IRIS® | ELVIRA®
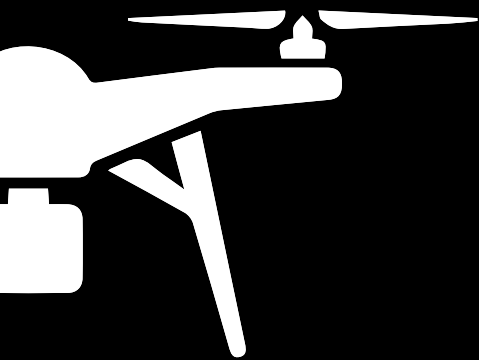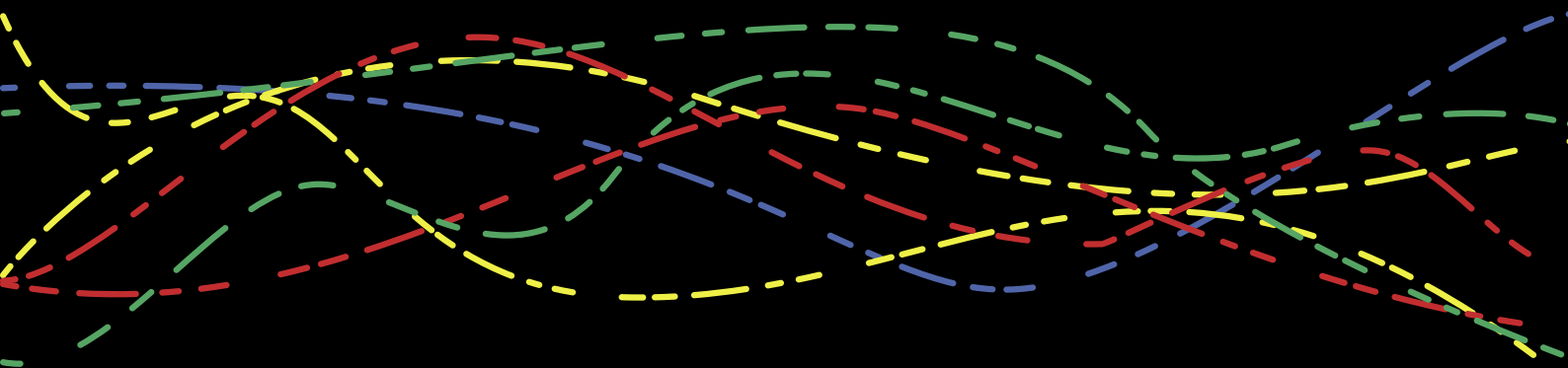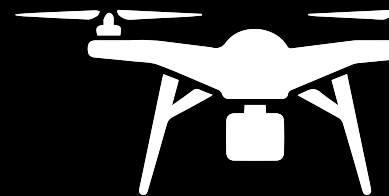
DRONE DETECTION RADAR

robin
radar systems

"MORE THAN TWO YEARS OF EXPERIENCE WITH THE ELVIRA DRONE DETECTION RADAR GIVES US THE ABILITY TO LOCATE DRONES QUICKLY AND EASILY. WE ARE CONVINCED THAT RADAR UNITS ARE A NECESSARY PART OF ALL CRITICAL INFRASTRUCTURE, AND THE DEMAND WILL ONLY CONTINUE TO GROW."

Riden, Marek Šoltys - CEO

Drones are increasingly widespread. They've become affordable, easy to obtain and simple to fly. This creates new opportunities, but also poses new threats. To mitigate the negative impact of drones on our society, there is a need for detection and intervention.

MEETING TODAY'S CHALLENGES

Near misses and collisions between planes and drones at AIRPORTS

Drones used to import weapons and drugs into PRISONS

Drones that cause disturbance at public EVENTS

Drones used to study or damage CRITICAL INFRASTRUCTURE

Drones used to survey containers and vessels at HARBOURS and PORTS

Drones used to threaten cyber security, privacy and safety on SUPER YACHTS

Drones used to survey and disrupt government employees and VIP's

With 100+ radars across Europe, Robin Radar has become the European Market Leader for drone and bird detection.

RADAR LOVE

Our technology is installed across the globe, on numerous terrains. But it all started in The Netherlands.

