



National Aeronautics and  
Space Administration  
John F. Kennedy Space Center

# Information Summaries

PMS 031 (KSC)  
June 1999

## Major NASA Launches

### Total Major ETR and WTR Launches

This chart lists all major NASA launches from the founding of the agency on October 1, 1958, through December 31, 1989, except those of the Space Shuttle and the Scout vehicle. (Space Shuttle launches are listed on KSC Historical Report No. 1B (KHR-1B), "Space Shuttle Launches," which is available from the Kennedy Space Center.)

All launches were from Kennedy Space Center and Cape Canaveral Air Station (Eastern Test Range) in Florida, and Vandenberg Air Force Base (Western Test Range) in California. In 1989, control of those vehicle programs listed here that were still active was assumed by the U.S. Air Force and the individual vehicle manufacturers. Some civilian spacecraft, in particular polar-orbiting weather satellites, were launched on military vehicles from Vandenberg under Air Force direction and are not included.

## Space Science

### Physics and Astronomy

Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
<b>BEACON</b>					
Beacon	10/22/58	Juno I RS-49	—	5	U
Beacon	8/14/59	Juno II AM-19B	—	26B	U
<b>VANGUARD</b>					
Vanguard 2	2/17/59	Vanguard SLV-4	59 Alpha	18A	P
Vanguard	4/13/59	Vanguard SLV-5	—	18A	U
Vanguard	6/22/59	Vanguard SLV-6	—	18A	U
Vanguard 3	9/18/59	Vanguard SLV-7	59 Eta	18A	S
<b>EXPLORER</b>					
Explorer	7/16/59	Juno II AM-16	S-1	5	U
Explorer 6	8/7/59	Thor-Able-3	S-2	17A	S
Explorer 7	10/13/59	Juno II AM-19A	S-1a	5	S
Explorer	3/23/60	Juno II AM-19C	S-46	26B	U
Explorer 8	11/3/60	Juno II AM-19D	S-30	26B	S
Explorer	2/24/61	Juno II AM-19F	S-45	26B	U
Explorer 10	3/25/61	Delta-4	P-14	17A	S
Explorer 11	4/27/61	Juno II AM-19E	S-15	26B	S
Explorer	5/24/61	Juno II AM-19G	S-45a	26B	U
Explorer 12	8/15/61	Delta-6	S-3	17A	S
Explorer 14	10/2/62	Delta-13	S-3a	17B	S
Explorer 15	10/27/62	Delta-14	S-3b	17B	S
Explorer 17	4/2/63	Delta-17	S-6	17A	S
Explorer 18	11/26/63	Delta-21	IMP-A (S-74)	17B	S
Beacon-Explorer	3/19/64	Delta-24	BE-A (S-66)	17A	U
Explorer 21	10/3/64	Delta-26	IMP-B (S-74a)	17A	S
Explorer 26	12/21/64	Delta-27	EPE-D (S-3c)	17A	S
Explorer 28	5/29/65	Delta-31	IMP-C (S-74b)	17B	S
Explorer 31/Alouette 2	11/28/65	Thor-Agena-5	<sup>1</sup> DME-A/Alou-B	<sup>1</sup> SLC-2E	S
Explorer 32	5/25/66	Delta-38	AE-B (S-6a)	17B	S
Explorer 33	7/1/66	<sup>2</sup> Delta-39	IMP-D	17A	S
Explorer 34	5/24/67	<sup>2</sup> Delta-49	IMP-F	<sup>1</sup> SLC-2E	S
Explorer 35	7/19/67	<sup>2</sup> Delta-50	IMP-E (lunar)	17B	S
Explorer 38	7/4/68	<sup>2</sup> Delta-57	RAE-A	<sup>1</sup> SLC-2E	S
Explorer 41	6/21/69	Delta-69	IMP-G	<sup>1</sup> SLC-2W	S
Explorer 43	3/13/71	<sup>2</sup> Delta-83	IMP-I	17A	S
Explorer 47	9/22/72	<sup>2</sup> Delta-90	IMP-H	17B	S
Explorer 49	6/10/73	<sup>2</sup> Delta-95	RAE-B (lunar)	17B	S
Explorer 50	10/25/73	<sup>2</sup> Delta-97	IMP-J	17B	S
Explorer 51	12/15/73	<sup>2</sup> Delta-99	AE-C	<sup>1</sup> SLC-2W	S
Explorer 54	10/6/75	<sup>2</sup> Delta-115	AE-D	<sup>1</sup> SLC-2W	S
Explorer 55	11/19/75	<sup>2</sup> Delta-117	AE-E	17B	S
<sup>3</sup> ISEE 1&2	10/22/77	<sup>2</sup> Delta-135	<sup>1</sup> ISEE A&B	17B	S
<sup>3</sup> IUE	1/26/78	<sup>2</sup> Delta-138	IUE	17A	S
<sup>3</sup> ISEE 3	8/12/78	<sup>2</sup> Delta-144	<sup>1</sup> ISEE-C	17B	S
Dynamic Explorer	8/3/81	<sup>2</sup> Delta-15	<sup>1</sup> DE A&B	<sup>1</sup> SLC-2W	S
SME/USAT	10/6/81	<sup>2</sup> Delta-15	<sup>1</sup> SME/USAT	<sup>1</sup> SLC-2W	S
COBE	11/18/89	Delta-183	COBE	SLC-2W	S

Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
<b>OSO (Orbiting Solar Observatories)</b>					
OSO 1	3/7/62	Delta-8	OSO-A (S-16)	17A	S
OSO 2	2/3/65	Delta-29	OSO-B2 (S-17)	17B	S
OSO	8/25/65	Delta-33	OSO-C	17B	U
OSO 3	3/8/67	Delta-46	OSO-E1	17A	S
OSO 4	10/18/67	Delta-53	OSO-D	17B	S
OSO 5	1/22/69	Delta-64	OSO-F	17B	S
OSO 6/PAC	8/9/69	<sup>2</sup> Delta-72	<sup>1</sup> OSO-G/PAC	17A	S
OSO 7/TETR 3	9/29/71	<sup>2</sup> Delta-85	<sup>1</sup> OSO-H/TETR-D	17A	S
OSO 8	6/21/75	<sup>2</sup> Delta-112	OSO-I	17B	S
<b>OGO (Orbiting Geophysical Observatories)</b>					
OGO 1	9/4/64	Atlas-Agena-10	OGO-A	12	S
OGO 2	10/14/65	<sup>2</sup> Thor-Agena-4	OGO-C	<sup>1</sup> SLC-2E	P
OGO 3	6/6/66	Atlas-Agena-16	OGO-B	12	S
OGO 4	7/28/67	<sup>2</sup> Thor-Agena-8	OGO-D	<sup>1</sup> SLC-2E	S
OGO 5	3/4/68	Atlas-Agena-26	OGO-E	13	S
OGO 6	6/5/69	<sup>2</sup> Thor-Agena-11	OGO-F	<sup>1</sup> SLC-2E	S
<b>OAO (Orbiting Astronomical Observatories)</b>					
OAO 1	4/8/66	Atlas-Agena-15	OAO-A1	12	P
OAO 2	12/7/68	Atlas-Centaur-16	OAO-A2	36B	S
OAO	11/30/70	Atlas-Centaur-21	OAO-B	36B	U
OAO 3 (Copernicus)	8/21/72	Atlas-Centaur-22	OAO-C	36B	S
<b>HEAO (High Energy Astronomy Observatories)</b>					
HEAO 1	8/12/77	Atlas-Centaur-45	HEAO-A	36B	S
HEAO 2 (Einstein)	11/13/78	Atlas-Centaur-52	HEAO-B	36B	S
HEAO 3	9/20/79	Atlas-Centaur-53	HEAO-C	36B	S
<b>SCATHA (Spacecraft Charging At High Altitudes)</b>					
<sup>3</sup> SCATHA	1/30/79	Delta-148	SCATHA	17B	S
<b>SMM (Solar Maximum Mission)</b>					
SMM	2/14/80	Delta-151	SMM	17A	S

