Letter of Appreciation

We, the undersigned, have been asked by Tudor-Adrian GÎNGA, final-year student within the Babeș-Bolyai University in Cluj-Napoca, Faculty of Mathematics and Computer Science to attend a demonstration of an automatic flight control system implementation for Lockeed Martin flight simulators. Our observations regarding this system are as follows:

1. The system exposes four main functionalities: operation in automatic mode, operation in manual (protected) mode, operation in manual (unprotected) mode, overview of system and flight parameters.

2. Regarding the operation in automatic mode, three functionalities were explored: autothrottle, command pitch and command roll. All of them succeed in maintaining the desired parameters at a preset value selected by the user within a small margin (i.e. speed for autothrust, altitude/vertical speed for command pitch and heading/bank angle for command roll).

3. One notable aspect is the possibility to engage the two command channels separately, for example letting the autopilot system manage the lateral navigation, while vertical navigation is performed manually. Also to be mentioned is the promptitude of the system response when a perturbance is induced either by the user or by external factors (speed/pitch or bank angle changes).

4. Regarding the operation in manual (protected) mode, five protections were observed: pitch protection, roll protection, alfa protection, overspeed protection and maneuver protection. All protection channels functioned properly, and the prioritized activation logic ensured that the aircraft remained within the operational flight envelope throughout the test flight.

5. The most remarkable aspect is the maneuverability of the aircraft while operating close to the edge of the flight envelope, at close to critical angles of attack and/or at very low speeds. Despite these conditions, the aircraft's stability is ensured by the automatic flight control system in all performed maneuvers. Also to be mentioned is the precise handling capabilities at high pitch/bank angles, and at overloads close to limit load.

6. The operation in manual (unprotected) mode inhibits the implemented system from interfering with the simulator in an unforeseen situation. This proves the software has been implemented with a view of safety throughout the development process.

7. Regarding the overview of system and flight parameters, the way in which they are displayed and the interaction between the user and the software is very intuitive and aids in maintaining the situational awareness while the user interface controls are operated.

In conclusion we, the undersigned, appreciate the evaluated implementation of an automatic flight control system to be of significant usefulness in line operations, both due to its precision and its reliability in operation throughout the aircraft operational envelope.

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