NaDES 2016
24-25 April 2016
INSTUN

Nasfarazi Mohd Din
OUTLINE

- Available UAS Solutions
- Mid Range UAS Experience (*from the local perspective*)
- Thank you
ABOUT US

- Geospatial Centric Company
- Over 20 years experience as a company
- Technical Experience
- Wholly own by Bumiputera
- www.antaragrafik.com (info@antaragrafik.com)
- End to End Geospatial Mapping Solutions
END TO END GEOSPATIAL MAPPING SOLUTIONS

Data Acquisition → Processing → Sharing → Delivering/Dissemination
Dragon 50

The Dragon 50 from SwissDrones combines safe and autonomous operation with exceptional performance and flexibility. The Dragon 50 can even be combined with the Leica RCD30, the only medium-format airborne camera that provides co-registered multispectral four-band imagery in RGB and near-infrared.

LEARN MORE

Aibot X6 Hexacopter

The Aibot X6 is a lightweight and innovative six-propeller design that is easily controlled with a tablet PC and gets incredible results. Discover them for yourself using virtual control video goggles and get the best view possible of your aerial imagery.

LEARN MORE
THE ROTARY EDGE

- Hovering Capabilities
- Maneuverability
- Accuracy
- Versatility
- Safety
<table>
<thead>
<tr>
<th><strong>Housing</strong></th>
<th>CFRP (Carbon Fiber Reinforced Polymer)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight</strong></td>
<td>7.5 lbs</td>
</tr>
<tr>
<td><strong>Take-off Weight</strong></td>
<td>ca. 10 - 14.5 lbs</td>
</tr>
<tr>
<td></td>
<td>(dependent on payload and batteries)</td>
</tr>
<tr>
<td><strong>Flying Height</strong></td>
<td>up to 3,280' over over ground</td>
</tr>
<tr>
<td></td>
<td>under ideal conditions, max. 9,842' ASL</td>
</tr>
<tr>
<td><strong>Flight Time</strong></td>
<td>up to 30 min</td>
</tr>
<tr>
<td><strong>Operating</strong></td>
<td>-4 - 104°F</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>remote control, tablet-PC (optional)</td>
</tr>
<tr>
<td></td>
<td>or automatic way point flight</td>
</tr>
<tr>
<td><strong>Power Source</strong></td>
<td>lithium-polymer 5,000 - 10,000 mA</td>
</tr>
<tr>
<td>Spec</td>
<td>Value</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Rotor System</td>
<td>Flettner Double Rotor System</td>
</tr>
<tr>
<td>Rotor Diameter</td>
<td>2 x 2, 262’</td>
</tr>
<tr>
<td>Engine</td>
<td>Jet Engine Jakadołsky</td>
</tr>
<tr>
<td>Fuel</td>
<td>Diesel / Jet A1</td>
</tr>
<tr>
<td>Empty Weight</td>
<td>77 lbs</td>
</tr>
<tr>
<td>Payload</td>
<td>110 lbs</td>
</tr>
<tr>
<td>MTOW</td>
<td>187 lbs</td>
</tr>
<tr>
<td>Max Fuel Capacity</td>
<td>13 L + Additional tank with 20 L</td>
</tr>
<tr>
<td>Max Time of Flight</td>
<td>1 hr (main tank), 4 hrs (add. tanks)</td>
</tr>
<tr>
<td>Max Speed</td>
<td>91 ft/sec</td>
</tr>
<tr>
<td>Service Ceiling</td>
<td>up to 6,213 mi MSL (ISA conditions)</td>
</tr>
<tr>
<td>#</td>
<td>Description</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Suitability of Area Coverage</td>
</tr>
<tr>
<td>2</td>
<td>Flight Time</td>
</tr>
<tr>
<td>3</td>
<td>Maximum Take off Weight</td>
</tr>
<tr>
<td>4</td>
<td>Sensors</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Service Ceiling</td>
</tr>
<tr>
<td>6</td>
<td>More Info:</td>
</tr>
</tbody>
</table>
The Dragon 50 integrates the proven benefits of the Leica RCD30 medium format camera into a UAS design that offers superior payload capacity, prolonged endurance, stable flight patterns and a high degree of safety, making it the ideal solution for complex mapping jobs in harsh environmental conditions.
FOCUS: GETTING IT AIRBORNE...

