



European
Global Navigation
Satellite Systems
Agency



GALILEO **EGNOS**

NAVIGATION SOLUTIONS
POWERED BY EUROPE

MyGalileoDrone competition Webinar #3

Wrap up: getting your application ready for submission

Carmen Aguilera, Head of Section, Safety critical applications. GSA

Eva Vordogianni, Legal Officer, GSA

Liam Day, Helios

Jose Luis Martin, Galileo Service Center

1 September 2020, 10AM

Agenda



- ☐ GSA & GNSS Introduction
- ☐ GSA MyGalileoDrone contest
- ☐ How/what/when to apply?
- ☐ Tips for a good proposal
- ☐ How to include Galileo in your idea
- ☐ Questions?



GSA MyGalileoDrone



- Who we are?

Mission:

Gateway to Services

- Galileo & EGNOS Operations and Service Provision
- Market Development of the applications and the receivers

Gatekeeper of security

- Security Accreditation
- Operation of Galileo Security Monitoring Centre, governmental service (PRS) activities

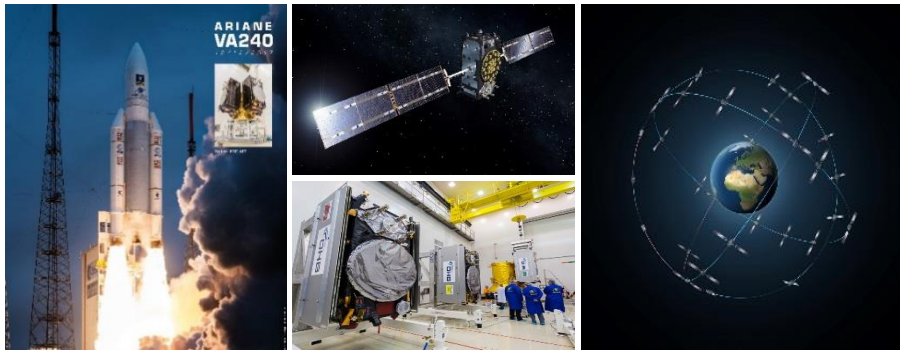
Resourcing:



GSA MyGalileoDrone



European Satellite Navigation Programmes



- Global Navigation Satellite System (GNSS)
- Autonomous infrastructure under EU civilian control
- 26 Satellites constellation today

- European Geostationary Navigation Overlay System
- Increased accuracy and integrity over GPS
- Next version will augment Galileo

GSA MyGalileoDrone



MyGalileoDrone contest is open!

The aim of the contest is to design, develop, test and prepare for commercial launch a drone-based application and/or service able to provide a position and/or time fix by using Galileo-enabled receiver.



<https://www.gsa.europa.eu/mygalileodrone>

Galileo can be used on the drone, smartphone app, payload, or in any other device supporting the Galileo drone application.

Flexibility of
using Galileo

myGalileoDrone

Do you have a **drone-based application** idea?

Do you have what it takes to win **100.000 €**

European Union flag and European Navigation Satellite Systems Agency logo

GSA MyGalileoDrone



Application/service targeting EU priorities

Drones for European Green Deal



- Robust drone automated navigation solutions
- Smart mobility: urban air mobility, package delivery
- Sustainable maritime and railway transportation
- Field to Fork strategies
- Preserving Europe's natural environment

Drones for European Digital Strategy



- U-Space services leveraging artificial intelligence
- Internet of Things
- Drones services to enable digital connectivity
- Synergies between 5G and Space data
- Efficient and digital surveying
- Infrastructure inspection & maintenance

Drones to Promote our European way of life



- Efficient search and rescue operations
- First aid drones and medicine delivery
- Support to migration processes and border operations

