CASE HISTORY

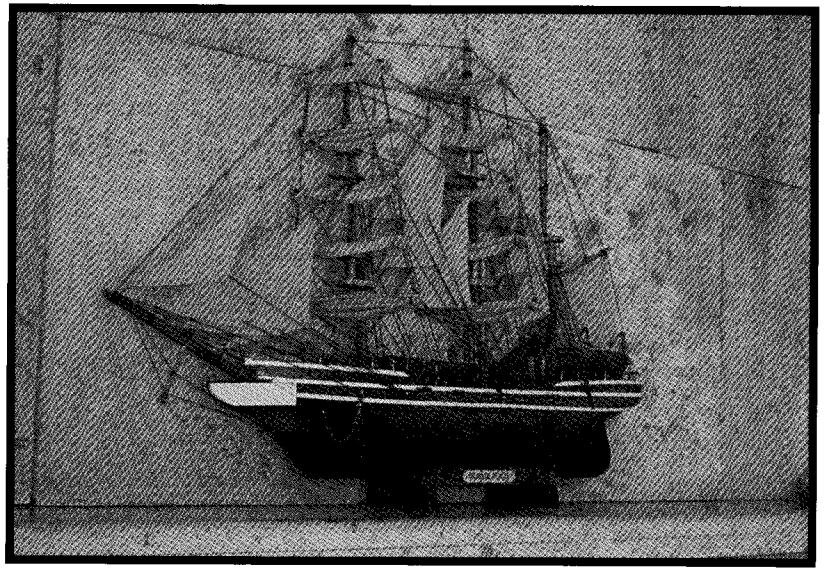
Four Square Laundry was an operation set up by a force known as the Military Reconnaissance Force (MRF), an undercover unit that functioned in Northern Ireland in the early 1970s. One of their tasks was to operate a mobile laundry service that collected from house to house. They were assured of good custom, as their prices were far lower than those of their nearest rivals. However, prior to washing, all the clothes would pass through a machine that would test them for traces of explosives. When a contaminated item was found, all that they had to do was to read the address label. This was a good indicator that bombs were being assembled at that address or someone associated with it. Unfortunately, several members of the MRF who had been former members of the IRA, converted to work for the British and then changed their allegiance back to the IRA. This led to a Four Square van being shot up. The male driver was killed but the woman managed to escape. Both were British undercover agents.

AUDIO-VISUAL SURVEILLANCE

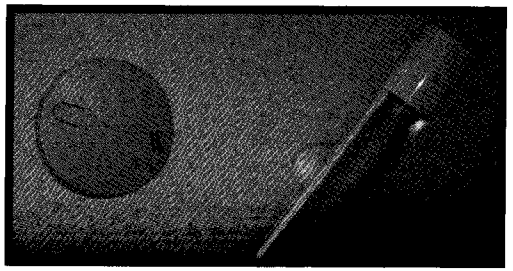
One method of surveillance allows the target to be observed both audibly and visually (with photographs and videos). Most modern devices can record both sound and pictures concurrently. The audio element provides voice patterns from which the target can be identified. The video element reveals an individual's hand and body gestures and facial expressions. Audio-visual is by far the greatest tool in the modern-day surveillance arsenal.

A combination of audio-visual devices can be hidden just about anywhere, even on an unsuspecting person. Homes, offices, vehicles and even public transport are easy targets for a technical department of any good intelligence agency. Hiding a "bug" in light fittings, smoke detectors, toys, clocks, garden rocks, front doors or in the bedroom ceiling are all easily achieved. The secret to fitting a good audio-visual surveillance device is to be inventive. The spy will always consider how long the device will be in place and work out battery consumption. Where the hiding place offers sufficient space, a series of batteries will be fitted to avoid having to return to the target's home to fit replacement batteries. He will always check that the area around the hidden device is clean of any debris or dirty finger prints.

◂ Audio-visual technical devices can be hidden almost anywhere.



▲ This ship that sits above the fireplace had a wireless covertly fitted audio-visual device. There was enough room for extra batteries and a motion sensor. The camera only activated when someone was in the room.



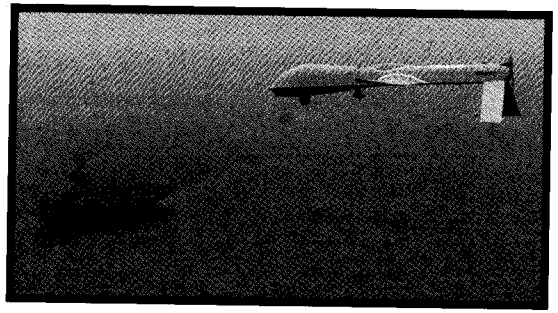
◂ A camera hidden in a smoke alarm.

A wireless audio-visual device fitted in a child's toy.

A wireless camera hidden in a mobile phone.

MICRO-AERIAL VEHICLES (MAV)

Since early the 1990s, there has been a lot of research into making small aerial vehicles which can take photographs and record video. These are basically unmanned drones, very much like the model aeroplanes made by amateur enthusiasts. That, however, is where the similarity ends. MAVs are both silent and capable of producing excellent real-time images as well as geo-referenced (on-board GPS) stills. Some are fitted with communication capabilities that allow pictures to be sent back while the vehicle is still in flight. They are perfect for short range, real-time situational awareness and reconnaissance information. MAVs range in size from 30 cm wide to 3 cm wide, making them almost invisible.



A Predator plane.

COMPUTER SURVEILLANCE

There is hardly a home or an office these days that does not contain a computer, most of which are linked to the Internet. For this reason, intelligence agencies regard computers as a vital element of surveillance. Computer surveillance, commonly known as "hacking" or "reading", is the ability to access a target's computer and to investigate any information that may be of a suspicious or incriminating nature.

Both PC and laptop computers can be modified in a number of ways. It is possible, for example, to fit a separate word processing system in a laptop, which, for the most part, will never be discovered. The designated user activates the system and, once finished, he simply hits a combination of keys to return the laptop to its normal state. This allows him to write and store messages outside of the laptop's normal functions, thus preventing any messages from being found if the laptop is lost or stolen.

Another system, known as SRAC (Short Range Agent Communication), allows messages written on a computer to be downloaded onto a small SRAC transmitter. This device, slightly larger than a cigarette packet, continually sends out a low power interrogation signal. When the receiving agent is close enough – about 100 m away – the SRAC transmitter makes contact automatically and "burst" transmits any waiting message.

TRACKING

Tracking devices, which may vary in type, size and ability, have become both increasingly popular and extremely accurate. The small tracking device, such as the one used in the Bond film *Goldfinger*, is now very much a

reality. Even though the technology of tracking devices has improved, they should only be seen as an aid to surveillance rather than an independent stand-alone system.

SATELLITE

Satellites have been used for the purpose of intelligence gathering since the late 1950s. There are three types of imagery satellites: photographic, electro-optical and synthetic aperture radar (SAR). The first satellites used conventional photography, i.e. they had a camera installed that looked down and took a picture of the earth. The film, once finished, would be scanned and processed into an electronic signal or ejected in a capsule and dropped back to earth. This method stopped in the mid-1980s. By comparison, electro-optical imaging satellites take pictures of a specified target; this is then transmitted to a ground station back on the earth's surface. The camera works in very much the same way as a normal digital camera, thus allowing for straightforward transmission of the image.

Both of the above methods have one failing – cloud cover can obscure the target area. The SAR system overcomes this by using microwaves that are fired down towards the target area. Microwaves have the ability to penetrate cloud cover and the SAR satellite simply creates a picture by analysing the returning microwave reflection. Once computed, the image is sent digitally back down to earth.

Satellite images have improved dramatically over the years and definition these days is now down to just a few centimetres. The advances in satellite images for the purpose of intelligence include 3D modelling, which is done by blending images from a variety of sources. This clarity enables intelligence agencies to have a clear idea of what is happening in any part of the world at any time. This includes spotting potential spies doing a "walk through" of a city or an area before they are actually assigned to a job. In addition, the commercial interest in satellite imagery has improved greatly; high-grade images are now widely available over the Internet.

