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Airborne Law Enforcement – Fighting Crime From The Air

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This paper reviews the use of the air for the police in their operations to fight crime throughout the UK. There is a description of the job of the aircrew, the role and navigation systems and the aircraft used in daily operations. There is an examination of the use of both the helicopter and fixed wing aircraft concentrating on their suitability for police operations in which the weather and cost constraints are seen to be major factors to be considered in striking the balance to obtain the best effectiveness.

KEY WORDS

1. Crime Enforcement.

1. INTRODUCTION. The fight against crime affects us all. Some of us will be the unfortunate victims of violent crime; others will be affected at a distance as their insurance premiums rise as the result of burglaries and auto theft. A recent survey in a national newspaper indicated that 49% of the UK population have been the victims of crime. Make no mistake, the war on crime is very real and, to date, there is no sign of a truce, or a lasting victory against the violent criminal, the drug pusher and the petty thief. Those of us who live in orderly surroundings where the biggest nuisance may be the sound of a neighbour's lawn mower early on a Sunday morning are fortunate. Spare a thought for those who live in urban housing estates

where stolen motor cars are set on fire and the fire fighters are pelted with stones and bottles as they try to extinguish the blaze.

2. AIR WARFARE. When we think of air warfare we may be forgiven for reflecting on the recent air campaign in Iraq, air operations in the former Yugoslavia, the campaign to liberate the Falkland Islands, or even the historic Battle of Britain. But, there is another air campaign that is happening now in the urban and, to a lesser extent, in the rural areas of the UK. The police forces of the UK had their first exposure to aviation when, in 1921, the wireless-equipped airship R33 was used by the Metropolitan Police to keep observations at the Epsom Derby. More recently high tech role equipment, principally the powerful video camera, together with the heat sensitive thermal imager, has justified the allocation of large sums of public money to purchase aeroplanes and helicopters to target criminals from the air. Today there are 29 police air support units with 5 aeroplanes and 29 helicopters in operation with 41 of the 52 police forces in the UK and Northern Ireland. But, despite the continuing war on crime, can this significant expenditure be justified when there are other important demands on the police budget and worthy competition from areas such as education and health? In truth police air operations are, like any other form of air power, only as good as the supporting ground environment and, in particular, the availability of sound intelligence. If used correctly the aircraft is a powerful tool that can make the difference between success and failure in the war that affects us all. If they are used wrongly, or indiscriminately aircraft are more likely to become a drain on the public purse.

3. A SYSTEM WITH THREE PARTS. With aircraft now available to the majority of the UK's police forces it is not uncommon to see references to 'the police helicopter' in the local press and many will have enjoyed the dramatic TV coverage in programmes such as '*Police, Camera, Action*'. But, what are the 'nuts and bolts' of police air support; how does it work? To answer these questions it is necessary to view police air support as a system with three parts. First, there is the crew of the aircraft and those officers on the ground who may decide to request airborne assistance, together with control room staff who may decide to 'scramble' the aircraft in response to a perceived demand. Next, there is the special role equipment that includes a powerful video camera, a sensitive thermal camera and the associated recording equipment. Remember, in this war the individual battle is won, or lost in a court of law and, to win, the police must provide conclusive evidence of the alleged crime and the identity of those responsible. The third component is the platform that carries the aircrew and their role equipment. This may be an aeroplane or a helicopter, or even an airship. Each type has its strengths and all types have their limitations. There is a sound argument for extending overall capability by having all types, but the final decision, aeroplane, helicopter, or airship must be driven by clearly defined objectives and the ever present limitation of a finite budget.

4. THE AIRCREW. The aircrew, together with their colleagues on the ground, are without doubt the most important component of the police air support system (Figure 1). It goes without saying that the aircrew must be totally familiar

Figure 1. The aircrew are the most important part of the police air support system.

with their aircraft and its associated role equipment. But also, the police officer on the ground, and in particular the staff at the police control room, must have a clear understanding of what an aircraft can do and what is simply impossible. A timely call for air support is an obvious requirement, but, make no mistake, a late call or a lack of basic information, 'what, where and when', will often result in frustration for the crew of the aircraft and, more than likely, a wasted mission.