Drones for Resilience and European Recovery

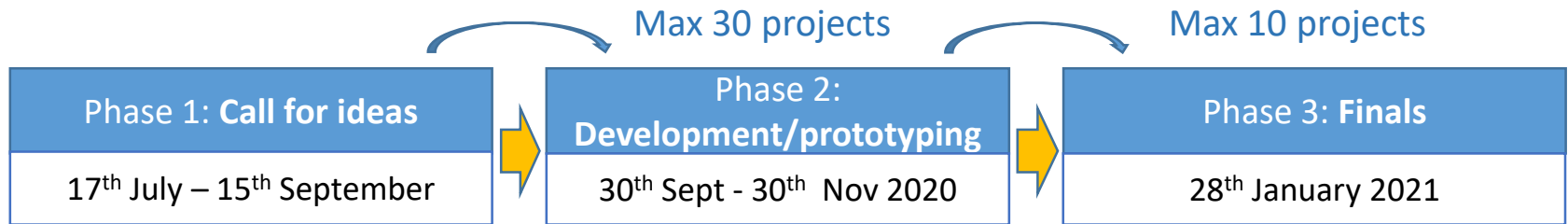



- eHealth: e.g. delivery of samples, tests, disinfection
- Support to safe tourism
- Food production: e.g. crop monitoring
- Support to production & inspection


GSA MyGalileoDrone



3 Phases of the contest




 Idea for application


 Administrative documents


Demo version

Video of the app

Logs of the flights

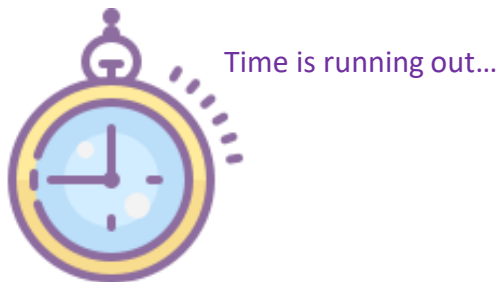


 Presentation to GSA evaluation board

 Demo

How?

- Finals in GSA/EU location
- Demo flight
- Network of investors by GSA



- The proposals will be evaluated by GSA evaluation board
- Selected teams will be announced on the official website




HOW TO APPLY?

GSA MyGalileoDrone



Steps for submitting your idea

- 1) Check the [MyGalileoDrone website](#)
- 2) Read the [Terms of Reference](#)
- 3) Create your profile on the [competition platform](#)
- 4) Submit your brilliant idea 
- 5) Create your profile on [Slack](#) to connect & brainstorm



GSA MyGalileoDrone



Phase 1: Call for ideas

<https://www.gsa.europa.eu/MyGalileoDrone>

myGalileoDrone competition

Deadline extended until 15 September!

The aim of the contest is to design, develop, test and prepare for commercial launch a drone-based application and/or service able to provide a position and/or time fix by using Galileo-enabled receiver.

Galileo can be used on the drone, smartphone app, payload, or in any other device supporting the Galileo drone application.

€ 100.000
1st PRIZE

196
DAYS

30
SELECTED TEAMS

REGISTER

TIMELINE

CRITERIA

CONNECT WITH US ON OUR SLACK GROUP

Application platform

1

Timeline

Criteria

Slack

For more detailed information go to: [Terms of Reference](#)

GSA MyGalileoDrone



Phase 1: Call for ideas

<https://www.gsa.europa.eu/MyGalileoDrone>

The innovation areas are based on the EU priorities below



TERMS OF REFERENCE

Read Terms of Reference
and clarifications

Please make sure you read the **Terms of Reference here** for requirements specifications and duly complete all the forms before submitting your application.

The Corrigendum #1 on the extension of the competition's deadline is available **here**.

Clarification note #1 is available **here**.

Clarification note #2 is available **here**.

For more detailed information go to: [Terms of Reference](#)

GSA MyGalileoDrone



Phase 1: Call for ideas

<https://www.gsa.europa.eu/MyGalileoDrone>

OTHER RESOURCES AND USEFUL LINKS

[Drones Operations White paper](#)

[Raw measurements white paper](#)

[Database of raw measurements](#)

[The forum of raw measurements task force](#)

[Glossary for GPS test](#)

[Galileo-enabled devices](#)

[List of Galileo-enabled drones](#)

