Yuri Gagarin

Юрий Гагарин

First human to travel into space

PATH

TO THE

SALYUT

SPACE

STATIONS

Vostok -

Voskhod -

Soyuz / Salyut

Missions

launched from the

Cosmodrome

Baikonur (Kazakhstan)

Union of Soviet Socialist Republics
Союз Советских Социалистических Республик

Russian Federation
Российская Федерация

Republic of Kazakhstan
Қазақстан Республикасы

PATH TO THE SALYUT SPACE STATIONS

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(1974 - 1979)

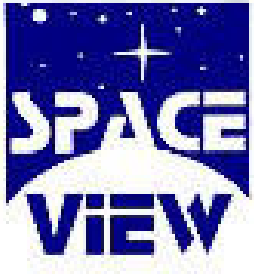
One of the most famous 'generic' patches that was worn by Soviet cosmonauts, is the Soviet seal.
The Soviet seal has been worn in many different versions.
Characteristic for the first version, is that the golden-yellow border is quite large, with the seal itself quite small.

SPACECRAFT LAUNCH CHRONOLOGY

1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
- - -	Vostok-1 Vostok-2	Vostok-3 Vostok-4	Vostok-5 Vostok-6	Voshkod-1	Voshkod-2	- - -	Soyuz-1	Soyuz-2 Soyuz-3	Soyuz-4 Soyuz-5 Soyuz-6 Soyuz-7 Soyuz-8

1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Soyuz-9	*SALYUT-DOS-1* Soyuz-10 Soyuz-11	*SALYUT-DOS-2*	*SALYUT-OPS-1* *SALYUT-DOS-3* Soyuz-12 Soyuz-13	*SALYUT-OPS-2* Soyuz-14 Soyuz-15 Soyuz-16 *SALYUT-DOS-4*	Soyuz-17 Soyuz-18A Soyuz-18 Soyuz-19 (ASTP) Soyuz-20	*SALYUT-OPS-3* Soyuz-21 Soyuz-22 Soyuz-23	Soyuz-24 *SALYUT-DOS-5* Soyuz-25 Soyuz-26	Soyuz-27 Soyuz-28 Soyuz-29 Soyuz-30 Soyuz-31	Soyuz-32 Soyuz-33 Soyuz-34 Soyuz-T-1

1980	1981	1982	1983	1984	1985	1986
Soyuz-35 Soyuz-36 Soyuz-T-2 Soyuz-37 Soyuz-38 Soyuz-T-3	Soyuz-T-4 Soyuz-39 Soyuz-40	*SALYUT-DOS-6* Soyuz-T-5 Soyuz-T-6 Soyuz-T-7	Soyuz-T-8 Soyuz-T-9	Soyuz-T-10 Soyuz-T-11 Soyuz-T-12	Soyuz-T-13 Soyuz-T-14 *KOSMOS-1686*	*MIR CORE Module* Soyuz-T-15



Spacepatches.nl

Vostok - 1

First Man in Space

Yuri Gagarin

Launch Date :	April 12, 1961 , 06:07 UTC
Launch Vehicle :	Vostok-K 8K72K / Vostok-3KA, No. 3
Crew :	Pilot Yuri Gagarin
Call Sign:	Kedr – "Sibirian pine"
Landing Date :	April 12, 1961 , 07:55 UTC
Landing Vehicle :	Vostok-3KA, No. 3
Orbits :	1
Mission Duration :	1 hour , 48 minutes

First human to travel into space

On April 12, 1961, at 6:07 UTC, the Vostok 3KA-3 spacecraft launched from the Baikonur Cosmodrome. After a flight time of 1 hour , 48 minutes and 1 Earth orbit, Gagarin exited the descending capsule as planned at an altitude of about 7,000 meters and landed on a parachute.
The Spacecraft and Juri Gagarin, both touched down at Smelovska, near Saratov.

Vostok - 2

First Day Long Flight

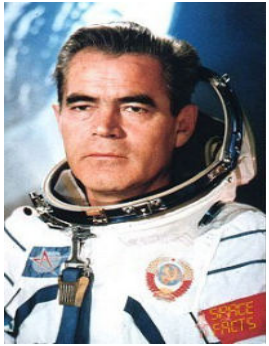
Gherman Titov

Launch Date :	August 6, 1961 , 06:00 UTC
Launch Vehicle :	Vostok-K 8K72K / Vostok-3KA, No. 4
Crew :	Pilot Gherman Titov
Call Sign:	Oryol - "Eagle"
Landing Date :	August 7, 1961 , 07:18 UTC
Landing Vehicle :	Vostok-3KA, No. 4
Orbits :	17
Mission Duration :	1 day , 1 hour , 18 minutes

1st man to spend one full day in space.
Spacecraft touched down
(pilot ejected prior to touchdown)
near Krasny Kut.

Vostok - 3

First Double Flight



Andriyan Nikolayev

Launch Date : August 11, 1962 , 08:24 UTC

Launch Vehicle : Vostok-K 8K72K / Vostok-3KA, No. 5

Crew : Pilot Andriyan Nikolayev

Call Sign: Sokol – "Falcon"

Landing Date : August 15, 1962 , 06:52 UTC

Landing Vehicle : Vostok-3KA, No. 5

Orbits : 64

Mission Duration : 3 days , 22 hours , 28 minutes

Spacecraft rendezvoused to within 6.5 km of Vostok-4.
Spacecraft touched down (pilot ejected prior to touchdown) near Karkaralinsk, 193 km form Vostok-4 site

Vostok - 4

First Double Flight

Pavel Popovich

Launch Date :	August 12, 1962 , 08:02 UTC
Launch Vehicle :	Vostok-K 8K72K / Vostok-3KA, No. 6
Crew :	Pilot Pavel Popovich
Call Sign:	Berkut - "Golden Eagle"
Landing Date :	August 15, 1962 , 06:59 UTC
Landing Vehicle :	Vostok-3KA, No. 6
Orbits :	48
Mission Duration :	2 days , 22 hours , 56 minutes

Spacecraft rendezvoused to within 6.5 km of Vostok-3.
Spacecraft touched down (pilot ejected prior to touchdown) near Atasu, 193 km from the Vostok-3 site

Vostok - 5

Double Flight

Valery Bykovsky

Launch Date : June 14, 1963 , 11:58 UTC

Launch Vehicle : Vostok-K 8K72K / Vostok-3KA, No. 7

Crew : Pilot Valery Bykovsky

Call Sign: Yastreb - "Hawk"

Landing Date : June 19, 1963 , 11:06 UTC

Landing Vehicle : Vostok-3KA, No. 7

Orbits : 82

Mission Duration : 4 days , 23 hours , 7 minutes

Spacecraft rendezvoused to within 5 km of Vostok-6.
Spacecfraft touched down (pilot ejected prior to touchdown) 542 km north west of Karaganda.

Vostok - 6

Double Flight / First Woman in Space

Valentina Tereshkova

Launch Date : June 16, 1963 , 09:29 UTC

Launch Vehicle : Vostok-K 8K72K / Vostok-3KA, No. 8

Crew : Pilot Valentina Tereshkova

Call Sign: Chayka - "Seagull"

Landing Date : June 19, 1963 , 08:20 UTC

Landing Vehicle : Vostok-3KA, No. 8

Orbits : 48

Mission Duration : 2 days , 22 hours , 50 minutes

Spacecraft rendezvoused to within 5 km of Vostok-5.
Spacecraft touched down (pilot ejected prior to touchdown) 628 km north east of Karaganda.

Vostok – 6 , cont.

[half size and full size Vostok 6 patche replica]

In 2013, half a century after the Vostok 6 mission,
a replica was made by the Dutch Artist Luc van den Abeelen

Close-up photograph of the patch emblem
carried by Valentina Tereshkova
on the left breast
of the lightweight blue suit she wore under the
orange pressure suit on her Vostok flight

Voskhod - 1

First Three-man Crew

From left to right :
Konstantin Feoktistov , Vladimir Komarov , Boris Yegorov

Launch Date : October 12, 1964 , 07:30 UTC
Launch Vehicle : Voskhod 11A57 / Voskhod 3KV No. 3

Crew : Cdr. Komarov , Eng. Feoktistov , Med. Doctor Yegorov

Call Sign: Rubin - "Ruby"

Landing Date : October 13, 1964 , 07:47 UTC
Landing Vehicle : Voskhod 3KV No. 3

Orbits : 16

Mission Duration : 1 day , 17 minutes , 3 seconds

Spacecraftraft touched down 312 km north east of Kustanai.

Starting with this flight, through Soyuz-11, space pressure suits were not flown due to a space saving measure.

Voskhod - 2

First Spacewalk

From left to right :
Alexei Leonov , Pavel Balyayev

First human to made a EVA into space

The third seat was occupied by EVA suits.
Utilizing a 15' tether Leonov made the world's first EVA lasting 24 minutes.
Prior to the automatic firing of the rertro rockets, an attitude control system sensor failed causing a one orbit delay in reentry. The craft overshot the landing zone and touched down 1000 km east of Tyuratam (Baikonur), in the forests of Perm. Due to the terrain the crew spent the night in the cabin, until ground forces rescued them the next morning.

Launch Date :	March 18, 1965 , 07:00 UTC
Launch Vehicle :	Voskhod 11A57 / Voskhod 3KD No. 4
Crew :	Cdr. Pavel Balyayev , Pilot Alexei Leonov
Call Sign:	Almaz – "Diamond"
Landing Date :	March 19, 1965 , 09:02 UTC
Landing Vehicle :	Voskhod 3KD No. 4
Orbits :	17
Mission Duration :	1 day , 2 hours , 2 minutes

Voskhod – 2 , cont.

The arrowhead shaped CCCP logo was the first Soviet space patch that was publicly seen. It was worn on the protective layer of the Berkut spacesuit on March 18, 1965, by Alexei Leonov during his famous spacewalk outside Voskhod-2.
(His crewmate Pavel Beljayev was also wearing it on his Berkut).

A small supply of patches was available from Alex Panchenko, who owned 3 patches flown and signed by Leonov and 7 unflown and unsigned copies.

Stewart Aviation in England produced a replica of the patch in the late 1980's. Apart from the materials used, this replica, is easy to distinguish from the original: the Earth is white and the rocket has a different shape.

Soyuz - 1

First Spaceflight Fatality

Vladimir Komarov

Launch Date :	April 23, 1967 , 00:35 UTC
Launch Vehicle :	Soyuz 7K-OK , No. 4
Launch Crew :	Pilot Komarov
Landing Crew :	Vladimir Komarov
Landing Vehicle :	Soyuz 7K-OK , No. 4
Landing Date :	April 24, 1967 , 03:22 UTC
Mission Duration :	1 day, 2 hours and 48 minutes

Original plans called for this spacecraft to dock with Soyuz - 2 and have two members of that crew transfer over, via EVA, to the Soyuz - 1 spacecraft.
Once on orbit the Soyuz-1 began to experience several problems. The tumbling spacecraft experienced excessive loads and heating but survived the rigors of the atmosphere. Unfortunately for Komarov his parachute had been damaged and tangled failing to deploy. The Soyuz-1 plummeted to the ground and was destroyed on impact, killing it's pilot.
The site, 3 km west of Karabutak, Orenburg, near Orsk has a memorial to remember Komarov's courage in realizing his situation.

Soyuz - 2

Launched Unmanned

Soyuz Spacecraft

Launch Date : October 25, 1968 , 09:00 UTC

Launch Vehicle : Soyuz 7K-OK , No. 11

Launch Crew : without crew

Landing Crew : without crew

Landing Vehicle : Soyuz 7K-OK , No. 11

Landing Date : October 28, 1968 , 07:51 UTC

This craft was launched to prove modifications following the ill-fated Soyuz-1 flight.

Mission parameters :

Mass :	6,520 kg (14,370 lb)
Perigee :	196.0 km (121.8 mi)
Apogee :	200.0 km (124.3 mi)
Inclination :	51.65°
Period :	88.50 minutes

Also, Soyuz - 2 was used as a rendezvous target for the manned Soyuz - 3.
The two craft approached closely, the docking did not take place.

Soyuz - 2 touched down (unmanned) at 07:51 UTC on October 28, near the village of Maiburnak, southwest of the city of Karaganda.

Duration : 2 days , 22 hours , 51 minutes

Orbits completed : 48

Soyuz - 3

Spacecraft Docking Test

Georgy Beregovoy

Launch Date :	October 26, 1968 , 08:34 UTC
Launch Vehicle :	Soyuz 7K-OK , No. 10
Launch Crew :	Pilot Beregovoy
Landing Crew :	Georgy Beregovoy
Landing Vehicle :	Soyuz 7K-OK , No. 10
Landing Date :	October 30, 1968 , 07:25 UTC
Mission Duration :	3 days, 22 hours and 51 minutes

The red Soyuz - 3 patch is printed on a ribbon of textile, the only copy of which seems to be in possession of the redaction of the Russian magazine Novosti Kosmonavtiki in Moscow. The patch was intended to be worn by Beregovoi or at least used during the mission, but never was.

Soyuz – 3 , cont.

Beregovoi's goal on this mission was probably

to dock with the unmanned Soyuz-2

and

- Complex testing of spaceship systems
- Development of procedures for spaceship manoeuvring and docking in orbit in joint flight with Soyuz 2
- Development of elements of celestial navigation
- Conduct of research under spaceflight conditions
- In television broadcasts, Beregovoi gave viewers a guided tour of the spacecraft modules

Ground controllers were able to bring the two spacecraft within 200 m of one another before Beregovoi took control of the Soyuz to complete the maneuver. Unfortunately, while he was able to close the gap to only one meter, three successive attempts to dock failed.

The descent module landed near the city of Karaganda, cushioned by a blizzard's snowfall.

Collecting Soyuz 3 patch

The 'original' Soyuz - 3 patch seems to be owned by Novosti Kosmonavtiki; no copy has been seen elsewhere. Stewart Aviation produced this souvenir Soyuz 3 patch after a design by Vadim Molchanov during the 1980's.

Soyuz - 4

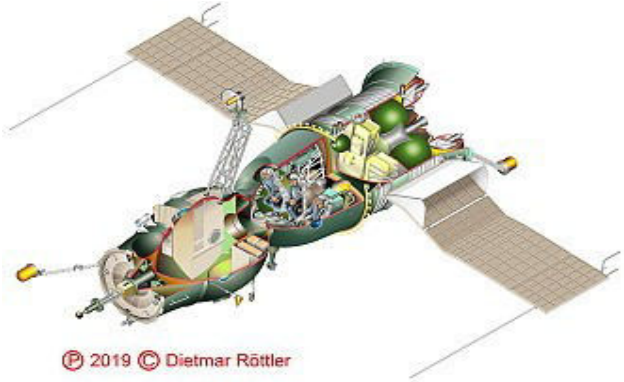
First Soviet Manned Docking

Vladimir Shatalov

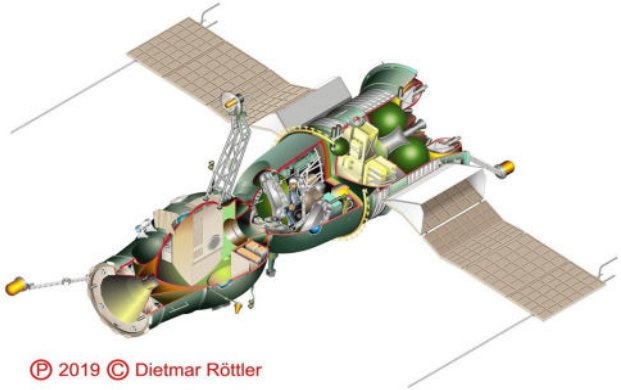
Launch Date :	January 14, 1969 , 07:30 UTC
Launch Vehicle :	Soyuz 7K-OK , No. 12
Launch Crew :	Cdr. Shatalov
Landing Crew :	Cdr. Shatalov , FE Yeliseyev , Research Engineer Khrunov
Landing Vehicle :	Soyuz 7K-OK , No. 12
Landing Date :	January 17, 1969 , 06:50 UTC

Soyuz-4 docked to Soyuz - 5 under Shatalov's manual control at 08:20 on January 16.
Spacecraft touched down (with Shatalov, Yeliseyev and Khrunov) 40 km north west of Karaganda.
Shatalov spending 2 days, 23 hours and 21 minutes in space, while Yeliseyev and Khrunov spent 1 day, 23 hours and 47 minutes in space.

Soyuz – 4 , Soyuz – 5



SOYUZ 4



SOYUZ 5

Docking Configuration of SOYUZ 4 and SOYUZ 5

Soyuz - 5

First Soviet Manned Docking

Soyuz - 4 & 5 crewmen, from left to right :
Alexei Yeliseyev , Yevgeni Khrunov ,
Vladimir Shatalov , Boris Volynov

Launch Date :	January 15, 1969 , 07:04 UTC
Launch Vehicle :	Soyuz 7K-OK , No. 13
Launch Crew :	Cdr. Volynov , FE Yeliseyev , Research Engineer Khrunov
Landing Crew :	Boris Volynov
Landing Vehicle :	Soyuz 7K-OK , No. 13
Landing Date :	January 18, 1969 , 07:59 UTC

Soon after docking Yeliseyev and Khrunov conducted an EVA, transferring from the Soyuz - 5 orbital module to the Soyuz - 4 orbital module, a process taking 37 minutes. There was one problem in store for Volynov when the parachute cables partially tangled and the soft-landing rockets failed, resulting in a hard impact which broke some of his teeth. The capsule came down in the Ural Maountains at 200 km of the southwest of Kostanay, near Orenburg, far short of its target landing site. The local temperature was −38 °C, and knowing that it would be many hours before rescue teams could reach him, Volynov abandoned the capsule and, walked for several kilometers to find shelter at a local peasant's house. Volynov having spent 3 days and 54 minutes in space, he landed alone.

Soyuz - 6

Triple Spacecraft Flight

From left to right :
Valeri Kubasov , Georgi Shonin

Launch Date :	October 11, 1969 , 11:10 UTC
Launch Vehicle :	Soyuz 7K-OK , No. 14
Launch Crew :	Cdr. Shonin , FE Kubasov
Landing Crew :	Georgi Shonin , Valeri Kubasov
Landing Vehicle :	Soyuz 7K-OK , No. 14
Landing Date :	October 16, 1969 , 09:52 UTC

Soyuz - 6 were launched to photograph and document the rendezvous of Soyuz - 7 and Soyuz - 8, as well as the crew exchange (via EVA).

Spacecraft touched down 180 km north west of Karaganda.

Duration: 4 days, 22 hours and 43 minutes

Soyuz - 7

Triple Spacecraft Flight

Anatoli Filipchenko / Vladislav Volkov / Viktor Gorbatko

Launch Date : October 12, 1969 , 10:44 UTC

Launch Vehicle : Soyuz 7K-OK , No. 15

Launch Crew : Cdr. Filipchenko, FE Volkov , Research Engineer Gorbatko

Landing Crew : Anatoli Filipchenko, Vladislav Volkov Viktor Gorbatko

Landing Vehicle : Soyuz 7K-OK , No. 15

Landing Date : October 17, 1969 , 09:25 UTC

Soyuz - 7 was launched to dock with Soyuz - 8, viewed by the nearby Soyuz - 6.

The docking was called off due to a manual control problem and the subsequent crew transfer was cancelled.

Spacecraft touched down 154 km northwest of Karaganda.

Duration: 4 days, 22 hours and 40 minutes

Soyuz - 8

Triple Spacecraft Flight

From left to right :
Vladimir Shatalov , Alexei Yeliseyev

Launch Date :	October 13, 1969 , 10:19 UTC
Launch Vehicle :	Soyuz 7K-OK , No. 16
Launch Crew :	Cdr. Shatalov , FE Yeliseyev
Landing Crew :	Vladimir Shatalov , Alexei Yeliseyev
Landing Vehicle :	Soyuz 7K-OK , No. 16
Landing Date :	October 18, 1969 , 09:09 UTC

As with Soyuz - 7, the mission was due to involve a docking and crew transfer (via EVA) documented by Soyuz – 6.

Manual approach problems cancelled that program.

The mission did involve the first three manned craft rendezvous, a record for the early spaceflights. Spacecraft touched down 145 km north of Karaganda.

Duration: 4 days, 22 hours and 51 minutes

Soyuz - 9

„Long - Duration“ Flight : 18 days

From left to right :
Andrian Nikolayev , Vitali Sevastyanov

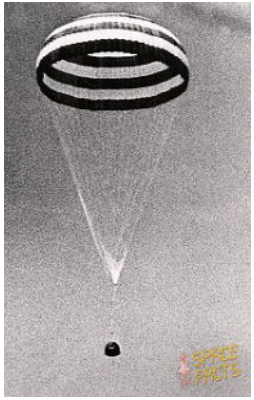
Launch Date :	June 1, 1970 , 19:00 UTC
Launch Vehicle :	Soyuz 7K-OK , No. 17
Launch Crew :	Cdr. Nikolayev , FE Sevastyanov
Landing Crew :	A. Nikolayev , V. Sevastyanov
Landing Vehicle :	Soyuz 7K-OK , No. 17
Landing Date :	June 19, 1970 , 11:58 UTC

Soyuz 9 performed the first night launch in the era of human spaceflights. Flight to demonstrate long duration effects. Spacecraft touched down 76 km west of Karaganda, and the crew was picked up immediately. Adjusting to gravity of Earth seemed to present a minor problem for the two cosmonauts. They required help exiting the descent module and were virtually unable to walk for a few days. Nonetheless, this experience proved the importance of providing crews with exercise equipment during missions. The crew spending 17 days, 16 hours and 59 minutes in space.

Soyuz Misson

SOYUZ launch

SOYUZ onboard

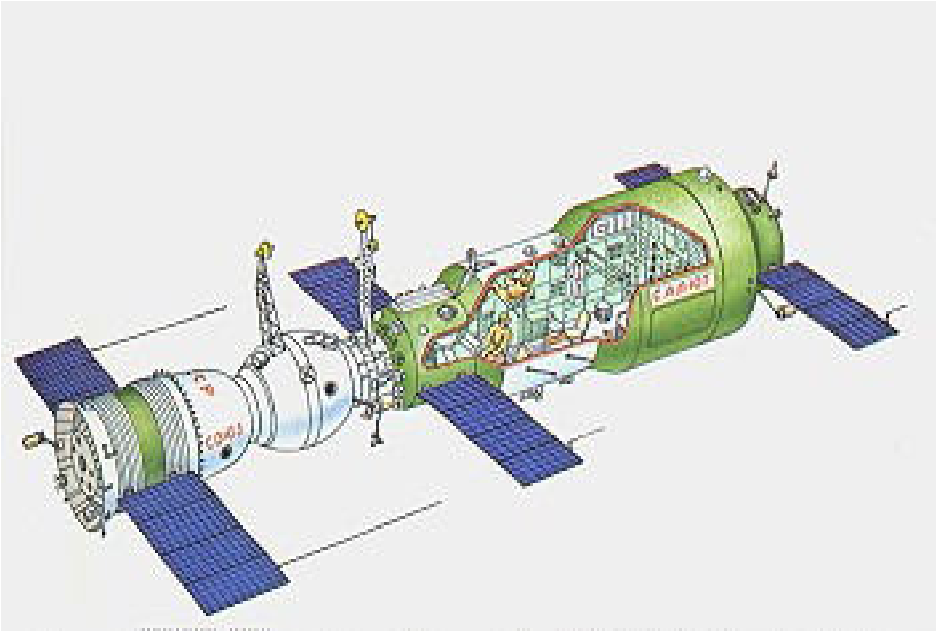


SOYUZ landing

SOYUZ recovery

SALYUT – 1 / DOS - 1

The world's first space stgation launched into low Earth orbit by the Soviet Union in 1971. Salyut 1 (Russian: Салют-1) was made out of five components: a transfer compartment, a main compartment, two auxiliary compartments, and the Orion 1 Space Observatory

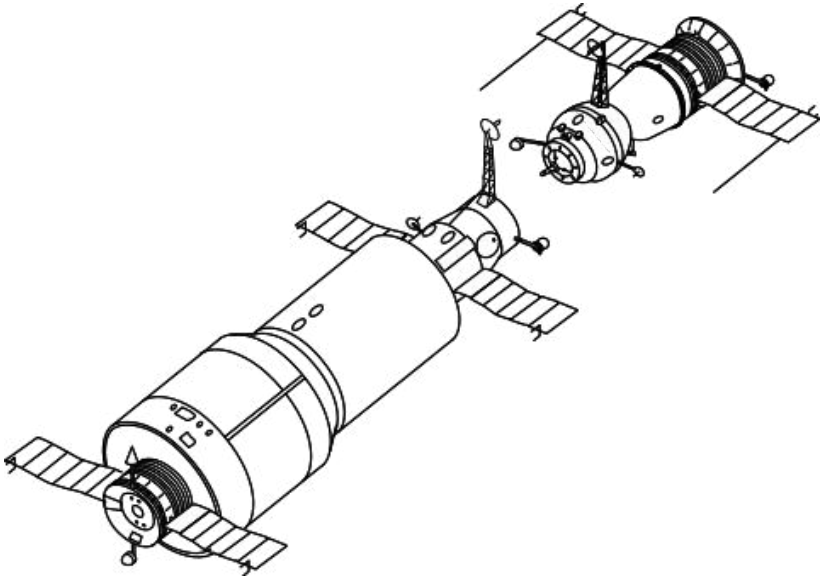


Soyuz (left) docking with Salyut 1 (right)

DOS – 1 , cont.