In the UK the crew of the aircraft will normally consist of three persons, the pilot and two police air observers. Many pilots are former members of the Royal Navy, the Army and the Royal Air Force. For them the change in colour of their flying suit from green to dark blue is a painless process and they quickly adapt to the challenge of flying their aircraft to the limits set by the Air Navigation Order (ANO) and the Civil Aviation Authority (CAA), often at low level and usually below 2,000 feet above the ground. For those pilots who come from the civil environment the challenge of putting the camera on a target when flying over the centre of a city on a dark night and in very bad weather is an altogether new experience. But, with careful training they are no less competent than their colleagues with a former military background. Once training is complete the experienced pilot will often have some spare capacity and there is merit in the approach adopted in the USA where the pilot and one observer work as team, sharing the workload, rather than the current UK approach of the pilot being the 'driver' for the two police observers. If it were thought to be necessary, the pilot could be enrolled into the police as a special constable and given additional training in police procedures.

The police air observers, mostly constables, are officers with around 10 years of police experience. For them there is a very large hill to climb as they are elevated, literally, from their powerful patrol cars, or sometimes from a quiet rural beat. Following an aptitude test, a medical examination and an interview they attend a three week training course followed by 'on the job' training. Navigation is one of the important items in the observers 'bag of tools', but he must be also acquire the skills necessary to gain the best possible results from the camera and other items of role equipment. Those officers with a technical background, traffic officers in particular,

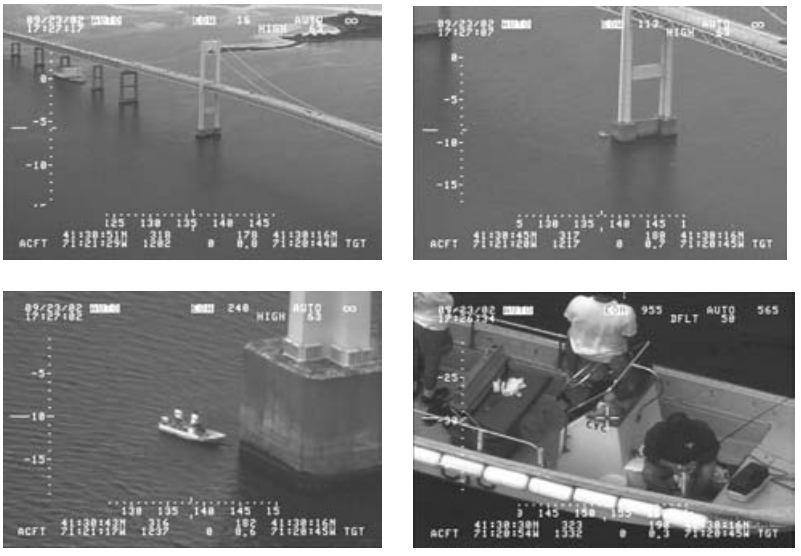

Figure 2. The latest cameras, such as the WESCAM MX-15, can zoom into a target from long-range in both the TV mode and when the camera is switched to the thermal imager.

quickly adapt. Nevertheless, there is an argument for recruiting more officers from the Criminal Investigation Department as a means to promote the aircraft as a vehicle to tackle serious crime and to target the persistent criminal. With initial training complete it can take up to a year before the observer is fully at home in a world that is quite different from his, or her, past experience. Within a year they will, if they are to succeed, have developed the ability to take command of officers on the ground and talk them onto a suspect who is, of course, doing his very best not to get caught! In this respect clear, unambiguous communication and radio discipline is absolutely vital and the new police Airwave digital radio system promises to give a distinct advantage to the crime fighter.

5. ROLE EQUIPMENT. After the crew of the aircraft the next most important part of the police air support system is the role equipment, especially the powerful video camera and the thermal imager that permits the observer to 'see in the dark'. Before these cameras became available and before reliable radio communication the use of aircraft by the police was of questionable value. Today, the widespread use of helicopters by the police may be attributed to an earlier period when the crew would land to be briefed by an officer at the incident and when it was necessary to hover close to the ground to have any chance of finding, or identifying a target. Fortunately, the new generation of cameras, recorders and associated navigation systems are absolutely first class and the criminal may now be targeted from a distance of several miles and from several thousand feet. Pictures are 'down linked' to the ground control and briefings take place on secure radio channels.

