrier aircraft, lifted off the runway	77-H-84	77-HC-59
Space Shuttle Orbiter mated atop 747 during first captive test flight	77-H-85	77-HC-49
Shuttle Orbiter is in the mate demate facility at Dryden	77-H-89	77-HC-50
Orbiter/747 being mated	77-H-90	77-HC-53
Space Shuttle Mission insignia	77-H-94	77-HC-55
Shuttle ALT crew insignia	77-H-184	77-HC-111
Boeing 747 Shuttle 4th approach and landing	77-H-107	77-HC-69
Roll out of 1st Shuttle	76-H-612	76-HC-840
Artist concept of launch from KSC	76-H-94	76-HC-76
Artist Concept Shuttle in earth orbit	76-H-907	76-HC-873
Artist Concept of Shuttle orbiter landing	NA	76-HC-826
First Captive flight		
Takeoff	77-H-431	77-HC-189

SPACE SHUTTLE

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Space Shuttle Orbiter Enterprise rides atop the 747 with chase plane following	77-H-425	
Space Shuttle Orbiter Enterprise atop the 747		77-HC-54
First Free Flight (tail cone on)		
Take off	77-H-574	77-HC-373
Shuttle atop the 747 with chase planes following	77-H-577	77-HC-375
Separation	77-H-539	77-HC-340
Shuttle flies alone	77-H-542	77-HC-349
Montage of the first free flight	77-H-573	77-HC-372
Shuttle and a T-38 fly formation	77-H-569	77-HC-371
Last Free Flight (Tail cone off)		
Take off	77-H-683	77-HC-449
Shuttle separating from the 747	77-H-682	77-HC-448
Shuttle dives for a landing	77-H-693	77-HC-455
Shuttle just before touch down	77-H-681	77-HC-447

SPACE COLONY

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Twin 19 mile long, 4 mile in diameter cylinders are seen as they would appear from an approaching spaceship	75-H-461	75-HC-272
Earth-like landscape from inside a 19 mile long space colony seen from the endcap	75-H-460	75-HC-271
Inside view of the colony as night approaches. This view is seen from the endcap.	75-H-824	75-HC-471
A view showing a bridge similar in size to the San Francisco Bay Bridge to emphasize eventual sizes of such colonies	75-H-823	75-HC-470
Outside view of a wheel-like colony that would be over a mile in diameter	75-H-822	75-HC-469
A segment of the torus-shaped space colony is shown during final construction	75-H-821	75-HC-468
Agricultural area of a space colony	76-H-282	76-HC-99
Photo of a model of the space colony's manufacturing facility.	76-H-542	76-HC-650
Photo of a model of a docking station for space colony	76-H-540	76-HC-648
Illustration of a space colony that looks like a giant wheel in space	76-H-541	76-HC-649
Artist's concept of the interior of the torus or outer ring of the space colony	76-H-539	76-HC-647

ASTRONOMY

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Aurora	68-H-51	68-HC-18
Aurora Borealis	69-H-1796	69-HC-1141
Comet Ikeya-Seki	78-H-157	78-HC-123
Earth from Apollo 17	72-H-1578	72-HC-928
Echo Satellite Trail in Milky Way	78-H-163	78-HC-129
Galaxy with Active Nucleus (M82)	78-H-161	78-HC-127
Galaxy (M32)	78-H-160	78-HC-126
Galaxy (NGC 205)	78-H-159	78-HC-125
Galaxy (NGC 7331)	78-H-171	78-HC-137
Galaxy, Type Sb, in Pegasus (NGC 7217)	78-H-151	78-HC-117
Andromedia Galaxy (M31)	78-H-168	78-HC-134
Edge-On Galaxy (NGC 5907)	78-H-173	78-HC-139
Sombrero Galaxy (M104)	78-H-174	78-HC-140
Spiral Galaxy (NGC 6946)	78-H-156	78-HC-122
Whirlpool Galaxy (M51)	78-H-155	78-HC-121

ASTRONOMY

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Jupiter (Pioneer fly by)	74-H-255	74-HC-151
Jupiter (telescope view)	78-H-158	78-HC-124
Mars (telescope view)	70-H-1651	71-HC-812
Mars (Mariner fly by mosaic)	74-H-650	N/A
Mercury (telescope view)	70-H-1657	N/A
Mercury (Mariner fly by mosaic)	75-H-1085	N/A
Nebula (M16)	78-H-165	78-HC-131
Nebula (NGC 7635)	78-H-164	78-HC-130
Crab Nebula (M1)	78-H-176	78-HC-142
Dumbell Nebula (M27)	78-H-166	78-HC-132
Orion Nebula (M42)	78-H-175	78-HC-141
Ring Nebula (NGC 7293)	*78-H-167*	*78-HC-133*
Ring Nebula in Lyra (M57)	78-H-153	78-HC-119
Trifid Nebula (M20)	78-H-170	78-HC-136
Veil Nebula (NGC 6992-5)	78-H-152	78-HC-118