Disclaimer:

*Information provided are case by case basis and each process and documentation requirements may varies, the information provided here is not comprehensive, it however best to consult the mandated agencies for better references and advise.*
PROCESSES

- UAS
  - ACQUISITION
  - REGISTRATION
  - MAINTENANCE

- CREW
  - TRAINING
  - CERTIFICATION
UAS

Initiation and Continued Air Worthiness

DCA / DGTA (UAV) – Maintenance Management Plan

Acquisition

End User Statement

Export Permit

Registration

DCA / DGTA (UAV)

MCMC – (Comm)

Initiation and Continued Air Worthiness

DCA / DGTA (UAV) – Maintenance Management Plan
END USER STATEMENT

- Required by the Manufacturer
  - End User Details
  - Products (eg: Sensor)
  - Country of Ultimate Destination
- Statement of Use
  - Aerial Mapping
  - Aerial Surveying
  - Aerial Photogrammetry
  - Others
- Declaration of restricted applications
  - Nuclear Weapons
  - Missiles
  - Etc
END USER STATEMENT - SAMPLE

5a. Nuclear Weapons
(a) Designing, developing, fabrication or testing nuclear weapons or nuclear explosive devices; or
(b) Designing, construction, fabrication or operating the following facilities, or components for such facilities:
   (1) Facilities for the chemical processing of irradiated special nuclear or source material;
   (2) Facilities for the production of heavy water;
   (3) Facilities for the separation of isotopes of special nuclear material; or
   (4) Facilities for the fabrication of nuclear reactor fuel containing plutonium.
  \[\text{\(\Gamma\) YES} \quad \text{\(\Gamma\) NO}\]

5b. Missiles
Designing, developing, production of or using rocket systems, space launch vehicles, and sounding rockets, or unmanned air vehicle systems (including cruise missile systems, target drones and reconnaissance drones), which are capable of delivering at least 500 kilograms payload to a range of at least 300 kilometers.
  \[\text{\(\Gamma\) YES} \quad \text{\(\Gamma\) NO}\]

5c. Chemical and Biological Weapons
Designing, developing, production, stockpiling or using chemical or biological weapons, or precursors.
  \[\text{\(\Gamma\) YES} \quad \text{\(\Gamma\) NO}\]

5d. Illegal drug production and trafficking
Crop growing, production, warehousing, and distribution of illegal drugs.
  \[\text{\(\Gamma\) YES} \quad \text{\(\Gamma\) NO}\]

6. Declaration:
We acknowledge and declare that we will not be using Leica Geosystems’ products (i.e. hardware, software, technical data etc.) either directly or indirectly in the design, development, fabrication, modification, assistance or support of nuclear, chemical, biological weapons or missile technology; NOR for the operation of facilities associated with the aforementioned; NOR in the training of personnel in these activities.

Furthermore, we will not use Leica Geosystems’ products in any of these endeavors and will only use the products for the purpose stated in section 4 above.
UAS REGISTRATION

- UAV above 20kg

5. REQUIREMENTS

5.1 Any civil UAV of more than 20 kg (MTOW) will be required to undergo a DCA Airworthiness certification process.

5.2 Any civil UAV shall, under Malaysia aviation safety legislation, comply with civil requirements. This does not apply to police, customs or other similar services.

5.3 A civil UAV registered in Malaysia must have either a certificate of airworthiness or a permit to fly issued by DCA Malaysia.

5.4 An exception to this requirement is small aircraft. For the purposes of this AIC, a small aircraft is defined as any unmanned aircraft weighing not more than 20 kg. However, the small aircraft has a prohibition on flight in controlled airspace or within an aerodrome traffic zone, unless in either case the permission of the air traffic control unit has been obtained, a normal maximum height of 400 feet above the surface and a prohibition on flight for the purposes of aerial work.

5.5 These rules for ‘small aircraft’ have been principally developed for the purpose of regulating recreational model aircraft flying.