Launch :	April 19, 1971 , 01:40:00 GMT	Length :	14,4 m (47,3 ft)
Launch Vehicle :	Proton – K Booster	Diameter :	4,15 m (13,6 ft)
Reentry :	October 11, 1971	Perigee Altitude :	200 km (124 mi)
No. of Orbits :	2.929	Apogee Altitude :	222 km (138 mi)

After 175 days, the world's first space station burned up over the Pacific Ocean



Soyuz (right) docking with Salyut 1 (left)

SALYUT – 1

Expedition - 1

From left to right :
Vladimir Shatalov , Alexei Yeliseyev , Nikolai Rukavishnikov

Launch Date :	April 22, 1971 , 23:54 UTC
Launch Vehicle :	Soyuz 7K - T , No. 31
Launch Crew :	Cdr. Shatalov , FE Yeliseyev , Test Engineer Rukavishnikov
SALYUT 1 Crew :	without crew
Landing Crew :	Vladimir Shatalov , Alexei Yeliseyev , Nikolai Rukavishnikov
Landing Vehicle :	Soyuz 7K - T , No. 31
Landing Date :	April 24, 1971 , 23:40 UTC

Soyuz – 10

First Mission to a Space Station

The spacecraft was the first of the upgraded Soyuz featuring the new "probe and drogue" docking mechanism with internal crew transfer capability, intended for space station visits.
The spacecraft docked to the station at April 23 and remained docked for 5.5 hours, then undocked following failed attempts to enter the station.
One last hitch presented itself when toxic fumes began to fill the capsule during reentry, causing Rukavishnikov to pass out; however, all three crew members were recovered unscathed.
The spacecraft touched down 119 km north west of Karaganda after 1 day, 23 hours and 46 minutes in flight.

SALYUT – 1

Expedition - 2

From left to right :
Georgi Dobrovolsky , Vladislav Volkov , Viktor Patseyev

Launch Date :	June 6, 1971 , 04:55 UTC
Launch Vehicle :	Soyuz 7K - T , No. 32
Launch Crew :	Cdr. Dobrovolsky , FE Volkov , Test Engineer Patseyev
SALYUT 1 Crew :	Dobrovolsky , Volkov , Patseyev
Landing Crew :	Georgi Dobrovolsky , Vladislav Volkov , Viktor Patseyev
Landing Vehicle :	Soyuz 7K - T , No. 32
Landing Date :	June 29, 1971 , 23:16 UTC

Soyuz – 11

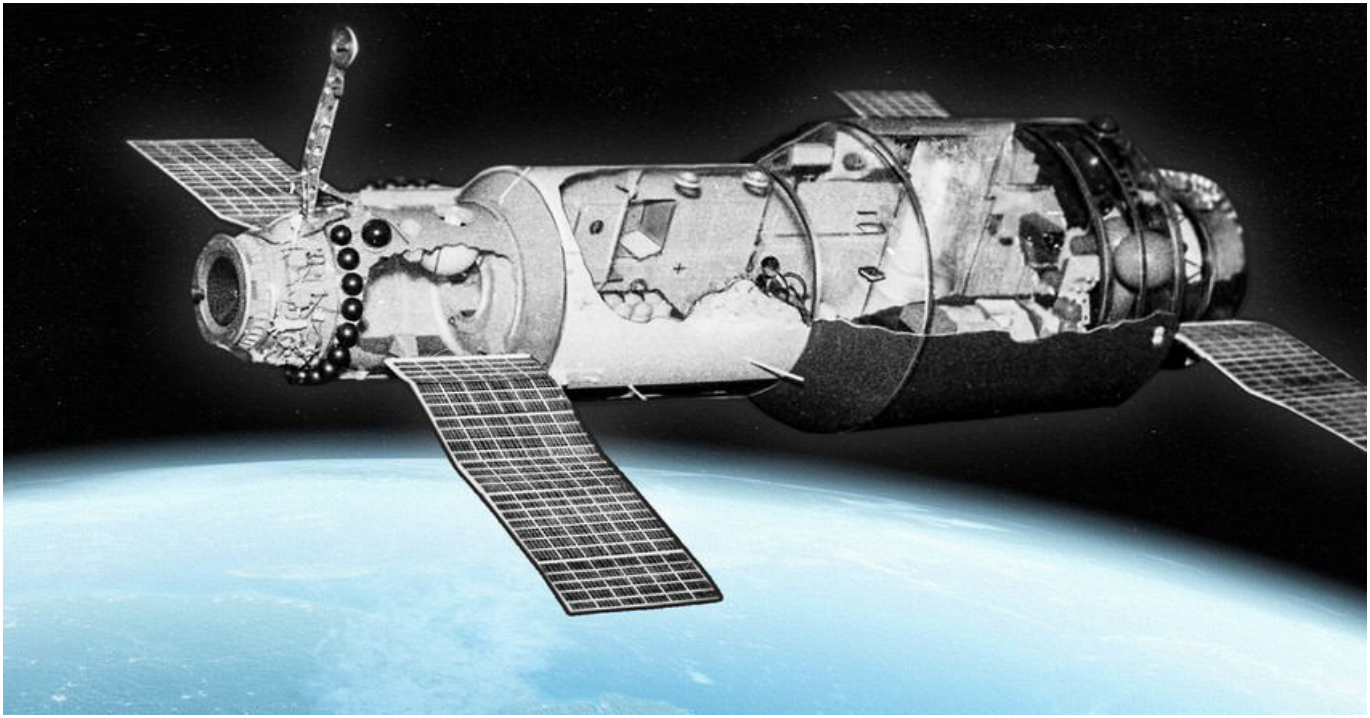
„Long - Duration“ Flight : 23 days

After the spacecraft docked to the station, the crew transferred to the station a few hours later, working onboard for 22 days. Following undocking the spacecraft began the reentry phase, and the explosive bolts that separated the orbital module an exhaust valve shook open and caused the spaccraft to roll. The ensuing disorientation caused the crew to take a few seconds to attempt to close the valve. In just 45 seconds the spacecraft was completely depressurized and the crewmen, not wearing pressure suits, were dead. The spaccraft touched down 800 km south west of Sverdlovsk. Communication with the crew was lost during reentry and ground forces were unaware of the situation until they opened the hatch.

Duration: 23 days, 18 hours and 22 minutes

„without name“ / DOS - 2

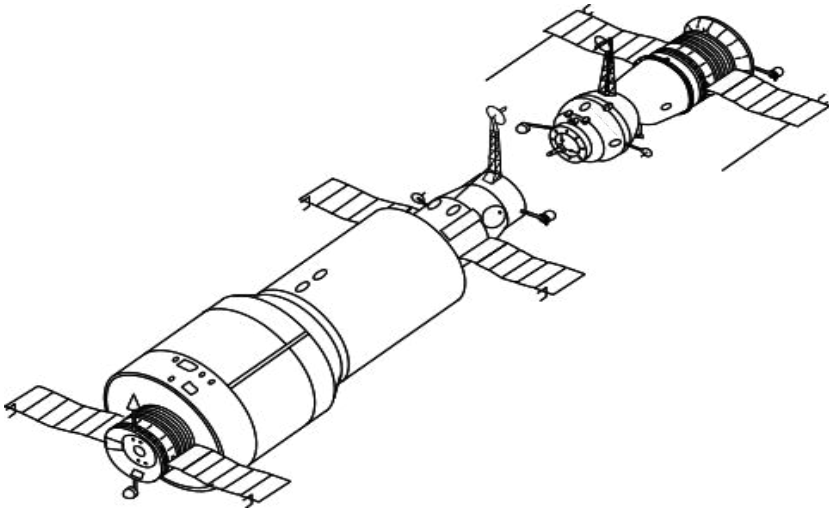
DOS-2 was structurally identical to Salyut-1, as it had been assembled as a backup unit for that station.



DOS – 2 , cont.

Launch :	July 29, 1972 , 03:21:00 GMT	Length :	14,4 m (47,3 ft)
Launch Vehicle :	Proton – K Booster	Diameter :	4,15 m (13,6 ft)
Reentry :	July 29, 1972	Perigee Altitude :	0
No. of Orbits :	0	Apogee Altitude :	0

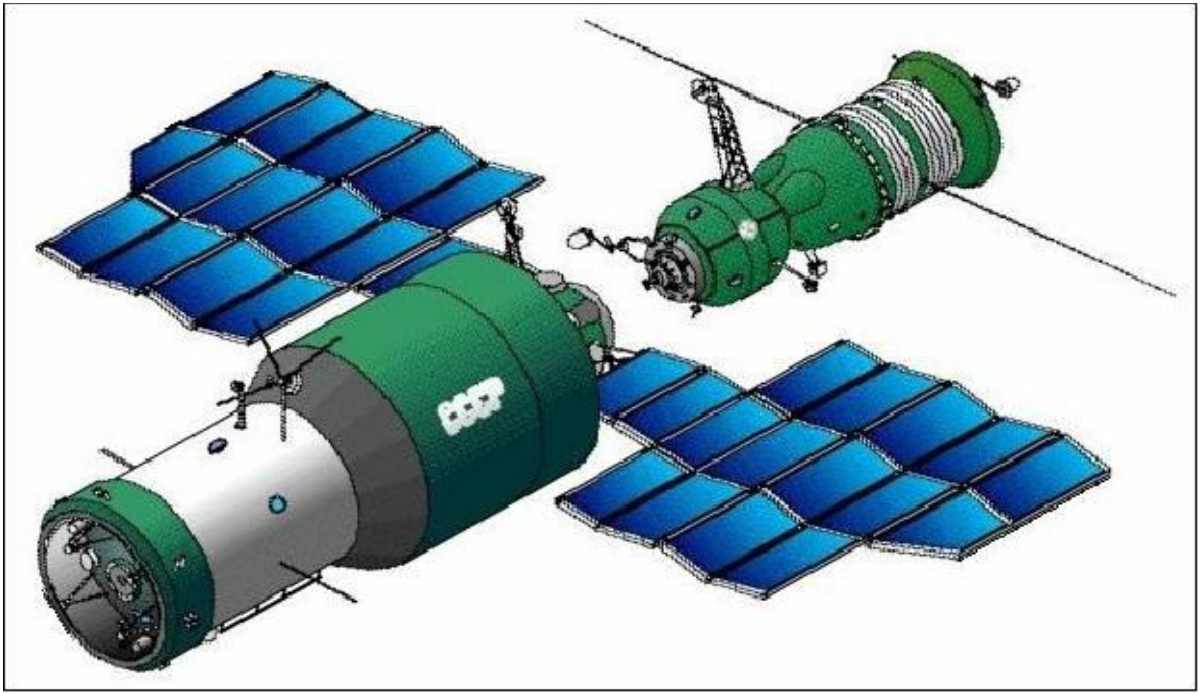
DOS-2 was lost in a launch failure on July 29, 1972, when the failure of the second stage of its Proton-K launch vehicle prevented the station from achieving orbit. It instead fell into the Pacific Ocean



Planned orbital configuration of DOS-2

SALYUT – 2 / ALMAZ – 1 / OPS - 1

Salyut-2 (Russian: Салют-2 meaning *Salute 2*) was launched in 1973.
It was the first Almaz military space station to fly.

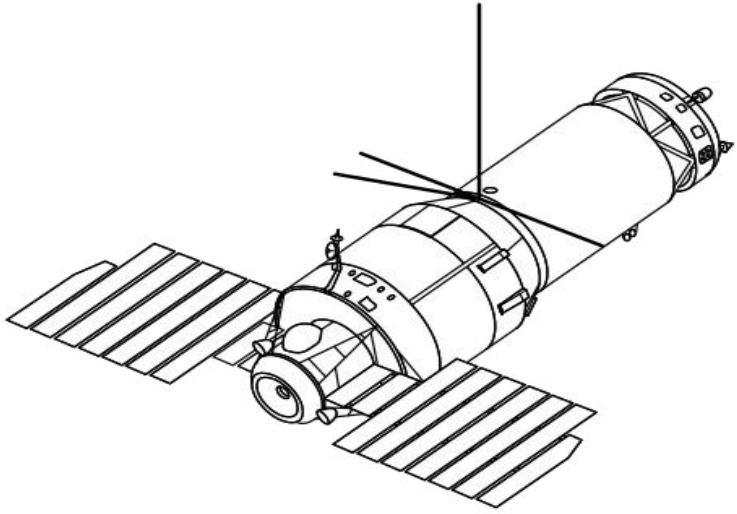


The Soyuz ferry (upper right) approaching the Almaz-1 station

OPS – 1 , cont.

Launch :	April 03, 1973 , 09:00:00 GMT	Length :	14,55 m (47,7 ft)
Launch Vehicle :	Three-stage Proton-K rocket	Diameter :	4,15 m (13,6 ft)
Reentry :	May 28, 1973 , 11:46:00 GMT	Perigee Altitude :	261 km (162 mi)
No. of Orbits :	866	Apogee Altitude :	296 km (184 mi)

Within two weeks of its launch, the station had lost attitude control and depressurized, leaving it unusable. Its orbit decayed and it re-entered the atmosphere on May 28,1973, without any crews having visited it.



An Almaz space station

KOSMOS 557 / DOS - 3

Kosmos 557 was originally intended to be launched as Salyut-3, but due to its failure to achieve orbit on May 11, 1973, three days before the launch of Skylab, it was renamed Kosmos-557 (Russian: Космос 557 meaning *Cosmos 557*)

требовал заменить носитель, второй обещал отремонтировать его прямо на стартовой пози-

Все четыре экипажа на ДОС-2 и ДОС-3: А.Губарев, В.Кубасов, Г.Гречко, В.Лазарев, В.Севастьянов, П.Климук, О.Макаров, А.Леонов (сидит)

Эксплуатация первой ДОС «Салют» выявила ряд ее конструктивных и технических недостатков, которые накладывали существенные ограничения на эффективность использования станции и значительно ограничива-

Кроме того, такой режим ограничивал проведение научных исследований.

На станциях ДОС-3 и ДОС-4 были установлены новые солнечные батареи, созданные в филиале ЦКБМ (ныне КБ «Салют»)

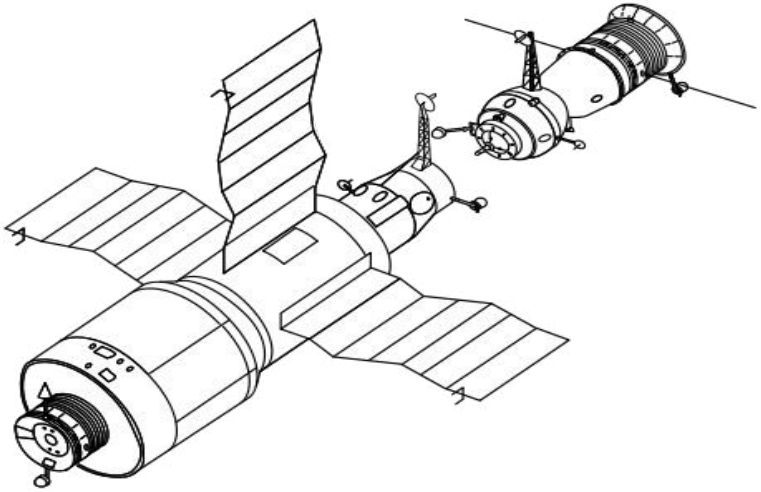
циклу. Для этого была создана система регенерации воды из конденсата СРВ-К, с помощью которой вода, выделяемая космонавтами с дыханием и потом, собиралась, очищалась и становилась пригодной для питья.

The planned orbital configuration of DOS-3

DOS – 3 , cont.

Launch :	May 11, 1973 , 00:20:00 GMT	Length :	14,4 m (47,3 ft)
Launch Vehicle :	Three-stage Proton-K rocket	Diameter :	4,15 m (13,6 ft)
Reentry :	May 22, 1973 , 03:07:00 GMT	Perigee Altitude :	218 km (135 mi)
No. of Orbits :	~175	Apogee Altitude :	266 km (165 mi)

Due to errors in the flight control system, the station fired its attitude thruster until it consumed all of its fuel and became uncontrollable. The Soviets quietly allowed it to reenter and burn up a week later.



The planned orbital configuration of DOS-3

Soyuz - 12

First Spaceflight of the Modified Soyuz Spacecraft

From left to right :
Vasili Lazarev , Oleg Makarov

Launch Date : September 27, 1973 , 12:18 UTC

Launch Vehicle : Soyuz 7K-T , No. 37

Launch Crew : Cdr. Lazarev , FE Makarov

Landing Crew : Vasili Lazarev , Oleg Makarov

Landing Vehicle : Soyuz 7K-T , No. 37

Landing Date : September 29, 1973 , 11:33 UTC

[No patch available for this mission]

The flight marked the return of the Soviets to crewed space operations after the 1971 accident.

The crew flying a modified Soyuz, with batteries instead of solar panels.

The crew capacity of the capsule had been decreased from three to two cosmonauts to allow for pressure suits to be worn during launch, re-entry and docking.

Spaceraft touched down 400 km south west of Karaganda.

Duration: 1 day, 23 hours and 16 minutes.

Soyuz - 13

Second Flight of the Mod. Soyuz / Test of Various Salyut Components

From left to right :
Pyotr Klimuk , Valentin Lebedev

Launch Date :	December 18, 1973 , 11:55 UTC
Launch Vehicle :	Soyuz 7K-T , No. 33
Launch Crew :	Cdr. Klimuk , FE Lebedev
Landing Crew :	Pyotr Klimuk , Valentin Lebedev
Landing Vehicle :	Soyuz 7K-T , No. 33
Landing Date :	December 26, 1973 , 08:50 UTC

[No patch available for this mission]

This flight was the second test flight of the redesigned Soyuz 7K-T spacecraft, which first flew as Soyuz 12.

Unlike Soyuz 12, the spacecraft was equipped with solar panels to allow for an extended mission. Additionally, an orbital module (later used for the ASTP mission) was attached, replacing unneeded docking equipment.

This module included the Orion 2 Space Observatory and equipment due for Salyut – 3 / OPS - 2.

The crew landed in a heavy snowstorm, but were recovered a few minutes later, some 200 km at south west of Karaganda.

Duration: 7 days, 20 hours and 56 minutes

[During its 8-day mission, Soyuz 13 was in orbit around the Earth at the same time as the U.S. Skylab – 4 mission, which had been launched on November 16, 1973 and which would remain in orbit until February 8, 1974 marking the first time that both the United States and the Soviet Union had crewed missions operating simultaneously]

SALYUT – 3 / ALMAZ – 2 / OPS - 2

Salyut-3 (Russian: Салют-3; English: Salute 3 or Almaz-2) was the second Almaz military space station, and the first such station to be launched successfully

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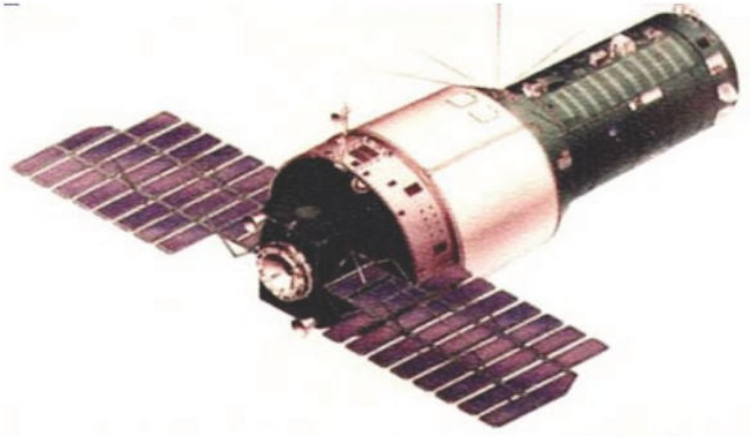
Salyut-3 (Almaz OPS-2) Flight Profile

Salyut-3/Almaz OPS-2 launched on Jun. 25, 1974, was virtually identical to the failed Salyut-2/Almaz OPS-1 military station with sun tracking solar arrays and recoverable capsule. Film capsule returned Sep. 23, 1974, Almaz-2 reentered Jan. 24, 75.

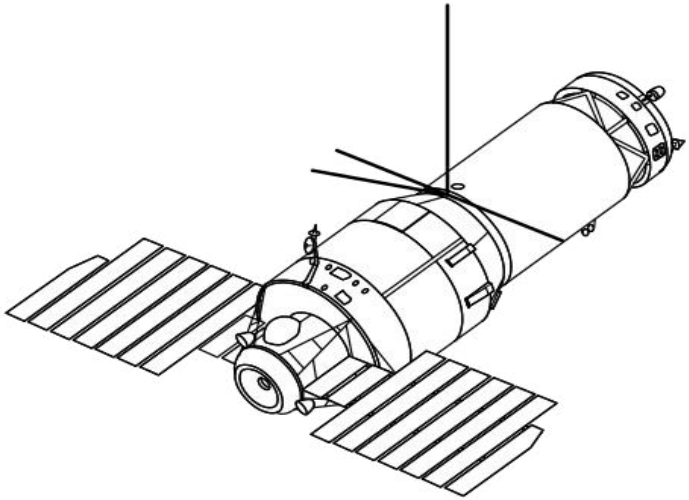


Military station Salyut Almaz OPS design

OPS - 2 , cont.

Launch :	June 24, 1974 , 22:38:00 GMT	Length :	14,55 m (47,7 ft)
Launch Vehicle :	Three-stage Proton-K rocket	Diameter :	4,15 m (13,6 ft)
Reentry :	January 24, 1975	Perigee Altitude :	253 km (157 mi)
No. of Orbits :	unknown	Apogee Altitude :	275 km (171 mi)

Due to the military nature of the station, the Soviet Union was reluctant to release information about its design, and about the missions relating to the station.
The station was deorbited on January 24, 1975 over the Pacific Ocean.



An Almaz space station

SALYUT – 3

Expedition - 1

From left to right :
Pavel Popovich , Yuri Artyukhin

Launch Date :	July 3, 1974 , 18:51 UTC
Launch Vehicle :	Soyuz 7K-T , No. 62
Launch Crew :	Cdr. Popovich , FE Artyukhin
SALYUT 3 Crew :	Popovich , Artyukhin
Landing Crew :	Pavel Popovich , Yuri Artyukhin
Landing Vehicle :	Soyuz 7K-T , No. 62
Landing Date :	July 19, 1974 , 12:21 UTC

Soyuz – 14

„Long - Duration“ Flight : 16 days

[No patch available for this mission]

The mission was part of the Soviet Union's Almaz program to evaluate the military applications of crew spaceflight.

At the time, the military nature of this mission and the station itself were not acknowledged by Soviet authorities.

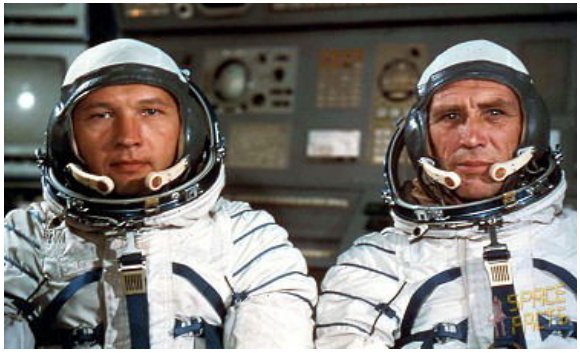
The crew conducted various visual observations of military targets following docking.

The cosmonauts exercised for two hours each day to counter the effects of weighlessness.
Because of this, they were able to climb from their Soyuz descent module without assistance when their spacecraft touched down 140 km south east of Dzhezkazgan.

Duration: 15 days, 17 hours and 31 minutes

SALYUT – 3

Expedition - 2



From left to right :
Gennadi Sarafanov , Lev Dyomin

Launch Date :	August 26, 1974 , 19:58 UTC
Launch Vehicle :	Soyuz 7K-T , No. 63
Launch Crew :	Cdr. Sarafanov , FE Dyomin
SALYUT 3 Crew :	without crew
Landing Crew :	Gennadi Sarafanov , Lev Dyomin
Landing Vehicle :	Soyuz 7K-T , No. 63
Landing Date :	August 28, 1974 , 20:10 UTC

Soyuz – 15

Failed Docking at the Station

[No patch available for this mission]

The Soyuz spacecraft arrived at the station,
but the Cosmonauts were unable to dock
because the electronics in the
Igla docking system malfunctioned.

Without sufficient fuel for prolonged attempts at
manual docking, the mission had to be abandoned.

