Scaled Composites, LLC

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Scaled Composites has historically not released technical status information of its flight test programs while the tests are being conducted. An obvious downside of a public flight test program is that if the team feels like their learning might be taken out of context by the public that they may make decisions that do not properly address test safety instead of public perception.

Accordingly, Scaled has made no comment about the active WhiteKnightTwo flight test program. However, several recent published articles have been sufficiently inaccurate and negative that we have decided, with our customer's approval, to set the record straight and report briefly on key test results to date.

The WK2 has a fully mechanical, reversible control system with no boost or augmentation of any kind. This always represents a challenge from the standpoint of aerodynamic design, since as vehicle size increases, so do control forces. The decision to use a simple, reliable mechanical system on the WK2 is not unusual; aircraft as large as the B-36 and the DC-9 have un-boosted controls for the same reasons. Thus, the WK2 was designed to provide acceptable pilot feel forces without boosted controls. We always expected that the aerodynamics would have to be adjusted as we conducted flight tests in order to optimize the forces (not too heavy, not "overbalanced" and thus too light or unstable. Regardless of aircraft size, it is not unusual to expend a significant portion of the flight tests to optimize pilot feel forces.

The good news from the first WK2 flights is that we only needed to adjust the rudder forces. The first flight, with the gear down, also illuminated that the main landing gear wake significantly affected these forces. As a result, we have made three modifications to the rudder aerodynamic balances, along with adding vortex generators to ensure we achieved the maximum effectiveness of these changes. We concluded the rudder aerodynamic modification tasks following flight 3.

The basic stability of the WK2 about all three axes is strongly positive, and the aerodynamic design predictions match the flight test data very closely.

We have now completed a significant portion of the longitudinal center of gravity envelope expansion with excellent results. Systems development is coming along well, and we will be flying to high altitudes (above 50,000 ft) this summer.

Flight 4, conducted on 20 April was very successful, with gear retraction, cg envelope expansion, and systems evaluations. During a touch and go landing, we encountered a significant thrust asymmetry (not a fault of the engines or the design but of an asymmetric idle thrust setting) that resulted in a large yaw upon power-up for the takeoff part of the maneuver. Both rudders were lightly scraped (less than ¼ inch of material) while recovering from this asymmetry. The aircraft behaved extremely well throughout the recovery, and we thoroughly understand the root cause of the asymmetry. Only procedural changes are required to ensure we do not experience it again. This was not a function of the crosswind at landing, which was within previously demonstrated levels.

We appreciate the opportunity to set the record straight. In the mean time, do be cautious of what you read if it does not come from either our flight test team or our customer. Also, to state the obvious, you should question the motivations of a publication that reports design or flight test information that is based only on speculation.