In cooperation with the Royal Netherlands Air Force, and later, the European Space Agency (ESA), TNO began developing unique algorithms to use radar. It was clear the technology had huge potential, and Robin Radar Systems was spun out of TNO in 2010. The rest, as they say, is history.

A lot has changed since, and today's market demands even more… Today's market demands more than detecting drones from kilometres away. It faces an evolving threat in a complex world.

Drones can be pre-programmed for autonomous flight without an operator, and can even approach in swarms.

The modern drone detection system needs to rise to these challenges, even under conditions of low visibility and in urban environments full of obstacles and moving objects. That's why we believe that high-performing radar technology must be at the heart of any worthy C-UAS System.

Our purpose-built drone detection radars seamlessly integrate with other technologies. They prevent false alarms by distinguishing between drones and other moving objects, such as birds, and even perform in difficult environments and conditions.

ELVIRA® combines smart software with affordable radar, specifically built for drone detection and tracking. This radar delivers a capability and price level that meets the needs of the professional security market, on a global scale.

IRIS® adds target elevation, increased performance and comes in a small and lightweight package. It is well-placed in both the global security and defence market.

UNIQUE CAPABILITIES

When early-warning and long-range detection are important, there's simply no substitute for radar.

Surveillance by humans and optical systems has advantages, but is also limited by range and visual conditions. Radar can detect multiple targets simultaneously, even under conditions of low visibility.

Since radar doesn't depend on signals transmitted by drones, it's also able to detect autonomously, whereas other sensors may only detect radio transmissions from remote-controls

Knowing exactly where the drone is in real-time is important when integrating other sensors and countermeasures, like cameras, jammers, lasers, spoofers, protocol manipulators, etc.

Automatic Drone Classification

Now, even if you've already managed to find a radar which can see small objects, it's unlikely it can tell birds apart from drones. Few can.

Where most other radars don't provide classification of birds and drones, both IRIS® and ELVIRA® do that for you - automatically. Giving you time to concentrate on the action you need to take.

Unlimited 360° Coverage

Both IRIS® and ELVIRA® cover a full 360-degrees and come with a standard instrumented range of five kilometres.

Our radars can be easily combined into an integrated sensor network. The output from multiple radars is incorporated into one unambiguous picture, meaning a single drone causes a single alarm.

IRIS® is a 3D radar and comes with a full 60-degree elevation coverage. Know exactly where your target drone is and how high it is. With accurate elevation reporting, IRIS® can cue other sensors and effectors for fast identification and mitigation.

Affordable

Radars are expensive. And military radars are seriously expensive. But it doesn't need to be that way.

In much the same way that drone technology itself has become affordable and accessible, we've combined affordable hardware with extremely smart software to provide you with military drone detection and tracking capabilities, at a fraction of the cost of military systems.

"IRIS® CAN DETECT AND CLASSIFY DRONES SWIFTLY AND SMOOTHLY. IT'S VERY EASY TO USE. MOVING TARGETS, STATIC TARGETS, EVEN MULTIPLE TARGETS; THEY'RE ALL DETECTED AND CLASSIFIED."

Marijn Verbaant - Min-Def C-UAS Expert

IT ALL STARTS WITH DETECTION

We've specialised in detecting and tracking small objects for more than 30 years. Birds actually. And even though we started with birds, we validated our data with drones to prove our tracking accuracy.

That's important, because accurately and quickly detecting, classifying and verifying non-cooperative objects in airspace is absolutely critical. It's the trigger that puts plans and countermeasures in motion. It's time to react. It's peace of mind and exactly what we've built our radars to do.

But neutralising a drone threat, in the most effective way, involves several technologies working together.

