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(ITU) للاتصالات الدولي الاتحاد في والمحفوظات المكتبة قسم أجراه الضوئي بالمسح تصوير نتاج (PDF) الإلكترونية النسخة هذه والمحفوظات المكتبة قسم في المتوفرة الوثائق ضمن أصلية ورقية وثيقة من نقلًا.

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table of artificial satellites launched between 1 january and 31 december 1969

This list of artificial satellites launched in 1969 was prepared from information provided by telecommunication administrations, the Committee on Space Research (COSPAR), the Goddard Space Flight Center (GSFC), the United States National Aeronautics and Space Administration (NASA), the International Frequency Registration Board (IFRB), one of the four permanent organs of the ITU, and from details published in the specialized press. For decayed satellites the data concerning the orbit parameters are those immediately after launching. For the others, still in orbit, the orbit parameters are those reported on 31 December 1969 by GSFC. Fragments or stages of rockets left over from launching operations and placed in orbit with the various spacecraft have not been included.



Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
Venera-5 1130 kg; height: approx. 3 m; diameter: approx. 1 m; two main sections: a cylindrical command module and a nearly spherical scientific capsule (404.5 kg)	1969-1-A	USSR	5 Jan.	heliocentric orbit		922.763 MHz	Interplanetary station. Carried a scientific capsule which separated from the spacecraft and landed on 16 May 1969 on the dark side of Venus. During descent it transmitted information about the chemical composition, pressure, density and temperature of the planet's atmosphere. Two solar panels
Venera-6 similar to Venera-5	1969-2-A	USSR	10 Jan.	heliocentric orbit		922.763 MHz	Interplanetary station. Carried a scientific capsule which separated from the spacecraft and landed on 17 May 1969 on the dark side of Venus. During descent it transmitted information about the chemical composition, pressure, density and temperature of the planet's atmosphere. Two solar panels
Cosmos-263	1969-3-A	USSR	12 Jan.	205 km 346 km	89.8 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radio telemetry system. Decayed on 20 January 1969
Soyuz-4 Approx. 6400 kg; three-part space- ship: two spherical habitable modules (orbital compartment and command module) connected in tandem to cylin- drical service module	1969-4-A	USSR	14 Jan.	213 km 227 km	88.8 min 51.7°	20.008 MHz	Spaceship piloted by cosmonaut Vladimir Shatalov. Rendezvoused with Soyuz-5 on 16 January. Landed 17 January 1969. Two solar panels
Soyuz-5 similar to Soyuz-4	1969-5-A	USSR	15 Jan.	196 km 212 km	88.6 min 51.7°	15.008 MHz	Spaceship crewed by three cosmonauts: B. Volynov, A. Yeliseyev, Y. Khrunov. Soyuz-4 and 5 were brought together on 16 January and Khrunov and Yeliseyev transferred to Soyuz-4. Landed 18 January 1969. Two solar panels
OSO-V 291 kg; height: 95 cm; base section: nine-sided spinning wheel; diameter: 112 cm, joined to fan-shaped sail section	1969-6-A	United States	22 Jan.	528 km 550 km	95.4 min 32.9°	Tracking beacon: 136.29 MHz 500 mW	Orbiting Solar Observatory; measures the frequency and energy of solar emissions. 2016 solar cells
No name	1969-7-A	United States	22 Jan.	148 km 1082 km	96.9 min 106.1°		Decayed on 3 February 1969