### International Space Science

Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
<b>AERIEL (British)</b>					
Aerial 1	4/26/62	Delta-9	S-51 (UK-1)	17A	S
<b>ALOUETTE (Canadian)</b>					
Alouette 1	9/29/62	Thor-Agena-1	S-27	<sup>1</sup> SLC-2E	S
Alouette 2/Explorer 31	11/28/65	Thor-Agena-5	<sup>1</sup> Alouette-B/ DME-A	<sup>1</sup> SLC-2E	S
<b>ISIS (Canadian)</b>					
ISIS 1	1/28/69	<sup>2</sup> Delta-65	ISIS-A	<sup>1</sup> SLC-2E	S
ISIS 2	3/31/71	<sup>2</sup> Delta-84	ISIS-B	<sup>1</sup> SLC-2E	S
<b>ESA (European Space Agency, Formerly ESRO)</b>					
<sup>3</sup> HEOS 1	12/5/68	<sup>2</sup> Delta-61	HEOS-A	17B	S
<sup>3</sup> HEOS 2	1/31/72	<sup>2</sup> Delta-87	HEOS-A2	<sup>1</sup> SLC-2E	S
<sup>3</sup> TD 1	3/11/72	<sup>2</sup> Delta-88	TD-1/A	<sup>1</sup> SLC-2E	S
<sup>3</sup> Cosmic 1	8/8/75	<sup>2</sup> Delta-113	COS-B	<sup>1</sup> SLC-2W	S
<sup>3</sup> Geos	4/20/77	<sup>2</sup> Delta-130	ESRO/Geos	17B	P
<sup>3</sup> Geos 2	7/14/78	<sup>2</sup> Delta-143	Geos-2	17A	S
<b>INTASAT (Spanish)</b>					
<sup>3</sup> INTASAT/NOAA 4/OSCAR 7	11/15/74	<sup>2</sup> Delta-104	<sup>1</sup> INSAT/ITOS/ OSCAR	<sup>1</sup> SLC-2W	S
<b>HELIOS (German)</b>					
<sup>3</sup> Helios 1	12/10/74	Titan III-Centaur-2	Helios-A	41	S
<sup>3</sup> Helios 2	1/15/76	Titan III-Centaur-5	Helios-B	41	S
<b>IRAS (Infrared Astronomical Satellite)</b>					
<sup>3</sup> IRAS	1/25/83	<sup>2</sup> Delta-166	IRAS	<sup>1</sup> SLC-2W	S
<b>EXOSAT</b>					
<sup>3</sup> Exosat	5/26/83	<sup>2</sup> Delta-169	Exosat	<sup>1</sup> SLC-2W	S
<b>ACTIVE MAGNETOSPHERIC PARTICLE TRACER EXPLORERS (AMPTE)</b>					
<sup>2</sup> AMPTE	8/16/84	<sup>2</sup> Delta-175	<sup>1</sup> AMPTE	17A	S

### Bioscience

Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
<b>BIOFLIGHTS (Suborbital Primate Flights)</b>					
BIOFLIGHT 1	12/13/58	Jupiter AM-13	Gordo	26B	P
BIOFLIGHT 2	5/28/59	Jupiter AM-18	Able-Baker	26B	S
<b>BIOS (Biological Satellites)</b>					
BIOS 1	12/14/66	<sup>2</sup> Delta-43	BIOS-A	17A	P
BIOS 2	9/7/67	<sup>2</sup> Delta-51	BIOS-B	17B	S
BIOS 3	6/28/69	<sup>2</sup> Delta-70	BIOS-D	17A	P