A leading supplier of cameras, on both sides of the North Atlantic, is WESCAM. Their MX-15 camera system (Figure 2) includes a TV camera with 38x zoom together with a thermal imager within a stabilized turret (Figure 3). An alternative package is

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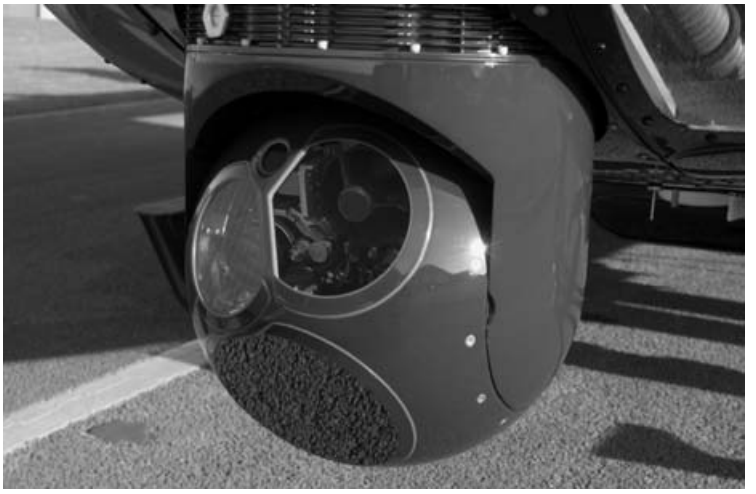

Figure 3. The turret of the WESCAM MX-15 camera.

a thermal imager, an acquisition camera with a 15x zoom and a 'spotter scope' with a 105x zoom for target identification and long range surveillance. The thermal mid-wave IR imager is optimized for transmission through atmospheric water vapour. Another option is a laser illuminator although the more interesting feature of this particular camera system is its high performance inertial measuring unit (IMU). The IMU provides a very stable turret and, with inputs from the aircraft navigation system, provides the operator with a geo-pointing steering mode. With this mode the camera turret maintains a line-of-sight on a fixed point on the Earth's surface without any intervention from the operator. In addition the MX-15 continuously estimates the intersection of the line-of-sight with the Earth's surface whilst the operator is steering the camera. This reduces operator workload, permits the automatic tracking of moving targets and givers the option to show both the aircraft and the target on an electronic 'moving' map which displays a topographical chart, or a street level map.

As an alternative to the WESCAM MX-15 an extensive range of cameras are provided by FLIR Systems. Some police aircraft are fitted with LEO 400 (now obsolete), others have LEO ll, the lightweight Ultra 8500, or the Ultraforce ll camera system. Ultraforce ll has a 4-axis gyro stabilized turret that contains two cameras. First, there is a colour TV camera with a 54x zoom that is particularly useful in daylight. The second camera is a long-wave IR imager with a wide, a medium and a narrow field of view. Additional packages include a 'spotter scope' for long range target identification and a laser 'pointer' that is visible to observers in the aircraft, or on the ground using night vision goggles (NVGs). The laser illuminator permits excellent crew co-ordination within the aircraft and also facilitates the handover of a target between aircraft, or between the aircraft and ground units. With both FLIR Systems and WESCAM the pictures may be recorded for evidential purposes and transmitted, in real time, to a ground station using a microwave 'downlink' transmitter. The key features of each camera system is shown at Table 1.

Night vision goggles (NVGs) offer the airborne crime fighter a further advantage when carrying out a search mission at night. Although NVGs are in widespread use

Table 1. Available camera systems.

Camera	Tv/ Video	Spotter Scope	Thermal Imager	Laser Illum.	Geo-Pointing	Down-Link
LEO 400	32x	No	Yes	No	No	Yes
LEO ll	32x	No	Yes	No	No	Yes
ULTRAFORCE ll	54x	105x	Yes	No	No	Yes
ULTRA 8500	72x	No	Yes	Yes	No	Yes
MX-15	38x	105x	Yes	Yes	Yes	Yes

by the military and by the police services in the USA there use by the UK police forces is, to date, very limited. Cost, like most aspects of aviation, is a factor, but there is also a serious flight safety issue. In the UK police helicopter pilots are permitted to fly at night under visual flight rules and without an instrument rating. There is an assumption that they will always, particularly in the urban environment, fly over a 'carpet of lights' and if they fly towards an area of darkness, and begin to lose visual references, they will turn back. With NVGs it is possible to retain visual contact with the ground without surface lighting. But what happens if, on a very dark night, the NVGs fail and there are no visual references on the ground or, more likely, the helicopter is inadvertently flown into cloud and the pilot is now suddenly and unexpectedly flying in instrument meteorological conditions? For flight safety reasons it may be decided that NVGs will only be used in aircraft that are equipped for flight on instruments and by pilots who have a current instrument rating. In the event of an NVG failure, or an inadvertent entry into cloud, the pilot would then revert to flight on instruments and 'bug out'.