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
Cosmos-264	1969-8-A	USSR	23 Jan.	219 km 330 km	89.7 min 70.0°	19.150 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radio telemetry system. Decayed on 5 February 1969
ISIS-A 239 kg; spheroid shape; diameter: 127 cm; height: 107 cm; two extendable antennae 73 m and 19 m long	1969-9-A	Canada	30 Jan.	580 km 3521 km	128.3 min 88.4°	Data: 401.75 MHz 136.08 MHz 4 W 136.59 MHz 2 W Radio beacon: 137.95 MHz 136.41 MHz 60 mW	International Satellite for Ionospheric Studies (ISIS); 11 136 solar cells
No name	1969-10-A	United States	5 Feb.	146 km 282 km	88.7 min 81.5°		Decayed on 24 February 1969
No name	1969-10-B	United States	5 Feb.	1398 km 1437 km	114.1 min 80.3°		
Intelsat-III F-3 287 kg cylinder; height: 104 cm; diameter: 142 cm	1969-11-A	United States	6 Feb.	35 767 km 35 798 km	1435.9 min 0.8°	Reception: 6042.5; 6307.5 MHz Transmission: 3817.5; 4082.5 MHz 12 W Telemetry and tracking: 3967 MHz; 0.45 W	INTELSAT commercial telecommunication satellite: 1200 two-way voice channels or four television channels; in geostationary orbit above Atlantic Ocean at 6° W longitude. Solar cells
Cosmos-265	1969-12-A	USSR	7 Feb.	283 km 485 km	91.9 min 71.0°		Carried scientific apparatus, radio-system for precise measurements of orbital elements and radiotelemetry system. Decayed on 1 May 1969
Tacsat-I 726 kg cylinder; height: 7.62 m; diameter: 2.75 m; despun upper portion containing large-sized antenna arrays and spinning right; circular cylindrical lower portion covered with solar cells	1969-13-A	United States	9 Feb.	35 772 km 35 804 km	1436.2 min 0.3°	225 to 400 MHz band and 7 to 8 GHz band	Governmental telecommunications satellite (TACTical communications SATellite). Capacity comparable to 10 000 two-way telephone channels; upper despun portion contains a biconical horn for telemetry and command, two microwave horns and five helical antennas for experimental reception by mobile lightweight surface and airborne terminals having antennas as small as 30 cm in diameter; cylindrical lower portion covered by 60 000 solar cells
Mariner-VI 413 kg; span: 579 cm with solar panels extended; height: 46 cm; 335 cm to top of antenna	1969-14-A	United States	25 Feb.	heliocentric orbit		Tracking signal and data transmitted continuously on 2296.851852 MHz, 10 W	Studies surface and atmosphere of Mars. Carried two television cameras, infrared and ultraviolet spectrometers. Four solar panels. On 31 July 1969 crossed the orbit of Mars within 3400 km, took 75 photos of the planet
Cosmos-266	1969-15-A	USSR	25 Feb.	208 km 358 km	89.9 min 72.9°	19.995 MHz	Carried scientific apparatus, radio-system for precise measurements of orbital elements and radiotelemetry system. Decayed on 5 March 1969

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
ESSA-9 155 kg; nearly cylindrical satellite; height: 57 cm; diameter: 107 cm	1969-16-A	United States	26 Feb.	1423 km 1506 km	115.2 min 101.8°	Data transmit- ted on command on 1697.5 MHz, 4 W Tracking beacon: 136.77 MHz 250 mW	Meteorological satellite. Has two AVCS cameras and circuits for magnetic tape recording and televi- sion transmission. Gathers infor- mation on the earth's heat balance. Solar cells
Cosmos-267	1969-17-A	USSR	26 Feb.	210 km 346 km	89.9 min 65.0°	19.995 MHz	Carried scientific apparatus, radio- system for precise measurements of orbital elements and radiotele- metry system. Decayed on 6 March 1969
Apollo-9 3848 kg; command module, service module, lunar module, lunar module adapter; diameter: 390 to 660 cm; total height: 29 m	1969-18-A	United States	3 March	176 km 462 km	90 min 33.5°	Data trans- mitted on command from command service module on 2272.5 MHz; from lunar module on 2282.5 MHz, 2.5 to 18 W	Three-man spacecraft; astronauts J. M. McDivitt, D. R. Scott, R. L. Schweickart. Objectives: to perform simulated translunar insertion, command service module separa- tion, transposition and docking with the lunar module. Batteries and fuel cells. Landed on 13 March 1969 in the Atlantic, 180 nautical miles east of the Bahamas
No name	1969-19-A	United States	4 March	118 km 454 km	90.2 min 92.0°		Decayed on 18 March 1969
Cosmos-268	1969-20-A	USSR	5 March	201 km 1263 km	99.4 min 48.3°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radio- telemetry system
Cosmos-269	1969-21-A	USSR	5 March	517 km 527 km	95.0 min 74.0°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radio telemetry system
Cosmos-270	1969-22-A	USSR	6 March	205 km 350 km	89.8 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 14 March 1969
Cosmos-271	1969-23-A	USSR	15 March	200 km 342 km	89.7 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 23 March 1969
Cosmos-272	1969-24-A	USSR	17 March	1181 km 1210 km	109.3 min 74.0°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system
OV1-17 141 kg cylinder; height: 0.80 m; diameter: 0.67 m; multifaced solar panel domes on each end; gravity gradient stabili- zation system consisting of 3 horizontal booms 15.2 m long forming a "Y" and 2 ver- tical booms 12.8 m long	1969-25-A	United States	18 March	318 km 350 km	91.1 min 99.1°		12 experiments including horizon day glow and night glow, solar X-ray measurements, particle measure- ments, electric fields measurements, extremely low frequency propaga- tion, thermal control coatings, meteor trail calibration beacon. A pane of 14 cadmium sulfide solar cells to evaluate performance of CdS cells. Solar cells. Partly success- ful

