

The International *Starlab* Commercial Space Station Concept

According to latest plans the International Space Station (ISS) is planned to be discontinued in 2030 after over 20 years since its construction.

When the ISS reaches the end of its lifetime, Airbus aims to have its successor up and running: *Starlab*, the next generation space station designed to ensure a continued human presence in low-Earth orbit and a seamless transition for microgravity science and research from into a new commercial space station era. Josef Aschbacher, ESA DG, seconded Airbus at the ILA Berlin Air Show: “We must secure Europe’s access to space research facilities after the ISS decommissioning”. [4]

To achieve this, Airbus, U.S.-based Voyager Space and Japan’s Mitsubishi Corporation have formed the Starlab Space LLC international joint venture to *design, build, and operate* the Starlab commercial space station. Starlab’s goal is to serve a global customer base of space agencies, researchers and companies. [1]



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Starlab with Service Module and Solar Generator (Copyright Starlab)

Starlab - a new Ecosystem

Starlab will be placed into low earth orbit prior to the International Space Station’s decommissioning, with the capacity to conduct more than 400 experiments or technical investigations per year. It will serve as a foundation for continued international cooperation in space –establishing a space ecosystem 400 km above the Earth.

The important design feature for Starlab is its ability to reach orbit as a fully assembled functional facility on a single flight of a super-heavy launcher: the SpaceX Starship has been selected for this historic launch. This “no assembly required” strategy is in contrast to other contemporary space station concepts which need to be built over a period of years. [2]



*Working decks with Greenhouse tunnel
(Copyright Starlab)*



*Inside one of the platform work decks
(Copyright Starlab)*

At the heart of Starlab is the Airbus LOOP multi-purpose orbital module. In this design, multiple decks, connected by a central tunnel surrounded by a greenhouse, will give astronaut ample space for their science and research activities as well as for their training and personal time – including the view from large windows of unprecedented dimensions.

Designed for a crew of four, it can temporarily accommodate a maximum of up to eight astronauts, e.g. during crew rotation periods and other events. [3]

Another important design feature of Starlab will be the possibility to exchange failed external components from the inside with the help of a manipulator arm (see main image above) without time consuming EVA's. [4]

The steel-cased module of approximately eight meters both in height and in diameter offers maximum protection from the harsh space environment while ensuring a 30-year lifetime. It will also comprise a smaller Equipment Bay Module with storage, support systems and hygiene facilities, while the Service Module provides 60 kW of power and the propulsion system.

At ILA Berlin Air Show, June 2024 the Starlab consortium proudly announced the provision of more than 200 M Dollars sponsoring money from the NASA budget. For crew- and ground personnel training Airbus associated with Lufthansa Aviation. [4]

To provide a sense of “home away from home” and optimize use of the available space, the Hilton hospitality team was selected as Starlab’s partner, supporting the design and development of crew suites, communal areas and more aboard (see image above, right)

Airbus’ Expertise in Human Spaceflight

The development of Starlab benefits from Airbus’ extensive expertise in human spaceflight including the construction of the European Columbus module, a key element of the current ISS. Produced by a consortium of companies from 10 European nations under Airbus leadership, Columbus external capability was enhanced with the addition of an easy access and quick turn-around *Bartolomeo* platform – built and operated by Airbus to host external payloads with such applications as Earth observation, astrophysics, robotics and material science experimentation.

Airbus also designed and constructed five 20t Automated Transfer Vehicles (ATVs) to be used as cargo resupply vehicles for the ISS from 2008 to 2015.

In the 1980's the company constructed and delivered the European *Spacelab* laboratory which was carried 22 times with the US Space Transportation System (STS) into low earth orbit beginning in 1983 with the First Spacelab Mission (FSLP).

And in the future, the Airbus-built European Service Module (ESM) is one of the core elements of NASA's new Orion spacecraft – the U.S. spacecraft that will return humans to the Moon later this decade.

References

[1] AIRBUS Future Space Stations_ <https://www.airbus.com/en/products-services/space/in-space-infrastructure/future-space-stations#:~:text=When%20the%20International%20Space%20Station,transition%20for%20microgravity%20science%20and>

[2] AIRBUS Starlab press release_ <https://www.airbus.com/en/newsroom/press-releases/2023-11-starlab-space-station-to-boost-european-space-agency-ambitions-in>

[3] The LOOP video_ https://www.google.com/search?q=The+LOOP+multi-purpose+module&oq=The+LOOP+multi-purpose+module&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIHCAEQIRigAdIBCDIwMzRqMGo3qAIAsAIA&sourceid=chrome&ie=UTF-8#fpstate=ive&vld=cid:6c4ef1a8,vid:0vk9jle8m2Y,st:0

[4] ILA Berlin Air Show, June 5-9, 2024