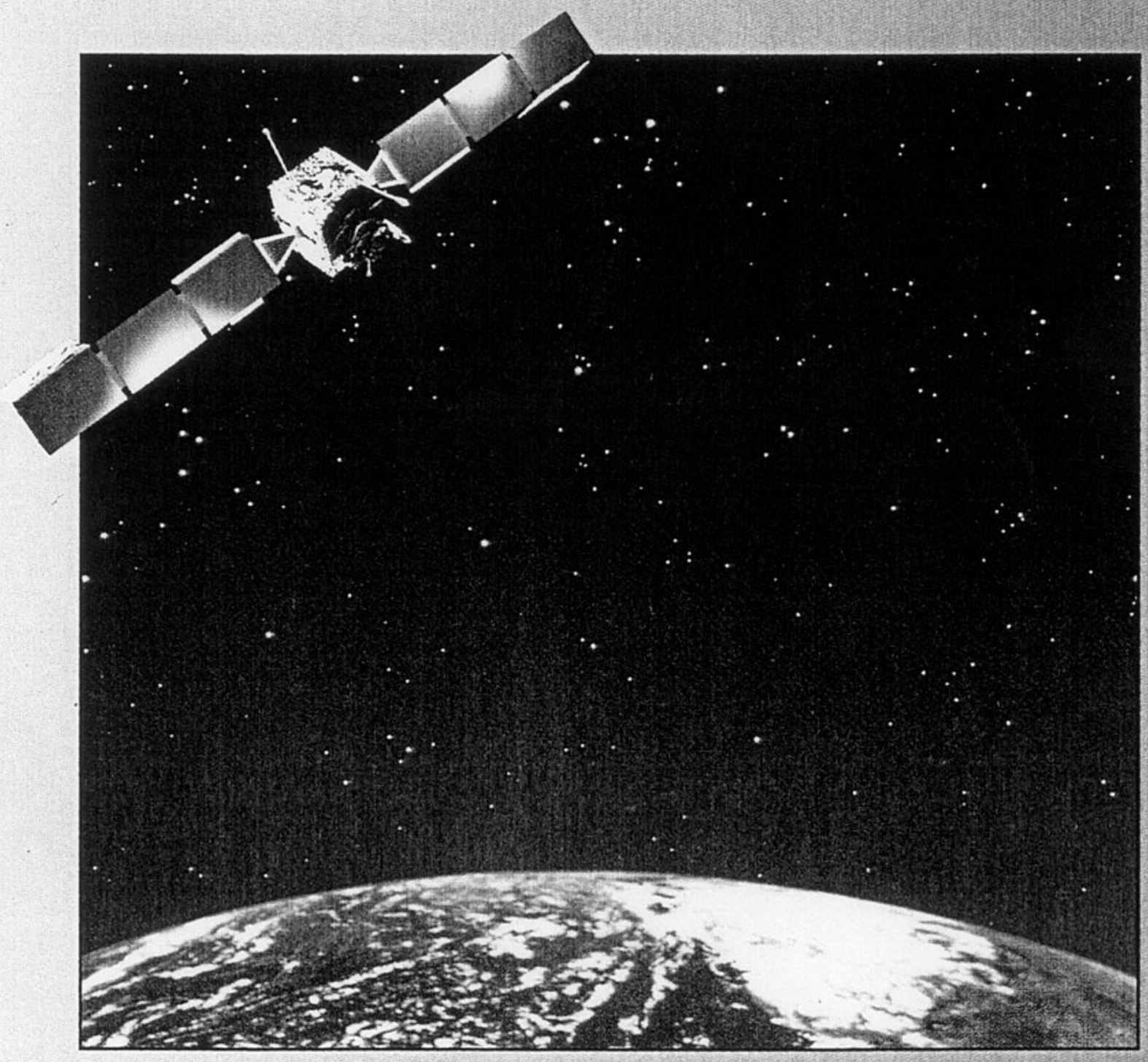
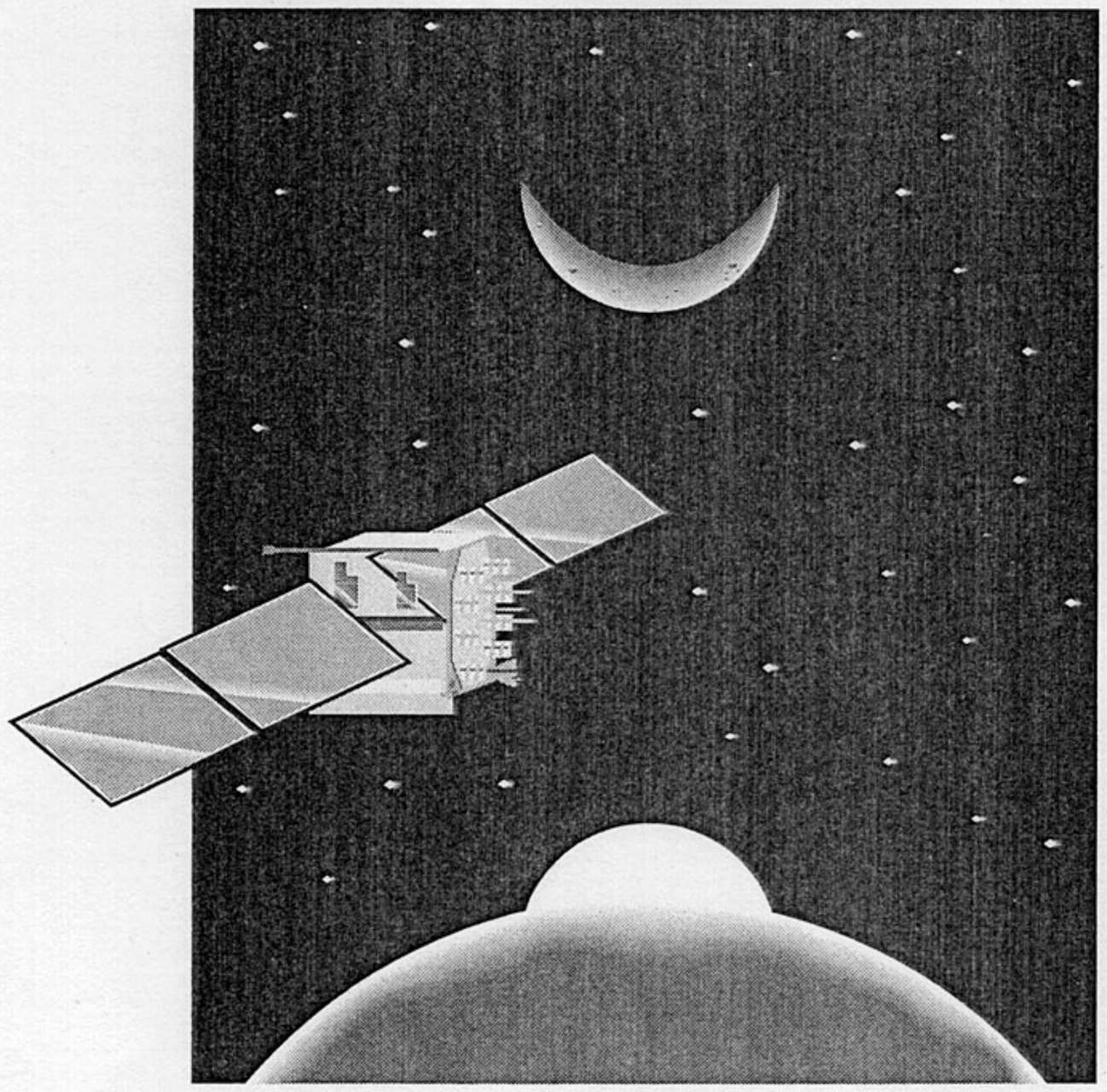
TABLE OF ARTIFICIAL SATELLITES LAUNCHED IN 1993



INTERNATIONAL TELECOMMUNICATION UNION



This list includes all artificial satellites launched in 1993. It was prepared from information provided by telecommunication administrations of ITU Member countries, the Committee on Space Research (COSPAR), national space research organizations, the Radiocommunication Bureau (BR) of the ITU, and from details published in the specialzed press. The data concerning the orbit parameters are the initial orbital data. Fragments or stages of rockets left over from the launching operations and placed in orbit with the various spacecraft have not been included.

