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Analysis Of Aerial Photography With Drone Type Fixed Wing In Kotabaru, Lampung

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Abstract
There are two types of drones namely quadcopter type and fixed wing type. This research uses fixed wing type drones. The advantage of this type of drone is being able to suppress the drone so that the speed is higher. Drones are pilotless aircraft controlled by pilots from the mainland. The process of controlling a drone with a robotic system, and with a computer system. The first process to fly a drone is to assemble a drone, then calibrate the drones on the mainland. Drones are flown at a certain height. Drone are airplane without pilot, drone uses robotic system. after being flown the drone is set to a certain height and the results of aerial photographs can be seen by the camera from the mainland. This fixed wing can fly 30 minutes and the load 1 kg. This fixed wing can mapping 20 to 50 hectares area until fly 100 m to 200 m from land. The aerial photographs in Kotabaru produce excellent aerial photographs that can help mapping the local government in the Kotabaru region.

Keywords: Drone, UAV, Mapping, Photography, Lampung

1. Introduction

Drones are of two types, quadcopter and fixed wing. The advantages of a fixed wing system can lift the load with its wings, so that the drones can lift faster as shown Fig.1

Fig. 1. Fixed Wing
(Jason et al., 2016)

Components of UAV Kolibri 08V2 aircraft manufacture as figure 2. The production process is 7 phase wing and aileron working phase, fuselage, vertical tail stabilizer and rudder, horizontal tail stabilizer and elevator; landing gear system; assembly control system and installation of engine. Flight test process starts from preflight, take off, cruising to landing for about three minutes. The results obtained at take off is the total runway distance taken by the UAV Kolibri 08V2 platform from the groundrun as shown in Figure 3, rotate, until the airbone is about 22.5 meters as shown in Figure 4. (Pratomo et al., 2013)

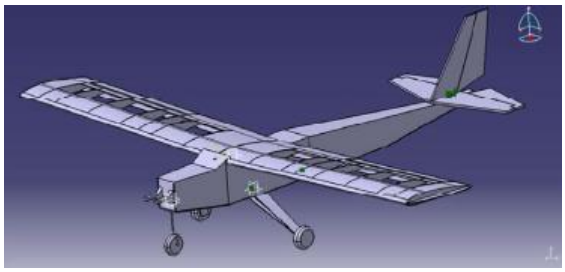

Fig.2. Three-Dimensional Models Aircraft Colibri 08V2
(Pratomo et al., 2013)

Fig.3 Ground run to rotate
(Pratomo et al., 2013)

Fig 4. Airbone is about 22.5 meter
(Pratomo et al., 2013)

Photos and dimensions of the avionics eagle on images and images are Avionic Eagle UAVs as figure 6. (Purwanto, 2012)

Fig. 6. UAV Type Fixed Wing
(Purwanto, 2012)

UAV (Unmanned Aerial Vehicle) is an unmanned aerial vehicle controlled by or without a pilot (autopilot). Autopilot is a system that can guide the flying motion of the aircraft without any interference from humans. An autopilot system is an aircraft motion control system that regulates the movement of an aircraft to stay on a predetermined path so that the aircraft can move from place to place safely automatically. Figure 7 is the image to see the surface of the aircraft type fixed wing. To overcome these problems, a control system is created in the landing process to keep the UAV resistant to the disturbance. Control system in question is with the design of PID-Fuzzy controller. The use of PID-Fuzzy algorithm is done to adjust the pitch angle of the plane during the landing process. With the design of PID-Fuzzy controller, the simulation result of airplane design gives an output value near the setpoint value given with error value of 5%. Dimension of elang avionik as figure 8. (Mulyani et al., 2012)

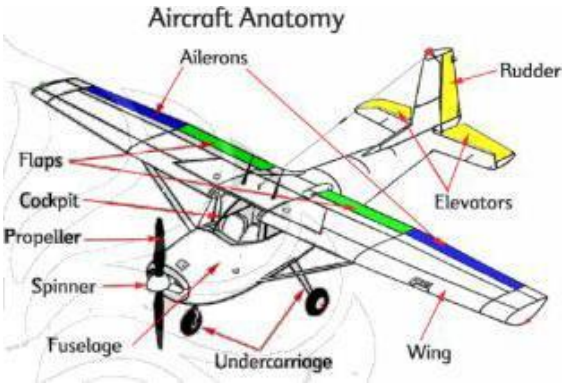

Fig. 7 The image surface of the aircraft type fixed wing Elang Avionik
(Mulyani et al., 2012)