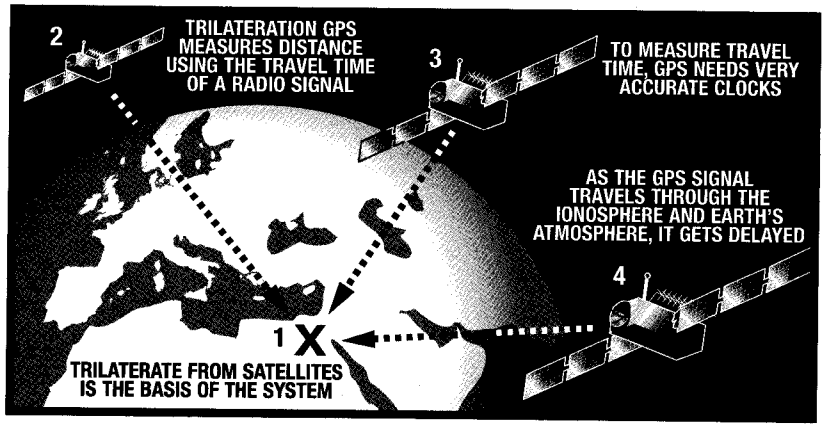
The disadvantage of satellites is their high cost and their relatively short lifespan. To help combat this, NASA is developing a new type of unmanned spy plane. These will operate some 30 km above the earth's surface and will be sustained by solar power. The aim is to try to get the new spy planes to fly in a controlled orbit at very low speeds. This combination should produce excellent imagery and should reduce the current reliance on satellites.

GPS/GSM

There have been great advances in this form of tracking. The arrival of the Global Positioning System (GPS) and the widespread use of mobile telephones provide an excellent platform for tracking. GPS's accuracy is increasing and will continue to do so as the European "Galileo" system comes into operation in 2008. When this happens, the accuracy of a ground position will be down to mere centimetres. Likewise, the advances in mobile phone technology continue to race ahead and excellent coverage is now available over most of the world's populated surface.

Current GPS/GSM tracking devices have shrunk to the size of a cigarette packet and they continue to become smaller. Their signal can be transmitted over the GSM network from anywhere to anywhere and even when a GSM signal in not available, the tracking device is capable of storing its positions until a signal can be regained. These signals transpose onto a computer map that indicates the movement of a tracking device in real time. Tracking devices can be installed in vehicles, on people or can be attached to movable objects.

THE GLOBAL POSITIONING SYSTEM (GPS)



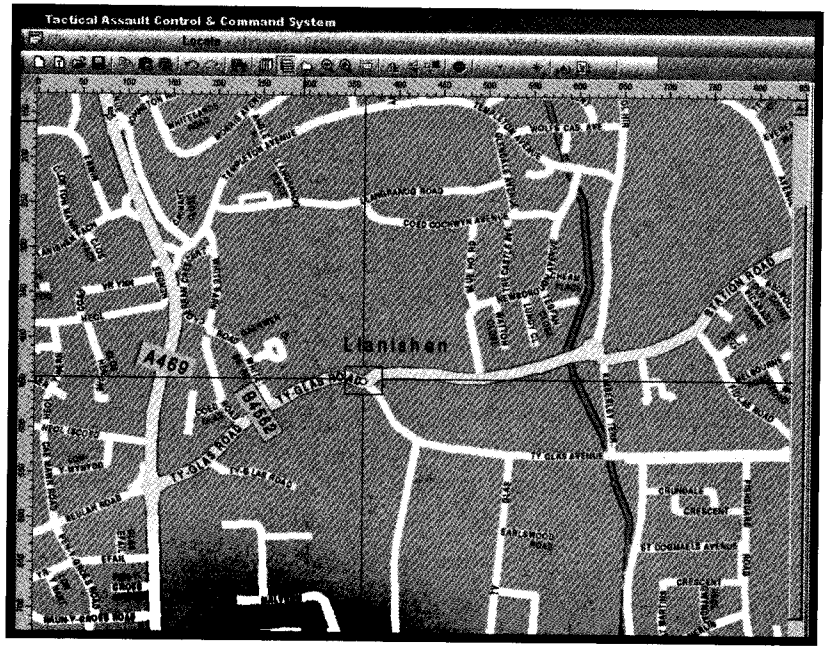
▲ The introduction of GPS has revolutionized surveillance.

The United States Department of Defence launched its satellite-based navigation system in the 1970s. It is made up of a network of 27 satellites (only 24 are actually used with the other three being kept in reserve) and was originally intended for military applications. Cruise missiles and smart bombs are guided to their target by GPS. In the 1980s, the US government

made the system available for civilian use, making it easier for commercial aircraft and ships to operate. Although the US government can switch the system off, it normally operates anywhere in the world, 24 hours a day and in all weather conditions. The GPS system (for civilian use) operates on a frequency of 1575.42 MHz in the UHF band and is free.

These satellites circle the earth in a very precise orbit and transmit signal information to earth. GPS receivers acquire this information and use it to calculate the user's exact location. A GPS receiver must acquire at least four satellite signals in order to calculate latitude, longitude and altitude. The more signals a receiver can "lock on" to, the higher the accuracy. As the receiver moves over the earth's surface, the position is updated. In doing so, the GPS unit can provide details on the object's speed, bearing, track, journey distance and distance to destination. Most modern GPS receivers, such as those in the TACCS system, can produce an accuracy of up to 1 m.

TACTICAL COMMAND AND CONTROL SYSTEM (TACCS)

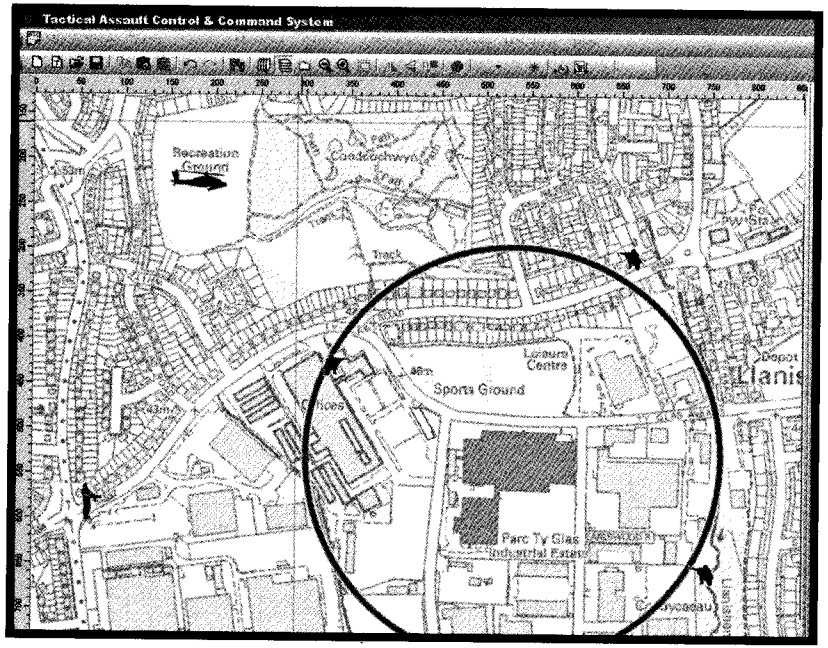


▲ TACCS is capable of tracking anything, either friend or foe.

The introduction of GPS/GSM tracking devices has revolutionized both foot and mobile surveillance. One such system is the Tactical Command and Control System (TACCS), which is produced in the United Kingdom. This form of surveillance is still very much in its infancy, but its capabilities have already made an impact. An additional bonus for many countries is its cost, which, when compared to drones and other satellite surveillance methods, is minuscule.

The TACCS software is Windows-based. It is extremely easy to use, yet it incorporates state-of-the-art, sophisticated functionality. The system is a stand-alone, secure-encrypted and self-contained GPS/GSM tracking and monitoring system. It also offers the user real-time planning and extensive database provision. The user is capable of tracking people, objects and vehicles, belonging either to the enemy or to their own forces. The TACCS system is a spatial decision support system that integrates GIS, GPS and GSM together with multimedia technologies. The TACCS package of software and hardware is designed to ease operational control anywhere in the world.

TACCS software is designed to aid independent unit commanders by supporting real-time information. This allows for the efficient use of unit



▲ The TACCS planning application allows real-time tracking with interactive multimedia participation.

personnel whilst providing a record of events for surveillance, assault operations, debriefing, report writing and future training.

The planning profile of the TACCS system allows the user to geo-reference any map, aerial and satellite photographs or scanned drawing within a few minutes. Icons representing people, vehicles or objects are then placed on the screen using a simple drag and drop sidebar library. This element of the software is particularly useful for planning and executing assault operations or for establishing contingency plans. The system also stores data, such as previously recorded surveillance sessions, personnel profiles and predefined contingency plans. The TACCS system can be used by a variety of military or civil commands to carry out a number of operations:

- Undercover surveillance
- VIP monitoring
- Anti-drugs units
- Counter-terrorism teams
- Covert military operations

Due to the high number of satellite signals received, TACCS can locate personnel, vehicles or objects with great accuracy. Certain devices can be programmed directly from the software to provide a series of specific tasks such as geo-fencing. This allows terrorists or known drug dealers to be fenced electronically – should they enter or leave a geo-fenced area an alarm is triggered. Each device can send its position update automatically or by request from the software. In the case of an emergency, the surveillance mobile device can be programmed to transmit an emergency message, together with co-ordinates, back to the software and/or other surveillance personnel who are working on the network.