The cosmonauts powered down all nonessential systems
in the Soyuz and waited until the next day for reentry

Following an emergency reentry
the spacecraft touched down
48 km south west of Tselinograd.

Duration: 2 days, 12 minutes

Soyuz - 16

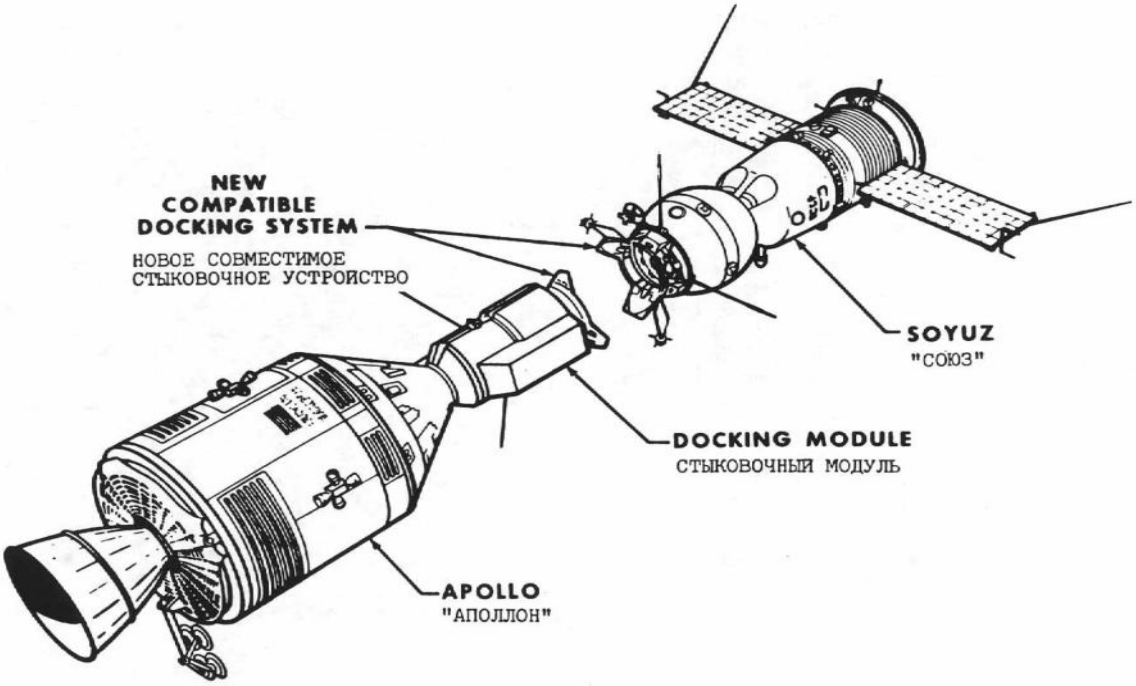
Apollo - Soyuz Test Project (ASTP) Rehearsal Flight Profile

From left to right :
Anatoli Filipchenko , Nikolai Rukavishnikov

Launch Date :	December 2, 1974 , 09:40 UTC
Launch Vehicle :	Soyuz 7K-TM , No. 73
Launch Crew :	Cdr. Filipchenko , FE Rukavishnikov
Landing Crew :	A. Filipchenko , N. Rukavishnikov
Landing Vehicle :	Soyuz 7K-TM , No. 73
Landing Date :	December 8, 1974 , 08:03 UTC

This mission was a full shakedown of the upcoming ASTP Soyuz-19 flight.
Testing guidance, orbital maneuvers, a docking ring and other systems to be used in the joint flight.
The spacecraft carried the APAS-75 docking system.
On December 7, this docking ring was jettisoned with explosive bolts to test emergency measures if the capture latches got stuck during the ASTP flight.
After 5 days, 22 hours and 24 minutes the crew touched down 30 km north east of Arkalyk.

APOLLO SOYUZ TEST PROCECT (ASTP)

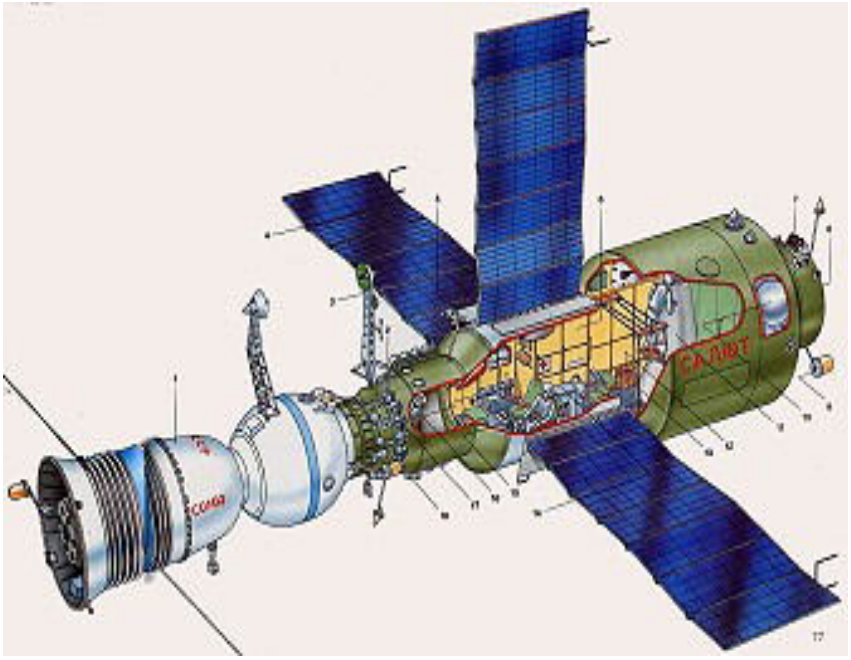


- Apollo-Soyuz Rendezvous and Docking Test project

ЭКСПЕРИМЕНТАЛЬНЫЙ ПРОЕКТ ВСТРЕЧИ И СТЫКОВКИ КОСМИЧЕСКИХ КОРАБЛЕЙ

SALYUT – 4 / DOS - 4

Salyut-4 was launched on December 26, 1974 into an orbit with an apogee of 355 km, a perigee of 343 km and an orbital inclination of 51.6 degrees. It was essentially a copy of the Kosmos 557 and unlike its ill-fated sibling it was a complete success.

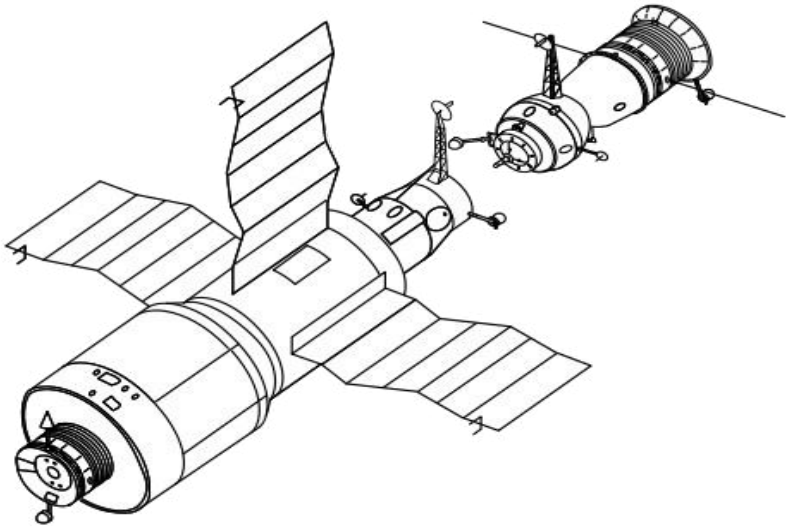


Salyut 4 (right) and Soyuz (left)

DOS – 4 , cont.

Launch :	December 26, 1974 , 04:15:00 GMT	Length :	14,4 m (47,3 ft)
Launch Vehicle :	Three-stage Proton-K rocket	Diameter :	4,15 m (13,6 ft)
Reentry :	February 2, 1977 , 23:31:00 GMT	Perigee Altitude :	343 km (213 mi)
No. of Orbits :	12.188	Apogee Altitude :	355 km (220 mi)

Salyut 4 was deorbited February 2, 1977, and re-entered the Earth's atmosphere on February 3.



Salyut 4 (left) and Soyuz (right)

SALYUT – 4

Expedition - 1

From left to right :
Alexei Gubarev , Georgi Grechko

Launch Date :	January 10, 1975 , 21:43 UTC
Launch Vehicle :	Soyuz 7K-T , No. 38
Launch Crew :	Cdr. Gubarev , FE Grechko
SALYUT 4 Crew :	Gubarev , Grechko
Landing Crew :	Alexei Gubarev , Georgi Grechko
Landing Vehicle :	Soyuz 7K-T , No. 38
Landing Date :	February 9, 1975 , 11:03 UTC

Soyuz – 17

First Mission to the Space Station

[No patch available for this mission]

Gubarev manually docked Soyuz - 17 to the station
on January 12, 1975,
and upon entering the new station
he and Grechko found a note from its builders which said,
"Wipe your feet"!

The crew conducted several science investigations
including earth and stellar photography.

Following undocking the spacecraft touched down
110 km north east of Tselinograd in a snowstorm
with winds of 72 km/h.

They wore gravity suits to ease
the effects of re-adaptation..

The flight set a Soviet mission-duration record
of 29 days, 13 hours and 20 minutes ,
surpassing the 23-day record
set by the ill-fated Soyuz - 11 crew.

Soyuz – 18 A

Launch Failure / Suborbital Flight

From left to right :
Oleg Makarov , Vasily Lazarev

[Soyuz 7K-T , No.39, also named Soyuz 18a or Soyuz 18-1 by some sources and also known as the „April 5 Anomaly“]

All was nominal for the ascent stage of the flight until stage three separation.

Three of six explosive separation bolts failed to fire and the Soyuz remained attached to the core stage and the rocket began tumbling.

When the cosmonauts screamed to mission control that they were out of control, they were told that that was impossible.

Data showed all was normal.

Once mission control understood the situation, the craft was blasted free from the rocket and the Soyuz fell back to earth.

The spacecraft touched down 1600 km east of Tyuratam (Baikonur) and 300 km from the USSR-China-Mongolia border.

The crew experienced forces as high as 18 G's during descent and survived, no worse for wear.

Duration: 22 minutes suborbital flight

Launch Date :	April 5, 1975, 11:04 UTC
Launch Vehicle :	Soyuz 7K-T , No. 39
Launch Crew :	Cdr. Lazarev , FE Makarov
Landing Crew :	Vasily Lazarev , Oleg Makarov
Landing Vehicle :	Soyuz 7K-T , No. 39
Landing Date :	April 5, 1975 , 11:26 UTC

SALYUT – 4

Expedition - 2

From left to right :
Vitali Sevastyanov , Pyotr Klimuk

Launch Date : May 24, 1975 , 14:58 UTC

Launch Vehicle : Soyuz 7K-T , No. 40

LaunchCrew : Cdr. Klimuk , FE Sevastyanov

SALYUT 4 Crew : Klimuk , Sevastyanov

Landing Crew : Pyotr Klimuk , Vitali Sevastyanov

Landing Vehicle : Soyuz 7K-T , No. 40

Landing Date : July 26, 1975 , 14:18 UTC

Soyuz – 18

Second Mission to the Station

The Soyuz - 18 docked to the station May 26, 1975.

The crew conducted various astrophysical and earth resources investigations over their extended stay aboard Salyut-4.

Following undocking the spacecraft
touched down 55 km north east of Arkalyk.

New spaceflight record now 62 days, 23 hours and 20 minutes

Soyuz - 19

Apollo Soyuz Test Project

From left to right :
Back Row: Thomas Stafford , Alexei Leonov
Front Row: Donald Slayton , Vance Brand , Valeri Kubasov

Launch Date :	July 15, 1975 , 12:20 UTC
Launch Vehicle :	Soyuz 7K-TM , No. 75
Launch Crew :	Cdr. Leonov , FE Kubasov
Landing Crew :	Alexei Leonov , Valeri Kubasov
Landing Vehicle :	Soyuz 7K-TM , No. 75
Landing Date :	July 21, 1975 , 10:50 UTC

Apollo-Soyuz Test Project (ASTP) Flight Profile

Call sign: Soyuz
The Soyuz spacecraft played the passive role in the mission, waiting on orbit for the arriving Apollo spacecraft. The vehicles docked on the Soyuz's 36th orbit with Apollo on it's 29th orbit.

Docking date First:	16:19:09 (UTC) , July 17, 1975
Undocking date Last:	15:26:12 (UTC) , July 19. 1975
Time docked:	47 hours and 7 minutes

After two days of joint activities, the two spacecraft undocked on July 19, 1975 and on July 21, 1975 the Soyuz-19 spacecraft landed 87 km north east of Arkalyk

* *

APOLLO 18

Launch Date :	*July 15, 1975 , 19:50 UTC*
Launch Vehicle :	*Apollo CSM 111 (Apollo 18) and Docking Module*
Launch Crew :	*Cdr. Stafford , CSM Pilot Brand , DM Pilot Slayton*
Landing Crew :	*Thomas Stafford , Vance Brand, Donald Slayton*
Landing Vehicle :	*Apollo CSM 111*
Landing Date :	*July 24, 1975 , 21:18 UTC*

Soyuz – 19 , cont.

This patch is an original Soviet "Soyuz-Apollo" mission patch. It is autographed by back-up commander Yuri Romanenko

The ASTP crew patch was a composite of Rockwell International and NASA ideas. Stan Jacobsen at the Johnson Space Center provided the final drawing of the patch. The Patch carries the names of the three American and two Soviet crewmen and the words Apollo in English and Soyuz in Russian around an artist's concept of the Apollo and Soyuz spacecraft about to dock in Earth orbit. The white stars on the blue background represent the American astronauts, the gold stars on the red background represent the Soviet Cosmonauts. Tom Stafford, Deke Slayton and Vance Brand presented the concept of the patch to the Soviet crew during a pre-mission training session. Leonov and Kubasov agreed that the design should become the crew patch for the international mission.

Soyuz – 19 , cont.

..."The Apollo Soyuz Test Project insignia was designed by the Soviets.
The emblem has the words Apollo in English and Soyuz in Russian around a center disc which depicts the two spacecraft docked together in Earth orbit.
The Russian word "Soyuz" means "Union" in English"...

The support crew for the Apollo-Soyuz Test Project had their own patch :
Instead of last names the support crew used their nick-names:
Bo (Karol Bobko), Bob (Robert Overmeyer),
Crip (Robert Crippen), Troop (Richard Truly),
Johnny (Dzhanibekov), Boris (Andreyev),
Yuri (Romanenko) and Sasha (Ivanchenko)

Soyuz – 19 , cont.

This ASTP Crew Kids emblem was designed by Jacques Tiziou.
Childish drawing of course.
[Kayta should be Katya .The astronaut office in Houston insisted at the time that it was Kayta...]
Only paper prints about 11 inches were done at the time.

A S T P - Snoopy meets the Bear

SALYUT – 4

Expedition – without crew

Soyuz Spacecraft

Launch Date : November 17, 1975 , 14:36 UTC

Launch Vehicle : Soyuz 7K-T , No. ?

LaunchCrew : without crew

SALYUT 4 Crew : without crew

Landing Crew : without crew

Landing Vehicle : Soyuz 7K-T , No. ?

Landing Date : February 16, 1976 , 02:24 UTC

Soyuz - 20

Launched Unmanned

Soyuz - 20 was an unmanned test demonstration of the Progress design.

The vehicle docked on November 19, 1975 with the Salyut - 4 station, automatically.

Soyuz 20 performed comprehensive checking of improved on-board systems of the spacecraft under various flight conditions.

It also carried several biological experiments that were recovered on landing.

Following a joint flight lasting 89 days

the craft undocked on February 16, 1976

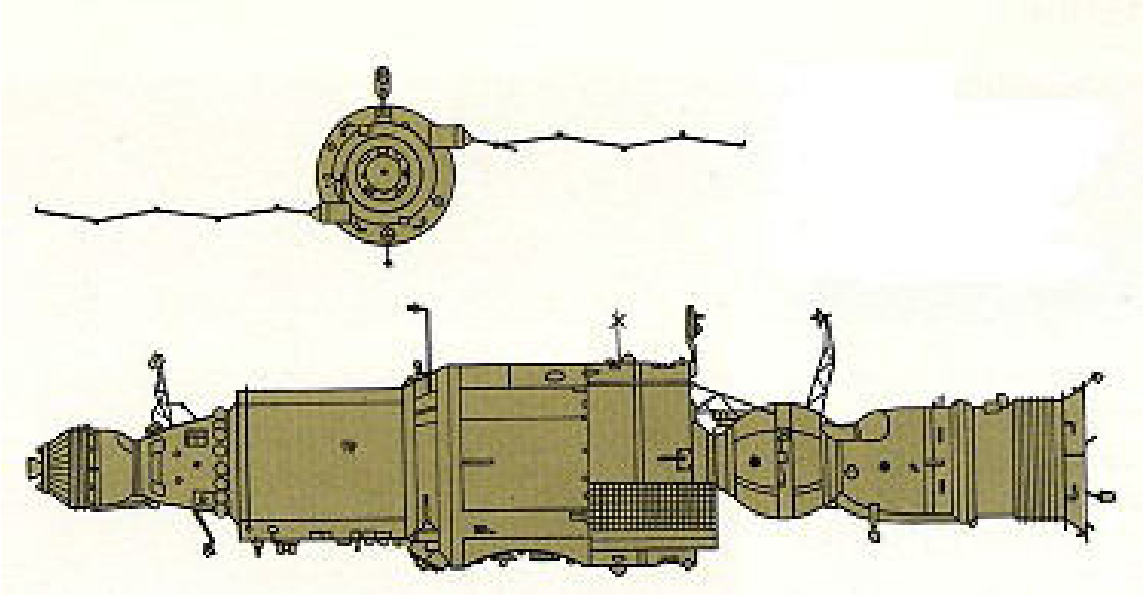
and touched down,

after 90 days, 11 hours and 47 minutes in flight

56 km south west of Arkalyk

SALYUT – 5 / ALMAZ – 3 / OPS - 3

Salyut 5 (Russian: Салют-5 meaning *Salute 5*), was the third and last Almaz space station to be launched for the Soviet military.

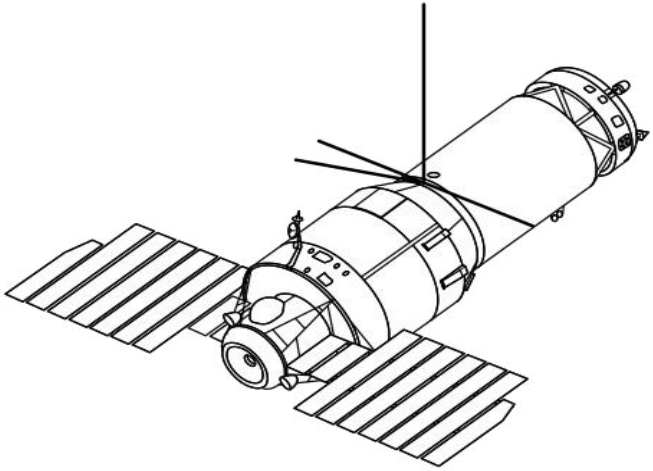


Salyut 5 (left) and Soyuz (right)

OPS - 3 , cont.

Launch :	June 22, 1976 , 18:04:00 GMT	Length :	14,55 m (47,7 ft)
Launch Vehicle :	Three-stage Proton-K rocket	Diameter :	4,15 m (13,6 ft)
Reentry :	August 08, 1977	Perigee Altitude :	256 km (159 mi)
No. of Orbits :	6.630	Apogee Altitude :	275 km (171 mi)

Almaz-3 starting to run low on propellant for its main engines and attitude control system. Since it could not be refuelled, the recoverable capsule was ejected and returned to Earth on February 26, 1977. Almaz-3 was deorbited on August 08, 1977 and burned up as it reentered the Earth's atmosphere.



An Almaz space station

SALYUT – 5

Expedition - 1

From left to right :
Boris Volynov , Vitali Zholobov

Launch Date :	July 6, 1976 , 12:08 UTC
Launch Vehicle :	Soyuz 7K-T , No. 41
Launch Crew :	Cdr. Volynov , FE Zholobov
SALYUT 5 Crew :	Volynov , Zholobov
Landing Crew :	Boris Volynov , Vitali Zholobov
Landing Vehicle :	Soyuz 7K-T , No. 41
Landing Date :	August 24, 1976 , 18:32 UTC

Soyuz – 21

First Mission to the Space Station

[No patch available for this mission]

July 7, 1976 Soyuz - 21 spacecraft docked to the new Salyut - 5, entering the station five hours later.

The mission's objectives were mainly military in scope, but included other scientific work.

The mission ended abruptly on August 24, 1976.
The Soyuz - 21 crew placed the station in an automatic mode, before departing.
It was later noted that the crew had ended their mission prematurely due to an acrid odour coming from the environmental control system (ECS), that could not be detected and became unbearable.

The spacecraft touched down during strong winds, which caused uneven firing of the retrorockets.
It made a hard landing in darkness, approx. 200 km south west of Kokchetav.

Duration : 49 days , 6 hours , 24 minutes (new record)

Soyuz – 22

Soviet Military Flight

Valeri Bykovsky / Vladimir Aksyonov

Launch Date :	September 15, 1976 , 09:48 UTC
Launch Vehicle :	Soyuz 7K – TM , No. 74
Launch Crew :	Cdr. Bykovsky , FE Aksyonov
Landing Crew :	Valeri Bykovsky , Vladimir Aksyonov
Landing Vehicle :	Soyuz 7K – TM , No. 74
Landing Date :	September 23, 1976 , 07:40 UTC

[No patch available for this mission]

This Soyuz mission was not intended to rendezvous with the Salyut-5 station.

The Soyuz - 22 spacecraft had been specially modified with earth resources camera systems mounted in the nose, replacing the standard docking port.

Thr cosmonauts spent a week in orbit photographing the surface of the Earth with a specially-built camera.

Soyuz - 22 was launched to orbit at the unusually high, record inclination of 64.75°; flown for the first time.

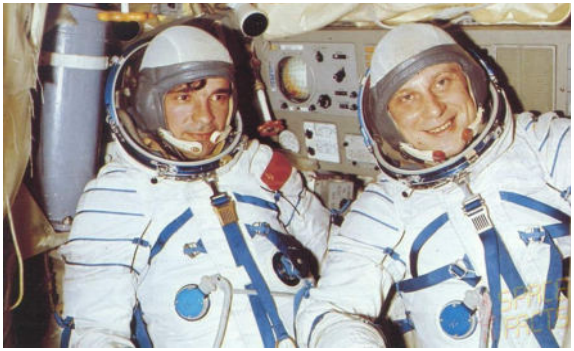
The retrofire, re-entry, and landing took place without incident.

The spacecraft landed 150 km north west of Tselinograd.

Duration: 17 days , 17 hours , 26 minutes

SALYUT – 5

Expedition - 2



From left to right :
Vyacheslav Zudov . Valeri Rozhdestvensky

Launch Date :	October 14, 1976 , 17:39 UTC
Launch Vehicle :	Soyuz 7K-T , No. 65
Launch Crew :	Cdr. Zudov , FE Rozhdestvensky
SALYUT 5 Crew :	without crew
Landing Crew :	V. Zudov . V. Rozhdestvensky
Landing Vehicle :	Soyuz 7K-T , No. 65
Landing Date :	October 16, 1976 , 17:45 UTC

Soyuz – 23

No Docking / Soyuz With Electrical Problems

[No patch available for this mission]

During the automatic rendezvous approach the computer malfunctioned and caused the maneuver to be cancelled.

This generation of Soyuz craft did not carry solar panels and relied on a limited battery supply.

Following the aborted docking
the only alternative was to return to earth.

The spacecraft fired its reentry motors to begin the reentry phase.
The crew landed at night on a frozen lake (Tengiz)
during a snow-storm,
195 km south west of Tselinograd /
140 km south east of Arkalyk

[First ever Soviet splashdown]

Duration: 2 days and 6 minutes

[Note that the recovery was very difficult and invlovedhelicopters trying to pull the craft through the ice laden lake, unsuccessfully, before finally raising the craft and crew and lowering them to the shore. The recovery took nine hours]

SALYUT – 5

Expedition - 3

From left to right :
Yuri Glazkov , Viktor Gorbatkov

Launch Date :	February 7, 1977 , 16:11 UTC
Launch Vehicle :	Soyuz 7K-T , No. 66
Launch Crew :	Cdr. Gorbatkov , FE Glazkov
SALYUT 5 Crew :	Glazkov , Gorbatkov
Landing Crew :	Yuri Glazkov , Viktor Gorbatkov
Landing Vehicle :	Soyuz 7K-T , No. 66
Landing Date :	February 25, 1977 , 09:38 UTC

Soyuz – 24

Last Mission to the Station

[No patch available for this mission]

On February 8, 1977 Soyuz - 24 spacecraft docked to Salyut – 5.
Following a full nights sleep in the Soyuz
the crew transferred into the station at the next day.
Gorbatkov stated :
"Its cosy, warm and easy to breathe"
a cryptic response indicating that
the ECS anomaly had been rectified.

