CORPS GRAND-DUCAL
INCENDIE & SECOURS

GATO

Groupe d'appui technologique opérationnel

18.01.21

CORPS GRAND-DUCAL
INCENDIE & SECOURS

How we setup a new Unit

within a civil protection organisation

18.01.21

Looking back to 2014

(Professional) Fire and Rescue Brigade – City of Luxembourg

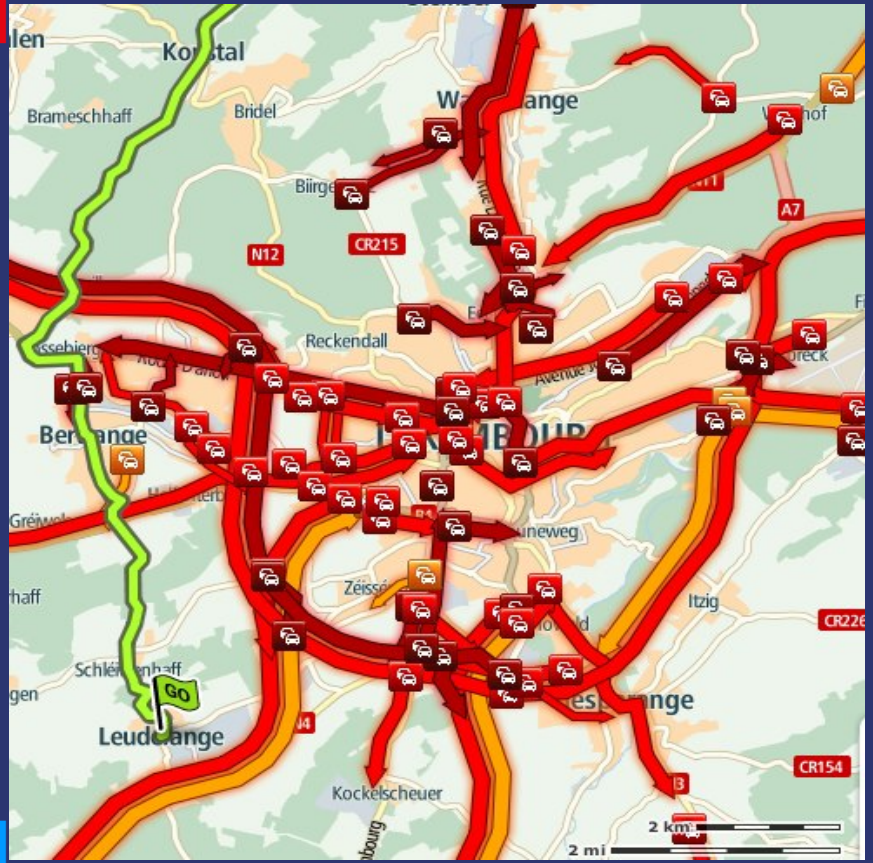
Capital city of the Grand-Duchy of Luxembourg
Densly urbanised
Dense traffic during work hours
120.000 residents, roughly doubled by commuters during daytime

Looking back to 2014

(Professional) Fire and Rescue Brigade – City of Luxembourg

Command is looking for

- Different, faster ways to get an overview of a scene;
- tools to avoid or reduce risk exposure to incident responders;


Brameschhaff
Bridel
Biirge
N12
CR215
A7
Reckendall
Itzig
CR226
CR154
GO
Leudelange
Kockelscheuer
2 km
2 mi

Centre de lorsirs
C.R. 205
C.R. 204
Couvent
Théâtre
N. 53
Police
Kiosque
Bureaux de Postes
Knuedeler
Hôtel de Ville
Palais Grand-Ducal
Musée
N. 50
Bibliothèque
Cathédrale
N. 1
Hôpital

At the same time

(Voluntary) Fire and Rescue Brigade – Municipality of Berdorf

Rural area of Luxembourg
Surrounded by farmland, woods and the “little Switzerland” (Mullerthal)
The brigade is also the home of a unit specialised in animal rescue

