



Training for space station flight operations

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Although he has long since completed his school and university education, Jérôme Campan carefully follows the presentation given by instructor Paolo De Lunardi on the projection screen. Sitting in the classroom, he makes notes every now and then, underlining text in his course handouts or highlighting an important detail on the schematic drawing in front of him. His future career requires it; his place of work will be unusual and the surroundings exciting. He will, as 'COL OC' (Operations Coordinator) at the Columbus Control Centre in Oberpfaffenhofen – just like his instructor – monitor International Space Station (ISS) operations, control activities in the European research laboratory and assist astronauts in performing their experiments.

Special training is necessary, because space is neither mundane nor ordinary. Timothy Peake and Thomas Pesquet, both selected in May 2009 as European astronauts, are in the same class and will get to know the ISS from the inside. In the meantime, they will join the Flight Control Team at Oberpfaffenhofen as EUROCOMs, and communicate with their astronaut colleagues in space from, and on behalf of, the DLR control centre. Just like Jérôme, they need special training to be able to do this.

Colleague's specialist knowledge

The path to becoming a fully certified flight controller is long and arduous. The candidate usually comes straight from university with qualifications in engineering or a natural science, but must first become acquainted with space station fundamentals. Detailed, one-week courses on the European laboratory, Columbus, and its experimental facilities follow. A training team, made up of five experienced flight controllers with varied expertise, then provides a four-week basic training course on control centre operations. Specialist training is then provided by the applicant's future colleagues, since every position requires a different knowledge base with the appropriate capabilities: a 'COL OC' must be an expert on the on-board experiments, a 'COSMO' (Columbus Stowage and Maintenance Officer) on stowage logistics, waste disposal and mechanical activities, a COL SYSTEMS on all equipment assemblies, ventilators, electronics and cooling systems, a COL DMS (Data Management System) monitors the on-board computers, a EUROCOM is responsible for communicating with the astronauts, an ESA BME (Biomedical Engineer) is responsible for medical issues and, finally, the Flight Director must manage and coordinate team activities and be able to make fast decisions, and carry overall responsibility. Only about 10 colleagues per position are in possession of this special expertise; they provide 24-hour shift support and have long since completed their training.

Upon completion of the theoretical training, the simulations begin and the candidates 'play' at being members of the Flight Control Team. The computer commands are not sent to the real space station but to a high-performance station simulator providing station data (telemetry) on the control room screens. The role of astronauts will also be played, quite often even with live camera transmissions from the Columbus model, connecting from the European Astronaut Centre in Cologne. Everything seems to be real; the only thing missing is microgravity – the substitute 'crew' is not able to float elegantly through the European laboratory.

At the end of the training, which also has other special features, including a period spent with NASA colleagues in Houston, the candidates receive an official certification from the European Space Agency (ESA).

Preparing to work at a control console

Like Jérôme, Henning Gläßer is in the course of his training: "I have been here since mid January and have learned very much about the workings of the complete station and life on board. I hope to be doing the real thing and finally start working with the actual space station early next year." Henning, like the other 11 participants in the week's training session, is a space enthusiast, and is preparing himself for COL DMS console work. "I have been fascinated by space since I was a child. After working as a system engineer on the ground system computers for the TanDEM-X satellite mission for several years, I thought it was about time to take the next step and take on a new position as a flight controller for the ISS, at the heart of manned spaceflight."

Daniela Hock, one of the trainers at the Columbus Control Centre and a member of the COL SYSTEMS group, is pleased by so much enthusiasm: "we have a really extraordinary job. All those on our team put their heart and soul into it." For her, a strenuous training week is coming to an end. Next week she will be on-console again, this time at night and possibly also over the weekend, since a colleague is off sick – and the next training block will soon begin. Space is not just hard work for astronauts.

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Training for working in the control room



Henning Gläßer and Jérôme Campan listening to a presentation about the European Columbus Laboratory on the International Space Station given by their trainer and future colleague, Paolo De Lunardi.

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View into the ISS Control Room at DLR Oberpfaffenhofen



A view of the Oberpfaffenhofen ISS control room showing the different console positions needed to monitor Columbus.

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