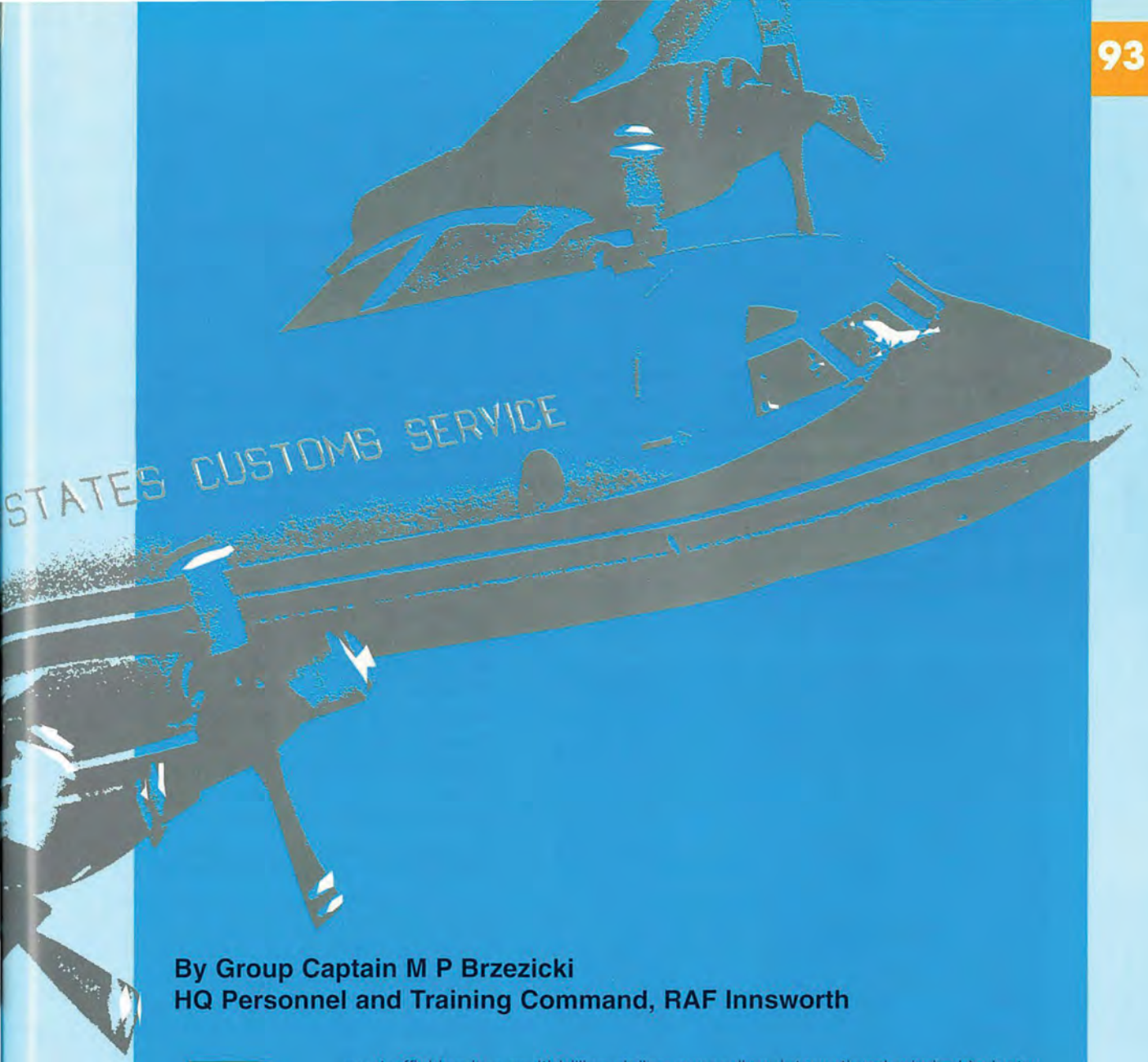
The Air War on Cocaine



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Drug trafficking is a multi-billion dollar, expanding, international criminal industry within which the countries of the Andean ridge region of South America (Bolivia, Peru and Columbia) form the largest source of cocaine in the world. The impact of that cocaine, particularly in the United States, has been enormous, prompting a series of responses by the authorities that include the extensive use of air power.

This article examines that use of air power, starting with the largest component: the aerial interdiction of drugs, both within and from South America. It then examines the use of air power in drug crop eradication programmes, the destruction of clandestine laboratories, and surveillance. The article also considers the effectiveness of air power in combating international drug trafficking. In doing so, it recognises that air power is but one component of a multi-faceted response, and that its contribution is made in conjunction with, and is complementary to, other military and civilian programmes and law enforcement operations.

In order not to exclude any of the wide-ranging air assets that are used to combat drug trafficking, this article considers civil as well as military contributions. In doing so it relates most to the definition adopted by the Royal Australian Air Force, which records, inter alia, that 'air power ... should be thought of as the sum total of a nation's aviation and related capabilities ...'.[1]

To appreciate the scale of the problem, a short résumé of the issues is called for. The world profits from illegal drug trafficking can be calculated in tens, if not hundreds, of billions of dollars, and the effects that the generation of such wealth have had on society are considerable. With narcodollars comes corruption of endemic proportions, with the consequence that counter-drug strategies in South America involve a continuous tension between those who genuinely seek reform and those corrupt actors who manoeuvre to preserve the status quo. There are also links between terrorism and guerrilla activities and the narcotics trade. In South America, some guerrillas earn money from protecting the traffickers from the authorities, as well as becoming involved in the trafficking themselves. It is estimated that between 1990 and 1994, Colombian guerrilla organisations raised $701 million from drug trafficking.[2] In Colombia in 1992, the Fuerzas Armadas Revolucionarias de Colombia is reported to have earned $118 million by 'taxing' the cocaine and heroin industry, and in Peru in the late 1980s, the Shining Path's earnings were $20 to $30 million per annum.[3] Such large incomes allow the terrorist and guerrilla groups to continue indefinitely, posing serious problems for the governments concerned. In addition, any actions that the authorities take that are perceived by the hundreds of thousands of coca farmers to be too heavy-handed risk driving them into the fold of the insurgents. This is not a point to be missed by extremist groups or political parties and it exerts a significant influence on government counter-drug policies.

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The direct impact on society is also enormous. The vast profits originate from the users, who often finance their habits, in whole or in part, through the proceeds of crime. An estimated 12.8 million Americans, aged 12 and older, use illegal drugs on a current basis, of whom some 600,000 are heroin addicts, and 1.5 million (as at 1995) are cocaine users.[4] Moreover, whilst Americans constitute only five per cent of the world's population, they consume annually over 50 per cent of the world's supply of illegal drugs.[5] As a consequence, drug abuse kills 14,000 Americans every year,[6] and drug-related illness, death, and crime cost the United States approximately $66.9 billion.[7]

The military and the war on drugs

In 1982, President Reagan declared war on drugs and brought in the US military, principally to counter the trafficking of South American cocaine. Since then, federal spending on drug control programmes has increased from $1.5 billion in fiscal year 1981 to $15.1 billion in fiscal year 1997,[8] and State and local governments spent $15.9 billion in 1991.[9] But the war has not been won, and the United States has decided that 'the metaphor of a "war on drugs" is misleading. Wars are expected to end. Addressing drug abuse is a continuous challenge …'.[10] Whilst the term 'war' appears, therefore, to be out of fashion, the US Department of Defense (DoD) remains involved in counter-drug operations, and although its assets may be reallocated and reassigned from time to time, there are no indications that they are to be withdrawn completely. Furthermore, it continues to receive support from the naval and air forces, and their civilian law enforcement counterparts, of France, the Netherlands and the United Kingdom.[11]

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INTERDICTION

The war on drugs is fought on two fronts: the demand side and the supply side. The interdiction of drugs, primarily cocaine, in transit from South America to the United States and the interdiction of coca paste and coca base whilst being moved from the producing countries (mainly Peru and Bolivia) to the processing country (Colombia), form a major element of the supply side effort.