ASTRONOMY

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
North Pole Stars	78-H-169	78-HC-135
Sagittarius Star Cloud	78-H-162	78-HC-128
Saturn (telescope view)	78-H-154	78-HC-120
Solar Eclipse (1966)	N/A	67-HC-375
Solar Eclipse (1970)	70-H-459	70-HC-309
Solar System (Artist Concept)	67-H-970	67-HC-153
Sun taken from Skylab:		
X-Ray Corona	73-H-728	73-HC-626
Spectacular Solar Flares	74-H-434	74-HC-260
Sun's corona color-code to distinguish levels of brightness	74-H-917	74-HC-543
Sun in soft x-ray region at wavelengths from 27 to 40 angstroms	NA	73-HC-711
False color isophote	NA	73-HC-752
Color density rendition of the solar eruption	74-H-38	74-HC-30
Scores of bright points of light, dots the solar disk, like scattered jewels.	NA	79-HC-509

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Pink chromosphere flashes out from behind the Moon just as the last bit of the brighter Sun is covered at a solar eclipse.	NA	79-HC-503
Breaking the grip — a spray of chromospheric material surges upward, free of the Sun.	NA	79-HC-513
Solar prominences in action — color enhancement of the original black & white images highlighting subtle brightness differences.	NA	79-HC-518
On the Sun are restricted to two parallel belts on either side of the solar equator; active regions were found in the two low-latitude bands shown here.	NA	79-HC-508
Ultraviolet picture disclose the patterns of magnetic loops that hold hot, ionized gases above all solar active regions.	NA	79-HC-497
"Bright points", smaller than sunspots, have been shown to be an unappreciated and basic element of solar activity.	NA	79-HC-512
Active solar prominences that erupt, often rising as though propelled outward through the corona by loaded springs.	NA	79-HC-507

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Computer color enhancement of the solar prominence in action. (beige and orange)	NA	79-HC-511
Same as above (purple, white and red)	NA	79-HC-516
Same as above (beige, green and brown)	NA	79-HC-491
Same as above (yellow, blue and pink)	NA	79-HC-504
Computer color enhancement of the solar prominence in action. (yellow, orange, pink and white)	NA	79-HC-514
Same as above (blue, red, pink, orange, and green)	NA	79-HC-492
A colassal coronal transient balloons outward from the Sun.	NA	79-HC-496
Computer color enhancement of the solar prominence in action. (beige and orange)	NA	79-HC-515
Same as above (beige, orange, blue and red)	NA	79-HC-517
Same as above (orange, brown and white)	NA	79-HC-510
Breaking the grip of the closed magnetic loops that constrain other gases around it, a spray of chromospheric material surges upward, free of the Sun.	NA	79-HC-495

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Eruption of the corona of the Sun is seen clearly with its twisted form-revealing the coiled, magnetic springs that tell the secret of its expulsion from the Sun.	NA	79-HC-493
Skylab captures a gargantuan disruption of the corona as it develops and moves outward from the Sun.	NA	79-HC-502
The Sun's outer corona	NA	79-HC-498
Computer enhancement of the solar prominence in action. (green, blue, red, pink and white)	NA	79-HC-506
Same as above (red, yellow, pink and blue)	NA	79-HC-505
A spray of chromospheric material surges upward, free of the Sun.	NA	79-HC-494
Uranus	70-H-784	NA
Venus (Mariner fly-by)	74-H-183	74-HC-133
Venus (Telescope view)	72-H-914	67-HC-466
Venus (First picture taken by Pioneer)	78-H-731	78-HC-584
Venus' northern hemisphere	78-H-733	78-HC-573
Venus' northern hemisphere (computer enhancement of 78-H-733)	78-H-734	78-HC-574
Atomic hydrogen cloud surrounding Venus	78-H-735	78-HC-575

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
VOYAGER I		
Spacecraft test model	77-H-281	77-HC-164
Titan/Centaur launch vehicle	77-H-584	77-HC-367
Crescent-shaped Earth & Moon	78-H-3	78-HC-3
Jupiter	78-H-738	78-HC-578
Jupiter (disk), taken Jan. 6, 1979 from 57.6 million km.	79-H-4	79-HC-6
Jupiter's (disk) — dominated by Great Red Spot taken Jan. 9, 1979 from 54 million km.	79-H-9	79-HC-11
Jupiter (disk), Ganymede and Europa taken Jan. 17, 1979 from 47 million km.	79-H-23	79-HC-26
Jupiter (disk) — dominated by Great Red Spot and Ganymede taken Jan. 24, 1979 from 40 million km.	79-H-34	79-HC-30
Jupiter (disk) and Io taken Jan. 17, 1979 from 47 million km.	79-H-33	79-HC-29
Jupiter (disk) taken Jan. 27, 1979 from 37.5 million km.	79-H-50	79-HC-41
Jupiter's (disk) — showing Great Red Spot area taken Jan. 29, 1979 from 35.6 million km.	79-H-49	79-HC-40

