



Chengdu, China

中国成都

DRONE ENABLE/2

10 to 14 September 2018

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Aircraft Registration Network (ARN) for Drones

A Recap

Rapid advancements in technology and emergence of small UA (drones) led to:

39th Assembly Resolution – ICAO to take a leading role in registration & identification

At Drone Enable 1, details were presented on the ICAO intent to:

- Bring standardization to the process and dataset for the registration of drones
- Provide States with their own custom electronic drone registration application
- Develop a system of connected registries to provide inter-State operability features

TARGET set for Drone Enable 2: a functional registration prototype

A Reminder: What do States Need?

Due to rapidly increasing numbers of drone operations around the world, it is increasingly difficult for States to maintain satisfactory safety oversight.

Two primary elements to this oversight:

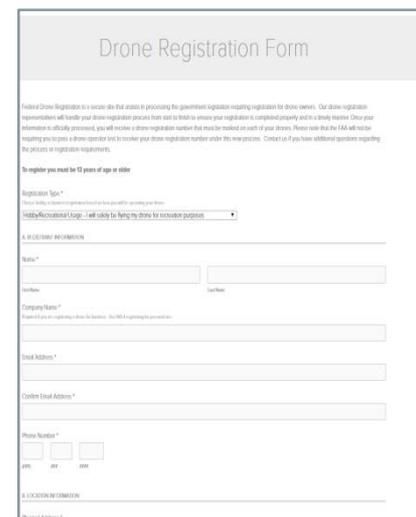
1. **Law Enforcement:** When infractions of established rules occur, States must ensure that enforcement actions can be taken against operators.
2. **UAS Traffic Management (UTM):** Establishing a reliable system to ensure manned aircraft and unmanned aircraft will be able to share existing airspace safely.

The Current Situation with States

How things stand with respect to drone (UA) registration systems:

- Majority of States without any registration system or process at all
- States with registration systems having a hard time keeping up with a rapidly evolving industry
- Lack of consistency between States
- No ability to identify or contact operators
- No ability to track drones across borders

The ICAO Aircraft Registration Network (ARN) begins to address ALL of these challenges!



The image shows a screenshot of a 'Drone Registration Form'. The form includes a title 'Drone Registration Form' and a detailed introductory paragraph explaining the purpose of the registration system. Below the text, there are several input fields and sections:

- A dropdown menu for 'Registration Type' with a note: 'This field is required and must be selected to ensure your registration is completed properly and is timely received. Check your information to officially process, you will receive a drone registration number that must be marked on each of your drones. Please note that the FAA will not be issuing you a drone in drone registration until you receive your drone registration number under the new process. Contact us if you have additional questions regarding the process or registration requirements.'
- A note: 'The register you must be 13 years of age or older.'
- A section titled 'PERSONAL INFORMATION' containing fields for 'Name*', 'Address*', 'City*', and 'Country*'. There are also fields for 'First Name' and 'Last Name'.
- A section titled 'Company Name*' with a note: 'Required only if you are registering a drone for business. Use ICAO 3-letter country code.'
- A field for 'Email Address*'. Below it is a field for 'Confirm Email Address*'. There are also fields for 'Phone Number*' with sub-fields for 'area', 'number', and 'extension'.
- A section titled 'LOCATION OF OPERATIONS' with a field for 'Place of Address*'. There are also fields for 'City*' and 'Country*'.

The Aircraft Registration Network (ARN)

A digital system *connecting* member State registries to establish a global aircraft dataset (certified & uncertified) for the provision of services and features to benefit the global aviation community.

Participation is optional, but States must have an ***ARN compliant system*** in order to benefit from:

- Standardized application data fields in accordance with ICAO recommendations
- CAST/ICAO classification for drone manufacturers and models
- Features that facilitate international operations for both States and Operators
- Third party applications developed around the global information dataset