Radio frequency (RF) analysers, acoustic sensors, optical sensors and human observers each bring unique powers to a formidable full-solution system.
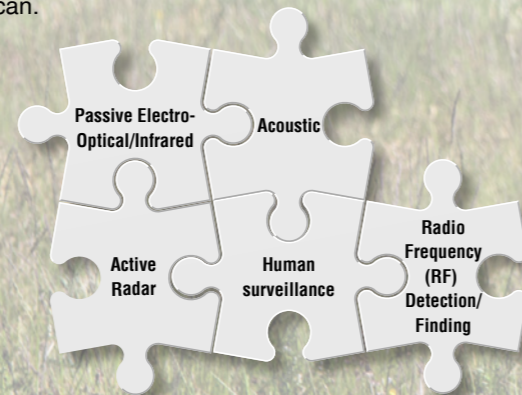
RF is used to detect radio communication between a drone and its controller. Some high-end RF systems not only detect, but can also locate both drone and controller positions. Some can also identify the MAC addresses of the drone and controller (if the drone uses Wi-Fi for
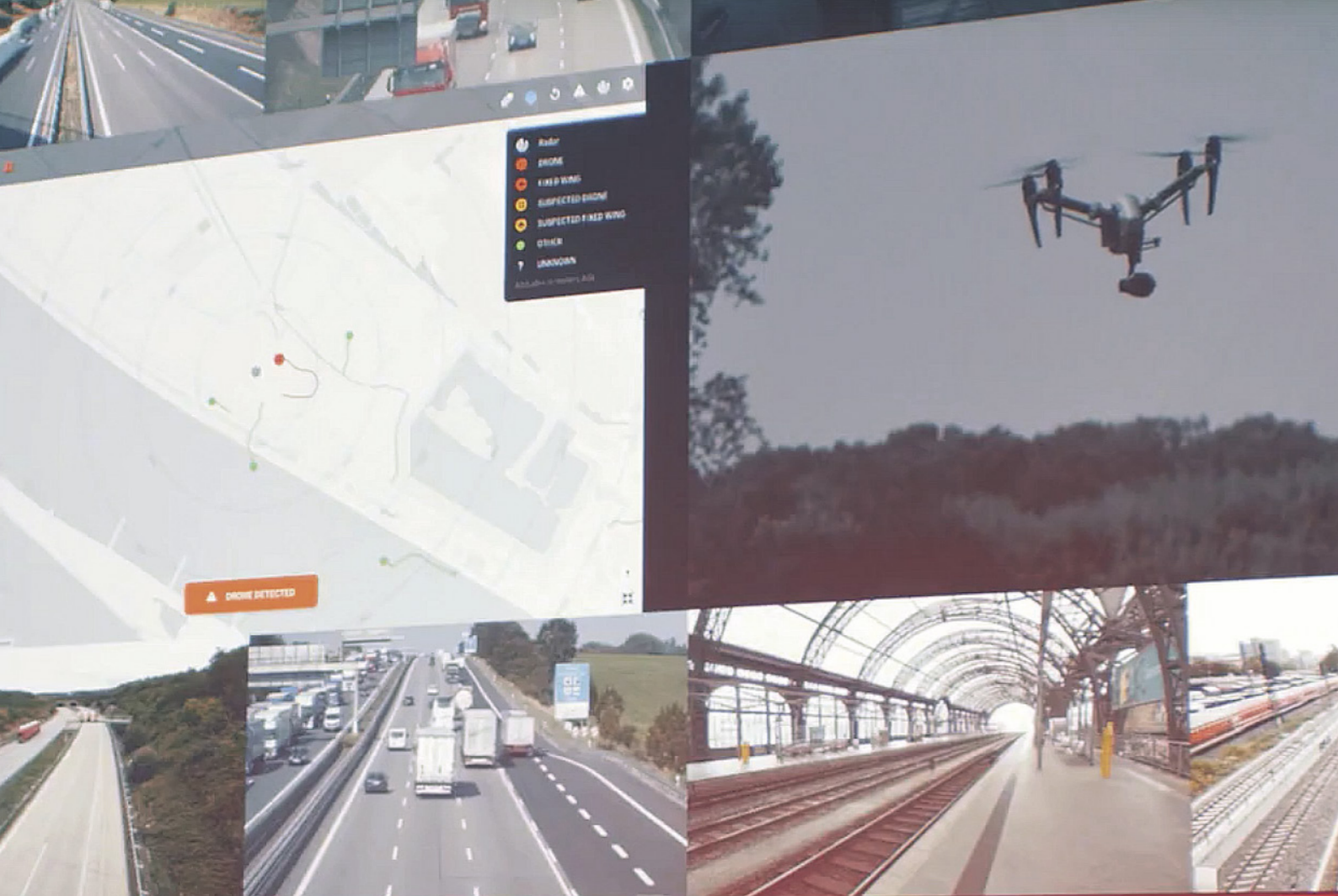
communication). This can be useful forensic data for potential prosecution procedures.

