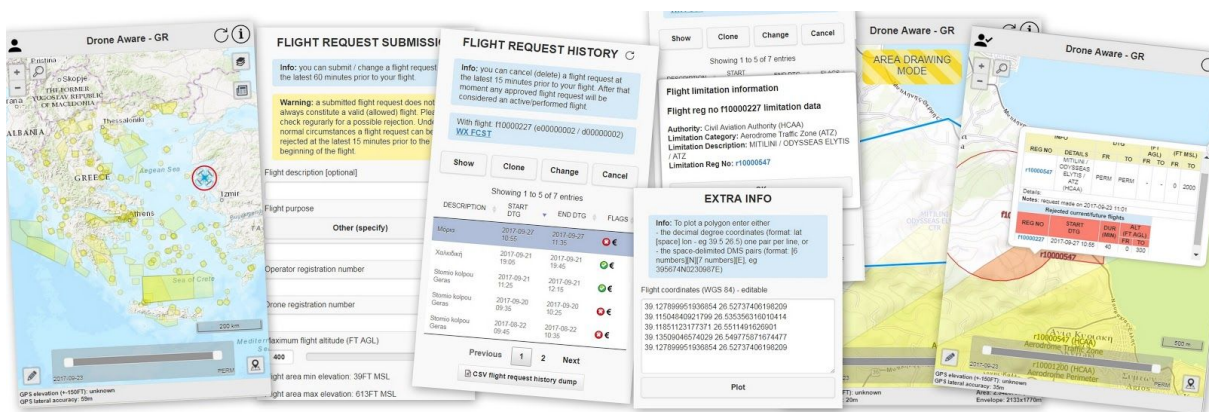# Drone Aware - GR
Hellenic Civil Aviation Authority

Quick Start Guide

DRONE
AWARE

Version 2.0
2017-06-05

TABLE OF CONTENTS

APPLICATION CONVENTIONS

General conventions

1. Each user has a maximum session timeout of 30 minutes.
2. Login is not needed in order to see the flight limitations without submitting a flight request.
3. While using this application you will come across 5 different kinds of registration numbers. Regarding these registration numbers the following apply:
   a. The person logging in the system is the drone pilot, not the owner or the operator, except if they are the same person. Thus, in order to login, a pilot registration number is needed, along with a password. This data is supplied during the registration process (UAS - https://uas.hcaa.gr).
   b. In order to submit a flight request the user (drone pilot) must also supply the operator and drone registration number (thus, in total, 3 registration numbers). Each registration number starts with a lower-case letter. All registration numbers are supplied during the registration process (UAS - https://uas.hcaa.gr).
   c. Pilot registration number (starts with the letter "p"): each pilot must have received this along with the rest of the login data. A pilot can perform only one flight within a specific time-frame.
   NOTE: in case you have registered in UAS as a company (eg because your drone will be used professionally by the company) you will not have received a pilot registration number. The person who will fly the drone for you must have registered in UAS as an individual and you must use his pilot registration number to file the request.
   d. Operator / Drone registration number (starting with "e" / "d"): each flight must be conducted by an operator, being either an individual, or a company. Each operator can operate one or more drones. A drone may belong to one or more operators. An operator/drone relationship has a start and an end date. A flight can be conducted only by an existing and valid (at the specific flight date) operator-drone pair. A specific drone cannot appear in different flights having overlapping timeframes. A specific operator can do so.
   e. Authority / Area (ie limitations, warnings, permission fragments) registration number (starting with "a" / "r"): areas are provided by certain authorities. Each area covers a certain space laterally and vertically and lasts for a specific period of time (or is of permanent nature - PERM).
4. Regardless of user input all DAGR-related data (map layers, tables) are automatically updated every 5 minutes.
5. All questions/bug reports/feature requests should be sent to: **info.dagr@hcaa.gr**

Data conventions

1. All dates and times are represented according to ISO8601 as follows: YYYY-MM-DD (date) and HH:mm (time). A combined date and time field is called DTG (Date-Time Group).
2. Time values are considered local (Athens time).
3. Sunrise/Sunset data used for flight validation correspond to the civil twilight of the centroid of the geometry (polygon/circle) drawn.
4. Flight and limitation data, both on the map and in tables, are filtered according to the date slider on the bottom of the map page.

