INTISARI

Penggunaan moda transportasi udara sangat membantu aktivitas manusia dalam berbagai aspek dan bidang. Salah satu manfaat yang diberikan adalah kegunaan dalam pemantauan udara dan distribusi logistik ke tempat yang sulit akses. Sulitnya akses dan infrastruktur pendukung membuat transportasi udara alternatif yang mampu mendarat pada lahan yang sempit sangat dibutuhkan agar distribusi dapat dilakukan secara merata. Teknologi airship menjawab kebutuhan tersebut dan menjadi solusi menghemat penggunaan energi fosil karena menggunakan prinsip *buoyancy*.

Penelitian ini membahas tentang perancangan airship untuk misi pemantauan udara dengan spesifikasi: *payload* 10 kg, jarak tempuh 50 km, dan kecepatan maksimum 10 m/s. Perancangan diawali dengan mencari desain konseptual, seperti: geometri selubung balon, *planform* ekor, dan gondola. Kemudiam berat dari airship beserta payload dihitung agar setimbang dengan hasil rancangan konseptual. Geometri yang sudah didapat kemudia digambar dalam tiga dimensi menggunakan aplikasi Autodesk Inventor 2018.

Hasil eksak rancangan airship menghasilkan selubung *body of revolution* dengan panjang 33.55 ft, diameter selubung 8.38 ft, ekor dengan konfigurasi *cruciform* dengan bentangan 12.75 ft, dua buah mesin dengan daya masing-masing 3.85 hp yang menggerakkan propeller pada samping gondola. Data dari perancangan: berat kotor airship 84.69 lb, berat kosong 61.29 lb, volume selubung 1236.03 ft^3, luas ekor vertikal 25.75 ft^2, dan luas ekor horizontal 28.88 ft^2.

Kata kunci: airship, misi pemantauan, perancangan airship

ABSTRACT

Use of the aerial transportation are greatly of help in various fields and aspects of human activity. Some of the benefits are in the use of air monitoring and logistic distribution to places that are difficult to access. The lack of access and supporting infrastructure have made alternative air transportation that is capable of landing on a narrow land is urgently needed so that the distribution can be done evenly. Airship technology can be used to overcome those needs and also can be a solution to save energy because it uses the principle of buoyancy.

This study discusses the design of a short range surveillance airship with the specs including: 10 kg of payload, 50 km range, and a maximum cruising speed of 10 m/s. Design begins with a conceptual design, such as: the geometry of the balloon, the tail planform, and gondola. The weight acting on the airship itself and its payload are calculated so that the results are made as reference to the conceptual design. The geometry that has been calculated drawn in three dimensions using Autodesk Inventor 2018.

Exact results of the design has concluded to a body of revolution with a length of 33.55 ft, 8.38 ft in diameter, with a cruciform tail configuration spanned 12.75 ft, two engines with respective power of 3.85 hp that drives the propeller attached to the side of the gondola. The data from the design shows: gross weightof 84.69 lb, empty operational weight of 61.29 lb, balloon volume of 1236.03 ft^3, vertical tail surface of 25.75 ft^2, and horizontal tail surface of 28.88 ft^2.

Keywords: airship, surveillance, airship design