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Jupiter's (disk) — showing Great Red Spot area taken Feb. 1, 1979 from 32.7 million km.	79-H-78	79-HC-63
Jupiter, Io and Europa taken Feb. 13, 1979 from 20 million km.	79-H-81	79-HC-66
Jupiter (disk) — Great Red Spot, Io, Europa and Callisto taken Feb. 5, 1979 from 28.4 million km.	79-H-80	79-HC-65
Jupiter, mosaic of nine individual photos taken Feb. 26, 1979 from 7.8 million km through a violet filter	79-H-85	
Jupiter, mosaic of nine individual photos taken through an orange filter Feb. 26, 1979 from 7.8 million km.	79-H-84	
Jupiter's Great Red Spot and its surroundings taken Feb. 25, 1979 from 9.2 million km.	79-H-89	79-HC-70
Jupiter's Great Red Spot rotations taken Feb. 2 — 3 from 31 million km.	79-H-86	
Jupiter — Great Red Spot just emerging from Jovian night — taken Feb. 22, 1979 from 12.2 million km.	79-H-90	79-HC-71
Jupiter — Never-before-seen small-scale features in the planet's atmosphere taken Feb. 19, 1979 from 14 million km.	79-H-96	79-HC-72

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Jupiter mosaic of six violet images taken Feb. 27, 1979 from 6.5 million km.	79-H-91	–
Jupiter – Great Red Spot and one of the white ovals seen from Earth taken March 1, 1979 from 4.3 million km.	79-H-97	79-HC-73
Jupiter – Great Red Spot and turbulent region immediately to the west, and one of several white ovals seen from Earth, taken March 1, 1979 from 5 million km.	79-H-98	79-HC-74
Jupiter – dark halo surrounding smaller bright spot, large oval and swirling streamer-like features taken March 1, 1979 from 4.3 million km.	79-H-99	79-HC-75
Jupiter – SE of Great Red Spot, white ovals and flow lines around ovals taken March 1, 1979 from 4.3 million km.	79-H-100	79-HC-76
Jupiter – large brown oval taken March 2, 1979 from 4 million km.	79-H-107	79-HC-80
Jupiter – mosaic of the Great Red Spot of 12 orange filter pictures taken March 4, 1979 from 1.8 million km.	79-H-118	–
Jupiter – just SE of the Great Red Spot in greatly exaggerated color taken March 4, 1979 from 1.8 million km.	–	79-HC-86

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Jupiter — just SE of the Great Red Spot taken March 4, 1979 from 1.8 million km.	—	79-HC-87
Jupiter — lights in the night on Jupiter taken on Jupiter's dark side on March 5, 1979.	79-H-132	—
Jupiter, Great Red Spot taken March 4, 1979 from 1.8 million km.	—	79-HC-92
Same as above in exaggerated color.	—	79-HC-91
Jupiter, East of the Great Red Spot taken March 4, 1979 from 1.8 million km.	—	79-HC-93
Same as above in exaggerated color.	—	79-HC-94
Photo shows first evidence of a ring around Jupiter taken March 4, 1979.	79-H-110	—
Ring drawn around actual photo of Jupiter showing ring path.	79-H-137	79-HC-105
Great Red Spot rotations 67-70 February 2 through February 3	79-H-86	
Jupiter taken 2/9/79 from 14 million miles — Europa's shadow and the Red Spot are shown		79-HC-97

VOYAGER

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Jupiter on the left was recorded with a 200 inch telescope on the right by Voyager 1	79-H-316	79-HC-235
Time-lapse sequence showing the disturbed region at the NEB/ NTRZ	79-H-318	
Plume nucleus showing evidence of convestive activity. Taken 3/4/79	79-H-317	
Cylindrical projection of Jupiter on 2/1/79	79-H-319	79-HC-236
The Great Red Spot shows a white oval with its "wake" of counter-rotating vortices (red and blue photo)	79-H-336	79-HC-246
The Great Red Spot shows a white oval with its "wake" of counter-rotating vortices (red and pink photo)	79-H-337	79-HC-247
Mosaic of Jupiter and its moons	79-H-356	79-HC-256
Dark side multiple image of Jupiter while Voyager was in eclipse	79-H-320	–
Time lapse sequence of flow around the Great Red Spot	79-H-323	
Time lapse sequence showing interaction of 2 anticyclonic dark spots	79-H-338	