Custom ARN Applications for States

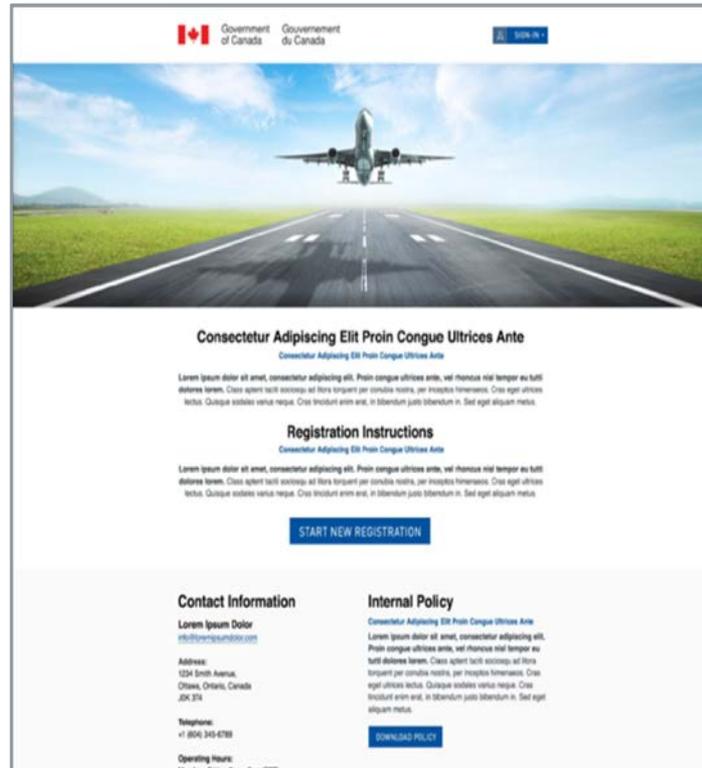
ICAO can provide a turnkey web-based solution for individual States to manage their day-to-day drone registration activities

(States that do not want an ARN application can work with ICAO to establish a technical interface with existing systems.)

Features available to States for <u>FREE</u>	Features available on <u>Cost Recovery</u> basis
✓ Establish an end-to-end electronic process	✓ Payment processing module
✓ Receive registration applications	✓ Delegated operator functionality
✓ Process an application (approve/deny)	✓ International operator dataset access
✓ Issue a certificate	✓ Electronic State Permit for foreign ops
✓ Search based on single data fields (e.g. UID)	<i>More to come...</i>
<i>More to come...</i>	



State Homepage and Form Creation



My Registration Website

Please Click on the Homepage tab in order to begin creating your registration website



FUTURELAND

Welcome to FUTURELAND's registration website for remote piloted/automated flight aircrafts

This website provides a platform to: Register remote piloted/ automated flight aircrafts and "drones", Report an update of contact information from certificate of registration, Transfer aircraft ownership, Communicate with FutureLand experts regarding aircraft registration

Registration Instructions

Please follow the registration instructions outlined in the coming steps. As you progress through the application process you will be required to provide the following categories of information: Aircraft Category, Registration Type, Aircraft Information, Titleholder Information. Based on your registration process, you may be prompted to provide additional aircraft / titleholder information. Please complete the registration form and make sure to have the following documents:

Proof of ownership; Statement of construction from plans or raw materials; A photo of the aircraft's ID plate; Name of manufacturer; Model and serial number

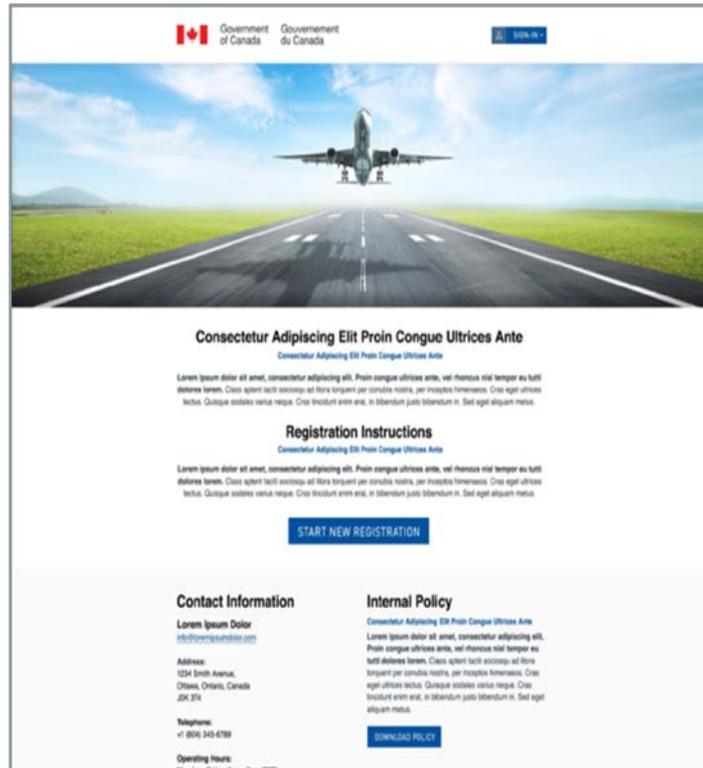
[START NEW REGISTRATION](#)

