

Transmission

LETTERS AND ONLINE

RAF Air Cadets – more unanswered questions

I was relieved to see, in *Transmissions* in June, that others had concerns over Howard Whealdon's article⁽¹⁾. I then read AVM Andy Turner's piece on Air Cadets at 75⁽²⁾, which raised similar concerns. Nowhere is there any explanation as to why the situation occurred that led to the grounding of the Air Cadet's aircraft or what lessons have been learned. This, I would suggest, should be fundamental to an article in the publication of the body responsible for setting professional standards in aerospace. Some of the questions that it would be instructive to know answers to:

- What was serious enough to warrant, in 2014, the whole fleet of gliders to be grounded over an Easter week, which is one of the Air Cadets busiest? It must have been more than just a technical fault for the grounding to remain in force for many months. There is only a vague statement of 'technical challenges'.
- What had 22 Group RAF been doing since 2010 when they took full charge?
- Was a full audit of the fleet conducted on their transfer to the Military Register and who signed it off?
- Where is the Military Aviation Authority in all of this?

There are many more questions both technical and organisational. It is not something that should be hidden behind the Official Secrets Act. These are simple training aircraft being used by school children and flown by volunteers. There may be lessons here for the wider general aircraft community. Perhaps AVM Turner

might like to invite the Society's Airworthiness and Maintenance Group to look into it. There is certainly the expertise within the Society and he could well learn much of value. However, I also suggest that the Society needs to maintain its leading publication as one that upholds its key value of improving professional standards and not as a way of promoting single points of view.

Roger Caesley MRaEs

Buccaneer and HUDs – the saga continues

In the May edition, Francis Whitehall's letter⁽¹⁾ quite reasonably draws attention to the mis-attribution in the article *A view to a kill*⁽²⁾ of the Buccaneer HUD to BAE Systems. Unfortunately the letter gives credit for this pioneering piece of equipment to the wrong company, Ferranti Defence Systems. Ferranti certainly developed the successful Blue Parrot radar and associated systems which provided output to the head-up display, but the HUD itself – pilot's display unit and waveform generator – was developed and provided by Rank Cintel from the outset of the project in the 1960s. Rank Cintel, then based in Purley Way, Croydon, alongside the old Croydon Airport, grew from Cinema Television Ltd – TV pioneer John Logie Baird's company – better known now for top-end teletext equipment. This part of Rank Cintel was acquired in 1963 by Elliott Automation of Rochester, who continued HUD production for Buccaneer, and its development for TSR2. EA was subsequently taken over by English Electric in 1967 and eventually subsumed

Hybrid airships – a fundamental flaw?

I read the article *Airship resurrection*, in the May edition⁽¹⁾ and thought to offer some words of caution concerning hybrid airship approaches. Several times, these past 25 years or so, logistic airship initiatives have emerged only, and without exception, to fail or to perform insufficiently well to progress to an operational system. I have witnessed some of this first hand as the program manager of the Defense Advanced Research Projects Walrus program in 2006, later in industry with advanced hybrid concepts, as a government consultant to high altitude surveillance airships and lastly, as author to a book on advanced airship technology approaches. The remarkable thing about lighter-than-air technology is that nature has provided logistics airship designers with an 'anti-gravity' material within a lower band of the atmosphere. An aircraft generates lift from the wing but incurs induced drag while an airship simply floats without any fuel use. Both aircraft and airships must overcome parasite drag in forward flight but the airship net fuel usage can be less because it does not need to expend fuel to sustain a flight altitude. Additionally, should an aircraft lose engines and be imagined to come to a stop, wing lift would disappear and it would drop out of the sky; a buoyant airship, on the other hand, would continue to float in vertical flight. For



Artist's concept of the HAV Airlander hybrid airship being used for oversized cargo transport. But would a hybrid airship have difficulty hovering without forward momentum to give it lift?

a logistics airship, this is the good news but despite it, one programme after another has failed to deliver. A most important issue was identified by Thomas Brandt, CEO at the Zeppelin NT airship company in Germany, who was reported to say that, until someone solves the 'lift-ballast technical problem', logistics airships cannot be conceptually viable. By this, he was saying, if notionally 40 tons payload is removed from a logistics airship, instantly it is 40 tons lighter and unless compensatorily re-ballasted (air or cable) it will ascend very rapidly. Many recent hybrid airships claim to have solved this problem by flying the airship in a 'heavy' state, essentially like a winged aircraft, except that lift is claimed to be generated by forward speed airflow. Operating like a fixed-wing aircraft, this hybrid airship must take-off, maintain cruise flight and land, generating aerodynamic lift

all the while. Post-landing, with dynamic lift zeroed, payload may be removed and the hybrid airship will again be neutrally buoyant. However, flight like an aircraft will come with all the drag issues associated with aircraft flight and also, the key airship values of zero-speed vertical flight and hover capability are lost – there are likely to be problems with control. It is the intention of hybrid airships to employ tail surface and thrust vectoring to achieve nose-up flight configuration in the 'heavy' state. However, safety issues associated with the above, control challenges, drag and a host of other unknowns certainly pose substantial risk in the development of hybrid airships. So, not to rain on anyone's parade and I wish hybrid airship efforts well but I do not think that fundamental problems have been solved.

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into BAE Systems. I worked for Rank Cintel and EA from 1962-65, as flight trials engineer supporting the HUD, first based at RAE West Freugh with the Ferranti team developing

the Buccaneer system with a Meteor NF11; then at Lossiemouth on a developmental hybrid Buccaneer/TSR2 HUD installed in a 809 Squadron Buccaneer. Incidentally,

the now ubiquitous 'HUD' acronym took over from 'PEEP' (pilot's electronic eye level presentation) in the early 1960s.

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