

Lufthansa Super Star

Cockpit Crew

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Frankfurt, 18 Jan. 2019

Ralph M Pettersen

Conniesurvivors

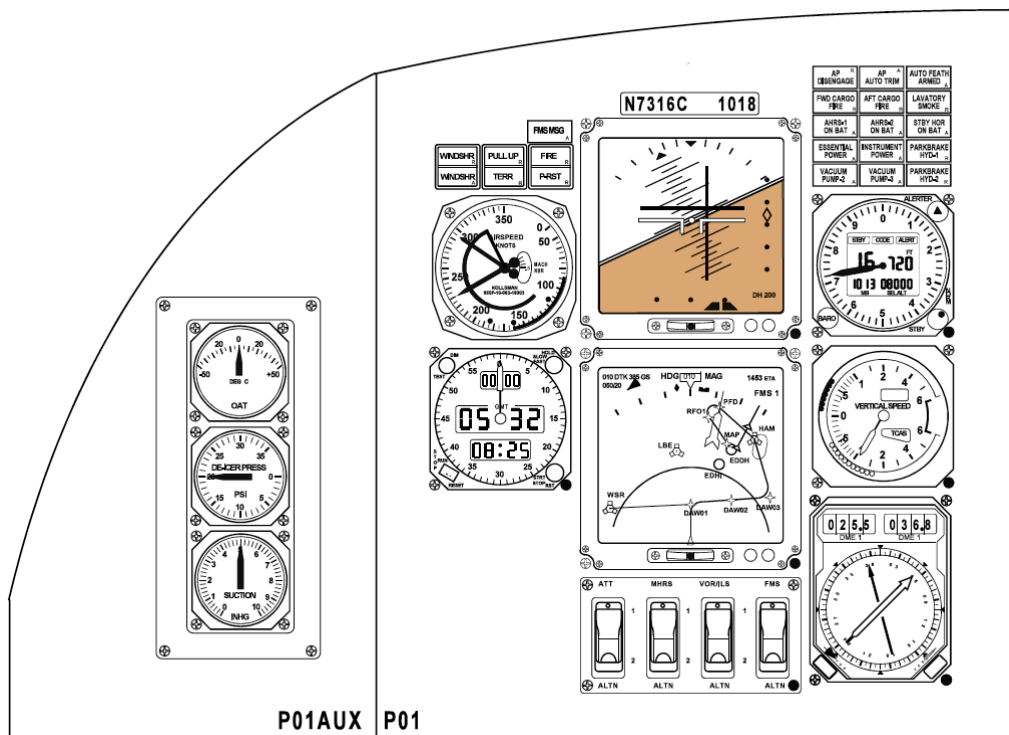
Following a recent publication on CONNIESURVIVORS about Lufthansa's Super Star which included rumours about the cockpit upgrade to „glass cockpit“ as a contributing factor for the project's current state of cancellation, the group of eight cockpit crewmembers feels the need to supply background information and present their point of view. The following information shall give an overview and help the public generate a better understanding of why and how cockpit modifications became a necessity, how they were planned and engineered during the ten-year period of reconstruction and in which way they were integrated into the overall restoration.

We hope that after reading this information you will be able to understand and agree.

Note: Whenever the term „WE“ or any of its forms is used, it is meant to represent four Flight Captains and four Flight Engineers who were designated and type-rated first crews for the Super Star and who were continuously involved in developing and adapting flight procedures, documentation and many other flight ops related issues between 2008 and 2018.

When the project started early in 2008 after the acquisition of three Lockheed Starliners in December 2007 initial ideas for future operation were anything but detailed. They ranged from occasional museum-style and demo flights through summer weekend leisure trips to full-blown airline service. It was decided, that Lufthansa's Super Star should be restored to original specification as much as possible, but also to the best industry standard of today in terms of safety, reliability, and regular commercial transport under instrument rules and airline certificate. This

decision necessitated the first step away from the tempting, puristic and favourable idea of restoring the cockpit 100% as it had been in the 1950s.