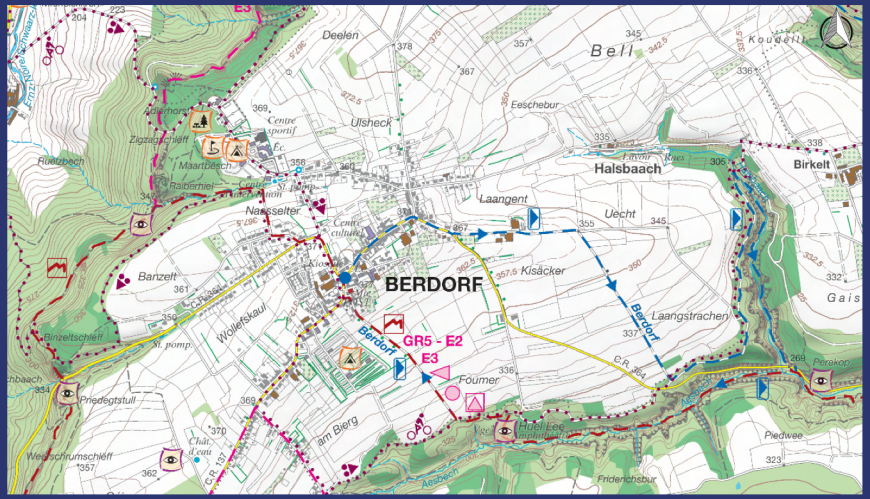
“Little Switzerland is thought to have similar terrain to its namesake country, hence the name; it is dominated by craggy terrain, thick forests, some caves and myriad small streams. Unlike Switzerland, Little Switzerland is low-lying, even by Luxembourg standards (its highest peak is only 414 m above sea level).” - Wikipedia

At the same time

(Voluntary) Fire and Rescue Brigade – Municipality of Berdorf

Members are looking

- to reduce personnel requirements to get a fast and easy overview of a scene
- to survey large outdoor surfaces in a short time period
  - to find persons
  - or animals


BERDORF
GR5 - E2
E3
Bell
Halsbaach
Birkelt
Laangent
Uecht
Kisäcker
Laangstrachen
Foumer
Banzelt
Wollefskaul
Deelen
Ulsheck
Eeschebur
Maartbesch
Naasselter
Ruelzbech
Binzeltschléif
Priedegtstull
Weetschrumschléif
Friederichsbur
Piedwee
Perekop
Gais
Koudelt
Aesbach
Hotel Lee

Both came up with the same idea

We need eyes in the sky to reduce

- number of heavy vehicules and crew required;
- risks related to ongoing traffic;
- time-frame to survey large or hidden areas

so we can provide

- imagery intelligence to the local chief of operations and remote command post;
- target acquisition assistance

How difficult can it be?

Preparations

- Notice that 2 fire brigades are working on a UAV concept
- Integrate both into 1 team

Step 1

- Take notes of your expectations
- Get a UAV and the authorisation to operate it
- Get to know the UAV’s capabilities
- and limits
- Try not to crash it; but if you do, try to learn from your mistake
- Revisit your notes. Did your UAV meet them? Did your expectations change?

Step 2

- Simulate an operation
- Define goals to achieve with your UAV
- Try to reach them
- Analyse which goals you met and those you didn’t
  - Analyse the cause for both
- Work on overcoming the shortcomings of the setup or the crew
- Make a list of shortcomings of the hardware
- Repeat for different operations

Step 3

- Find another unit with a UAV and have them join the team
- Get accessories necessary to complete your simulated operations
- Deploy your unit during a few incidents
- Review the accessories
- Review your selections of UAVs and equipment
- Get in touch with other national & international government UAV operators (Police Grand-Ducale (LU), Police locale (BE), Police fédérale (BE), Gendarmerie nationale (FR), Sécurité civile (BE)
- Exchange knowledge about hardware, SOP, training methods

Lessons learned

- Your expectations change as you learn about UAVs
- Every step brings new insights
- Your UAV is going to suffer a collision
- You are going experience a fly-away
- Equipment malfunctions are real
- Firmware upgrades do break things (sometimes)

Step 4

- Prepare the creation of a new specialized unit in CGDIS
  - Get to know pertinent legislation and internal CGDIS regulation
- Define
  - scope and tasks for the unit
  - Roles, activities and requirements applicable to firefighters within the unit
  - vehicle fleet and equipment
  - personal protective equipment
  - budget

Step 4

- Develop risk management
  - Regular checks
  - Pre-flight checks
  - Post-flight checks
  - SOPs
  - Location specific risk assessment
- Develop CGDIS internal courses
  - 3 levels
  - Practical and theoretical exercises
  - Timetables, material requirements and learning objectives of the courses

Step 5

- Present your work to superiors
- Apply requested changes
- Add your own changes
- Repeat step 5 as necessary
- Present the final work to steering committee and the board of directors

Result

Creation a specialised intervention unit as of 1st January, 2021.