Flight conventions

1. Flights intersecting a limitation area will be automatically rejected and may only be allowed after an evaluation by the limitations's authority.
2. Flights intersecting a warning area require user own discretion as to whether they can take place or not.
3. Flights wholly included in a permission area are automatically allowed.
4. A flight request can be submitted at the latest 60 minutes prior to the beginning of the flight.
5. A flight request can be changed at the latest 60 minutes prior to the beginning of the flight.
6. A flight request can be cancelled at the latest 15 minutes prior to to the beginning of the flight.
7. A flight request status can normally be changed by an authority at the latest 15 minutes prior to the beginning of the flight. **Note: under special circumstances a flight request can be rejected ("grounded flight") <u>even if the flight has already started</u>. Always check your flight request status just prior to the beginning of the flight. Also, if the duration of your flight exceeds 30 minutes always check your flight request status every half hour during the flight.**
8. All non-cancelled and non-rejected flight requests are considered flown flights.
9. Requests for night flights cannot be submitted.
10. **CAUTION: you, the pilot, are solely responsible to fly up to the requested Above Ground Level (AGL) altitude at all times, following the flight area elevation. Failure to do so may result in a conflict with a manned flight!**

Map display conventions

1. Active / Future limitation areas are coloured light yellow.
2. Active / Future warning areas are coloured light purple.
3. Active / Future permission areas are coloured light green.
4. Allowed flight areas are coloured with a blue outline.
5. Rejected flight areas are coloured with a red outline.
6. A rejected flight area's rejected / allowed part is coloured red / blue respectively.
7. Expired flight areas are coloured with a grey outline.

Table conventions

1. Expired tabular data (eg past flights) are coloured grey.

APPLICATION QUICK START

GENERAL

1. The application has been tested on the latest (June 2018) versions of the following browsers:
   a. Desktop: Google Chrome, Mozilla Firefox.
   b. Mobile: Google Chrome, Mozilla Firefox, Apple Safari.
2. After loading the application web page for the first time from a mobile device it is advised to add it to your homescreen in order to make it look like a native mobile app.
3. This is an example of the map page:
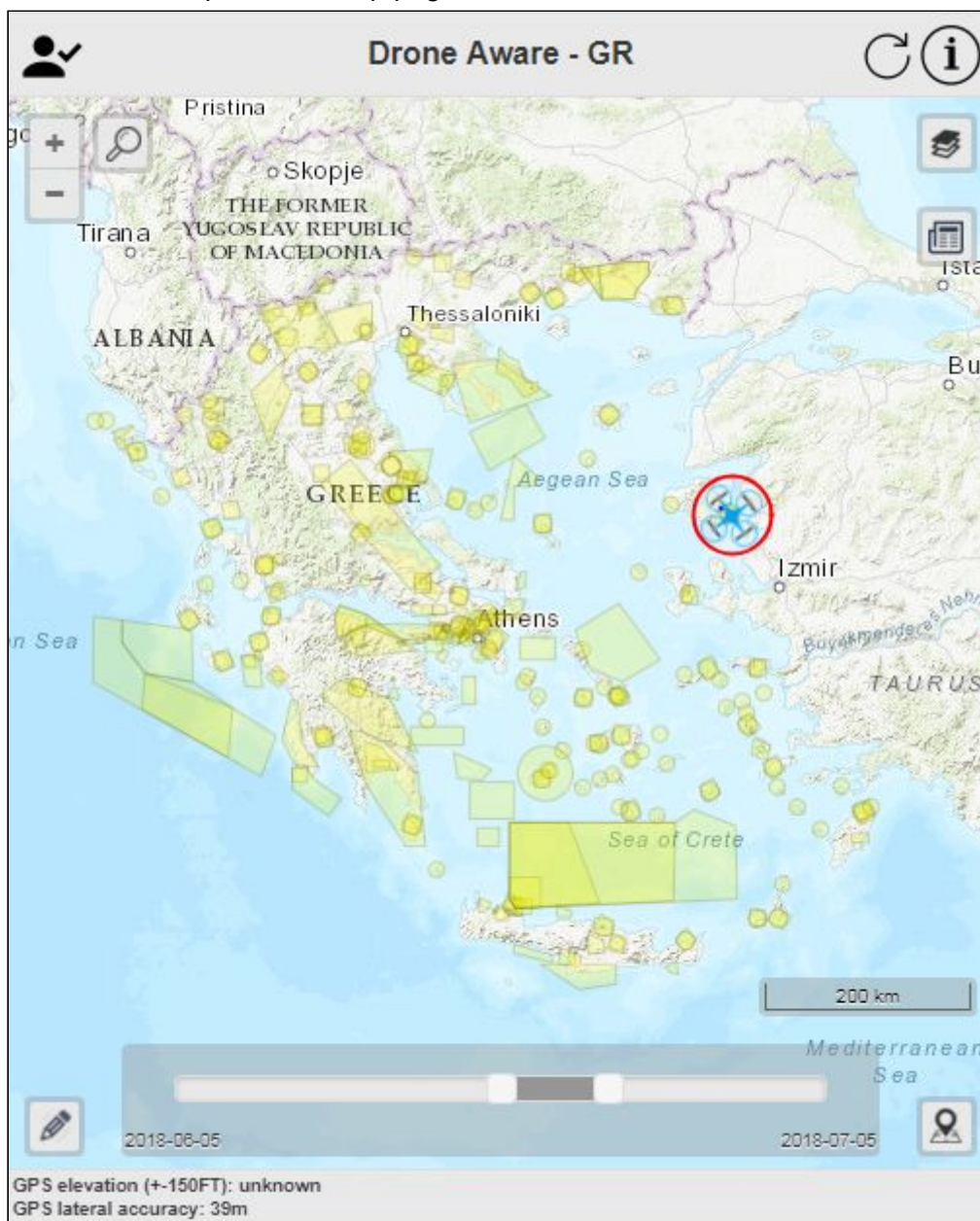
PILOT LOGIN PAGE

