No NVGs?

If night vision goggles are so good for police work, why don’t more UK forces use them?

The bad guys waited until it was dark before they struck. There were a few customers still inside the store on the outskirts of Plymouth, UK. The raid was over quickly – in and out – lots of shouting and threats throwing staff and customers into shock, then out into the waiting car and away.

Well planned, they thought, but an alarm had gone off and the police vehicle, arriving quickly, crossed with the robbers making their getaway. A 180° turn and the pursuit began.

The bad guys had a head start and it took several minutes before other units began manoeuvring into intercept positions. The felons knew the city – the side roads, the short cuts – but it wasn’t enough and the turns became more erratic as the net closed.

Then it changed. A couple of unexpected turns, a sliding halt at the entrance to a municipal park and the bad guys were out and sprinting into the all enveloping dark, their getaway virtually assured.

But it wasn’t. They hadn’t bargained for the overhead arrival of Devon & Cornwall’s BK117C-1-C helicopter fitted with a FLIR Systems Ultra 4000 thermal imager, a Spectrolab Nightsun SK5 Searchlight and a crew proficient in the use of its Ferrari NITEOP Generation III night vision goggles (NVG). Within the hour the arrests had been made. With the park closed for the night and police coming in from several directions, the thieves tried to change their hiding place and were detected by the helicopter crew. Had the police on the ground had dogs, their capture would have been quicker still.

The above incident may be fiction, says Captain Pete O’Connor, but it illustrates the potency of an NVG-equipped Air Support Unit (ASU). O’Connor is an ex-Royal Marine flyer and joined the ASU in 1999.

Although none of its systems are leading edge technology – the NITEOP goggles were bought a decade ago – they are still excellent bits of kit for law enforcers, says O’Connor. Having used NVGs since his military days, he is amazed that Devon & Cornwall is still the only UK ASU to use them operationally (see Defence & Public Service Helicopter, February/March, p95).

Trial and error

It all began in 1978 when Devon & Cornwall became the first UK police force to have a full-time ASU in the form of a twin-engined AS350. In February 1994, the unit undertook a Home Office sponsored evaluation of NVG with its BO105 (purchased in 1984). The aircraft’s cockpit was modified for NVG use by the Alan Mann Group. Flying trials were cleared by the Civil Aviation Authority (CAA) in January 1995 allowing single pilot operation down to 500 ft with the proviso that a second front seat trained operator would have to be present at all times. Three sets of battery operated NITEOP Generation III goggles were purchased.
However, in July 1998 the trial came to an abrupt halt when the force traded in its old helicopter for a new BK 117 that arrived with a non-compatible cockpit. The trial was not to be resumed for nearly three years. O’Connor outlines what followed: “Our problem was in getting this ‘first’ cockpit cleared by the CAA – instrument markings, gauges that need lighting, radio lighting, internal lighting, and it took a number of visits. We were the first civil aircraft in the UK to do this – so it was trial and error. Nowadays this is all done in the factory,” he says.

The process involved CAA engineering inspectors, on-site engineers, off-site engineers and the time to do the work (taking the helicopter out of use on each occasion). One system would be identified and the work completed. The CAA would visit and then identify another system. The process was painfully slow; in fact it took a couple of years. According to O’Connor “a lot of that was waiting for people to approve, waiting for work to be done, waiting for parts and so on.”

Finally, in April 2001, a compliance report was issued by the CAA and NVG trials were finally resumed, resulting in the CAA granting full clearance for NVG operations later that year.

The ASU is mainly used for crime and missing person searches, pursuits, video and photographic surveillance, rapid transport and casualty evacuations. So how does NVG help in reality?

O’Connor reels off the uses: “NVG makes it easier for you to pick up information such as the strobelight on a police car. In a city, when a police car is behind a building, you can pick up the flash of the light on the buildings behind it. Without NVG you can’t. This means you can locate incidents much quicker. Also in parks surrounded by lights you can often see people moving. A dog handler with a torch stands out very well.”

In fact, one experiment involved attaching a flashing, NVG compatible light to a dog so they could follow it during a chase. “We would arrive overhead and locate the dog quickly. Although dog and criminal rarely went in straight lines, it did give us a general guide as to which way they were heading so that we could begin to search ahead.” The main problem was attaching the light and not hindering the dog’s ability to follow the criminals.

NVGs also work well in tandem with the on-board searchlight. “The model we have is old and does not throw out a lot of light out. While not great for the naked eye it is still perfect for gloggle users and its emissions don’t close them down that much. Flare is easy to ignore or, if it becomes a problem, we just come off goggles.”

Identifying limitations
There are limitations. “If it’s pitch black with no moon the gogggles don’t work very well. But the magnification of light is such that even the appearance of a little moonlight will make a huge difference. It is worth remembering that every time you use them the experience can be different. The point is that a 40° view in a green and black picture gives you a damn sight more information than if you take the things off.”

