ABSTRAK

PERANCANGAN SISTEM KONTROL *LEAD COMPENSATOR* UNTUK MENGENDALIKAN *PITCH ATTITUDE AUTOPILOT* PESAWAT BOEING 747

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Pitch attitude atau sikap *pitch* merupakan masalah *longitudinal* yang dikendalikan oleh *elevator, elevator* biasanya terletak dibagian belakang pesawat sejajar dengan sayap yang juga menjadi tempat *aileron* berada. Penelitian ini menyajikan rancangan kontrol *pitch attitude* yang diperlukan untuk mengatasi karakteristik dinamis *longitudinal* dengan menggunakan pengontrol *Lead Compensator*.

Dalam merancang sistem *pitch attitude* dimulai dengan memproses data parameter gerak *longitudinal*, data tersebut digunakan untuk mencari *State space*. Setelah *state space* didapatkan, maka akan dicari *transfer function*. Setelah itu dibuatlah simulasi perancangan sistem menggunakan *root locus* dan akan distabilkan oleh *lead compensator*.

Hasil simulasi menunjukkan bahwa sistem mengalami penurunan *overshoot* berkisar antara 10.24% – 40.39%. Penurunan *settling time* berkisar antara 25% – 55%. Keterlambatan *rise time* berkisar antara 25.7% – 80%. *Steady state error* berkisar antara -112.5% – 37.5%.

Kata kunci : *Pitch attitude, state space, root locus, lead compensator*.

ABSTRACT

DESIGN OF LEAD COMPENSATOR CONTROL SYSTEM TO CONTROL THE PITCH ATTITUDE OF THE BOEING 747

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Pitch attitude is a longitudinal problem that is controlled by elevators, elevators are usually located at the rear of the plane parallel to the wing which is also where the aileron is located. This study presents the pitch attitude control design needed to overcome the longitudinal dynamic characteristics using the Lead Compensator controller.

In designing the pitch attitude system, it starts by processing longitudinal motion parameter data, the data is used to find the State space. After the state space is obtained, the transfer function will be searched. After that the system design simulation is made using the root locus and will be stabilized by the lead compensator.

Simulation results show that the system has decreased overshoot ranging from 10.24% – 40.39%. The decrease in settling time ranged from 25% – 55%. The rise time delay ranges from 25.7% – 80%. Steady state error ranges from -112.5% – 37.5%.

Keywords **:** *Pitch attitude, state space, root locus, lead compensator*