The planning feature allows the operator to insert a highly accurate ground vision of the area, be it the seating layout of a commercial aircraft, the platform of an oilrig or a building rendered in 3D. The comprehensive assault screen is unlimited in its ability to provide a detailed picture of who is where and what is happening in real time.

The planning window allows the user to "grab" a section of any geo-referenced map and use this for detailed planning. The user can then build up an interactive model of the immediate incident area. Field operators, such as assault team commanders, can then be monitored by the commander as they move around the map. This ability provides the unit commander with precise real-time control right up to the point when an assault is made.

TACCS SURVEILLANCE MOBILE

◀ **The TACCS mobile is ideal for the surveillance operator as it looks natural and does away with traditional body-worn radio.**

The TACCS Mobile is a revolutionary communication/navigation instrument. It looks and operates in a similar way to any mobile phone and is, therefore, ideally suited to surveillance work as it offers both a natural and secure way of communicating with other operators or the base station. Communication can be carried out using voice, text or SMS. The mobile is equipped with a GPS navigator and street maps can be inserted for any location in the world. A pre-programmed panic button, when pressed, sends an SMS to the control centre providing information on the user's location. Lost or kidnapped people can be found as a result of this feature and, for the user, it could mean the difference between life and death.

TACCS AUTO/MAGNETIC

▲ The TACCS tracking device can be magnetically fitted in seconds. Given a few minutes the device can be wired into the vehicle's electrical system.

The TACCS Auto/Magnetic can be fixed in a vehicle the spy intends to track either by another TACCS device or from the TACCS control centre. Once fixed, the TACCS Auto can be tracked anywhere in the world where there is a GSM coverage. The unit can be hardwired and permanently fitted using a back plate and the relevant cabling. This is normally done for the user's own vehicles. When the TACCS Auto/Magnetic is used on target vehicles, there are two options – the "quick fix" and the "magnetic conversion".

The quick fix involves the two wires protruding from the unit, the ends of which have bulldog grips. The unit is hidden under the car in a position where it will not be easily found. The bulldog grips are then attached to the nearest positive and negative terminals. An external aerial can be fitted in order to get the best GPS signal. This procedure takes about four minutes to perform, but it removes the problem of battery power. Once the type of target vehicle is known to the field operators, they will acquire a similar model and carry out tests to determine the best location to place the unit, to attach the power cables and to fit any remote aerial. This cuts down the amount of time that will be required to fit the unit onto the target vehicle. It also adds to the accuracy of the GPS signal.

In an emergency, and for rapid deployment, the fixed back plate can be exchanged for a heavy-duty magnetic plate. The unit is then simply placed under the target vehicle. However, the unit then has to rely on battery power. This will last any time from between six to 24 hours, depending on the amount of tracking signals requested. The unit has an emergency cut-off at 20 per cent of battery power, enabling the desk or field operators to locate the target vehicle at a specified time – normally during the hours of darkness. Once again the field operator will find a similar type and make of vehicle in order to establish the best position to place the TACCS Auto/Magnetic. The characteristics of the unit make it perfect for covert surveillance.

TACCS ASSAULT

The TACCS Assault is a body-worn unit used mainly by field operators who carry out "dirty" jobs. It requires no installation; it is simply switched on in order for it to operate. As with other TACCS units, it sends back a position on request in order for the commander to control or assist during "hard-hit" raids. The TACCS Assault unit has a large panic button, operated in emergencies such as "man-down". The unit also incorporates a very sensitive microphone that enables the commander to listen to the surrounding conversation. In this mode the unit can be planted and used to covertly listen to a target's conversation.

TECHNICAL OBSERVATION EQUIPMENT

There is little point in locating and constructing a good OP if the spy does not have the correct equipment with which to observe the target. The surveillance operators must make a list of their technical requirements prior to entering the OP and these must enable viewing over a 24-hour period and in all weather conditions. This list may include monoculars, binoculars, telescopes, periscopes, night-vision devices, thermal imaging devices and acoustic devices. Many of these devices can produce still photography, video or audio playback. A major consideration when selecting equipment should be the range to target, the magnification requirements and current audio volume (traffic noise) between the OP and the target. The technical equipment used might include:

- Binoculars and telescopes
- Conventional and digital cameras
- Analogue and digital video cameras
- Night-vision equipment
- Pinhole and microcircuit cameras
- Wireless and remote image transmission technology

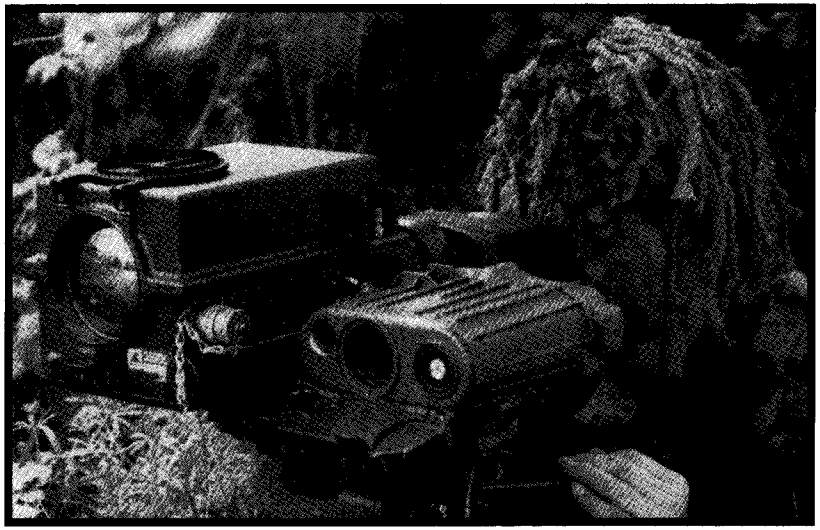
OBSERVATION

The equipment is only an aid when it comes to surveillance; the "mark one" eyeball is still the best observation device around.

BINOCULARS AND TELESCOPES

Binoculars and telescopes have been with us for centuries and they are still one of the best surveillance aids available today. The spy will generally have a small pair of binoculars to hand, either on his person or in the surveillance vehicle. Binoculars are quick to acquire a moving target; on the other hand, telescopes, which are often mounted, are much slower.

Modern telescopes are extremely powerful and capable of immense magnification. They are generally used in the OP, whether it is in a rural or an urban location. The secret to selecting the correct telescope is to assess the range to the target and to define the definition required. While it is often too easy to select a very powerful telescope, this can pose several problems. The first is one of stabilization – if the telescope is too powerful, the target image will appear "shaky" and the spy will not be able to read target detail correctly.



▲ Modern telescopes are highly advanced, and they remain the backbone of surveillance.

▲ Binoculars with built-in video and still camera.

CONVENTIONAL AND DIGITAL CAMERAS

Until the 1950s, cameras were the epitome of surveillance. The only other reasonable source of technical information came from a telephone tap. There is much truth in the saying "a picture is worth a thousand words", as a camera can capture a single moment in time. In surveillance terms, that may be the moment when the target's identity is established or when you discover his association with another. Whatever the case, it provides a lasting image for others to examine.

The first "spy" camera was little more than a normal camera reduced in size; it required film, which in turn required processing. From such simple beginnings, subsequent years have seen some wonderful and ingenious adaptations. Surveillance or "spy" cameras were to be found hidden in books or vehicles, they were sometimes used in Ops, with a telephoto lens attached. These "conventional" cameras produced outstanding quality in their definition clarity. They could also be adapted for use in total darkness by using infrared. Ingenious enough, but then came the digital age.

INFRA-RED (IR)

It is possible for a spy to convert a normal SLR camera into an infra-red camera. The process is fairly easy and, in the absence of any other night-

vision camera, is worth doing. It requires two items – a gelatine filter and a high-speed infra-red film.

A rough template of the flash lens can be marked out using the face of the camera flash. The sheet of gelatine filter is (held by the edges and) placed on the template and cut around, leaving a generous overlap. It is then carefully fixed onto the lens flash with masking tape, making sure there are no gaps for light to shine through.

A roll of high-speed infa-red film is carefully loaded into the back of the camera in total darkness, and the camera is now ready to take photographs – also in total darkness.

It important that the spy pre-focuses his camera, as he will obviously not be able to see anything in the dark. If the spy is intending to take photographs of documents, for example, he will prepare beforehand a measuring stick, which he will use to guage the distance between the camera and the documents in the darkness.