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State User Registration Review & Approval



My Registration Website

Form Category	Form Type	Model	Customer	Serial #	Modified On	Status	
Unmanned	Informal	SOLO	contactus@futurelandreg.com	Name: NO SERIES EXISTS, ICAO designator: ZZZZ, Popular Name: No Popular Name, Make: 3D ROBOTICS	9/5/2018 9:30:01 AM	Pending	<div data-bbox="1400 658 1572 758"> View Submission Export to PDF </div>

Additional Feature Development

The ARN environment will allow States to keep abreast of this rapidly evolving industry, as ICAO continues development in line with the needs of the community.

For example, the intent is to establish features that *go beyond* basic registration and identification. Consider these two scenarios:

- 1. Delegated Operators**
- 2. International Operations**

States with their own custom ARN applications will be able to benefit from this functionality more readily

Scenario 1: Delegated Operators

Consider this situation:

Owner of the drone (title holder) \neq Operator of the drone (custody and control)

ARN Feature:

The ability to transfer the ‘responsibility for operations’ between owners and operators registered in the ARN.

Benefit:

State maintains oversight of operators, even if they are not the owners, as their required details are always accessible in the ARN.



Custody and Control Transfer

Registration: XB12345 / DJI Mavic Pro

Legal disclaimer where by the title holder transfers Custody and Control with operation responsibility

Small UA Title Holder:

- Title Holder has Custody and Control
- Custody and Control Transferred
- Only activate during this time range



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Drone Registry



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Small UA Title Holder:

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Transfer only active during this time range:

Start time:

End time:

Custody and Control transferred to:

Name of individual/entity:

eMail address:

C & C Xfer Status

In Progress

Accepted



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Drone Registry



Custody and Control Transfer

Registration: XB12345 / DJI Mavic Pro

Small UA Title Holder:

John Doe

Legal disclaimer where by the title holder transfers Custody and Control with operation responsibility

- Title Holder has Custody and Control
- Custody and Control Transferred

Transfer only active during this time range:

Start time:

Mon 03/09/2018



05:00



End time:

Sun 16/09/2018



18:00



Custody and Control transferred to:

Name of individual/entity:

Steve Smith

eMail address:

ssmith@email.com

Submit

C & C Xfer Status

In Progress

Accepted



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Submit

C & C Xfer Status

In Progress

Accepted

Scenario 2: International Operations

Consider this situation:

An Operator registered in State A intends to Operate their drone in State B

ARN Features:

1. The ability for operators to 'opt in' to the provision of pertinent details to ARN compliant States
2. The ability for operators to apply to individual States for a specific foreign operators permit

Benefits for States:

1. States are able to identify 'foreign' drones, with access to ARN 'international' dataset
2. States are able to define specific requirements to grant permission to foreign operators

Scenario 2: International Operations

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ARN Features:

1. The ability for operators to 'opt in' to the provision of pertinent details to ARN compliant States
2. The ability for operators to apply to individual States for a specific foreign operators permit

Benefits for Operators:

1. Operators can be more informed of individual State rules and regulations
2. International operations can be achieved without undue burden for the drone owner/operator



International Operations

Registration: XB12345 / DJI Mavic Pro

- De-activate International Operations
- Activate International Operations
 - Only activate during this time range



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Drone Registry



International Operations

Registration: XB12345 / DJI Mavic Pro

De-activate International Operations

Activate International Operations

Only activate during this time range:

Start time:

End time:

Link to drone regulations in States :

Apply for operating permit
(Participating States)



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Drone Registry



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Drone Registry



International Operations

Registration: XB12345 / DJI Mavic Pro

De-activate International Operations

Activate International Operations

Only activate during this time range:

Start time:

End time:

Link to drone regulations in States :

Apply for operating permit
(Participating States)

State B
State C
Eutopia



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Drone Registry



International Operations Foreign Operators Permit: EUTOPIA

Registration: XB12345 / DJI Mavic Pro

Dates requested for small UA operations permit:

From: ▼

To: ▼

Local Contact Information

Name of Hotel:

Address:

Mobile Telephone Number:

Submit

The Next Steps

1. Contact us if you would like to trial a drone ARN application in your State
2. Reach out with ideas and recommendations for other features and functionality
3. Continue progress on the implementation of Unique Identifier (UID)
4. Looking for industry support prior to Drone Enable 3...



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Send comments to: aircraftregistry@icao.int

THANK YOU