INTERDICTION OPERATIONS

The aim of interdiction

The aim of interdiction is to lower the coca leaf price to encourage growers to abandon the crop whilst at the same time raising the cocaine price to consumers in order to discourage consumption. These targets are not as contradictory as they first appear; they can be made compatible by increasing the cost of trafficking from coca leaf to cocaine at the consumer level. This can be done by raising the cost of chemicals, destroying processing laboratories, destroying or interfering with shipping routes, and by forcing smugglers to use more expensive and less effective techniques.[12] Through this, the traffickers' reduced output also reduces their demand for the raw product and consequently the price paid to the farmers drops; yet at the same time the reduced supply raises prices to the consumer. Interdiction also can, and often does, act as a deterrent.

The phases of air interdiction

Air interdiction of aerial and maritime targets is conducted in four phases: detection, interception, tracking and apprehension. Detection is primarily by ground-based and airborne radars, and includes the sorting of likely suspects from unlikely ones. Interception is carried out in order visually to identify the suspect aircraft or vessel. For aircraft, this is usually a covert process although overt intercepts can take place. For vessels, the intercept may be covert or overt depending on the nature of the vessel and the activities in which it is engaged. Tracking involves following the aircraft or vessel to its destination with the 'end game' aim of apprehending the aircraft or vessel, seizing the drugs, and arresting the smugglers.

Drug-smuggling methods and routes

The drugs are initially transported to their destinations or trans-shipment points in surface vessels or by aircraft, or by a combination of the two; for example, light aircraft may drop their cargoes into the sea where they are picked up by fast launches and taken to the shore. Recently, operations have concentrated on moving drugs to trans-shipment points from where they are moved in trailers by road, in containers by sea, or as air cargo. For large shipments, traffickers have even been known to buy old Boeing 727s which they have discarded after one flight.

What routes do the drugs take? The 1900 miles long US-Mexican border is the primary entry area point for drugs leaving South America. The second most significant drug trafficking route into the United States is through the Caribbean, specifically Puerto Rico and the US Virgin Islands. South Florida continues to be a key site for drugs entering the United States and for taking money out. Mexican coastal ports are entry points for drugs being smuggled northwards necessitating interdiction operations on key trafficking routes through the eastern Pacific and western Caribbean. Ports in the Pacific north-west and along the Pacific coast, as well as the border with Canada and any airport that handles international cargo or passengers, are vulnerable to drug trafficking.[13]

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The development of interdiction practices and organisations

Air interdiction originated in the 1970s with the US Customs Service using confiscated aircraft, flown by those of its agents who happened to hold a private pilot's licence. Recognising the need for a detection capability, it developed what became known as C3 (Command, Control and Communications) within the Federal Aviation Administration (FAA) radar centres in Miami and Houston; there, US Customs Service agents monitored the slaved radars in the buildings' basements for suspicious aircraft and relayed the information to their aviation colleagues. The Miami operation was subsequently enhanced by the addition of information from an aerostat (a large, tethered balloon with on-board surveillance equipment) at Cudjoe Key, Florida. The system achieved considerable success, primarily against marijuana smuggling.

To enhance these interdiction efforts, Congress gave its approval in the mid-1980s for the US Customs Service to procure its first P-3 Airborne Early Warning (AEW) Orion. Operations continued to be successful and the US Customs Service remained the lead agency for drug interdiction.

The major change came as the Cold War began to thaw and the military became involved in detection and monitoring. They used the North American Aerospace Defense (NORAD) Command, Airborne Warning and Control Systems (AWACS) aircraft, aerostats, ships and satellites to feed their newly created Joint Task Forces (JTFs) in Alameda, California, Key West, Florida and El Paso, Texas. At this time C^3I (Command, Control, Communications and Intelligence) East and West were formed in Miami and Riverside respectively as an evolution of C^3. The new facilities fed off all the FAA radars, the military radars, and the Cudjoe Key aerostat, twenty-four hours a day. However, C^3I East's responsibilities overlapped and clashed with those of JTF 4 at Key West.

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Under President Bush, a comprehensive evaluation of the interdiction programme led to a Memorandum of Understanding between the US Customs Service and the US military. This resulted in the three zones concept: departure, transit, and arrival. The departure zone covered the northern coastal areas of Venezuela, Colombia and across Central America. The transit zone covered the Gulf of Mexico, the Caribbean Sea and the Atlantic Ocean and the Pacific coastline of South America. The arrival zone covered the land mass of the United States. In addition to these three zones, operations in South America itself are often referred to in the context of the source countries or the source zone.

Presidential Decision Directive 14 (PDD 14) then formed the catalyst for the creation of three Joint Interagency Task Forces (JIATFs) and the Domestic Air Interdiction Coordination Center (DAICC) through the National Interdiction Command and Control Plan of 1994.[14] The JIATFs are manned by

DoD (Service and civilian), US Customs Service and US Coast Guard personnel. JIATF South was formed at Howard AFB, Panama to control the source zone; JTF 4 in Key West became JIATF East and covered the transit zone, replacing the C³I facility in Miami; JIATF West was formed in Alameda to cover the remainder of the Pacific within the transit zone. At the same time DAICC was established at March AFB, Riverside, California to control the arrival zone; because it deals with domestic interdiction it has no military participation. Interdiction across the southwest border continued to be the responsibility of JTF 6 at El Paso.

Thus the three JIATFs and DAICC are equal facilities; an aircraft originating in the source zone could first be monitored by JIATF South and then be passed to JIATF East and on to DAICC. The JIATFs coordinate and direct the detection, monitoring and sorting of suspect drug-trafficking aircraft and vessels and allocate targets to appropriate law enforcement agencies for apprehension. This is important because whilst overt, military interception could force an aircraft to abandon its mission or dump its load, it is unlikely to result in a satisfactory 'end game'. Covert interception and tracking, on the other hand, can enable the law enforcement agencies to have a reception party ready at the aircraft's landing ground or at its drop-off point to effect the actual interception, seizures and arrests.

US and international agencies

There are numerous national and local agencies involved in the counter-drug effort in the United States. In the context of this paper, the primary national ones are the Drug Enforcement Administration (DEA), the US Customs Service, the DoD and the US Coast Guard. The DEA is the principal federal agency responsible for coordinating drug enforcement intelligence overseas and conducting all drug enforcement operations. It conducts bilateral criminal investigations and supports worldwide narcotics investigations. The US Customs Service plays a key role in interdicting illegal drugs and investigating drug-smuggling organisations, for which it utilises its border inspection force, an extensive air programme, and a variety of seagoing vessels. The US Coast Guard is the principal maritime law enforcement agency with jurisdiction on and over the high seas as well as in US territorial waters. The DoD's contribution to interdiction is to: provide training and other operational support to source-nation counter-drug units to enable them to interdict drug operations, seize deliveries, and arrest traffickers; operate detection and monitoring assets that cover the 2.5 million square mile source and transit zones stretching from South America to US borders.[15]

International dimensions and contributions in the transit zone are recognised: 'Multinational counterdrug operations in the Caribbean provide an additional force multiplier. ... British, French, and Dutch Naval forces participate in fully coordinated operations helping to block smuggling routes out of South America.'[16] And the British, Dutch and Canadian air forces also contribute:

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the RAF provides a Nimrod Maritime Patrol Aircraft (MPA) on an ad hoc basis; the Canadian Forces assist with CP-140 Aurora aircraft; but the major international contribution to the US-led effort is from the Royal Netherlands Air Force which permanently deploys P-3 MPAs and two Fokker 27s to the Caribbean, contributing approximately one third of all JIATF East flying hours.[17]

North American Aerospace Defense Command

Interdiction starts with detection. From the very beginnings of the interdiction efforts radar, in one form or another, has had a major role to play. The detection and monitoring task was given to the DoD in 1991, when it was envisaged that the considerable resources of NORAD would form the foundation of the air interdiction effort.