Nomination of

- 2 platoon leaders
- 5 squad leaders
- 9 team leaders
- 23 team members
- 2 experts

Result

Unit in charge of deploying 3 operational units and 1 internal unit

- Unmanned aerial vehicles (UAV, e.g. drones)
- Unmanned ground vehicles (UGV, e.g. robots)
- Information & Communication Technologies (ICT)
- *Logistical Support (equipment provisioning & maintenance)*

Result

Vehicle fleet

- 3,5t small truck with loading ramp
- 5,5t small truck integrated light pole
- 7,5t small truck with loading ramp

Result

UAV fleet

- 1 DJI Matrice 210 v2 RTK
- 2 DJI Mavic 2 Enterprise Dual
- 7 UAVs for training purposes

Result

On-call teams

- 1-2 advisors for chief of operations and/or command post
- 3-4 persons for the deployment of 1 operational unit (limited to 1 UAV/UGV)

Certifications (EU 2019/947)

- 22 CoC A1 A3 open sub category

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Being aware of the risks

Active threat assessment

18/01/2021

Risk management

"Risk management is the identification, evaluation, and prioritization of risks (defined in ISO 31000 as the effect of uncertainty on objectives) followed by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of unfortunate events or to maximize the realization of opportunities." – *Wikipedia, 12.885 words*

Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Commission Implementing Regulation (EU) 2019/947 – *EASA, 45.928 words*

Risk management

Be prepared

- Setup SOPs for easier and methodical implementation of risk management and assessment
- Regular training and rehearsal of SOP
- Regular maintenance and inspection of UAV and accessories
- Pre-define the role of on-call remote pilot and spotter