Also check other sources

Drone models fitted with Galileo capable receivers by the manufacturer

Manufacturer	Model	Additional Information
ADFM	Ready MT	
ADFM	Ocio	
Aerialtronics	ALTURA ZENITH ATX8	
AIRK	FireClouds FC4r Ultimate	
AIRK	FireClouds FC4r Pro	
AIRK	FireClouds FC4r Core	
AIRK	FireClouds FC4r Now bio	
AIRK	FireClouds FC6 Essence	
AIRK	FireClouds FC8 Plus	
DeLair	UXS iF	
DJI	Phantom 4 RTK	
DJI	M MultiSpectral	
DJI	Agras T16	
DJI	Matrice 200 series V2	
DJI	Matrice 300 RTK	
DJI	Inspire 2	u-blox chip requires re-configuring to enable Galileo capabilities
DJI	Mavic Air 2	requires "super patcher" update to unlock Galileo capabilities
DJI	Mavic Mini	requires "super patcher" update to unlock Galileo capabilities
DJI	Mavic 2 Pro	requires "super patcher" update to unlock Galileo capabilities

Updated list of commercial drone models fitted with Galileo capable receivers (examples)

For more detailed information go to: [Terms of Reference](#)

GSA MyGalileoDrone:

How to submit in the application platform



Phase 1: Call for ideas

<https://mygalileodrone.awardsplatform.com/>

myGalileoDrone
competition

European Global Navigation Satellite Systems Agency

Welcome to myGalileoDrone competition!

- 1 Register an account.
- 2 Start your entry.
- 3 Complete the Application form.
- 4 Submit your entry to be judged.

Good luck!

For further information, please visit [myGalileoDrone website](#).

Register

First name

Last name

Email

Password

Confirm password

☐ I understand and agree that the personal data I provide for the registration will be processed by the GSA in accordance with the privacy statement under section 6 of the competition [Terms of Reference](#).

Register

Log in

Email or mobile

Password

☐ Remember me

Log in

[Forgot password](#)

or log in with

Facebook Twitter

3

Create your profile
&
Submit your idea!

For more detailed information go to: [Terms of Reference](#)

You can submit your idea and modify anytime before the official deadline

GSA MyGalileoDrone:

Documents to be submitted in the platform



Phase 1: Call for ideas

Accompanying documents

- ☐ [Application form with the technical description](#)
- ☐ [Declaration of honour](#) — each member of the team
- ☐ [Financial Identification Form](#)
- ☐ [Legal Entity Form](#) *

** Every natural person participating to a team shall submit a “Natural Person” form + a copy of their own ID. Persons representing a legal entity shall submit a “Private Company” or “Public Law Body” form for the legal entity they represent + a extract of the company’s registration.*

For more detailed information go to: [Terms of Reference](#)

What is next: MyGalileoDrone Phase 2



Phase 2:
Development/prototyping

15th Sept – 30th Nov 2020

- ✓ Selected teams are developing a demo version of the proposed application and/or service
- ✓ The demonstrator shall implement the general concept, prove feasibility via a flight in a representative scenario and provide a test report
 - ☐ Detailed description of the application/service
 - ☐ Flight tests definition and operations performed
 - ☐ Drone & additional equipment configuration – which GNSS receiver or Galileo equipment is used?
 - ☐ Video of demonstration in flight → show the application in simulated scenario!
 - ☐ Recorded logs/proof of Galileo use in drone or other equipment during the demonstration
 - ☐ **Are you developing software application?** → Submit demo version of the app, showing its functionalities and a report of testing results
- ✓ You will receive technical support during the development



For more detailed information go to: [Terms of Reference](#)

What is next: MyGalileoDrone Phase 2



Phase 2: Development/prototyping - Support during the development

- Demonstration support
 - Assistance to access suitable flying sites
 - Providing list of certified pilots or service providers
- Mentoring scheme
 - Experts supporting selected teams
 - Tailored support to selected team to build the application / service
 - Support to plan and execute the demonstration
 - Support on the development of the business plan