VOYAGER

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Southern hemisphere of Jupiter from directly above the pole taken by Voyager 1	79-H-360	79-HC-258
Northern hemisphere of Jupiter directly above the pole taken by Voyager 1	79-H-359	79-HC-257
JUPITER'S MOONS Ganymede from 8.025 million km taken Feb. 26, 1979.	79-H-88	79-HC-69
Callisto, outermost of Jupiter's four Galilean satellites taken Feb. 26, 1979 from 8,023,000 km.	79-H-87	79-HC-68
Io, against background of part of Jupiter's disk taken Feb. 27, 1979 from 7 million km.	79-H-92	–
Europa taken March 1, 1979 from 5.9 million km.	79-H-93	–
Callisto, taken Feb. 28 from 7 million km.	79-H-94	–
Ganymede, taken Feb. 27, 1979 from 6 million km.	79-H-95	–
Io, against background of Jupiter taken March 2, 1979 from 8.3 million km.	79-H-101	–
Ganymede, taken March 2, 1979 from 3.4 million km.	79-H-102	79-HC-77

VOYAGER

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Europa, Jupiter's brightest of satellites taken on 3/2/79 from 1.75 million miles	79-H-105	
The four large Galilean satellites of Jupiter in a mosaic	79-H-108	
Two simultaneously occurring volcanic eruptions on Io	79-H-141	
Ganymede from 2.6 million miles taken on 3/1/79	79-H-115	
Europa from 3.66 million miles taken 3/1/79	79-H-114	
Io with what appears to be a volcanic caldera that is venting gasses (bright blue patch)	79-H-303	79-HC-227
Computer generated 4 frame color mosaic of Callisto taken by Voyager 1 in March, 1979	79-H-328	79-HC-238
Io, taken March 3, 1979 from 2.7 million km.	79-H-103	79-HC-78
Callisto, taken Feb. 28, 1979 from 7 million km.	79-H-104	79-HC-79
Europa, taken March 2, 1979 from 2,869,252 km.	79-H-109	79-HC-81
Io, four picture mosaic taken March 4, 1979 from 496,000 km.	79-H-119	—
Io (partial disk) taken March 4, 1979 from 862,200 km.	79-H-111	79-HC-82

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Ganymede, taken March 4, 1979 from 2.6 million km.	–	79-HC-83
Europa, taken March 4, 1979 from 2 million km.	–	79-HC-84
Amalthea, Jupiter's innermost satellite, taken March 4, 1979 from 425,000 km.	–	79-HC-85
Io, partial disk, taken March 5, 1979 from 377,000 km.	–	79-HC-88
Io, partial disk, taken March 4, 1979 from 377,000 km.	–	79-HC-89
Io, partial disk, taken March 5, 1979 from 377,000 km.	–	79-HC-90
Ganymede – many bright impact craters are shown that have radial ejecta patterns – taken March 5, 1979 from 272,000 km.	79-H-123	–
Ganymede – south western limb region shows numerous impact craters and light bands taken March 5, 1979 from 253,000 km.	79-H-124	–
Ganymede – showing impact craters and bright bands taken March 5, 1979 from 246,000 km.	79-H-125	–
Ganymede – bright rayed impact craters is prominent – taken March 5, 1979 from 267,000 km.	79-H-126	–

VOYAGER

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Io — taken March 5, 1979 from 128,500 km.	79-H-127	79-HC-102
Io — four picture color mosaic taken March 4, 1979 from 376,951 km.	79-H-128	79-HC-103
Ganymede — showing complex patterns of ridges and grooves taken March 5, 1979 from 145,000 km.	79-H-129	—
Io — during closest approach, taken March 5, 1979, shows irregularly shaped composited crater about 50 km in diameter.	79-H-130	—
Callisto — photomosaic of pictures taken March 6, 1979 from a range of 202,000 km.	79-H-131	—
Callisto — taken March 6, 1979 from 350,000 km.	79-H-133	79-HC-104
Io, volcanic eruption — showing plume-like structure rising more than 100 km — taken March 4, 1979 from 499,000 km.	79-H-138	—
Io — showing at least four simultaneous volcanic eruptions taken March 4, 1979.	79-H-139	—
Ganymede — showing a variety of impact structures, including razed and unrazed craters, groove-like structures and bright ray craters — taken March 5, 1979 from 230 to 250 thousand km.	79-H-120	79-HC-99