Cover: graphic representation of the "Inmarsat-2" satellite (photo: INMARSAT)

TABLE OF ARTIFICIAL SATELLITES LAUNCHED IN 1993

A

Acts	1993-58-B
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Cosmos-2231	1993-4-A
Cosmos-2232	1993-6-A
Cosmos-2233	1993-8-A
Cosmos-2234	1993-10-A
Cosmos-2235	1993-10-B
Cosmos-2236	1993-10-C
Cosmos-2237	1993-16-A
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Cosmos-2239	1993-20-A
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Molnya-1 (85)	1993-2-A
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USA-89	1992-86-B
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I

Code name and spacecraft description	*International number*	*Country Organization Site of launching*	*Date*	*Initial orbital data*		*Frequencies and transmitter power*	*Observations*
				Perigee (km) Apogee (km)	*Period (min) Inclination (degree)*		
COSMOS-2230	1993-1-A	CIS (Plesetsk)	12 January	988 1020	105 83	150.00; 400 MHz	Navigation and radiolocation. CICADA series
MOLNYA-1 (85) Hermetically sealed cylinder with conical ends; 1000 kg; 6 solar panels	1993-2-A	CIS (Plesetsk)	13 January	647 40 609	735 63	800 MHz band 40 W (emission) 1000 MHz (reception) 3400-4100 MHz (retransmission of television)	Television and multichannel radiocommunications
STS-54 space shuttle Endeavor	1993-3-A	United States (Cape Canaveral)	13 January	179 614	92.5 62.8		Reusable spacecraft. Five astonauts. Two diffuse X-ray spectrometers (420-840 nm band) to study hot gases/plasma in the Milky Way. Experiments for pharmaceutical production and solid surface combustion. Landed on 19 January 1993
TDRS-F6 2.5 tonnes	1993-3-B	United States launched from STS-54	13 January	35 779 35 792	1436.0 0.6		Tracking and Data Relay Satellite system. The fully functional TDRS-F5 will remain at 41 and 174° W respectively. TDRS-F1 will be moved to 85° E and TDRS-F3 to 171° W
				in geostationary-satellite orbit at 62° W			
COSMOS-2231	1993-4-A	CIS (Plesetsk)	19 January	177 370	89.6 67.2		SOYUZ launcher. Decayed on 25 March 1993
SOYUZ-TM 16	1993-5-A	CIS (Baikonur)	24 January	257 308	89.9 51.6		Transported two cosmonauts to MIR-1 orbital complex with which it docked on 26 January 1993. Returned to Earth on 22 July 1993
COSMOS-2232	1993-6-A	CIS	26 January	616 39 667	718 62.7		Telecommunications
USA-88 (GPS-2-18) (NAVSTAR-22)	1993-7-A	United States (Vandenberg)	3 Feb.	175 20 341	355.9 54.83	1575.42; 1227.60 MHz	Navigation
COSMOS-2233	1993-8-A	CIS (Plesetsk)	9 Feb.	972 1021	104.6 82.9	150.03; 400.08 MHz	COSMOS launcher
OXP-1	1993-9-A	United States (Cape Canaveral)	9 Feb.	642 871	99.7 24.9		PEGASUS launcher
SCD-1	1993-9-B	Brazil (Cape Canaveral)	9 Feb.	722 787	99.7 24.9		Meteorology. Twenty instuments to monitor cloud cover, rainfall, tide levels and air quality. PEGASUS launcher
COSMOS-2234	1993-10-A	CIS (Baikonur)	17 Feb.	19 117 19 146	676.5 64.8		GLObal NAvigation Satellite System (GLONASS). PROTON launcher
COSMOS-2235	1993-10-B	CIS (Baikonur)	17 Feb.	18 860 19 131	669.7 64.8		GLObal NAvigation Satellite System (GLONASS). PROTON launcher