### Lunar and Planetary

Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
<b>PIONEER (Lunar)</b>					
Pioneer 1	10/11/58	Thor-Able-1	—	17A	U
Pioneer 2	11/8/58	Thor-Able-2	—	17A	U
Pioneer 3	12/6/58	Juno II AM-11	—	5	U
Pioneer 4	3/3/59	Juno II AM-14	—	5	U
Pioneer	11/26/59	Atlas-Able-1	—	14	U
Pioneer	9/25/60	Atlas-Able-2	P-30	12	U
Pioneer	12/15/60	Atlas-Able-3	P-31	12	U
<b>PIONEER (Interplanetary)</b>					
Pioneer 5	3/11/60	Thor-Able-4	P-2	17A	S
Pioneer 6	12/16/65	<sup>2</sup> Delta-35	Pioneer-A	17A	S
Pioneer 7	8/17/66	<sup>2</sup> Delta-40	Pioneer-B	17A	S
Pioneer 8/TTS 1	12/13/67	<sup>2</sup> Delta-55	<sup>1</sup> Pioneer-C	17B	S
Pioneer 9/TETR 2	11/8/68	<sup>2</sup> Delta-60	<sup>1</sup> Pioneer-D	17B	S
Pioneer/TETR	8/27/69	<sup>2</sup> Delta-73	<sup>1</sup> Pioneer-E	17A	U
Pioneer 10	3/2/72	Atlas-Centaur-27	Pioneer-F	36A	S
Pioneer 11	4/5/73	Atlas-Centaur-30	Pioneer-G	36B	S
Pioneer Venus 1	5/20/78	Atlas-Centaur-50	Pioneer Venus Orbiter	36A	S
Pioneer Venus 2	8/8/78	Atlas-Centaur-51	Pioneer Venus Multiprobe	36A	S
<b>RANGER</b>					
Ranger 1	8/23/61	Atlas-Agena-1	P-32	12	U
Ranger 2	11/18/61	Atlas-Agena-2	P-33	12	U
Ranger 3	1/26/62	Atlas-Agena-3	P-34	12	U
Ranger 4	4/23/62	Atlas-Agena-4	P-35	12	P
Ranger 5	10/18/62	Atlas-Agena-7	P-36	12	P
Ranger 6	1/30/64	Atlas-Agena-8	Ranger-A (P-53)	12	P
Ranger 7	7/28/64	Atlas-Agena-9	Ranger-B (P-54)	12	S
Ranger 8	2/17/65	Atlas-Agena-13	Ranger-C	12	S
Ranger 9	3/21/65	Atlas-Agena-14	Ranger-D	12	S
<b>SURVEYOR</b>					
Surveyor 1	5/30/66	Atlas-Centaur-10	Surveyor-A	36A	S
Surveyor 2	9/20/66	Atlas-Centaur-7	Surveyor-B	36A	P
Surveyor 3	4/17/67	Atlas-Centaur-12	Surveyor-C	36B	S
Surveyor 4	7/14/67	Atlas-Centaur 11	Surveyor-D	36A	P
Surveyor 5	9/8/67	Atlas-Centaur-13	Surveyor-E	36B	S
Surveyor 6	11/7/67	Atlas-Centaur-14	Surveyor-F	36B	S
Surveyor 7	1/7/68	Atlas-Centaur-15	Surveyor-G	36A	S
<b>LUNAR ORBITER</b>					
Lunar Orbiter 1	8/10/66	Atlas-Agena-17	LO-A	13	S
Lunar Orbiter 2	11/6/66	Atlas-Agena-18	LO-B	13	S
Lunar Orbiter 3	2/4/67	Atlas-Agena-20	LO-C	13	S
Lunar Orbiter 4	5/4/67	Atlas-Agena-22	LO-D	13	S
Lunar Orbiter 5	8/1/67	Atlas-Agena-24	LO-E	13	S
<b>MARINER</b>					
Mariner 1 (Venus)	7/22/62	Atlas-Agena-5	P-37	12	U
Mariner 2 (Venus)	8/27/62	Atlas-Agena-6	P-38	12	S
Mariner 3 (Mars)	11/5/64	Atlas-Agena-11	Mariner-64C	13	U
Mariner 4 (Mars)	11/28/64	Atlas-Agena-12	Mariner-64D	12	S
Mariner 5 (Venus)	6/14/67	Atlas-Agena-23	Mariner-67E	12	S
Mariner 6 (Mars)	2/24/69	Atlas-Centaur-20	Mariner-69F	36B	S
Mariner 7 (Mars)	3/27/69	Atlas-Centaur-19	Mariner-69G	36A	S
Mariner 8 (Mars)	5/8/71	Atlas-Centaur-24	Mariner-71H	36A	U
Mariner 9 (Mars)	5/30/71	Atlas-Centaur-23	Mariner-71I	36B	S
Mariner 10 (Mercury)	11/3/73	Atlas-Centaur-34	Mariner-73J	36B	S
<b>VIKING</b>					
Viking 1 (Mars)	8/20/75	Titan III-Centaur-4	Viking-A	41	S
Viking 2 (Mars)	9/9/75	Titan III-Centaur-3	Viking-B	41	S
<b>VOYAGER</b>					
Voyager 2	8/20				

RELAY						
Relay 1	12/13/62	Delta-15	A-15	17A	S	
Relay 2	1/21/64	Delta-23	A-16	17B	S	
SYNCOM						
Syncom 1	2/14/63	Delta-16	Syncom-A (A-25)	17B	P	
Syncom 2 (Atlantic)	7/26/63	Delta-20	Syncom-B (A-26)	17A	S	
Syncom 3 (Pacific)	8/19/64	Delta-25	Syncom-C	17A	S	
SYMPHONIE (French-German Experimental Communications Satellites)						
<sup>3</sup> Symphonie 1	12/18/74	<sup>2</sup> Delta-106	Symphonie-A	17B	S	
<sup>3</sup> Symphonie 2	8/26/75	<sup>2</sup> Delta-114	Symphonie-B	17A	S	
COMMUNICATIONS TECHNOLOGY SATELLITES						
CTS (U.S.-Canadian)	1/17/76	<sup>2</sup> Delta-119	CTS	17B	S	
<sup>3</sup> SIRIO (Italian)	8/25/77	<sup>2</sup> Delta-133	SIRIO	17B	S	
<sup>3</sup> OTS-1 (ESA)	9/13/77	<sup>2</sup> Delta-134	OTS	17A	U	
<sup>3</sup> CS (Japan)	12/14/77	<sup>2</sup> Delta-137	CS	17B	S	
<sup>3</sup> BSE (Japan)	4/7/78	<sup>2</sup> Delta-140	BSE	17B	S	
<sup>3</sup> OTS-2 (ESA)	5/11/78	<sup>2</sup> Delta-141	OTS-2	17A	S	