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Ganymede — showing two distinctive types of terrain, the darker ungrooved regions and the lighter areas which show grooves or fractures in abundance; and bright ray craters — taken March 5, 1979 from 230 to 250 thousand km.	79-H-121	79-HC-100
Ganymede — most striking features are the bright ray craters — taken March 5, 1979 from 230 to 250 thousand km.	79-H-122	79-HC-101
Reconstruction of one of the erupting volcanoes on Io discovered by Voyager 1	79-H-607	79-HC-456
Views of 2 active plumes on Io	79-H-327	79-HC-239
Callisto from 5 million miles taken on 2/28/79	79-H-113	—
Io's volcano from 490,000 km taken March 4, 1979	79-H-140	79-HC-107
Io taken 3/5/79 from 92,000 km (55,000 miles)	79-H-315	
Io a computer-generated mosaic made from 4 sets of images	79-H-329	79-HC-237
Observation geometry for Amalthea	79-H-335	79-HC-245
Global images of the 4 Galilean satellites taken by Voyager 1	79-H-334	79-HC-244
Full-disk image of Io from Voyager 1	79-H-349	79-HC-250

VOYAGER

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Dark cratered terrain & light grooved terrain on Ganymede	79-H-321	
Broad N-S strip grooved terrain offset by transverse fault	79-H-322	–
Terminator view of a multiringed structure on Callisto	79-H-324	–
Io's complex graben & irregular scarps near the terminator	79-H-325	–
Wide angle of Io	79-H-326	–
Complex pattern of grooved terrain near the terminator of Ganymede	79-H-339	–
Shaded relief map of Io	79-H-355	–
Shaded relief map of Europa	79-H-354	–
Shaded relief map of Ganymede	79-H-353	–
Shaded relief map of Callisto	79-H-352	–
Region of Io that will be monitored for volcanic eruptions by Voyager 2	79-H-374	79-HC-270

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Saturn		
Full planet of Saturn and three of its moons, Enceladus, Dione, and Tethys taken by 8-24-80 from 66 million miles.	80-H-694	80-HC-546
Full planet of Saturn taken on 8-12-80 from 50 million miles. The Cassini & Encke Divisions in the rings and the ring's shadow on the planet are very obvious.	80-H-753	80-HC-576
Full planet of Saturn and five of its moons, Titan, Dione, Tethys, Mimas and Enceladus taken on 8-17-80 from 47 million miles.	80-H-757	80-HC-580
About 1/8 of the planet Saturn, portions of its A, B, C, and F rings and its moon Mimas taken on 10-13-80 from 25 million miles.	80-H-802	80-HC-613
Full planet of Saturn from 21.1 million miles taken on 10-18-80. Dione appears as three color spots just below the planet's south pole.	80-H-804	80-HC-615
Color enhanced image of the full planet of Saturn shows bright features in its North Temperate Belt. This blue, green and red color composite was taken on 10-18-80.	80-H-805	80-HC-616

VOYAGER

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Four photos of about 1/8 of the planet Saturn and its rings taken on 10-4/10-5/80 from 32 million miles. Visible in these photos of the rings are patterns of dark, fingerlike areas that rotate around the planet like spokes in a wheel.	80-H-801	–
About 1/8 of the planet Saturn and its rings taken on 10-5-80 from a distance of 32 million miles. Visible in this photo of the rings is a pattern of a dark, fingerlike area that rotates around the planet like a spoke in a wheel.	80-H-800	–
Full view of Titan on 11-4-80 from 7,560,000 miles. This photo shows little more than the upper layers of clouds covering the moon in an orange colored haze.	80-H-816	80-HC-626
About 1/4 of Saturn and its moons, Tethys and Dione taken on 11-3-80 from 8 million miles. The shadows of Saturn's three bright rings and Tethys are cast onto the cloud tops.	80-H-817	80-HC-627
Two small satellites of Saturn appear as white dots. One is near the bottom edge of the A ring and the other is just outside the F ring which is barely visible.	80-H-818	–

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Dark spokelike features in Saturn's rings are seen revolving around the planet with the rings' orbital motion in these six photographs taken in sequence about every 15 minutes. Only 1/8 of Saturn is seen. This was taken on 10-25-80 from 14.9 million miles.	80-H-819	–
Saturn's rings taken on 11-3-80 from 8.19 million miles shows complex structure within the Cassini Division. None of the planet Saturn is in this photo.	80-H-820	–
Saturn's rings taken on 11-6-80 from 5 million miles shows about 95 individual concentric features in the entire span of the ring system. The 14th satellite of Saturn is just outside the narrow F ring. About 1/8 of Saturn is in this photo.	80-H-824	–
Iapetus taken 11-6-80 from 5 million miles shows the unusual variation in the satellite's hemispheres. Photo is very fuzzy.	80-H-825	–