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
OV1-18 125 kg, similar to OV1-17	1969-25-B	United States	18 March	454 km 548 km	94.6 min 98.8°		16 experiments to gather information on horizontal ion density gradients, electric fields, gamma rays, and radio frequency interference, large, disk-shaped RFI antenna. Solar cells. Partly successful
OV1-19 124 kg, basic OV1-17 satellite but spin sta- bilized	1969-25-C	United States	18 March	467 km 5774 km	153.5 min 104.6°		7 experiments studying trapped radiation and 5 more studying radiation hazards. Solar cells
OV1-17A 221 kg; propu- sion module of OV1-17; payload enclosed between forward end of active rocket motor and satellite attachment flange; spin stabilized; two 6.4 m transmitting antenna beacons; one 6.4 m inertia boom	1969-25-D	United States	18 March	172 km 375 km	89.8 min 99.0°	8.9825 MHz 13.2525 MHz 2 W	Also known as <i>Orbis-Cal 2</i> because housed a propagation experiment to be monitored by several ground stations to study unusual transmission of radio waves through the ionosphere. Batteries. Decayed on 24 March 1969
No name	1969-26-A	United States	19 March	165 km 252 km	86.6 min 82.9°		Decayed on 24 March 1969
No name	1969-26-B	United States	19 March	480 km 491 km	94.2 min 83.0°		
Cosmos-273	1969-27-A	USSR	22 March	205 km 356 km	89.9 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 30 March 1969
Cosmos-274	1969-28-A	USSR	24 March	213 km 323 km	89.6 min 65.0°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 1 April 1969
Meteor-1	1969-29-A	USSR	26 March	632 km 681 km	97.8 min 81.2°		Carries meteorological apparatus, radio system for precise measurements of orbital elements and radiotelemetry system, photographic and radiation measuring equipment
Mariner-VII 413 kg; span: 579 cm with solar panels extended; height: 46 cm, 335 cm to top of antenna	1969-30-A	United States	27 March	heliocentric orbit		Tracking signal and data transmitted continuously on 2297.2205 MHz at 10 W	Studied surface and atmosphere of Mars. Carries two television cameras, infrared and ultraviolet spectrometers. Four solar panels. On 5 August 1969, crossed the orbit of Mars within 3500 km, took 126 photos of the planet
Cosmos-275	1969-31-A	USSR	28 March	235 km 425 km	91.1 min 70.9°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
Cosmos-276	1969-32-A	USSR	4 April	214 km 410 km	90.4 min 81.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 11 April 1969
Cosmos-277	1969-33-A	USSR	4 April	280 km 494 km	92 min 71.0°		Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 17 April 1969
Cosmos-278	1969-34-A	USSR	9 April	203 km 338 km	89.7 min 65.0°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 6 July 1969
11th Molnya-1	1969-35-A	USSR	11 April	894 km 39 440 km	717.3 min 65.2°	Transmitting: 800 MHz band 40 W Receiving: 1000 MHz band	Carries apparatus for transmitting television programmes and multi-channel radio communication, apparatus of the command measuring complex, orientation system, orbit correction system and power supplies. Six solar panels
No name	1969-36-A	United States	13 April	current elements not maintained			
Nimbus-3 576 kg; butterfly shaped spacecraft; 254 cm tall, 279 cm wide with a 127 cm diameter ring housing experiments and electronic equipment	1969-37-A	United States	14 April	1072 km 1133 km	107.2 min 99.9°	Tracking beacons transmit continuously on 136.500 MHz 300 mW APT on 136.950 MHz 5 W, 401.500 and 466.000 MHz. Stored data transmitted on command on 1702.500 MHz. Multiplex frequencies at 2 W	Meteorological satellite. Carries 7 experiments including apparatus to measure infrared and ultraviolet radiation, image dissector camera, and an interrogation recording and location system. 2 solar paddles; twin nuclear isotopic electrical generating system <i>SNAP-19</i> (System for Nuclear Auxiliary Power)
EGRS-13 20 kg; rectangular package 22 × 28 × 33 cm; 8 antennas extended from sides, one from top	1969-37-B	United States	14 April	1072 km 1133 km	107.2 min 99.9°	136.800 MHz	Continued geodetic position-determination measurements, concentrating on completing accurate measurements of distances and locations of islands in the Pacific begun with previous EGRS satellites. Known also as <i>SECOR-13</i> (SEquential COLLation of Range). Covered by solar cells
Cosmos-279	1969-38-A	USSR	15 April	194 km 280 km	89.1 min 51.8°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 23 April 1969
No name	1969-39-A	United States	15 April	127 km 471 km	89.9 min 108.7°		Decayed on 30 April 1969
Cosmos-280	1969-40-A	USSR	23 April	206 km 272 km	89.1 min 51.6°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 6 May 1969

