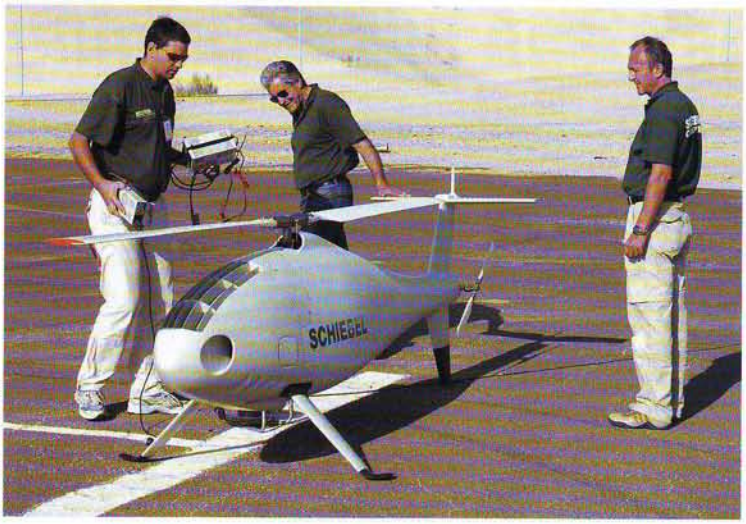

Schiebel: 1130692

■ A Camcopter S-100 air vehicle is prepared for a test flight without its optronic payload. It can be flown at an altitude of 20,000 ft and with a single relay can be controlled over a 400 km ground-air link, or further still using a satellite connection.

fitted with a palletised loading system.

Mantra customers include Gabon, Nigeria and the Saudi Arabian National Guard, the latter acquiring a total of 200 vehicles in different versions. Saudi Arabia, along with Iran and Iraq, has also been a customer for Achleitner's semi-trailers, which it produces in four, five and six-axle versions for transporting plant equipment and heavy armoured vehicles.

Schiebel Elektronische Geräte, which has 140 employees and offices in the Middle East and the US, has hitherto been especially well known in the field of de-mining. It notably made its name as the supplier of 30,000 hand-held mine detectors to the US Army and, in somewhat smaller quantities, to armed forces and non-government organisations in another 100 countries worldwide.

In the 1990s the company was to the fore in introducing pulse technology for mine detection, exemplified by its 3.82 kg AN19/2 hand-held detector (designated AN/PSS-12 in US service). Similar technology was applied to the company's VAMIDS vehicle array mine-detection system, and to the downsized 2 kg MIMID (miniature mine detector). Schiebel now also produces an all-terrain mine detector (ATMID), combining the pulse detection technology of the AN19/2 with a continuous-wave mode for use in areas with severe laterite conditions, and its latest compact mine detector (COMID), which embodies the attributes of MIMID and ATMID in a single 1.7 kg unit.

Reliable method

Managing Director Hans Georg Schiebel says: "Metal detection remains the only reliable mine-detection method – it may give rise to a lot of false alarms, but at the same time it does not miss anything. Ground-penetrating radars, thermal goggles and so on might give fewer false alarms but they miss a lot, and 99 per cent detection is not good enough."

Schiebel has been involved in sensor fusion in the past, under the auspices of the European Union. An early model of the company's rotary-wing Camcopter unmanned aerial vehicle (UAV) was also employed in trials with multispectral cameras systems, which Schiebel observes "proved quite successful for identifying mined areas".

The Camcopter has since evolved into a general purpose airborne surveillance platform, and is emerging as an important new business sector for the company. The current order backlog exceeds 100 units from several customers, the largest of which is the UAE (80+ on order). The company is opening a new production facility outside Vienna, where it is planning to start producing UAVs at a rate of four per month from this month (May). According to Schiebel, "we are in a very significant growth phase – we can expect to see a multiplication of production volume over the next two years".

Orders have already been taken for border protection and surveillance applications, but Camcopter is also suitable for deployment at battalion level or higher as a battlefield tactical UAV (TUAV), and it could become a key enabler for battlefield digitisation systems, featuring communications relay as a standard feature. Early models are already in use at sea with the Egyptian Navy, and in September 2006 the latest version is due to begin a demonstration with a European NATO navy.

■ The dual-mode ATMID all-terrain metal detector is effective in both normal soil conditions and those with a high content of iron or aluminium oxides. Scheibel: 1130691

Demonstrators

The initial Camcopter 3.1–5.1 models, introduced from the mid-1990s, were essentially demonstrators, some 20 examples having been sold for proof-of-concept trials to combat engineers and others. In 2003 the platform was redesigned from scratch, resulting in the present S-100 model with a carbon-fibre monocoque fuselage. It has a 200 kg take-off weight and a 3.4 m diameter rotor, compared with the 3 m rotor diameter and 70 kg take-off weight of its predecessor.

According to Schiebel, the unique advantage of the helicopter UAV over its fixed-wing counterpart is that it does not need a runway and has a small logistic footprint. Its automatic flight-control system makes it very easy to fly, with a substantially lower loss rate than fixed-wing UAVs. It is launched and recovered automatically, using vertical take-off and landing, and can be programmed to navigate via pre-programmed GPS waypoints. Alternatively it

■ Schiebel's VAMIDS vehicle-mounted mine detector attached to a Mechem Casspir de-mining vehicle.