◂ It's simple to convert a camera into an infra-red camera capable of taking pictures in total darkness.

DEVELOPING IR PHOTOGRAPHS

Although it has diminished with the advancement of digital cameras, developing photographs is still a required tradecraft skill. While this should be done under ideal conditions, the spy often has to improvise. The following is a basic method for developing infra-red film. Some basic photographic chemical and equipment is needed. Many photographic shops sell basic kits that contain just about everything you need, including a set of instructions. There are two stages in producing a photograph from a roll of film: firstly, developing the film and, secondly, developing the picture from the film.

DEVELOPING THE FILM

To do this requires a developing tank. This is a small, black plastic tank with a reel inside. The top is unscrewed and the reel removed. The spy will then lay the parts out so he can identify them in the dark. The top and bottom of the reel move in different directions for about 5 cm. There is also an inner edge, into which the film is threaded.

The developer preparation is done by adding warm water – around 28ºC – to the quantity specified on the label. Enough water is needed to cover the film when it is in the tank. The stop solution and fixing agent is prepared as described on their instruction labels.

The following process must take place in total darkness. The film is removed from the camera and some 30cm pulled free. This is fed into the reel. The start point should be located here. Once the film is partly in position, the two parts of the reel will feed in the rest of the film.

The reel is placed in the tank, the top is screwed on and developer added. A paddle stick is provided with the tank that fits through a hole in the top and clips into the reel. The film is agitated using the paddle stick for six minutes and 45 seconds before the developer is emptied out. The stop solution is inserted and agitated for one-and-a-half minutes before emptying out the solution. The fixing agent is then poured in and agitated for five minutes. The fixing agent is then poured out.

The film will now be developed. The top is unscrewed and the open tank placed under a running tap for several minutes in order to remove any chemicals. Once this has been done, the reel should be taken out and the developed film slowly removed. Clothes pegs can be used to weight the roll open and hang it in a clean warm place to dry. The careful use of a hairdryer will speed up the process.

While the film is drying, three flat trays are prepared, filled with 5 cm of developer, stop and fixer. As the negatives are small, an enlarger will be required in order to print out a picture that can be viewed easily.

Once the film is dry, it can be cut into manageable strips of four to six exposures. A strip is placed in the enlarger and manoeuvred until the desired exposure is visible on the enlarger board. The height and the focus should be adjusted to the desired size the enlarger should be switched off and a sheet of contact paper placed on the board. It should be exposed for five seconds by switching on the enlarger lamp. The contact paper should then be removed and placed in the developer dish. It should be agitated by hand until the picture is visible and sharp. It should then be removed from the developer and placed for one minute in the stop solution. Finally, it should be placed in the fixing agent for five minutes before removing it, washing it in clean water and hanging it up to dry. It will be necessary to experiment with both exposure and developer timings in order to achieve the best results. **Note:** it is easy to see why digital cameras are so popular.

DIGITAL

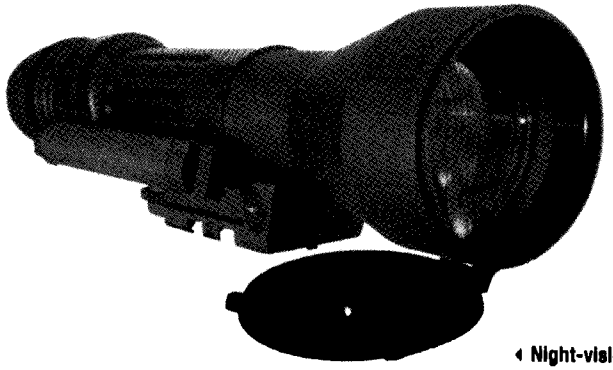
▲ This digital SLR has a very high megapixel output (6.1 million).

While the first digital cameras produced poor-quality pictures, it did not take long for them to catch up with their more conventional counterparts. Digital cameras today are, in terms of quality, capable of taking near-perfect photographs, the results of which can be viewed instantly. Most are capable of running rapid sequences or full video, albeit at a lower resolution. While these features are a major asset to any surveillance operator, their true capabilities come from the fact that they are digital. This means that, when it comes to taking or transmitting images, a digital camera can be controlled electronically. A digital camera can be disguised as a rock and placed in your front garden. It can take pictures day or night on command or by sensor activation. These pictures can then be downloaded by RF, over the Internet or via the GSM network. Most digital cameras used for surveillance are available commercially. If there is an adaptation, it is simply in their usage, that is to say they are disguised in one form or another.

NIGHT-VISION SYSTEMS

Night-vision systems range from miniature "pocketscopes" to large, tripod-mounted models. The present range of third-generation image intensifiers, which can operate with virtually no available light, can be adapted to suit various phases of surveillance; individual weapon sights (IWS), night observation devices (NODs) and night-vision goggles (NVGs). All should be available during the various stages of surveillance depending on the requirements for the moment; NVG for a target recce, a NOD observation or IWS, if a night assault phase is required.

Thermal imagers can also be supplied for surveillance and target acquisition during night and day. A number of different models, varying in size from hand-held types to tripod-mounted devices coaxially mounted

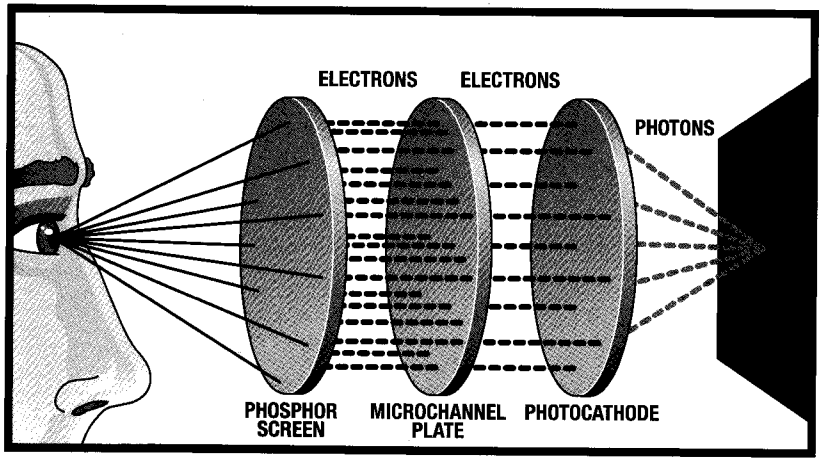


◀ Night-vision weapon sight.

with laser rangefinders, are available. When the target is obscured by weather, smoke, dust or any other form of masking, thermal imagers have the distinct advantage over image intensifiers, as they work on heat detection. Depending on the type and model, night-vision devices can work over distances up to several thousand metres.

◂ Due to a change in fighting tactics, night vision has become an everyday item with Special Forces and intelligence agents.

HOW NIGHT VISION WORKS



▲ How an image intensifier works.

There are two forms of night vision: image intensifier (light amplification) and thermal imaging (infrared). Image intensifiers take small amounts of light (starlight and moonlight) and convert the light photons into electrons. These electrons are then multiplied inside the image intensifier tube before being converted back into photons. This provides the viewer with a clear night vision image that would be impossible for the human eye. The process of most image intensifiers causes the viewed image to appear green, a distinctive characteristic of night vision.

The first operational night vision device appeared in the mid-1960s and was used extensively in the Vietnam War. These could be hand-held or used on a weapon. They have progressed by generation, the latest being Generation 3. The photocathode in Gen 3 enables vastly increased viewing distance under near total darkness. Because an image intensifier emits no beam, it is known as "passive" night vision.

Thermal imaging has been around since the 1940s, but it was overtaken by the introduction of image intensifiers – until the shortcomings of the latter became obvious. In certain operations, a thermal imager is very much superior to an image intensifier, as it can locate human or structural images that would be obscured to image intensifiers by smoke, cloud, mist or snow, to name just a few. Because they need to emit a beam of infra-red light, they are known as "proactive" night vision.

LISTENING DEVICES

As is the case with audio-visual devices, there are an unbelievable amount of listening devices available for surveillance. They range from straightforward bugging devices hidden in a building or in a vehicle to microwave or laser beams that are aimed at a window. No matter which device is used, the most important aspect with any system is to anticipate where the best reception can be achieved and balance this with placing the correct device in the best possible position.

The best position for a listening device depends on the target's social habits. That is to say, does he spend a lot of time in the home, in the office or driving his car? While he may spend several hours a day in his car, is he alone? Drivers don't generally talk to themselves while driving. The original target recce will provide an insight as to the best place to fit a listening device. For example, if the family gathers in the kitchen, this would be an obvious location. Alternatively, if the target spends eight hours a day sitting at an office desk, this may also prove a good opportunity to use a listening device. In the final event, a full range of listening devices may be deployed in order to monitor most of the target's conversation.

