

# First Prototype of Our New Drone Radio Telemetry System

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We have completed the initial tests of a **new drone-based radio telemetry system**.

**-Aircraft:** Compatible with any flying device, such as light weight **drones** under 250 g, meteorological **balloons**, RC airplanes

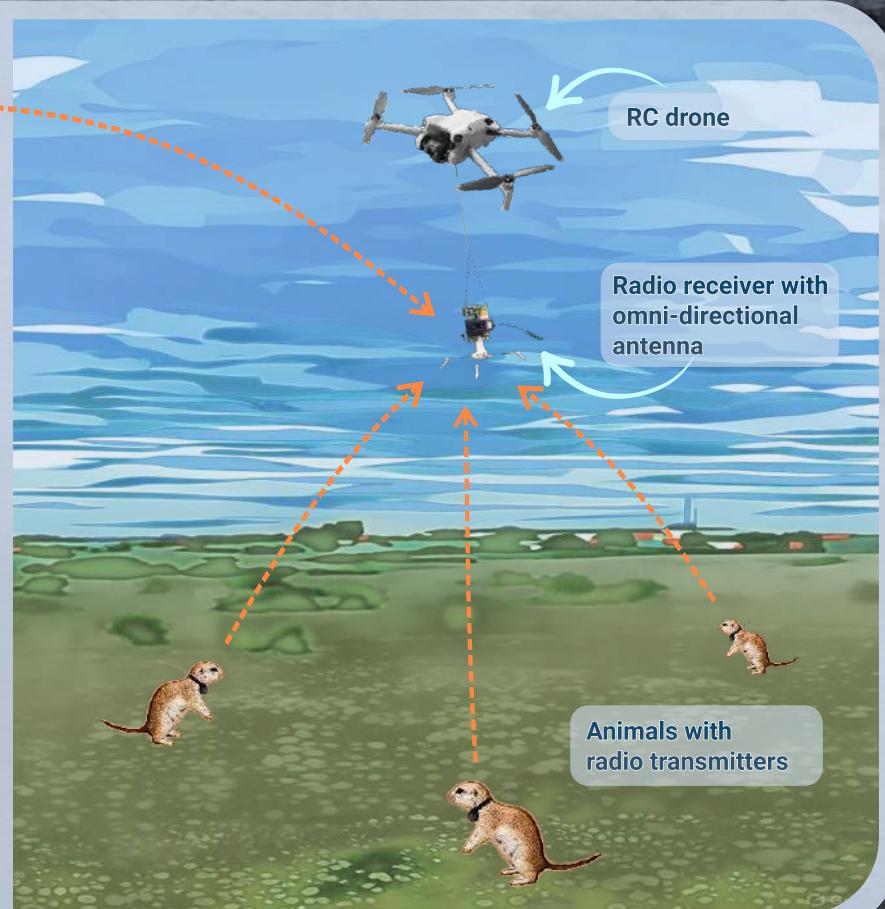
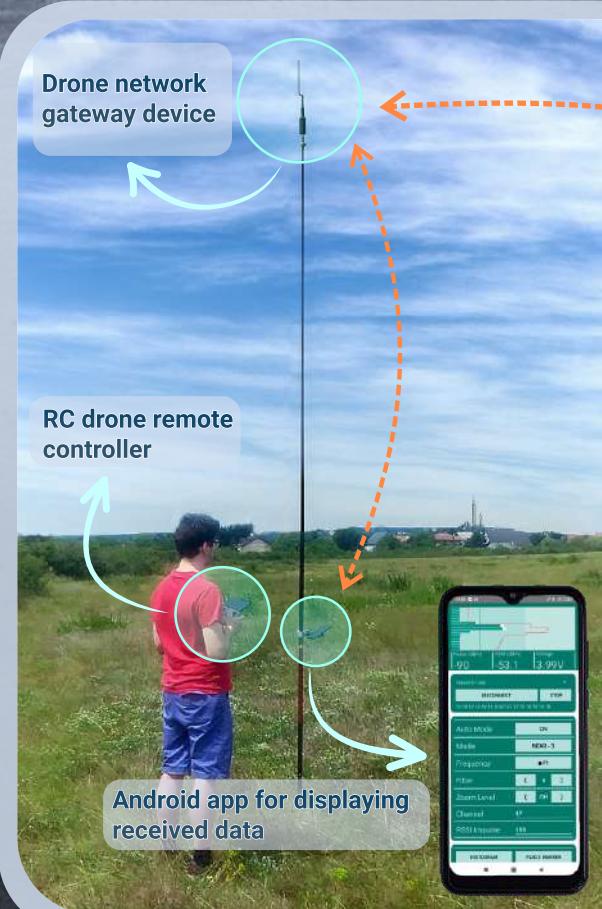


**-Receiver:** Attached to the drone, either via cable or a solid anchoring part.

**-Gateway:** The received signals are relayed to the android device via the gateway.

**-Android Device:** Enables remote control of the receiver, displays measurement and flight path, and logs data.

The system is expected to be **available for purchase in the summer of 2025**.