### Operational Systems

Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
INTERNATIONAL TELECOMMUNICATIONS SATELLITE ORGANIZATION					
<sup>3</sup> Intelsat I (Early Bird)	4/6/65	<sup>2</sup> Delta-30	EB-A	17A	S
<sup>3</sup> Intelsat II (Lani Bird)	10/26/66	<sup>2</sup> Delta-42	F-1	17B	P
<sup>3</sup> Intelsat II	1/11/67	<sup>2</sup> Delta-44	F-2	17B	S
<sup>3</sup> Intelsat II	3/22/67	<sup>2</sup> Delta-47	F-3	17B	S
<sup>3</sup> Intelsat II	9/27/67	<sup>2</sup> Delta-52	F-4	17B	S
<sup>3</sup> Intelsat III	9/18/68	<sup>2</sup> Delta-59	III-A	17A	U
<sup>3</sup> Intelsat III	12/18/68	<sup>2</sup> Delta-63	F-2	17A	S
<sup>3</sup> Intelsat III	2/5/69	<sup>2</sup> Delta-66	F-3	17A	S
<sup>3</sup> Intelsat III	5/21/69	<sup>2</sup> Delta-68	F-4	17A	S
<sup>3</sup> Intelsat III	7/25/69	<sup>2</sup> Delta-71	III-E	17A	U
<sup>3</sup> Intelsat III	1/14/70	<sup>2</sup> Delta-75	F-6	17A	S
<sup>3</sup> Intelsat III	4/22/70	<sup>2</sup> Delta-78	F-7	17A	S
<sup>3</sup> Intelsat III	7/23/70	<sup>2</sup> Delta-79	III-H	17A	P
<sup>3</sup> Intelsat IV	1/25/71	Atlas-Centaur-25	F-2	36A	S
<sup>3</sup> Intelsat IV	12/19/71	Atlas-Centaur-26	F-3	36A	S
<sup>3</sup> Intelsat IV	1/22/72	Atlas-Centaur-28	F-4	36B	S
<sup>3</sup> Intelsat IV	6/13/72	Atlas-Centaur-29	F-5	36B	S
<sup>3</sup> Intelsat IV	8/23/73	Atlas-Centaur-31	F-7	36A	S
<sup>3</sup> Intelsat IV	11/21/74	Atlas-Centaur-32	F-8	36B	S
<sup>3</sup> Intelsat IV	2/20/75	Atlas-Centaur-33	F-6	36A	U
<sup>3</sup> Intelsat IV	5/22/75	Atlas-Centaur-35	F-1	36A	S
<sup>3</sup> Intelsat IV-A	9/25/75	Atlas-Centaur-36	F-1	36B	S
<sup>3</sup> Intelsat IV-A	1/29/76	Atlas-Centaur-37	F-2	36B	S
<sup>3</sup> Intelsat IV-A	5/26/77	Atlas-Centaur-39	F-4	36A	S
<sup>3</sup> Intelsat IV-A	9/29/77	Atlas-Centaur-43	F-5	36A	U
<sup>3</sup> Intelsat IV-A	1/6/78	Atlas-Centaur-46	F-3	36B	S
<sup>3</sup> Intelsat IV-A	3/31/78	Atlas-Centaur-48	F-6	36B	S
<sup>3</sup> Intelsat V	12/6/80	Atlas-Centaur-54	F-2	36B	S
<sup>3</sup> Intelsat V	5/23/81	Atlas-Centaur-56	F-1	36B	S
<sup>3</sup> Intelsat V	12/15/81	Atlas-Centaur-55	F-3	36B	S
<sup>3</sup> Intelsat V	3/4/82	Atlas-Centaur-58	F-4	36A	S
<sup>3</sup> Intelsat V	9/28/82	Atlas-Centaur-60	F-5	36B	S
<sup>3</sup> Intelsat V	5/19/83	Atlas-Centaur-61	F-6	36A	S
<sup>3</sup> Intelsat V	6/9/84	Atlas-Centaur-62	—	36B	U
<sup>3</sup> Intelsat V-A	3/19/85	Atlas-Centaur-63	F-10	36B	S
<sup>3</sup> Intelsat V-A	6/29/85	Atlas-Centaur-64	F-11	36B	S
<sup>3</sup> Intelsat V-A	9/26/85	Atlas-Centaur-65	F-12	36B	S