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
No name	1969-41-A	United States	2 May	178 km 322 km	89.5 min 64.9°		Decayed on 23 May 1969
No name	1969-41-B	United States	2 May	331 km 361 km	91.4 min 65.7°		
Cosmos-281	1969-42-A	USSR	13 May	194 km 317 km	89.4 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 21 May 1969
Apollo-10 44 676 kg; command module, service module, lunar module, spacecraft lunar module adapter; diameter: 390 to 660 cm; total height: 29 m	1969-43-A	United States	18 May	earth-moon trajectory, lunar orbits moon- earth trajectory		Tracking beacon transmits con- tinuously on 5765 MHz at 400 W Data trans- mitted on command from command mod- ule on 2287.5 MHz 374 mW and 2272.5 MHz 138 mW Data trans- mitted on com- mand from lunar module on 2282.5 MHz 1.5W	Three-man spacecraft; astronauts T. P. Stafford (commander), J. W. Young (command module pilot), E. A. Cernan (lunar module pilot). Objectives: to demonstrate crew/space vehicle/mission support facility performance during a manned lunar mission with command service module and lunar module, and to evaluate command module performance in the cis-lunar and lunar environment. Lunar module with two astronauts descended to within 15 km of the lunar surface. Command module landed on 26 May 1969 in the Pacific east of Pago Pago after a 168-hour trip including 61.6 hours in lunar orbit
Cosmos-282	1969-44-A	USSR	20 May	209 km 343 km	89.8 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 28 May 1969
Intelsat-III F-4 278 kg cylinder; height: 104 cm; diameter: 142 cm	1969-45-A	United States	22 May	35 764 km 35 810 km	1436.1 min 0.5°	Reception: 6042.5 6307.5 MHz Transmission: 3817.5 4082.5 MHz 12 W Telemetry and tracking: 3967 MHz 0.45 W	INTELSAT commercial telecommu- nication satellite. 1200 two-way voice channels or four television channels in geostationary orbit above the Pacific Ocean at 176° E longitude. Solar cells
OV5-5 (ERS 29) 11.3 kg; octahedron spin- stabilized satellite 30.5 cm per side; magneto- meter mounted on rigid boom away from basic structure; a 53.4 cm deployed VLF loop antenna, 3 music-wire antennas	1969-46-A	United States	23 May	17 446 km 111 255 km	3120.0 min 33.2°	136.650 MHz	VLF plasma-wave detector, magneto- meter, attitude sensor, 7 particle detectors, 30 different experiment measurements. 888 solar cells

