

Commander 690 Avionics Upgrade by Hawker Pacific

WHEN NZ Aerial Mapping (NZAM) decided to upgrade the avionics in their Aero Commander 690A, ZK-PVB, they turned to Hawker Pacific at Ardmore. Chief Engineer at NZAM, Les Appleford says that this decision was based on Hawker Pacific Avionics can-do approach. "Nothing was too much of a problem and the timeframe for completion was attractive. Also Harry's (Avionics Manager) expertise and knowledge of these new product upgrades helped make the decision to put the work through Hawker Pacific."

The need for an upgrade

The old (mainly Collins) equipment and wiring in PVB was starting to show its age and maintenance costs were rising as this equipment became more expensive to repair (expensive parts and/or no new parts available), often with long lead times. Wiring problems were also becoming too much of a regular issue. As well as improving reliability and reducing pilot workload, the substantial technology upgrade also provided a lot more safety features, not to mention a significant weight saving of more than 90lb.

A project partnership

Hawker Pacific Avionics Manager Harry Van Der Hoeven says that an excellent working relationship was formed with NZAM early on in the project. Initial technical and financial options were worked through with Mike Davies at NZAM, with Les Appleford taking over shortly before PVB arrived in the Hawker Pacific hangar. The project was in fact delayed several times due to extra work for PVB being requested and booked, requiring replanning of other scheduled Hawker Pacific projects. Harry explains this as being "just part of a co-operative relationship", made stronger by regular communication and "the realistic view and support from Mike and Les throughout the project".



New Zealand Aerial Mapping's Aero Commander ZK-PVB on the apron at Hawker Pacific, about to be stripped for its major avionics upgrade.



The cockpit before work began.



Mission accomplished. The new panel is loaded with Garmin equipment and provides substantial improvements for reliability, safety, and pilot workload.

The design and decision process

Mike and Harry worked on the new avionics selection and layouts for several months during the design phase of the project. Harry says that "we looked at several other options with Avidyne and Sandel but in the end the Garmin

G600 won the battle. Another bonus was that at the decision time, Garmin added Synthetic Vision Technology (SVT), a GAD43 Auto Pilot interface and compatibility with the Garmin radar in their standard package. It also helped that the G600 comes with an STC for the Aero Commander."

The new suite consists of a Garmin G600, GNS530W, GNS430W, GTX330D (Transponder), KR87 (ADF), Garmin GMA340 (Audio Panel) and Garmin GWX68 (Weather Radar). The G600 "glass cockpit" created opportunities to remove several big heavy units such as the FD-112 ADI/HSI. As well, all the Air Data, VHF, NAV, ADF, weather etc. can now be shown on one unit.

Also installed was a Terrain Awareness Systems (TAWS) with the GNS530W, Weather Radar and Jeppesen style ChartView. A Mode S Transponder will show Traffic Information Service (TIS) alerts, (not in New Zealand but NZAM operates world wide) which is another significant advantage for the type of work NZAM carries out.

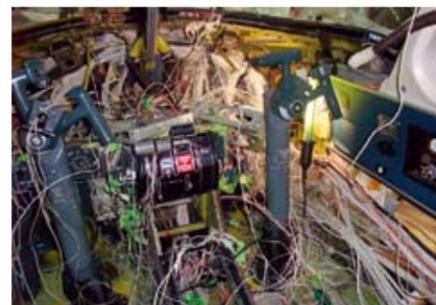
The Garmin G600, GNS530W, and GNS430W are units that have an STC and could be installed directly according to specification. The Transponder, ADF, Audio Panel, Weather Radar and AP connection to the G600 all have a local modification. These were mainly prepared by Harry with support of avionics and mechanical designers within the Hawker Pacific Group based in Cairns and Sydney. Wiring was all laser printed locally.

Installation

Installation proceeded remarkably smoothly for such a substantial refit. Harry says that no one part of the project stands out as being particularly difficult, although the sheer volume of the job offered some challenges at times. Much planning was required to keep the work flowing between sheet metal and avionics



The pilot's instrument view when the aircraft arrived at Hawker Pacific.