NORAD's regions and their subordinate sectors receive information from a surveillance network of ground-based radars (GBRs), satellites and airborne radars (AWACS and aerostats). The radars include the Canadian NORAD Region's (CANR's) North Warning System (NWS) and Canadian Coastal Radar System (CCRS) radars, as well as the Continental US Regional (CONR) GBRs. Whilst the Regions forward important information to the NORAD/United States Space Command Air Defense Operations Center in the Cheyenne Mountain Complex in Colorado Springs, they accomplish the majority of the aerospace control missions at the regional level.

NORAD was called in to the drug war at a time when it was to have been enhanced by the $2 billion CONUS (Continental United States) Over-The-Horizon-Backscatter (OTH-B) radar project. The AN/FPS-118 OTH-B radar operates by bouncing signals off the ionosphere to increase range and high-low coverage, and has a range of between 800 to 2800km.[18] Thus the one operational in Bangor, Maine had the capability to look as far south as the northern tip of Colombia. It was this radar which most of all was to contribute to the detection effort in the transit zone; however, it has followed the fate of the CONUS project as a whole and is no longer in use, having been placed in 'warm' storage. It appears probable that the military seized the opportunity to push the OTH-B through on the back of drug interdiction as a last attempt to salvage something from the doomed CONUS project.

How did NORAD fare? In 1994, of the 880 aircraft initially categorised as NORAD unknown, about ten to fifteen per cent (88 to 132 aircraft) were involved in drug smuggling.[19] More recently, the figure of up to eight per cent of the approximately two unknowns per day has been quoted.[20] As a percentage figure these results are not discouraging, but they are difficult to analyse; it is probable that most of the smugglers were first detected by assets in the transit zone and were merely monitored by NORAD as they flew closer. The figures for Canada are easier to analyse: up to 26 June 1996, CANR had assisted the RCMP in the interdiction of illegal drugs worth in excess of CDN$3.5 billion,[21] but this included CDN$2.7 billion worth of drugs recovered in a single incident in 1992. When compared to the 1995 global and US seizure figures for cocaine of 230 and 98 tonnes respectively,[22] CANR's efforts do not appear to be making a significant difference to interdiction.

The reality is that NORAD's contribution to interdiction is now minimal, although official explanations as to why are not forthcoming. However, many of NORAD's components, such as the NWS, are clearly of no use for detection in the transit zone and were obviously not gated for low-flying, drug-smuggling aircraft. And notwithstanding the end of the Cold War it is unlikely that NORAD would lower its guard to the primary threat which it still exists to counter. In addition, the trend has been to shift interdiction efforts towards the source zone, raising different requirements for radar information.

Aerostat radar coverage

Aerostats have been used by NORAD along the southern coastline of the United States, and they have also been used by the law enforcement agencies (LEAs). As with NORAD, considerable hopes were pinned on the aerostats...' providing the detection necessary for successful interdiction; their advantage over ground based radars (GBRs) being their look-down capability to detect low-flying aircraft and/or ships. Aerostats can be tethered at altitudes up to 10,000ft and are equipped with either the Westinghouse TPS-63 radar or the General Electric FPS-117 air search radar. They have a maximum effective search radius of 150nm, giving an operational diameter of 300nm.[23]

Originally there were three, USAF maintained, Seek Skyhook balloons: one at Cudjoe Key, Florida, one at Patrick AFB, and a third in the Bahamas. These were supplemented in 1985 with US Coast Guard Small Tethered Aerostat Relocatable System (STARS) balloons to detect drug boats in the Caribbean passages.[24] These were added to on an ad hoc basis until eventually there was a complete variety of aerostats, including ship-tethered ones, in many locations, operated by different agencies. Subsequently, a plan was conceived to erect an overlapping screen of sixteen aerostats to cover the United States' southern border from San Diego, California, through to the Bahamas and Puerto Rico; however, this was never fully implemented.

Overall, reaction to the aerostats' efficacy is ambivalent. Some operators clearly achieved successful interdictions through them, but others were adamant that they did not work. The reason for lack of success can generally be attributed to the fact that the aerostats spent some forty to fifty per cent of their time on the ground, either for servicing or because of strong winds. Another reason for a lack of effectiveness was that, depending on its location and the nature of the trafficking activity, an aerostat's range was not always adequate to provide sufficient warning time for a successful interdiction. Selection of suspect targets would also have been a problem, given the large number of aircraft flying close to and into the United States. But there are also indications that lack of funds led to reduced numbers. Whilst the Omnibus Drug Control Act of 1986 authorised the acquisition of seven aerostats at a cost of $95 million, money was provided for only five.[25] And sea-based aerostats are reported to have cost $10 million each,[26] with operating costs running at approximately $1 million per year per aerostat.[27] Cost-effectiveness would have been a major consideration.

Thus from the initial grand design for NORAD to form the foundation of the aerial detection capability, it has been almost totally retired from the drugs war and once more focuses primarily on its designated role. Similarly, the use of aerostats has a chequered history. But there have been further initiatives to overcome the lack of progress; these are described below.

The US Customs Service and the US Coast Guard share the interception responsibility.

The US Customs Service operates Cessna Citation IIs equipped with an integrated F-16 (AN/APG-66) radar and an AN/AAS-36 Forward Looking Infrared (FLIR) sensor package, as well as P-3s (with AN/APS-138 radars and FLIR)

Interdiction in the arrival zone

In the arrival zone, coordination is effected by DAICC which acts as an information clearinghouse as well as a tactical control centre. Some sixty military, intelligence and law enforcement radar systems feed twenty-eight screens to provide a panorama of all air traffic bound for the United States;[28] its radars can handle up to 3,000 targets per twelve second scan. The US Customs Service and the US Coast Guard share the interception responsibility.

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The US Coast Guard also contributes to the interdiction effort, albeit its primary mission remains that of search and rescue. It operates Dassault Falcon HU-25C interceptors equipped with the AN/APG-66 radar and slaved FLIR systems.[29] The Falcon, however, does not have the slow speed handling characteristics of the Citation and has been known to stall when tracking at low speed. Other relevant aircraft include the Dassault Falcon HU-25A/Bs (with AN/APS-131 side looking radar) for surveillance and the Schweizer RG-8 surveillance aircraft.[30] It also has E-2C Hawkeyes on loan from the US Navy. Its helicopter support is provided by the Sikorsky HH-60J Jayhawks, albeit it is primarily its patrol boats and high-speed coastal intercept vessels that effect the surface apprehensions, arrests and seizures.

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Interdiction in the transit zone

Suspect aircraft in the transit zone may be identified by radar, AWACS, or naval ships acting as radar piquets. Suspect vessels are detected primarily by AWACS/MPA. This section first reviews the radar cover, then the aircraft detection assets and then the interception assets. However, it should be noted that in practice there is an overlap of responsibilities between the arrival and the transit zones.

Within the transit zone, radar coverage is concentrated in the Caribbean, with the Caribbean Regional Operations Centre (Carib ROC) located at Key West acting as the focus for all assets. These assets include the US Navy Space Command AN/TPS-71 Relocatable Over-The-Horizon Radars (ROTHRs) in Virginia and Texas and the residue of the defunct Caribbean Basin Radar Network (CBRN) concept. This residue comprises: three GBRs of the Joint Surveillance System on

the south coast of Florida supplemented by the aerostat at Cudjoe Key; four Southern Reporting GBRs in Venezuela and Colombia; an aerostat and three GBRs in Puerto Rico; a GBR at Guantanamo Bay, Cuba; and two GBRs in the Bahamas.