Main Instrument Panel Captain (SEPT 2008)

Why had this step to be taken? Simply because the equipment installed would not allow certification as an airliner under current FAA and EASA rules. If the cockpit layout and instrumentation would be restored as it had been, flight ops would have been restricted to basic instrument flying without any realistic chance for integration into today's traffic flow. (No Area Nav, no GPS, no Mode S Transponder, no 8,33 MHz COM spacing, no „real“ weather radar etc). As the aircraft was planned to be certified as an airline transport for commercial service the common practice with other historic aircraft to restore to original and add loose “mission equipment” like handheld GPS or tablets for flight planning and then register as “EXPERIMENTAL” quite clearly was no option. It became evident pretty soon, that at least some additional and / or upgraded equipment would be necessary. The big question was: How much and where to put it?? In addition to the more technical and legal aspects of cockpit equipment our primary concern was safety. The Lockheed Constellation series may well be the most attractive and interesting design of all airliners, however its safety record does not at all qualify for any positive ranking. Many, way too many Connies were lost in operation with work error (frequently caused by poor ergonomic design or a demanding, complicated or misleading system layout) being at least a contributing, if not the root cause. With this in mind and a clear commitment and order by the company to try to achieve the highest possible standard for Lufthansa's Super Star we had to find a compromise. And we did. Some of the interesting and very rewarding steps were relocation and rearrangement of instruments and system controls for a more logical, grouped and ergonomic layout. This layout would also

enable one crewmember to monitor critical actions/ switchings performed by his colleague. Examples for relocation and rearrangement of instruments and controls include, but are not limited to: Anti-ice controls, fire warnings and extinguishing switches, grouping of engine related instruments on the FEs panels, warning lights and master caution, and lots more. End of 2011 our cockpit layout had stabilized. (SEE PANEL (2) JAN12 and FE-Panels (5) at the end)



Main Instrument Panel Captain (JAN. 2012)

All changes, additions and modifications had been closely monitored by both the engineering department to ensure fit & function and the authorities to make sure it would be certifiable. We were quite happy with our set of panels. They consisted of mostly original instruments in modified locations and arrangement and the biggest change were two small screens in the basic flying pack for each pilot (electronic attitude indicator instead of mechanical artificial horizon and electronic Map / HSI instead of gyro compass. We admit, it was quite a step away from 100% original, however it conserved most of the original indicators. Still it would have allowed to integrate vital systems like collision avoidance (TCAS), Ground Proximity / Terrain Warning (GPWS), Area Navigation, weather radar indication in a place where you can see it without losing all other instruments (as it was in the '50s if you had a WXR at all).

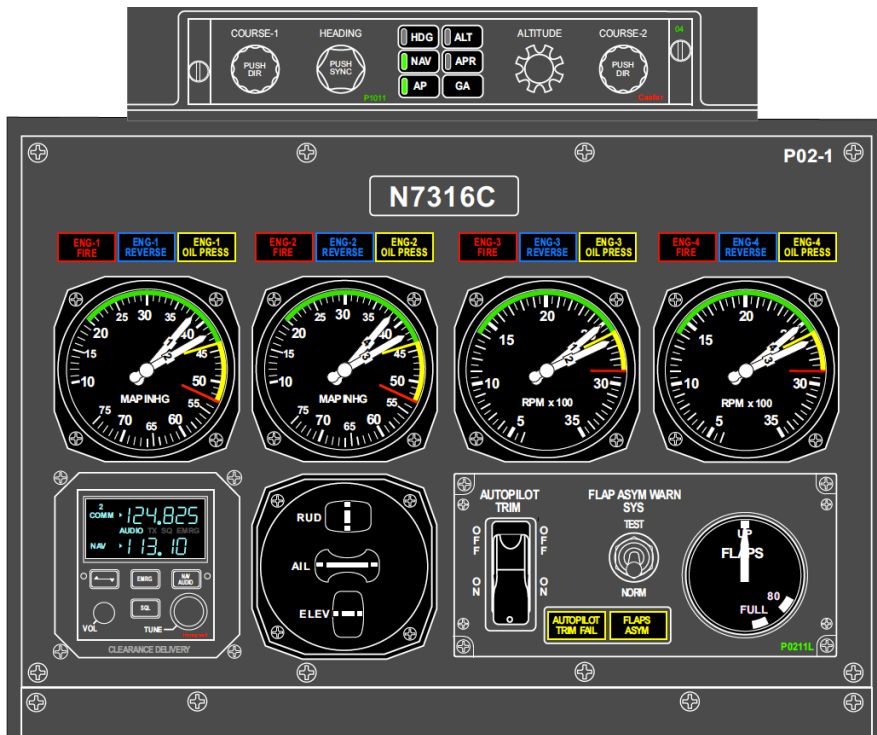
A little more than a year later, the project already being overtime, over budget and still full of questions, a major sponsorship was offered by Honeywell avionics.