COSMOS-2236	1993-10-C	CIS (Baikonur)	17 Feb.	19 198 19 497	683.7 64.8		GLObal NAvigation Satellite System (GLONASS). PROTON launcher
ASTRO-D (ASUKA) (ASCA)	1993-11-A	Japan ISAS/NASA (Kagoshima)	20 Feb.	536 650	96.3 31.1		Advanced satellite for cosmology and Astrophysics. Reflecting X-ray imager for 0.5-10 keV photons. Emphasis is on remote objects billions of light-years away

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				Perigee (km) Apogee (km)	*Period (min) Inclination (degree)*		
PROGRESS-M16	1993-12-A	CIS (Baikonur)	21 Feb.	191 254	88.7 51.6		Expendable supply craft. Docked with MIR-1 orbital complex. Decayed on 27 March 1993
USA-89	1992-86-B	United States launched from 1992-83-A					
RADUGA-29 3-axis stabilized; 5 tonnes; solar panels	1993-13-A	CIS (Baikonur)	25 March	36 509	1473 1.4	5.7-6.2 GHz (reception) 3.4-3.9 GHz (emission)	Television and multichannel communications. PROTON launcher
				in geostationary satellite orbit			
START-1	1993-14-A	CIS	25 March	695 966	101 75.8		Experimental spacecraft
UHF-1	1993-15-A	United States (Vandenberg)	25 March	216 9735	200.3		ATLAS-CENTAUR launcher
COSMOS-2237	1993-16-A	CIS (Plesetsk)	26 March	851 879	102 71		ZENIT launcher
USA-90 SEDS-1	1993-17-A 1993-17-B	United States United States	30 March 30 March	184 20 426	356.8 54.8	1575.42; 1227.60 MHz	 Decayed on 31 March 1993
COSMOS-2238	1993-18-A	CIS (Baikonur)	30 March	412 428	92.8 65.0		TSIKLON-M launcher
PROGRESS-M17	1993-19-A	CIS (Baikonur)	31 March	187 238	88.5 51.6		Automatic cargo spacecraft. Docked with MIR-1 orbital complex and provided supplies
COSMOS-2239	1993-20-A	CIS (Plesetsk)	1 April	979 1011	104.8 82.9	149.97; 399.84 MHz	COSMOS launcher
COSMOS-2240	1993-21-A	CIS (Plesetsk)	2 April	196 342	89.6 62.8		SOYUZ launcher. Decayed on 7 June 1993
COSMOS-2241	1993-22-A	CIS (Plesetsk)	6 April	620 39 171	706 62.8		MOLNYA launcher
STS-56 space shuttle Discovery	1993-23-A	United States (Cape Canaveral)	8 April	295 307	90.5 57.0		Manned spacecraft with crew of four. Instrument of the Atlas 2 programme to study the atmosphere, Sun and Earth. Returned to Earth and landed on 17 April 1993
SPARTAN-201	1993-23-B	United States (Cape Canaveral)	8 April	295 311	90.3 57.0		UV and X-ray instrument to study the solar corona and the galaxy. It was later hauled back to the shuttle on 13 April
COSMOS-2242	1993-24-A	CIS (Plesetsk)	16 April	645 680	97.8 82.5		TSIKLON-M launcher
MOLNYA-3 (44) 3 axis stabilized; 1550 kg	1993-25-A	CIS (Plesetsk)	21 April	671 40 610	735 62.8	5.9-6.2 GHz (reception) 3.4-3.9 GHz (emission)	Television and multichannel radio-communications. MOLNYA launcher
ALEXIS	1993-26-A	United States	25 April				PEGASUS launcher

Code name and spacecraft description	*International number*	*Country Organization Site of launching*	*Date*	*Initial orbital data*		*Frequencies and transmitter power*	*Observations*
				Perigee (km) Apogee (km)	*Period (min) Inclination (degree)*		
STS-55 space shuttle Columbia	1993-27-A	United States (Cape Canaveral)	26 April	298 306	90.5 28.4		Seven crew, including two from the German Aerospace Resarch Establishment. Carried German SPACELAB D2 containing experiments in material science, life science and technology and for observations of Earth and celestial objects. Landed on 6 May 1993