➔ Safe time by managing generic risk before deploying units to an incident

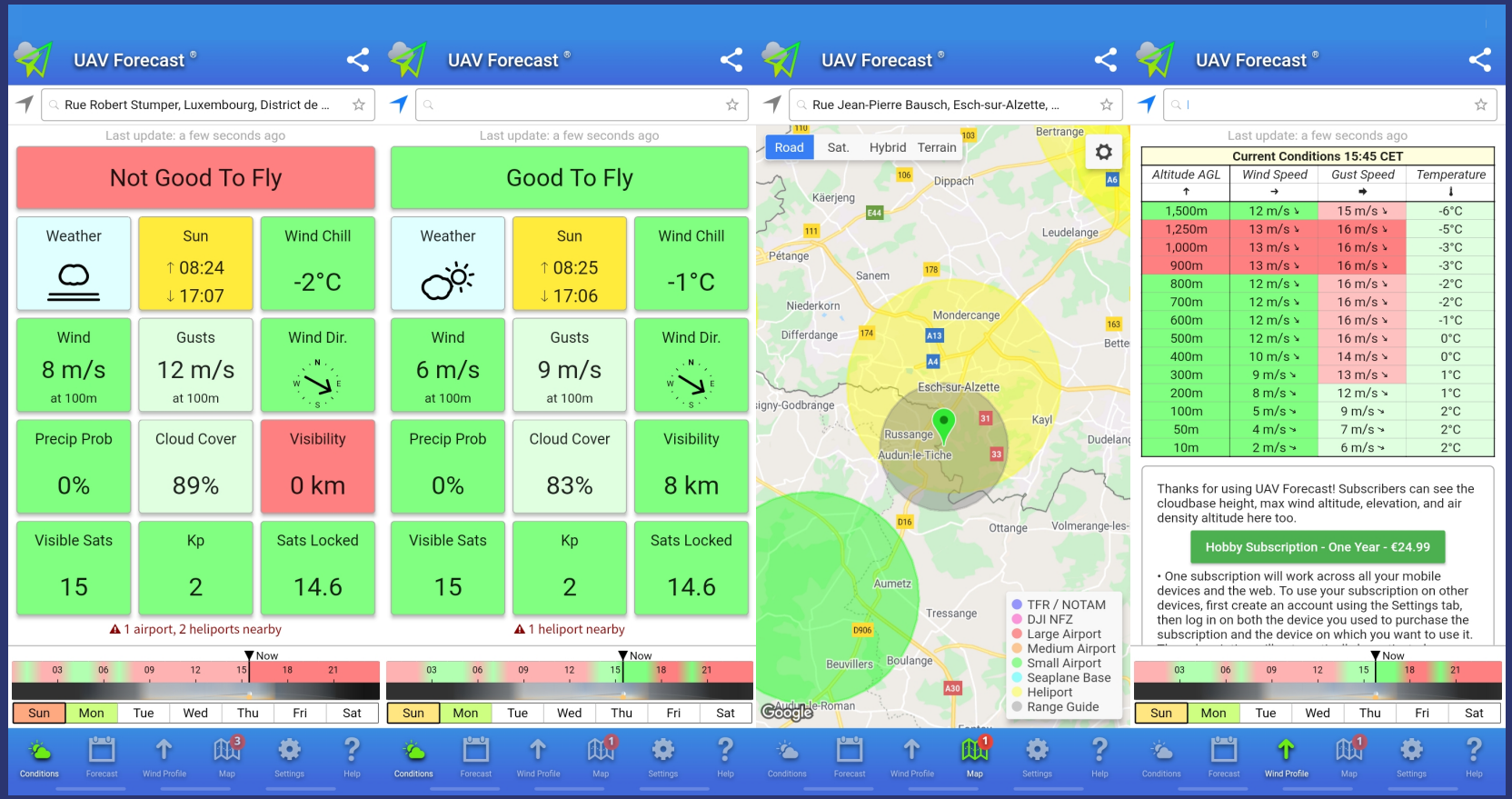
Risk management

Include technology to gather information

- Wind, precipitation, visibility, temperature
- GPS+GLONASS coverage
- Maps and Aerial views

➔ Reduce time necessary to complete the location specific risk assessment

Gebrachene Bierg
Gaalgebierg
Wengert
Burbaacher Lach
Scheierchen
Stand de tir
Antenne
Rue Jean-Pierre Bausch
Arbed 1914
Ellergronn


UAV Forecast ®
Rue Robert Stumper, Luxembourg, District de ...
Last update: a few seconds ago
Not Good To Fly
Weather
Sun
↑ 08:24
↓ 17:07
Wind Chill
-2°C
Wind
8 m/s
at 100m
Gusts
12 m/s
at 100m
Wind Dir.
Precip Prob
0%
Cloud Cover
89%
Visibility
0 km
Visible Sats
15
Kp
2
Sats Locked
14.6
1 airport, 2 heliports nearby
Now
03 06 09 12 15 18 21
Sun Mon Tue Wed Thu Fri Sat
Conditions Forecast Wind Profile Map Settings Help
UAV Forecast ®
Last update: a few seconds ago
Good To Fly
Weather
Sun
↑ 08:25
↓ 17:06
Wind Chill
-1°C
Wind
6 m/s
at 100m
Gusts
9 m/s
at 100m
Wind Dir.
Precip Prob
0%
Cloud Cover
83%
Visibility
8 km
Visible Sats
15
Kp
2
Sats Locked
14.6
1 heliport nearby
Now
03 06 09 12 15 18 21
Sun Mon Tue Wed Thu Fri Sat
Conditions Forecast Wind Profile Map Settings Help
UAV Forecast ®
Rue Jean-Pierre Bausch, Esch-sur-Alzette, ...
Road Sat. Hybrid Terrain
Bertrange
Dippach
Käerjeng
Leudelange
Pétange
Sanem
Niederkorn
Mondercange
Differdange
Esch-sur-Alzette
Kayl
Russange
Audun-le-Tiche
Ottange
Volmerange-les-
Aumetz
Tressange
Beuvillers
Boulange
Audun-le-Roman
Google
TFR / NOTAM
DJI NFZ
Large Airport
Medium Airport
Small Airport
Seaplane Base
Heliport
Range Guide
Conditions Forecast Wind Profile Map Settings Help
UAV Forecast ®
Last update: a few seconds ago
Current Conditions 15:45 CET
Altitude AGL | Wind Speed | Gust Speed | Temperature
1,500m 12 m/s 15 m/s -6°C
1,250m 13 m/s 16 m/s -5°C
1,000m 13 m/s 16 m/s -3°C
900m 13 m/s 16 m/s -3°C
800m 12 m/s 16 m/s -2°C
700m 12 m/s 16 m/s -2°C
600m 12 m/s 16 m/s -1°C
500m 12 m/s 16 m/s 0°C
400m 10 m/s 14 m/s 0°C
300m 9 m/s 13 m/s 1°C
200m 8 m/s 12 m/s 1°C
100m 5 m/s 9 m/s 2°C
50m 4 m/s 7 m/s 2°C
10m 2 m/s 6 m/s 2°C
Thanks for using UAV Forecast! Subscribers can see the cloudbase height, max wind altitude, elevation, and air density altitude here too.
Hobby Subscription - One Year - €24.99
• One subscription will work across all your mobile devices and the web. To use your subscription on other devices, first create an account using the Settings tab, then log in on both the device you used to purchase the subscription and the device on which you want to use it.
Now
03 06 09 12 15 18 21
Sun Mon Tue Wed Thu Fri Sat
Conditions Forecast Wind Profile Map Settings Help