With panel removed, work began to also remove a great amount of redundant wiring.



Looking rearward with the cabin partially stripped. Note the camera port in the floor.



The pilot's instrument view when the aircraft returned to New Zealand Aerial Mapping.



The Hawker Pacific Avionics team. From L to R; Harry Van Der Hoeven, Rens Molenaar, Greg Jackson and Chris Rampling

requirements and particularly since it was not possible to have several people working in the cockpit or in the rear avionics bay next to each other.

A lot of careful work had to be done to remove the obsolete Collins equipment without damaging other systems that had to stay in the aircraft. The team was surprised to find a good deal of redundant wiring already in the aircraft that had to be understood and removed. That said, this was generally considered to be the easiest part of the job. Harry says the pressure bulkhead feedthroughs were a particular challenge to do and comments that the constant competition between the sheetmetal workers and the avionics crew created a few entertaining situations.

When asked what the most enjoyable part of the job was, the team is unanimous that this was the final part, seeing it all come together and perform to requirement.

The installation was completed by the Hawker Pacific avionics team at Ardmore (Greg Jackson, Chris Rampling, Rens Molenaar, supervised by Harry) with sheetmetal work by Gareth McCurdy and John Baxter. Harry also performed all testing requirements. From arrival to departure, including delays caused by a few unexpected discoveries with the existing installations, the project took the team approximately 8 weeks.

Testing and commissioning

Harry says that although switching the power on for the first time always creates a tense situation because "you never know...", the fact is the team were very confident of their work. Power is always brought in gradually however and there were no problems at all.

Testing and programming of the systems was the next challenge and the team achieved the desired results fairly quickly with the help of an extensive range of test equipment in Hawker Pacific's avionics inventory.

Following a re-weigh and compass swing, test flying by NZAM was just about to commence as this issue of KiwiFlyer went to print. The programme was expected to progress quickly and smoothly as although more systems were installed than removed, the cockpit is now a lot less cluttered and a lot more pilot friendly.

Hawker Pacific capabilities

Hawker Pacific are set up to operate as a one-stop avionics shop, supplying a comprehensive range of avionics that includes Garmin, Sandel, Avidyne, Aspen,

The Upgrade Inventory

Garmin G600

Dual 6.5" full colour displays, featuring PFD (Primary Flight Display) and MFD (Multi function Flight Display). The PFD offers synthetic vision. The MFD gives terrain information, chartview, traffic and weather display.

Garmin GNS530W TAWS

5" display, GPS, NAV (VOR/ILS), COM, TAWS B.

Garmin GNS430W

4" display, GPS, NAV (VOR/ILS), COM.

Garmin GMA340

Digital audio selector panel with integrated marker beacon system, intercom, music inputs.

Garmin GTX330D

Mode S transponder, antennae diversity, meets new and future international standards, timer and QNH altitude displays.

Bendix King KR87

ADF fully integrated with G600 PFD.

Garmin GWX68

Weather Radar antennae displays weather and ground radar images on the G600 MFD.

Collins, Bendix King (Honeywell), S-TEC and more. Their dedicated avionics and sheet metal group can undertake all design, installation and testing work in house.

Avionics Manager, Harry Van Der Hoeven explains that their special test equipment (RVSM approved Air Data tester, Aeroflex VHF/NAV/ATC/DME/TCAS/ELT) provides for fast (and therefore less expensive) trouble shooting and system testing. "And if there is any special equipment required that we do not have at Ardmore, then we can most likely organise it through one of our HP facilities. In particular, prompt and comprehensive support is always available from the Hawker Pacific team at Australian Avionics."

The team prides itself on customer communication and satisfaction and can perform the smallest jobs (for example two yearly avionics checks) to the largest (cockpit modifications, auto-pilots, and more). Hawker Pacific also have a van service operating where-ever needed in the Auckland area and can easily travel to other destinations when required.

For more information

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