COSMOS-2243	1993-28-A	CIS (Baikonur)	27 April	191 249	88.6 70.3		SOYUZ launcher. Spacecraft reported to have broken up on 6 May 1993
COSMOS-2244	1993-29-A	CIS (Baikonur)	28 April	204.4 274.4	89 70.4		SOYUZ launcher
COSMOS-2245 to COSMOS-2250	1993-30-A to 1993-30-F	CIS (Plesetsk)	11 May	1400 1400	114 82.6		TSIKLON launcher
ASTRA-1C 3-axis stabilized; 1045 kg	1993-31-A	Luxembourg SES (Kourou)	12 May	35 777 35 798	1436.1 0.0	14.25-14.50 GHz (reception) 11.45-11.70 GHz (emission)	ARIANE launcher. Eighteen transponders
				in geostationary-satellite orbit at 19.2° E			
ARSENE 154 kg	1993-31-B	France Radio amateur club de l'espace (Kourou)	12 May	223 36 075	637 5.0	435.100 MHz (uplink) 2446.540 MHz (downlink) 2446.447 MHz (tracking and telemetry)	Amateur radio
USA-91	1993-32-A	United States (Vandenberg)	13 May	175 20 334	356 54.97	1575.42; 1227.60 MHz	Global Positioning System. Replaces NAVSTAR-8 which was deactivated
RESURS-F2	1993-33-A	CIS (Plesetsk)	21 May	194 285	88.9 82.6		SOYUZ launcher. Spectro-photometers. Decayed on 20 June 1993
PROGRESS-M18	1993-34-A	CIS (Baikonur)	22 May	194 258	88.7 51.6		Automatic cargo spacecraft. Docked with MIR-1 orbital complex and provided supplies. Decayed on 4 July 1993
MOLNYA-1 (86) hermetically sealed cylinder with conical ends; 1000 kg; 6 solar panels	1993-35-A	CIS (Plesetsk)	26 May	454 40 883	737 62.7	800 MHz band 40 W (emission) 1000 MHz band (reception) 3400-4100 MHz (retransmission of television)	Television and multichannel radiocommunications
COSMOS-2251	1993-36-A	CIS (Plesetsk)	16 June	783 821	101 74		COSMOS launcher
STS-57 space shuttle Endeavor	1993-37-A	United States NASA (Cape Canaveral)	21 June	407 483	93.5 28.4		SPACELAB-01 research laboratory carrying six materials science and six biotechnology experiments. Retrieved the EURECA-1 spacecraft that had been released from STS-46 on 2 August 1992. Landed at Cape Canaveral on 1 July 1993
COSMOS-2252 to COSMOS-2257	1993-38-A to 1993-38-F	CIS (Plesetsk)	24 June	1419 1439	114.2 83		TSIKLON launcher. Defense communications

Code name and spacecraft description	*International number*	*Country Organization Site of launching*	*Date*	*Initial orbital data*		*Frequencies and transmitter power*	*Observations*
				Perigee (km) Apogee (km)	*Period (min) Inclination (degree)*		
GALAXY-4 (USASAT-24J) 3-axis stabilized; Hughes type HS 601; 2988 kg; solar panels (4.3 kW)	1993-39-A	United States Hughes Communi-cations Inc. (Kourou)	25 June	35 700 35 911	1437.1 0.1 in geostationary-satellite orbit at 99° W	6/4 and 14/12 GHz bands	Commercial communications. twenty-four 6/4 GHz transponders of 16 W and twenty-four 14/12 GHz transponders of 50 W
RESURS-F18	1993-40-A	CIS (Plesetsk)	25 June	187 271	89 82.6		Spectral photometers to map natural resources. Decayed on 12 July 1993
RADCAL	1993-41-A	United States	25 June	791 900	101.4 89.5		