Lufthansa was to receive a so-called „Honeywell Suite“, which is a complete, certified set of instruments and avionics which they had developed as retrofit for two other Lockheed models, the C 130 Hercules and the P 3 Orion. These two Lockheed models share some system design and components with the Constellation series, and Honeywell saw no major problem to get the whole set working and certified in our Connie. So, the board of directors happily agreed to take the next step, the quantum leap to glass cockpit including FMS for the pilot's stations. This decision was not simply a financial one but was supported as well by the expected improvement in reliability and spare part availability on the long run. (Projected ops time span was 20 years, meaning approx. until 2035). Had they known then what we all know by now, maybe the bosses would have refused that sponsorship, which was a real generous one if you look at it as hardware only. We are definitely not blaming Honeywell here. While the hardware came „for free“ the required engineering costs to integrate all the equipment and make it work together with what was left over old-style simply went through the roof. Every single plug, every cable and component needed to be looked at, despite the overall certified status of the retrofit for Hercules and Orion. But there was no way back. All of us would rather hesitate to say we loved the new look, but on the other hand, we did not have much of a choice, and what would YOU accept if you get the chance to fly a Constellation? Apart from the modern looks it might even prove to be an additional improvement for future operations. The next generation of crew would definitely not meet our level of proficiency and experience with analogue cockpit instrumentation. All of us would have been able to fly the Super Star with „steam gauges“, pointers, needles and mechanical dials, because we learned to fly that way more than three or four decades ago and never lost it (we were lucky enough to keep our skills active in the Junkers 52...) The Suite consisted of two BIG screens for each pilot, very much Boeing or Airbus style, eliminating all historic ambience on the forward panels except for the centre panel, which kept the RPM and MAP double pointer round dials. (SEE PANELS (3) NOV17 & (4) DEC16).



Main Instrument Panel Captain (Nov. 2017)

Anyway, we were not expected to love it, we did actually not request it, but once it was offered and decided upon, we put all our effort into it to make it work. It would mean a book of its own just to describe the literally hundreds of details that had to be taken into account, that needed engineering over and over again. (By the way, apart from the more technical questions it saw us re-writing a large number of procedures, both normal and abnormal, to reflect the new equipment).



Center Instrument Panel and Glareshield (Dec. 2016)

Allow us just a few examples of questions:

Will the screens fit into the space available? Yes, with about half an inch of space left to the aircraft skin at some spots.

Will the power supply (Connies are DC monsters) be guaranteed under all conditions? Yes, finding a solution for six generators, three inverters a ships battery and two emergency batteries took a while, but we found a solution (certifiable!!)

How much and which sections of the big screens will be obstructed by the control column and wheel? Well, more than just a bit, we had to switch the “industry standard” of PFD on the outer position to make it acceptable for us and FAA.

Is it legal to have dials and controls in side panels which are 90 degrees to one another? Possibly.

Which type of equipment cooling blowers do we need and where can we install them? In a separate rack aft of the cockpit wall.

How do bulbs, screens and LED light assemblies mix in one dimming control unit for day and night? Nicely, after some costly adjustment

