

Subject: Next avionics discussion

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Hi Forrest and Lee,

Thanks for your time on Tuesday. It was another good discussion on the market and appreciate the insight.

Just to make sure we're all aligned for our next discussion on Monday, I just wanted to recap this last discussion and lay out what we are looking for on the next one.

For the aftermarket, it would appear we have over-estimated the amount of avionics upgrade activities (and likely also repair activities) that are happening at regular intervals. Based on the current discussion, we likely need to lower the amount of activity we see going forward and possibly eliminate upgrades for certain items.

I would like to further pressure test this on the next call. Just to be clear, I am not advocating that we use the current assumptions and I'm looking for whatever is the closest to reality. At the same time, for such a big change, I want to be confident that my team can explain the differences to customers and back up these new assumptions if challenged.

Joanne pointed out the Retrofit/Upgrade section of the report, and we would like to hear your thoughts/comments on where Peter's assumptions might be incorrect as I feel he had a compelling argument in the last report.

I also want to sense check this against industry data;

- Honeywell's commercial aftermarket sales, for example, are 2.6x their commercial OE and represent nearly half of all aerospace sales. This is not all avionics but their Electronics systems business accounts for over a third of revenue, so it would appear there should still be some substantial aftermarket for their avionics business;
- Similarly, Thales reported in their 2023 financials that "Order intake in the Aerospace segment totaled 5,592 million compared to €5,892 million in 2022 (-5% at constant scope and exchange rates). This decrease reflects two contrasting trends. On the one hand, **strong sales activity in aeronautics activities (avionics and in-flight entertainment (IFE)), linked to a 32% increase in order intake in the civil aftermarket** and the IFE Emirates contract mentioned above. On the other hand, while Thales Alenia Space recorded new commercial successes in observation (IRIDE, I-HAB) and navigation (Galileo), it did not record any new large orders in commercial telecommunications. At December 31, 2023, the segment's order book stood at 9.3 billion, up 2% from 2022.
 - Thales is also more than just avionics and IFE is not in scope, but it looks like there is a significant amount of aftermarket activity here
- American Airlines announced this year of a MMR upgrade for their A320s: <https://www.aerotime.aero/articles/american-airlines-airbus-upgrades-retrofit>
- Also AA with cockpit display upgrades for the A320s: <https://www.flightglobal.com/airlines/large-batch-of-american-a320s-to-receive-cockpit-display-upgrades/152925.article>
- Emirates in 2021 signed an agreement with Collins to upgrade MMR in over 200 aircraft: <https://avitrader.com/2021/11/17/emirates-signs-avionics-upgrade-agreement-with-collins-aerospace-at-dubai-air-show/>
- JAL announced in 2021 they were upgrading 767 flight displays
- Bombardier (with Collins) unveiled an upgrade option for Global 5000 and 6000 aircraft which is available for in service aircraft: <https://aviationweek.com/business-aviation/aircraft-propulsion/bombardier-adds-vision-avionics-upgrade-global-50006000>
- UPS in 2018 announced a major upgrade of LDS on 137 aircraft: <https://aviationweek.com/air-transport/ups-undertakes-major-avionics-upgrade>
- Around 2008/2009, we say Southwest upgrade their FMS: <https://www.aero-news.net>

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- Collins offers Flight display retrofit for 757/767 <https://www.collinsaerospace.com/what-we-do/industries/commercial-aviation/flight-deck/integrated-systems/flight-deck-retrofits/large-display-system>
- Collins is a L2 aviation fits these <https://l2aviation.com/what-we-do/manufacturing/l2/>
- Universal Avionics, part of Elbit Systems, offers flight deck updates for commercial aircraft <https://www.universalavionics.com/home/products/flight-displays> and business jets <https://universalavionics.com/home/products/flight-displays/insight-upgrades-for-business-jets>
- Business jet cockpit upgrades seems like a growth business <https://aviationweek.com/business-aviation/maintenance-training/whats-driving-cockpit-upgrades>
- Genesys has lots of STCs for cockpit upgrades https://genesys-aerosystems.com/products/?gad_source=1&gclid=Cj0KCQjwtsy1BhD7ARIsAHOi4xYRix_kcz6CAZeLH15ig9VXzG1t1iyutxgBn5KXjhn_4QXAGIV1VVEaAkBLEALw_wcB#pills-11-tab
- Honeywell is also active <https://aerospace.honeywell.com/us/en/products-and-services/product/hardware-and-systems/cockpit-systems-and-displays/display-unit-phase-3a-upgrade>

It would be great if you all could comment on these above.

In addition to the aftermarket discussion, I would also like to discuss other enhancements to the report. Ahead of that call, if you could please give us a quick overview of changes you have made in the Overleaf up to that point, that will help us guide the discussion.

Many thanks,

Collin

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