In order to login click/tap on the "Sign in" icon and enter your credentials.

After you have logged-in a small tick will be displayed on the map page next to the "Sign in" icon.
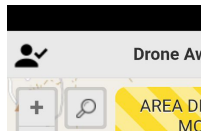
To logout press/tap the "Sign in" icon again to be transferred to the login page.

MAP PAGE

The map has two distinct modes of operation:
1. **Navigation/query mode**: in this mode the user can navigate or click/tap to request information about the queryable features present.
2. **Drawing mode**: in this mode the user can draw a polygon or a circle, reset (delete) or change the drawing.

MAP NAVIGATION / QUERY MODE

1. Zoom-in/out either by clicking/tapping on the corresponding button or by double clicking/tapping on the map.
2. Search: reverse geocoding tool for Greece or coordinate location (lat/lon decimal degrees, eg "39.06 26.60" or DDMMSS, eg "390336N0263600E").
3. Geolocation: if geolocation information is allowed by the user then each tap on the geolocation button will recenter and zoom to the user's location as provided by the browser.
4. If the user clicks on the map, any existing information of the (queryable) layers at the specific point will be displayed in an appropriately centered popup box.
5. Both the flight and limitation layers may be filtered using the date slider at the bottom of the page. This date slider is applied to all tabular data as well.
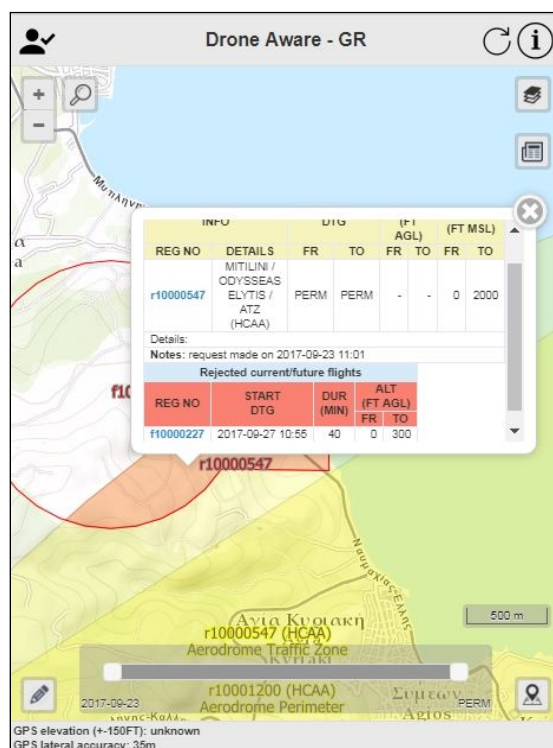
MAP DRAWING MODE