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Saturn's northern hemisphere taken on 11-5-80 from 5.5 million miles shows an isolated convective cloud with a dark ring in the light brown zone; and a longitudinal wave in the light blue region.	80-H-828	80-HC-630
Saturn's southern hemisphere taken on 11-6-80 from 4.9 million miles. The color contrasts are an indication of the divisions between belts and zones in this region. The dark circle is the shadow of the moon Dione.	80-H-829	80-HC-631
Full moon Titan shown in its true color on 11-9-80 from 2.8 million miles.	80-H-835	80-HC-636
Both the limb of Saturn and the shadow of its ring system are seen through the transparent C-ring taken on 11-9-80 at 3 million miles.	80-H-837	–
Saturn's F ring taken from 470,000 miles with several components seen. Two narrow, braided, bright rings that trace distinct orbits are evident.	80-H-841	

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
The full moon Rhea taken 11-11-80 through violet, blue and orange filters from one million miles.	80-H-846	80-HC-637
A view of Saturn's clouds extending from 40° to 60° N latitude shows a ribbon-like wave structure taken on 11-10-80 from 2,200,000 miles.	80-H-847	80-HC-638
This image of Saturn's moon Mimas was taken 11-12-80 and shows the heavily and uniformly cratered surface from 129,000 miles.	80-H-849	–
Multiple impact craters are seen on Saturn's moon Rhea taken on 11-12-80 from 45,000 miles. About 1/4 of the moon is seen in this photo.	80-H-850	–
Large impact craters are seen on Saturn's moon Dione taken 11-12-80 from 149,000 miles. About 3/4 of the moon is in this photo.	80-H-851	–

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Two photos of Saturn's 11th moon taken on 11-12-80 from 110,000 miles show the south polar region of the body. Photos are very fuzzy.	80-H-853	–
Saturn's ring system taken on 11-12-80 from 446,000 miles. This is from an angle about 30 degrees above the ring plane. The lighting in this view brings out the many hundreds of bright and dark ringlets that make up this very thin, phonograph record-like ring system.	80-H-854	–
The crescent of Saturn, its rings and their shadows are seen from 930,000 miles as the spacecraft began to leave the Saturn system.	80-H-855	–
Full moon Dione is seen above the clouds of Saturn on 11-11-80 from 234,000 miles.	80-H-856	80-HC-640
Titan's thick haze layer is shown in this photo taken on 11-12-80 from 270,000 miles. Titan is completely enveloped by haze that merges with a darker "hood" or cloud layer over the north pole. About 1/4 of the moon is shown.	80-H-857	80-HC-641

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Many impact craters—the record of the collision of cosmic debris are shown in this mosaic of Saturn's moon Dione, taken from 100,600 miles on Nov. 12, 1980.	80-H-858	80-HC-642
The rings of Saturn viewed from the unilluminated side, taken Nov. 12, 1980 from 444,000 miles.	80-H-864	80-HC-645
A montage of images of the Saturian system prepared from an assemblage of images taken during Voyager 1 encounter Nov. 1980. Shows Saturn, Dione, Tethys, Mimas, Enceladus, Rhea, and Titan.	80-H-866	80-HC-647
Voyager 1 looked back at Saturn on Nov. 16, 1980, four days after the spacecraft flew past the planet, to observe the appearance of Saturn and its rings from this unique perspective. Taken from 3.3 million miles.	80-H-886	80-HC-670

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
VOYAGER II		
Spacecraft	77-H-508	77-HC-334
Titan/Centaur launch vehicle	77-H-564	77-HC-367
"Sound of Earth" Record	77-H-508	77-HC-334
Jupiter		
Jupiter (disk) — two photos of Jupiter one taken by Voyager I and the other taken by Voyager II	79-H-301	79-HC-225
Jupiter (disk) — two photos taken by Voyager II from 46.3 million km; small insert taken by Voyager I from 40 million km.	79-H-302	79-HC-226
Jupiter — the long lived disturbed region west of the Great Red Spot taken by Voyager II on 7/9/79 from 24 million km.	79-H-361	79-HC-259
Jupiter, Io and the shadow of Ganymede on Jupiter taken by Voyager II on 6/10/79 from 24 million km.	79-H-362	79-HC-260

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Jupiter — southern hemisphere with Io in front of the turbulent clouds taken on 6/25/79 from 12 million km.	79-H-363	79-HC-261
Jupiter — color composite of the Jovian atmosphere, the Equatorial Zones lies across the middle of this photo	79-H-365	79-HC-263
Jupiter — Great Red Spot during the afternoon taken on 6/29/79 from 9 million km.	79-H-366	79-HC-264
Jupiter — the equatorial region of the planet with brown and white oval-shaped clouds visible; turbulent region showing west of the Great Red Spot taken on 6/29/79 from 9.3 million km.	79-H-367	79-HC-265
Jupiter — the equatorial plumes are seen in the region west of the Great Red Spot	79-H-368	79-HC-266
Jupiter — shows the Great Red Spot and the south equatorial belt extending into the equatorial region.	79-H-369	79-HC-267
Jupiter — southern hemisphere extending from the Great Red Spot to the southpole with the white oval beneath the GRS	79-H-370	79-HC-268