CHAPTER 4

Overtly or covertly, gaining entry to a building is one of the essential skills for a spy. Gaining information from public or not-so-public sources forms the basis of much spycraft.

METHODS OF ENTRY

All of the information and techniques explained in this section are in the public domain. They outline the skills of secret agents and Special Forces operating in foreign countries. None of the literature in this section will tell you how to construct a bomb or how to make real explosives. Similarly, the section on lock picking is merely an outline and the skills required to perfect the art take years to master.

Methods of entry cover a wide variety of spycraft skills, which fall into two categories – covert (gaining access) and overt (making access). If a spy wishes to plant a bug in the target's house, he will most probably wish to enter the premises and leave covertly. In contrast, a raid on a suspected terrorist bomb-making factory would almost certainly be initiated by the use of force that will inevitably result in a loud noise at the point of entry.

In its basic form, infiltration is simply gaining access to a structure, whether it is a building, an aircraft, a ship or a vehicle. To gain access, a spy may have to climb up, abseil down or carry out direct penetration, i.e. he may need to go through a wall. Much of the equipment required for MoE is termed "low tech", and, for the most part, has been developed through necessity or constant civilian usage. Counter-terrorist techniques have turned the humble builder's ladder into a rapid means of access, while much of the cutting equipment used has been developed from items similar to those used on a day-to-day basis by the rescue services.

Other more specialist MoE skills use a mixture of military and civilian techniques; these include lock picking and the use of explosives. Covert entry can be made by picking the locks, or by silently cutting through steel bars or doors. Overt entry, on the other hand, is normally carried out using the fastest methods – through the use of explosives or wall-breaching cannons. Although this type of work is highly specialized, it is important that a spy has a general working knowledge of such skills.

When access to a house or building is required, the agents will normally carry out **a target recce** (*see* Surveillance section). This entails a simple observation of the premises to establish the correct address, the main points of entry and to ascertain the time when the property is occupied. Once this basic information has been collated, a method of entry will then be formulated. Depending on the security devices protecting the house, a plan will be made either to break in – and make it look as though a burglary has taken place – or to effect a covert entry.

Surprising as it may seem, it is often better for a spy to break in during daylight hours, especially if he intends it to look like a robbery. At 10 am in the morning, the man of the house is likely to be at work, the children are probably at school and the wife could well be out shopping or at work. In contrast, a house is almost always occupied from six in the evening and throughout the night.

ALARMS

▲ **The picture on the left shows a normal house, while the one on the right has been "cleaned" to show how its occupants have protected from possible attack.**

All but a few alarms are controlled by a four-digit code that is punched into a box conveniently situated somewhere close to the main point of entry. This allows the property owner a short period of time to enter the house and to deactivate the alarm. Alarm systems are designed to activate under certain conditions; for the most part when one of the internal sensors has detected somebody's presence or when a door or window contact has been broken. This activates the alarm and the box on the outside of the building is set off. In some cases the alarm may phone the local police (they will only accept VIPs), or even the house owner's mobile phone.

There are several ways a spy can bypass an alarm system. For example, the spy may get a ladder and insert expanding foam into the outside alarm box, remembering to break the light if one is attached. Or he may try to identify the alarm system manufacturer and then obtain the engineer's shutdown code.

While both of these methods are effective, the modern agent will often have a small plate-like device at his disposal (the name of which is classified) that he simply places over the keys on the control box and which will display the correct code instantly. The device measures the pressure of the push buttons, as each is minutely different. The pad is sensitive enough to measure the difference (and will also determine the order) in which the four code keys are pressed. The device works on 70 per cent of known keypads.

The best way a spy has of carrying out daylight entry is by walking up to the front door and knocking loudly (he will not rely on the doorbell as it may be broken), in order to establish whether anyone is at home. If someone answers the door, the spy can simply switch to a back-up plan and say that he is collecting for charity, for example. If no one is at home, he may wish to enter the premises directly, by forcing the door with a wrecking bar or, if the property is hidden from view, using a hydraulic spreader. Or he may go to the rear of the house and try there. He will try not to break glass as it has a nasty habit of making a distinctive sound that could arouse the suspicion of any neighbours.

Once entry has been effected, the spy will consider the amount of time that it will take to plant bugs and to search the place. If he has forced his way into the property, he will make it look like a burglary; if he has entered covertly, he will make sure not to disturb anything. If the house is not under observation from a static OP, he will probably have a sentry posted outside to provide a warning if anyone should return to the property.

MoE CONSIDERATIONS

- A spy will check around the property and take all possible points of entry into consideration. Almost two-thirds of all burglaries take place through unlocked windows and doors.
- He will check under the mat, flowerpot, the nearest garden stone or gnome, and peer through the letterbox for a length of string as it is surprising where people hide keys.
- Street lights often illuminate the front or rear of a property. The spy may use an air rifle to take them out a couple of nights before he intends to enter. He will knock out several in the same street to avoid suspicion.
- The doors are one of the most common means of entry. They are also the most protected, however. The front door normally controls any alarm system, so the spy must either deactivate the alarm externally or enter through this door and then deactivate the alarm. Entering at any other point will instantly trigger the alarm.
- Given their accessibility, windows are the most vulnerable point of entry. However, the spy will always bear in mind the fact that glass makes a sharp, distinctive noise when it is broken.
- Sliding glass doors provide an easy point of entry as their locks are notoriously poor; some 50 per cent of them refuse to lock after a couple of years' usage.
- The spy will make a note of any fences that surround the property. If they are high, he will locate the entry and exit points in the event that he needs to make a quick getaway.
- The spy will not bother with roof hatches unless the property is a large industrial unit or similar type of building.
- Cellars or basement apartments are an ideal point of entry and, while many are self-contained, there is generally a way up into the main house. Basements will give the spy the time he needs to pick locks or to force an entry undetected.
- Garages and tool sheds may not be the main target of attack, but they are generally easy to enter. They will also provide a great deal of equipment – from ladders to cordless drills – that can be used to effect entry in an emergency.

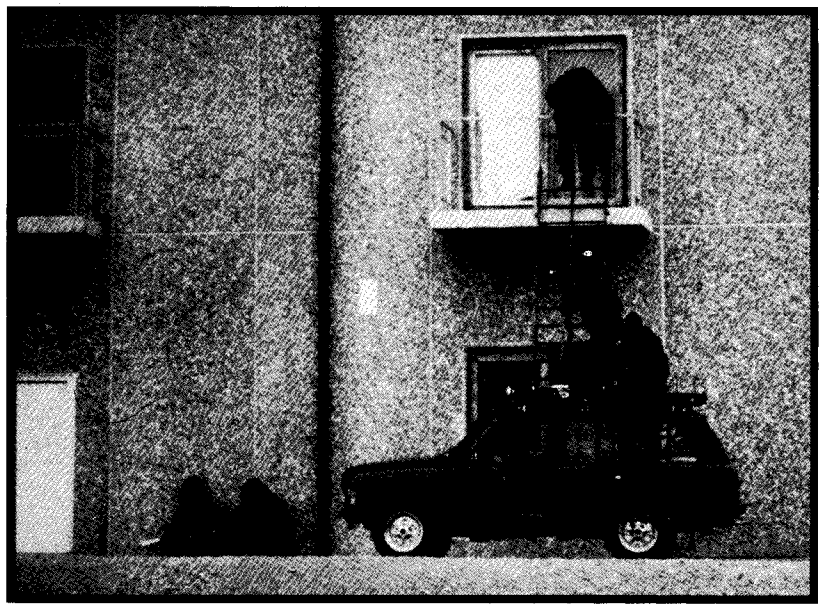
Note: Breaking and entering is illegal and should not be undertaken by civilians.

ASSAULT LADDERS

▲ Assault ladders cater for any eventuality: gaining access to buildings to assaulting aircraft.

There are an extensive range of assault ladders available, most of which were originally developed to cope with terrorist siege situations. These include single section, multi-sectional and extending types in single-width, double-width and triple-stile designs. The best ladders are those that are manufactured from structural grade aluminium alloy with deeply serrated rung sections and heavy-duty rectangular sections. They are fitted as standard with non-slip rubber feet, noise-reducing buffers on all exposed faces, and are finished in black polyester powder coating with etch primer. The reason for having double- and triple-width ladders is to enable several personnel to climb side by side. This allows one of them to open an upper door or window, and enables the others to make an immediate entry. The end result is a lightweight, multi-purpose climbing frame that is adaptable to most requirements.