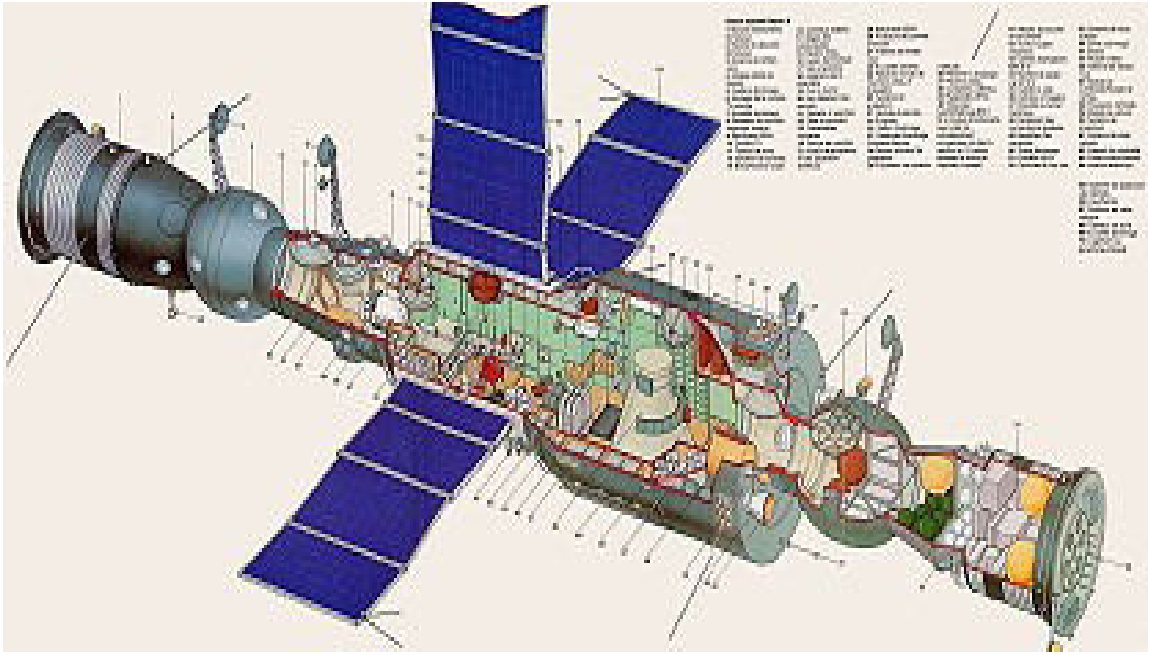
February 25, 1977 Soyuz-24 undocked from the station.
The spacecraft landed 36 km (22.3 mi.) north east of Arkalyk.
The Soyuz landed in a blowing snowstorm and recovery crews could not locate the space capsule. As it turned out, the search and rescue beacon was unable to deploy due to being jammed shut from snow, so Gorbatko had to free it by hand.

Duration : 17 days, 17 hours and 26 minutes

[On February 26, 1977, Salyut-5 launched a re-entry module, which was recovered on Soviet territory, with valuable large-format film containers. It seems that the preparation and loading of this re-entry capsule was the main purpose of the Soyuz - 24 crew]

SALYUT – 6 / DOS - 5

Salyut 6 was the first space station to accommodate a large number of manned and unmanned spacecraft for human habitation, crew transfer, international participation and resupply, setting precedents for life and operations on a space station.



Progress (left) , Salyut 6 (center) and Soyuz (right)

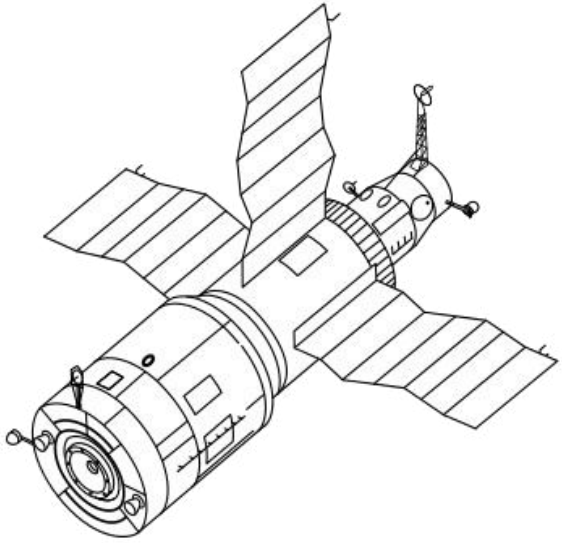
DOS – 5 , cont.

Launch :	September 29, 1977 , 06:50:00 GMT	Length :	15,8 m (51,8 ft)
Launch Vehicle :	Three-stage Proton-K rocket	Diameter :	4,15 m (13,6 ft)
Reentry :	July 29, 1982	Perigee Altitude :	219 km (136 mi)
No. of Orbits :	27.785	Apogee Altitude :	275 km (171 mi)

Salyut-6 had two docking ports, allowing two craft to visit simultaneously. This feature made it possible for humans to remain aboard for several months. Short-term visiting crews routinely included international cosmonauts participating in the Soviet Union's Intercosmos programme.

These cosmonauts were the first spacefarers from countries other than the Soviet Union or the United States.

Salyut 6 was visited and resupplied by twelve uncrewed new *Progress spacecraft* including Progress-1, the first instance of the series. Additionally, Salyut 6 was visited by the first instances of the new *Soyuz-T spacecraft*.



Basic orbital configuration of Salyut 6

SALYUT - 6

- - - - -

From top to bottom :
Vladimir Kovalyonok , Valeri Ryumin

Launch Date :	October 9, 1977 , 02:40 UTC
Launch Vehicle :	Soyuz 7K-T , No. 42
Launch Crew :	Cdr. Kovalyonok , FE Ryumin
SALYUT 6 Crew :	without crew
Landing Crew :	V. Kovalyonok , V. Ryumin
Landing Vehicle :	Soyuz 7K-T , No. 42
Landing Date :	October 11, 1977 , 03:25 UTC

SOYUZ - 25

First Flight to the Space Station / Docking Failure

[No patch available for this mission]

October 10, 1977 :

Soyuz-25 vehicle failed to dock after several attempts were made with the forward docking port of the Salyut.

It seems that the trouble lay with the latching system on the Soyuz-25 docking probe.

The attempt was aborted.

October 11, 1977 :

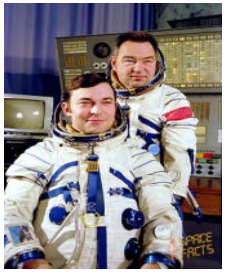
Soyuz-25 lands 185 km (114 mi.) north west of Tselinograd.

Duration: 2 days and 46 minutes

SOYUZ – U rocket on the way to the launch pad

SALYUT - 6

Expedition - 1



From left to right :
Yuri Romanenko , Georgi Grechko

Salyut 6 Patch

SOYUZ - 26

„Long-Duration“ Crew Mission : 96 days

Launch Date :	December 10, 1977 , 01:18 UTC
Launch Vehicle :	Soyuz 7K-T , No. 43
Launch Crew :	Cdr. Romanenko , FE Grechko
SALYUT 6 Crew :	Romanenko , Grechko
- Visiting Crew – 1 :	Dzhanibekov , Makarov [Soyuz – 27]
- Visiting Crew – 2 :	Gubarev , Remek (CZE) [Soyuz – 28]
- Cargo Vehicle :	Progress – 1
Landing Crew :	V. Dzhanibekov , Oleg Makarov *[Soyuz – 27]*
Landing Vehicle :	Soyuz 7K-T , No. 43
Landing Date :	January 16, 1978 , 11:24 UTC

SOYUZ - 26 , cont.

December 11, 1977: Soyuz-26 docked to the aft port of Salyut-6.
This successful docking was the first official announcement that there was a second docking port.
Grechko took over manual control only a few meters prior to soft dock.

December 19, 1977: Soyuz-26 crew conduct an EVA to inspect the forward docking port for possible damage and to discover the cause of the Soyuz-25 abort. This was the first Soviet EVA in 9 years since the Soyuz-4 & 5 flight.
Inspection of the fwd. docking unit showed no outward damage, all latches proved to be in good working order. The failure of Soyuz-25 to dock was clearly in that spacecrafts mechanisms.
Duration : 1 hour and 28 minutes ; Grechko spent only 20 minutes outside the station on the EVA, while Romanenko stood in the EVA hatch opening assisting.

January 10, 1978: Soyuz-27 launch. Soyuz-27 docked to the forward docking unit of Salyut-6.

January 16, 1978: Soyuz-26 craft, carrying the Soyuz-27 crew (Dzhanibekov and Makarov) undocked from the aft Salyut docking port and touched down west of Tselinograd.

March 16, 1978: The Soyuz-26 crew placed the Salyut-6 space station in an automatic mode.

March 16, 1978: Soyuz-27 spacecraft carrying the Soyuz-26 crew (Romanenko and Grechko) undocked from the forward port of Salyut-6. The vehicle touched down 265 km (165 mi.) west of Tselinograd.
The crew established a new endurance record of 96 days and 10 hours in space.

Visiting crews / Cargo Vehicle

January 20, 1978: Progress-1 launch. Vehicle docked to the aft port of Salyut-6.
Progress-1 spacecraft transfers fuel to the Salyut station. This is a first in space history.

February 6, 1978: Progress-1 undocked from the aft port of Salyut-6. Before being commanded to a destructive reentry the spacecraft was commanded to a second automatic approach to the station.
Reentry occurred on February 8, 1978 over the Pacific.

March 2, 1978: Soyuz-28 launch. Soyuz-28 docked to the Salyut-6 aft port

March 10, 1978: Soyuz-28 spacecraft and crew undocks from the station aft port and touched down west of Tselinograd.

SALYUT - 6

Visiting Crew - 1

From left to right :
Vladimir Dzhanibekov , Oleg Makarov

Launch Date :	January 10, 1978 , 12:26 UTC
Launch Vehicle :	Soyuz 7K-T , No. 44
Launch Crew :	Cdr. Dzhanibekov , FE Makarov
SALYUT 6 Crew :	Romanenko , Grechko , Dzhanibekov , Makarov
Landing Crew :	Y. Romanenko , G. Grechko *[Soyuz – 26]*
Landing Vehicle :	Soyuz 7K-T , No. 44
Landing Date :	March 16, 1978 , 11:18 UTC

SOYUZ - 27

First Tripple Docking of Spacecrafts

Personal patch

Vladimir Dzhanibekov

January 11, 1978 :
Soyuz-27 docked to the forward docking unit of Salyut-6.
The crew boarded the station three hours later
January 16, 1978 :
Soyuz-26 spacecraft, carrying the Soyuz-27 crew undocked from the aft Salyut docking port.
The vehicle touched down 310 km (192 mi.) west of Tselinograd

Dzhanibekov and Makarov spent
5 days, 22 hours and 59 minutes in space.

Soyuz 26 crew and Souz 27 crew on board the Salyut 6 space station

SALYUT - 6

Visiting Crew - 2

From left to right :
Alexei Gubarev , Vladimir Remek (CZE)

Launch Date :	March 2, 1978 , 15:28 UTC
Launch Vehicle :	Soyuz 7K-T , No. 45
Launch Crew :	Cdr. Gubarev , Researcher Remek (CZE)
SALYUT 6 Crew :	Romanenko , Grechko , Gubarev , Remek (CZE)
Landing Crew :	A. Gubarev , V. Remek (CZE)
Landing Vehicle :	Soyuz 7K-T , No. 45
Landing Date :	March 10, 1978 , 13:44 UTC

SOYUZ - 28

INTERCOSMOS Crew 1 - Czechoslovakia

Vehicle docked to the Salyut-6 aft port on March 3, 1978.
The crew entered the station 3 hours later.
March 10, 1978 :
Soyuz-28 spacecraft and crew undocks from the station aft port.
Touch down occurred 310 km (192 mi.) west of Tselinograd.

Gubarev and Remek having spent
7 days, 22 hours and 16 minutes in space

Soyuz 28 marked the **first Intercosmos mission**
with a foreign cosmonaut on board

SOYUZ - 28 , cont.

Patch History

The Council for International Cooperation in the Exploration and Use of Outer Space (Interkosmos) was founded in 1976. Naturally, new emblems for uniforms and pressure suits were needed to reflect the cooperative nature of the missions. On December 14-15, 1977, a conference was held in Moscow by representatives of Bulgaria, Czechoslovakia, East Germany and the USSR, discussing the public relations aspect, the creation of the emblems and logos, and candidates for the flights. On December 23, 1977, Chairman B.I. Petrov of the Interkosmos council informed Zvezda General Director/Designer G. I. Severin announcing that Bulgaria, Czechoslovakia, and East Germany had agreed to participate in joint missions. Probably, it was in this letter that Zvezda was instructed to produce the Bulgarian, Czechoslowakian and East German joint mission Sokol-K suits and mission patches.

Some prototypes of the Soyuz 28 mission patch.

SOYUZ - 28 , cont.

The Real Thing

The Czech Flag

A yellow-type Interkosmos council patch

The Czech Seal

SOYUZ - 28 , cont.

Collecting Soyuz-28

The patch was designed and produced by the Zvezda corporation. Two souvenir versions were made in the West by Stewart Aviation in England and Space Commerce Corporation in the United States. Two related patches were produced by Eagle One Aerospace in Virginia: one with the portraits of the cosmonauts and one with the Interkosmos logo. Unfortunately, the cyrillic "ch" character was picked up as a "4" in this version, a typical mistake in Western-made souvenir patches. The Stewart Aviation version is no longer available in their catalogue. The EOA-version with the flags and Interkosmos logo is still available from Cargo Bay Emblems.
The original Soviet-made patch was made available to officials as part of a Presentation Set, which is scarcely seen in auctions.

The Space Commerce Corporation reproduction

The Stewart Aviation reproduction

The patche is a souvenir versions made by Eagle One Aerospace

The patche is a souvenir versions made by Eagle One Aerospace

SALYUT - 6

Expedition - 2

From left to right :
Vladimir Kovalyonok , Alexander Ivanchenkov

Salyut 6 Patch

SOYUZ - 29

„Long-Duration“ Crew Mission : 140 days

Launch Date :	June 15, 1978 , 20:16 UTC
Launch Vehicle :	Soyuz 7K-T , No. 46
Launch Crew :	Cdr. Kovalyonok , FE Ivanchenkov
SALYUT 6 Crew :	Kovalyonok , Ivanchenko
- Visiting Crew – 3 :	Klimuk , Hermaszewski (POL) [Soyuz – 30]
- Visiting Crew – 4 :	Bykovsky . Jaehn (DDR) [Soyuz – 31]
- Cargo Vehicle :	Progress – 2 Progress – 3 Progress – 4
Landing Crew :	V. Bykovsky , S. Jaehn (DDR) *[Soyuz – 31]*
Landing Vehicle :	Soyuz 7K-T , No. 46
Landing Date :	September 3, 1978 , 11:40 UTC

SOYUZ - 29 , cont.

June 15, 1978: Soyuz-29 docked with the Salyut-6 forward port.

July 29, 1978: The Soyuz-29 prime crew conduct an EVA to retrieve the 'Medussa' exposure experiment, mounted externally on the Salyut. Duration: 2 hours and 5 minutes

August 26, 1978: Soyuz-31 launch. The vehicle docked to the Salyut-6 aft port on August 27, 1978

September 3, 1978: Soyuz-29 spacecraft, carrying the Soyuz-31 crew (Bykovsky and Jaehn) undocked from the station forward port. The spacecraft touched down 140 km (87 mi.) south east of Dzhezkazgan in Kazakhstan.

September 7, 1978: Soyuz-31 spacecraft, carrying the Soyuz-29 crew undocked from the aft Salyut-6 port and backed off over 100 m (328 feet) and station kept while the station was commanded into a 90 degree pitch using its onboard thrusters. Soyuz-31 redocked to the forward port.

November 2, 1978: The Soyuz-29 prime crew placed the Salyut-6 station in an automatic mode.

November 2, 1978: Soyuz-31 spacecraft, carrying the Soyuz-29 prime crew (Kovalyonok and Ivanchenkov) undocked from the Salyut-6. The spacecraft touched down 180 km (112 mi.) south east of Dzhezkazgan. Duration: 139 days, 14 hours and 48 minutes (a new record).

Visiting crews / Cargo Vehicle

June 27, 1978: Soyuz-30 launch. The vehicle docked with the Salyut-6 aft port on June 28, 1978.

July 5, 1978: Soyuz-30 spacecraft and crew undocked from Salyut-6 and touched down 300 km (186 mi.) west of Tselinograd.

July 7, 1978: Progress-2 launch. Vehicle docked to the aft port of Salyut-6 on July 9, 1978.

August 2, 1978: Progress-2 undocked from the aft port of Salyut-6. Before being commanded to a destructive reentry the spacxecraft was commanded to a second automatic approach to the station. Reentry on August 4, 1978 over the Pacific.

August 7, 1978: Progress-3 launch. Vehicle docked to the aft port of Salyut-6 on August 9, 1978.

August 21, 1978: Progress-3 undocked from the aft port of Salyut-6. Before being commanded to a destructive reentry the spacecraft was commanded to a second automatic approach to the station. Reentry on August 24, 1978.

October 3, 1978: Progress-4 launch. Vehicle docked to the aft port of Salyut-6 on October 6, 1978

October 24, 1978: Progress-4 undocked from the aft port of Salyut-6. Reentry occurred on October 26, 1978

SALYUT - 6

Visiting Crew - 3

From left to right :
Pyotr Klimuk . Miroslaw Hermaszewski (Polish)

Launch Date : June 27, 1978 , 15:27 UTC
Launch Vehicle : Soyuz 7K-T , No. 67

Launch Crew : Cdr. Klimuk ,
Researcher Hermaszewski (POL)

SALYUT 6 Crew : Kovalyonok , Ivanchenko
Klimuk , Hermaszewski (POL)

Landing Crew : P. Klimuk , M.Hermaszewski (POL)

Landing Vehicle : Soyuz 7K-T , No. 67
Landing Date : July 5, 1978 , 13:30 UTC

SOYUZ - 30

INTERCOSMOS Crew 2 - Poland

The vehicle docked with the Salyut-6 aft port on June 28, 1978
with the crew entering the station 3 hours later.

July 5, 1978 :
Soyuz-30 spacecraft and crew undocked from Salyut-6
and touched down 300 km (186 mi.) west of Tselinograd.

Klimuk and Hermaszewski having spent
7 days, 22 hours and 4 minutes in space

Patch History

The Council for International Cooperation in the Exploration and Use of Outer Space (Interkosmos) was founded in 1976. Naturally, new emblems for uniforms and pressure suits were needed to reflect the cooperative nature of the missions. On December 14-15, 1977, a conference was held in Moscow by representatives of Bulgaria, Czechoslovakia, East Germany and the USSR, discussing the public relations aspect, the creation of the emblems and logos, and candidates for the flights. On December 23, 1977, Chairman B.I. Petrov of the Interkosmos council informed Zvezda General Director/Designer G. I. Severin announcing that Bulgaria, Czechoslovakia, and East Germany had agreed to participate in joint missions. Probably, it was in this letter that Zvezda was instructed to produce the Bulgarian, Czechoslowakian and East German joint mission Sokol-K suits and mission patches. When Poland joined in, is unknown.

A number of prototypes was considered before choosing the white version for the mission

SOYUZ - 30 , cont.

The Real Thing

The Polish Flag

The red / white-type Interkosmos council patch

The Polish Seal

SOYUZ - 30 , cont.

Collecting Soyuz-30

The patch was designed and produced by the Zvezda corporation. Two souvenir versions were made in the West by Stewart Aviation in England and Space Commerce Corporation in the United States. Two related commemorative patches were produced by Eagle One Aerospace in Virginia. The Stewart Aviation version is no longer available from their catalogue. The EOA-versions are no longer available. The original Soviet-made patch was made available to officials as part of a Presentation Set, which is scarcely seen in auctions.

The
Space Commerce Corporation
reproduction

The
Stewart Aviation
reproduction

The patche is a souvenir
versions made by
Eagle One Aerospace

The patche is a souvenir
versions made by
Eagle One Aerospace

SALYUT - 6

Visiting Crew - 4

From left to right :
Valeri Bykovsky , Sigmund Jaehn (DDR)

Launch Date :	August 26, 1978 , 14:51 UTC
Launch Vehicle :	Soyuz 7K-T , No. 47
Launch Crew :	Cdr. Bykovsky , Researcher Jaehn (DDR)
SALYUT 6 Crew :	Kovalyonok , Ivanchenko Bykovsky , Jaehn (DDR)
Landing Crew :	V. Kovalyonok , A. Ivanchenkov *[Soyuz – 29]*
Landing Vehicle :	Soyuz 7K-T , No. 47
Landing Date :	November 2, 1978 , 11:04 UTC

SOYUZ - 31

INTERCOSMOS Crew 3 - East Germany

Vehicle docked to the Salyut-6 aft port on August 27, 1978.
September 7, 1978 :
Soyuz-31 spacecraft, carrying the Soyuz-29 crew (Kovalyonok and Ivanchenkov) , undocked from the aft Salyut-6 port and backed off over 100 m (328 feet) and station kept while the station was commanded into a 90 degree pitch using its onboard thrusters.
Soyuz-31 redocked to the forward port.
November 2, 1978 :
Soyuz-31 spacecraft, carrying the Soyuz-29 prime crew (Kovalyonok and Ivanchenkov) undocked from the forward port of Salyut-6. The spacecraft touched down 180 km (112 mi.) south east of Dzhezkazgan.
Duration: 139 days, 14 hours and 48 minutes (a new record)

SOYUZ - 31 , cont.

The Artwork

The Council for International Cooperation in the Exploration and Use of Outer Space (Interkosmos) was founded in 1976. Naturally, new emblems for uniforms and pressure suits were needed to reflect the cooperative nature of the missions. On December 14-15, 1977, a conference was held in Moscow by representatives of Bulgaria, Czechoslovakia, East Germany and the USSR, discussing the public relations aspect, the creation of the emblems and logos, and candidates for the flights. On December 23, 1977, Chairman B.I. Petrov of the Interkosmos council informed Zvezda General Director/Designer G. I. Severin announcing that Bulgaria, Czechoslovakia, and East Germany had agreed to participate in joint missions. Probably, it was in this letter that Zvezda was instructed to produce the Bulgarian, Czechoslowakian and East German joint mission Sokol-K suits and mission patches.

SOYUZ - 31 , cont.

The Real Thing

The East-German Flag

The yellow-type Interkosmos council patch

Intercosmos DDR 1978

The East-German Seal

SOYUZ - 31 , cont.

Source / Souvenirs

The patch was designed and produced by the Zvezda corporation. Two souvenir versions were made in the West by Stewart Aviation in England and Space Commerce Corporation in the United States. Two related commemorative patches were produced by Eagle One Aerospace in Virginia. The Stewart Aviation version is no longer available from their catalogue. The EOA-versions are no longer available. The original Soviet-made patch was made available to officials as part of a Presentation Set, which is scarcely seen in auctions.

The
Space Commerce Corporation
reproduction

The
Stewart Aviation
reproduction

The patche is a souvenir
versions made by
Eagle One Aerospace

The patche is a souvenir
versions made by
Eagle One Aerospace

SALYUT - 6

Expedition - 3

From left to right :
Vladimir Lyakhov , Valeri Ryumin

Salyut 6 Patch

SOYUZ - 32

„Long-Duration“ Crew Mission : 175 days

Launch Date :	February 25, 1979 , 11:53 UTC
Launch Vehicle :	Soyuz 7K-T , No. 48
Launch Crew :	Cdr. Lyakhov , FE Ryumin
SALYUT 6 Crew :	Lyakhov , Ryumin
- Visiting Crew – 4 :	docking was cancelled Rukavishnikov , Ivanov (BGR) [Soyuz – 33]
- Cargo Vehicle :	Progress – 5 Progress – 6 Progress – 7
Landing Crew :	without crew
Landing Vehicle :	Soyuz 7K-T , No. 48
Landing Date :	June 13, 1979 , 16:18 UTC

SOYUZ - 32 , cont.

