Aside from amply demonstrating the utility of Unmanned Aircraft Systems (UAs) in both the strike and reconnaissance roles, America’s ‘Global War On Terror’ (GWOT) has had the interesting side effects of raising market awareness of UAS as civilian surveillance tools and as a potentially significant revenue stream for industry in terms of the contractorisation of both civilian and military UA operations.

Taking these in reverse order, contractorisation of military UAS operations has allowed militaries to field experimental and/or non-inventory UAS expeditiously where time-scales would have been extended if traditional procurement, training and fielding procedures had been used. The frequent ability to split UA launch and recovery from mission functionality has facilitated the use of civilian contractors because the military is able to retain compartmentalised control of the mission (with ‘blue suits’ able to fly (or, at least, oversee) it and process acquired data) while contractors are used to manage the overall system and undertake housekeeping tasks such as UAS maintenance and launch and recovery.

As might be expected, the United States (US - with its long history of ‘field representative’ support for its military) has led the way in this area, with contractor personnel being extensively used to bring on line Advanced Concept Technology Demonstration (ACTD) standard Global Hawk and Predator UAS into the southwest Asian theatre of GWOT operations. Some idea of the continuing level of US contractor involvement in the operational use of UAS in Afghanistan and Iraq can be gained from an examination of relevant US Department of Defense contracts during the period October 2007 to March 2008. Accordingly, on 1 October 2007, both Northrop Grumman and General Atomics Aeronautical Systems Inc (GA-ASI) received UAS support awards with a combined value of US$ 66,375,913. In more detail, Northrop Grumman received US$ 44,461,740 to provide the «logistic support activities» needed to «support the Global Hawk fielded systems and sub-systems used in peacetime operations», with the range including «fielded air vehicles, engines, payloads, ground segments and support segments». On the same day, GA-ASI was awarded a US$ 21,914,173 top-up to an existing contract with regard to «organizational maintenance support» for the Reaper UAS at Creech Air Force Base (AFB), Nevada and «deployed sites worldwide». Here, the work package was to include «aircrew duties/responsibilities, maintaining equipment in accordance with approved applicable [Air Force] technical engineering data, quality assurance, parts/supplies ordering and accountable and flying and maintenance schedule development».

Eighteen days later (31 March 2008), Boeing was awarded a US$ 8,406,000 modification to an existing firm, fixed-price contract with regard to the provision of «persistent intelligence, surveillance [and] reconnaissance [UAS] services» in support of the US Marine Corp’s 24th Marine Expeditionary Unit’s «Operation ‘Enduring Freedom’ surge detachment». Quite apart from the substantial amount of tax dollars involved, these contracts collectively paint a picture of an extremely close contractor/military relationship that encompasses all aspects of operating the US military’s UAS fleet in southwest Asia up to and including «aircrew duties» and «responsibilities». 
While the foregoing has emphasised the US experience, readers should be in no doubt that the contractorisation of military UAS operations is a global phenomena. By way of illustration, June 2007 saw the British Ministry of Defence (MoD) enter into a lease deal with UAV Tactical Systems Ltd (U-TacS - a Thales UK/Elbit Systems joint venture) under which U-TacS would supply a number of Hermes 450 UAS to meet a British Army Urgent Operational Requirement for a UAS surveillance capability to support its operations in Iraq and Afghanistan. A Thales spokesperson characterises this deal as being a «by the hour» arrangement and as involving U-TacS in UAS launch and recovery and maintenance. Usually reliable sources suggest that during the period mid-2007 to early-2008, the British Army's Hermes 450s had clocked up in excess of 3,000 flight hours over southwest Asia, with the overall operation costing the MoD around GBP 70 million. Elsewhere in the world, both Australia’s Boeing Australia (teamed with Insitu Inc) and Israel’s Aeronautics Defense Systems (ADS) have been identified as providing contractorised UAS surveillance services to their respective militaries. In the first instance, Boeing Australia is known to have been contracted to provide ScanEagle UAS-based «services» in support of Australian Army operations in both Afghanistan and Iraq. As of June 2007, Boeing Australia had been awarded an AUS 20 million contract with regard to the provision of ScanEagle «services» for a six month period in Afghanistan, while operations in Iraq have been ongoing since at least 2006. As of April 2007, Australian ScanEagle UAS had flown 172 sorties in «less than five months» in support of Operation 'Catalyst' (the Australian Army’s overwatch operation in Iraq’s Dhi Qar province) and by February 2008, the service’s ScanEagles had clocked up no less than 10,000 hours of surveillance and reconnaissance in support of Australian troops in Afghanistan and Iraq.