Acoustic sensors detect the sound made by a drone and calculate a direction. More sets of microphone arrays can be used for rough triangulation.

Optical sensors (cameras) provide essential visuals on the drone and its (potential) payload. They even record images as forensic evidence for use in eventual prosecution.

Advanced technology is essential, but none can predict, verify and react in the same way that human observers can.

Passive Electro-Optical/Infrared

Acoustic

Active Radar

Human surveillance

Radio Frequency (RF) Detection/ Finding

FLEXIBLE INTERFACES

Actionable Information with Early Warning and Classification… in One Sensor

For early warning of incoming drones, you need radar. Simply put, no other sensor technology has as a wider coverage area. Both IRIS® and ELVIRA® provide early warning of approaching targets, giving you precious time to react.

Classifying, and most importantly, differentiating drones from birds and other moving objects, is a critical feature in preventing false positives. Whereas other systems require a combination of multiple sensors to go from detection to classification of targets, IRIS® and ELVIRA® combine detection and classification in a single sensor. This gives space and time to make accurate, critical and informed decisions.

Source: Joint Nucleus C-UAS Test Centre

Actual Drone and Radar Track Comparison

Drones in 60 Seconds

Our radars are so easy to set-up and use that you'll be detecting and tracking drones within minutes. And our newest radar, IRIS®, is so small and lightweight that a single person can carry it, deploy it and redeploy quickly, simply and easily.

Simple and Intuitive Map-Based Interface

Our map-based DRONE VIEWER is an intuitive web interface comprised of colour coded tracks. Red tracks indicate drones and their flight path. Orange tracks represent suspected drones. Green tracks represent birds and other moving targets. All track types can be toggled on and off, and the track visualisations and colours are all user-configurable. Mapping and satellite imagery are also available and configurable.

Live Stream All Tracks and Alarms to Your External Security and Command & Control (C2) Systems

With both IRIS® and ELVIRA® you can integrate tracks and alarms as an additional layer in your existing security systems and Command and Control (C2) systems. A simple XML broadcast-based interface is included with both IRIS® and ELVIRA® as standard. Other protocols, e.g. ASTERIX, are available on request.

Record all Data

To enable case evaluation, all tracks and alarms are stored in a spatial SQL database.

Customise Your Own Alarm Zones

As a user, you can define virtual zones depending on your own special use-cases. You can cause both visual and acoustic alarms to be triggered when a drone is detected and classified. And for the more complex environments or scenarios, you can also trigger alarms only when a drone enters a specific area, which you define yourself.

Friend or foe? Defining safe zones where you deploy your own drones is also possible, and will ensure detections do not trigger alarms in these areas.

Remote Diagnostics

The system's performance can be monitored from a remote location. If something is not working the way it should, technical staff can immediately log into the system, perform diagnostics and in most cases, solve it remotely.

Easily Integrate PTZ Cameras

Our micro-doppler capability provides the necessary confirmation that a target has mechanical propulsion. Even so, users often require a visual picture in order to take further action. ELVIRA® is designed to work with a high-resolution pan-tilt-zoom (PTZ) camera for fast visual confirmation of the targets it detects. When a drone is detected, the camera zooms into its direction for a controller to acquire an image and report details. With IRIS® external camera can be cued and slewed right onto the target directly, thanks to its 3D capability and accurate height tracking.