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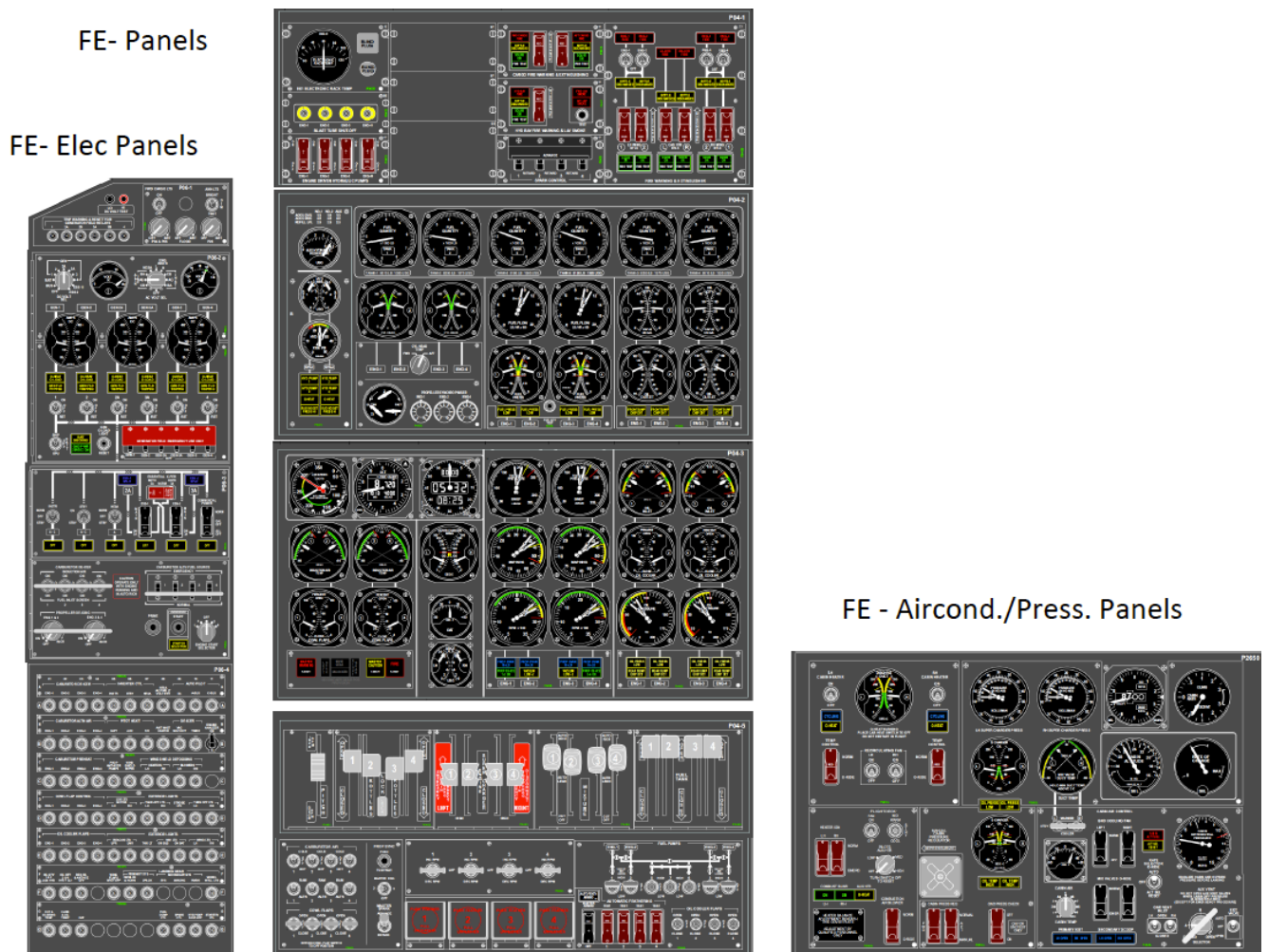
As of November 2017, when a team of former Lockheed engineers, who had proven extremely helpful, knowledgeable and supportive since 2014, production managers, cockpit crew, FAA representatives and a few more had met for two weeks, all involved had, to the best of our knowledge, solved ALL problems and answered ALL questions foreseeable to complete the aircraft, prepare it for first flight and certify it for commercial service.

Only a few months later, in March 2018, the well-known decision was made to transfer the project to Germany, the aircraft, which had been a pleasure to observe growing and nearing completion was taken apart.....

Over the years, under the steady pressure of time and budget runaway, all involved did a real great job of engineering, production, paperwork and administration, negotiation with authorities (who were generally co-operative and supportive, but proved they can be picky as well on one item or another....) coordinating work in Auburn, Maine, other U.S. locations, Hamburg and Frankfurt, and most of the hundreds of workers in all sections never dared to think it might not come to a good end.

Reasons for the project's cancellation (or the „interruption of completion“ as our chiefs prefer to call it) are multiple and some of them will remain unclear even to us as long-term insiders, but we can assure that it was not a crew's request for a glass cockpit that killed the Connie.

Thank you for your support and interest.



FE-Panels ELEC, MAIN, Aircond. and Press. (Dec.2016)