- Single-section ladders are available in single widths, double widths and triple-stile designs up to four metres in length. They offer silent climbing and are ideally suited for gaining rapid access to public transport vehicles, ships and aircraft or to be used for scaling walls. Wall hooks and sniper platforms can be fitted to all sizes.
- Multi-sectional ladders are mainly manufactured in double-width or triple-stile configurations. The sections of these ladders range in length from one metre up to four metres and can be quickly assembled to give finished lengths of up to eight metres. They can be transported easily in vans or estate cars and provide team capability for two to four personnel, depending on both the length of the ladder and the conditions. They are fitted as standard with heavy-duty channel connectors complete with nylon slides and locking pins. Sniper platforms are also available.
- Wire coil ascent and descent ladders are available in lengths up to 30 metres. As is the case with fixed ladders, they are manufactured from structural grade aluminium alloy and high-tensile wire. They have non-slip rubber feet, noise-reducing buffers on all exposed faces and are finished in black polyester powder coating with etch primer. The ladder is rolled into a coil for transport. Coil ladders are normally put in place via an extendable hook which can be used on a building or for gaining access to a ship.



▲ Vehicle ladder platforms deliver a large number of personnel on target at varying heights.

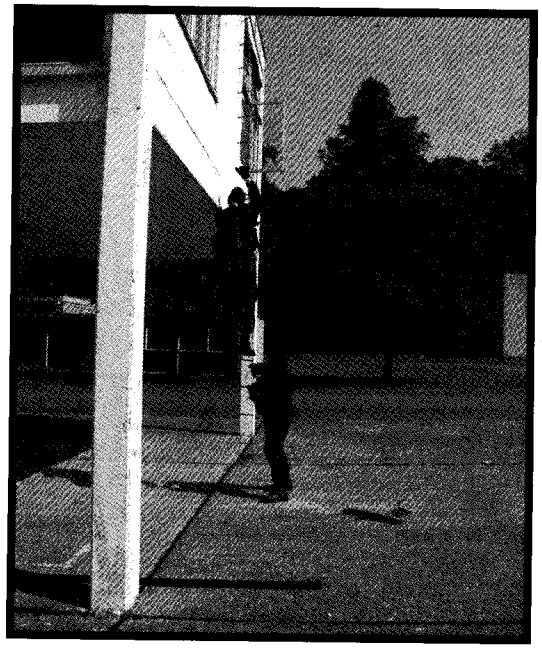
VEHICLE LADDER AND PLATFORM SYSTEMS

The most common delivery system used by most anti-terrorist teams today is a vehicle ladder and platform system. The system provides the assault team with both delivery and access to buildings, trains, coaches and aircraft. While a covert assault may require the use of normal assault ladders, both the IA and a rapid assault are best carried out by the employment of a vehicle-mounted, multi-role, personnel delivery system. There are various systems being currently developed. Some are designed to fit permanently onto armoured vehicles, while other systems are carried within a standard pick-up and can be assembled in minutes. In both cases, the assembled ladders can be configured to suit a wide range of user needs, capable of deploying fully equipped personnel to a variety of levels. For example, the system can be adjusted to deliver a ten-man assault team directly to the doors of a Boeing 747. The same system can be adjusted in a few minutes to enable an assault on a building window some seven metres above ground level. The system can also be used for assaulting ships if they are in dock.

The members of the assault team are carried on load-carrying platforms that are secured to the sides, top and front hood of the vehicle. In addition to this, ladders can be formed into access bridges if and when a void needs to be crossed. It is also possible to fit a 360-degree turntable with an extended ladder, similar to those used by fire-fighters, which enables multi-role functions at difficult angles.

ABSEILING

Abseiling is used for descending a rock face or the side of a building. It can also be used from a helicopter. Abseiling equipment consists of the following: an abseil harness, designed to be used as either as a full-body harness – permitting a person to be suspended for protracted periods of time e.g. outside a window – or as a simple sit harness for straightforward descending. A normal abseil rope is made of 11 mm-diameter, non-stretch, black polyester rope. This is available in differing pre-cut lengths of 50, 100, 150 and 200 metres. Various descenders are used, the most common of which is a horned, figure-of-eight abseil descender on which the lower ring is set at 90 degrees to the upper one. This eliminates any tendency to twist during a descent. The "stop" descender works on the "fail-safe" principle, meaning that the rope can only move through it if the handler applies pressure to the handle. Any release of pressure on the handle causes the descent to be halted immediately. Karabiners, fitted with locking screwgates that have a breaking strain of 3,000 kg, join the separate abseiling units. Rope bags are used during covert work to ease the smooth deployment of a rope during a descent.



◀ **Abseiling down the face of a building remains one of the most popular methods of entry. As seen here, specially constructed wire ladders can also be used to gain access to buildings.**

SPIDERMAN SUCKERS

Spiderman suckers allow a spy to climb up vertical walls with a great degree of safety. The four vacuum pads will adhere to any surface, be it concrete, sandstone, plaster, wood, glass or metal. Each pad is computer controlled, which means that the vacuum effect of each pad can be constantly measured and adjusted. A visual and acoustic warning signal informs the user about the load-carrying capacity of each pad and a fail-safe method ensures that only one pad can be removed at any time.

The unit is operated using compressed air supplied by an air cylinder that is worn on the operator's back. The air cylinder allows approximately two hours of climbing time. The total unit weight is about 25 kg, and offers a carrying capacity of around one metric tonne. Training to use the device takes about one hour and, with practice, the operator can learn to climb overhangs.

◂ "Spiderman" suckers allow an agent to climb any vertical surface.

RAPID-ENTRY EQUIPMENT

Once a spy has climbed or abseiled into position, they will require a means of gaining entry. Rapid-entry equipment ranges from silent hydraulic cutters and spreaders to sledge hammers, crowbars and axes. These tools are commonly referred to as a "Barclaycard", meaning an entry tool that works particularly well for gaining quick access into a building. Most hydraulic tools use lightweight pumps that can be easily carried by a single spy. The following is a selection of the equipment available:

- A **Manual Door Ram** is a hand-held ram designed to force inward-opening doors. The ram is swung against the lock area and imparts a weight load of approximately three tons. It is effective against all but reinforced steel doors and weighs 16 kg.
- A **Door ripper** is a lightweight tool designed to force outward-opening doors. The blade of the tool is driven between the door and the frame in the lock area. A ratchet mechanism helps overcome resistance by allowing the blade to be worked behind the door thus providing increased force.
- A **Hydraulic Door Ram** is designed to force reinforced inward-opening doors. It is supplied with three sets of claws to suit all standard widths of door from 760 mm to 920 mm. The main ram is positioned over the lock area while the secondary ram forces the jaws into the frame. A valve then activates the main ram to force the door open exerting a maximum force of five tons. An 11-ton version is also available.
- The **Hooligan bar** is an American-designed rapid-entry tool. Essentially, it is a one metre metal bar with various attachments. Two or three blows with the bar will take out most of the window; the hooks are then used to pull out the debris or can be used as leverage on sash-type windows.
- **Spreaders** are used to either lift a door off its hinges or to lift or move a heavy object.
- **Jaws and disk cutters** are used to cut or penetrate any form of metal. Some hydraulic models can cut metal bars that are up to 35 mm thick.

▲ Standard tools such as sledge hammers and bolt cutters are used to remove basic doors and locks.

SPECIALIST AMMUNITION

The Hatton round is designed to remove hinges off doors without the risk of ricochet. These rounds contain 12-gauge, semi-solid, frangible slugs weighing 50 gm. They smash hinges from their fixings and cause damage to the surrounding woodwork. These rounds will penetrate vehicle tyres, fire doors that are clad on both sides with metal plate, cell-type doors, 12 mm thick Makralon and armoured glass from a range of 1.5 m. The Hatton ammunition can only be used in Magnum shotguns with three-inch chambers and unchoked barrels.

RIP, 12-gauge, close-range ammunition comprises of cartridges filled with a mixture of micronized CS, an inert powder to add weight and another non-toxic powder. On firing, the compression and friction produces a large amount of carbon dioxide gas when the cartridges exit the barrel of the shotgun. The mixture is propelled towards the target at a very high speed, forming a cloud of incapacitating airborne irritant in the process. The muzzle of the shotgun can be held against any wooden door up to 65 mm in thickness and the powder will blast a hole through it. One round will fill a room that is nine by six metres in size.

