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COL-CC GROUND OPERATIONS – CHANGES OVER THE YEARS

**Abstract**

Five years ago the European Laboratory Columbus was launched and attached to the International Space Station. This is usually seen as the point when the Columbus Control Center (Col-CC) at Oberpfaffenhofen, Germany became fully operational. This is only partially true as the European Ground Segment supporting Columbus operations and European Payload Operations in the ISS in general was activated much earlier. This ground segment was operated from Col-CC starting with the intensive testing and qualification activities and later – pre-Columbus- the Col-CC already supported European User Center for their payload operations in the ISS during the so called Early Utilization Phase.

The Columbus Ground Control Team (GCT) started their work on console already for the testing phase, began the permanent on-console presence for the Early Utilization and was staggered ramped up from there to the full manpower until the Columbus activation respectively the first ATV flight, which happened nearly in parallel.

Since then the GCT itself as a team as well as the work of the GCT did undergo quite some changes to the routine standard operations phase of today. Some of the ideas of the original ground operations concept had to be revised or given up at all, some principles were proved and were elaborated further, some aspects, we never thought of before had to be added.

The structure and set-up of the team remained the same although the work was more differentiated with growing manpower. Specialization to subsystem matter experts with a dedicated focus to one subsystem per person helped to gain synergies with subsystem engineering as well as it was one of the direct answers to working permanent in shift mode with rare office days. Due to this shift constraint the communication inside the team and with supporting engineering had to be adapted. Processes and ops support tools are utilized to support this communication and the daily work. The training and certification of new personnel and the re-certification and introduction of system changes to the team has to be effective and respect the small shift working team as well.

This paper goes along this way from the beginning and describes where we are today. And this way is not finished yet as the operations go on and have to face further force to increase the efficiency of the ISS utilization and at the same time with further decrease of budget.