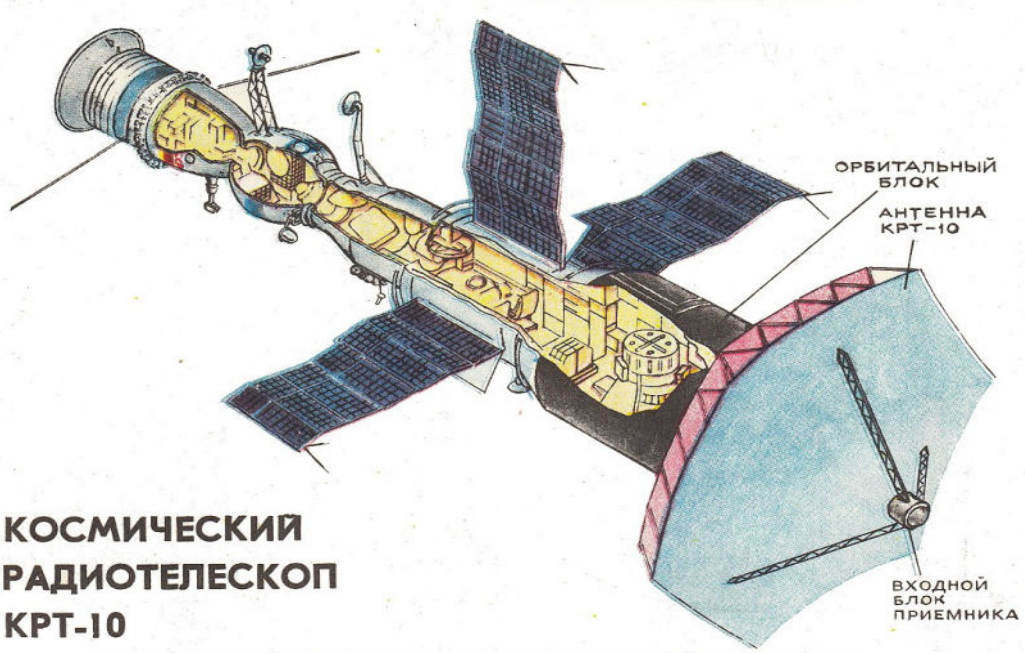
February 25, 1979:	Soyuz-32 launch. Vehicle docked to the station forward port at 13:30 the next day.
June 6, 1979:	Soyuz-34 launch (unmanned). Vehicle was to test the Soyuz propulsion system.
June 8, 1979:	Soyuz-34 spacecraft docked to the aft port of Salyut-6.
June 13, 1979:	Soyuz-32 spacecraft (unmanned) was undocked form the forward port of Salyut-6. Vehicle touched down (unmanned on landing) 295 km north west of Dzhezkazgan. Duration: 108 days, 4 hours and 24 minutes
June 14, 1979:	Soyuz-34 spacecraft, carrying the Soyuz-32 prime crew, undocked from the aft port of the station and backed away approx. 100 m and station kept. The Salyut was then comm. to rotate 180 degrees (along its longitudinal axis) so that its fwd. docking port was now facing the waiting Soyuz-34 spacecraft. The Soyuz then appr. the station and redocked at the fwd. Port. This operation takes approx. 30 minutes.
August 15, 1979:	The resident Salyut-6 crew (Lyakhov and Ryumin) conducted their first EVA (contingency) to remove the KRT-10 Antenna. Also, to place and retrieve exposure samples to the exterior of the station. Duration: 1 hour and 23 minutes.
August 19, 1979:	The Soyuz-32 prime crew placed the Salyut-6 station in an automatic mode.
August 19, 1979:	Soyuz-34 spacecraft, carrying the Soyuz-32 prime crew (Lyakhov and Ryumin) undocked from the station fwd. Port. The spaceraft touched down 170 km south east of Dzhezkazgan. The crew establishing a record flight time of 175 days and 36 minutes in space.

Soyuz 32 patch

SOYUZ - 32 , cont.

Visiting crews / Cargo Vehicle

March 12, 1979:	Progress-5 launch. Vehicle docked to the aft port of Salyut-6 on March 14, 1979.
April 3, 1979:	Progress-5 undocked from the aft port of Salyut-6. Reentry occurred on April 5, 1979.
April 10, 1979:	Soyuz-33 launch. Vehicle was planned to dock with the station aft port the next day at 19:15.
April 11, 1979:	Soyuz-33 fired its braking motors to make the final orbital adjustment for the impending docking. Unfortunately for the crew the motor terminated its burn prematurely, this meant that the Soyuz failed to slow down and match the speed of the Salyut. The crew aboard the Salyut witnessed the Soyuz-33 motor ignite, flicker and terminate with the spacecraft zipping by the station. Due to limited consumables the docking was cancelled.
April 12, 1979:	Soyuz-33 touched down, 320 km south east of Dzhezkazgan.
May 13, 1979:	Progress-6 launch. Vehicle docked to the aft port of Salyut-6 on May 15, 1979.
June 8, 1979:	Progress-6 undocked from the aft port of Salyut-6. Reentry occurred on June 9, 1979 over the Pacific.
June 28, 1979:	Progress-7 launch. Vehicle docked to the aft port of Salyut-6 on June 30, 1979.
July 18, 1979:	Progress-7 undocked from the aft port of Salyut-6. As the craft drifted from the aft port a special exp., set up earlier by the resident crew, was conducted. The experiment was the KRT-10 parabolic dish antenna (350 kg Radio Telescope), resembling at this point a closed umbrella. As the Progress cleared the length of the folded antenna the dish was slowly unfurled to its full diam. of 10 m, affixed centrally to the Salyut-6 aft docking unit pointing out to space. Progress-7's TV cameras showed the successful unfurling 'Live' to the FCC in Moscow.
July 20, 1979:	Progress-7 reentry occurred over the Pacific.



Soyuz 32 and Salyut 6 with KRT-10 antenna

SALYUT - 6

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From left to right :
Nikolai Rukavishnikov , Georgi Ivanov (Bulgarian)

Launch Date :	April 10, 1979 , 17:34 UTC
Launch Vehicle :	Soyuz 7K-T , No. 49
Launch Crew :	Cdr. Rukavishnikov , Researcher Ivanov (BGR)
SALYUT 6 Crew :	Lyakhov , Ryumin
Landing Crew :	N. Rukavishnikov , G. Ivanov (BGR)
Landing Vehicle :	Soyuz 7K-T , No. 49
Landing Date :	April 12, 1979 , 16:35 UTC

SOYUZ - 33

INTERCOSMOS Crew 4 - Bulgaria

Vehicle was planned to dock with the station aft port.
Rukavishnikov becomes the world's first civilian spaceship Cdr.
April 11, 19798 :
Soyuz-33 fired its braking motors to make the final orbital adjustment for the impending docking. Unfortunately for the crew the motor terminated its burn prematurely, this meant that the Soyuz failed to slow down and match the speed of the Salyut. The crew aboard the Salyut witnessed the Soyuz-33 motor ignite, flicker and terminate with the craft zipping by the station.
Due to limited consumables the docking was cancelled.
April 12, 1979 :
Soyuz-33 touched down, 320 km south east of Dzhezkazgan.

The crew having spent 1 day and 23 hours in space.

SOYUZ - 33 , cont.

The Artwork

The Council for International Cooperation in the Exploration and Use of Outer Space (Interkosmos) was founded in 1976. Naturally, new emblems for uniforms and pressure suits were needed to reflect the cooperative nature of the missions. On December 14-15, 1977, a conference was held in Moscow by representatives of Bulgaria, Czechoslovakia, East Germany and the USSR, discussing the public relations aspect, the creation of the emblems and logos, and candidates for the flights. On December 23, 1977, Chairman B.I. Petrov of the Interkosmos council informed Zvezda General Director/Designer G. I. Severin announcing that Bulgaria, Czechoslovakia, and East Germany had agreed to participate in joint missions. Probably, it was in this letter that Zvezda was instructed to produce the Bulgarian, Czechoslowakian and East German joint mission Sokol-K suits and mission patches.

SOYUZ - 33 , cont.

The Real Thing

The joint mission patch was worn on the right sleeve of the intra-vehicular suits. The Interkosmos council logo (unknown version) was worn on the right lower torso, with the Soviet and Bulgarian seals at the upper left chest. On the Sokol suits, the Interkosmos council patch was worn on the right sleeve. On both suits, the flags were worn on the left sleeve. The Soviet flag was a felt, square lettered type on both the Sokol and the intravehicular suit.

The blue bordered Interkosmos council patch from the Presentation Patch Set that might have flown on this mission

The Bulgarian Seal

The Bulgarian Flag

SOYUZ - 33 , cont.

Source / Souvenirs

Two souvenir versions were made in the West by Stewart Aviation in England and Space Commerce Corporation in the United States. A related patch was produced by Eagle One Aerospace. The Stewart Aviation version is still in their catalogue; the SCC version is offered every now and then on eBay and the EOA-version might still be available from Cargo Bay Emblems. The original Soviet-made patch was made available to officials as part of a Presentation Set, which is scarcely seen in auctions.

The
Space Commerce Corporation
reproduction

The
Stewart Aviation
reproduction

The patche is a souvenir
versions made by
Eagle One Aerospace.

The patche is a souvenir
versions made by
Eagle One Aerospace.

SALYUT - 6

- - - - -

SOYUZ Spacecraft

Launch Date : June 6, 1979 , 18:12 UTC

Launch Vehicle : Soyuz 7K-T , No. 50

Launch Crew : without crew

SALYUT 6 Crew : Lyakhov , Ryumin

Landing Crew : Vladimir Lyakhov , Valeri Ryumin
[Soyuz – 32]

Landing Vehicle : Soyuz 7K-T , No. 50

Landing Date : August 19, 1979 , 12:29 UTC

SOYUZ - 34

Spacecraft Replacement Flight

[No patch available for this mission]

June 6, 1979 :
Soyuz-34 launch unmanned.
Soyuz 34 was sent to supply the resident crew with a reliable return vehicle after the previous flight, Soyuz 33, suffered an engine failure.
Vehicle was to test the Soyuz propulsion system.

June 14, 1979 :
Soyuz-34 craft, carrying the Soyuz-32 prime crew, undocked from the aft port of the station and backed away approx. 100 m and station kept. The Salyut was then commanded to rotate 180 degrees (along its longitudinal axis) so that its forward docking port was now facing the waiting Soyuz-34 craft.
The Soyuz then approached the station and redocked at the forward port. This operation takes approx. 30 minutes.

August 19, 1979 :
Soyuz-34 spacecraft, carrying the Soyuz-32 prime crew (Lyakhov and Ryumin) undocked from the station forward port.
The spacecraft touched down 170 km south east of Dzhezkazgan, 73 days after launching.
The crew establishing a record flight time of 175 days and 36 minutes in space.

SOYUZ - U rocket on the launch pad

SALYUT - 6

- - - - -

SOYUZ - T Spacecraft

Launch Date : December 16, 1979 , 12:30 UTC

Launch Vehicle : Soyuz 7K – ST , No. 6L

Launch Crew : without crew

SALYUT 6 Crew : without crew

Landing Crew : without crew

Landing Vehicle : Soyuz 7K – ST , No. 6L

Landing Date : March 25, 1980 , 21:47 UTC

SOYUZ - T - 1

„Long-Duration“ Spacecraft Mission : 100 days

[No patch available for this mission]

December 16, 1979 :
Soyuz-T1 launch unmanned

Vehicle docked to the station forward port on December 19, 1979
The approach differed from the standard Soyuz approach,
by flying above and in front of the Salyut, losing altitude
to meet the station.
Standard approaches are made by catching up to the station
by making forward motion engine burns.

March 23, 1980 :
Soyuz-T1 undocked from the forward port of Salyut-6
and conducted autonomous orbital tests over the next 2 days.

Vehicle touched down unmanned in Kazakhstan

Duration: 100 days, 9 hours and 20 minutes.

SOYUZ - U rocket on the launch pad

SALYUT - 6

Expedition - 4

From left to right :
Leonid Popov , Valeri Ryumin

Salyut 6 Patch

SOYUZ - 35

„Long-Duration“ Crew Mission : 185 days

Launch Date :	April 9, 1980 , 13:38 UTC
Launch Vehicle :	Soyuz 7K – T , No. 51
Launch Crew :	Cdr. Popov , FE Ryumin
SALYUT 6 Crew :	Popov , Ryumin
- Visiting Crew – 5 :	Kubasov, Farkas (HUN) [Soyuz – 36]
- Visiting Crew --- :	Malyshev , Aksyonov , [Soyuz–T-2]
- Visiting Crew – 6 :	Gorbatko , Pham Tuan (VNM) , [Soyuz – 37]
- Visiting Crew – 7 :	Romanenko , Tamayo-Mendez (CUB) [Soyuz – 38]
- Cargo Vehicle :	Progress – 8 Progress – 9 Progress – 10 Progress – 11
Landing Crew :	V. Kubasov , Bertalan Farkas (HUN) *[Soyuz 36]*
Landing Vehicle :	Soyuz 7K – T , No. 51
Landing Date :	June 3, 1980 , 15:06 UTC

SOYUZ - 35 , cont.

April 9, 1980:	Soyuz-35 launch. Vehicle docked to the station forward port the next day, over the Caspian Sea.
May 26, 1980:	Soyuz-36 launch. Vehicle docked to the aft port of Salyut-6 on May 27, 1980.
June 3, 1980:	Soyuz-35 spacecraft, carrying the Soyuz-36 crew (Kubasov and Farkas) undocked from the Salyut-6. Vehicle touched down 140 km south east of Dzhezkazgan.
June 4, 1980:	Soyuz-36 spacecraft, carrying the Soyuz-35 crew (Popov and Ryumin) undocked from the aft port of Salyut-6 and redocked to the forward port 30 mins. later, after Salyut-6 was rotate 180 degrees.
July 23, 1980:	Soyuz-37 launch. Vehicle docked to the aft port of Salyut-6 on July 24, 1980.
July 31, 1980:	Soyuz-36 spacecraft, carrying the Soyuz-37 crew (Gorbatko and Tuan) undocked from the station forward port and touched down 180 km south east of Dzhezkazgan.
August 1, 1980:	Soyuz-37 spacecraft, carrying the Soyuz-35 crew (Popov and Ryumin) undocked from the aft port of Salyut-6 and redocked to the forward port 30 mins. later, after Salyut-6 was rotate 180 degrees.
October 11, 1980:	The Soyuz-35 prime crew (Popov and Ryumin) placed the Salyut-6 station in an automatic mode.
October 11, 1980:	Soyuz-37 spacecraft, carrying the Soyuz-35 crew (Popov and Ryumin), undocked and touched down 180 km south east of Dzhezkazgan. The crew spent 184 days, 20 hours and 12 minutes in space

SOYUZ - 35 , cont.

Visiting crews / Cargo Vehicle

March 27, 1980	Progress-8 launch. Vehicle docked to the aft port of the unmanned Salyut-6 on March 29, 1980.
April 25, 1980:	Progress-8 undocked from the aft port of Salyut-6. Reentry occurred on April 26, 1980 over the Pacific.
April 27, 1980:	Progress-9 launch. Vehicle docked to the aft port of Salyut-6 on April 29, 1980.
May 20, 1980:	Progress-9 undocked from the aft port of Salyut-6. Reentry occurred on May 22, 1980 over the Pacific.
June 5, 1980:	Soyuz - T–2 launch. Vehicle docked to the aft port of Salyut-6 on June 6, 1980.
June 9, 1980:	Soyuz – T-2 vehicle and crew (Malyshev and Aksyonov) undocked from the aft port of Salyut-6. Vehicle touched down 200 km south east of Dzhezkazgan.
June 29, 1980:	Progress-10 launch. Vehicle docked to the aft port of Salyut-6 on July 1, 1980.
July 17, 1980:	Progress-10 undocked from the aft port of Salyut-6. Reentry occurred on July 19, 1980 over the Pacific
September 18, 1980:	Soyuz-38 launch. Vehicle docked to the Salyut-6 aft port on September 19, 1980.
September 26, 1980:	Soyuz-38 spacecraft, carrying the Soyuz-38 crew (Romanenko and Tamayo-Mendez (CUB)), undocked from the aft docking port and touched down 175 km south east of Dzhezkazgan.
September 28, 1980:	Progress-11 launch. Vehicle docked to the aft port of Salyut-6 on September 30, 1980

Soyuz 36 crew on board the Salyut 6 space station

SALYUT - 6

Visiting Crew - 5

From left to right :
Bertalan Farkas (HUN) , Valeri Kubasov

Launch Date :	May 26, 1980 , 18:20 UTC
Launch Vehicle :	Soyuz 7K – T , No. 52
Launch Crew :	Cdr. Kubasov , Researcher Farkas (HUN)
SALYUT 6 Crew :	Popov , Ryumin Kubasov , Farkas (HUN)
Landing Crew :	Viktor Gorbatko , Pham Tuan (VNM) *[Soyuz – 37]*
Landing Vehicle :	Soyuz 7K – T , No. 52
Landing Date :	July 31, 1980 , 15:15 UTC

SOYUZ - 36

INTERCOSMOS Crew 5 - Hungary

May 26, 1980 :
Soyuz-36 launch

June 4, 1980 :
Soyuz-36 spacecraft, carrying the Soyuz-35 crew (Popov and Ryumin) undocked from the aft port of Salyut-6 and redocked to the forward port 30 minutes later, after Salyut-6 was commanded to rotate 180 degrees.

July 31, 1980 :
Soyuz-36 spacecraft, carrying the Soyuz-37 crew (Gorbatko and Tuan) undocked from the station forward port and touched down 180 km south east of Dzhezkazgan, spending 7 days, 20 hours and 42 minutes in space.

SOYUZ - 36 , cont.

The Artwork / Variation

The Council for International Cooperation in the Exploration and Use of Outer Space (Interkosmos) was founded in 1976. Naturally, new emblems for uniforms and pressure suits were needed to reflect the cooperative nature of the missions. On December 14-15, 1977, a conference was held in Moscow by representatives of Bulgaria, Czechoslovakia, East Germany and the USSR, discussing the public relations aspect, the creation of the emblems and logos, and candidates for the flights. On December 23, 1977, Chairman B.I. Petrov of the Interkosmos council informed Zvezda General Director/Designer G. I. Severin announcing that Bulgaria, Czechoslovakia, and East Germany had agreed to participate in joint missions. Hungary was included later.

Like with many Interkosmos missions, several prototypes of patches were produced. This variation shows the Soyuz 36 design with just a narrow blue border, instead of the green-red border used in the flight version.

The patch is a souvenir version made by Eagle One Aerospace

SOYUZ - 36 , cont.

The Real Thing

The Cyrillic Interkosmos council patche

The Hungarian Interkosmos council patche

The Hungarian Seal

The Hungarian Flag

SOYUZ - 36 , cont.

Collecting Soyuz-36

The patch was probably designed and produced by the Zvezda corporation. Two souvenir versions were made in the West by Stewart Aviation in England and Space Commerce Corporation in the United States. Two related patches were produced by Eagle One Aerospace. The Stewart Aviation version (with black insetad of green...) is still in their catalogue; the SCC version is offered every now and then on eBay and the EOA-version might still be available from Cargo Bay Emblems. The original Soviet-made patch was made available to officials as part of a Presentation Set, which is scarcely seen in auctions.

The Space Commerce Corporation reproduction

The Stewart Aviation reproduction

The Patch presentation Set

SALYUT - 6

- - - - -

From left to right :
Yuri Malyshev , Vladimir Aksyonov

Launch Date :	June 5, 1980 , 14:19 UTC
Launch Vehicle :	Soyuz 7K – ST , No. 7L
Launch Crew :	Cdr. Malyshev , FE Aksyonov
SALYUT 6 Crew :	Popov , Ryumin Malyshev , Aksyonov
Landing Crew :	Yuri Malyshev , Vladimir Aksyonov
Landing Vehicle :	Soyuz 7K – ST , No. 7L
Landing Date :	June 9, 1980 , 12:39 UTC

SOYUZ - T - 2

Test of the New Soyuz–T Spacecraft

[No patch available for this mission]

June 5, 1980 :
Soyuz-T2 launch

Vehicle docked to the aft port of Salyut-6 on June 6, 1980.

Primary purpose was to perform a
crewed test of the new Soyuz - T spacecraft.

June 9, 1980 :
Soyuz-T-2 vehicle and crew (Malyshev and Aksyonov)
undocked from the aft port of Salyut-6.

Vehicle touched down 200 km south east of Dzhezkazgan.

Crew spent only
3 days, 22 hours and 20 minutes into space

Soyuz T-2 crew after landing / recovery

SALYUT - 6

Visiting Crew - 6

Viktor Gorbatko

Pham Tuan (VNM)

Launch Date : July 23, 1980 , 18:33 UTC

Launch Vehicle : Soyuz 7K – T , No. 53

Launch Crew : Cdr. Gorbatko ,
Researcher Pham Tuan (VNM)

SALYUT 6 Crew : Popov , Ryumin
Gorbatko , Pham Tuan (VNM)

Landing Crew : Leonid Popov , Valeri Ryumin
[Soyuz – 35]

Landing Vehicle : Soyuz 7K – T , No. 53

Landing Date : October 11, 1980 , 09:49 UTC

SOYUZ - 37

INTERCOSMOS Crew 6 - Vietnam

July 23, 1980 :
Soyuz-37 launch
Vehicle docked to the aft port of Salyut-6 on July 24, 1980

August 1, 1980 :
Soyuz-37 spacecraft, carrying the Soyuz-35 crew
(Popov and Ryumin) undocked from the aft port of Salyut-6
and redocked to the forward port 30 mins. later,
after Salyut-6 was commanded to rotate 180 degrees.

October 11, 1980 :
Soyuz-37 spacecraft, carrying the Soyuz-35 crew
(Popov and Ryumin), undocked and touched down
180 km south east of Dzhezkazgan.
The crew spent 184 days, 20 hours and 12 minutes in space
(a new record).

SOYUZ - 37 , cont.

The joint mission patch was worn on the right sleeve of the intra-vehicular suits.
The Interkosmos council logo was worn on the right lower torso, with the Soviet and Vietnamese seals at the upper left chest.
On the Sokol suits, the Interkosmos council patch was worn on the right sleeve.
On both suits, the flags were worn on the left sleeve.
The Soviet flag was a felt, square lettered type on both the Sokol and the intravehicular PK-suit.

The crew just before launch in their flight Sokols

The crew after landing.
Note that Gorbatko is wearing a 'yellow' Interkosmos patch

SOYUZ - 37 , cont.

The Real Thing

The Vietnamese flag

The latin-script Interkosmos-patch
as worn by Tuan on his
intravehicular PK-suit

The Vietnamese seal

SOYUZ - 37 , cont.

Collecting Soyuz-37

The patch was designed and produced by the Zvezda corporation. Two souvenir versions were made in the West by Stewart Aviation in England and Space Commerce Corporation in the United States. A related patch was produced by Eagle One Aerospace. The Stewart Aviation version is still in their catalogue; the SCC version is offered every now and then on eBay and the EOA-version might still be available from Cargo Bay Emblems. The original Soviet-made patch was made available to officials as part of a Presentation Set.

The patch is a souvenir version made by Eagle One Aerospace

SALYUT - 6

Visiting Crew - 7

From left to right :
Yuri Romanenko , Arnoldo Tamayo-Mendez (CUB)

Launch Date :	September 18, 1980 , 19:11 UTC
Launch Vehicle :	Soyuz 7K – T , No. 54
Launch Crew :	Cdr. Romanenko , Researcher Tamayo-Mendez (CUB)
SALYUT 6 Crew :	Popov , Ryumin Romanenko , Tamayo-Mendez (CUB)
Landing Crew :	Yuri Romanenko , Arnoldo Tamayo-Mendez (CUB)
Landing Vehicle :	Soyuz 7K – T , No. 54
Landing Date :	September 26, 1980 , 15:54 UTC

SOYUZ - 38

INTERCOSMOS Crew 7 - Cuba

September 18, 1980 :
Soyuz-38 launch
Vehicle docked to the Salyut-6 aft port on September 19, 1980

September 26, 1980 :
Soyuz-38 spacecraft, carrying the Soyuz-38 crew,
undocked from the aft docking port and touched down
175 km south east of Dzhezkazgan.

The crew spent 7 days, 20 hours and 43 minutes in space.

SOYUZ - 38 , cont.

The Real Thing

The Cuban flag

The English-spelled Interkosmos-patch
as worn by Mendez on his
intravehicular PK-suit

The patch is a souvenir
version made by
Eagle One Aerospace

The Cuban seal

SALYUT - 6

Expedition - 5

From left to right :
Oleg Makarov , Leonid Kizim , Gennadi Strekalov

Salyut 6 Patch

SOYUZ - T - 3

Duration of the Mission : 13 days

Launch Date :	November 27, 1980 , 14:18 UTC
Launch Vehicle :	Soyuz 7K – ST , No. 8L
Launch Crew :	Cdr. Kizim , FE Makarov , Research Engineer Strekalov
SALYUT 6 Crew :	Kizim , Makarov , Strekalov
- Visiting Crew :	no Visiting Crew
- Cargo Vehicle :	Progress-11
Landing Crew :	Leonid Kizim , Oleg Makarov , Gennadi Strekalov
Landing Vehicle :	Soyuz 7K – ST , No. 8L
Landing Date :	December 10, 1980 , 09:26 UTC

SOYUZ - T - 3 , cont.

November 27, 1980: Soyuz-T–3 launch. (1st 3 man crew since Soyuz-11).
Vehicle docked to the station forward port on November 28, 1980

The main objective of the crew's mission was to refurbish Salyut - 6,
part of their mission also involved testing their spacecraft.