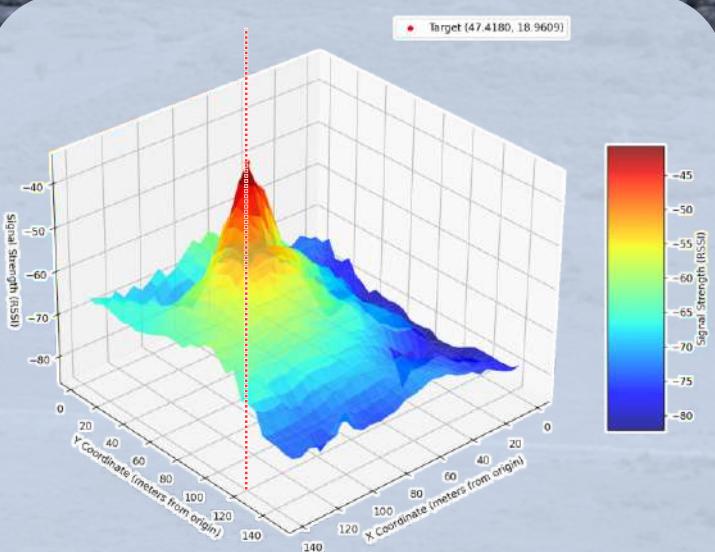
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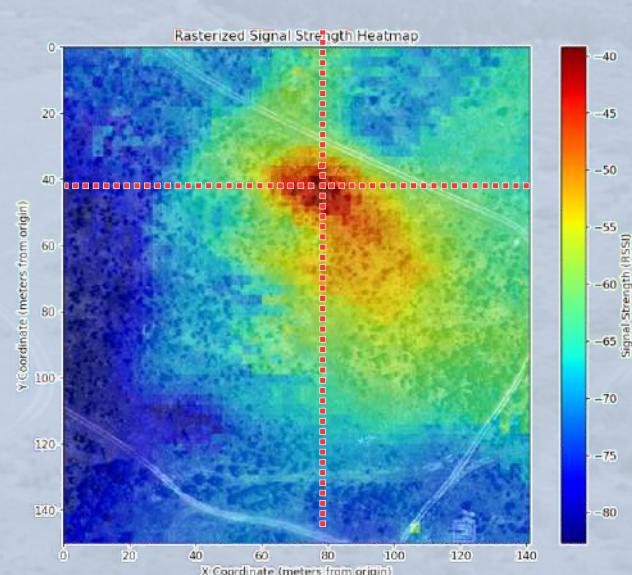
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Using a manually controlled DJI Mini drone, we flew along the route shown on the map over the area, in **wind speeds of 30–40 km/h**. The test transmitter (implantable model, made for snakes), was placed on the ground. The total **flight time was 8 minutes**. Based on the flight path and measured signal strengths, we evaluated the results as shown in the diagrams below.

We achieved an **accuracy** of approximately **5 meters**.



3D surface-fitted to radio measurements made with the drone system.



Map overlay showing the surface-fitted radio measurements

## Measurement Methods

- With omnidirectional antenna:  
RSS-based, simple, inexpensive
  - With phase-coupled antenna system:  
RSS-based – more accurate
  - Traditional direction finding
- 
- Manual control:** direction finding or signal-strength-based tracking for individual animals, with map-based real-time support and camera view
  - Automation:** automated flight, for observing multiple specimens.