USA-92 (GPS-2-20)	1993-42-A	United States (Cape Canaveral)	26 June	20 123 20 246	720 54.83	1575.42; 1227.60 MHz	Final member of fleet of 24 global positioning system spacecraft
SOYUZ-TM 17 7 tonnes at launch	1993-43-A	CIS (Baikonur)	1 July	219 372	90.1 51.6		Carried franco-russian team of astronauts. Docked with MIR-1 orbital complex
COSMOS-2258	1993-44-A	CIS (Baikonur)	7 July	411 427	92.7		TSIKLON-M launcher
COSMOS-2259	1993-45-A	CIS (Plesetsk)	14 July	176 373	89.7 67.2		SOYUZ launcher. Decayed on 25 July 1993
USA-93	1993-46-A	United States	19 July				
COSMOS-2260	1993-47-A	CIS (Plesetsk)	22 July	241 297	89.9 82.3		SOYUZ launcher. Natural resources exploration. Decayed on 5 August 1993
HISPASAT-1B 3-axis stabilized Eurostar platform; 1325 kg in orbit	1993-48-A	Spain Hispasat SA (Kourou)	22 July	35 659 35 785	1432.8 0.1 in geostationary-satellite orbit at 30° W	14/11-12, 8/7 and 2 GHz bands	National telecommunications and direct broadcasting; communications with Latin America
INSAT-2B 3-axis stabilized; solar panels	1993-48-B	India (Kourou)	22 July	35 774 35 802	1436.2 0.1 in geostationary-satellite orbit at 93.5° E		
MOLNYA-3 (45) 3-axis stabilized; 1500 kg	1993-49-A	CIS (Plesetsk)	4 August	455 39 147	702 62.7	5.9-6.2 GHz (reception) 3.6-3.9 GHz (emission)	Communications. MOLNYA launcher
NOAA-13	1993-50-A	United States NOAA (Vandenberg)	9 August	860 876	102 98.9		Meteorology. Instruments to monitor atmosphere and clouds, energetics electrons and protons. Data gathering from floating buoys, balloons and remote ground stations. Power failure led to loss of all radio-communications. ATLAS-E launcher
COSMOS-2261	1993-51-A	CIS (Plesetsk)	10 August	613 39 400	708 62.8		MOLNYA launcher
PROGRESS-M19	1993-52-A	CIS (Baikonur)	10 August	192 243	88.5 51.6		Automatic cargo spacecraft. Docked with MIR-1 orbital complex and provided supplies. Decayed on 13 October 1993

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				Perigee (km) Apogee (km)	*Period (min) Inclination (degree)*		
RESURS-F19	1993-53-A	CIS (Plesetsk)	24 August	188 267	88.5 82.6		Natural resources monitoring. SOYUZ launcher. Decayed on 10 September 1993
USA-94 (GPS-2-22) (NAVSTAR-35)	1993-54-A	United States (Cape Canaveral)	30 August	20 074 20 221	716 54.9	1575.42; 1227.60 MHz	Global Positioning System. DELTA-2 launcher
METEOR-2 (21) cylinder; 2750 kg; 2 solar panels	1993-55-A	CEI (Plesetsk)	31 August	945 980	104 82.5		Meteorology. TSIKLON launcher
TEMISAT	1993-55-B	Italy released from METEOR-2 (21)	31 August	945 980	104.1 82.5		Microsatellite for gathering weather data from some 50 ground stations in the mediterranean region
USA-95 (UFO-2)	1993-56-A	United States (Cape Canaveral)	3 Sept.	285 26 970	485 27.1	UHF	Second of group of ten navy communication satellites. ATLAS-1 launcher
COSMOS-2262	1993-57-A	CEI (Baikonur)	7 Sept.	180 316	89.2 64.9		SOYUZ launcher. Decayed on 18 December 1993
STS-51 space shuttle Discovery	1993-58-A	United States (Cape Canaveral)	12 Sept.	298 307	90,5 28,4		Reusable spacecraft. Five astronauts. Landed on 22 September 1993
ACTS	1993-58-B	United States launched from STS-51	12 Sept.	323 39 957	719 15.3		Experimental telecommunications
