

The Drone, that Smart Animal



Inaugural flight of an S-100 at Wiener Neustadt

It is comforting to see, in our brutal world of defence where often-confusing acronyms have become a plague, that several publications – including an American one – have reverted to the good old fashioned word «drone».

Eric H. Biass

And what a noble title it is. For those who may have forgotten, a drone is the male member of that smart bee family that is in charge of keeping the hive's queen happy. The word drone was originally adopted by the Americans themselves (particularly Ryan) to designate their first unmanned aeroplanes, and later abandoned by the Americans (particularly the bureaucratic species) in favour of a full collection of acronyms that now requires a glossary to be deciphered. Food for thought: the US Army FCSS are fitted with FCSS.

New Factory...

Hans Schiebel had every reason to be happy on 7 September 2006. Indeed all the concerned Austrian and local authorities were at the Wiener Neustadt airport for the inauguration of the brand new Schiebel factory. In clinical cleanliness, the € 8.5 million plant has a production capability of 100 to 150 Camcopter S-100s per annum, and this includes the autoclaves for the manufacture of the carbon fibre elements (material from which most of the aircraft's structure is made).

At the time of the author's visit to the factory, Schiebel's Managing Director Dr. Stephan Viewag said that one S-100 was being prepared in

conjunction with the Austrian police to test its suitability for border surveillance. This has since taken place with nine night flights completed between 18 and 28 September flying at a height of 1500 metres above the ground. These 70 km flights over the Austro-Slovakian border are routinely performed by police helicopters. Although the aircraft was operated by Schiebel personnel, the IAI-Tamam Pop200 stabilised electro-optical and infrared cameras were managed by those very same police officers that fly the manned helicopters using similar payloads. The current payload weight is about 25 kg (with which the S-100 has an endurance of six hours), however, that actual capacity is close to 55 kilos. Other sensors being looked at are a lidar and even a synthetic aperture radar (incidentally, for which Schiebel is in discussion with Eads). It must be noted that the S-100 seen in our title photograph carries a non-standard 'package' right aft the gimballed assembly. This is a backup radio control, in compliance with Austria's flight safety regulations.

The Camcopter S-100 now has 100 orders on its scoreboard, with 60 under firm order from the United Arab Emirates (plus another 20 on option), and another 20 firmly ordered by two undisclosed customers. The above-mentioned tests performed by the Austrian

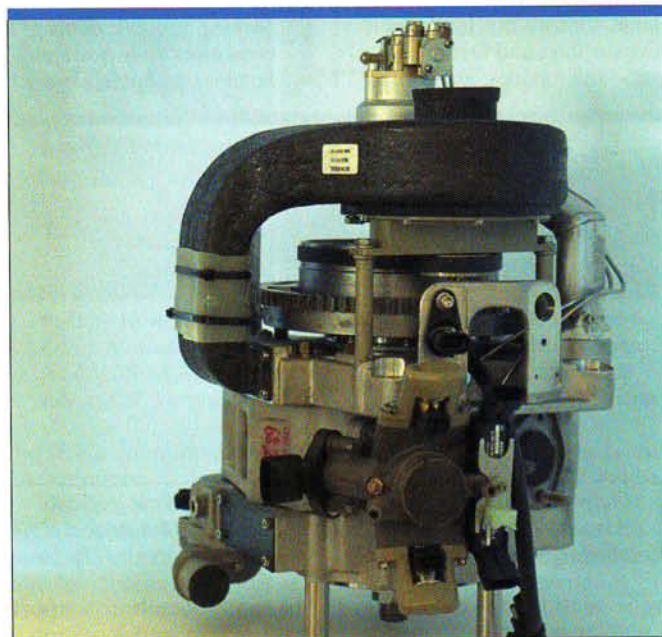
Police will no doubt increase interest from the country's army, who has been holding serious negotiations with the manufacturer. Things are also progressing in the United States where negotiations for demonstrations were underway with the Department of Defense for the US Navy and the Marine Corps.

In September, the United Arab Emirates was already flying two aircraft in Afghanistan for night missions using the same payload

(which is the standard fit for the time being). By the time that these lines are printed the United Arab Emirates should have taken delivery of 30 aircraft. Given the size of the order, production of certain fuselage parts and final assembly take place locally.

