

Lapap MK II

Laptop Application Mark II. New look on board Columbus.



Astrium's Bremen-based software engineers have brought a 21st century 'look and feel' to the International Space Station (ISS) with the installation of new software in the Columbus module. This is providing ISS astronauts with a crew interface that boasts major improvements in terms of both user-friendliness and appearance.

On 11 February 2008, the Columbus laboratory successfully docked with the ISS. On 23 September 2009 – after 591 days of operation – the software systems in Columbus and the ground control centres were updated to incorporate a new user interface for astronauts known as **Lapap Mk II** (Laptop Application Mark II). Astronauts in the ISS' European laboratory now have access to a modern monitoring and control system with a look and feel that is unrivalled on the space station. This system allows users to monitor and control all the functions of the Columbus module. These functions – which include oxygen supply, temperature and water circulation – are displayed on the laptop screen, with readings showing the system's current status.

A major new feature of **Lapap Mk II** is the way it integrates all the functions required to operate the Columbus laboratory within just one application on a single laptop. Before the introduction of **Lapap Mk II**, two laptops working in parallel were required to carry out all operations.

The decision to implement a new display system that could be used both in the ground control centres and on board the space station was taken before the Columbus development phase had even been completed. Gerd Winkelmann, **Lapap Mk II** Project Manager, explains: "To fulfil the specific requirements on board Columbus, Astrium's Bremen team developed an integrated display system in close collaboration with astronauts, the

operations team and the test team. In addition to the functions described above, the system offers additional user features such as information to support situational awareness, direct integration of manual procedures and a variety of help and search functions."

Astronauts were particularly keen to get a better overview of the systems in Columbus to be incorporated within the new crew interface. The new system now allows the astronauts on the ISS to gauge the status of the Columbus laboratory at a glance. In the event of a malfunction or unexpected system behaviour, the measurement data displayed on screen changes colour and provides direct access to information relating to the incident.

According to Uwe Brauer, Team Leader Software Development at Astrium's Bremen site, "**Lapap Mk II**'s success was only made possible by using software processes, which facilitated close collaboration with the astronauts and flight operations experts throughout its development."

The new system was put into operation on schedule. ESA astronaut and ISS Commander Frank De Winne praised Astrium for a job well done: "**Lapap Mk II** is great! I like its ease of use (I now power-on Standard Utility Panels myself) and I also look every morning at situational awareness before doing anything else in Columbus."