This mode is indicated by a yellow "AREA DRAWING MODE" sign at the top of the map and provides some of the functionality of the navigation/query mode, as well as the following:

1. The user can select whether a polygon (P) or a circle (C) should be drawn by clicking/tapping on the "Polygon/Circle toggle" button located just above the pencil icon.
2. The current drawing can be deleted/reset by clicking/tapping on the "Clear polygon/circle" button (dustbin icon) located by the right side of the "Polygon/Circle toggle" button.
3. Polygon drawing
   a. To draw a polygon the user must click/tap on the map to create its vertices and either double click/tap to close the polygon or click/tap the first vertex to close the polygon.
   b. To change a polygon the user can drag its vertices or sides.
   c. A vertex can be deleted by clicking/tapping on it.
   d. Each polygon must be simple. If not the user will be informed and the polygon must be corrected to continue.
4. Circle drawing
   a. To draw a circle the user must click/tap for its center and then click/tap to indicate its radius.
   b. To change the circle the user must delete it first.
5. To draw an area consisting of a circle and a polygon draw the circle first, then click/tap on the polygon/circle toggle and then click on the drawing to change the polygonized circle vertices.
6. While in drawing mode the user can see the drawn area measurement and its envelope in the footer (bottom right).
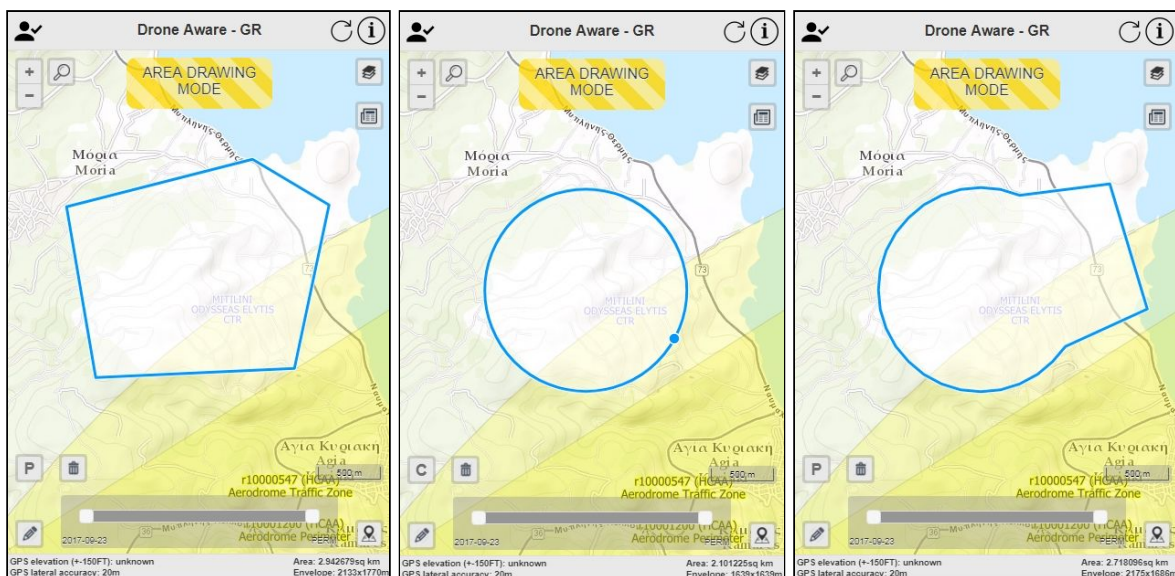
FLIGHT MANAGER PAGE

The Flight Manager page shows all of the pilot's flight requests (FLIGHT REQUEST HISTORY) and provides the functionality to submit/change/cancel a flight request (FLIGHT REQUEST SUBMISSION).