As might be expected, rather less detail is available concerning ADS’s activities in the field. Usually reliable sources suggest that the company was awarded a year-long contract to operate its Aerostar UAS on intelligence, surveillance and reconnaissance missions over the Gaza strip on behalf of the Israeli Defence Force (IDF) circa 2007 and the Aerostar UAS appear to have been in service by or on behalf of the IDF since 2003. During the same year (2003), ADS is understood to have begun a company-run, Aerostar-based, round-the-clock surveillance operation on behalf of Angola’s national oil company Sonangol. Initially, this effort concentrated on monitoring approximately 100 off-shore oil platforms and has subsequently expanded to cover all of Sonangol’s oilfields. As of January 2005, this programme is noted as having accumulated a total of more than 6,000 flight hours. Mention of ADS’s Sonangol venture leads neatly into consideration of contractorised operations on behalf of police forces. While there can be little doubt of the utility of UAS in the police surveillance role (persistence, the potential for multiple sensor payloads and cost advantages over manned aircraft being just some of the technology’s advantages), such operations (as, indeed, are all civil and military UAS applications) are hampered by a lack of a clear regulatory structure that will allow UAS to operate freely in national and international airspace. Long recognised by UVS International, this problem will have to be resolved if UAS are to fulfil their full potential and it is heartening to see a move in the right direction encapsulated in the European Defence Agency’s January 2008 award of a EUR 500,000 contract to the Air4All consortium [comprising Alenia Aeronautica, BAE Systems, Dassault Aviation, Diehl BGT, EADS CASA + EADS Defence & Security Germany, Galileo Avionica (trading as Selex Galileo), QinetiQ, Rheinmetall Defence Electronics, Saab, Sagem Defence Systems and Thales Aerospace] with regard to the definition of a UAS usage roadmap that will encompass relevant stakeholders such as airworthiness and air traffic management authorities, procurement bodies, industry and research institutes. Subsequent efforts are scheduled to cover specific areas of interest including the civil security and commercial use of UAS. This said, consideration of the necessary regulatory framework continues to lag dangerously behind the current and evolving capabilities of UAS technology with a particular emphasis on the civilian arena.

Returning to the specifics of police UAS efforts, both Insitu and ADS are known to have undertaken work in the field, with the former having been involved in a UAS technology demonstration for the Houston Police Department that was...
conducted under a US Federal Aviation Authority Certificate of Authorisation that covered the period 09.00 to 12.00 Central Standard Time on 16 November 2007. The trial itself was conducted at a sight some 72 km west of Houston itself and was restricted to an altitude of 305 m (1,000 ft) and a radius of 3.2 km from the UAS launch sight. At the end of the experiment, Insitu noted that the Houston Police Department would not be using UAS on a regular basis in the near future because «until regulations have been developed to ensure the safe integration of [UAS] into [national] airspace, unrestricted use of such systems will not be possible». For its part, ADS is reported to have undertaken flight trials of the Aerostar UAS in support of Israel’s Highway Police during 2006, with the UAS proving itself «ideal for the observation of traffic and the rapid detection, tracking and identification of rogue drivers». While such observations may be true, the effectiveness of UAS as ‘spies in the sky’ should at least be a cause of debate in terms of the benefits or otherwise of such an expansion of the ‘surveillance society’. Staying with police and paramilitary UAS applications (and despite the fact that it is not a contractorised operation other than in terms of logistical support) it is worth mentioning that the US Department of Homeland Security’s Office of Customs and Border Patrol (CBP) Air and Marine has acquired a fleet of five Predator B UAS with which to patrol America’s south-western and northern borders. The CBP first trialled the Predator B in the surveillance role during 2003 and as currently structured, divides its UAS force between south-western and northern operations based at Libby Army Airfield, Sierra Vista, Arizona and Grand Forks AFB, North Dakota respectively. To-date, this operation probably represents the largest ‘homeland security’ UAS application anywhere in the world and CBP’s use of UAS is also significant in that the loss of its Predator B CBP-101 due to pilot error on 24 April 2006 is understood to have prompted a US National Transportation Safety Board public forum to examine the subject of UAS in civil airspace that (at the time of writing) was scheduled to take place during April 2008.

Having considered the UAS’ potential in the police surveillance role, the reader’s attention is now directed towards other civil applications that have been or might be suitable for contractor-type operations. Here, uses that immediately spring to mind include pollution monitoring (particularly where the environment could be injurious to human life), meteorological research (with, again, a particular emphasis on missions where an onboard crew would be in danger), environmental research and communications relay. While UAS usage of the kinds described is already well established within governmental organisations such as America’s National Oceanic and Atmospheric and National Aeronautics and Space Administration Administrations (NOAA and NASA respectively), contractorisation of such services can probably be said to be in its infancy. This said, UVS International has identified growing activity within the area, with active contractors including America’s Evergreen Unmanned Systems (EUS), Canada’s Provincial Aerospace, Sweden’s SmartPlanes and the Australian-American company Aerosonde.