What is next: MyGalileoDrone Phase 2

Flying sites for demonstration & pilots



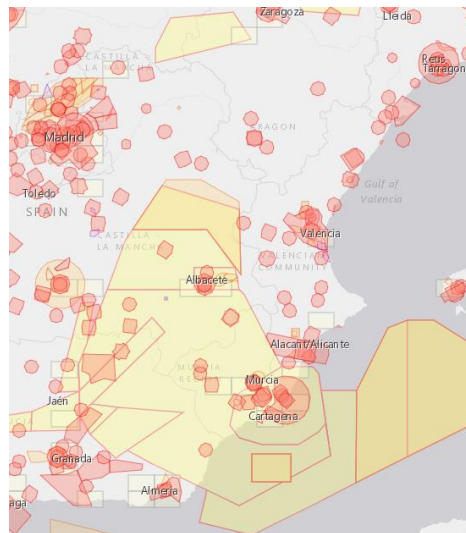
Credit dronescene.co.uk.es 2020-08-13



Credit: stock



Credit: npuasts.com 2020-08-14



Credit: drones.enaire.es 2020-08-13



Credit: nottingham.ac.uk 2020-08-14

myGalileoDrone Slack channel:

Join the technical discussion



The screenshot displays the Slack interface for the 'myGalileoDrone' workspace. On the left sidebar, the 'Channels' list includes '# general' (selected), '# random', and several topic-specific channels like '# drones-for-european-digital' and '# drones-for-resilience-and...'. Below the channels are 'Direct messages' and a 'Slackbot' section. The main area shows the '#general' channel with a search bar at the top. The message history includes:

- Paulina Raeva** (10:56 AM): Hello, As for the natural person - should we also submit a CV? Or DoH and Id is enough? Thanks 😊
- Mante GSA** (11:20 AM): Dear all, we'd like to inform you that the competition deadline has been extended to 15 September 2020. Please take a look at the updated terms of reference: https://www.gsa.europa.eu/sites/default/files/uploads/terms_of_reference_mygalileodrone_competition.pdf, and corrigendum: https://www.gsa.europa.eu/sites/default/files/uploads/corrigendum_1_extension_of_mygalileodrone_deadline.pdf
- Nayer** (11:51 AM): Another question: can a member of participating private company can be permanent resident in the listed countries? Note that a legal entity is applicant, not independent natural persons. (edited)
- Justas Poderys** (11:55 AM): @Mante GSA the updated ToR still lists 1st of September as a deadline.
- Mante GSA** (12:33 PM): replied to a thread: @Mante GSA the updated ToR still lists 1st of September as a deadline.
Hi Justas, thanks for your comment. You can see the updated schedule of the competition in section 3, "The Schedule" in the ToR. https://www.gsa.europa.eu/sites/default/files/uploads/terms_of_reference_mygalileodrone_competition.pdf Moreover, we have published the corrigendum on the extension of the deadline: https://www.gsa.europa.eu/sites/default/files/uploads/corrigendum_1_extension_of_mygalileodrone_deadline.pdf The schedule in section 3 of the Terms of Reference for "GSA MyGalileoDrone Competition 2020" is amended as follows in the corrigendum
- Kevy Elyod** (3:05 PM): Hi GSA, regarding the Gantt Chart that is required for submission. My team Gantt chart shows how our current solution / (competition entry) was created in time and resource allocation. It just mentions that this month time is spent on applying for the MyDrone Competition and also some in-house work we have planned for next month. Does the Gantt chart have to predict what Galileo will require us to do over the next few months of the competition?
- Jesús Rodríguez** (7:39 PM): @Jan cernan @Katerina, GSA We have a question with regards to uploading the proposal and the documentation that has to be added to it: where should the team members mention that they are part of a specific team? Should they add an entry with the team name? Or is there any other way to link the team members to one entry? All in all, is a single entry used by all the team members and they upload all the required documentation?
- Mante GSA** (11:24 AM): Hello! Thank you for all the questions. We will answer all of them in due-time, currently, we're working together with our colleagues in Legal Dpt. to provide you with clear answers and then include everything in a new clarification note. We're also organising one more webinar, on 1 September 2020. You can register here: <https://www.gsa.europa.eu/webinars> We strongly advise you to join as we will also have a Q&A session.