6. NAVIGATION. The development of the Global Positioning System (GPS) by the US Department of Defense with free access to anyone who wishes to purchase a receiver has revolutionised navigation on and above the Earth's surface. Following the introduction of the first GPS receivers in the early 1990's moving map displays showing the position of the host vehicle with near pinpoint accuracy are now the norm. Nevertheless, despite the availability of these advanced navigation systems there is still a place for the Ordnance Survey map and the A-Z street atlas. The typical aircraft library in either paper or electronic format will include the quarter million aeronautical chart for terrain clearance and obstruction data, the Ordnance Survey 1:50,000 for rural navigation and the A-Z for finding streets in an urban setting. The latter, the A-Z proves to be quite a surprise for the former military 'top gun', but the 'urban war' is fought on the streets of our cities and larger towns and the street map is an essential 'tool of the trade'. Indeed, a typical check ride for both the pilot and the police air observer includes a 'street find' using the A-Z to navigate the aircraft to a specific street.

The most popular electronic moving maps in the UK (Figure 4) are the Bendix/King Skyforce Moving Map Task Management System and the Skyquest EuroNav Moving Map System. The core capability of Skyforce is its intuitive mapping and navigation function which is capable of displaying highly detailed vectored (digital) and raster (scanned) area maps. Based on the customers operational needs a typical map set-up will include vectored maps with Jeppesen Aeronautical data, raster

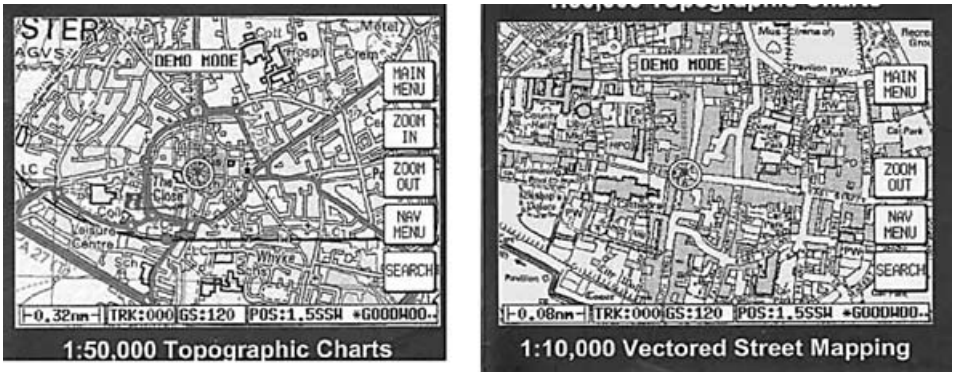

Figure 4. Electronic maps of several scales, down to street level, provide aircraft navigation in a cockpit without paper.

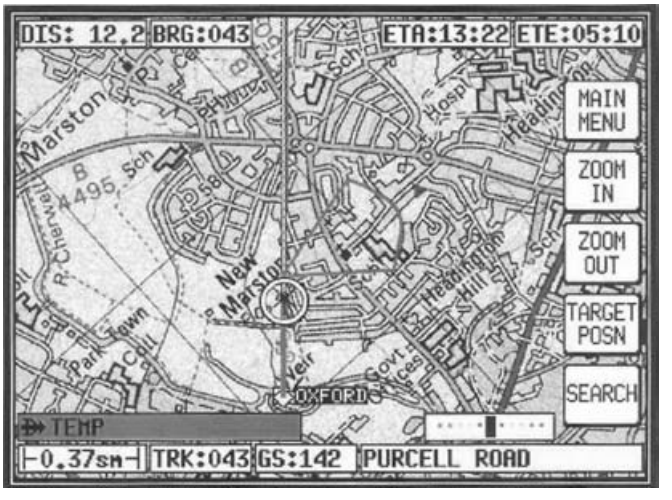

Figure 5. The electronic map will show the precise position of the aircraft, (Purcell Road), and the 'footprint' of the camera.