But the radar picture was once much greater and a number of assets have been disbanded. The final picture, therefore, is that the almost total coverage of Central America, the Caribbean and the northern coast of South America has been reduced to generally patchy coverage of the Caribbean, partial coverage of Central America and the same coverage of the northern coast of South America. Whilst the ROTHRs provide a degree of compensation for this, access lanes are left open for the traffickers in the Gulf of Mexico and over the Pacific. The only reasons that can be suggested for these reductions is that either coverage was ineffective, or it was not cost effective for the results achieved, or that it was discontinued because of a lack of funds.

Aircraft detection assets in the transit zone include those of the US Navy, the US Customs Service, the US Coast Guard, the Royal Netherlands Air Force, the RAF, and the Canadian Forces.

The US Navy provides JIATF East with a constant presence of P-3s and E-2C Hawkeyes. The E-2Cs are used for detection and tracking of aerial traffic, whilst the different variants of US Navy P-3s are primarily used for maritime patrol. All P-3s have some electronic surveillance measures, some have Inverted Synthetic Aperture Radar (ISAR), which provides a video image of the target,

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but the P-3CDU (counter drugs upgrade) has air-to-air radar, electro-optical sensors and a signals intelligence suite. The P-3s conduct patrols according to case-specific or geographic intelligence and search for 'go-fast' launches or for motor vessels such as fishing boats and trawlers, rather than cargo vessels. Trawlers can be suspicious due to previous history, lack of appropriate rigging etc, but if a go-fast launch is spotted it will almost invariably be involved in drug smuggling. The US Customs Service also uses P-3s, as well as a C-130 MPA (with APS-137 ISAR), and at Puerto Rico it has a Nomad maritime detection aircraft equipped with 360 degrees Litton Seasearch radars and FLIR.[31] The RAF uses its Nimrod MPA, the Royal Netherlands Air Force its P-3s, and the Canadian Forces its CP-140 Auroras.

Maritime surface interdiction may be effected by the US Coast Guard or by naval vessels, either from the United States or other nations...

Target aircraft may include those taking off from jungle airstrips in South America as well as those already airborne approaching American airspace. An aircraft may initially be suspicious because a flight plan was filed late, or it may be using the wrong codes, and checks are first made with the FAA before the option of launching an interceptor is considered. Other factors such as the lack of, or failure to follow, a filed flight plan, take off during darkness, no 'squawking' on proper frequencies, type of aircraft and its height and speed, as well as more sensitive electronic interrogation/assessments, all combine to help decide what may or may not be suspicious. Additionally, aircraft movements may be anticipated following receipt of intelligence.

Once suspicious aircraft are detected they are monitored with the eventual aim of an 'end game' of apprehension, arrest and seizure. Maritime surface interdiction may be effected by the US Coast Guard or by naval vessels, either from the United States or other nations; in the case of naval vessels, US law enforcement personnel are carried on board to effect the actual arrests. Airborne interdiction may be effected either on landing in the arrival zone or on an aircraft's return to its place of take off. A variety of aircraft may be used for tracking, including those discussed under the arrival zone above, and the US Customs Service has a Customs High Endurance Tracker (CHET), based on the Piper Cheyenne III (with APG-66 and mini-FLIR),[32] on alert in Puerto Rico.

Outside the area of Carib ROC, a suspect aircraft may be detected by NORAD. A Sector Operations Control Centre (SOCC) has two to three minutes to identify an aircraft before it notifies the Region Operations Control Centre (ROCC) which has the option to launch an interceptor.[33] Normally this task would

be passed to Air National Guard units or the US Air Force equipped with F-15s or F-16s. However, where intelligence information was previously received, covert tracking of the aircraft is more likely to be passed to the US Customs Service, US Coast Guard or DEA. Details of a suspect aircraft are passed electronically to DAICC and the appropriate JIATF, where a decision is made on which tracking assets are to be used.

Interdiction in the source zone

In 1995, the Pentagon considered a three-part initiative to reduce drug exports from the source countries. This involved radar coverage by US ROTHRs and in-theatre mobile ground radar installations, the introduction of five new T-47Bs (modified Cessna Citation IIs) to direct Peruvian and Colombian air force aircraft, and enhancing the interdiction capabilities of the source nations' own forces.[34] But interdiction in the source zone has become controversial, particularly in Peru and Colombia. The two countries have undertaken aggressive air interdiction actions having been provided with intelligence from the US-operated aircraft and US-operated mobile ground radar installations.

The US-operated mobile ground radar installations were established in the source countries under Operation Support Justice; culminating under Operation Support Justice IV with one each in Peru and Ecuador, and two in Colombia,[35] with the Colombian Ministry of Defence recently agreeing to the emplacement of a third installation.[36] The military also use satellite sensors and ROTHRs. The ROTHR is a bi-static ionosphere backscatter system designed to provide a wide OTH surveillance of both aircraft and ships. In addition to the ROTHR in Virginia, which has a reported range of 800 to 2400km,[37] another is now operational in Texas, and a third is due for erection in Puerto Rico.[38] Eventually the trio will be able to cover the Caribbean Basin, Colombia, Peru and two thirds of Bolivia.[39]

The radar assets are supplemented by AWACS: the E-3 over Colombia, operating with tanker support, and the P-3 over Peru. The US Customs Service also operates P-3s in South America. They are based at Corpus Christi, Texas and are operated by the Surveillance Support Branch, flying to Panama for operations where they work with the Citations. The US Customs Service operates two types of P-3. One is the P-3B-AEW (dome) which is a P-3 Orion modified to carry an externally mounted rotating radar. The other is the P-3A (slick) which has no dome, but is equipped with the F-15 radar. The P-3B looks for targets and the P-3A carries out the actual intercepts.

In addition to the detection assets, there are six Citation IIs which are assigned to JIATF South but which operate out of Venezuela, Peru and Colombia. Whilst the Citations are operated by the US Customs Service, five are funded by DoD. However, the US Customs Service aircraft and pilots will gradually be withdrawn and replaced by CIA-operated Citation Vs.[40] When the AWACS or radars

detect a suspicious aircraft, the information is passed to the relevant Citation's location and one is launched to intercept it. The Citation locates the suspect aircraft, makes a covert, visual identification, and continues to track it. A host nation representative on board the Citation feeds information on the aircraft to his own command structure. The host nation may then task its own aircraft to effect the actual interdiction; and this could include, in the case of the Peruvian air force, shooting down a suspicious aircraft if it ignores instructions from the air force aircraft. Colombia's policy is, in theory, not quite so aggressive; it will destroy drug-smuggling aircraft whilst they are on the ground, and when they are sure that the aircraft has no-one on board, but in practice there are also reports of aircraft being aggressively forced down. To destroy the aircraft on the ground, and everything else in the area, the Colombians use a DC-3 (C-47) gunship, equipped with a laser-sighted, 30mm Gatling gun with a rate of fire of 3,000 rounds a minute; the DC-3 is known colloquially as 'Puff the magic dragon'. Whether for an aerial shoot down or ground attack, the Citation will remain on task and record the events on video tape from the images on its FLIR screen. Copies of the video tapes are passed to the State Department.

Not surprisingly, there has been considerable controversy over these interdiction activities, and their origins and results are interesting. In 1993, the mobile ground radars detected 600 flights, resulting in Colombia raiding more than 100 illegally used airstrips and destroying 27 aircraft on the ground.[41] But Peru shot down a drug-smuggling aircraft on 4 November 1993, and this led to the United States cutting off intelligence/information from the radars to Peru and Colombia and the removal of foreign personnel from US surveillance flights;[42] the United States maintained that to provide intelligence that might be used to shoot down civilian aircraft was illegal.[43] This decision proved contentious and Congress subsequently approved legislation in August 1994 that intelligence sharing was legal. In October 1994, President Clinton signed legislation enabling intelligence sharing to take place, and in December 1994, he determined that US cooperation could resume.

