

# EUREKA EUROSTARS PROJECT 5468 HELI-FLR



## HIGH STAKES FOR HIGH-FREQUENCY HELICOPTER RADAR

**German and Israeli industrial R&D teams have pulled off a flying feat with their innovative bespoke radar system to help helicopter pilots navigate even the most difficult conditions. Successful test-flights demonstrated the system in action at low altitudes. Refits to the sensor hardware are now under way to make the radar fully flight-ready. As an innovation frontrunner, the stakes are high.**

The system they designed and tested under the Heli-FLR Eurostars project is based on high-frequency radar navigation systems using interferometric 3D-topography. The innovation means the radar can see through rain, fog, dust, snow and glare as it detects obstacles and maps the area surrounding the helicopter, warning pilots of obstacles like antenna, cables/wires, buildings and uneven landing surfaces.

As the name suggests, interferometry measures the interference or observed change in waves (light, radio, sound) and the materials or objects they are interacting with. The 'wave displacement' that takes place when bouncing off, for example, treetops can be analysed and calibrated into a 3D topographic map.

"From the moment we realised we qualified for EU funding, we were convinced of its potential and dedicated ourselves to the project," notes Birgit Jackson of Germany's RST Radar Systemtechnik GmbH, a leading player in radar technology which coordinated Heli-FLR. "Without the funding, the financial risk would have been to high. The Eurostars

programme and helpful team, including support from National Contact Points, made this large and rather complex multi-partner project possible!"

It enabled the team to develop and flight-test the beta version in cooperation with end-users. And according to Jackson, the pilots who first tested the demonstrator remarked that it represented a "big step in the right direction". Easy-to-interpret visual feedback on an aircraft's position in relation to its surrounds is vital intelligence for pilots facing stressful flights and landings, especially in built-up areas.

Heli-FLR's Israeli partner, Elbit Systems Ltd., is active in a range of aerospace and defence sectors including command and control for air, land and naval applications, advanced electro-optics, unmanned aircraft systems, data links, intelligence, surveillance and communications.

The project's end-user partner, DRF Stiftung Luftrettung Gemeinnützige AG, is a German helicopter-based rescue organisation. DRF's pilots provided essential feedback on tricky flying conditions during their trials of the new radar system.

### Not all smooth flying

The Heli-FLR's airborne radar system is designed to help pilots make critical decisions in any conditions, day or night, and during flight and landing. The innovative 'final approach mode', with colour-coded altitude 'visualisation' tools, is tailored so crews can quickly recognise obstacles in the landing zone.

But according to the team, the testing phase was not all smooth flying: "The demonstrator worked perfectly at altitudes of up to 30m, which was a strong proof of concept, but due to technical limitations in our hardware we couldn't reach the 100m level required in real-world flying conditions."

This was a bit of a set-back, but RST and partners remain convinced that, with the sensor design update currently under way, the 100m mark is within reach. The patents

“ **High-frequency radar cuts through any prevailing weather or obstructions, giving an accurate reading of the surrounds** ”

originally filed are on pause until the new specifications are finalised.

"Though this refit is likely to take some time, we still firmly believe that our system will be a winner once it's ready because the competitors have yet to reach this level of technical sophistication."

And in the meantime, the R&D-led cooperation has opened up several avenues for future partnerships and the sharing of best practices in a complex domain. "Working with experts in their fields and discovering different solutions to problems was a great benefit to all of the organisations involved in Heli-FLR," concludes Jackson, "The experience and know-how offered by DRF's pilots was especially important."

This project has received funding from the Eurostars-2 joint programme with co-funding from the European Union Horizon 2020 research and innovation programme



### MAIN PARTNER

RST Radar Systemtechnik GmbH,  
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### OTHER PARTNERS

Elbit Systems Ltd., Israel  
DRF Stiftung Luftrettung  
Gemeinnützige Ag, Germany

### TOTAL R&D INVESTMENT

€ 3 399 760

### DURATION

March 2011 - September 2013

### COUNTRIES AND NATIONAL FUNDING BODIES INVOLVED



BMBF - Bundesministerium für Bildung und Forschung



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