The interface also shows a date separator for 'Thursday, August 27th' and 'Friday, August 28th'. At the bottom, there is a message input field for '#general' with various formatting and media icons.

GSA MyGalileoDrone



- Do you have questions on the scope of the competition or Terms of reference?

- for additional information write to prizes@gsa.europa.eu
- Subject: 'MyGalileoDrone 2020' + name of your team



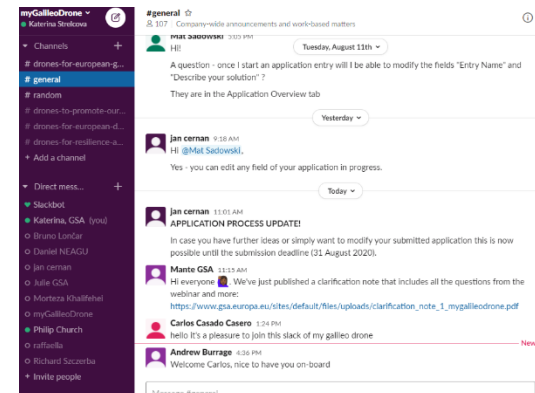
Send the requests for additional information as early as possible before the deadline for submission of each phase.

- Do you want to connect with applicants & enthusiasts?



Join myGalileoDrone on Slack

Start by entering the email address you use for work.



Some tips: Do and don'ts



Do

- Integrate Galileo in any component of the application: drone, smartphone, payload, etc
- Check the list of receivers and commercial drones with Galileo (www.useGalileo.eu and www.gsa.Europa.eu/myGalileoDrone)
- Look at 'how to's' in the webinars material
- Ask, ask ask questions: Slack and prizes@gsa.Europa.eu
- Think big: your idea can be your future business

Don't

- Don't wait until the deadline to submit, you can submit and modify your idea at any time
- Don't be afraid of admin documents: examples available
- Don't need to buy new equipment, use your own one with Galileo or add it (more info in webinars, Slack, etc)



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GALILEO **EGNOS**

NAVIGATION SOLUTIONS
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Getting into the technology:
how to start your Galileo ready
application with drones

Where to find information on Galileo services



Complete description of Galileo system and Services is available within European GNSS Service Centre (GSC) Web Portal <https://www.gsc-europa.eu/>

The screenshot shows the homepage of the European GNSS Service Centre (GSC). The header includes the GSA logo, the text 'European Global Navigation Satellite Systems Agency', and a navigation bar with links: HOME, FAQ, LOGIN, REGISTER, and social media icons. Below the header is a main navigation bar with categories: GALILEO, GNSS MARKET & APPLICATIONS, ELECTRONIC LIBRARY, SYSTEM & SERVICE STATUS, GSC PRODUCTS, and SUPPORT TO DEVELOPERS. A search icon is also present. The main content area features a 'GALILEO HELP DESK' section with the text 'OUR EXPERTS WILL PROVIDE ANSWERS TO YOUR QUESTIONS, INCIDENTS AND PRODUCTS REQUESTS' and a 'GALILEO SYSTEM STATUS' section with the text 'CLICK FOR SATELLITE INFORMATION AND NOTIFICATIONS'. A large banner at the bottom reads 'Calling for GNSS apps in the COVID-19 response' and 'GNSS Apps for COVID-19 response'. Callouts point to specific features: 'Galileo General Description' points to the GSA logo; 'Galileo Official Documentation' points to the ELECTRONIC LIBRARY link; 'Galileo System & Services Status' points to the SYSTEM & SERVICE STATUS link; 'GSC Helpdesk service via Web portal' points to the GALILEO HELP DESK section; 'Or GSC Helpdesk via email' points to the email address helpdesk@gsc-europa.eu; and 'Access to the website and register to receive the complete set of services' points to the REGISTER link in the header.

Galileo General Description

Galileo Official Documentation

Galileo System & Services Status

GSC Helpdesk service via Web portal

Or GSC Helpdesk via email
helpdesk@gsc-europa.eu

Access to the website and register to receive the complete set of services

<https://www.gsc-europa.eu/>

Introducing Galileo in drone operations.