Pre-Flight Checklist

...

, when you submit this form, the owner will be able to see your name and email address.

* Required

1

Check the motors to confirm that they are rotating smoothly. *

- Checked
- Other

2

Check the propellers to confirm that they have not come loose. *

- Checked
- Other

3

Check the arm connectors to confirm that they are mounted firmly. *

- Checked
- Other

4

Ensure that all the gimbals are rotating smoothly. *

- Checked
- Other

5

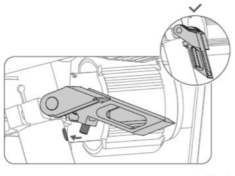


Fig.1

Ensure that the landing gears are mounted firmly and check the pins to confirm that they are inserted fully and tightly. *

- Checked
- Other

6

Ensure that the SD card cover and the rear cover are closed tightly. *

- Checked
- Other

7

When mounting an upward gimbal, ensure the gimbal cables are tied properly to avoid affacting the propellers. *

- ◯ Checked
- ◯ Not relevant
- ◯ Other

8

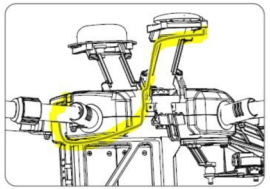


Fig.2

An external GPS module is required when the upward gimbal is used. Ensure the GPS cable is connected to the rear port and the cable is tied properly. *

- ◯ Checked
- ◯ Not relevant
- ◯ Other

9

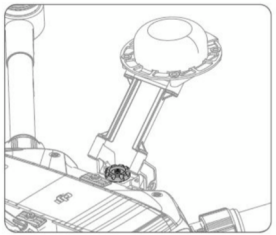


Fig.3

When using the M210 RTK, check that the RTK antenna screws have been tightened. *

- ◯ Checked
- ◯ Not relevant
- ◯ Other

Submit

Risk Assessment UAS

...

Hi when you submit this form, the owner will be able to see your name and email address.

* Required

Riskoanalyse ausfüllen

1. Startposition *

Enter your answer

2. Wer ist der Pilot? *

Enter your answer

3. Wird ein Spotter benötigt? *

Wenn Ja, bitte Namen angeben!

Enter your answer

4. Art der Mission auswählen: *

- ◯ Mission
- ◯ Bereitschaft
- ◯ Training
- ◯ Sonstige

5. Einsatznummer und Beschreibung: *

Enter your answer

6. Geschätzte maximale Flughöhe: *

Enter your answer

7. UAV Forecast screenshot: (Non-anonymous question ⓘ) *

Lade hier den Screenshot hoch welcher mit UAV Forecast erstellt wurde.

↑ Upload file

File number limit: 1 Single file size limit: 10MB Allowed file types: Image

8. Wie lautet das Ergebnis der App UAV Forecast? *

- ◯ Good to Fly
- ◯ Not Good to Fly

Next

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18/01/2021

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Thank you all