December 9, 1980 Progress-11 undocked from the aft port of Salyut – 6.
Reentry occurred on December 11, 1980 over the Pacific.
Progress-11 had been in space for 74 days and was a test of the crafts orbital lifetime

December 10, 1980: The Soyuz-T–3 crew placed the Salyut-6 station in an automatic mode.

December 10, 1980: Soyuz-T-3 spacecraft and crew undocked from Salyut - 6.
The spacecraft touched down 130 km (78 mi.) east of Dzhezkazgan.
The crew having spent 12 days, 19 hours and 8 minutes in space.

Personal patch :

Gennadi Strekalov

SALYUT - 6

Expedition - 6

From left to right :
Vladimir Kovalyonok , Viktor Savinykh

Salyut 6 Patch

SOYUZ - T - 4

„Long-Duration“ Crew Mission : 74 days

Launch Date :	March 12, 1981 , 19:00 UTC
Launch Vehicle :	Soyuz 7K – ST , No. 10L
Launch Crew :	Cdr. Kovalyonok , FE Savinykh
SALYUT 6 Crew :	Kovalyonok , Savinykh
- Visiting Crew – 8 :	Dzhanibekov , Gurragcha (MNG) [Soyuz – 39]
- Visiting Crew – 9 :	Popov , Prunariu (ROU) [Soyuz – 40]
- Cargo Vehicle :	Progress – 12
Landing Crew :	V. Kovalyonok , V. Savinykh
Landing Vehicle :	Soyuz 7K – ST , No. 10L
Landing Date :	May 26, 1981 , 12:37 UTC

SOYUZ - T - 4 , cont.

March 12, 1981: Soyuz – T-4 launch. Vehicle docked to the Salyut-6 forward port on March 13, 1981.

May 26, 1981: Soyuz – T-4 spacecraft and crew undocked from the stations forward port and the spacecraft touched down 125 km east of Dzhezkazgan.
The crew having spent 74 days, 17 hours and 38 minutes in space.

The undocking followed an unusual procedure, that involved leaving the orbital module (OM) of the Soyuz – T-4 attached at the docking hub.
The OM apparently separated on May 31, 1981 and reentered some time later.

Visiting crews / Cargo Vehicle

January 24, 1981: Progress-12 launch. Vehicle docked to the aft port of Salyut-6 on January 26, 1981.

March 19, 1981: Progress-12 undocked from the aft port of Salyut-6. Reentry occurred on March 20, 1981 over the Pacific.

March 22, 1981: Soyuz-39 launch. Vehicle docked to the aft port of Salyut-6 on March 23, 1981.

March 30, 1981: Soyuz-39 spacecraft and crew undocked from the aft port of Salyut-6 and touched down 170 km south east of Dzhezkazgan.

May 14, 1981: Soyuz-40 launch. Vehicle docked to the Salyut-6 aft port on May 15, 1981.

May 22, 1981: Soyuz-40 spacecraft and crew undocked from the station aft port and touched down 225 km south east of Dzhezkazgan in the Bet-Pak-Dala desert.

SALYUT - 6

Visiting Crew - 8

From left to right :
Vladimir Dzhanibekov , Judgerdemidiyn Gurragcha (MNG)

Launch Date : March 22, 1981 , 14:58 UTC

Launch Vehicle : Soyuz 7K – T , No. 55

Launch Crew : Cdr. Dzhanibekov ,
Researcher Gurragcha (MNG)

SALYUT 6 Crew : Kovalyonok , Savinykh
Dzhanibekov , Gurragcha (MNG)

Landing Crew : Vladimir Dzhanibekov ,
Judgerdemidiyn Gurragcha (MNG)

Landing Vehicle : Soyuz 7K – T , No. 55

Landing Date : March 30, 1981 , 11:40 UTC

SOYUZ - 39

INTERCOSMOS Crew 8 - Mongolia

March 22, 1980 :
Soyuz-39 launch
Vehicle docked to the aft port of Salyut-6 on March 23, 1980

March 30, 1980 :
Soyuz-39 spacecraft and crew undocked from
the aft port of Salyut-6 and touched down
170 km south east of Dzhezkazgan.

Crew spent 7 days, 20 hours and 42 minutes in space.

SOYUZ - 39 , cont.

The Real Thing

The Mongolian flag

The Interkosmos-patch

The patch is a souvenir version made by Eagle One Aerospace

The Mongolian seal

SALYUT - 6

Visiting Crew - 9

From left to right :
Leonid Popov , Dumitru Prunariu (ROM)

Launch Date :	May 14, 1981 , 17:16 UTC
Launch Vehicle :	Soyuz 7K – T , No. 56
Launch Crew :	Cdr. Popov , Researcher Prunariu (ROM)
SALYUT 6 Crew :	Kovalyonok , Savinykh Popov , Prunariu (ROM)
Landing Crew :	Leonid Popov , Dumitru Prunariu (ROM)
Landing Vehicle :	Soyuz 7K – T , No. 56
Landing Date :	May 22, 1981 , 13:58 UTC

SOYUZ - 40

INTERCOSMOS Crew 9 - Romania

May 14, 1980 :
Soyuz-40 launch
Vehicle docked to the Salyut-6 aft port on May 15, 1980.

May 22, 1980 :
Soyuz-40 spacecraft and crew undocked
from the station aft port and touched down
225 km south east of Dzhezkazgan in the Bet-Pak-Dala desert.

The crew spent 7 days, 20 hours and 42 minutes in space.

SOYUZ - 40 , cont.

The Crew

The joint mission patch was worn on the right sleeve of the intra-vehicular suits.
The Interkosmos council logo was worn on the right lower torso, with the Soviet and Mongolian seals at the upper left chest.
On the Sokol suits, the Interkosmos council patch was worn on the right sleeve.
On both suits, the flags were worn on the left sleeve.
The Soviet flag was a felt, square lettered type on both the Sokol and the intravehicular PK-suit.

Front row: The crew in flight Sokols / Back row: backup crew

The patch is a souvenir version made by Eagle One Aerospace

SALYUT - 6 Mission Overview

YEAR	LAUNCH VEHICLE	LAUNCH DATE	MISSION NAME *[IC = INTERCOSMOS]*		LANDING VEHICLE	LANDING / DECAY DATE
1977	Soyuz 25	October 9	- - - - -		Soyuz 25	October 11
1978	**Soyuz 26** Soyuz 27 Progress – 1 Soyuz 28	**Dec. 10, 1977** January 10 January 20 March 2	**Expedition Crew - 1** Visiting Crew – 1 Visiting Crew – 2	 IC Crew-1 [CZE]	**Soyuz 27** Soyuz 26 Progress – 1 Soyuz 28	**March 16** January 16 February 8 March 10
	Soyuz 29 Soyuz 30 Progress – 2 Progress – 3 Soyuz 31 Progress – 4	**June 15** June 27 July 7 August 7 August 26 October 3	**Expedition Crew - 2** Visiting Crew – 3 Visiting Crew – 4	 IC Crew-2 [POL] IC Crew-3 [DDR]	**Soyuz 31** Soyuz 30 Progress – 2 Progress – 3 Soyuz 29 Progress – 4	**November 2** July 5 August 4 August 23 September 3 October 26
1979	**Soyuz 32 *** Progress – 5 Soyuz 33 Progress – 6 Soyuz 34 ** Soyuz 32 * Progress – 7	**February 25** March 12 April 10 May 13 June 6 - - - - - June 28	**Expedition Crew - 3** - - - - - - - - - - - - - - -	 IC Crew-4 [BGR]	**Soyuz 34 **** Progress – 5 Soyuz 33 Progress – 6 - - - - - Soyuz 32 * Progress – 7	**August 19** April 5 April 12 June 9 - - - - - June 13 July 20

SALYUT - 6 Mission Overview , cont.

YEAR	LAUNCH VEHICLE	LAUNCH DATE	MISSION NAME *[IC = INTERCOSMOS]*		LANDING VEHICLE	LANDING / DECAY DATE
1980	Soyuz T-1	Dec. 16, 1979	unnmanned flight / automic docking		Soyuz T-1	March 26
	Soyuz 35 Progress - 8 Progress – 9 Soyuz 36 Soyuz T-2 Progress - 10 Soyuz 37 Soyuz 38 Progress - 11	**April 9** *March 27* April 27 May 26 June 5 June 29 Junly 23 September 18 September 28	**Expedition Crew – 4** Visiting Crew – 5 - - - - - Visiting Crew – 6 Visiting Crew – 7	 IC Crew-5 [HUN] *[First Crewflight]* IC Crew-6 [VNM] IC Crew-7 [CUB]	**Soyuz 37** Progress - 8 Progress – 9 Soyuz 35 Soyuz T-2 Progress - 10 Soyuz 36 Soyuz 38 Progress - 11	**October 11** April 26 May 22 June 3 June 9 July 19 July 31 September 26 December 11
	Soyuz T-3	**November 27**	**Expedition Crew – 5**		**Soyuz T-3**	**December 10**
1981	**Soyuz T-4** Progress – 12 Soyuz 39 Soyuz 40	**March 12** *January 24* March 22 May 14	**Expedition Crew – 6** Visiting Crew – 8 Visiting Crew – 9	 IC Crew-8 [MNG] IC Crew-9 [ROU]	**Soyuz T-4** Progress – 12 Soyuz 39 Soyuz 40	**May 26** March 21 March 30 May 22

SALYUT – 7 / DOS - 6

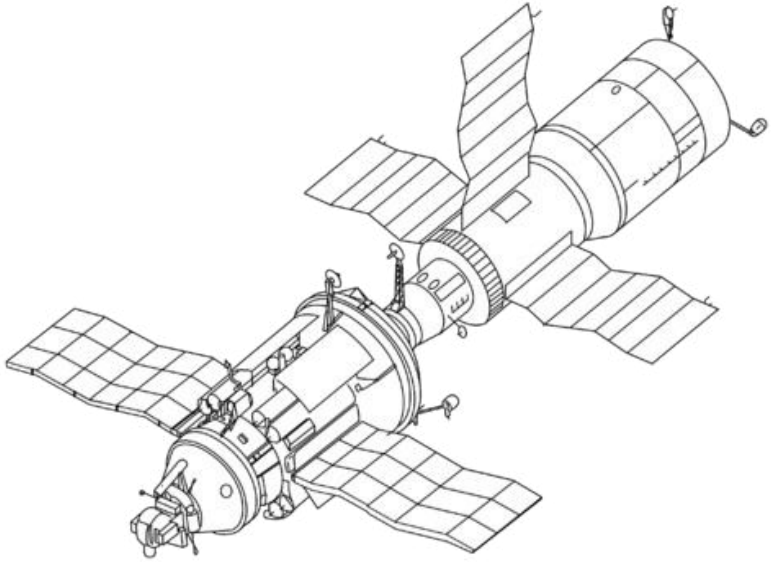
Salyut 7 was part of the transition from monolithic to modular space stations, acting as a testbed for docking of additional modules and expanded station operations.

The Salyut-7 orbital station (left) with the docked Soyuz T spacecraft (right) in flight

DOS – 6 , cont.

Launch :	April 19, 1982 , 19:45:00 GMT	Length :	~16 m (52,5 ft) (min.)
Launch Vehicle :	Three-stage Proton-K rocket	Diameter :	4,15 m (13,6 ft)
Reentry :	February 7, 1991 , 02:44:00 GMT	Perigee Altitude :	213 km (132 mi)
No. of Orbits :	51.917	Apogee Altitude :	260 km (161 mi)

Salyut 7 was last inhabited in 1986 by the crew of Soyuz T-15, who ferried equipment from Salyut 7 to the new *MIR space station*. Between 19 and 22 August 1986, engines on Kosmos 1686 boosted Salyut 7 to a record-high mean orbital altitude of 475 km to forestall reentry until 1994. However, unexpectedly high solar activity in the late 1980s and early 1990s increased atmospheric drag on the station and sped its orbital decay. It finally underwent an uncontrolled reentry on February 07, 1991 over the town of Capitán Bermúdez in Argentina after it overshot its intended entry point, which would have placed its debris in uninhabited portions of the southern Pacific Ocean



Salyut 7 (right) with docked Kosmos 1686 (left)

SALYUT - 7

Expedition - 1

From left to right :
Anatoli Berezovoy , Valentin Lebedev

Salyut Patch

SOYUZ - T - 5

„Long-Duration“ Crew Mission : 211 days

Launch Date :	May 13, 1982 , 09:58 UTC
Launch Vehicle :	Soyuz 7K – ST , No. 11L
Launch Crew :	Cdr. Berezovoy , FE Lebedev
SALYUT 7 Crew :	Berezovoy , Lebedev
- Visiting Crew – 1 :	Dzhanibekov , Ivanchenkov , Chretien (FRA) [Soyuz – T-6]
- Visiting Crew – 2 :	Popov , Serebrov , Svetlana Savitskaya [Soyuz – T-7]
- Cargo Vehicle :	Progress – 13 Progress – 14 Progress – 15
Landing Crew :	Leonid Popov , Aleksander Serebrov , Svetlana Savitskaya *[Soyuz – T-7]*
Landing Vehicle :	Soyuz 7K – ST , No. 11L
Landing Date :	August 27, 1982 , 15:04 UTC

SOYUZ - T - 5 , cont.

May 13, 1982:	Soyuz-T-5 launch. Vehicle docks with the station at the forward docking port on May 14, 1982.
May 17, 1982:	The crew of Soyuz-T-5, via a refuse airlock, eject a small 28 kg communications subsatellite, Iskra-2.
July 30, 1982:	Soyuz-T-5 crewmen conduct an EVA to place and retrieve exposure experiments, lasting 2 hrs., 33 mins..
August 19, 1982:	Soyuz-T-7 launch. Vehicle docks to the station aft port on August 20, 1982.
August 27, 1982:	Soyuz-T-5 spacecraft, carrying the Soyuz-T-7 crew (Popov, Serebrov and Svetlana Savitskaya) , undocks from the station forward port and touches down 70 km north east of Arkalyk.
August 29, 1982:	Soyuz-T-7 spacecraft with the Soyuz-T-5 crew (Berezovoy and Lebedev.) undocks from the station aft port. The Salyut-7 station is commanded into a 180 degree turn and the Soyuz-T-7 craft redocks to the station forward port. This operation takes approx. 30 minutes.
November 18, 1982:	The Soyuz-T-5 crew, via the station's refuse airlock, eject the 2nd communications subsatellite, Iskra-3.
December 10, 1982:	The departing Soyuz-T-5 crewmen placed the station in an automatic mode.
December 10, 1982:	Soyuz-T-7, carrying the Soyuz-T-5 crew (Berezovoy and Lebedev.) , undocks from the station forward port and touches down 190 km east of Dzhezkazgan. The Soyuz-T-5 crew spent 211 days, 9 hours and 5 minutes in space (a new record).

SOYUZ - T - 5 , cont.

Visiting crews / Cargo Vehicle

May 23, 1982:	Progress-13 launch. The vehicle docked at the station's aft docking port on May 25, 1982.
June 4, 1982:	Progress-13 undocks from the station aft port and reenters the atmosphere on June 6, 1982.
June 24, 1982:	Soyuz-T-6 launch. Vehicle docks with the station aft port on June 25, 1982.
July 2, 1982:	Soyuz-T-6 spacecraft undocks from the station aft port and touches down 65 km north east of Arkalyk.
July 10, 1982:	Progress-14 launch. The vehicle docked at the station's aft docking port on July 12, 1982.
August 10, 1982:	Progress-14 undocks from the station aft port and reenters the atmosphere on August 13, 1982.
September 18, 1982:	Progress-15 launch. The vehicle docked at the station's aft docking port on September 20, 1982.
Octopber 14, 1982:	Progress-15 undocks from the station aft port and reenters the atmosphere on October 16, 1982.
October 31, 1982:	Progress-16 launch. The vehicle docked at the station's aft docking port on November 2, 1982. Delivered the Iskra-3.
December 13, 1982:	Progress-16 undocks from the station aft port and reenters the atmosphere on December 14, 1982.

Soyuz T-5 crew on board the Salyut 7 space station

SALYUT - 7

Visiting Crew - 1

From left to right :
Aleksander Ivanchenkov , Vladimir Dzhanibekov ,
Jean-Loup Chretien (FRA)

Launch Date :	June 24, 1982 , 16:29 UTC
Launch Vehicle :	Soyuz 7K – ST , No. 9L
Launch Crew :	Cdr. Dzhanibekov , FE Ivanchenkov , Researcher Chretien (FRA)
SALYUT 7 Crew :	Berezovoy , Lebedev Dzhanibekov , Ivanchenkov , Chretien (FRA)
Landing Crew :	V. Dzhanibekov , A. Ivanchenkov , Jean-Loup Chretien (FRA)
Landing Vehicle :	Soyuz 7K – ST , No. 9L
Landing Date :	July 2, 1982 , 14:20 UTC

SOYUZ - T - 6

INTERCOSMOS Crew 10 - France

SOYUZ T-6 / „PVH“

June 24, 1982 :
Soyuz-T-6 launch.

Vehicle docks with the station aft port
on June 25, 1982.

July 2, 1982 :
Soyuz-T-6 craft undocks from the station aft port
and touches down 65 km north east of Arkalyk.

The Soyuz-T-6 crew
having spent 7 days, 21 hours and 51 minutes in space.

SOYUZ - T - 6 , cont.

Note: The mission is known these days as PVH; Premier Vol Habite (First Manned Flight).
The name was coined after Chretien participated in a second flight with the Soviets in 1988.

The Artwork

The artwork for 'L'Homme etoile' (Starman) designed by Michel Granger of Zigzag enterprises.

Another patchversion of the Soyuz T-6 mission

SOYUZ - T - 6 , cont.

The Real Thing

The French flag

The patch for CNES,
Centre National d'Etudes Spatial

The French seal

SOYUZ - T - 6 , cont.

Collecting Soyuz-T6

This variation was probably produced by the Russian Zvezda company for PR purposes. It appears there were production problems with the original French version and this slightly larger patch was intended for presentation plaques.

Variation

The Space Commerce Corporation souvenir edition :

The AB Emblem version with the unequally devided colours in the French flag, which still is widely available from several sources.

Personal patches

Jean-Loup Chretien

SALYUT - 7

Visiting Crew - 2

From center to left to right :
Svetlana Savitskaya (2nd woman in space) ,
Aleksander Serebrov , Leonid Popov

Launch Date :	August 19, 1982 , 17:11 UTC
Launch Vehicle :	Soyuz 7K – ST , No. 12L
Launch Crew :	Cdr. Popov, FE Serebrov , Researcher Svetlana Savitskaya
SALYUT 7 Crew :	Berezovoy , Lebedev Popov , Serebrov , S. Savitskaya
Landing Crew :	Anatoli Berezovoy , Valentin Lebedev *[Soyuz – T-5]*
Landing Vehicle :	Soyuz 7K – ST , No. 12L
Landing Date :	December 10, 1982 , 19:02 UTC

SOYUZ - T - 7

Second Woman in Space

Personal patch

Aleksandr Serebrov

Vehicle docks to the station aft port on August 20, 1982
August 29, 1982 :
Soyuz-T7 craft with the Soyuz-T5 crew undocks from the station aft port. The Salyut-7 station is commanded into a 180 degree turn and the Soyuz-T7 craft redocks to the station forward port. This operation takes approx. 30 minutes
December 10, 1982 :
Soyuz-T7, carrying the Soyuz-T5 crew, undocks from the forward port and touches down 190 km east of Dzhezkazgan.
The Soyuz-T5 crew (Berezovoy , Lebedev) spent 211 days, 9 hours and 5 minutes in space
(a new record)

SALYUT - 7

- - - - -

From left to right :
Aleksander Serebrov , Vladimir Titov , Gennadi Strekalov

Launch Date :	April 20, 1983 , 13:10 UTC
Launch Vehicle :	Soyuz 7K – ST , No. 13L
Launch Crew :	Cdr. Titov , FE Strekalov , Researcher Serebrov
SALYUT 7 Crew :	Berezovoy , Lebedev
Landing Crew :	Vladimir Titov , Gennadi Strekalov , Aleksander Serebrov
Landing Vehicle :	Soyuz 7K – ST , No. 13L
Landing Date :	April 22, 1983 , 13:28 UTC

SOYUZ - T - 8

Docking Failure

Personal patch

Gennady Strekalov

Vehicle failed to dock with the station at the aft docking port on April 21, 1983. Due to a launch anomaly where the protective launch shroud apparently ripped the rendezvous antenna off the exterior of the Soyuz during ascent. This prevented the crew from locking on to the Salyut approach and docking system and prevented the docking.

The spacecraft touched down 60 km north east of Arkalyk on April 22, 1983

Duration: 2 days, 18 minutes

SALYUT - 7

Expedition - 2

From left to right :
Vladimir Lyakhov , Aleksander Aleksandrov

Salyut Patch

SOYUZ - T - 9

„Long-Duration“ Crew Mission : 149 days

Launch Date :	June 27, 1983 , 09:12 UTC
Launch Vehicle :	Soyuz 7K - ST , No. 14L
Launch Crew :	Cdr. Lyakhov , FE Aleksandrov
SALYUT 7 Crew :	Lyakhov , Aleksandrov
- Visiting Crew :	*Planned* [Soyuz–T-10A]
- Cargo Vehicle :	Progress – 17 , Progress – 18
Landing Crew :	V. Lyakhov , A. Aleksandrov
Landing Vehicle :	Soyuz 7K - ST , No. 14L
Landing Date :	November 23, 1983 , 19:58 UTC

SOYUZ - T - 9 , cont.

June 27, 1983: Soyuz-T-9 launch. Vehicle docks with the station aft port on June 28, 1983.

July 27, 1983: The Soyuz-T-9 crew undergo an emergency escape procedure, involving quick fallback to the Soyuz capsule and preparations for an emergency separation. This followed a small meteorite impact on a station window, causing a 4 mm crater and was termed 'safe' following meticulous inspection.

August 16, 1983: Soyuz-T-9 spacecraft with the Soyuz-T-9 crew undocks from the station aft port. The Salyut-7 station is commanded into a 180 degree turn and the Soyuz-T-9 craft redocks to the station forward port. This operation takes approx. 30 minutes.

September 9, 1983: Station evacuation is ordered following a Nitric Oxide line rupture, during refuelling by the Progress-17. The line supplied control jets on the aft propulsion section of the Salyut-7 station. Once the leak was discovered and identified the evac. is cancelled. Future orbital adjust. are made by Progress spacecraft.

November 1, 1983: Soyuz-T-9 crew conduct an EVA to install a supplementary solar panel to one side of the central main array of the Salyut. Also, the crew inspected the extent of damage from the Nitric Oxide line leak. Duration : 2 hours , 50 minutes.

November 3, 1983: Soyuz-T-9 crew conduct a second EVA to install a second supplementary solar panel to the other side of the central main array of the Salyut. Duration : 2 hours , 55 minutes.

November 23, 1983: The departing Soyuz-T-9 crewmen placed the station in an automatic mode.

November 23, 1983: Soyuz-T-9, carrying the Soyuz-T-9 crew, undocks from the station forward port and touches down 160 km east of Dzhezkazgan.
The crew spending 149 days, 10 hours and 46 minutes in space.

SOYUZ - T - 9 , cont.

Visiting crews / Cargo Vehicle

August 17, 1983: Progress-17 launch. The vehicle docked at the station's aft docking port on August 19, 1983.

September 17, 1983: Progress-17 undocks from the station aft port and reenters the atmosphere on the same day at 23:43.

September 26, 1983: Soyuz-T10-A launch failure.
At T-90 seconds a fire at the base of the first stage began climbing the booster and the Launch Escape System (LES) was commanded to fire.
The LES pulled the craft 4 km east of the pad, as the Soyuz made its descent via parachute, the booster exploded.
The men experienced forces as high as 17-Gs, but escaped injury.
Duration: 6 minutes

October 20, 1983: Progress-18 launch. The vehicle docked at the station's aft docking port on October 22, 1983.

November 13, 1983: Progress-18 undocks from the station aft port and reenters the atmosphere on November 16, 1983.

SALYUT - 7

- - - - - -

From left to right :
Vladimir Titov , Gennadi Strekalov

Launch Date :	September 26, 1983 , 19:37 UTC
Launch Vehicle :	Soyuz 7K - ST , No. 16L
Launch Crew :	Cdr. Titov , FE Strekalov
SALYUT 7 Crew :	Lyakhov , Aleksandrov
Landing Crew :	Vladimir Titov , Gennadi Strekalov
Landing Vehicle :	Soyuz 7K - ST , No. 16L
Landing Date :	September 26, 1983 , 19:43 UTC

SOYUZ - T – 10 A

Suborbital Flight / Launch Failure

Personal patch

Gennady Strekalov

September 26, 1983 :
Soyuz-T10-A launch failure.