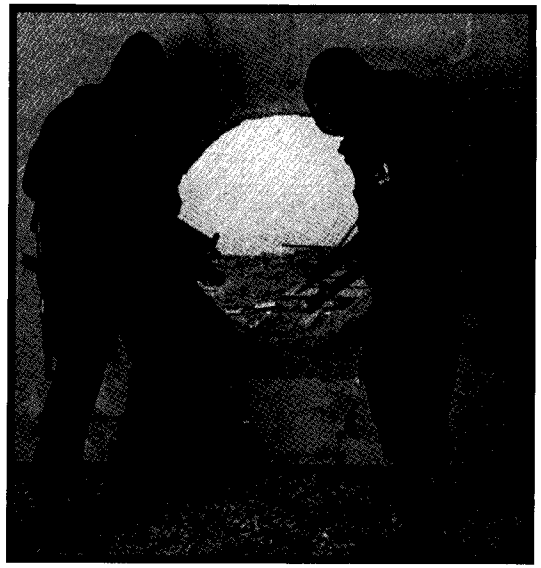
THERMAL LANCE

The thermal lance is designed for cutting mild steel, including objects that are underwater. The basic system consists of a 4 metre flexible thermal lance made from Kerie cable, a single three-litre oxygen cylinder fitted with pressure gauges, a pressure regulator, a battery-powered igniter and a three-way valve which switches the system's working pressure on or off. Once ignited, the Kerie cable burns at approximately 60 cm a minute during cutting, and has a maximum cutting time of six minutes. A backpack portable system, that weighing 10.5 kg, is favoured for cutting during a covert entry.

WALL-BREACHING CANNON

The wall-breaching cannon is a device that eliminates the need for using high explosives as a method of entry in a hostage situation. Every wall differs and it is very difficult to judge the amount of explosive required to blow a hole without causing severe debris on the opposite side. In the case of a hostage rescue situation, this could cause loss of life to the hostages.

The wall-breaching cannon was developed to direct a heavy, soft projectile with sufficient velocity to accumulate enough kinetic energy to breach a wall, while instantly dissipating the energy after the wall had been breached. It was discovered that a water-filled plastic container fired by compressed air could fulfil this requirement very adequately. A muzzle-loaded, smooth bore barrel was then designed to launch the container. The rear of the barrel is fitted with an air reservoir that is separated from the main barrel by an entrapped glass disc, which ruptures by electrical detonation at a given pressure, thus presenting instantaneous pressure to



▲ The wall-breaching cannon uses water to smash its way through walls and allows an entry to be made.

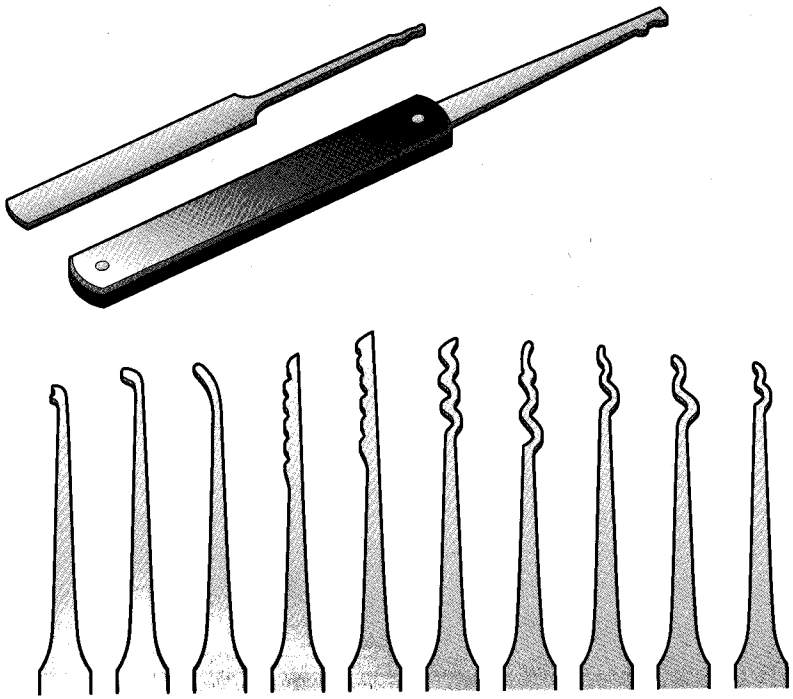
◀ The effect on a wall from a single wall breach.

the rear of the projectile. A loose piston stops any air leakage past the projectile, and gives good velocity at pressures between 100, 200 and 300 kg psi. The system can be easily transported in helicopters or estate cars.

LOCK PICKING

All agents need to learn the basics of lock picking as part of their tradecraft. The principle of picking locks is fairly basic, as are lock-picking tools, many of which can be easily made or improvised by a spy. The problem with picking locks lies in the skill. It can take many years to perfect the fundamentals of lock picking, and it is a skill that requires great practice in order to maintain the "feel". A very brief guide to how a spy goes about the lock-picking process is outlined below. **Note:** picking locks in order to gain unauthorized entry into a person's property is illegal and not recommended.

LOCK-PICKING EQUIPMENT



▲ No agent should leave home without taking a lock-picking set.

There is a wide range of lock-picking equipment on the market, and available in stores and especially over the internet. These vary from the simple, traditional lock-picking sets to the more expensive and advanced lock-pick guns. The basic lock-pick set consists of a range of tools including several different lock-pick shapes and a variety of tension bars. Most sets tend to include tools for the removal of key ends that get snapped off in the lock.

There are many different types of lock-picking guns available to the agent – and indeed the general public – but these are generally bulky by comparison to the lock-pick set. Lock-pick guns are available in either manual or electric operation, and all have interchangeable picks. While the Cobra Electronic lock pick is often acclaimed as the ultimate device, the Lockaid gun, in this author's opinion, is more efficient and reliable.

PIN TUMBLER LOCK

Most of the locks manufactured over the past 20 years are of the pin tumbler type. In its basic form, it is a very simple locking device. A series of small pins fit into the inner barrel of a cylinder. The pins are in two pieces, normally at different lengths and are forced into recesses within the inner barrel by a small spring. If a correct key is inserted, the different sized pins are brought into line where their break meets in the outer casing of the inner barrel. This allows the inner barrel to turn freely within the casing and the lock is then released.

Any method of aligning the pins in this manner and turning the inner barrel will open the lock. This can be achieved by two methods – racking or picking the pins. To achieve this, two basic tools are required – a lock pick or a rake and a tension bar.

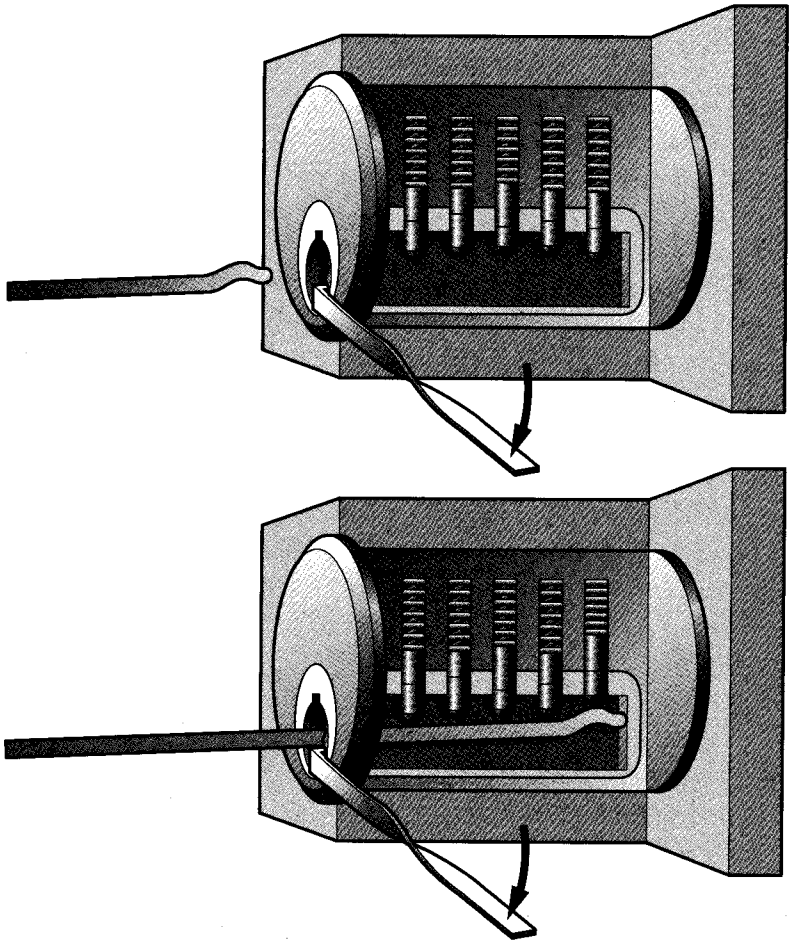
The pick, or rake, is a flat strip of hardened metal that has had its end shaped to fit into the lock and which advances the pins on their small springs to the required depth.