Subsequently, over twenty-three narcotics aircraft were forced down or destroyed on the ground, including six shot down.[44] Similar figures are provided by the DEA which claims that the Peruvian air force forced down or shot down twenty drug aircraft; it further claims that the Colombian air force also strafed or forced down at least fifteen drug aircraft.[45] The results were significant, the number of trafficking flights declined by forty-seven per cent in 1995 compared to 1994. As a result of the increased interdiction, coca leaf prices dropped by eighty-nine per cent and washed coca paste prices by eighty-eight per cent.[46] According to McCaffrey, the record low prices paid to farmers by trafficking organisations resulted 'in pleas for alternative development in some areas' and 'led significant numbers of coca farmers ... to forego harvesting in the second half of the year'.[47] Thus the first of the two aims mentioned earlier appears to have been achieved. Furthermore, the success of this interdiction effort continued into 1996. By the end of that year the number of detected trafficker flights over the Andean ridge region, compared with the number of flights detected before the denial program was launched in early 1995, had been reduced by two-thirds.[48] By October 1996, the Peruvian air force (using A-37Bs and T-27 Tucanos fitted with machine guns) had interdicted only five aircraft[49] whilst, over the whole year, the Colombian air force launched 172 intercept/interdiction missions against drug-trafficking aircraft/vessels resulting in thirty-four losses of trafficking 'assets'.[50] As a result, coca crop output exceeded the transportation capabilities of the drug traffickers forcing the average coca price in Peru to drop by fifty per cent over the period.[51] Consequently, in 1996, total coca cultivation in Peru decreased by eighteen per cent, from 115,300 hectares in 1995 to 94,400 hectares in 1996.[52]

ASSESSING THE EFFECTIVENESS OF INTERDICTION

According to RAND, the probability of a smuggler being interdicted may be written as a product of four conditional probabilities: that a smuggler will be 'seen' by a surveillance device; that he will then be identified as suspicious; that he will then be pursued; that he will then be caught.[53] In RAND's model the product of these conditional probabilities can be no larger than the smallest of the four. But that is too simplistic: interdiction, to a degree, can also be effected if a smuggler is turned away, even though an apprehension may not be achieved. However, the RAND model is a useful one to bear in mind when assessing the effectiveness of interdiction.

In respect of RAND's first conditional probability, air power, with all its forms, has a major role to play; there is no real substitute for the detection and surveillance assets. Similarly, air power is essential for rapid identification and tracking. Air power is not so essential for apprehension, although it may often be the only way to transport personnel efficiently. For maritime apprehensions, surface vessels are ultimately essential. It is clear, therefore, that without air power there would be no interdiction as discussed in this thesis. But does it follow that more air power and associated interdiction assets would result in more seizures?

A study into the impact of committing additional resources to the value of $200 million and $500 million to the transit zone interdiction effort, concluded that neither amount would result in a significant enough impact to affect US drug use. The study evaluated that the two options would reduce the estimated 560 tonnes of cocaine moved successfully in the transit zone by smugglers to 470 and 430 tonnes respectively; but given that annual US cocaine consumption was less than 300 tonnes it would not affect the supply to the United States.[54] Clearly, that is a parochial, American perspective; such a reduction could have a considerable impact on the 180 tonnes of cocaine that transits the Caribbean to Europe.[55] The $200 million model could halve the amount of cocaine destined for Europe, whilst the $500 million one could reduce it by seventy-two per cent. It may be that this option will be revisited as cocaine abuse in Europe increases. In theory, therefore, it does seem that more resources could result in increased interdiction. But is this view shared? Moreover, how can the military contribution be measured?

According to a RAND paper, measuring the effectiveness of any military interdiction campaign 'will be both difficult to assess and controversial ... mostly because of the complex and dynamic nature of interdiction campaigns'.[56] Indeed, because of these very complexities the report offers no real solution, but suggests that assessments at three levels (tactical, operational and strategic) 'provide a basis for overall judgements about the performance or efficacy of interdiction and for insights as to where the supporting operations may be broken or need most improvement'.[57] It maintains that failures at the strategic level should be of the greatest concern because they will have the greatest impact on the overall enterprise. In essence, the RAND paper suggests that interdiction is a complex, dynamic operation in that its actions may or may not be effective, depending on a number of factors; and that it will cause reactions amongst the organisations it is attempting to disrupt, which may be to the operation's advantage or disadvantage, and which may alter the nature of the operation. These actions, reactions and advantages/disadvantages may be carried out at, and may impact upon, the tactical, operational or strategic levels.

Perhaps it is with good reason that the RAND paper's conclusions remain somewhat abstract. In its March 1997 report, the US General Accounting Office, in considering the effects of the United States' and host countries' efforts, concluded that 'the United States faces other significant and

long-standing obstacles, such as ... a lack of ways to tell whether or how well counternarcotic efforts are contributing to the goals and objectives of the national drug control strategy, which results in an inability to prioritise the use of limited resources'.[58]

Considerable investment has been made in detection and surveillance capabilities in particular, although not all have been successful. However, detection remains the first step of successful interdiction and without it interdiction, as presented in this paper, would not be possible. Air power also remains essential for interception and tracking, and it also contributes to apprehensions, seizures and arrests. Whilst air power, therefore, is essential to interdiction, is interdiction essential to the national drug control strategy?

Interdiction has had its successes and some battles have been won, but it is not winning the war; the traffickers have proven to be resilient and adaptive and the flow of cocaine to the United States continues to meet the demand. Interdiction has often altered the nature of the struggle, but not necessarily to the advantage of the authorities. But interdiction is not losing the war either. Without it the traffickers would exploit the resultant vulnerabilities to the full. Despite evidence that the potential of interdiction is limited, there is also evidence that the full potential is not being exploited, but it is clear that there are limits as to how much the United States is prepared to spend.

However, perhaps as the demand for cocaine continues to increase in Europe and the former Soviet Union, other countries will increase their contributions to the US-led effort and a greater level of success may be achievable. In the meantime, interdiction should be viewed in the context of the whole drug control strategy and should not be held individually responsible for any overall lack of achievement. Thus interdiction, in concert with the other strands of the counter-drug strategy, is helping to contain the situation but no more.

CROP ERADICATION, DESTRUCTION OF LABORATORIES AND SURVEILLANCE

The above section stressed that interdiction is but one component of the counter-drug, supply-side strategy. This section looks at the other major components of this strategy, specifically crop eradication, the destruction of illicit laboratories and surveillance.

CROP ERADICATION

Eradication of drug-producing crops may be effected either manually or by aerial spraying, and can be carried out on a mandatory or voluntary basis, either with or without compensation. Crop eradication by hand is a time-consuming process, whereas aerial spraying is much quicker. Whilst there are both advantages and disadvantages to the two methods, the slowness of manual eradication remains a significant disadvantage. The paper reviews the United States' national drug control strategy, past eradication programmes and eradication operations.