A problem can arise when flying low over a brightly lit city. “At 500 ft with the cloud base just above you get a lot of light coming off the underside of the cloud. If there is rain in the air it also reflects the light so everything becomes bright.”

O’Connor says that the trap pilots must be aware of is their ability to see through the weather. “Just because you can see that light 5 km away, if you cannot see it with the goggles off then you are flying illegally. You have got to stay within visual range and not fly to the limits of the gogggles. In bad
No NVGs? No excuse.

weather the picture starts to deteriorate so when you start to see that fuzzy picture look outside without them and if there is nothing there... but that's in the training. Another indicator is the flashing of the aircraft's anti-collision lights; normally you can't see it but if you are too close to the ground or going into bad weather, you suddenly become aware of the flash around the aircraft.

Flying below 500 ft

The low level rule sometimes hampers operations, claims O'Connor. "CAA regulations state that when we come down through 500 ft the goggles must come off, so using them for landings, take-off and hovering at low level is out. There are times when this is too restrictive and we are trying to progress our case for getting below this height."

He explains with an example: "A baby has been found in a pond, in the country, at night. There are no signs of life and time is of the utmost if it is to stand any chance of survival. With NVG, you will be on the ground a lot quicker than the cautious approach you have to make without the goggles."

Another example, "If you are in the middle of nowhere and a fire caption comes on and you have no signs of fire apart from that caption, as the captain of the aircraft there is no right answer as to what to do. If you try and put it down in the middle of nowhere in the dark very quickly without goggles, you are likely to make an error and that's not right. If you fly it back to base and end up on fire, that's not right either. With goggles you put it down safely and check out the fire, if there is one. Goggles, used correctly, make life much safer."

Night landings on unfamiliar terrain are not necessarily dangerous, it is just that there is large scope for error. One-off emergencies are one thing, but to do them regularly would be too risky. Normally on these calls there is someone on the ground, usually the initiator of the call-out. The problem is that the pilot rarely knows how experienced the person is at directing the aircraft's approach. "Around here (Exeter), there are lots of ex-forces personnel in the police who have directed helicopters before. But it could also be a young guy who's on his first day in the job. We do have other equipment we could use - the thermal camera and Nightsun - but the piece of kit everyone would select would be the goggles."

The unit's NVGs are maintained by the Royal Navy's engineers at RNAS Yeovilton but O'Connor claims they need very little maintenance and only need an annual check: "The last time we had a fault was when someone dropped them by accident and broke them in half. We've never had a failure at work."

One chore is the need to change batteries every 16 hours. This does not pose a problem as their longest mission is rarely over two hours. "We keep a log book of how long the goggles have been worn then change them after 16 hours. They aren't dead by this time; it's just a safety procedure we follow."

O'Connor said that a visit was organised to the Bayern Munich police to see how they operated with NVG (they have goggles with Omnibus 4 tubes) and discovered an operational benefit of having two large batteries on the back of their helmets. "With ours, if the battery goes then you have to replace it in-flight; the way they work is that you have two batteries on the back of the helmet with both goggles working on one battery. When it starts going flat a red light appears and at the flick of a switch, power for the whole set is changed to the spare battery. There is no need to record battery life. The old one is binned on arrival back at base and a new one becomes the reserve."

NVG training is conducted in-house using guidelines laid down by experienced ex-military personnel and is regulated through the Police Air Operations Manual PT II (PAOM) with all crew having to pass an annual flying check.

As for training: "We did look at an RAF 412 simulator - marvellous, but not really suitable for our needs."

Devon and Cornwall remains the only UK police force using NVGs. Previously, the only reason not to have goggles was cost but today that argument is not acceptable.

O'Connor offers plain advice: "Get them as soon as possible."

To have made the initial capital investment in buying a helicopter - and then not going the 'final mile' in buying goggles leaves O'Connor puzzled. "When we were trailblazing it was expensive because we were writing the rule book in terms of getting compatible lighting into the cockpit (at a cost of around £20,000). But now when other 'first users' of helicopters look to change model, their NVG compatible lighting can be specified straight from the factory.

But how about using them over a city? "Anyone who says they are useless over the city has not used them over the city. All our pilots testify to their use. While some may say that there's a big difference between the relatively small amount of light over Exeter compared to big cities such as Manchester and Birmingham, my answer is that you may not need them to fly but you do need them to help you spot the criminals."

Police priority

It is still true that the police must apply to the CAA for NVG approval in the same way as any other civil operator and, at time of writing, were still not considered a special case. O'Connor believes that this is about to change and that both the CAA and Home Office have signified that they will now recommend NVG use for all police operations, although still above 500 ft. He says the whole task could be served by the CAA appointing a flight operations inspector to judge applications from a flying point of view.

O'Connor is firmly convinced of their value. "Once purchased, they will last a long time. Furthermore, there is no pressure to buy the latest model because our work doesn't demand it. We've had our goggles for a decade and we still catch the bad guys in the same way as when we started." DH