Jane's/IDR: 1130682

may be operated manually through its highly stable flight-control system. Schiebel notes: "With fixed wing you always have to deal with speed: with Camcopter, if you let go of the controls, it just stops where it is in the sky. If need be, it will operate without a datalink for recovery, landing automatically." Six pre-series Camcopter S-100s were built prior to production startup, and not one has been lost, their triple-redundant flight controls having had zero failures in 700 hours of operation.

■ The M6C-210 commando mortar has a trigger mechanism for rapid intuitive firing at short ranges, using either elevated or flat trajectories.
Hirtenberger: 1130684

The Camcopter S-100 has a dynamic performance akin to that of a typical fixed-wing UAV, with a 100 kg gross payload (sensors and fuel) and 130 kt+ forward speed. Carrying a 25 kg useful load, its endurance is six hours on internal fuel. External tanks can be added, and with a single relay the normal maximum datalink range can be doubled to 400 km. Given appropriate clearance, the Camcopter S-100 may be flown at altitudes as high as 20,000 ft and, thanks to its comparable speed and (even greater) endurance, lends itself to co-operation with standard helicopters. Under the latter's direct control, it could be used as a precursor. Inaudible from a few hundred metres and much smaller, it would be unlikely to attract ground fire or attention in the same way as its manned counterpart.

The Camcopter S-100 has a maximum sensor payload of 55 kg, variously taking the form of a stabilised gimballed day/night camera package, a synthetic aperture radar, a LIDAR (light detecting and ranging) sensor, multi-spectral imager or ground-penetrating radar. The customer-specified optronic sensor package would typically provide dual video feeds in real time, allowing a ground station to view thermal and daylight imagery simultaneously. A C-band link is used for UAV control and streaming data relay, providing four channels for data or multiple (compressed) video transmissions, or a single 10 MB/s (after error correction) analogue channel. It is also possible to introduce a GPRS telephone module in one of the aerial vehicle's electronics slots, or operate it via a 128 Kbit/s satellite phone link (enough for a few pictures per second).

Ground system

According to Schiebel, a system generally includes two or three UAVs, and costs approximately EUR1 million per platform, including training and spares. Each comes with its own ground system, but an open-system architecture is utilised to facilitate networking, and the aerial vehicles could be made compatible with a STANAG 4586 common ground system.

Hirtenberger: 1130685

Hirtenberger: 1130683

■ Left: Hirtenberger is developing an enhanced version of its APFSDS M57 105 mm medium-pressure round to provide increased lethality for the Kurassier light tank.

■ Right: Hirtenberger's 60 mm HE Mk 2 mortar bomb has a range of better than 4 km when fired from a 1 m tube. It can be used with a point detonating fuze such as the Junghans DM111A4 or the Fuchs M9815 proximity fuze.

The Hirtenberger Defence Systems company, which originated in 1860, employs some 400 personnel at its Hirtenberg production site, with another 200 at its other civil production facility (which include an airbag manufacturing operation) at Papa in Hungary. The focus of Hirtenberger's military activities is development and production of mortar systems, together with their associated ammunition, plus rounds for artillery and tanks. More than 70 per cent of its defence output is exported.

The current family of 60 mm mortar ammunition is the Mk2, which includes high explosive (HE), smoke (white phosphorous, red phosphorous, titan tetrachloride), illuminating, and infrared illuminating natures. Since its introduction in 2004, it has been adopted by the forces of 20 nations including those of the UK (which use it in conjunction with the US M224 commando mortar). Principal benefits of the HE round are its range and terminal effects, the latter being derived from the use of a special cast-iron body filled with 0.3 kg of high explosive that yields more than 590 fragments. Range is 3,761 m

AUSTRIAN DEFENCE INDUSTRY: PRINCIPAL PLAYERS

F.Achleitner Fahrzeugbau – armoured vehicles, troop carriers, heavy transporters;
AMT – V201SM special mission aircraft, Eyrie UAV;
J.Blaschke Wehrtechnik – NBC clothing and camouflage systems;
Carinthia Gold-Eck – sleeping bags, foul-weather gear;
Empl Fahrzeugwerk – riot-control vehicles, tanker bodies, wreckers, tank transporters, shelters;
Glock GmbH – semi-automatic pistols, field knives, entrenching tools;
Goetzloff – NBC clothing and customised products;
Habernig Camouflage – personnel and vehicular camouflage systems;
Hirtenberger – mortars and ammunition systems for artillery, mortars, and tanks;
Hitzinger – ground power units;
Interforst Group – demining vehicles;
MAN Nutzfahrzeuge – military logistics vehicles;
NAUTICAST – bespoke navalised vessel-tracking systems;
Raytech – military vehicle harness systems;
Rheinmetall Waffe Munition ARGES – hand grenades, 40 mm grenades;
Schiebel – mine detectors and UAV systems;
Scotty Group – secure mobile communications systems;
Siemens AG – encryption systems, mobile networks, C2 centres;
Steyr-Daimler-Puch – tracked and wheeled armoured fighting vehicles;
Steyr Mannlicher – assault rifles, sniper weapons, pistols.