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
OV5-6 10.4 kg; tetrahedron- shaped satellite with 4 tape- measure antennas and 4 music- wire antennas	1969-46-B	United States	23 May	17 435 km 111 114 km	3114.9 min 33.2°	136.380 MHz	Solar flare monitor
OV5-9 13.1 kg; modified tetrahedron- shaped satellite to include 7.6 cm mid-section, one tape-measure antenna and 3 music-wire antennas	1969-46-C	United States	23 May	17 412 km 111 137 km	3114.9 min 33.1°	136.530 MHz 17 W	6 experiments. One ceased function- ing after two months. Low-energy proton detectors, VLF radiation detector, solar X-ray monitor, solar flare electron detector. 1272 solar cells
VELA-9 347 kg at launch 259 kg in orbit; 26 sided, 127 cm diameter satellite; 4 stub telemetry antenna arrays at opposite ends of the satellite and 8 whip antennas	1969-46-D	United States	23 May	approx. 100 000 km circular orbit	approx. 6700 min. 32.8°	transmitter operating at 4 W during acquisition and injection into orbit and 0.5 W after earth orientation	Carries 28 detectors designed to monitor X-rays, gamma rays, neu- trons, electromagnetic pulse and air fluorescence. Nuclear detection sys- tem for detection and identification of nuclear detonations in space. In orbit, 180° apart from VELA-10 so as to monitor both sides of the earth continuously. 22 500 solar cells cover 24 faces
VELA-10 similar to VELA-9	1969-46-E	United States	23 May	approx. 100 000 km circular orbit	approx. 6700 min 32.8°	similar to VELA-9	Similar to VELA-9
Cosmos-283	1969-47-A	USSR	27 May	153 km 210 km	102.1 min 82.0°		Carried scientific apparatus, radio- system for precise measurements of orbital elements and radiotele- metry system. Decayed on 10 December 1969
Cosmos-284	1969-48-A	USSR	29 May	207 km 308 km	89.5 min 51.8°	19.995 MHz	Carried scientific apparatus, radio- system for precise measurements of orbital elements and radiotele- metry system. Decayed on 6 June 1969
Cosmos-285	1969-49-A	USSR	3 June	279 km 518 km	92.2 min 71.0°		Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 7 Octo- ber 1969
No name	1969-50-A	United States	3 June	130 km 399 km	89.7 min 109.9°		Decayed on 14 June 1969
OGO 6 632 kg; rectangular shaped space- craft; length: 180 cm; width: 90 cm; depth: 90 cm; two experi- mental booms 6.7 m long, and four 1.2 m booms	1969-51-A	United States	5 June	398 km 1063 km	99.3 min 81.9°	Data trans- mitted on com- mand on 400.250 MHz at 4 W and 400.850 MHz at 500 mW Tracking beacon transmits con- tinuously on 136.200 MHz at 100 mW	Orbiting Geophysical Observatory. Designed to investigate the earth's upper atmosphere and ionosphere, the auroral regions surrounding the poles and the edges of the regions of trapped radiation. 33 000 solar cells on two panels; 2 Ni/Cd storage batteries. 23 of 25 experiments functioning

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Cosmos-286	1969-52-A	USSR	15 June	206 km 349 km	89.8 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 23 June 1969
Explorer-41 (IMP-7) 79 kg; octagonal spacecraft; height: 25 cm; diameter: 71 cm	1959-53-A	United States	21 June	1208 km 175 672 km	4842.8 min 82.8°	Data transmitted continuously on 136.080 MHz at 4 W	Interplanetary Monitoring Platform. Carries experiments to investigate particles, magnetic fields, plasma and cosmic dust in interplanetary space. Four solar panels
Cosmos-287	1969-54-A	USSR	24 June	190 km 268 km	89 min 51.8°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 2 July 1969
Cosmos-288	1969-55-A	USSR	27 June	201 km 281 km	89.2 min 51.8°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 5 July 1969
Biosatellite-3 697 kg; adapter section, re-entry vehicle, experimental capsule; total height: 213 cm	1969-56-A	United States	29 June	266 km 282 km	90.0 min 33.5°	Data transmitted on command on 136.68 MHz at 2 W Tracking beacon transmits continuously on 136.05 MHz at 100 mW	Biological research spacecraft provided with a recoverable capsule and designed to study the effects of weightlessness on the mental, emotional and physiological process of a primate (pigtail monkey). Experiments gather wave patterns from the brain, records of heart action and respiration, measurements at four points in the circulatory system, urinary measurements and reactions to two behaviour tasks. Fuel cell and Ag/Zn storage batteries. The capsule landed on 7 July 1969, monkey died the following day
Cosmos-289	1969-57-A	USSR	10 July	200 km 350 km	89.8 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 15 July 1969
Luna-15	1969-58-A	USSR	13 July	earth-moon trajectory			Put into orbit around the moon on 17 July 1969. Impacted the moon on 21 July 1969. Investigation of moon and circumlunar space
Apollo-11 44 676 kg; command module, service module, lunar module spacecraft, lunar module adapter; diameter: 390 to 660 cm; total height: 29 m	1969-59-A	United States	16 July	earth-moon trajectory first manned landing on the moon's surface, moon-earth trajectory		Tracking beacon transmits continuously on 5765 MHz at 400 W Data transmitted on command from command module on 2287.5 MHz 374 mW and 2272.5 MHz 138 mW	Three-man spacecraft, astronauts Neil A. Armstrong (commander), Michael Collins (command module pilot), Edwin E. Aldrin Jr. (lunar module pilot). On 20 July 1969 lunar module landed on the moon (Sea of Tranquillity). Armstrong and Aldrin gathered up surface material, took photographs and left an experiments package on the surface. Television pictures were transmitted during the mission. Lunar module left moon's surface on 21 July 1969, 21.3 hours after lunar landing,