The national drug control strategy

No doubt encouraged by past successes, and with few options to choose from in the supply-side struggle, the United States has included crop eradication under Goal No 5 of the National Drug Control Strategy 1997: i.e., to 'break foreign and domestic drug sources of supply'.[59] Indeed, the strategy sees gaining control over the cultivation and production of illegal drugs as being key to supply reduction efforts,[60] and places reduction of worldwide cultivation as the first of the six objectives of Goal No 5.[61] The strategy notes that in 1995, enough coca was grown on 214,800 hectares of land in Bolivia, Colombia and Peru to produce 780 metric tons of cocaine for the world market, and maintains that a 'top international drug policy priority is support for the efforts of Bolivia, Colombia and Peru to reduce coca cultivation'.[62]

Eradication programmes

There have been a number of successful crop eradication programmes in the past. In 1972, the United States exerted pressure on Turkey to eradicate legal poppy cultivation, which was providing the opium for Marseilles' heroin laboratories. Turkey complied with vigour and wiped out legal cultivation of the plant. In the late 1970s, the Mexican government, at the insistence of the United States, sprayed its country's marijuana crops with paraquat, reducing both cultivation and desirability.[63] And in 1992, Mexico eradicated about two thirds of its 10,310 hectares of opium.[64] In Colombia between 1984 and 1988, the government eradicated 27,000 hectares of Marijuana, essentially through aerial spraying, leaving just 2,400 hectares remaining.[65]

Whilst Marijuana eradication has had more success in Colombia than in Peru, coca eradication has failed, initially through lack of a suitable herbicide, then through lack of political will, and finally through what amounted to a small-scale operation, negated by replacement with new plants. More recently, an altogether more vigorous programme has been conducted by the Colombian National Police; however, their (claimed) substantial effort in 1995 was insignificant when compared to the fact that overall cultivation had risen to 50,900 hectares through new planting in the same year.[66] Difficulties in accounting for exact figures suggest that it is not unrealistic to consider that the pilots may have been bribed to dump their herbicides, and there is also evidence that pilots have been briefed to spray fields that were harvested several days before the eradication missions took place.[67]

In 1996, the Colombians, assisted by the Americans, sprayed over 16,000 hectares of coca, but yet the acreage under coca cultivation increased from 50,900 in 1995 to 67,000 in 1996 – an increase of thirty-two per cent.[68] These tendencies to replace eradicated crops with new plants, and even to increase the total areas under cultivation are not necessarily new. In Peru's Upper Huallaga Valley, a US-supported eradication campaign from 1983 to 1989 destroyed 17,000 hectares but coca cultivation in the area increased by 72,500 hectares, meaning that 89,000 hectares of new crops were planted.[69] Eradication has had other, unpredicted effects: McCoy and Block maintain that following Turkey's eradication campaign, American drug syndicates simply shifted their sources to southeast and southwest Asia and Mexico. Moreover, they maintain that, paradoxically, the simple Turkey-Marseilles-New York pipeline was replaced by a 'cat's-cradle of smuggling routes far more resistant to suppression than ever before'.[70]

The efficacy of Manual versus aerial eradication

Notwithstanding the attractiveness of aerial spraying, there are problems with it. Some US herbicide manufacturers have refused to provide products, fearing liability lawsuits in the US[71] and only Colombia allows aerial spraying; Peru and Bolivia permit only manual eradication. And rain can dilute the effectiveness of the herbicide, as happened in Colombia in 1996.[72] Attempts have been made to overcome this by the use of granular herbicides but the Colombian government has strongly opposed the testing of more than one herbicide at any one time.

Manual eradication on the other hand, as well as being slow, can be dangerous in areas where crops are protected by guerrillas or armed guards. Aerial eradication is, therefore, attractive although it too is not without its dangers. In Colombia in 1995, a number of aircraft on eradication missions were shot at and a helicopter and a fixed-wing aircraft were shot down, killing a Colombian National Policeman and a Colombian pilot.[73] And in the first six months of 1996, Colombian National Police and Bureau for International Narcotics Control and Law Enforcement Affairs (INL) aircraft on eradication missions were hit twenty-four times by ground fire, and a US Government-owned T-65 aircraft was shot down and its Colombian pilot killed.[74] The traffickers even acquired surface-to-air and air-to-air missiles, although there is no evidence that they were ever used.[75] But the Colombian Army has improved considerably its cooperation with the Colombian National Police, and has dedicated a mobile brigade full time to the Colombian National Police task of crop eradication, and this has provided a deterrent against ground fire.[76] However, notwithstanding this development, DEA agents report that ground fire remains a frequent occurrence.[77]

The eradication debate

Linowitz maintained that eradication campaigns would make better use of resources than interdiction efforts and, where they were backed by real commitment and sufficient financing, they could be successful.[78] He also pointed out that they would be made more effective not primarily by spending more to uproot crops, but by investing in new jobs for the farmers whose livelihoods had been destroyed.

The thrust of Linowitz's arguments has been recognised by the Office of National Drug Control Policy; the national drug control strategy states that regional initiatives will focus on alternative economic developments in Peru (eighty per cent of the cocaine in the US is produced from Peruvian coca crops), whilst at the same time recognising that, in the source countries, drug cultivation is an important source of income for poor farmers. It concludes that to be successful, 'drug crop cultivation must include measures to resolve the socio-economic factors that promote the cultivation of illegal drug crops'.[79] However, there is no certainty that crop substitution programmes will work. Coca crops are harvested three to four times a year compared to one harvest for alternative crops; therefore alternative crops would have to be extremely profitable to compete. Moreover, there is no guarantee that the farmers would not be tempted to supplement their alternative income by growing coca as well. Moran maintains that drawing those peasants who produce coca for drug purposes into other crops is unlikely and compares the situation with California where marijuana has come to be the largest cash crop even though alternatives are abundant.[80] But the proponents of crop eradication would argue that a particularly effective or

sudden eradication programme could indeed drive up prices and reduce availability to such an extent that some cocaine users might abandon the drug altogether.[81] The counter to eradication is that the farmers merely relocate their crops and renew their efforts elsewhere. But this is in turn countered by Clawson, who points out that it takes eighteen months for new coca plants to grow and that this time delay represents a considerable opportunity for the counter-drug effort.[82]

Whatever, the efficacy of eradication, US funding to support international activities has been inconsistent. According to the US General Accounting Office: the inconsistent funding levels have adversely affected drug control efforts; and reduced funding has sometimes made it difficult to carry out US operations and has also hampered source and transit countries' operations. Moreover, the lack of consistent funding has in some cases made countries hesitant fully to cooperate with the United States.[83] The reality is that Congress is just not enthusiastic about source country programmes. The House Appropriations Committee's 1995 report on foreign operations concluded that:

> We thus find ourselves continuing to march steadily down a path towards devoting more and more resources to helicopters, vehicles, police and army bases, and weaponry, while not doing enough to fund comprehensive economic solutions ... The programme has done little in its country programmes to ensure sustainability, and thus the Committee has no confidence that the reforms achieved so far will stick.[84]

According to the US General Accounting Office, counter-narcotics efforts in drug-producing and transit countries are constrained by competing economic and political policies, and internal problems such as terrorism, corruption, and civil unrest.[85] The reality is that the livelihoods of the farmers are at stake, and measures that are too drastic could drive them into the arms of the guerrillas. Aerial eradication, in particular, is seen as repressive, heavy handed, indiscriminate, and the work of a US hegemon. Furthermore, eradication hurts the farmers more than the traffickers. Accordingly, interdiction is politically easier to support than eradication because it hurts the traffickers rather than the farmers. These difficulties are reflected in President Fujimori's speech of October 1990, in which he gave his reasons for effectively abandoning eradication:

> In no way are we opposed to an effective program to eradicate illegal coca crops ... But we wish to address repression in a larger context ... An effective programme of repression that leaves peasants without other alternatives would sharply increase the numbers of those in extreme poverty and could unchain a civil war of unsuspected proportions ... We will not repeat the errors of President Ngo Dinh Diem of Vietnam who, during the 1950s, pitted himself against the informal, common law order of the peasants ... We will not push peasants and their families into the arms of terrorists and drug traffickers.[86]

Conclusions

Again arguments and counter-arguments abound. Crop eradication can work but it is not a one-off phenomenon; eradication must be a continuous process to sustain the advantage, and to do this it needs strong governmental commitment and appropriate resources. However, the activities are expensive and funding is limited. Furthermore, manual eradication is unlikely to be able to keep up with replanting, and aerial spraying creates political dilemmas that Peru and Bolivia in particular are desperate to avoid. Moreover, without alternative or crop substitution programmes eradication will

not succeed. Thus talk today is less of eradication and more of illicit drug crop 'reduction', which implies cooperation, compensation, and alternatives. But the harsh reality is that despite all efforts at aerial eradication, Colombia's acreage of coca under cultivation has risen steadily over recent years, and by as much as thirty-two per cent between 1995 and 1996. Paradoxically, therefore, a sustained and systematic aerial eradication campaign remains the one component that could make a significant impact on the supply side effort, yet at the moment the eradication campaign is ineffective.