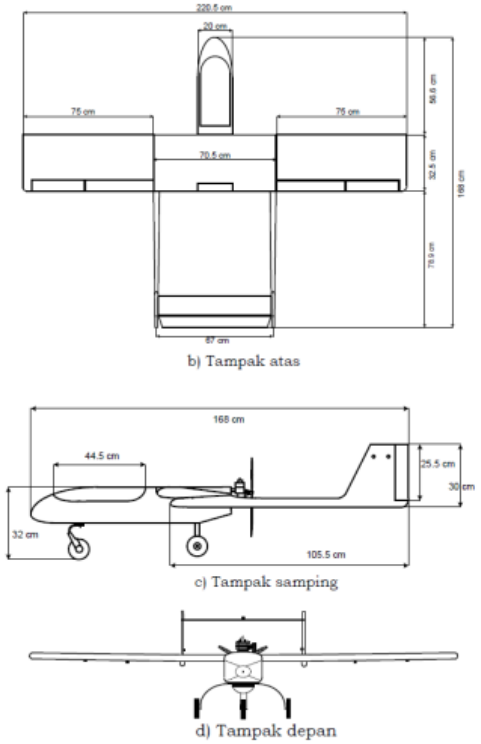

Fig 8. Dimention of drone Elang Avionik
(Mulyani et al., 2012)

Fixed wing aircraft type Sirius I as in Figure Drone type fixed wing named Sirius made by Oltmanss comes from Germany Equipped with Panasonic Lumix GF digital camera system 1. Battery system based on aircraft model made of Elapor. It has a wingspan of 163 cm and a length of 120 cm, weighs 2.3 kg without charge. At a ground speed of 45-85 km / h, the flight with a battery of 550 grams one to 40 minutes as figure 9. (Oltmanns et al., 2012)

Fig. 9. Fxed wing named Sirius made by Oltmanss
(Oltmanns et al., 2012)

The use of drone mapping techniques has several advantages, one of which is to be more accurate in calculating the existing plants and assets. When compared to the land census method, which is to mobilize workers to calculate the number of trees in each block of the garden, the activity may last for one month. When using a drone as an air mapping vehicle, the time required is relatively short for 7500 hectares of land, requiring only 3 days of data collection (aerial imagery) effective, and interpretation for 1 week as shown in Figure 10 (Aerogeosurvey, 2017)

Fig.10 Drone type fixed wing for minning area mapping
(Aerogeosurvey, 2017)

A method for characterizing magnetic interference is demonstrated for a 21 kg, 3.7 m wingspan, 6 kW electric fixed-wing UAS purposely built for magnetic surveying. (Tuck, 2018) Autopilot system use of AVR-XMEGA microcontroller is good choice to main control device or On Board Data Handling as shown Fig.11. (Wibowo, *et all*, 2015)

Fig. 11. Autopilot system
(Wibowo, *et all*, 2015)

The purpose of community service in Sukoreno Village, Sentolo Sub-district, Kulonprogo Regency, is to make geospatial information system of agricultural land with an area of about 10 hectare, (Muryamto, et al., 2016)

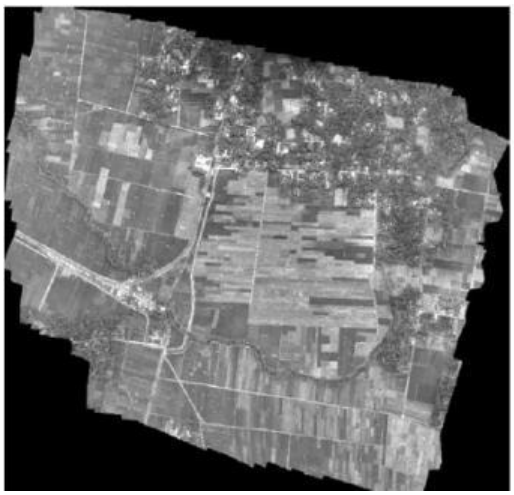

Fig.12. Results of aerial photographs with a height of 350 meters in the area of Sentolo, Kulonprogo
(Muryamto, et al., 2016)

The development of increasing technology and spatial information will be a challenge for the providers of spatial information to obtain spatial information swiftly. One way to obtain spatial information is the aerial photograph using drones or UAVs as hown Figure 13. (Octory and Cahyono, 2015)

Fig. 13. Himage flight path
(Octory and Cahyono, 2015)

2. Research Methode

A. Location: The area around Kotabaru, Lampung as shown in Figure 14. Location Racing Plane Competition in Kotabaru, Lampung.

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Fig. 14. Location Racing Plane Competition in Kotabaru, Lampung

B. Instrument : Drone type fixed wing can operation flying in the sky until 30 minutes for an area 20 hectare until 50 hectare with height 100 to 200 metres. Drone can use 4000 mAh battery, load 1 kg, drone creates aerial photo mapping picture.