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
Lunar Module	1969-59-C			selenocentric orbit		Data transmitted on command from lunar module on 2282.5 MHz 1.5 W	rendezvoused with the command module which was in circumlunar orbit. Command module returned to earth and landed on 24 July in the Pacific Ocean after a 195.3 hours trip. Batteries and fuel cells
Cosmos-290	1969-60-A	USSR	22 July	200 km 352 km	89.8 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 30 July 1969
12th Molnya-1	1969-61-A	USSR	22 July	544 km 39 811 km	717.7 min 64.9°	Transmission: 800 MHz band Reception: 1000 MHz band	Carries apparatus for transmitting television programmes and multi-channel radio communication, apparatus of the command measuring complex, orientation system, orbit correction system and power supplies. Six solar panels
No name	1969-62-A	United States	23 July	786 km 857 km	101.3 min 98.8°		
No name	1969-63-A	United States	24 July	178 km 219 km	88.4 min 74.9°		Decayed on 23 August 1969
Intelsat-III F-5 278 kg cylinder; height: 104 cm; diameter: 142 cm	1969-64-A	United States	26 July	268 km 5322 km	145.7 min 30.3°		INTELSAT commercial telecommunication satellite. 1200 two-way voice channels or 4 television channels. Did not achieve its programmed geostationary orbit over the Atlantic Ocean after launch from Cape Kennedy. Solar cells
No name	1969-65-A	United States	31 July	455 km 531 km	94.4 min 75.0°		
Cosmos-291	1969-66-A	USSR	6 Aug.	153 km 574 km	91.5 min 62.2°		Carried scientific apparatus. Decayed on 8 September 1969
Zond-7 approx. 5000 kg	1969-67-A	USSR	7 Aug.	barycentric orbit			Automatic station. Main objectives were investigations of moon and circumlunar space, testing of on-board systems and units. Took photos of the earth and the moon. Landed near Kustanay (Kazakhstan, USSR) on 14 August 1969. Two solar panels
OSO-6 290 kg spin stabilized satellite. Base section: 9 sided wheel, 112 cm diameter, with three arms carrying spin control gas supply. Top section with pointing instrumentation	1969-68-A	United States	9 Aug.	489 km 550 km	95.0 min 32.9°	Tracking telemetry transmits continuously on 136.710 MHz at 540 mW Data transmitted on command via the telemetry transmitter	Orbiting Solar Observatory. Carries seven experiments for monitoring the solar disk. Solar cells
PAC-A 120 kg	1969-68-B	United States	9 Aug.	481 km 545 km	94.9 min 32.9°	Telemetry beacon transmits continuously on 136.320 MHz at 250 mW	Package Attitude Control system. Objective is to flight-test a long-life, lower-power three axis earth stabilized control system

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
ATS-5 Weight at lift off: 862 kg; cylindrical satellite; height: 180 cm; diameter: 150 cm	1969-69-A	United States	12 Aug.	35 777 km 35 790 km	1435.9 min 2.5°	Telemetry data transmitted on 136.470 MHz and 137.350 MHz at 2W; 4119.599 MHz and 4135.957 MHz at 8W	Applications Technology Satellite. Geostationary orbit. Carries six experiments. 22 000 n on p radia- tion resistant silicon solar cells. Satellite was tumbling in orbit and also incorrectly positioned over the Indian Ocean, instead of at a point 1000 km west of Quito, Ecuador
Cosmos-292	1969-70-A	USSR	13 Aug.	745 km 765 km	99.9 min 74.0°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system
Cosmos-293	1969-71-A	USSR	16 Aug.	208 km 270 km	89.8 min 51.8°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 28 August 1969
Cosmos-294	1969-72-A	USSR	19 Aug.	202 km 348 km	89.8 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 27 August 1969
Cosmos-295	1969-73-A	USSR	22 Aug.	282 km 500 km	92 min 71.0°		Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 1 Decem- ber 1969
No name	1969-74-A	United States	23 Aug.	117 km 405 km	89.7 min 108.0°		Decayed on 7 September 1969
Cosmos-296	1969-75-A	USSR	29 Aug.	211 km 322 km	89.6 min 65.0°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 6 Sep- tember 1969
Cosmos-297	1969-76-A	USSR	2 Sept.	211 km 334 km	89.7 min 72.8°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radio- telemetry system. Decayed on 10 September 1969
Cosmos-298	1969-77-A	USSR	15 Sept.	140 km 140 km	— 50.0°		Carried scientific apparatus. De- cayed on 15 September 1969
Cosmos-299	1969-78-A	USSR	18 Sept.	214 km 311 km	89.5 min 65.0°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 22 September 1969
No name	1969-79-A	United States	22 Sept.	177 km 253 km	88.7 min 85.0°		Decayed on 12 October 1969
No name	1969-79-B	United States	22 Sept.	479 km 487 km	94.2 min 85.1°		
Cosmos-300	1969-80-A	USSR	23 Sept.	190 km 208 km	88.24 min 51.5°		Carried scientific apparatus, radio system for precise measurements of orbital elements and radio- telemetry system. Decayed on 27 September 1969