5.6 Operators of aircraft, irrespective of the purposes for which they fly, are required to hold adequate levels of insurance in order to meet their liabilities in the event of accident.
<table>
<thead>
<tr>
<th>Percentage Ratio</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>D</td>
</tr>
<tr>
<td>0.5</td>
<td>D</td>
</tr>
<tr>
<td>0.5</td>
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<td>0.5</td>
<td>D</td>
</tr>
<tr>
<td>0.5</td>
<td>D</td>
</tr>
</tbody>
</table>

**Direction (D)**
MCMC REGISTRATION

- Video Link
- Control Link
- To ensure there’s no signal overlapping
UAS MAINTENANCE & CONTINUED AIRWORTHINESS

- Ensuring that the UAS are air worthy, safe and operating within the specification
- Documentations & SOP
  - Daily Inspection Check List
  - Turbine overhaul
  - Injection System
  - Rotor Blade Replacement
  - Geor oil
  - etc
CREW

Training

Flying School  Operator Training

Certification
REQUIREMENTS

- UAV Commander
- UAV Pilot

7.1.1 **UAV Commander.** Every flight of a UAV must be under the command of a UAV – c. The UAV - c is a qualified person (minimum qualification – hold a valid Private Pilot’s License (PPL) Malaysia) who is overall in charge of, and responsible for, a particular UAV flight or flights. The UAV-c must meet the training, qualifications, proficiency and currency requirements stated in the approved Flight Operations Manual of the operating organization.

The UAV Commander can:

(a) be in direct control of the vehicle by remote controls; or
(b) co-located with the UAV-p; or
(c) monitoring the state and progress of the vehicle at the flight deck location in the Ground Control Station (GCS).

7.1.2 **UAV Pilot.** The UAV-p is a qualified person (minimum qualification – hold a valid Private Pilot’s License (PPL) Malaysia) who is actively exercising remote control of the non-autonomous UAV flight, or monitoring an autonomous UAV flight. The UAV-p may or may not be the UAV - c. The UAV-p must meet the training, qualifications, proficiency and currency requirements stated in the approved Flight Operations Manual of the operating organization.
## APPROVED FLYING TRAINING ORGANISATION (AFTO)

<table>
<thead>
<tr>
<th>AFTO NAME</th>
<th>Malaysian Flying Academy</th>
</tr>
</thead>
</table>
| APPROVED COURSES | 1. Private Pilot (Aeroplane) Licence.  
2. Commercial Pilot (Aeroplane) Licence.  
4. Assistant Flying Instructor Rating (Aeroplane).  
5. Flying Instructor Rating (Aeroplane). |
| ADDRESS | Malaysian Flying Academy Sdn Bhd  
No.13617-1, Off Lapangan Terbang Batu Berendam  
75350 Malacca  
Malacca, Malaysia |
| WEBSITE | [http://www.mfa.edu.my](http://www.mfa.edu.my) |
| CONTACT | Ms. Chua Airin  
Registrar, Enquiry Desk  
Tel : +606 3174026 or +606 3174834  
Fax : +606 3174362 |
| E-MAIL | [enquiries@mfa.edu.my](mailto:enquiries@mfa.edu.my) |
SYLLABUS – GROUND SCHOOL

- Air Law
- Navigation / Meteorology
- Aircraft General
- VFR Communication
- Human Performance & Limitation
- Radio Telephony
OPERATOR TRAINING

- Model Specifics
  - Safety Requirements
  - Safety Equipment's
  - Ground Handling
  - Transporting UAV
  - Pre Flight Check
  - Post Flight Check
- GCS Software / Hardware
- Flight Control

Safety Requirements & Groundhandling

Written by Dennis Menick
04-08-2015
CONCLUSION

- It’s a long process to legally fly about UAV above 20kg, however….. Once it is done, the possibilities are endless.
MENTIONS (SPECIAL THANKS):

- Bahagian Geospatial Pertahanan (BGSP) JUPEM
- Bahagian Pemetaan Topografi Semenanjung JUPEM
- Suruhanjaya Komunikasi dan Multimedia Malaysia (SKMM)
- Directorate General Technical Airworthiness
- Federal Office of Civil Aviation (Switzerland)
- Department of Civil Aviation (Malaysia)
- Malaysian Flying Academy
- Hexagon Geosystem
- SwissDrone Operating AG