Taking these in the order given, EUS describes itself as a «[UAS] service provider» that «concentrates on commercial, [UAS] surveillance [for] both maritime and land-based applications». Here, it envisages using its initial fleet of six Insitu Insight UAS (together with an associated truck-mounted mobile command and control station and launch and recovery system) to undertake a variety of roles that could include commercial fishing monitoring, communications relay, environmental clean-up support, fire mapping, ice flow tracking, oilfield/pipeline monitoring (including off-shore facilities), sea-life observation, search and rescue and security monitoring. As of mid-2007, EUS’s initial focus was said to be on fire management, petrochemical industry support, maritime monitoring and environmental clean-up support.
For its part, Canadian contractor Provincial Aerospace is on record as stating UAS technology «represents the future of air surveillance» and that the benefits of operating UAS in «harsh ocean environments such as the North Atlantic and the Arctic are obvious». To this end, Provincial is known to have teamed with the Memorial University of Newfoundland to undertake the first commercial UAS flights in Canadian airspace during the period 23 to 26 November 2006. Forming part of the Remote Aerial Vehicle for Environmental Monitoring (RAVEN) project, the trial made use of at least one Aerosonde UAS and is reported to have culminated in a four hour maritime surveillance sortie over the Random Sound. Provincial also notes that as a result of the described test programme, it became the first Canadian aviation company to receive a Transport Canada permit to operate UAS in Canadian national airspace. Looking to the future, UVS International expects Provincial to augment its existing manned maritime surveillance business with a UAS capability should such an add-on prove commercially viable.

On the other side of the Atlantic, Swedish contractor SmartPlanes has developed the SmartOne UAS that is specifically designed for forestry, agriculture and land survey applications. Alongside supplying SmartOne airframes to a range of customers, SmartPlanes is also understood to provide a complete SmartOne package that includes the UAS, operator training, necessary certification, image processing and support and to offer commercial flight and aerial mapping services if required.

Last but by no means least, Aerosonde provides a «full service» in support of its Aerosonde UAS that is divided into field deployment or global operation options. In the first instance, field deployment sees specialised crews deploy to operate the UAS as required under the direction of a local mission director/principle investigator. Aside from the expected operation and support services, the field deployment package includes acquisition of the necessary regulatory approvals. For its part, the global operations approach makes use of a central command facility, with UAS being operated from a distributed set of launch and recovery sites. The global operations package was first trialled with the Australian Bureau of Meteorology during 1998 and became fully operational during a series of missions for South Korea’s Meteorological Research Institute in October 2001.

Over time, Aerosonde has amassed an extensive customer base for its UAS and operating services with the range including NOAA and NASA, the Georgia Institute of Technology, Japan’s Meteorological Research Institute, the Taiwanese Central Weather Bureau, the US Department of Energy, the US National Center for Atmospheric Research, the US National Weather Service, the US Office of Naval Research, the University of Colorado and the University of Hokkaido, as well as the already cited Australian and South Korean institutions.

While originally an Australian concern, Aerosonde was acquired by the American AAI Corporation (itself part of Textron Systems) during June 2006 and a highlight of this second incarnation must be the Aerosonde UAS flights into Hurricane ‘Noel’ which took place on 3 November 2007. Taking the form of a partnership made up of AAI Aerosonde, NASA and NOAA, the ‘Noel’ flight launched from the NOAA Wallops Flight Facility in Virginia at 02.08 pm local time on the 3rd November 2007 and after trailing the storm for some time, penetrated it. Thereafter, the UA flew within ‘Noel’s’ eye wall and eye for 7.5 hours and was subjected to wind gusts of up to 119 km/h. Throughout the sortie, real-time data was streamed back to the National Hurricane Center in Miami, Florida, with UAS control being exercised by an AAI Aerosonde team based at Wallops. Aside from demonstrating the utility of the UAS as a research tool in extreme and dangerous conditions, the 3 November 2007 mission is noted as having marked «three historic milestones» namely the first hurricane mission in which a UAS was able to explore the interior structure of a storm; the longest (17 hours, 27 minutes) UAS hurricane research mission flown to-date and collection of data from the lowest altitude (91 m (300ft)) of any hurricane research sortie to-date.

Hopefully, the foregoing will have given the reader some insight into the evolving field of the contractorisation of UAS operations in both the military and civil arenas. While there can be no doubt that turnkey UAS packages combined with advances in sensor technology offer a cost effective and persistent data collection capability (particularly in environments where a human operative could come to grief), the genre’s potential cannot be realised without the urgent addressing of the regulatory structure that will allow it to operate freely and safely in national and international airspace. Without such a framework, there can be no forward movement, however capable, effective and needed the available UAS and sensor technology might be.