

Unmanned air vehicles are increasingly being adapted for civilian policing. **Gary Mason** looks at what the future holds for this new technology.

# Taking flight

Police forces in Europe have now had some success in testing unmanned air vehicles for specific operations—including border controls. Industry experts warn that before any further development in this field, statutory guidelines must also be developed.

The GPEC (General Police Equipment Conference) conference in Munich this spring, displayed several UAVs that had been tested by police forces. The German Federal Ministry of the Interior held a special conference to discuss upcoming and future uses of the vehicles including a deployment during the recent Euro 2008 football tournament held in Austria and Switzerland.

During the tournament, Zurich Police used a Ranger UAV supplied by RUAG Aerospace to mount surveillance operations around the stadiums and to monitor restricted areas and tunnels.

The conference also displayed the AR100-B and AR70 designed by AirRobot GmbH & Co. A company representative Burhard Wiggerich told delegates that a 30 percent reduction in size and increased stability allowing for flights in windy conditions had made the new generation of UAVs safer and more reliable for law enforcement.

'Future concepts include autonomous

collision avoidance, point to point navigation systems to avoid unknown obstacles and laser scanning technology,' said Mr. Wiggerich.

'We have also developed an optical camera that creates a virtual memory map of its own over a short range.'

Wiggerich added that technical advances need to be backed up by formal protocols agreed at national and international level for the safe operation of UAVs. 'We are at the beginning of a new industry whose legal

**'Future concepts include autonomous collision avoidance, point to point navigation systems and laser scanning technology'**

basis for civilian application must still be established,' he said.

New legislation is currently being prepared by the German Government to cover use of UAVs in civilian aerospace. Input from police forces and the aviation industry is being included.

Many UAVs being tested in law enforcement operations were designed as military models and still require expertise from the armed forces to operate them.

The Swiss made UAV system known as the Ranger was designed for military use but has recently been used for civilian missions including monitoring traffic, policing natural disasters and for border surveillance. The drones are close to the size of a light aircraft, and are operated by military personnel via control stations at air strips.

Rene Gauch, from RUAG Aerospace, told the conference that the UAV was used during the recent Euro 2008 football tournament in Switzerland with flights operating from the host cities of Basle, Bern, Genf and Zurich.

'The UAVs were controlled with pre-planned flight paths and restricted areas over a 20km radius,' he said. In February 2008 police in Bern tested the drone ranger under the guidance of a major from the German Air Force.

Images from the drone were relayed to the police control room at headquarters during the exercise. Mobile control rooms with screens could also receive information including mapping information and busy arterial road traffic.

UAVs are becoming more adaptable and can be launched from the sea to patrol busy waterways and major shipping channels. For example the CAMCOPTER s-100 designed by Schiebel, one of the best known UAVs for law enforcement following a border patrol

mission on the Austrian/Slovakian Border in 2006, was recently tested at sea by the Spanish Police, off Grand Canaria.

Andrea Bartl from Schiebel told delegates that the S100 had been used at night for the Austrian border trials with each flight lasting between 1.5 and 2.5. The total length of border patrolled was 70km.

Restrictions on the flights included a 3km-wide flight corridor and a maximum altitude of 2,500 feet. Flight permits for the test

were granted and specified by the Austrian aviation authorities and the European Aviation Safety Agency (EASA).

'There were flight approaches to two international airports nearby so the airspace had to be very strictly controlled,' she said.

The Grand Canaria pilot of the UAV was conducted by the Guardia Civil in April 2008.

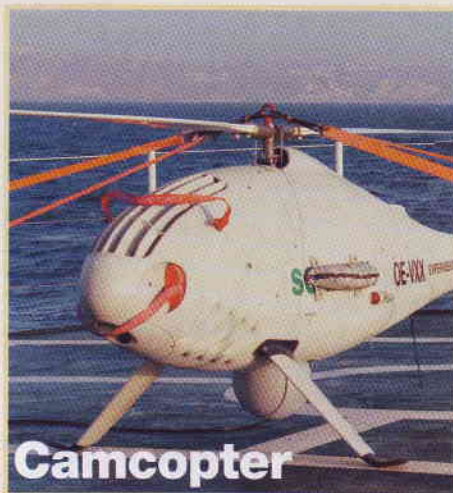
The UAVs were flown from helipads on board one of the police vessels.

'This was the smallest ship the UAV had

ever been tested on – it was only 50 metres long,' she said. The UAV was operated by the Guardia on a pre-programmed flight path in restricted airspace.

To make the UAV suitable for ship launch and landing it was fitted with an automatic decking device (ADD) and emergency landing floats if it needed to land in the sea. Images from the onboard cameras were relayed to laptop computers used by officers on the small patrol vessel.

**UAVS USED IN EUROPEAN TRIALS:**



**Camcopter**

Schiebel/1293548

THE S-100 has been designed as a platform for a wide variety of payloads, and therefore no standard payload is offered. The AV features two payload bays, side hard points and an internal auxiliary electronics/avionics bay. The primary payload bay, located directly beneath the main rotor shaft, is capable of mounting payloads weighing up to 50 kg (100 lbs.) Fixed-mounted daylight and/or infrared cameras provide the operator with situational awareness and orientation.

The AV fuselage is a carbon-fiber monocoque. The AV is capable of carrying a 25 kg (55 lbs) payload for up to 6 hours. The AV is powered by an aviation-certified rotary engine. The S-100 is also being developed for maritime applications, where, like its predecessor, it will be capable of landing on helicopter deck-equipped ships without the use of additional landing equipment.



**Ranger**

RUAG Aerospace/1290183

The RANGER Unmanned Air Vehicle (UAV) is a miniature fixed-wing light weight aircraft, remotely controlled from the Ground Control Station. The UAV is equipped with a skid system which allows landing on unprepared grass strips or snow. A wheeled version is also available. Standard payload is the MOSP Mk III, an advanced, lightweight multi-mission spherical payload with auto-track capability. It is available in various configurations, either: TV, FLIR (infrared camera) – FLIR is an aeronautics company that makes thermal imaging cameras for UAVs and other aircraft – Combi TV/FLIR, TV with Laser Designator, FLIR with Laser

Designator. As well as system status reports, the UAV transmits real-time video/FLIR pictures with coordinates of the objects observed or other information, depending on the payload, to the ground control station for decision making and/or processing.

A key feature of the RANGER system is the autoland system. An autoland position sensor scans, tracks and measures the position of the approaching UAV continuously. The measured positions are transmitted by a fiber-optic link to the ground control section. The control-loop to UAV is closed by the data uplink from the remote control terminal to the UAV.



AirRobot GmbH/1321990

**AirRobot**

Does not need to share civil airspace as can be deployed at close range and at low altitudes. Low weight and small kinetic energy generated through flight results in minimum impact risk should the operator lose control. Safety features include: GPS positioning control and an outside protection ring made of carbon. It also has built in automatic landing and 'lost link' cut out systems should the operator lose control of the aircraft.

**Aladin Fancopter**

Used by the military in Afghanistan, Kosovo and the Congo this small UAV can be started by hand or using a motor from the ground. It provides operators with live video footage and can be used in night operations via the onboard infra-red camera.