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
Cosmos-301	1969-81-A	USSR	24 Sept.	197 km 807 km	89.4 min 65.4°	19.995 MHz	Carried scientific apparatus, radio-system for precise measurements of orbital elements and radiotelemetry system. Decayed on 2 October 1969
No name	1969-82-A	United States	30 Sept.	431 km 470 km	93.5 min 69.6°		
No name	1969-82-B	United States	30 Sept.	current elements not maintained			
Boreas (Esro-1B) 85 kg cylinder; height: 93 cm; diameter: 76 cm	1969-83-A	Europe	1 Oct.	305 km 392 km	90.6 min 85.1°	Telemetry: 136.170 MHz 0.2W continuous 136.950 MHz 1.2W on command. Control in flight: 148.25 MHz	European Space Research Organization (ESRO) satellite. Carried 8 experiments to study ionospheric and aurora phenomena particularly over the northern polar regions. Stabilized along earth's magnetic field lines; no spin. Solar cells. Decayed on 23 November 1969
Meteor-2	1969-84-A	USSR	6 Oct.	622 km 672 km	97.6 min 81.2°		Carries meteorological apparatus, television cameras, radio-system for precise measurements of orbital elements and radiotelemetry system
Soyuz-6 approx. 6400 kg; three-part spaceship: two spherical habitable modules (orbital compartment and command module) connected in tandem to cylindrical service module	1969-85-A	USSR	11 Oct.	186 km 223 km	88.36 min 51.7°		Two-man spacecraft: commander G. Shonin; flight engineer V. Kubasov. Carried apparatus to test various methods of welding metals in conditions of deep vacuum and weightlessness; photographed geological and geographical features of the earth; investigated the atmosphere and near-earth outer space, and the effect of space flight on the human organism. Landed on 16 October 1969 near Akmolinsk. Two solar panels
Soyuz-7 similar to Soyuz-6	1969-86-A	USSR	12 Oct.	207 km 226 km	88.6 min 51.7°		Three-man spacecraft: commander A. Filipchenko; flight engineer V. Volkov; research engineer V. Gorbatko. Mission included manoeuvring in orbit, joint navigation observations of spaceships <i>Soyuz-6</i> and <i>Soyuz-7</i> in group flight, observation of celestial bodies and the horizon of the earth and determination of the real luminosity of stars. Landed on 17 October 1969 155 km north-west of Karaganda. Two solar panels
Soyuz-8 similar to Soyuz-6	1969-87-A	USSR	13 Oct.	205 km 228 km	88.6 min 51.7°		Two-man spacecraft: commander V. Shatalov; flight engineer A. Yeliseyev. Carried out scientific studies in near-terrestrial space; testing of system of controlling a simultaneous group flight of three space ships. Landed on 18 October 1969 150 km north of Karaganda. Two solar panels. <i>Soyuz-6, 7, 8</i> experimented a 5-channel VHF/UHF transmission-system with <i>Molnya</i> telecommunication satellite used as relay

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
Intercosmos-1	1969-88-A	USSR	14 Oct.	207 km 292 km	89.5 min 48.3°		Carries scientific apparatus and experiments from the USSR, Eastern Germany and Czechoslovakia for the study of solar ultraviolet and X radiations and their effect on the upper layers of the earth's atmosphere. Eight solar panels
Cosmos-302	1969-89-A	USSR	17 Oct.	202 km 340 km	89.7 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 25 October 1969
Cosmos-303	1969-90-A	USSR	18 Oct.	238 km 344 km	90.3 min 70.9°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system
Cosmos-304	1969-91-A	USSR	21 Oct.	741 km 761 km	99.8 min 74.0°		Carries scientific apparatus
Cosmos-305	1969-92-A	USSR	22 Oct.	193 km 205 km	— 51.5°		Carried scientific apparatus. Decayed on 24 October 1969
Cosmos-306	1969-93-A	USSR	24 Oct.	208 km 332 km	89.7 min 65.0°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 5 November 1969
Cosmos-307	1969-94-A	USSR	24 Oct.	212 km 1982 km	107 min 48.4°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system
No name	1969-95-A	United States	24 Oct.	126 km 637 km	92.1 min 108.0°		Decayed on 8 November 1969
Cosmos-308	1969-96-A	USSR	4 Nov.	212 km 260 km	89.2 min 71.0°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system
Azur 72 kg; cylindrical spacecraft with conical shaped top; diameter: 762 mm; length: 1226 mm	1969-97-A	Federal Republic of Germany	8 Nov.	388 km 3143 km	121.8 min 102.9°	Telemetry PCM/ PM: 136.740MHz 0.5 W 136.560 MHz 0.5 W	Carries 7 experiments designed to study the earth's radiation belt, the aurorae, and solar particle events. Solar cells, Ag-Cd battery pack. Launched by NASA
Cosmos-309	1969-98-A	USSR	12 Nov.	203 km 384 km	90.1 min 65.4°		Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotelemetry system. Decayed on 20 November 1969