C. Methode:

1) Preparation of drone assembly
2) Planning the drone altitude flying 1500 m above ground levelDrone testing on land for security and check flight.
3) Turn on the remote controller first, then turn on the plane.
4) Carry out Compass Calibration.
5) Make the flight out in the open, so it can landing and take off easily without the canopy tree and so forth.
6) When taking off, put your plane on a flat plane, and backtrack a few steps until you are completely unreachable by the propeller planeflick carefully.
7) Make sure your attention remains focused on the drones, and make sure the drones stay within range of your remote signals note also the surroundings, such as wind or rainlanding on a flat surface. Flowchart this research can shown as figure 15.

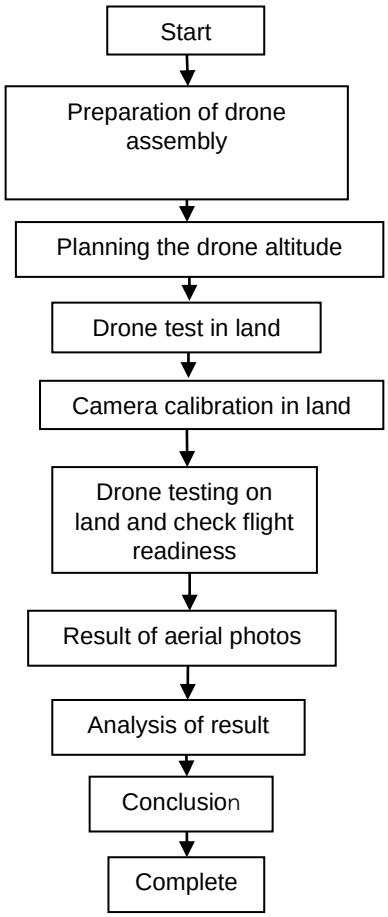

Fig.15 Research flow diagram

3. RESULT AND DISCUSSION

The unmanned aircraft used by the aeronautical cadets of high school aerospace technology is a type of fixed wing. This fixed wing drone can penetrate the height of 100 meters to 200 meters and drone can fly for 30 minutes, while payload drones fixed wing is 1 kg. Drone type fixed wing has battery 4000 mAH. Drone type fixed wing can operate 20 hectare to 50 hectare. Figure 16 Dimention of dronefixedwing, Figure 17 here is a cadet image with a drone type fixed wing in preparing for drone contest aeromodelling in Kotabaru, Lampung. Figure 18 Plan of implementation of Indonesia Flying Robot Contest Contest in Kotaru Lampung, Figure 19Results Of Fixed Wing Air Photos In Lampung Area, and Figure 20.The Field Of Kotabaru, Lampung.

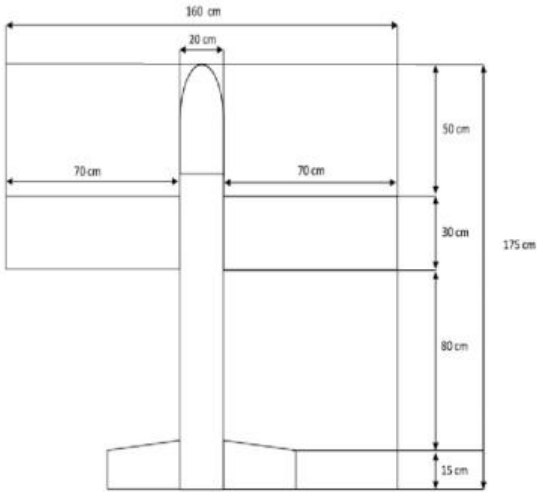

Fig 16. Dimention of drone fixed wing

Fig. 17. A cadet image with a drone type fixed wing in preparing for drone contest aeromodelling in Kotabaru, Lampung

Fig 18. Plan of implementation of Indonesia Flying Robot Contest Contest in Kotaru Lampung

Fig. 19. Results Of Fixed Wing Air Photos In Kotabaru, Lampung

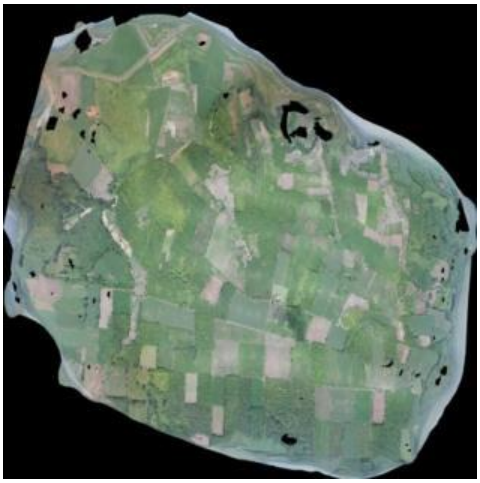

Fig.20. The Field Of Kotabaru, Lampung

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