WESTAR (U.S. Domestic Communications Satellites)					
<sup>3</sup> Westar 1	4/13/74	<sup>2</sup> Delta-101	Westar-A	17B	S
<sup>3</sup> Westar 2	10/10/74	<sup>2</sup> Delta-103	Westar-B	17B	S
<sup>3</sup> Westar 3	8/9/79	<sup>2</sup> Delta-149	Westar-C	17A	S
<sup>3</sup> Westar IV	2/25/82	<sup>2</sup> Delta-160	Westar-D	17A	S
<sup>3</sup> Westar V	6/8/82	<sup>2</sup> Delta-162	Westar-E	17A	S
See Note 5					

RCA (U.S. Domestic Communications Satellites)					
<sup>3</sup> SATCOM 1	12/12/75	<sup>2</sup> Delta-118	SATCOM-A	17A	S
<sup>3</sup> SATCOM 2	3/26/76	<sup>2</sup> Delta-121	SATCOM-B	17A	S
<sup>3</sup> SATCOM 3	12/6/79	<sup>2</sup> Delta-150	SATCOM-C	17A	P
<sup>3</sup> SATCOM 3R	11/19/81	<sup>2</sup> Delta-158	SATCOM-D	17A	S
<sup>3</sup> SATCOM IV	1/15/82	<sup>2</sup> Delta-159	SATCOM-C	17A	S
<sup>3</sup> SATCOM V	10/27/82	<sup>2</sup> Delta-165	SATCOM-E	17B	S
<sup>3</sup> SATCOM 1R	4/11/83	<sup>2</sup> Delta-167	SATCOM 1R	17A	S
<sup>3</sup> SATCOM 2R	9/8/83	<sup>2</sup> Delta-172	SATCOM 2R	17B	S
See Note 5					

GALAXY					
<sup>3</sup> Galaxy I	6/28/83	<sup>2</sup> Delta-170	Galaxy A	17B	S
<sup>3</sup> Galaxy II	9/22/83	<sup>2</sup> Delta-173	Galaxy B	17A	S
<sup>3</sup> Galaxy III	9/21/84	<sup>2</sup> Delta-176	Galaxy III	17B	S

MARISAT (U.S. Maritime Communications Satellites)					
<sup>3</sup> Marisat 1	2/19/76	<sup>2</sup> Delta-120	Marisat-A	17B	S
<sup>3</sup> Marisat 2	6/9/76	<sup>2</sup> Delta-124	Marisat-B	17A	S
<sup>3</sup> Marisat 3	10/14/76	<sup>2</sup> Delta-127	Marisat-C	17A	S

FLTSATCOM (U.S. Fleet Satellite Communications Spacecraft)					
<sup>3</sup> FLTSATCOM 1	2/9/78	Atlas-Centaur-44	FLTSATCOM-A	36A	S
<sup>3</sup> FLTSATCOM 2	5/4/79	Atlas-Centaur-47	FLTSATCOM-B	36A	S
<sup>3</sup> FLTSATCOM 3	1/17/80	Atlas-Centaur-49	FLTSATCOM-C	36A	S
<sup>3</sup> FLTSATCOM 4	10/30/80	Atlas-Centaur-57	FLTSATCOM-D	36A	S
<sup>3</sup> FLTSATCOM 5	8/6/81	Atlas-Centaur-59	FLTSATCOM-E	36A	S
<sup>3</sup> FLTSATCOM 7	12/4/86	Atlas-Centaur-66	FLTSATCOM-G	36B	S
<sup>3</sup> FLTSATCOM F	3/26/87	Atlas-Centaur-67	FLTSATCOM-F	36B	U
<sup>3</sup> FLTSATCOM 8	9/25/89	Atlas-Centaur-68	FLTSATCOM-8	36B	S

COMSTAR (U.S. Domestic Communications Satellites)					
<sup>3</sup> Comstar D-1	5/13/76	Atlas-Centaur-38	Comstar D-1	36A	S
<sup>3</sup> Comstar D-2	7/22/76	Atlas-Centaur-40	Comstar D-2	36B	S
<sup>3</sup> Comstar D-3	6/29/78	Atlas-Centaur-41	Comstar D-3	36B	S
<sup>3</sup> Comstar D-4	2/21/81	Atlas-Centaur-42	Comstar D-4	36A	S