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Jupiter – extending from the equator to the southern polar latitudes near the Great Red Spot with a white oval south of the GRS taken from 6 million km.	79-H-375	79-HC-271
Jupiter – showing the wispy clouds of the North Equatorial Belt taken on 7/6/79 from 2,200,000 miles	79-H-379	79-HC-273
Jupiter – one of the long dark clouds observed in the North Equatorial Belt taken on 7/5/79 from 3.2 million km.	79-H-385	79-HC-279
Jupiter – two of the long lived white oval clouds residing in the Jovian southern hemisphere for nearly 40 years taken on 7/5/79 from 3.4 million km.	79-H-386	79-HC-280
Jupiter – thin ring of particles taken on 7/8/79 from 1,400,000 km.	79-H-395	79-HC-285
Jupiter – Cylindrical projections shows movement of Red Spot from Voyager I and Voyager II	79-H-501	79-HC-288
Jupiter – a striking view of Jupiter's ring was taken from 930,000 miles.	79-H-507	–

VOYAGER

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Jupiter — High resolution view of Jupiter's ring which may be divided into several components.	79-H-508	—
Jupiter — a brilliant halo around Jupiter, the thin ring of particles was taken by Voyager 2.	79-H-505	—
Jupiter — high resolution pictures of Jupiter's ring.	79-H-504	—
Jupiter, color composite of Jupiter's faint ring	79-H-517	79-HC-296
Jupiter, mosaic of the Great Red Spot showing significant change since the Voyager 1 encounter three months ago	79-H-518	79-HC-297
Jupiter's Moons		
Io, two photos showing what appears to be a volcanic caldera that is venting gasses	79-H-303	79-HC-227
Callisto, covered with meteorite impact craters, taken on 7/7/79 from 2,318,000 km.	79-H-373	79-HC-269
Europa, global scale dark streaks are visible, taken 7/4/79 from 4.2 million km.	79-H-376	79-HC-272

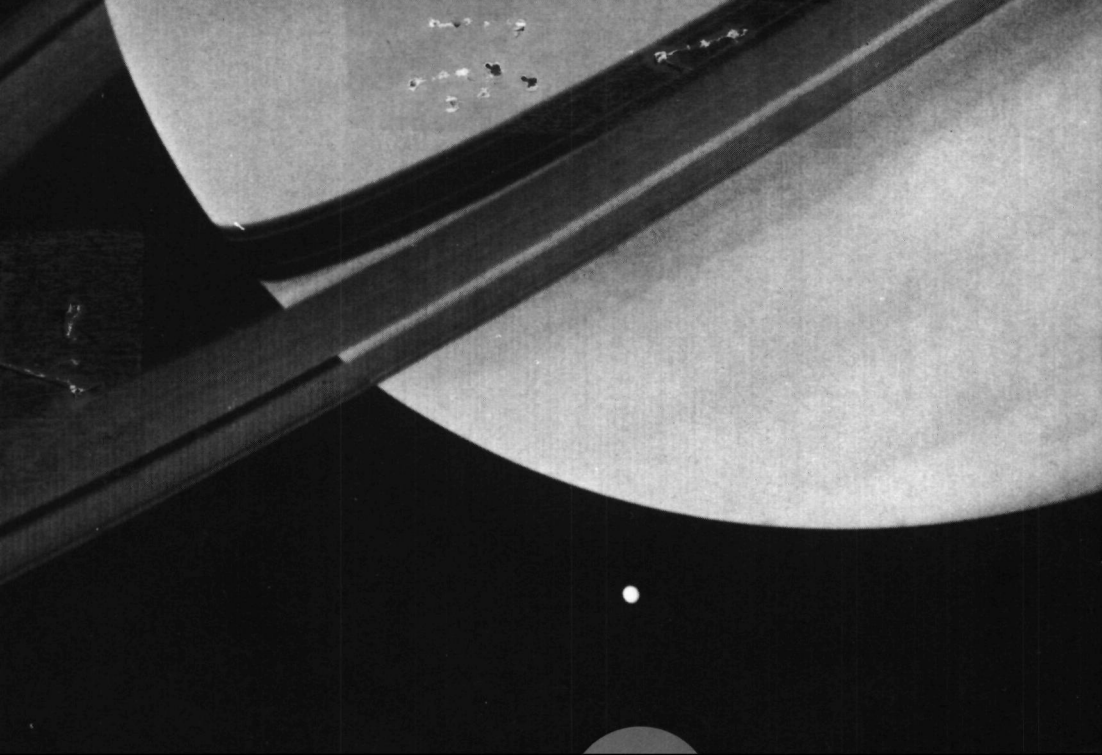
DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Callisto, false color showing craters taken on 7/7/79 from 1,094,666 km.	79-H-380	79-HC-274
Ganymede, the largest of Jupiter's satellites taken 7/2/79 from 6 million km.	79-H-381	79-HC-275
Ganymede, the largest of Galilean satellite was taken on 7/7/79 from 1.2 million km.	79-H-383	79-HC-277
Europa, taken about noon on 7/8/79 from 1.2 million km.	79-H-384	79-HC-278
Europa, close encounter is thought to have a crust of ice taken 7/9/79	79-H-392	79-HC-282
Ganymede, northern hemisphere, with many visible craters	79-H-393	79-HC-283
Ganymede, showing a bright halo impact crater	79-H-394	79-HC-284
Europa, taken on 7/9/79 from 241,000 km.	79-H-396	79-HC-286
Ganymede, surface showing the different types of terrain taken from 312,000 km.	79-H-400	79-HC-287
Io, taken in ultraviolet light shows one of the volcanic eruptions in the evening taken on 7/4/79 from 4.7 million km.	79-H-371	–