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
Apollo-12 command module, service module, lunar module, space- craft lunar module adapter; diameter: 390 to 660 cm; total height: 29 m Lunar Module	1969-99-A 1969-99-C	United States	14 Nov.	barycentric orbit selenocentric orbit		Tracking beacon transmits con- tinuously on 5765 MHz at 400 W peak. Data transmitted on command from command mod- ule on 2272.5 MHz at 138 mW or 11.2 W and 2287.5 MHz at 374 mW or 11.2 W; from lunar module on 2282.5 MHz at 1.5 W or 20 W	Three-man spacecraft; astronauts Charles Conrad (commander) Ri- chard F. Gordon (command module pilot), Alan L. Bean (lunar module pilot). On 19 November at 01 55 h lunar module landed on the moon. Conrad and Bean gathered surface material, took photographs and tele- vision pictures and deployed a radio isotope thermo-electric generator and experiments. Lunar module left moon's surface on 20 November at 09 23 h, rendezvoused with the command module which was in selenocentric orbit. Lunar module was then crashed onto moon for seismometric measurements. Com- mand module returned to earth and landed on 24 November in the South Pacific, 244 h 36 min after launch. Batteries and fuel cells
Cosmos-310	1969-100-A	USSR	15 Nov.	208 km 347 km	89.8 min 65.0°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 23 November 1969
Skynet-A 129 kg; cylindri- cal satellite; diameter: 137 cm; height: 160 cm	1969-101-A	United Kingdom	22 Nov.	34 695 km 36 678 km	1431.0 min 2.4°	Command and telemetry: 375 to 400 MHz band	Government communication satel- lite to be placed in synchronous orbit at 45° E longitude over Indian Ocean. Spin stabilized. 7236 solar cells. Launched by NASA
Cosmos-311 129.3 kg	1969-102-A	USSR	24 Nov.	265 km 432 km	91.4 min 71.0°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system
Cosmos-312	1969-103-A	USSR	24 Nov.	1143 km 1178 km	108.5 min 74.0°		Carries scientific apparatus, radio- system for precise measurements of orbital elements and radiotele- metry system
Cosmos-313	1969-104-A	USSR	3 Dec.	204 km 276 km	89.1 min 65.4°	19.995 MHz	Carried scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system. Decayed on 15 December 1969
No name	1969-105-A	United States	4 Dec.	215 km 225 km	88.8 min 81.4°		
Cosmos-314	1969-106-A	USSR	11 Dec.	268 km 446 km	91.6 min 70.9°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system
Cosmos-315	1969-107-A	USSR	20 Dec.	518 km 541 km	95.2 min 74.0°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system
Cosmos-316	1969-108-A	USSR	23 Dec.	147 km 1638 km	102.8 min 49.4°		Carries scientific apparatus, radio system for precise measurements of orbital elements and radiotele- metry system

Code name Description	International number	Country	Date	Perigee Apogee	Period Inclination	Frequencies Transmitter power	Observations
Cosmos-317	1969-109-A	USSR	23 Dec.	191 km 296 km	89.3 min 65.4°		Carries scientific apparatus, radio system for precise measurements of orbital elements
Intercosmos-2	1969-110-A	USSR	25 Dec.	200 km 1169 km	98.4 min 48.4°	20.005 MHz 30.075 MHz	Carries scientific apparatus, which was made in Eastern Germany and designed in Bulgaria, Czechoslovakia and USSR for investigation of the ionosphere; concentration of electrons and positive ions, electron temperature close to the satellite and average electron concentration between the satellite and ground receiving stations. "Mayak" transmitter made in Eastern Germany. Ion engine. Batteries