DESTRUCTION OF LABORATORIES

The destruction of illicit laboratories and associated facilities, equipment and chemicals is the third major aspect of combating the supply side.

The task force included six UH-60A Black Hawk helicopters and 160 personnel of 193rd Infantry Brigade based in Panama. The original aim was to target the laboratories and their supply systems in complementary attack and interdiction operations

Operation Blast Furnace

Details of the first major operation against illicit laboratories are provided in Menzel's account of Operation Blast Furnace,[87] mounted at the invitation of the Bolivian government between July and November 1986. The operation comprised a US airmobile task force, which was placed at the disposal of the Bolivian government and its antinarcotics field police, as well as DEA ground and aerial support. The task force included six UH-60A Black Hawk helicopters and 160 personnel of 193rd Infantry Brigade based in Panama. The original aim was to target the laboratories and their supply systems in complementary attack and interdiction operations. In the event, only the laboratories were targeted and attacked. Furthermore, instead of a minimum preparatory phase of four months, the task force was given just over two weeks.[88]

The operation commenced with the task force being deployed to Santa Cruz airport by USAF C-5A. From there it deployed with the Bolivian police to mobile, forward operating bases. Fuel delivery was effected with 3,000-gallon aerial bulk fuel delivery systems (C-130 "Bladder Bird"), and forward area refueling equipment systems with 500-gallon blivots supported forward-based operations of multiple aircraft. Intelligence and operations staff identified and selected the targets and aerial reconnaissance flights were flown prior to attack missions. The photographic reconnaissance missions were flown by the DEA using FLIR-equipped Gulfstream Aero Commanders.[89] The DEA also flew logistics resupply missions for personnel in the field.

Whilst Operation Blast Furnace destroyed twenty-two illicit laboratories no cocaine was recovered, although precursor chemicals were seized and destroyed, and no significant arrests were made. However, the price of coca leaf in Bolivia fell from approximately $100 per hundredweight to approximately $14, well below the minimum profit margin of about $30.[90] Yet the traffickers rebuilt their systems and resumed operations in 1987.

Menzel drew a number of conclusions from Operation Blast Furnace. Trafficking activities can be severely suppressed in the short term but sustained operations are necessary for longer-term impact. In particular, surface forces must be equipped to conduct interdiction operations on land and on rivers and these must be complemented by aircraft to interdict aerial trafficking. All-source intelligence assets, including signals intelligence, photographic, infrared, aerial radar information and human intelligence, should be utilised, and adequate time should be allowed for preparation of targeting material before the operation commences. Fixed-wing reconnaissance of targets was essential and preferable to rotary-wing. Surprise was considered essential for optimum outcome. In Operation Blast Furnace, the American press knew about the tasking almost as soon as the military did, and the arrival at Santa Cruz of the enormous C-5A transport aircraft was anything but unobtrusive; according to Menzel 'the narcotraffickers ... began a fast scramble to get out of Bolivia the moment the first C-5As landed at Santa Cruz. Scores of small aircraft ... headed for all points of Latin America'.[91]

Many of Menzel's observations were noted. Operation Blast Furnace was followed by Operation Snowcap, a series of smaller DEA-supported operations in Bolivia, Peru and Colombia, but this was discontinued in 1994. Operations now tend to be conducted by source countries' forces, operating US-provided fixed and rotary wing aircraft, thus overcoming many of the problems of deploying foreign forces in unfamiliar terrain.

Host nation operations in Colombia

In Colombia in particular, the military and the police have shouldered a heavy burden in counter-drug operations. In 1996, the Colombian air force participated in 662 coordinated counter-narcotics operations with, amongst others, the Colombian National Police and the Colombian Army. In addition to the interception/interdiction missions, it provided airlift support to Colombian National Police forces and transported herbicides to Colombian National Police forward operating bases.[92] But again, these operations are not without their dangers: in February 1995, four helicopters carrying Colombian National Policemen were fired upon by guerrillas during a raid on two cocaine base laboratories.[93]

Conclusions

Operation Blast Furnace proved that destruction of laboratories can disrupt trafficking operations, but that the disruption will only be temporary if the offensive is not maintained. Furthermore, deployment of foreign troops is not ideal, particularly if the planning is not thorough, as they are unlikely to remain long enough to achieve any lasting results. On the other hand, the Colombians have an impressive record in the destruction of laboratories and associated equipment and facilities and have shown that host nations can do the job. Yet Colombia continues to produce sufficient cocaine to satisfy the United States' demand. Clearly there are minor successes but the hoped for major breakthrough remains elusive.

SURVEILLANCE

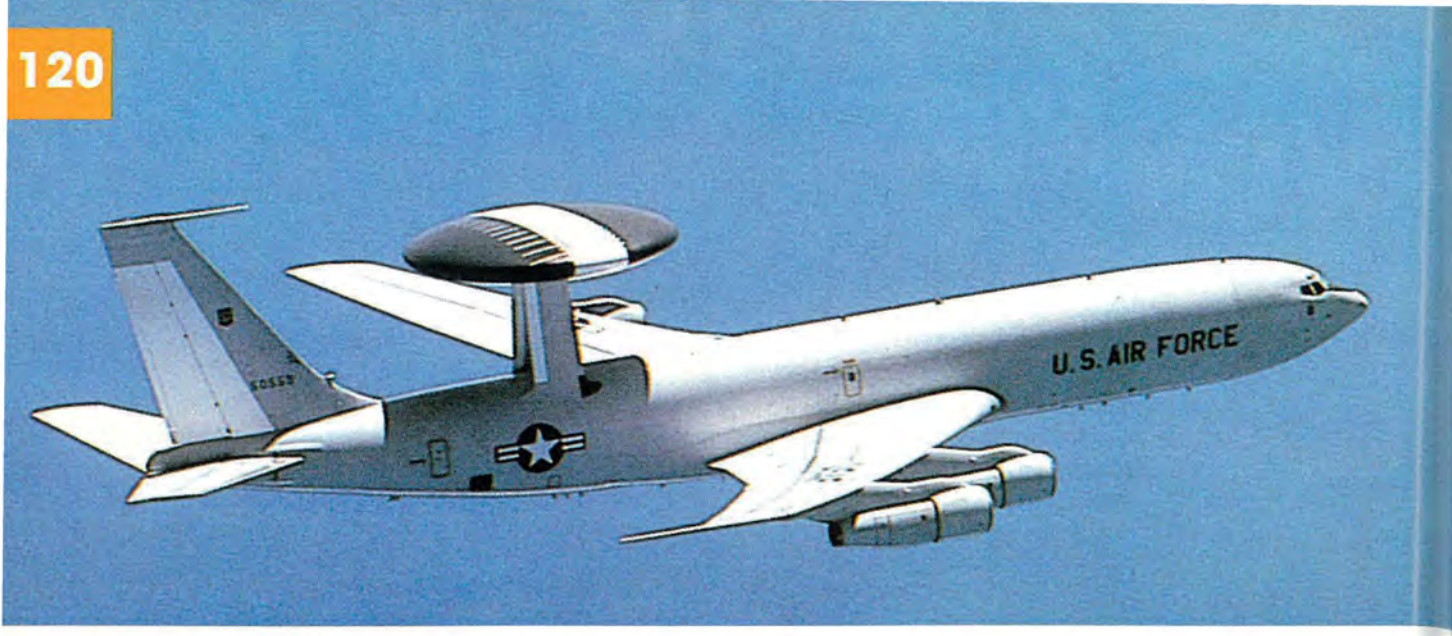
The ability to gain intelligence through the use of aerial and space assets is an essential component of the war on drugs. This part examines photographic reconnaissance, signals intelligence and satellite imagery.