SKYNET (British Communications Satellites)					
<sup>3</sup> Skynet 1	11/21/69	<sup>2</sup> Delta-74	Skynet-A	17A	S
<sup>3</sup> Skynet 2	8/19/70	<sup>2</sup> Delta-80	Skynet-B	17A	S
<sup>3</sup> Skynet	1/18/74	<sup>2</sup> Delta-100	Skynet-2A	17B	U
<sup>3</sup> Skynet 3	11/22/74	<sup>2</sup> Delta-105	Skynet-2B	17B	S

TELESAT (Canadian Domestic Communications Satellites)					
<sup>3</sup> Telesat 1 (Anik 1)	11/9/72	<sup>2</sup> Delta-92	Telesat-A	17B	S
<sup>3</sup> Telesat 2 (Anik 2)	4/20/73	<sup>2</sup> Delta-94	Telesat-B	17B	S
<sup>3</sup> Telesat 3 (Anik 3)	5/7/75	<sup>2</sup> Delta-110	Telesat-C	17B	S
<sup>3</sup> Telesat 4 (Anik B)	12/15/78	<sup>2</sup> Delta-147	Telesat-D	17A	S
<sup>3</sup> Telesat 6 (Anik D-1)	8/26/82	<sup>2</sup> Delta-164	Telesat-F	17B	S
See Note 5					

NATOSAT (North Atlantic Treaty Organization Communications Satellites)					
<sup>3</sup> NATOSAT 1	3/20/70	<sup>2</sup> Delta-77	NATO-A	17A	S
<sup>3</sup> NATOSAT 2	2/2/71	<sup>2</sup> Delta-82	NATO-B	17A	S
<sup>3</sup> NATO IIIA	4/22/76	<sup>2</sup> Delta-122	NATO IIIA	17B	S
<sup>3</sup> NATO IIIB	1/27/77	<sup>2</sup> Delta-128	NATO IIIB	17A	S
<sup>3</sup> NATO IIIC	11/18/78	<sup>2</sup> Delta-146	NATO IIIC	17B	S
<sup>3</sup> NATO IIID	11/13/84	<sup>2</sup> Delta-177	NATO IIID	17A	S

PALAPA (Indonesian Domestic Communications Satellites)					
<sup>3</sup> Palapa 1	7/8/76	<sup>2</sup> Delta-125	Palapa-A	17A	S
<sup>3</sup> Palapa 2	3/10/77	<sup>2</sup> Delta-129	Palapa-B	17A	S
<sup>3</sup> Palapa B2P	3/20/87	Delta-182	Palapa B2P	17B	S
See Note 5					

SBS-A (Satellite Business Systems)					
<sup>3</sup> SBS-1	11/15/80	<sup>2</sup> Delta-153	SBS-A	17A	S
<sup>3</sup> SBS-2	9/24/81	<sup>2</sup> Delta-156	SBS-B	17A	S
See Note 5					

INSAT					
<sup>3</sup> Insat 1A	4/10/82	<sup>2</sup> Delta-161	Insat-1A	17A	P

TELSTAR					
<sup>3</sup> Telstar 3-A	7/28/83	<sup>2</sup> Delta-171	Telstar-C	17A	S
See Note 5					

## Space Applications and Technology

### Launch and Space Vehicle Development

Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
SATURN					
Saturn	10/27/61	Saturn C-1	SA-1	34	S
Saturn	4/25/62	Saturn C-1	SA-2	34	S
Saturn	11/16/62	Saturn C-1	SA-3	34	S
Saturn	3/28/63	Saturn I	SA-4	34	S
Saturn	1/29/64	Saturn I	SA-5	37B	S
Saturn	7/5/66	Upgraded Saturn I (IB)	AS-203	37B	S
CENTAUR					
Centaur	5/8/62	Atlas-Centaur-1	F-1	36A	S
Centaur	11/27/63	Atlas-Centaur-2	AC-2	36A	S
Centaur	6/30/64	Atlas-Centaur-3	AC-3	36A	S
Centaur	12/11/64	Atlas-Centaur-4	AC-4	36A	S
Centaur	3/2/65	Atlas-Centaur-5	AC-5	36A	U
Centaur	8/11/65	Atlas-Centaur-6	AC-6	36B	S
Centaur	4/7/66	Atlas-Centaur-8	AC-8	36B	U
Centaur	10/26/66	Atlas-Centaur-9	AC-9	36B	S
FIRE (Flight Investigation of Reentry Environment)					
Fire 1	4/14/64	Atlas-X259	—	12	S
Fire 2	5/22/65	Atlas-X259	—	12	S
SERT (Space Electric Rocket Tests)					
SERT 2	2/3/70	<sup>2</sup> Thor-Agena-12	SERT II	<sup>c</sup> SLC-2E	P
TITAN III-CENTAUR					
Titan-Centaur Proof Flight	2/11/74	Titan IIIE-Centaur D	TC-1	41	U

