ABSTRAK

ANALISIS KEGAGALAN UJI TERBANG *CRUISE* KE *HOVER* PADA UAV *FLYING WING* KIT GLIDER 525

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Pada era modern ini sistem *Vertical Take-Off* dan *Landing* (VTOL) merupakan salah satu inovasi yang menarik dan diminati untuk meningkatkan kinerja *Unmanned Aerial Vehicle* (UAV) agar lebih maksimal sekalipun harus melakukan misi terbang di lahan yang minim. Dalam proses implementasinya seringkali UAV mengalami kendala saat uji terbang berlangsung. Pada penelitian ini penulis hendak mendiagnosa masalah pada wahana *flying wing* kit Glider 525 dengan sistem VTOL tipe *tailsitter* yang mengalami *stall* saat uji terbang berlangsung. Untuk dapat mendiagnosa masalah dilakukan pembacaan data log (*log dataflash*) yang terdapat pada memori *flight control*. *Dataflash logs* yang diperoleh merupakan data penerbangan saat UAV melakukan uji terbang di ruang terbuka selama kurang lebih 1 menit 8 detik. Pada proses pengujian sistem VTOL, wahana melakukan 4 mode terbang. Uji terbang *take-off* dimulai saat UAV berada pada mode *hover*, kemudian melakukan transisi *hover to cruise* dan terbang level. Setelah melakukan terbang level dengan mode *cruise* wahana kembali melakukan transisi *cruise to hover*. Terjadinya *stall* saat uji terbang VTOL berlangsung disebabkan karena terdeteksinya *mechanical failures* karena kegagalan untuk menonaktifkan salah satu parameter, sehingga *throttle* berkurang saat *nose-up* dan membuat UAV terbang menukik lebih jauh lagi. Hal ini juga dipengaruhi oleh bentuk *control surface* pada *fuselage*. Pada sistem VTOL *tailsitter*, *control surface* akan diskalakan langsung dengan *throttle*. *Throttle* yang tinggi akan menghasilkan lebih sedikit gerak pada *control surface*, sedangkan *throttle* yang rendah akan menghasilkan lebih banyak gerakan.

Kata Kunci: *tailsitter, flying wing,* VTOL, *Mission Planner, dataflash logs, pitch*

ABSTRACT

ANALYSIS OF CRUISE TO HOVER FLIGHT TEST ON THE UAV FLYING WING KIT GLIDER 525

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In this modern era, the Vertical Take-Off and Landing (VTOL) system is one of the exciting innovations. It is in demand to improve the performance of Unmanned Aerial Vehicle (UAV) to be more optimal even if they have to carry out flying missions on minimal runways. In the implementation process, the UAV often encountered problems during test flights. In this study, the authors wanted to diagnose a problem with the Glider 525 flying wing kit with a VTOL tailsitter system which experienced a stall during the flight test. To have the capacity to *diagnose the problem, read the data flash logs contained in the flight control memory. The data flash logs obtained are flight data when the UAV conducts a test flight in open space for approximately 1 minute and 8 seconds. In the process of testing the VTOL system, the vehicle has 4 flight modes. The take-off test flight begins when the UAV is in hover mode, then transitions from hover to cruise and fly level. After flying level in cruise mode, the rides return to the cruise to hover transition. The occurrence of a stall during the VTOL flight test took place due to the detection of mechanical failure due to failure to deactivate one of the parameters, so that the throttle was reduced during nose-up and made the UAV fly even further. This is also influenced by the shape of the control surface on the fuselage. On a VTOL tailsitter, the control surface scales directly with the throttle. A high throttle will result in less movement of the control surfaces, while a low throttle will result in more action.*

Keywords: *tailsitter, flying wing,* VTOL*, Mission Planner, log dataflashs, pitch*