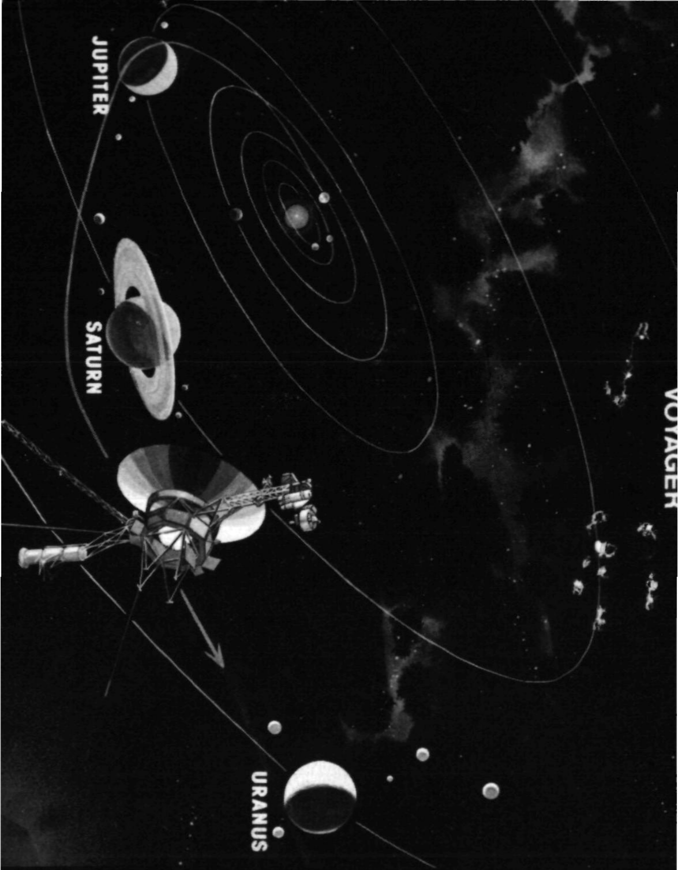
VOYAGER

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Io, taken on 7/4/79 from 4.7 million km.	79-H-372	–
Callisto, (disk) taken 7/7/79 from 1.1 million km.	79-H-377	–
Callisto, photomosaic composed of nine frames, craters distributed across the photo	79-H-378	–
Europa, showing its complex surface that is believed to be icy	79-H-397	–
Ganymede, two photos showing different views of the large crater terrain	79-H-387	–
Ganymede, two photos taken from Voyager I & II of its terrain	79-H-388	–
Europa, the first close up taken 7/9/79 from 246,000 km.	79-H-390	–
Europa, showing the surface of complex ridges, seen as bright streaks taken 7/9/79 from 225,000 km.	79-H-398	–
Io, active volcanoes are spewing materials to a height of about 100 km taken 7/9/79 from 1 million km.	79-H-399	–

VOYAGER

DESCRIPTION	B&W PHOTO NO.	COLOR PHOTO NO.
Io, on the limb are two blue volcanic eruption plumes about 100 km. high	79-H-516	79-HC-295
1979-JI – the new moon of Jupiter, orbits at the edge of this Jupiter's ring.	79-H-626	–
Io – from 1.2 million kilometers with 3 volcanic eruption plumes on the limb.	79-H-503	–
Ganymede – photomosaic shows numerous impact craters.	79-H-502	–
VOYAGER Insignia	77-H-486	77-HC-324
SEASAT		
Radar image of the Baja Peninsula coast of Mexico	78-H-496	NA
A portion of the Beaufort Sea ice pack west of Banks Island, Canada	78-H-494	NA
Gulf Stream, off the Florida coast NE of Miami	78-H-495	NA
Tenessee near Knoxville	78-H-493	NA





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