At T-90 seconds a fire at the base of the first stage
began climbing the booster and the
Launch Escape System (LES) was commanded to fire.
The LES pulled the craft 4 km east of the pad, as the Soyuz
made its descent via parachute, the booster exploded.
The men experienced forces as high as 17-Gs,
but escaped injury.

Duration: 6 minutes suborbital flight

SALYUT - 7

Expedition - 3

From left to rigt :
Oleg Atkov , Leonid Kizim , Vladimir Solovyov

Salyut Patch

SOYUZ - T – 10 B

„Long-Duration“ Crew Mission : 237 days

Launch Date :	February 8, 1984 , 12:07 UTC
Launch Vehicle :	Soyuz 7K - ST , No. 15L
Launch Crew :	Cdr. Kizim , FE Solovyov , Researcher Atkov
SALYUT 7 Crew :	Kizim , Solovyov , Atkov
- Visiting Crew – 3 :	Malyshev , Strekalov , Sharma (IND) [Soyuz – T-11]
- Visiting Crew – 4 :	Dzhanibekov, Svetlana Savitskaya , Volk [Soyuz – T-12]
- Cargo Vehicle :	Progress – 19 , Progress – 20 , Progress – 21 , Progress – 22 , Progress – 23
Landing Crew :	Yuri Malyshev , Gennadi Strekalov , Rakesh Sharma (IND) *[Soyuz – T-11]*
Landing Vehicle :	Soyuz 7K - ST , No. 15L
Landing Date :	April 11, 1984 , 10:48 UTC

SOYUZ - T – 10 B , cont.

February 8, 1984:	Soyuz-T-10B launch. Vehicle docks at the forward port on February 9, 1984.
April 3, 1984:	Soyuz-T-11 launch. Vehicle docks at the aft station port on April 4, 1984.
April 11, 1984:	Soyuz-T-10B spacecraft, carrying the Soyuz-T11 crew (Malyshev, Strekalov and Sharma (IND)) undocks from the station forward port and touched down 46 km east of Arkalyk The Soyuz-T11 crew spent 7 days, 21 hours and 41 minutes in space .
April 13, 1984:	Soyuz-T-11 spacecraft with the Soyuz-T10B crew (Kizim, Solovyov and Atkov) undocks from the station aft port. The Salyut-7 station is commanded into a 180 degree turn and the Soyuz-T-11 spacecraft redocks to the station forward port. This operation takes approx. 30 mins.
April 23, 1984:	Soyuz-T-10B crew conduct their first EVA to set up a ladder and deliver tools to the area of the fuel leak on the aft propulsion module of the Salyut. Duration: 4 hours , 20 minutes.
April 26, 1984:	Soyuz-T-10B crew conduct their second EVA to open the Salyut hull, via cutting, to expose the fuel line plumbing for later planned repair work. Duration: 4 hours , 56 minutes.
April 29, 1984:	Soyuz-T-10B crew conduct their third EVA to install a bypass oxidizer line and replace insulation. Duration: 2 hours 45 minutes.
May 3, 1984:	Soyuz-T-10B crew conduct their fourth EVA to install a second bypass line and replace insulation. Duration: 2 hours , 45 minutes.
May 18, 1984:	Soyuz-T-10B crew conduct their fifth EVA to add two supplemental solar arrays to the port prime array, repeating the task performed by the Soyuz-T9 crew during their two EVAs in early November 1983. Duration: 3 hours , 05 minutes
August 8, 1984:	Soyuz-T-10B crew conduct their sixth EVA to close the repair site of the propulsion module of the Salyut. Duration: 5 hours , 00 minutes.
October 2, 1984:	The departing Soyuz-T-10B crew placed the station in an automatic mode.
October 2, 1984:	Soyuz-T-11, carrying the Soyuz-T-10B crew (Kizim, Solovyov and Atkov) , undocks from the station forward port and touches down 145 km (100 mi.) east of Dzhezkazgan. The Soyuz-T-10B crew spent 236 days, 22 hours and 50 minutes in space (new record)

SOYUZ - T – 10 B , cont.

Visiting crews / Cargo Vehicle

February 21, 1984:	Progress-19 launch. The craft docks at the station aft port on February 23, 1984.
March 31, 1984:	Progress-19 spacecraft undocks from the station aft port and reenters the atmosphere on April 1, 1984.
April 15, 1984:	Progress-20 launch. The spacecraft docks at the station aft port on April 17, 1984. Delivered exterior ladder for EVAs.
May 6, 1984:	Progress-20 spacecraft undocks from the station aft port and reenters the atmosphere on May 7, 1984.
May 7, 1984:	Progress-21 launch. The craft docks at the station aft port on May 10, 1984. Delivered 2nd pair of solar arrays.
May 26, 1984:	Progress-21 spacecraft undocks from the station aft port and reenters the atmosphere on May 28, 1984.
May 28, 1984:	Progress-22 launch. The craft docks at the station aft port on May 30, 1984.
July 15, 1984:	Progress-22 spacecraft undocks from the station aft port and reenters the atmosphere on July 17, 1984.
July 17, 1984:	Soyuz-T-12 launch. Vehicle docked to the aft station port on July 18, 1984.
July 25, 1984:	The Soyuz-T-12 members (Dzhanibekov and Savitskaya / first woman to EVA) conduct during an EVA various activities including cutting, welding and plating. Duration: 3 hours , 35 minutes.
July 29, 1984:	Soyuz-T-12 spacecraft carrying the Soyuz-T12 crew, undocks from the station aft port and touches down 140 km south east of Dzhezkazgan.
August 14, 1984:	Progress-23 launch. The craft docks at the station aft port on August 16, 1984.
August 26, 1984:	Progress-23 spacecraft undocks from the station aft port and reenters the atmosphere on August 28, 1984.

Note: During unmanned flight the SALYUT-7 station lost power and many subsystems froze. The next crew are to conduct major repairs to reactivate the electrically dead station.

Soyuz T-10B crew and Soyuz T-11 crew on board the Salyut 7 space station

SALYUT - 7

Visiting Crew - 3

From left to right :
Yuri Malyshev , Rakesh Sharma (IND) , Gennadi Strekalov

Launch Date :	April 3, 1984 , 13:08 UTC
Launch Vehicle :	Soyuz 7K - ST , No. 17L
Launch Crew :	Cdr. Malyshev , FE Strekalov , Researcher Sharma (IND)
SALYUT 7 Crew :	Kizim , Solovyov , Atkov Malyshev , Strekalov , Sharma (IND)
Landing Crew :	Kizim , Solovyov , Atkov *[Soyuz – T-10B]*
Landing Vehicle :	Soyuz 7K - ST , No. 17L
Landing Date :	October 2, 1984 , 10:57 UTC

SOYUZ - T - 11

INTERCOSMOS Crew 11 - India

April 3, 1984 :
Soyuz-T-11 launch
Vehicle docks at the aft station port on April 4, 1984.
April 13, 1984 :
Soyuz-T-11spacecraft with the Soyuz-T-10B crew undocks from the station aft port.
The Salyut-7 station is commanded into a 180 degree turn and the Soyuz-T-11 spacecraft redocks to the statio forward port. This operation takes approx. 30 minutes.
October 2, 1984 :
Soyuz-T-11, carrying the Soyuz-T-10B crew (Kizim, Solovyov and Atkov) , undocks from the station fwd. port and touches down 145 km (100 mi.) east of Dzhezkazgan.
The Soyuz-T-10B crew spent
236 days, 22 hours and 50 minutes in space (New Record)

SOYUZ - T - 11 , cont.

Soyuz T-11 Researcher , Wing Commander Rakesh Sharma (Indian Cosmonaut)

SOYUZ - T - 11 , cont.

The Real Thing

The Indian flag

The ISRO seal
(Indian Space Research Organisation)

The Indian state seal

SOYUZ - T - 11 , cont.

The mission patch features the horse-drawn sun chariot,
travelling accross the skies,
applied in manual heavy metal embroidery,
and the Soviet and Indian flags

Collecting Soyuz-T11

The Space Commerce Corporation reproduction

The Stewart Aviation version

SALYUT - 7

Visiting Crew - 4

From left to right :
Igor Volk , Svetlana Savitskaya , Vladimir Dzhanibekov

Launch Date :	July 17, 1984 , 17:40 UTC
Launch Vehicle :	Soyuz 7K - ST , No. 18L
Launch Crew :	Cdr. Dzhanibekov , FE Svetlana Savitskaya , Researcher Volk
SALYUT 7 Crew :	Kizim , Solovyov , Atkov , Dzhanibekov , S. Savitskaya , Volk
Landing Crew :	Dzhanibekov , S. Savitskaya , Volk
Landing Vehicle :	Soyuz 7K - ST , No. 18L
Landing Date :	July 29, 1984 , 12:55 UTC

SOYUZ - T - 12

First Woman to Perform a Spacewalk

Personal patch

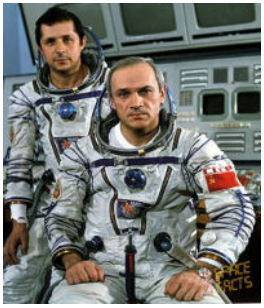
Vladimir Dzhanibekov

Vehicle docked to the aft station port on July 18, 1984.
July 25, 1984 :
Two members (Dzhanibekov and Savitskaya) of the Soyuz-T12 crew conduct an EVA, conduct various activities including cutting, welding and plating.
Duration: 3 hours, 35 minutes (First woman to EVA).
July 29, 1984 :
Soyuz-T12 craft carrying the Soyuz-T12 crew, undocks from the station aft port and touches down 140 km south east of Dzhezkazgan
The crew spent 11 days, 19 hours and 15 minutes in space.

Soyuz T-10B crew and Soyuz T-12 crew on board the Salyut 7 space station

SALYUT - 7

Expedition - 4 - 1



From left to right :
Victor Savinykh , Vladimir Dzhanibekov

Salyut Patch

SOYUZ - T - 13

Rescue Mission for a Space Station

Launch Date :	June 6, 1985 , 06:39 UTC	
Launch Vehicle :	Soyuz 7K - ST , No. 19L	
Launch Crew :		
Expedition – 4 – 1a :	Cdr. Savinykh	
Expedition – 4 – 1b :	FE Dzhanibekov	
SALYUT 7 Crew :	Savinykh	*[Soyuz – T-13]*
	Dzhanibekov	*[Soyuz – T-13]*
	Vasyutin , Volkov	*[Soyuz – T-14]*
- Visiting Crew – 5 :	Grchko	*[Soyuz – T-14]*
- Cargo Vehicle :	Progress – 24	
Landing Crew :	Dzhanibekov	*[Soyuz – T-13]*
	Grechko	*[Soyuz – T-14]*
Landing Vehicle :	Soyuz 7K - ST , No. 19L	
Landing Date :	September 26, 1985 , 09:51 UTC	

SOYUZ - T - 13 , cont.

June 6, 1985: Soyuz-T-13 launch. Vehicle docked at the forward docking port of the station on June 8, 1985

August 2, 1985: Soyuz-T-13 crew (Dzhanibekov and Savinykh) conduct an EVA to add a third pair of supplemental solar arrays to the station's starboard side main array.
Repeating the Soyuz-T-9 and Soyuz-T-10 crew activity.
Duration: 5 hours , 00 minutes.

September 26, 1985: Soyuz-T-13 spacecraft undocks from the station forward port,
with Dzhanibekov of the Soyuz-T-13 crew and Grechko of the Soyuz-T-14 crew.
The spacecraft touched down 220 km north east of Dzhezkazgan (new landing zone !).
Dzhanibekov spent 112 days, 3 hours, 12 minutes in space.
Grechko spent 8 days, 21 hours and 13 minutes in space.

Note: This is the first swap/mix of returning space crews,
a method that will become common place on Mir.

Visiting crews / Cargo Vehicle

June 21, 1985: Progress-24 launch. The spacecraft docks at the station aft port on June. 23, 1985.
Delivered 3rd set of solar arrays.

July 15, 1985: Progress-24 spacecraft undocks from the station aft port and reenters the atmosphere the same day.

SALYUT - 7

Expedition - 4 - 2

From left to right :
Georgi Grechko , Aleksander Volkov , Vladimir Vasyutin

Salyut Patch

SOYUZ - T - 14

First Partial Crew Exchange

Launch Date :	September 17, 1985 , 12:38 UTC	
Launch Vehicle :	Soyuz 7K - ST , No. 20L	
Launch Crew :		
Expedition – 4 – 2 :	Cdr. Vasyutin , Volkov	
-Visiting Crew – 5 :	Grechko	
SALYUT 7 Crew :	Savinykh	*[Soyuz – T-13]*
	Dzhanibekov	*[Soyuz – T-13]*
	Vasyutin , Volkov	*[Soyuz – T-14]*
- Visiting Crew – 5 :	Grchko	*[Soyuz – T-14]*
- Cargo Vehicle :	Kosmos 1686	
Landing Crew :	Vasyutin , Volkov	*[Soyuz – T-14]*
	Savinykh	*[Soyuz – T-13]*
Landing Vehicle :	Soyuz 7K - ST , No. 20L	
Landing Date :	November 21, 1985 , 10:31 UTC	

SOYUZ - T - 14 , cont.

September 17, 1985: Soyuz-T-14 launch. Vehicle docked at the aft docking port of the station on September 18, 1985.

November 21, 1985: Soyuz-T-14 spacecraft undocks from the station aft port,
with Savinykh of the Soyuz-T-13 crew, Vasyutin and Volkov of the Soyuz-T-14 crew.
The craft touched down 180 km south east of Dzhezkazgan.
Savinykh spent 168 days, 3 hours and 51 minutes in space.
Vasyutin and Volkov spent 64 dys, 21 hours and 52 minutes in space.

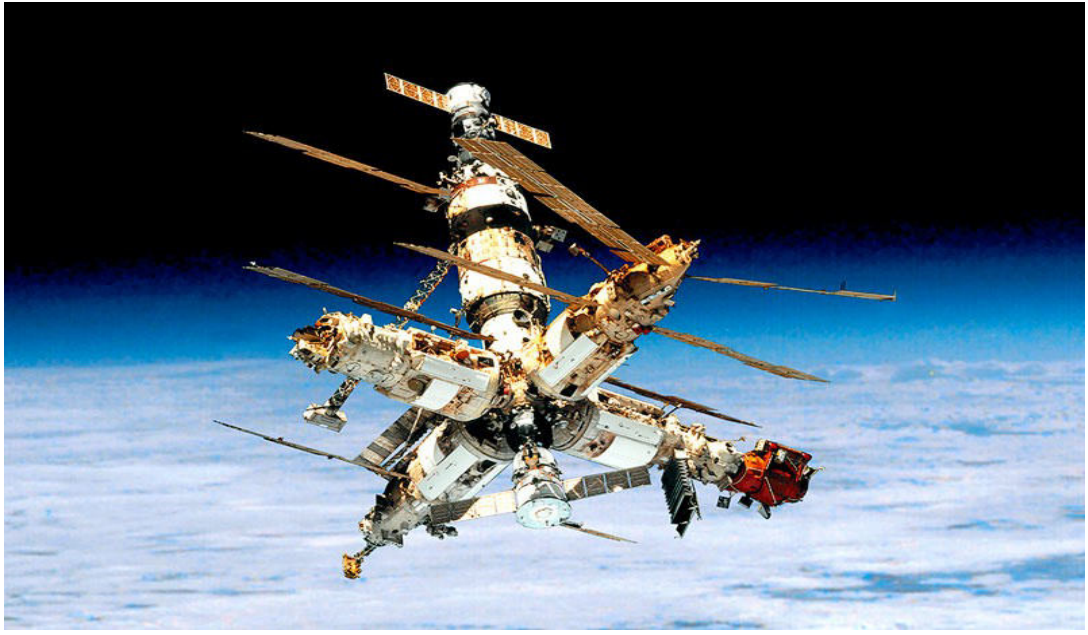
Note: This is the first swap/mix of returning space crews,
a method that will become common place on Mir.

Visiting crews / Cargo Vehicle

September 27, 1985: Cosmos-1686 'TKS' Module launch. Vehicle docks at the station forward port on October 2, 1985.
Delivered a girder.

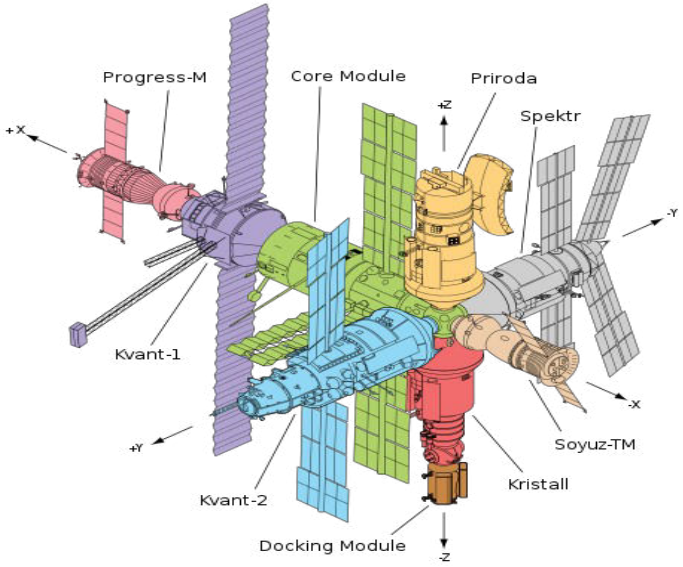
M I R Space Station

The next generation of Salyut stations called for the cores **DOS-7** and **DOS-8** to allow,
for the first time in spaceflight,
the addition of several modules to a station core and to create a modular space station.
DOS-7 evolved into the *MIR Core Module*, and DOS-8 was used as the *Zvezda Service Module* for the *Internationa Space Station (ISS)*



M I R Space Station , cont.

First module launch:	February 19, 1986 , 21:28:23 UTC	Length: 19 m (62,3 ft) from core module to Kvant-1	
Last module launch:	April 23, 1996 , 11:48:50 UTC	Width : 31 m (101,7 ft)	from Priroda to docking module
Launch Vehicle :	Three-stage Proton-K rocket		
Reentry :	March 23, 2001 , 05:59:36 UTC	Hight : 27,5 m (90,2 ft)	from Kvant-2 to Spektr
No. of Orbits :	86.331	Perigee Altitude :	354 km
Station elements as of May 1996		Apogee Altitude :	374 km



M I R / SALYUT - 7

M I R Expedition – 1 / Saljut Expedition - 5

From left to right: Leonid Kizim, Vladimir Solovyov

Launch Date : March 13, 1986 , 12:33 UTC
Launch Vehicle : SOYUZ 7K-7T . No. 21L
First MIR Crew : Cdr. Kizim , FE Solovyov (Russia)
Landing Date : July 16, 1986 , 12:34 UTC

Summary :
Cosmonauts Leonid Kizim and Vladimir Solovyov docked to the front port of the MIR station and they were busy activating it over the next 52 days. **On May 5, the cosmonauts undocked Soyuz T-15 from MIR and directed it towards the near-by (2500km!) Salyut-7 station, unoccupied since November 1985. They arrived 29 hours later and used the aft port of the Salyut-7/Kosmos-1686 combination for docking. Aboard Salyut-7 - visited for the final time - they stripped some 400 kg of equipment. They left Salyut-7 on June 25 and flew back to MIR.** *The cosmonauts returned to Earth in their Soyuz T-15 capsule on July 16, 1986. MIR to remain unmanned until 1987.*

SOYUZ - T - 15

First Station-to-Station Transfer

The first mission to MIR did not have its own patch. The cosmonauts were launched with the typical Salyut configuration on their Sokol suits: a wedge-shaped Salyut patch on their chest, a Soviet seal on the right sleeve and a CCCP-flag (red felt background, square letters) on the left sleeve.

SOYUZ - T - 15 , cont.

May 6, 1986: Soyuz-T-15 craft and crew docks to the Salyut-7/Cosmos-1686 complex at the aft docking port, following a intership (MIR to Salyut-7) journey that took 28 hrs., 46 mins. The purpose was to check Salyut-7's status and close out operations there. The crew also retrieved some equipment and conducted two EVAs.

May 28, 1986: Soyuz-T-15 crew at Salyut-7 conduct an EVA to raise a 15 m tall EASE/ACCESS type tower (delivered by the Cosmos-1686) and to retrieve the COMET experiment samples.
Duration: 3 hours, 50 minutes.

May 31, 1986: Soyuz-T-15 crew at Salyut-7 conduct a second EVA to lower the tower and photograph the exterior of Salyut-7. (the tower was a test of a precursor to the centrally mounted solar array mast of Mir).
Duration: 5 hours, 00 minutes.

June 25, 1986: Soyuz-T-15 craft and crew undocks from the Salyut-7/Cosmos-1686 complex after a stay of 49 days, 22 hours. The craft makes a return journey to Mir that takes 28 hours and 48 minutes.

Note:

February 7, 1991: Salyut-7/Cosmos-1686 complex is deorbited and reenters the atmosphere on ground command. The complex reentered at 34.9 degrees south and 63.8 degrees west over the Argentine districts of Paymun and Catriel, in the Neuquen Province and near the La Pampa and Rio Negro province, there were no injuries or damage.

SALYUT - 7 Mission Overview

YEAR	LAUNCH VEHICLE	LAUNCH DATE	MISSION NAME *[IC = INTERCOSMOS]*		LANDING VEHICLE	LANDING / DECAY DATE
1982	**Soyuz T-5** Progress - 13 Soyuz T-6 Progress - 14 Soyuz T-7 Progress - 15 Progress - 16	**May 13** May 23 June 24 July 10 August 19 September 18 October 31	**Expedition Crew – 1** Visiting Crew – 1 Visiting Crew - 2	IC Crew-10 [FRA]	**Soyuz T-7** Progress - 13 Soyuz T-6 Progress - 14 Soyuz T-5 Progress - 15 Progress - 16	**December 10** June 6 July 2 August 13 August 27 October 16 December 14
1983	Soyuz T-8	April 20	no docking		Soyuz T-8	April 22
	Soyuz T-9 Progress - 17 Soyuz T-10A Progress - 18	**June 27** August 17 September 26 October 20	**Expedition Crew – 2** - - - - -	Suborbital flight	**Soyuz T-9** Progress - 17 Soyuz T-10A Progress - 18	**November 23** September 17 September 26 November 16

SALYUT - 7 Mission Overview , cont.

YEAR	LAUNCH VEHICLE	LAUNCH DATE	MISSION NAME *[IC = INTERCOSMOS]*		LANDING VEHICLE	LANDING / DECAY DATE
1984	**Soyuz T-10B** Progress – 19 Soyuz T-11 Progress - 20 Progress – 21 Progress – 22 Soyuz T-12 Progress – 23	**February 8** February 21 April 3 April 15 May 7 May 28 July 17 August 14	**Expedition Crew – 3** Visiting Crew – 3 Visiting Crew – 4	IC Crew-11 [IND]	**Soyuz T-11** Progress – 19 Soyuz T-10B Progress - 20 Progress – 21 Progress – 22 Soyuz T-12 Progress – 23	**October 2** April 1 April 11 May 7 May 26 July 15 July 29 August 28
1985	**Soyuz T-13** **Soyuz T-13** Progress – 24 **Soyuz T-14** **Soyuz T-14** Kosmos 1686	June 6 June 6 June 21 September 17 September 17 September 27	**Expedition - 4 - 1a** **Expedition - 4 - 1b** Visiting Crew - 5 **Expedition - 4 - 2**		**Soyuz T-14** **Soyuz T-13** Progress – 24 **Soyuz T-13** **Soyuz T-14** Kosmos 1686	**November 21** **September 26** July 15 **September 26** **November 21** Feb. 7, 1991 *[with Salyut – 7]*
1986	**Soyuz T-15**	*March 13* **May 6**	*M I R Expedition – 1* **SALYUT - 7** **Expedition – 5**	First Station-to-Station Transfer	**Soyuz T-15**	*July 16* **June 25**

SUMMARY of the SALYUT OPERATIONS

SALYUT – 1	The only spacecraft that ever docked to Salyut - 1 were Soyuz10 and Soyuz 11. Soyuz 10 failed to hard-dock with Salyut - 1 and had to abort the mission. Soyuz 11 conducted experiments in Salyut - 1 for 23 days, however the cosmonauts later died during reentry in their Soyuz capsule.
SALYUT – 2	Within two weeks of its launch, the station had lost altitude control and depressurized, leaving it unusable.
SALYUT – 3	Only one crewed spacecraft, Soyuz 14, docked with Salyut - 3. One other spacecraft, Soyuz 15, came within 40 metres of the station, but failed to dock due to a malfunctioning rendezvous system.
SALYUT – 4	Three crews attempted to make stays aboard Salyut – 4 : (Soyuz 17 and Soyuz 18 docked; Soyuz 18A suffered a launch abort)
SALYUT – 5	Two Soyuz missions, Soyuz 21 and Soyuz 24, visited the station, each crewed by two Cosmonauts. A third Soyuz mission, Soyuz 23 attempted to visit the station, but failed to dock.