Photographic reconnaissance

From the DEA Aviation Operations Centre, Fort Worth, Texas, the Aviation Intelligence Group provides tactical aerial reconnaissance support to DEA offices and task forces, both foreign and domestic. This includes support to the in-country DEA agents assigned to the American embassies in South America. As a rule, DEA reconnaissance missions are flown in response to intelligence or in preparation for a particular mission, and not as routine patrols. Taskings include: crop detection and identification; raid planning; surveillance planning; detection of clandestine laboratories, airstrips, transshipment sites; vessel identification; and tactical operational support. Reconnaissance also serves to confirm information provided by informants which would otherwise be virtually impossible to verify.

The main workhorse is the Beechcraft Aero Commander 1000 equipped with FLIR 2000, colour video camera and recorder, and two internally mounted, interchangeable 70mm Vinten cameras: the KS87 5" framing camera and the KS116C 5" panoramic camera. A King Air 350C can also be fitted with cameras and FLIR on external wing pods. Mobile photographic laboratories are pre-positioned in the operating countries and can be moved to operating locations to provide on-site processing. A permanent laboratory is located at the Aerial Intelligence Group which has its own intelligence analysts. Imagery can be black and white, colour, or camouflage detection colour infrared.

The US Customs Service has recently begun aerial surveillance operations using its P-3As, and they have also been used to search for clandestine laboratories. The P-3A is equipped with CASOS (Customs Airborne Stabilised Optical System), the imagery from which is digitally enhanceable and is recorded on colour video tape. It can be used from a distance of five miles and at altitudes over 5,000ft (for safety reasons the customs aircraft do not operate below this altitude in Peru and Colombia) and is day and night capable. Single-frame pictures can be transmitted to land via satellite in near real-time, and the camera can lock-on to a moving target. Its digital optics can provide 40x and 120x magnification, whilst the video tape records date, time, altitude, position of aircraft and position of target.



The use of aircraft for SIGINT monitoring of traffickers' aircraft is confirmed in a US SOUTHCOM representation of airborne operations. Radar coverage is provided by the E-3 AWACS which can monitor drug trafficking aircraft, vessels and vehicles

Signals intelligence

As resources are reduced, operations need to become more focused. One way that this can be done is through the acquisition of intelligence. There are a number of intelligence gathering methods of which signals intelligence (SIGINT) is one. Here, SIGINT refers to Communications Intelligence (COMINT), Electronic Intelligence (ELINT)) and Radiation Intelligence (RINT). That SIGINT is being used is not in doubt. In September 1996, the DEA assisted the Colombian National Police in the establishment of a communications intercept facility in San Jose del Guaviare, and it is now providing information on transportation routes, cocaine processing sites, and traffickers' communications'.[94] But intelligence can also be gathered by aerial platforms.

The trafficking organisations use modern technology such as cellular communications equipment to communicate and to coordinate transportation arrangements as well as to monitor and report on the activities of the authorities' counter-drug activities.[95] Given the mountainous, jungle terrain of the Andean ridge region and the lack of communications infrastructure (i.e. ground cables) as well as the nature of the traffickers' operations (e.g. use of aircraft), this is not surprising. But their communications then become vulnerable to interception and analysis, particularly by SIGINT platforms operating out of Howard AFB, Panama. The SIGINT or radar information gained could be used in the immediate interception of an aircraft, as in the case of the Peruvian and Colombian air forces' interdictions, or for the longer-term intelligence picture. The use of aircraft for SIGINT monitoring of traffickers' aircraft is confirmed in a US SOUTHCOM representation of airborne operations.[96] Radar coverage is provided by the E-3 AWACS which can monitor drug trafficking aircraft, vessels and vehicles.

RINT can be difficult to suppress and can be provided, for example, by the firing of a vehicle's spark plug. The Americans took advantage of this in the Vietnam war to identify enemy supply efforts on the Ho Chi-minh Trail. Using a purpose developed vehicle-detection sensor, the AN/ASD-5 Black Crow, on board AC-130E and H aircraft, they were able to locate emissions from Soviet truck ignition systems. The system was apparently also used in the clandestine campaign in Nicaragua.[97] Given that clandestine laboratories utilise generators and other electrical equipment they are vulnerable to detection by aerial SIGINT platforms.

Satellite surveillance

Satellite imagery is the domain of the Defence Intelligence Agency, and whilst it is involved in activities over South America[98] its exact contribution has not been established. Therefore, any comment would be speculative and for that reason none is offered.

Conclusions on surveillance

It is difficult to quantify the results of the overall surveillance effort. The DEA's photographic reconnaissance and surveillance activities are not expensive (the budget for the whole of the Aviation Operations Center's sponsored activities is approximately $24 million per year), and from the evidence available they are extremely effective and essential tools in its operations. But it is just not possible to assess the contribution of the SIGINT and satellite assets. Apart from assisting in the interdiction effort, and providing intelligence for further investigations and operations, the other 'end games' of these activities are not ones that are made available in open source material. Accordingly, no conclusions are offered.

The current extensive use of air power to combat the supply side of the Andean cocaine industry has evolved in proportion to the challenges faced. From the continental United States to the jungles of the Andean ridge nations, ground based radars, AWACS and surveillance aircraft, interceptors and helicopters, operated by military and civil personnel from single or joint facilities, have meshed together in a coordinated, cooperative venture to share the interdiction task according to capabilities, experience and expertise. Whilst air power is essential to interdiction, some operations have gone to the extreme: particularly the Peruvian shoot-down policy in practice, and the Colombian one in theory.

In the mountainous, jungle terrain of the source countries, air power has also proven to be the only realistic approach to reconnaissance and logistics support, and it is also essential for troop deployments for such operations as the destruction of illicit laboratories. However, aerial eradication, which has the potential to devastate coca cultivation, has achieved the least impressive results of all aerial operations. In addition, ground support has often been necessary to suppress hostile fire.

But so far, this impressive organisation, with all its resources and potential, has been unable to stem the flow of cocaine from South America to the United States. To be sure, there have been successes but not on a large enough scale to turn the tide. The traffickers have proven to be extremely resilient and adaptive and have been able to counter any moves that have been made against them.

The reality is that air power is not a panacea. The issues surrounding drug trafficking are extensive and military/law enforcement solutions on their own will not suffice. There are deep social and political problems to be overcome in the source countries before they can contribute to the extent required. Ultimately it must be the source countries that contribute most to the supply side programme. Of course, user nations alone can tackle the demand issue; in the meantime the supply side operations can do little more than contain the situation. This is particularly so at the moment, when the United States appears to have reached the limit of how much money it is prepared to allocate to its national drug control strategy.

This leads to the final point. Each and every aspect of the employment of air power contributes to the supply side effort of interdiction, eradication and disruption. In turn, these supplement the demand side contributions of education, treatment, and law enforcement, which together combine to form the US national drug control strategy. Thus it is the synergy of the whole that is important, not necessarily the winning contribution of any individual component. That said, whilst any one component is unlikely to win the war, any weak one could undermine the achievements of the others. Therefore, there is no alternative but to continue to contain the situation on all fronts. In the meantime, the search will need to continue for that all important but elusive factor that could help define the optimum balance of resources between the components of the strategy. In doing so, the United States accepts that it is no longer engaged in a war. It is enacting a long-term strategy in order to contain and to reduce to manageable proportions the nation's predilection for drugs.

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