Some examples



The introduction of Galileo in drone operations can be accomplished in several ways:

- **Commercial drone model or drone built using components**, being equipped with a receiver and/or a flight management system compatible with Galileo (see next slides)
- **Smartphone App** using Galileo for different drone operations:
 - Flying the drone and controlling the camera on board, e.g. [DJI Go](#), [Litchi](#)...
 - UAS Traffic Management (UTM), providing capabilities required as geo-fencing , flight log, drone mapping, surveillance, etcetera. [Airmap](#) and [Unifly](#) provides these services.
- **Payloads** integrated with drones and using Galileo (based on PVT solution provided by receiver on board) for:
 - Surveillance within a controlled area by means of ADS-B transmitters on board, for instance [DJI Airsense](#)
 - Photogrammetry operations (drones also equipped with cameras suitable for aerial maps) with RTK modules (on board or as a mobile stations) or LIDAR sensors, e.g. [Trimble](#), [DJI](#), [CHCNAV](#)
 - Additional Navigation sensorRAD
- **Other equipment needed for the application**

Where to find info on Galileo capable receivers, drones and smartphones



- Visit UseGalileo web portal to:
 - Search commercial receivers Galileo-enabled collected within “[In the Air](#)” section
 - Identify smartphones/tablet supporting Galileo listed within “[Going Mobile](#)” section

www.useGalileo.eu

USE GALILEO EU
FIND A GALILEO-ENABLED DEVICE TO USE TODAY

Accuracy matters
When close isn't enough, use Galileo
Galileo. Navigation made in Europe.

1 484 155 682
Estimated number of Galileo-enabled smartphones today

Click here to find out if your phone is Galileo-enabled

Your smartphone is not alone,
discover the other devices that are Galileo-enabled.

ON THE ROAD ON THE WATER ON THE TRAIN IN THE AIR ON TIME INTERNET OF THINGS
GOING MOBILE ON THE FARM ON THE MAP DURING AN EMERGENCY SPACE APPLICATIONS

Going Mobile

In the Air

www.gsa.europa.eu
/myGalileoDrone

myGalileoDrone

Do you have a drone-based application idea?
Do you have what it takes to win €100,000?

OTHER RESOURCES AND USEFUL LINKS

Drones Operations White paper
Raw measurements white paper
Database of raw measurements
The forum of raw measurements task force
Glossary for GPS test
Galileo-enabled devices
List of Galileo-enabled drones

Enabling Galileo in Drone models locked by default



- There are drone models that, even though are supporting Galileo, by default they require to enable the reception of Galileo satellite signals.
- The guidelines and the SW needed to enable Galileo can be found in drone user manual (see next slide), drone manufacturer FAQs and user or developers forums.
- This is the case for DJI following models:
 - Mavic Pro/Platinum/Alpine White
 - Spark
 - Phantom 4 Pro/Standard/Advanced/Pro V2
 - Inspire 2
- In [Github](#), the platform for developers community, it is offered for free the [SW and guidelines](#) to unlock limitations introduced by DJI, for instance, the Galileo satellites reception. (Superpatcher)
- In manufacturers' forum, it is described the procedure to configure the drone receiver GNSS supported, for instance <https://forum.dji.com/thread-135156-1-1.html>
- Additional support will be provided by GSA/GSC on enabling Galileo in compatible receivers

Enabling Galileo in receivers/flight navigation systems



- Manufacturers of Receivers and flight navigation systems allow the configuration of GNSS supported in their products.
- U-blox via U-center [SW user guide](#)
- Drotek RTK F9P [Tutorial](#)

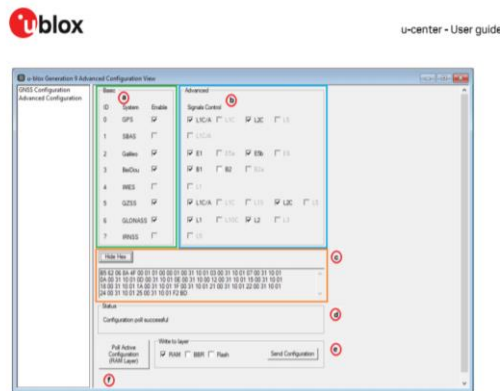


Figure 29: u-blox Generation 9 Advanced Configuration View

- Septentrio via RxTool SW for AsteRx-m2a UAS [Reference Guide](#)



1.24 Check the Capabilities of your Receiver

The capabilities of your receiver are defined by the set of enabled features. The capabilities depend on the hardware, the current firmware version and the current set of permissions. Permissions are further explained in section 1.25.