FLIGHT HISTORY

a) This part provides a table with details of the date-filtered (past and/or future) submitted flight requests. The most important part of this table is the FLAGS column, which shows whether the flight request:

- Is allowed by all authorities ✅
- Is rejected / under evaluation by at least one authority ❌
- Violates an LG area ⚠️
- Violates a heliport area 🅷
- Is of professional nature €
- Is flagged with a message by an authority ✉️

For rejected flight requests the user can be informed about the limitation details by clicking/tapping on the red icon. Each limitation is linked to its bounding box on the map page. In case the flight conflicts with other flights (from other pilots), a conflict icon ♛ will be displayed, along with the number of the other conflicting flights. If for some reason one of the pilot/operator/drone have been invalidated a red INVALID sign will be displayed. No action can take place unless the triplet is valid. For each future flight request taking place in the next week the user can get a detailed weather forecast by clicking the WX FCST link next to the flight request registration number in the "With flight:" line.
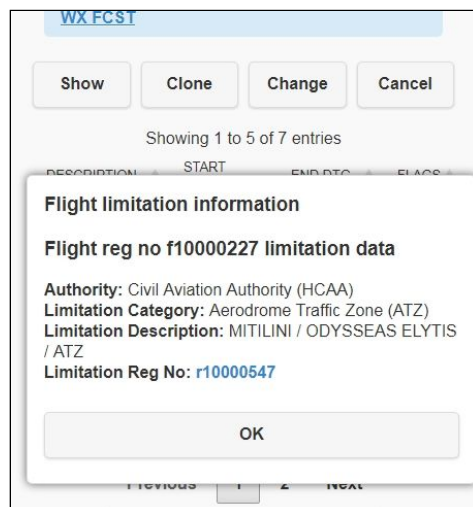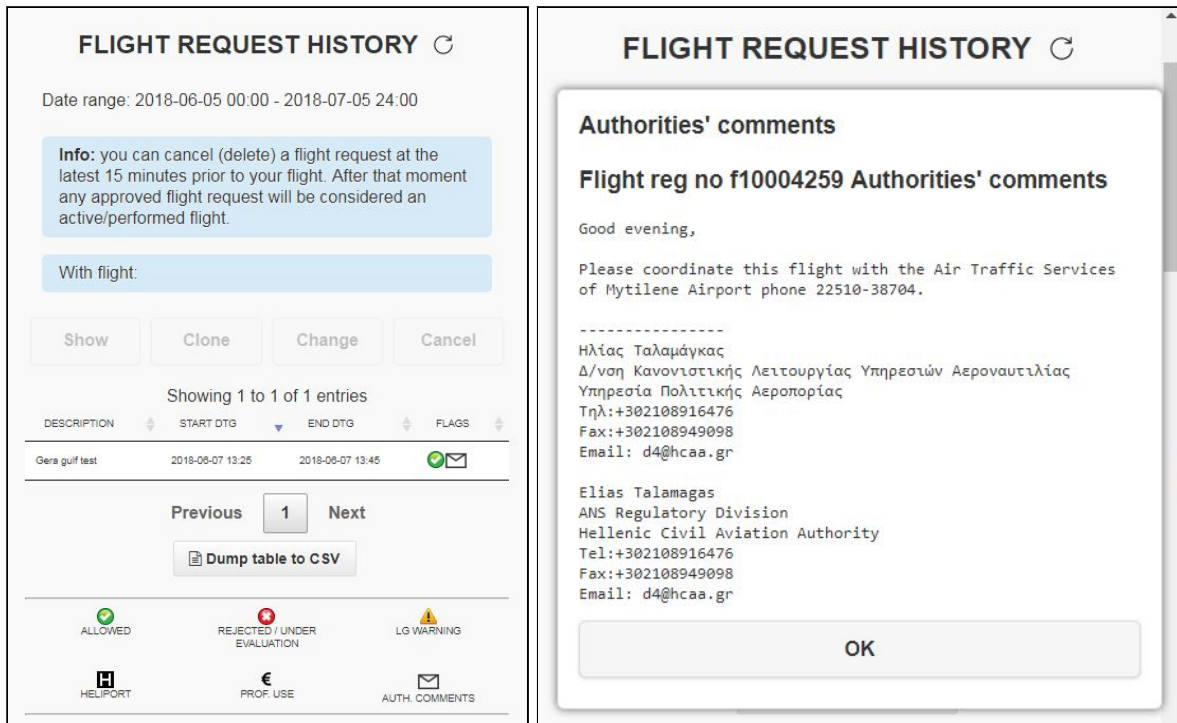
b) The buttons surrounding the table do the following:
   ○ Show: shows the selected flight on the map.
   ○ Clone: all flight request data, apart from the flight beginning date/time, is copied to a new flight request and the flight is shown on the map in MAP DRAWING mode.
   ○ Change: the user can change (edit) a flight request, provided it conforms to the timing conventions of this tutorial. While in this mode the flight request table is inaccessible.
   ○ Cancel: cancels a flight request (timing conventions also apply).
   ○ Download a CSV dump of all flights.