SUMMARY of the SALYUT OPERATIONS , cont.

SALYUT – 6	Salyut - 6 hosted five long duration crew : 12 visiting crews (one failed to dock – Soyuz 33) and 12 Progress vehicles. Also, hosting the Cosmos-1267 'TKS' module that was still docked during the station's destructive reentry, 4 years and10 months after launch on September 29, 1977.
SALYUT – 7	Salyut-7 hosted five long duration crews : including Soyuz T – 15 (MIR Exp. 1 / Salyut Exp. 5), 4 short visit crews, including the first Frenchman, the second woman in space (on two visits) and the first Indian Cosmonaut. The station had one near miss docking failure, Soyuz-T-8. Visited by 13 Progress vehicles, including the Progress-M test vehicle. Finally, the station was docked to two large expansion modules : Cosmos-1443 (with a Merkur reentry capsule) and Cosmos-1686 (a Mir type expansion module). Salyut - 7 was the site of 13 EVA's totalling 48 hrs., 14 mins. Total Soviet EVA time up to Salyut - 7 was 6 hours , 20 minutes.

A T T A C H M E N T

Interkosmos program

Интеркосмос Космическая Программа
Interkosmos Kosmicheskaya Programma

Interkosmos (Russian: Интеркосмос) was a Soviet space program, designed to help the Soviet Union's allies with crewed and uncrewed space missions.

The program included the allied east-European states of the Warsaw Pact, Eastern Bloc, CoMEcom, and other socialist states like Afghanistan, Cuba, Mongolia, and Vietnam.

In addition, pro-Soviet non-aligned states such as India and Syria participated, and even states such as France and Austria, despite them being capitalist states.

The Soviet Union also made offers of joint human spaceflight on a commercial basis to the United Kingdom and Japan resulting in the first British and Japanese cosmonauts.

Interkosmos patch

Acronyms

The **SALYUT** programme was composed of :

D O S (Durable Orbital Station) civilian stations
the civilian DOS space station cores were designed by
Sergei Korolev's OKB – 1 organisation as civilian space station

and

O P S (Orbital Piloted Station) military stations
the Almaz-OPS space station cores were designed by
Vladimir Chelomey's NPO Mashinostroyeniya OKB – 52
organization as military space station

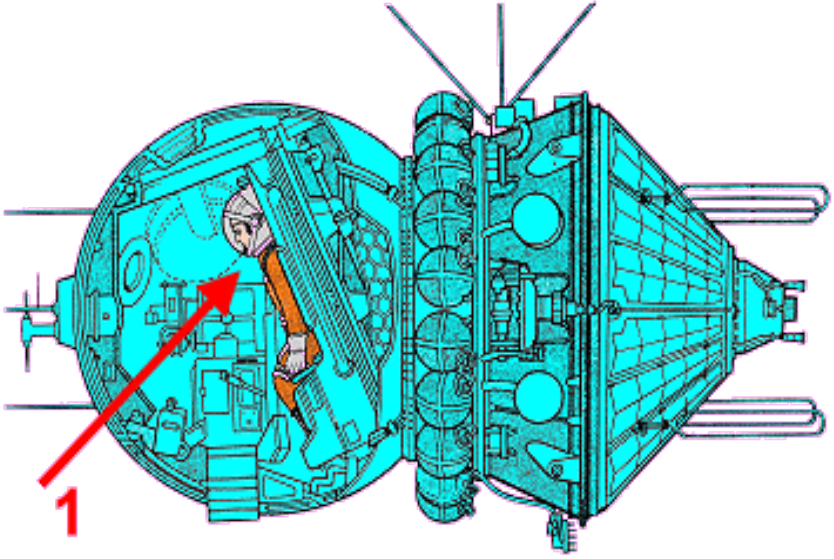
OKB is a transliteration of the Russian initials of
"опытно-конструкторское бюро" – *opytno konstruktorskoye byuro*,
meaning 'experiment and design bureau'

NPO Mashinostroyeniya (Russian: НПО машиностроения,
Lit.: 'RDA of machine manufacturing',
is a rocket design bureau)

VOSTOK

The Vostok programme (Russian: Восток, IPA: lit: translated as "East") was a Soviet human space flight project to put the first Soviet citizens into low Earth orbit and return them safely.
The Vostok spacecraft was designed to carry a single cosmonaut

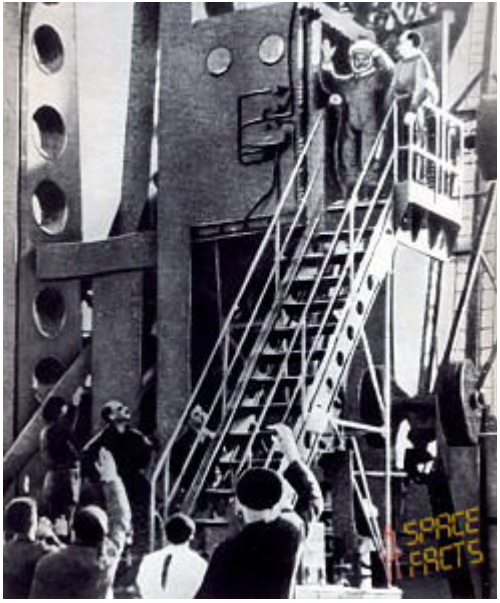
Version : Vostok 3KA



VOSTOK , cont.

Vostok – K 8K72K rocket

This was the version actually used for human spaceflight

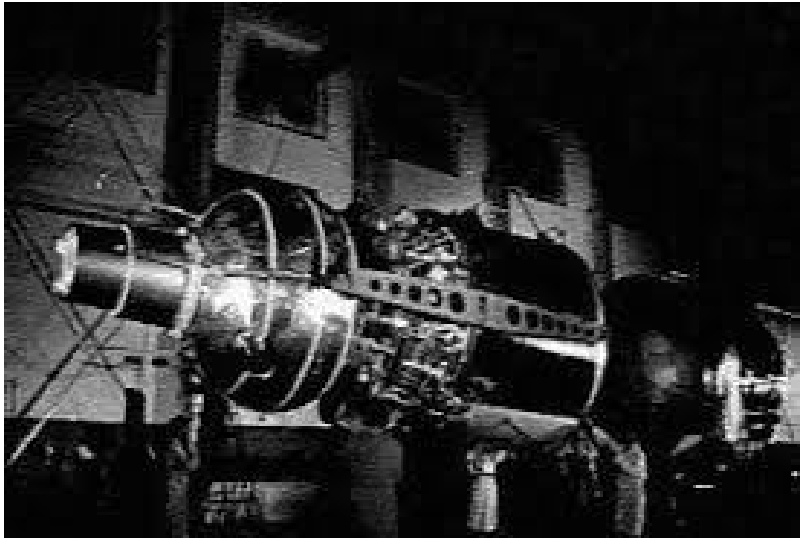


Baikonur Cosmodrome Site No.1.

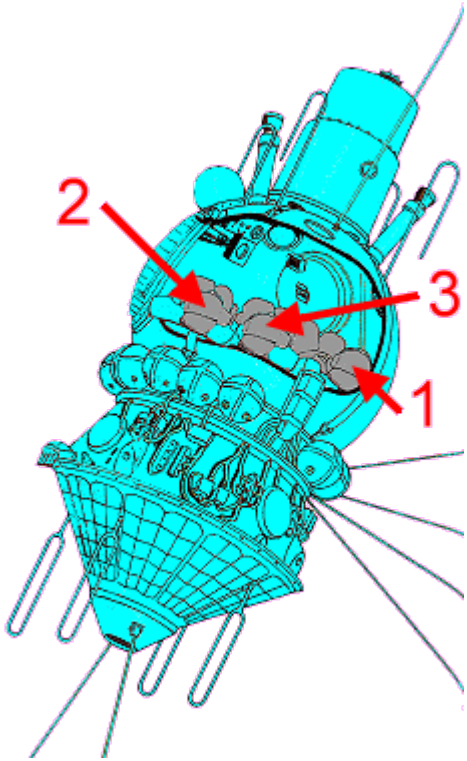
VOSKHOD

The Voskhod (Russian: Восход, *"Sunrise"*) was a spacecraft built by the Soviet Union's space program for human spaceflight. They consisted of a spherical descent module (diameter 2,3 metres (7,5 ft)), which housed the cosmonauts and instruments, and a conical equipment module (mass 2,27 tonnes or 5000 pounds, 2,25 m (7,4 ft) long, 2,43 m (8,0 ft) wide, which contained propellant and the engine system. Voskhod-1 was used for a three-man flight whereas Voskhod-2 had a crew of two.

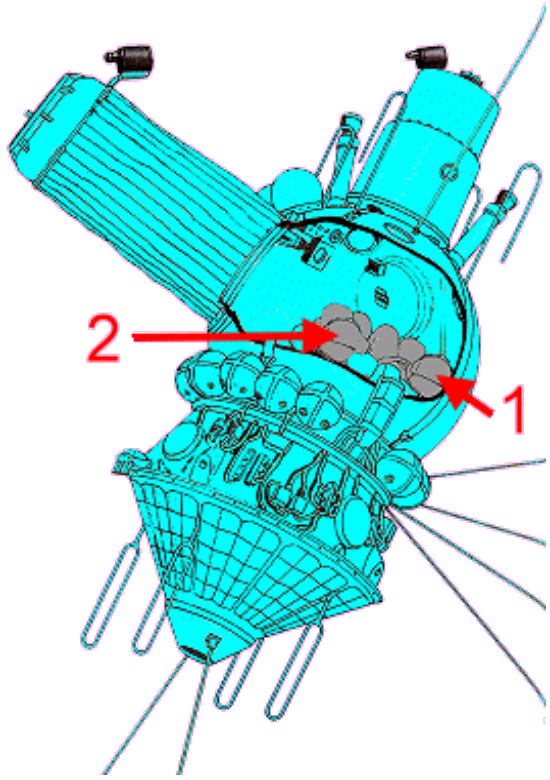
Versions : Vostok 3KV (1964) Voskhod 3KD (1965)



VOSKHOD , cont.



Voskhod 1 spacecraft

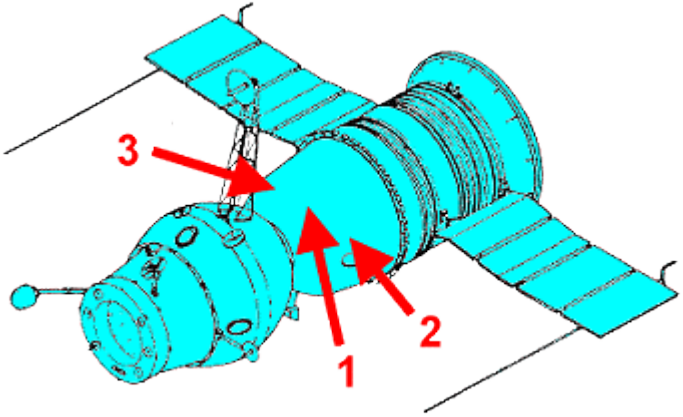


Voskhod 2 spacecraft, with inflatable airlock deployed

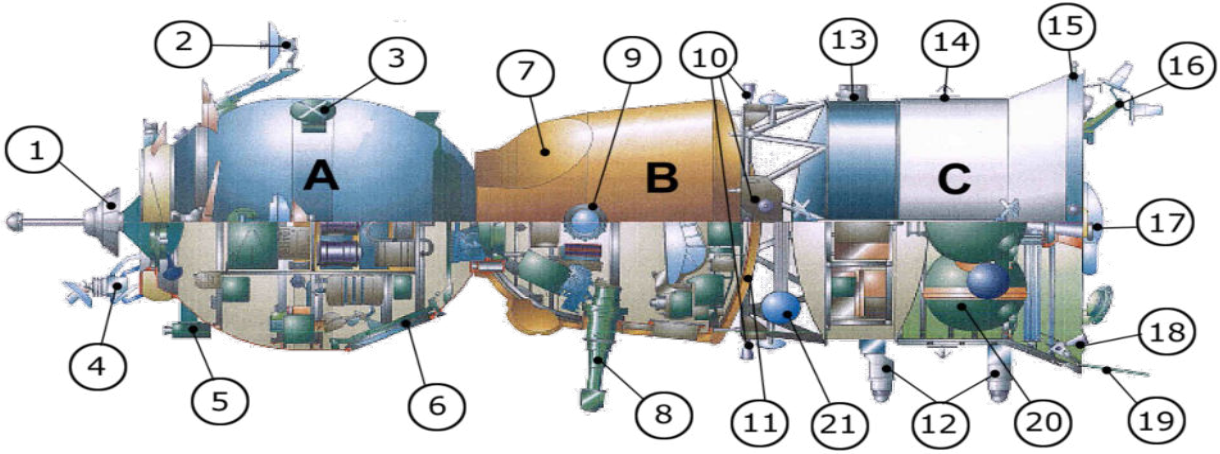
SOYUZ

Soyuz (Russian: Союз, IPA: lit: 'Union') spacecraft was designed for the Soviet space program by the Korolev Design Bureau. Soyuz can carry up to three crew members and provide life support for about 30 person days. The space ship can be operated automatically or by a pilot independently of ground control.

Versions : **Soyuz 7K** (1963–1967) **Soyuz 7K-OK** (1967–1970) **Soyuz 7K-L3** (LOK) (1970–1972)



SOYUZ , cont.



Orbital module (A)
1 docking mechanism
2, **4** Kurs rendezvous radar antenna
3 television transmission antenna
5 camera
6 hatch

Descent module (B)
7 parachute compartment
8 periscope
9 porthole
11 heat shield

Service module (C)
10, **18** attitude control engines
12 Earth sensors
13 Sun sensor
14 solar panel attachment point
15 thermal sensor
16 Kurs antenna
17 main propulsion
19 communication antenna
20 fuel tanks
21 oxygen tank

SOYUZ T

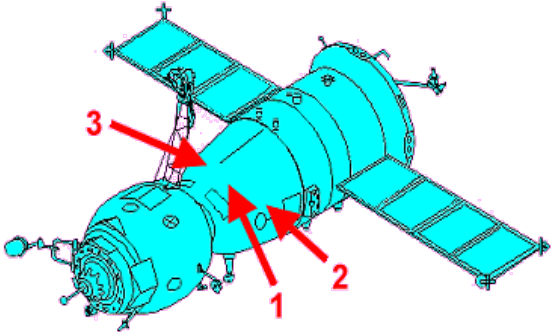
The Soyuz-T (Russian: Союз-Т, *Union-T*) spacecraft ("T" stood for "transport") was the third generation Soyuz spacecraft. The Soyuz-T was a major upgrade over previous Soyuz spacecraft, sporting solid-state electronics for the first time and a much more advanced onboard computer to help overcome the chronic docking problems that affected cosmonauts during space station missions. In addition, solar panels are extended, allowing the Soyuz-T to fly up to 11 days independently as well as a redesigned propulsion system. Finally, it could at last carry three cosmonauts with pressure suits.

Version : **Soyuz 7K-T** (1973–1981 / 1986)

SOYUZ T , cont.

The 7-metre- (23-foot-) long, seven-metric-ton vehicle comprises three modules joined in line : a central, bell-shaped descent module with contoured couches for as many as three persons during ascent, descent, and landing; a cylindrical service module mounted at the rear that provides propulsion, life support, and electrical power; and a spheroidal orbital module in front that carries the docking system and contains living facilities and cargo for the orbital phase of the mission. The three modules remain together throughout the mission until the spacecraft is deorbited; only the descent module returns to Earth intact.

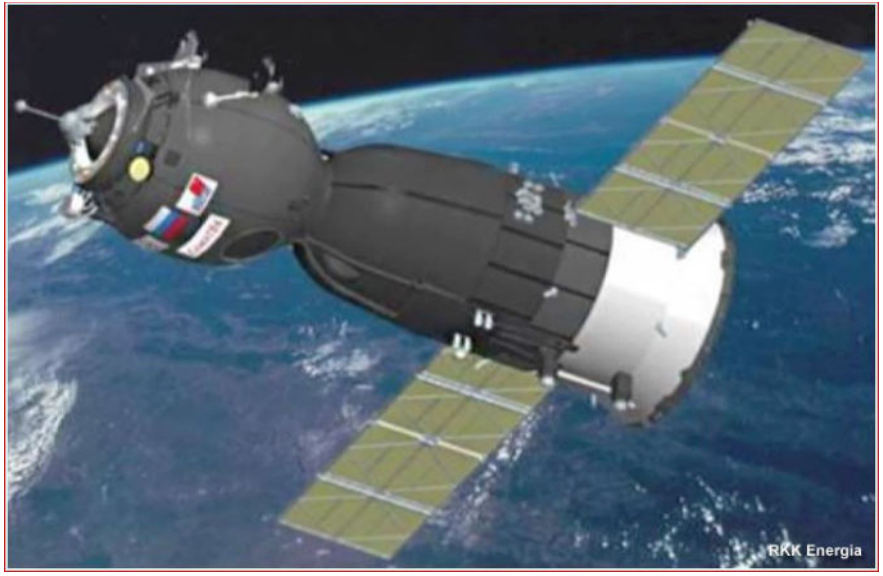
New developed Soyuz T spacecraft



PROGRESS

The Progress (Russia: Прогресс) is a Russian expendable cargo spacecraft. Its purpose is to deliver the supplies needed to sustain a human presence in orbit. While it does not carry a crew, it can be boarded by astronauts when docked to a space station, hence it is classified as *crewed* by its manufacturer. Progress is derived from the crewed Soyuz spacecraft.

Version : Progress 7K-TG (1978–1990)



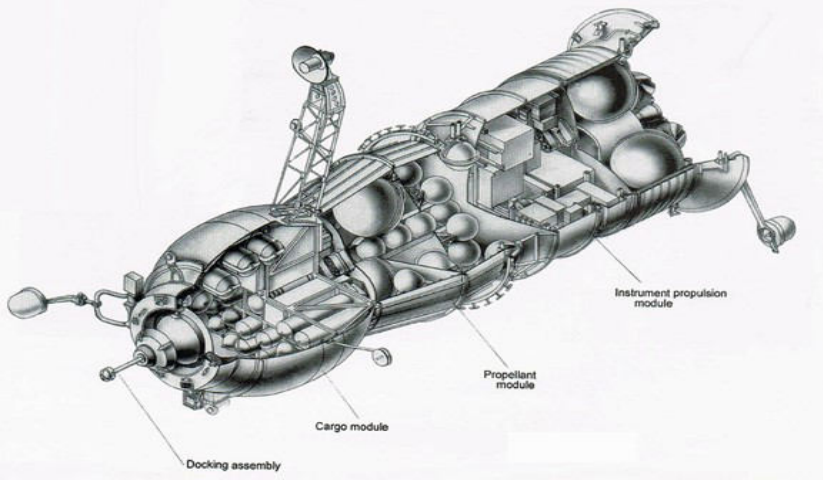
PROGRESS , cont.

Progress consists of three modules:

Pressurized forward module: This carries the supplies for the crew such as scientific equipment, clothes, prepackaged and fresh food, and letters from home. The docking drogue has ducts for the Unsymmetrical dimethylhydrazine (UDMH) fuel and N2O2 oxidiser.

Fuel compartment: The reentry module of the Soyuz was replaced with an unpressurized propellant and refueling compartment with ducting along the outside of the spacecraft.

Propulsion module: The propulsion module, at the rear of the spacecraft, contains the orientation engines used for the automatic docking. It may be used to boost the orbit of the station once docked.

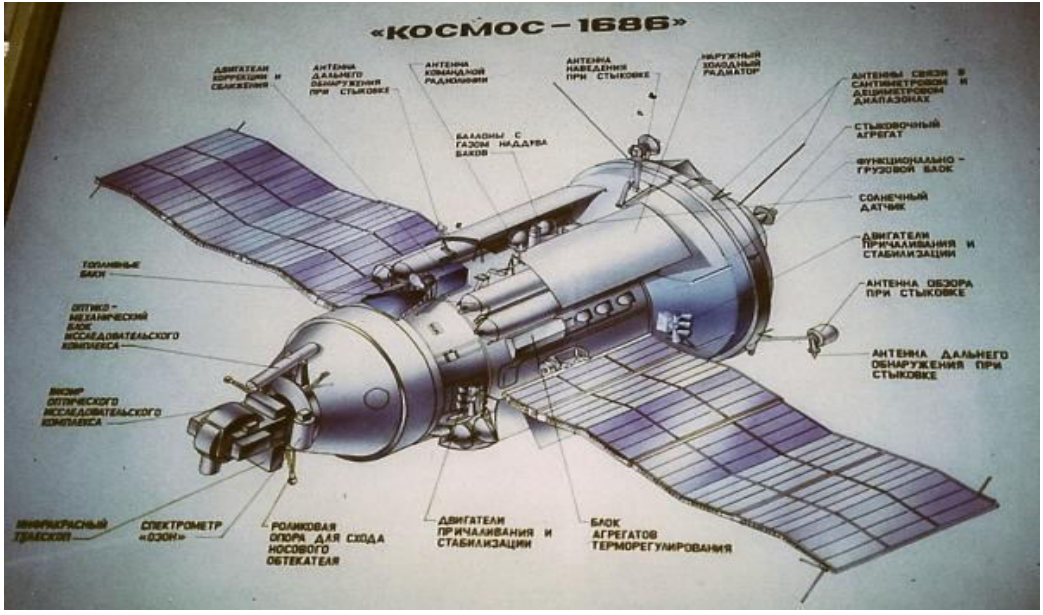


Dry cargo module (left); the tanker compartment (center); and a stretched service module (right).

KOSMOS 1686

Kosmos 1686 (Russian: Космос 1686 meaning *Cosmos 1686*), also known as TKS-4, was a heavily modified TKS-spacecraft. Docked to the Soviet space station Salyut 7 it was a unmanned FGB component of the TKS-spacecraft used for tests to attach scientific expansion modules to stations in Earth orbit.

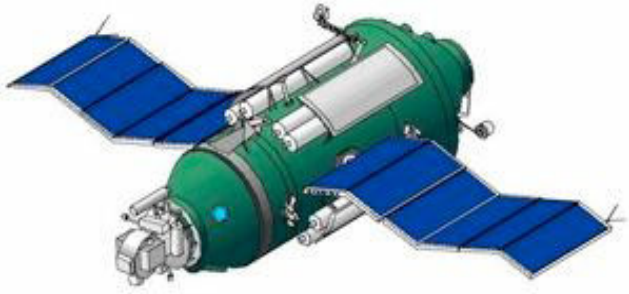
Launch : September 27, 1985 , **Docked to Salyut 7 :** October 2, 1985
Reentry together with Salyut 7: February 7, 1991



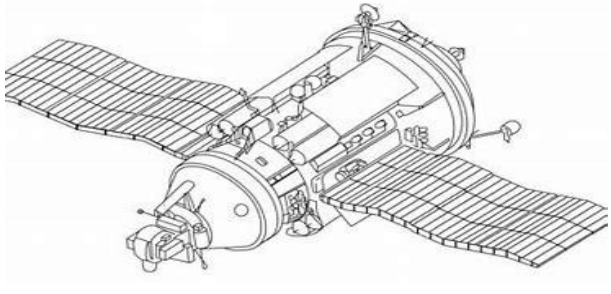
KOSMOS 1686 , cont. / TKS - Spacecraft

The TKS spacecraft
(Russian: Транспортный корабль снабжения,
Transportnyi Korabl' Snabzheniia, *Transport Supply Spacecraft*)
was a Soviet spacecraft conceived in the late 1960s for resupply flights to the military Almaz space station.
The spacecraft was designed for both crewed and autonomous uncrewed cargo resupply flights,
but was never used operationally in its intended role – only four test missions were flown.
The Functional Cargo Block (FGB) carried docking hardware, tanks, and a large pressurized cargo compartment. Furthermore, the FGB carried the on-orbit maneuvering engines for the TKS

Length : 13.2 m (43.31 ft)
Span: 17.00 m (55.00 ft)
Maximal diameter: 4.15 m (13.61 ft)
Habitable volume: 45.00 m^3



[Photo shows the TKS- 3 version]



TKS spacecraft

Number of pages Overview

Юрий Алексеевич Гагарин (Yuri Alekseyevich Gagarin)

Spacepatches.nl: Commemorative version of the Soyuz TMA-21 patch

The ISS Expedition 28 mission patch honors 50 years of manned space flight

Launch version of the Soyuz MS-18 patch. A banner shows the years 1961, 2021 and no. 60 in between, commemorating Yuri Gagarin's first human spaceflight, six decades ago.

© copyright Lucreation 2021:
April 12, 1961 brought us an event and a smile we will never forget.

Landing version of the Soyuz MS-18 Patch. A banner shows the years 1961, 2021 and no. 60 in between, commemorating Yuri Gagarin's first human spaceflight, six decades ago.

Salyut 1

Expedition 2

Crew of

Soyuz 11

Salyut 6

Soyuz 28 marked the first Intercosmos mission

The Czechoslovakian Vladimir Remek became the first foreign cosmonaut on board a Salyut space station