The command `getReceiverCapabilities` lists the capabilities. You can also check them using the web interface or RxControl (go to *Help > Receiver Interface* and select the *Permitted Capabilities* tab):

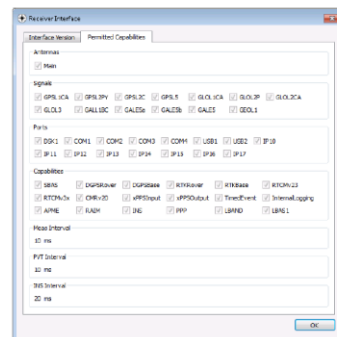
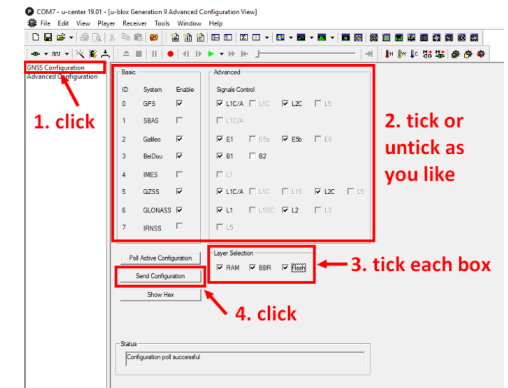


Figure 1-8: Example of receiver capabilities.



Android GNSS Raw Measurement applied to drones



- GNSS Raw Measurements allows Android-based devices the access to GNSS raw data, enabling precise positioning techniques to enhance the accuracy of position calculated by the device based on GNSS signals
- The “White Paper on using GNSS Raw Measurements on Android devices” document, publicly available at GSA web portal (<https://www.gsa.europa.eu/gnss-applications/gnss-raw-measurements/workshops-and-resources>), facilitates the GNSS Raw Measurement exploitation and the development of applications on the Android platform
- This document addresses two main objectives:
 - To share knowledge and expertise on Android raw measurements and its wider use, including its potential for high accuracy positioning techniques”
 - Valorise the Galileo differentiators
- This capability is offered in those Android devices from (and included) Nougat version onwards (API level versions greater than or equal to 24)