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DRONE DETECTED

DRONE VIEWER interface
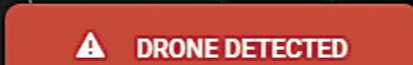
SYSTEM SPECIFICATIONS
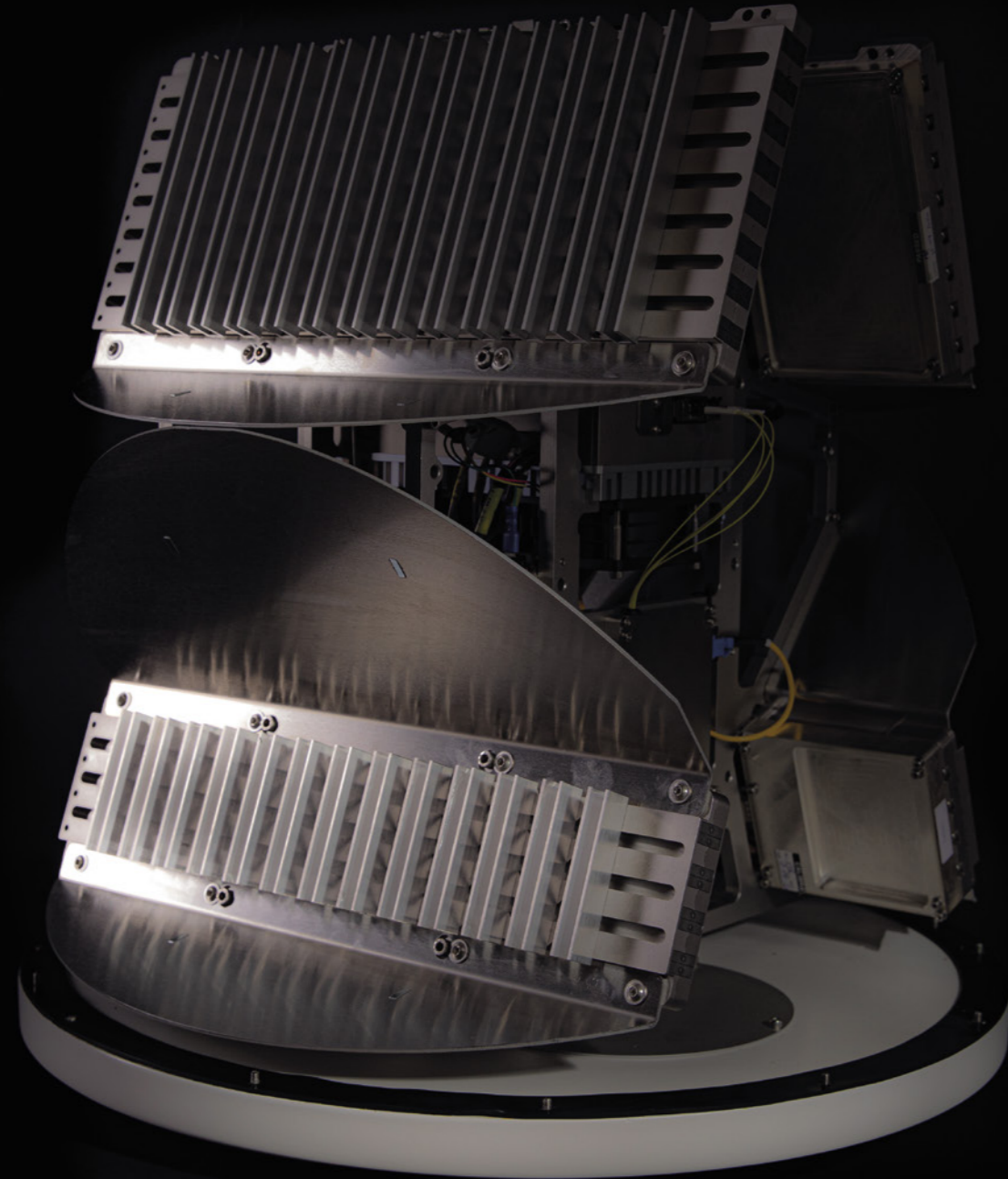
	ELVIRA® Specifications	IRIS® Specifications
Technology	FMCW Solid State Radar (2D)	FMCW Solid State Radar (3D)
Frequency	X-Band	X-Band
Power Output	4W	2x 12W
Rotation/Scan Speed	45rpm / 1.3s	30rpm / 1s
Instrumented Range	5km	5km
Azimuth Coverage	360°	360°
Elevation Coverage	10°	60°
Classification Method	Micro-Doppler	Micro-Doppler
Dimensions	918mm diameter, 1060mm height	554mm diameter, 623mm height
Weight	72kg	25kg

SYSTEM INTEGRATORS

We know you have a tricky job, because there is no 'silver bullet' when it comes to counter-drone solutions. They differ per case and require a mix of integrated technologies.

We believe in the power of cooperation. IRIS® and ELVIRA® are designed to talk to other technologies, and that's what makes them the preferred primary sensors within a 'system of systems'.