aviation charts including the scales 1:500,000 and 1:250,000, 1:50,000 topographical charts and street mapping down to 1:10,000, or even 1:1,000. The street mapping is further enhanced with a street/house database for individual address searching, street naming and a highlight showing the street that is directly below the aircraft. Basic navigation is simple; move the on screen pointer to the desired location and press the 'DIRECT TO PTR' key. Alternatively, the 'SEARCH' key will access the internal database and permit the operator to select track and distance information to a specific point, such as an individual address. Skyforce is also capable of interfacing with the camera system to display the viewed footprint on the map. (See Figure 5)

Like Skyforce the EuroNav is a sophisticated moving map system designed to ease observer workload whilst being able to interact with other on-board mission equipment. With the option to display digital data the observer can call up the familiar Ordnance Survey 1:50,000 map and then highlight and name individual roads. Move

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the cursor to the required point and the road name is automatically displayed. In the camera pointing mode the road in the centre of the camera screen is automatically named and a marker on the map shows where the camera is pointing. Another feature is the picture-in-picture facility that permits the user to view the moving map and select the video input on the same screen simultaneously. A further feature of Euronav is a switch to change from moving map to moving aircraft to show the position of the aircraft in an orbit or hover. With differential GPS both Skyforce and EuroNav can offer accuracy down to one metre and the moving map, with the position of the aircraft, may be transmitted to the ground to give the ground commander an understanding of the 'air picture'.

7. THE AIRCRAFT. The third component of the police air support system is the platform that carries the aircrew and their role equipment into the air. For some police forces the preferred platform, the one that the public and the media often associate with the police (a problem if the mission is covert), is the helicopter. Experiments with helicopters for police operations took place in the UK in the early 1960's when the Home Office organized a trial with aircraft belonging to the Army. More recently such helicopters as the AS355 Twin Squirrel and the Bolkow BO105 were adapted for the police role with additional radios, a searchlight and an entry level video/thermal camera. Today the most popular helicopters for police air support in the UK are the Eurocopter EC-135 and the MD Explorer. Both have powerful video and thermal cameras and both have electronic navigation systems. Their maximum flight endurance is around 2 hours, reducing to 1.5 hours with an additional crew member, extra role equipment and reserve fuel. In common with the majority of helicopters the operator must choose between payload and fuel. With maximum fuel to give maximum flight endurance the payload must be reduced to remain below the maximum permitted take-off weight. Even so, the helicopter cannot be expected to remain airborne for a long period and it would not be the first choice of platform for an extended surveillance operation.

With the introduction of high performance cameras, precision navigation and reliable and secure communications it is no longer necessary to hover directly over a target to keep it in view, or to land to communicate with officers on the ground. With modern role equipment we may now expect the aeroplane to experience a renaissance as the cost-effective, the more affordable aerial platform for police air operations. When equipped with a modern high performance camera the aeroplane, flying at endurance speed, may keep observations on a target at long range for several hours and neither the public, nor the criminal, will be aware of the presence of the aircraft (Figure 6). Not that the aeroplane is restricted to surveillance type operations. If it is necessary to fly close into a target, for example during a vehicle pursuit, it can be shown that the aeroplane in a tight orbit is just as effective as a helicopter in the hover. The statistics indicate that for a vehicle pursuit, or when searching for a person who has run away from the scene of a crime, the 'hit rate', the number of persons arrested, is the same for the aeroplane and the helicopter. As an example, one police force found that 64% of its annual air support tasking was for vehicle pursuit and an air search at scenes of a crime. The other 36% included searching for missing people and air-ground photography. When using a helicopter the 'hit rate', the number of arrests divided by the number of tasks, was 22%. A second police force

Figure 6. The BN Defender 4000 of Greater Manchester Police. With modern cameras, such as the WESCAM MX-15, a target may be observed at long range and for a period of several hours.

used an aeroplane for their air support. Seventy five per cent of their annual air support tasking was for vehicle pursuit and for attending scenes of a crime; their 'hit rate', with the aeroplane, was 23%. These figures give lie to the misconception, the myth, that for crime fighting the helicopter is in some mysterious way vastly superior to the role equipped aeroplane. Sadly, the airship, despite its many qualities, particularly flight endurance, has failed to meet the challenge of the aeroplane and the helicopter in the police role.