Map of a **manually controlled** drone's flight path, while measuring data

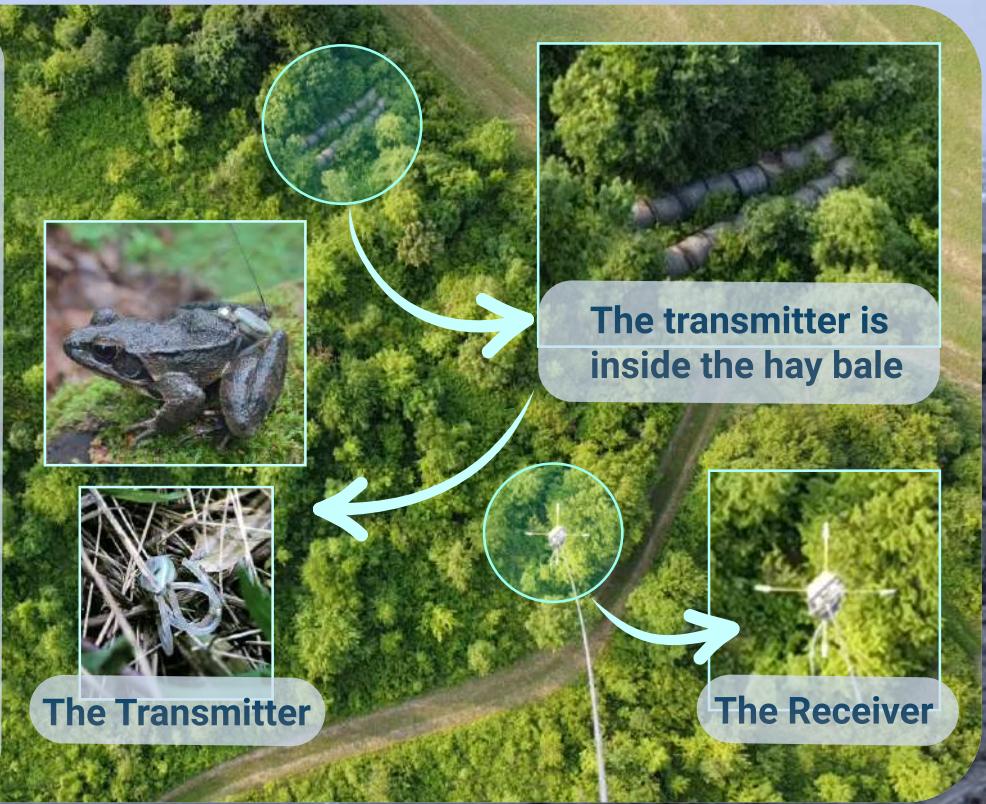
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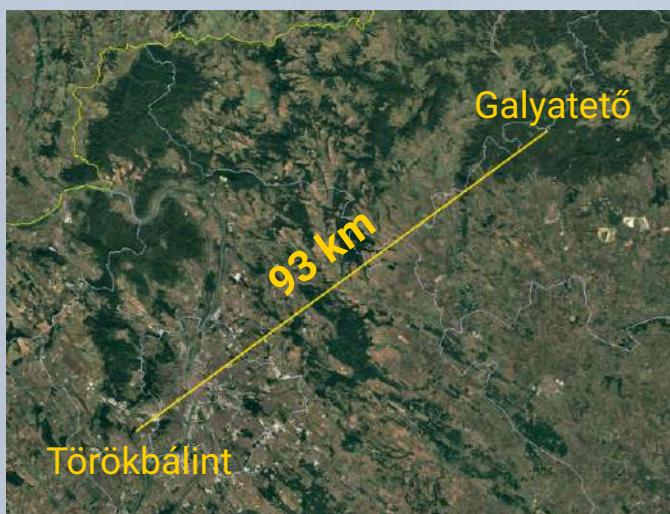
During a study on **Rana dalmatina** frogs, two specimens **disappeared** from the monitored area, beyond the range of the handheld receivers.

Using the drone system, we were able to quickly locate the transmitters frogs' remains, which had been carried away by a predator. Without the extended range of the drone system, this may not have been possible.



## 93 km Range Test

We conducted a range test with our transmitters developed for the Asian hornet. The drone was launched in the Mátra region, while the receiver was stationed at the Anna Hill Lookout Tower near Budapest. The signal was successfully received from a distance of 93 km.



## Use Cases of The Drone System

- Used as extension for the automated radio telemetry system for monitoring movement beyond observation area.
- Tracking small animals (such as insects) over long distances.
- Long term studies with remote activated transmitters.
- Small sample count measurement automation (daily 10-50 positions).
- Observing aquatic or subterranean animals.
- Long-term monitoring of animals using areas from 100 Ha to 10000 Ha.