The tension bar is a flat strip of metal inserted into the mouth of the barrel to employ a minute amount of tension onto it. This process helps seat the pins and turn the barrel.

Note: While most locks turn clockwise, some cylinders may turn the opposite way. If the tumbler's pins will not break, or if they stay broken, it means that tension is being applied in the wrong direction. If several clicks are heard once the tension has been released, it means that the tumbler is being turned in the right direction.

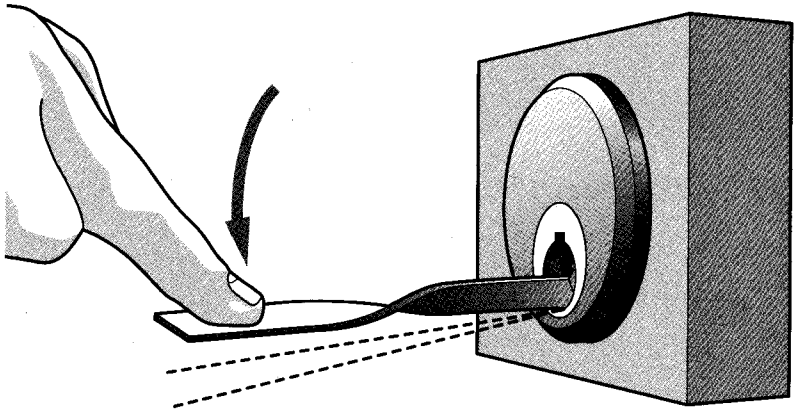
RAKING AND PICKING

There are many different types and designs of lock-picking tools and they can all be used by a spy for different functions. Two are probably sufficient for a spy. Raking is the quickest method of opening a lock. It is fast and straightforward providing that the pin sizes do not change suddenly, such as the combination illustrated below. Before the spy starts he will make sure that the lock is clean and free from any grit or dirt by blowing hard into the lock before attempting to open. Raking involves inserting the pick to the rear of the pins and swiftly snapping the pick outwards, running the tip over the pins in the process.



▲ The spy starts raking the lock by placing the pick at the end of the pins. He withdraws the pick, running it over the pins, while maintaining a little pressure on the tension bar.

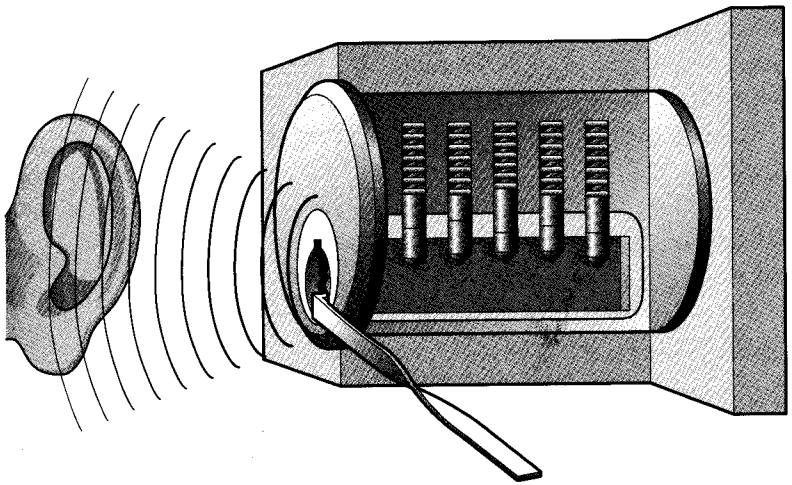
Prior to doing this, he will insert a tension bar into the bottom of the keyway and apply a slight pressure on the lock's inner barrel. The tension is applied in the unlock direction. The amount of tension exerted should just be enough to turn the barrel once the pins are seated, but not so strong as to bind the pins against the barrel. It is this single "feel" that is the basis of all good lock picking. If the tension is too heavy, the top pins will bind and the shearline will not allow the breaking point to meet. If it is too weak, the pins will simply fall back into the locked position.



▲ The tension bar simply replaces the key body as a means of turning the tumbler.

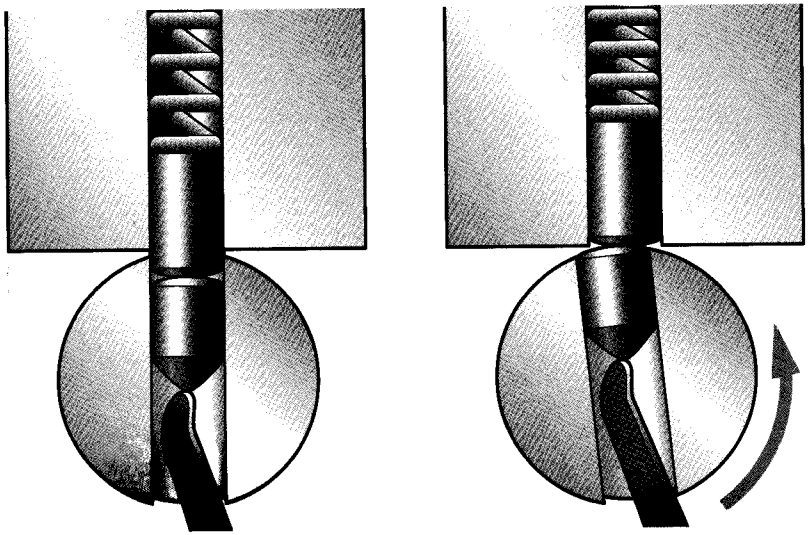
When raking, he will have to repeat the operation several times. If the barrel does not turn by the fourth time, he will hold the tension with the tool. He will place his ear to the lock and slowly release the tension. If the pitting sound of the pins falling back to rest is heard, then he has applied too much pressure. If he hears nothing, then he needs to apply more pressure on the tension bar.

The ease with which a lock can be opened will depend on three things: firstly, the length and position of the pins, secondly, the type of tools you use, and thirdly, the make of the lock. Cheap locks will be easier to open than expensive ones. Cheaper locks are generally poorly constructed, allowing for a much greater clearance between the barrel and the body, thus making it far easier to assemble during manufacture. Cheap locks can also have poor barrel alignment and oversized pin holes – both of which make them very easy to pick.



▲ The spy will isten to the pins "popping" and count the number of "pops" for problems pins.

Lock picking is very similar to raking, but it requires a lot more skill, as the pins need to be seated individually. Starting at the back of the lock, the spy feels for the rearmost pin and gently pushes it up. The barrel should move a fraction. Working towards the end of the lock, he will seat each pin in turn until the barrel is released. A combination of one swift rake followed by picking is sometimes the easy answer to cracking the lock.



▲ The picks act as the teeth on the key. The pick is pushed into the lock under the pins and used to lift them. Once all the pins reach the shear line the tumbler will turn.

One of the reasons some pins bind or stick is that the top is often mushroom-shaped, causing the top to topple and bind on the shearline. Careful picking will overcome this. One particular make of lock, called Medeco, splits the pins at an angle, making it a very difficult lock to pick.

In an emergency, it is possible to bypass the pins by drilling a line through the lock. The spy will direct the drill towards the top centre of the lock where the tumbler meets the body. He will use a centre punch to provide the drill with a good start guide. A spy will drill straight through for at least three centimetres and will push a screwdriver into the keyhole to turn the lock.

A good agent will develop the feel for lock picking by doing a daily exercise. He will wash his hands and then rub in hand cream. He will massage both hands and fingers for about five minutes and then let them relax. He will find a smooth surface, such as a sheet of glass, (an old picture frame is perfect), and place a few grains of sugar on the surface of it. He will close his eyes and gently use his fingers to locate the grains of sugar. When has done this, he will play with each one of them very gently. He will try to differentiate the size and shape of each grain. This exercise not only helps the spy's feel, but it also helps his mind to visualize what he is feeling. Visualization is the key to understanding the techniques of lock picking.

Note: A spy will sometimes sharpen one end of a pick to a needlepoint. If this point is forced all the way to the rear of a padlock – until it hits the rear plate – the sharpened pick will grip the metal. The spy will try to force the plate either up or down as this will sometimes release the lock without the need for raking or picking.

CLANDESTINE LOCK PICKING TIPS

- The spy will define the lock type and its make during target recce phase. He will purchase a similar lock and practise. If he has the time and the tools, he will cut the lock open and examine its inner mechanics in detail.
- Some locks take time to pick, so a spy will take short breaks to rest his fingers.
- He will avoid scratching the outer face of the lock.
- He will return the lock to its natural state once finished. Leaving the pins in a "floating" position will inhibit the key being placed in the lock.