Our radars provide some critical pieces of the puzzle: detection, tracking, classification and automatic alarming. But we understand that users also want, and in many cases, need, the ability to verify via multiple sensors, intervene, mitigate, displace or remove the drone threat.

Our goal here at Robin Radar Systems is to build the most capable, and affordable, drone detection and tracking radar in the world. We do that by focusing solely on our radar solutions. We don't act as system integrators ourselves for one simple reason: it would pull us from our goal of being technology leader in drone radars.

So, this is where you come in. Are you a system integrator with:

- access to the market;
- counter-drone as a strategic topic; and
- an ability to integrate and build a modular and holistic counter-drone system…

Then we want to work with you!

"THE LINE BETWEEN COMPETITORS AND PARTNERS IS THIN. I'M AN OPTIMIST, AND I BELIEVE IN THE POWER OF COLLABORATION AND COOPERATION.

Siete Hamminga - Robin Radar Systems CEO

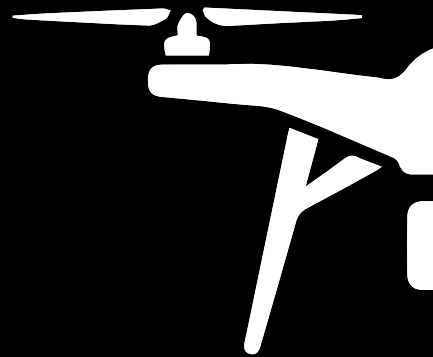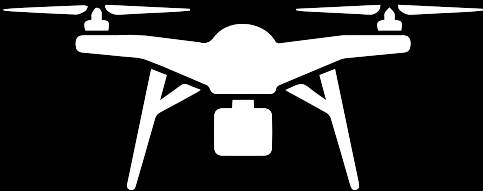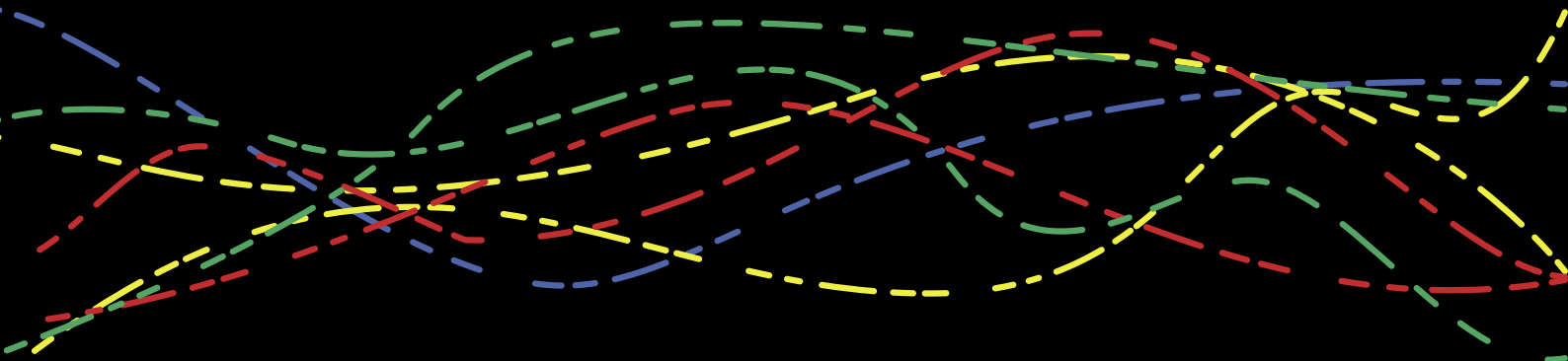# ROBIN IN ACTION

Protecting World Leaders

If you told us, ten years ago, that our technology would be applied to protect Donald Trump from aerial threats, we'd have said: "You had a pretty vivid imagination. And there's nothing wrong with that."

Well, that happened. And we secured several high profile political events leading up to it, including a G7 and Nuclear Security Summit.

In 2018 we were brought in to help protect world leaders as they gathered in Brussels for a NATO Summit. Amongst the attending were Donald Trump, Theresa May and King Philippe of Belgium - to name just a few.

As impressive as those political leaders look, we can't help but admire the VIP positioned on the top right pillar of the building. (Psst, it's ELVIRA®).