Click here to
download the
document



Android GNSS Raw Measurement applied to drones

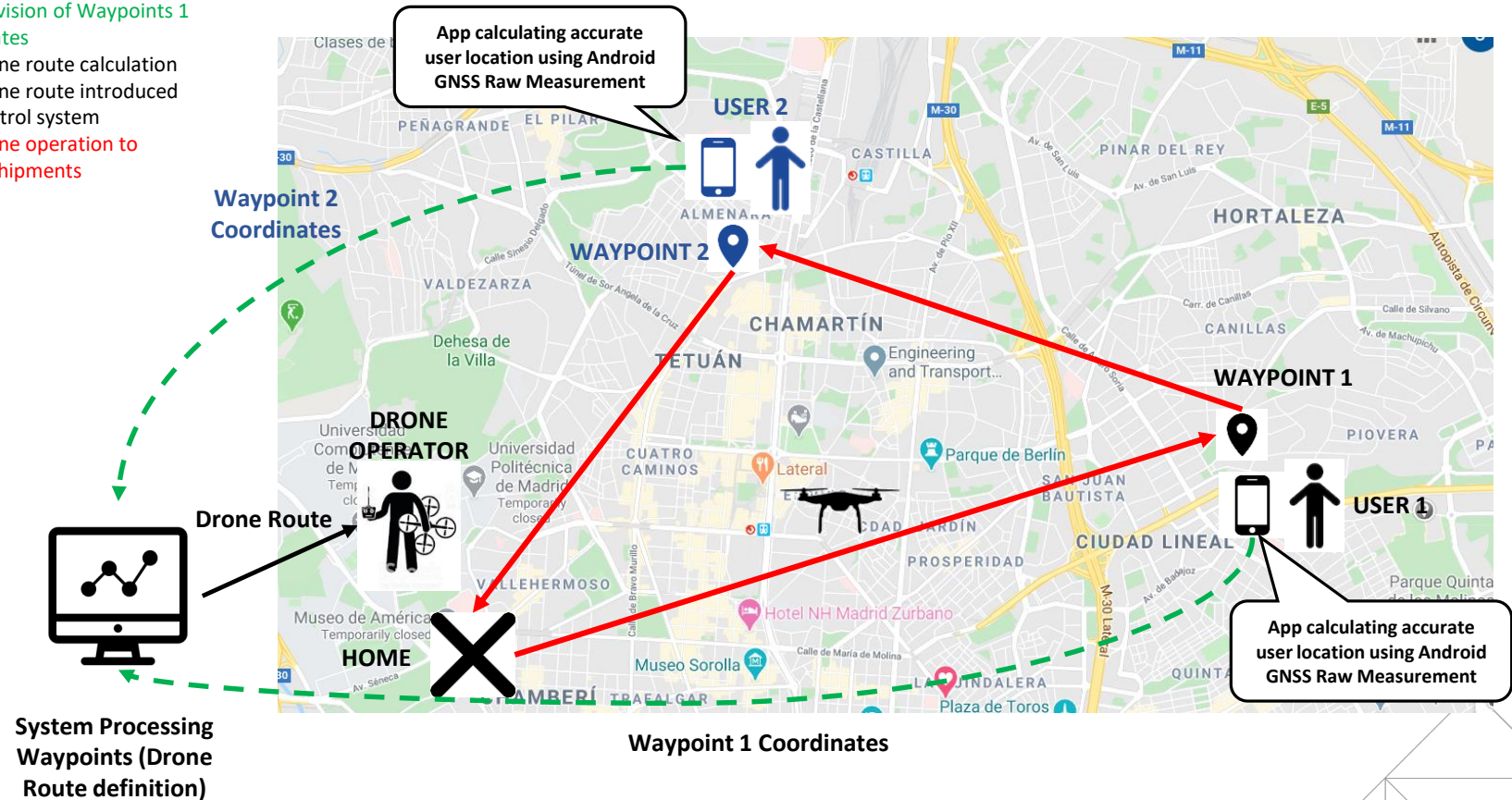


- The following example introduces the definition of an application/service exploiting Android GNSS Raw Measurement:
 - Service is focused on shipment deliveries using drones
 - The service provider develops an App exploiting Android GNSS Raw Measurement
 - This App is provided to the users of this service
 - When an user is the consignee of a package delivery, it is requested to run the App in his/her mobile device (smartphone/tablet).
 - The App sends the accurate location of the consignee to the Service Provided system.
 - This system, based on different parameters (daily plan for deliveries, users locations, drone operation range, etcetera) defines and provides the delivery routes (with the users locations or waypoints) to the drone operator.
 - Then, drone operator introduces these routes into drone control system so the drone automatically flies and delivers the shipment in the locations (waypoints) along the route

Android GNSS Raw Measurement applied to drones



- **Step 1** – Provision of Waypoints 1 & 2 coordinates
- **Step 2** – Drone route calculation
- **Step 3** – Drone route introduced in drone control system
- **Step 4** – Drone operation to deliver the shipments



Linking space to user needs



Get in touch:

15^{Years of}
EU Satellite
Navigation



www.GSA.europa.eu



EGNOS-portal.eu



GSC-europa.eu



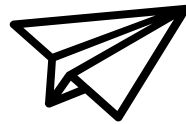
UseGalileo.eu



The European GNSS Agency is hiring!

Apply today and help shape the
future of satellite navigation!





Thank you for your attention.
Questions?