8. THE WEATHER FACTOR.

"*No modern pilot can be considered fully qualified until he has a thorough knowledge of air traffic control procedures and a sound basic skill in instrument flying.*"

Royal Air Force Manual of Elementary Flying Training

In the UK police aircraft are operated under the rules contained within the Air Navigation Order (ANO), the base document, together with additional rules within the Police Air Operations Manual (PAOM). Police aircraft are classified as 'public transport' and, to comply with the ANO when the weather deteriorates, or at night they should be operated under instrument flight rules (IFR), or special visual flight rules (special VFR) when inside controlled airspace. The aeroplanes used by the police are equipped to do this and their pilots have a licence with an instrument rating. Unfortunately, many of the police helicopters are not equipped for single pilot IFR and the majority of police helicopter pilots do not have an instrument rating.

To permit the police to operate their helicopters at night the PAOM contains an exemption to the ANO that allows the police, but not the air ambulance service, to fly what is termed a 'visual contact flight' (VCF) at night. What, in practical terms, does this mean? At night in the urban environment there is a 'carpet of lights' and in these circumstances the police helicopter, or aeroplane may be flown under the VCF rule. If the weather deteriorates to below the weather limits for VCF the aeroplane pilot, with an instrument rating, may choose to continue his flight under IFR; a useful option if the requirement is to complete an electronic 'Tracker' search in, or above cloud. Unfortunately, the police helicopter pilot is grounded if the weather deteriorates below the minima for VCF, or if it is necessary to operate in a rural area at night without sufficient visual references on the ground. If the requirement is to fly to an area with good weather from an area with bad weather, or to fly from an area with good weather, through an area of bad weather, to another area of good weather then it is the aeroplane and its pilot, with their 'all weather' capability, that will 'deliver the goods'.

Should the current rules be changed as the result of the number of weather related accidents involving helicopters, particularly as the result of an inadvertent entry into cloud at night, it is quite possible that in the future all public transport aircraft, including police helicopters, will be required to be capable of flying under IFR. In these circumstances the helicopter manufacturers, the providers of police air services, and the pilots' themselves, will face a new challenge. Moreover, the budget manager, when faced with additional costs for helicopters and pilot training, may decide to look more closely at the capabilities and the difference in operating costs of the aeroplane and the helicopter. Do the police have an overriding requirement for tactical air transport? How many times has a police helicopter been required to carry a police dog and its handler, or to carry one or two members of a four-man firearms team? As for casualty evacuation and the rescue part of search and rescue, these special duties are the domain of the air ambulance and the military and coastguard search and rescue helicopters. These life saving operations require extensive training for the aircrew and properly equipped aircraft. (Figure 7.) Despite the occasional use of a police helicopter to transport a casualty from a road accident it would be naïve to believe that, without the correct equipment and protective clothing, without training and without regular practice, the police helicopter may be used as a substitute for a dedicated rescue aircraft. The use of unqualified police officers could, in these testing circumstances, prove to be disastrous.

9. THE COST FACTOR. The one advantage of the helicopter is its ability to take-off and land vertically, but this perceived 'flexibility' must be weighed against the many other attributes required of an aircraft that is to be used for fighting crime. In the USA there is a view that:

> "*In these times of fiscal restraint and tight budgets, fixed-wing aircraft can offer substantial savings in operating expenditures and acquisition costs. The Los Angeles County Sheriff's Department experiences an approximate overall 50% reduction in maintenance costs per flight hour for fixed-wing aircraft over helicopters……Aircraft replacement costs for fixed-wing aircraft generally range from one-quarter to one-third of comparable rotary-wing aircraft. The expected service life for fixed-wing aircraft averages two the three times that of a helicopter. This combined benefit of less required maintenance and greater service life results in an aerial surveillance resource that is more readily available at a lower cost.*"

Figure 7. MD Explorer air ambulance with a doctor, pilot and paramedic and RAF Sea King with two pilots, winch operator and winch man. Air ambulance and search and rescue are roles that require special skills and properly equipped aircraft.

In the UK the BN Islander, a very dependable and cost-effective aeroplane, may be purchased for one third the price of a helicopter of similar size and its operating costs would be half as much. Nevertheless, although the BN Islander has proved itself, in the military and in police service, to be a dependable all-weather observation platform and a viable alternative to the helicopter there are other, more cost-effective, more capable aeroplanes on the horizon. In Italy VulcanAir have developed their successful P68 Observer utility aircraft, used by the Italian Polizia Di Stato as well as a number of government agencies in the United States and Australia, so that it may be powered by fuel efficient SMA SR305 Jet-A1 engines as an alternative to the current piston engines. Other aeroplanes are manufactured from lightweight composite materials and, like the new version of the P68 Observer, they are powered by extremely efficient compression ignition piston engines fuelled by inexpensive kerosene. These engines, which may be turbo-charged and liquid cooled, are noted for their very low noise signature. An example of this cutting edge technology is the

Diamond DA42 Twin Star. The Twin Star is an all weather, 4-seat aeroplane that can take-off and land from short 1,000 metre runways, fly at speeds of up to 200 knots, loiter at 60 knots and all for around £60 ($100) per flying hour including the cost of fuel and maintenance; less than one tenth the operating cost of the 4-seat, twin turbine helicopter.