FLIGHT REQUEST SUBMISSION

a) In this part the pilot can submit a new flight request or change an already submitted one (if it isn't too late to do so).

b) Flight description: in case a flight request violates a limitation this field can provide useful information to the authority regarding its evaluation.

c) Flight purpose: needed for statistics.

d) Operator and Drone registration number: these are needed in order to check whether the operator-drone tuple exists and is valid on the flight's date.

e) Maximum flight altitude: AGL altitude range from 100 to 400FT AGL, in 100FT steps.

f) Flight start date and time is the local Athens date/time of the flight, in 5-minute steps.

g) Flight duration: 5-minute step range from 5 to 120 minutes.

h) Apart from the above the application computes the civil sunrise/sunset times as explained above.

FLIGHT REQUEST SUBMISSION

Info: you can submit / change a flight request at the latest 60 minutes prior to your flight.

Warning: a submitted flight request does not always constitute a valid (allowed) flight. Please check regurarly for a possible rejection. Under normal circumstances a flight request can be rejected at the latest 15 minutes prior to the beginning of the flight.

Flight description [optional]

Flight purpose

Other (specify)

Operator registration number

Drone registration number

Maximum flight altitude (FT AGL)

400

Flight area min elevation: 39FT MSL
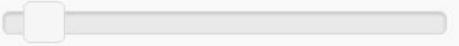
Flight area max elevation: 613FT MSL

Flight start date and time (local time)

Saturday, September 23, 2017

Flight area & date-based civil dawn: 06:34, civil dusk: 19:37

11:00

Flight duration (5 - 120')

20

Flight end date and time (local time)

Saturday, September 23, 2017

11:00

Submit

ADDITIONAL INFO

a) Whenever the user plots a polygon/circle on the map its coordinates are displayed in the editable "Flight coordinates (WGS 84)" textarea.

b) The user can also draw a polygon by manually providing its coordinates in the textarea and pressing/tapping the Plot button.

c) The coordinates must comply with the following rules:

    i) Decimal degrees format: one pair per line (format: lat [space] lon - eg 39.5 26.5).

    ii) DMS format: space-delimited DMS pairs (format: [6 numbers][N][7 numbers][E], eg 395674N0230987E).

EXTRA INFO

Info: To plot a polygon enter either
- the decimal degree coordinates (format: lat [space] lon - eg 39.5 26.5) one pair per line, or
- the space-delimited DMS pairs (format: [6 numbers][N][7 numbers][E], eg 395674N0230987E)

Flight coordinates (WGS 84) - editable

```
39.127899951936854 26.52737406198209
39.11504840921799 26.535356316010414
39.11851123177371 26.5511491626901
39.13509046574029 26.549775871674477
39.127899951936854 26.52737406198209
```

Plot

APPENDIX

GENERAL DATA SOURCES

In this application the following data sources are being used:

1) HELLAS AIS: Greek aeronautical data.
2) Global Multi-resolution Terrain Elevation Data 2010 (GMTED2010): 7.5-arc-second elevation data (RMSE: 26-30m).
3) Aviation Digital Data Service (ADDS): METARs/TAFs.

METARs are downloaded every 5 minutes. METAR symbology looks like a station model illustration. The wind barbs show wind speed (the little lines are 5kt, the larger 10kt and the filled triangles 50kt) and direction, while the circle shows cloud coverage at the station: FEW (1-2/8), SCT (3-4/8), BCN (5-7/8), OVC (8/8) are 1/4, 1/2, 3/4 and 4/4 filled respectively (no fill for SKC/CLR/NSC/NCD and CAVOK - although the latter depends only in part on cloud coverage...).

The barb/circle color indicates station conditions as shown in the following table.