Applications Technology					
Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
ATS (Applications Technology Satellites)					
ATS 1	12/6/66	Atlas-Agena-19	ATS-B	12	S
ATS 2	4/5/67	Atlas-Agena-21	ATS-A	12	P
ATS 3	11/5/67	Atlas-Agena-25	ATS-C	12	S
ATS 4	8/10/68	Atlas-Centaur-17	ATS-D	36A	P
ATS 5	8/12/69	Atlas-Centaur-18	ATS-E	36A	S
ATS 6	5/30/74	Titan III-C	ATS-F	40	S
STRATEGIC DEFENSE INITIATIVE					
<sup>3</sup> SDI-1	9/5/86	Delta-180	SDI-1	17B	S
<sup>3</sup> SDI-2	2/8/88	Delta-181	SDI-2	17B	S

## Manned Space Flight (Mercury through Apollo)

Mercury					
Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
SUBORBITAL					
Big Joe	9/9/59	Atlas-10D	<sup>5</sup> BP S/C	14	S
MA-1	7/29/60	Mercury-Atlas-50D	<sup>5</sup> S/C-4	14	U
MR-1	11/21/60	Mercury-Redstone-1	<sup>5</sup> S/C-2	5	U
MR-1A	12/19/60	Mercury-Redstone-3	<sup>5</sup> S/C-2A	5	S
MR-2 (Chimp "Ham")	1/31/61	Mercury-Redstone-2	<sup>5</sup> S/C-5	5	S
MA-2	2/21/61	Mercury-Atlas-67D	<sup>5</sup> S/C-6	14	S
MR-BD	3/24/61	Mercury-Redstone-5	<sup>5</sup> BP S/C	5	S
MR-3 (Shepard)	5/5/61	Mercury-Redstone-7	Freedom 7	5	S
MR-4 (Grissom)	7/21/61	Mercury-Redstone-8	Liberty Bell 7	5	S
ORBITAL					
MA-3	4/25/61	Mercury-Atlas-100D	<sup>5</sup> S/C-8	14	U
MA-4	9/13/61	Mercury-Atlas-88D	<sup>5</sup> S/C-8A	14	S
MS-1	11/1/61	Mercury-Scout	—	18B	U
MA-5 (Chimp "Enos")	11/29/61	Mercury-Atlas-93D	<sup>5</sup> S/C-9	14	S
MA-6 (Glenn)	2/20/62	Mercury-Atlas-109D	Friendship 7	14	S
MA-7 (Carpenter)	5/24/62	Mercury-Atlas-107D	Aurora 7	14	S
MA-8 (Schirra)	10/3/62	Mercury-Atlas-113D	Sigma 7	14	S
MA-9 (Cooper)	5/15/63	Mercury-Atlas-130D	Faith 7	14	S

Gemini					
Mission Name	Launch Date	Launch Vehicle	Payload Code	Launch Pad	Results
SUBORBITAL					
Gemini 2	1/19/65	Titan II GLV-2	<sup>5</sup> Gemini S/C 2	19	S
ORBITAL					
Gemini 1	4/8/64	Titan II GLV-1	<sup>5</sup> Gemini S/C-1	19	S
Gemini 3 (Grissom-Young)	3/23/65	Titan II GLV-3	<sup>5</sup> Gemini S/C-3	19	S
Gemini 4 (McDivitt-White)	6/3/65	Titan II GLV-4	<sup>5</sup> Gemini S/C-4	19	S
Gemini 5 (Cooper-Conrad)	8/21/65	Titan II GLV-5	<sup>5</sup> Gemini S/C-5	19	S
Gemini 6 Target Vehicle	10/25/65	Atlas TLV-5301	Agema TV-5002	14	U
Gemini 7 (Borman-Lovell)	12/4/65	Titan II GLV-7	<sup>5</sup> Gemini S/C-7	19	S
Gemini 6A (Schirra-Stafford)	12/15/65	Titan II GLV-6	<sup>5</sup> Gemini S/C-6	19	S
Gemini 8 Target Vehicle	3/16/66	Atlas TLV-5302	Agema TV-5003	14	P
Gemini 8 (Armstrong-Scott)	3/16/66	Titan II GLV-8	<sup>5</sup> Gemini S/C-8	19	P