A development of the Twin Star is the DA42 Observer. This project was spawned from the Wescam Stealth programme that saw Diamond Aircraft adapt their Super Dimona motor glider to carry a stabilized camera together with a microwave 'downlink' transmitter. The enormous advantage of this aircraft, apart from its very low operating costs, is that police observation duties will not be limited by the need to land and refuel at regular intervals and patrol flying to target crime 'hot spots' will become an affordable option for the police commander. No longer will it be necessary to ration the flying rate because the operating cost of the police helicopter has exceeded its annual budget. In the future the modern, cost-effective aeroplane may become the preferred, the more affordable, platform for the carriage of the very best camera systems and other specialist role equipment including night vision goggles.

Back in the USA, where there are many more aircraft in police service, the Chief Pilot of the Lee County Aviation Division in Florida, who is qualified to fly both aeroplanes and helicopters, has the following view:

> "*Two years ago we had an all-helicopter operation. In January 2004, the Aviation Unit flew more total hours aboard its fixed-wing airplanes, though it still operates one MD 500 and one OH-6 helicopter. For surveillance, the fixed-wing aircraft is unmatched. It's not going to replace the helicopter, but we're getting more hours over the county, and that allows us to spend more time in the air without affecting our budget. For the cost of one hour in the helicopter we can get ten hours in the airplane. We're actually looking at expanding our personnel because of the lower cost.*"

10. STRIKING THE BALANCE. This paper has highlighted some of the differences between the aeroplane and the helicopter, but it would be wrong to imagine that in the police role one type of aircraft must compete against the other. On the one hand, the aeroplane has the better flight endurance, a better payload and an 'all-weather' capability; it is also the more cost effective. These qualities come to the fore if the requirement is to operate over a large geographic area, to patrol a particular area, or to complete observations of a particular event for a protracted period. In these circumstances a commentary together with the 'downlink' picture may be transmitted to a control room, or to the commander on the ground, without having to break the link at regular intervals by the need to return to an airfield to refuel. Air to ground photography may be completed by the aeroplane at a much lower cost than doing the same job with a helicopter. With its 'all-weather' capability the aeroplane may search in, or above, cloud for a stolen motor vehicle fitted with an electronic 'Tracker' locator. On the other hand, the helicopter with its ability to land vertically may be used, if necessary, for local transport. If the dedicated air ambulance, or military search and rescue helicopter is not immediately available for a life threatening emergency the police helicopter may, with proper safeguards, be used to provide a limited 'first aid' service until a specialist unit arrives at the scene. In some areas of the UK, Wiltshire and Sussex, the police and the ambulance

Figure 8. MD Explorer. Two of the UK police forces, Wiltshire and Sussex, share the operating costs of their MD Explorer with the local air ambulance service.

service share costs and operate a joint police-ambulance helicopter with a crew of pilot, police observer and para-medic. (Figure 8.) This gives better utilization of the aircraft and there are manpower savings as well, but this cost-sharing arrangement has yet to find favour in other parts of the UK.

11. THE FUTURE. In a recent edition of the magazine *Rotor & Wing* the editor, James T McKenna was of the opinion that, "*Helicopters create operational alternatives unmatched by any other means of transportation. But they are too expensive to operate.*" Fortunately for the police there is sufficient evidence to prove that the aeroplane can, when properly managed and equipped, achieve the same degree of success as the helicopter when the requirement is to detect, identify and track persons suspected of committing crime. Moreover, because of its high running costs the helicopter is, for the most part, shackled to the ground, on standby until a crime is known to have been committed. With this reactive, 'fire brigade', response, the aircraft will always arrive late, often too late to be of any value. In Canada William Pitt, a professor of criminology at the University of Alberta has pointed out that the EC-120 helicopter used by the Edmonton Police spends 75% of its time on the ground. The UK police air support units share the same experience. Some of the UK units with 24-hour cover are budgeted for around 1,200 flying hours per annum, less than 4 hours per day. Other units with 20-hour cover are airborne for around 3 hours per day; for the rest of the time the helicopter is parked on the ramp. This low utilization, around 15%, may be seen to be a poor return on a very large investment in aircraft, infrastructure and manpower, especially when compared to a front-line police officer who spends 63% of his time patrolling, dealing with crime, or meeting the public (UK Government statistic).