				in geostationary-satellite orbit at 30° W			
ORFEUS-SPAS 3.5 tonnes	1993-58-C	Germany launched from STS-51	12 Sept.	270 304	90.1 28.4		Telescope. Retrieved by STS-51 on 22 September 1993
COSMOS-2263	1993-59-A	CEI (Baikonur)	16 Sept.	852 880	102 70.6		ZENIT launcher
COSMOS-2264	1993-60-A	CEI (Baikonur)	17 Sept.	429 437	92.9 65		TSIKLON-M launcher
SPOT-3 1907 kg	1993-61-A	France CNES (Kourou)	26 Sept.	819 846	101.2 98.6		Natural resources observation. Ten-meter resolution. ARIANE launcher
				heliosynchronous orbit			
STELLA 48 kg	1993-61-B	France (Kourou)	26 Sept.	802 823	100.9 98.6		Uranium alloy sphere with 60 laser reflectors on the surface for geodetic measurements. Similar to STARLETTE 1975-10-A
KITSAT-2	1993-61-C	Rep. of Korea (Kourou)	26 Sept.	800 823	100.9 98.6		Experimental microsatellite. It is intended to receive and retransmit images, to determine its own position with the help of the GPS system, and to expriment with signal compression techniques
POSAT-1	1993-61-D	Portugal (Kourou)	26 Sept.	800 822	100.9 98.6		Experimental microsatellite. It is intended to receive and retransmit images, to determine its own position with the help of the GPS system, and to expriment with signal compression techniques

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				Perigee (km) Apogee (km)	*Period (min) Inclination (degree)*		
HEALTHSAT-1	1993-61-E	United Kingdom/ United States (Kourou)	26 Sept.	797 821	100.8 98.6		Microsatellite intended to relay medical emergency information from Africa to hospitals
ITAMSAT	1993-61-F	Italy (Kourou)	26 Sept.	799 823	100.9 98.6		ITalian AMateur SATellite. Microsatellite for amateur radio communication
EYESAT-1	1993-61-G	United States (Kourou)	26 Sept.	794 823	101 98.5		Microsatellite to acquire and relay environmental data from ground-based stations and industrial facilities
RADUGA-30 3-axis stabilized; 5 tonnes; solar panels	1993-62-A	CIS (Baikonur)	30 Sept.	35 547 35 950	1434.3 1.5	5.7-6.2 GHz (reception) 3.4-3.9 GHz (emission)	Communications. PROTON launcher
				in geostationary-satellite orbit			
JIANBING-30	1993-63-A	Chine (Jiuquan)	8 Oct.	181 2868	116.5 56.6		Experimental spacecraft. LONG MARCH-2C launcher. Became inoperational soon after separation and could not be retrieved
PROGRESS-M20	1993-64-A	CIS (Baikonur)	11 Oct.	191 242	83.5 51.6		Automatic supply craft. Docked with the Kvant module of MIR-1 on 13 October 1993 and delivered provisions and scientific apparatus. Decayed on 21 November 1993
STS-58 space shuttle Endeavor	1993-65-A	United States NASA (Cape Canaveral)	18 Oct.	282 291	90.2 39.0		Spacelab life science program SLS-2. Carried 48 rodents for biological microgravity experiments. Landed on 1 November 1993
INTELSAT-7 F1 3650 kg at launch	1993-66-A	International INTELSAT (Kourou)	22 Oct.	35 669 35 939	1436.3 0.0		First of a new generation of INTELSAT satellites. Three television channels and 18 000 telephone channels. ARIANE launcher
				in geostationary-satellite orbit			
COSMOS-2265	1993-67-A	Russia (Plesetsk)	26 Oct.	301 1592	104 82.9		COSMOS launcher modified to reduce environmental toxicity