...and New Drone

New yes, but not one that will be going into real operations in spite of its aggressive designation: Raytheon has recently unveiled the Cobra, although the aircraft actually took to the air in January 2006. Entirely developed in-house (including the airframe), the



The Camcopter S-100 is powered by a Diamond rotary-piston engine that develops 55 horsepower at 7100 rpm. A gearbox reduces this to a 1000-rpm output to the rotor. Currently, the time between overhauls is set at 100 hours, but Schiebel has good hopes of soon seeing this being stretched to 250 hours. (Armada/EHB)

Cobra is in fact a payload test platform. As a company official in Tucson told the author, the trend is for smaller and smaller systems, the reason why the company embarked on this programme to offer customers a most cost-effective and ready-to-operate platform. The sensors to be tested, by the way, are not restricted to those to be potentially carried by drones, but also by missiles, and include radio-frequency, electro-optical, infrared and even synthetic aperture radars. The

testing». Some nine aircraft have so far (November) been built, but the company intends to build more next year (2007).

While the Cobra appears to be the third unmanned aircraft to have received the FAA stamp of approval (the other two are believed to be the Altair followed by the Eagle Eye) it certainly is the first comparatively lighter aircraft of its kind to be granted the official civilian airspace ticket (interestingly, the maximum flight altitude of the



The Herti is based on a Polish motor-glider, the J6 from J&AS Aero design, originally powered by a Honda motorboat engine. However, the Herti flies under the power of a BMW motorbike flat twin, although a Rotax 914 might cut in to increase power. It has a 12.6-metre wingspan and a 5.1-metre length. (BAE Systems)



The 3.05-metre wingspan Cobra is powered by a two-stroke, 16.5-horsepower Desert Aircraft engine. It weighs about 20.5 kilos and is 2.75-metres long. (Raytheon)

Cobra was thus developed from the outset to accept various «payload trays». Asked whether the system was intended for sale, the same company official said that this was a possibility and that Raytheon would also offer a comprehensive training programme, but the emphasis is on «mainly integration and

Cobra has not yet been explored, according to Raytheon). The other components of the system are ground-related, of course, and include the Piccolo ground control suite from Cloud Cap Technology operating in conjunction with Raytheon's own open architecture Multi-Vehicle Control System,

which enables one to simultaneously operate vehicles of different nature.

Herti to Exercise

Unveiled at the 2006 Farnborough air fair, the BAE Systems Herti is now at the heart

of a project intended to introduce the unmanned aircraft into British military exercises – a «first» according to the manufacturer. BAE Systems is currently working with the Royal Air Force's Air Warfare Centre on a programme called 'Project Morrigan' with



The Sidm, the interim male drone system, has made its maiden flight from the Istres French Air Force base complete with full satellite communications and line-of-sight datalink package. The aircraft, based on an IAI E-Heron airframe, demonstrated the full functionality of both the payload and the automatic take-off and landing system during this flight. (Eads)

Wide Angle View

Northrop Grumman has recently provided Armada with pictures produced by the RQ-4 Global Hawk maritime demonstration system during the multi-national Rim of the Pacific exercise carried out late July. The purpose of the exercise for the Global Hawk was to demonstrate its ability not only to identify targets in a coastal environment, but also to search and track objects of interest over a wide maritime area. In this exercise the US Navy operated one of its two maritime demonstration Global Hawks from Edwards Air Force Base, California to Hawaii for each mission flown (about 4000 kilometres each way, plus over eight flight hours on station for each of the four missions). Equipped with sensors carrying new maritime software modes, the aircraft captured images of various activities, including a ship-sinking exercise, expanded maritime interdiction operations and wide-area search and surveillance performed during the exercise. Unfortunately, Northrop Grumman declined to say from what altitude these pictures were taken, although in a later statement regarding the company's intention to enter the competition related to the US Navy's maritime surveillance programme, it puts forward the ability of the Global Hawk to clearly identify and track target vessels in various sea states from twelve miles above the ocean's surface.



a view to defining the introduction of the Herti system «into progressively more complex military exercises, in order to better understand the contribution autonomous UAV systems can make in the joint battlespace». Although the drone features a conventional faired-wheel, fixed undercarriage, the Herti has been launched from a Robonic catapult.

How many more drones could BAE Systems have up its sleeve(s)? The answer is anybody's guess. Over the past year or so the company has unveiled the existence of several hitherto hush-hush programmes, amongst which are the turbo-jet-powered Kestrel and Raven (of which one has been secretly flown in remote Australia) and the Corax. □