Figure 9. The UK CAA may decide that as the result of weather related accidents all police aircraft, including helicopters, must be IFR capable and their pilots must be proficient at flying on instruments.

Although the helicopter is expensive to operate Professor Pitt believes that the Edmonton City Council should either provide the necessary funding or get rid of it. An alternative strategy would be to sell the helicopter and buy an aeroplane. Aeroplanes are, compared to helicopters, inexpensive to purchase and inexpensive to operate, but if they are equipped with the right cameras and complimentary role equipment they will also deliver the required 'punch'.

As well as a renaissance of the aeroplane in police service we may, in the future, expect to see more expenditure on improvements in observation and evidence gathering capability. Those police air support units with older cameras and paper charts should expect to embrace new technology as the new generation of cameras and electronic navigations systems become more affordable. With the greater use of aeroplanes we may also expect to see an increase in patrol flying and, as a consequence, a closer integration between the air support and ground based police units. With the aircraft already in the air the response to a call for assistance will be minimal. In addition, pre-planned proactive operations could be flown on a regular basis to take full advantage of the extremely low operating costs of aeroplanes that are now entering service. An aircraft parked on the ramp with its crew 'kicking their heels' in the office because the demand for air support has exceeded the annual budget will be a thing of the past. Nevertheless, the UK CAA may decide that, as the result of weather related accidents, all police aircraft, including helicopters, must be IFR capable and that all police pilots must be proficient at flying on instruments (Figure 9).

With an overall increase in the number of aircraft used for airborne law enforcement we would be able to move forward with new ideas and new procedures. For example, if the operating costs of the next generation of aeroplanes prove to be as low as we anticipate, ten hours in the aeroplane for one hour in the helicopter, then targeting areas of known criminal activity from the air will become a fact rather than a one line entry on a police commanders 'wish list'. In the event of an incident the

aeroplane, already in the air, would be immediately available to co-ordinate an effective ground response and also protect the safety of both the police and the public. With additional aeroplanes the existing helicopters could, with additional equipment and training, be dual-rolled for police and air ambulance duties. But first, if we are to move forward, we will need a clear and unbiased evaluation of the police air support system of today. Is police air support providing value for money? Is aircraft noise an issue and, if it is, how is it being addressed? Are personnel being trained to the right standard? Are the command and control arrangements effective? Are the air-ground communication links sufficiently robust? Does the role equipment meet the requirement and is it reliable? Do we need a small fleet of helicopters with their known complexity and high running costs when a larger fleet of aeroplanes with the correct role equipment would provide greater utility for a fraction of the cost? Would we strike a better balance, and provide the public with a better air service, if the police were to operate more aeroplanes and share their small fleet of helicopters with the air ambulance service? The reader may agree that a police helicopter parked next to an air ambulance helicopter at the same airfield, with their three-man crews on standby in adjacent offices, should, in terms of value for money alone, be the subject of scrutiny by an independent auditor.

12. CONCLUSION. Can the police air support system, the aircrew, the role equipment and the aircraft, make a difference in airborne law enforcement? Can the expenditure of public funds be justified? The simple answer is yes, it can. Police aircraft are used to assist and add value to the work of police officers on the ground. Many suspects would have escaped detection and arrest without the intervention of air support. Auto theft, together with the associated danger of a high speed pursuit, has certainly decreased as the result of an airborne response. Some prosecutions for serious criminal activity would not have succeeded without the significant evidence that was recorded on a camera mounted in a police aircraft. There may never be a final victory in the war on crime, but, day and night, many incidents are brought to a successful conclusion as the result of the crew of a police aircraft providing timely assistance to their colleagues on the ground. Today's challenge is to take full advantage, to gain the maximum utility, from the new generation of aircraft, together with new cameras, NVGs and other role equipment, that are now in prospect. With these new aircraft and their 'state of the art' role equipment we may look forward to winning many more of the battles in the continuing war on crime.