USA-96 (GPS-2-23) (NAVSTAR-34)	1993-68-A	United States (Cape Canaveral)	26 Oct.	20 107 20 264	718 54.90	1574.42; 1227.60 MHz	Global Positioning System. A publicity available frequency channel will enable navigational accuracy of 100 m. DELTA-2 launcher
GORIZONT-28 3-axis stabilized; solar panels	1993-69-A	Russia (Baikonur)	28 Oct.	35 354 35 788	1435 1.4	5.7-6.2 GHz (reception) 3.4-3.9 GHz (emission)	Telephony and television transmission between Russia, Siberia and the Far East. PROTON launcher
				in geostationary-satellite orbit			
COSMOS-2266	1993-70-A	Russia (Plesetsk)	2 Nov.	967 1031	108 82.9	149.97; 399.84 MHz	COSMOS launcher
COSMOS-2267	1993-71-A	Russia (Plesetsk)	5 Nov.	198 279	89 70.4		SOYUZ launcher

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				Perigee (km) Apogee (km)	*Period (min) Inclination (degree)*		
GORIZONT 29 (RIMSAT) 3-axis stabilized; solar panels	1993-72-A	Russia (Baikonur)	18 Nov.	35 037 35 088	1399 1.4 in geostationary-satellite orbit at 130° E	5.7-6.2 GHz (reception) 3.4-3.9 GHz (emission)	Commercial communications for the Asia-Pacific region. PROTON launcher
SOLIDARIDAD-1	1993-73-A	Mexico (Kourou)	20 Nov.	27 746 35 690	1233.3 0.4 in geostationary-satellite orbit at 109.20° W	6/4 and 14/12 GHz bands	National telecommunications
METEOSAT-6	1993-73-B	Europe ESA (Kourou)	20 Nov.	35 674 35 757	1432.5 1.2 in geostationary-satellite orbit at 0°	1.6/1.7 GHz band	Meteorology
USA-97 (DSCS-3)	1993-74-A	United States US Air Force (Cape Canaveral)	28 Nov.	160 35 533	623.3 26.5		Government communications. ATLAS launcher
STS-61 space shuttle Endeavor	1993-75-A	United States NASA (Cape Canaveral)	2 Dec.	588 594	96.5 28.4		Landed on 13 December 1993
USA-98 (NATO-4B) 3-axis stabilized: similar to the United Kingdom's SKYNET-4 series; 1430 kg at launch	1993-76-A	United States NATO (Cape Canaveral)	8 Dec.	737 33 913	645 23.2 in geostationary-satellite orbit at 6° E	3 SHF transponders (40 W) 2 UHF transponders (25 W)	Encrypted communications. DELTA launcher
TELSTAR-401	1993-77-A	United States (Cape Canaveral)	16 Dec.	in geostationary-satellite orbit			ATLAS-2AS launcher
DBS-1 Hughes-type HS 601; 3-axis stabilized; 2.8 x 4.5 m; 2860 kg at launch; solar panels (4700 W)	1993-78-A	United States Hughes Communi-cations Inc. (Kourou)	18 Dec.	in geostationary-satellite orbit at 101° W		14/12 and 17/18 GHz bands	Sixteen repeaters. ARIANE-44L launcher
THAICOM-1 Hughes-type HS 376; spin-stabilized cylinder; height: 2.5 m; diameter: 2.17m; 1080 kg at launch; solar panels (705 W)	1993-78-B	Thailand Shinawatra Satellite Co. (Kourou)	18 Dec.	in geostationary-satellite orbit at 100.3° E		6/4 and 14/12 GHz bands	Ten 6/4 GHz and two 14/12 GHz transponders. ARIANE-44L launcher
MOLNYA-1 (87) hermetically sealed cylinder with conical ends; 1000 kg; 6 solar panels	1993-79-A	Russia (Plesetsk)	22 Dec.	446 39 206	703 62.8	800 MHz band 40 W (emission) 1000 MHz band (reception) 3400-4100 MHz (retransmission of television)	Television and multichannel radiocommunication. MOLNYA launcher