STATION CONDITIONS COLOR TABLE				
Visibility (V)	**and/or**	**Ceiling (C)**	**Conditions**	**Color**
V < 800m	or	C < 200ft	VIIFR	
800m ≤ V < 1500m	or	200ft ≤ C < 500ft	IIFR	
1500m ≤ V< 5000m	or	500ft ≤ C < 1000ft	IFR	
5000m ≤ V< 8000m	or	1000ft ≤ C < 3000ft	MVFR	
V ≥ 8000m	and	C ≥ 3000ft	VFR	
Classification impossible			UNK	
where VIIFR: very intensive IFR and IIFR: intensive IFR				
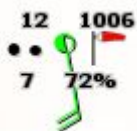
The barb is surrounded by up to 6 other symbol groups as shown in the following example (southerly wind @ 20kt with gusts, temperature 12°C, dew point 7°C, QNH 1006mb, relative humidity 72% and light rain at the station).
The station phenomena permutations are in fact very specific and can be found in ICAO Annex 3, Meteorological Services for International Air Navigation.

4) US Department of State Detailed (2013) Large Scale International Boundaries (LSIB): Coastline/boundary data.

DAGR-RELATED DATA SOURCES

DAGR is a dynamic system and new operational data (ie limitations, warnings, permission fragments) are entered/updated regularly. The user can see which Authority has entered any data in the system as well as detailed info on the data itself (along with a data-entry timestamp) in the "App info page".

CAUTION: Article 19.3 of the <u>Greek UAS Regulation</u> (shown below) lists the area categories where a special permission is needed from the relevant Authority in order to operate any UAS. Irrespective of the data shown in DAGR, the user is ultimately responsible to take all necessary measures in order to ensure that the flight will not violate any of those areas or that a special permission is obtained, via the software or otherwise.

3. Prohibited Areas for UAS flights

In order to conduct a UAS flight within the areas listed below, a special permission from the HCAA / Air Navigation Services Regulatory Division is required, along with any competent Civil Service Entity (e.g. Ministry of Culture for archaeological sites, the Ministry of Defense for military facilities etc.):

3.1 In prohibited, restricted, dangerous and reserved areas as mentioned in every form of aeronautical publications of HCAA.

3.2 At a height of more than four hundred feet from the surface of the ground or water.

3.3 Less than eight kilometers - five nautical miles (8km -5nm) from a controlled aerodrome, airfield and heliport.

3.4 Above, close to or within any kind of military areas / Installations and vital infrastructures.

3.5 Within military or civil airports and heliports

3.6 Above or near schools, hospitals, establishments, detention facilities

3.7 Above or near constructions of common utilities

3.8 Above or close to archaeological sites

3.9 Environmental protection areas

Instructions for filing requests and related electronic forms will be available in the HCAA website.

CHANGELOG

S/N	DATE	REASON	AFFECTED PAGES	CHANGED BY
1	170220	Version 1.0		DS
2	170422	Inserted "Table conventions". Amended "Flight history" (a). Inserted "Changelog". Version 1.1	4 9 13	DS
3	170428	Amended "Map navigation / Query mode" (2). Amended "Map drawing mode" (6). Amended "Flight history" (b.v). Version 1.2	7 8 9	DS
4	170518	Amended "Map navigation / Query mode" (2). Amended "Flight manager / Extra Info" (c). Amended "Appendix / Data sources" (3). Version 1.3	7 11 12	DS
5	170524	Amended "Flight conventions" (1, 3). Amended "Flight manager / Flight history" (a). Version 1.4	4 9	DS
6	170620	Amended "Application conventions / Data conventions" (removed 4). Amended "Application conventions / Flight conventions" (10). Version 1.5	3 4	DS
7	170701	Inserted "Data sources / DAGR-related data sources". Version 1.6	13	DS
8	170714	Amended "Flight manager / Flight history" (added WX FCST). Version 1.7	9	DS
9	170802	Amended "Flight manager / Flight history" (added conflicting flights). Version 1.8	9	DS
10	170923	Small changes. New images. Version 1.9	-	DS
11	170927	Amended "General conventions" (2.b).	3	DS

		Minor text changes. Version 1.10	-	
12	180605	Document page numbering update. Document changes <mark style="background:yellow">highlighted yellow</mark>, important notes <mark style="background:red">highlighted red</mark>. Inserted "Data conventions" (4). Inserted "Map navigation / Query mode" (5). Amended "Flight manager / Flight history" (added authority messaging). Amended "Flight manager / Flight request submission" (b). Updated / Inserted some images to correspond to DAGR v.2.0. Version 2.0	- - 4 8 10 11 -	DS