THE PERCEIVED NEEDS OF THE U.S. CUSTOMS AIR INTERDICTION SYSTEM ALONG THE EAST COAST OF THE UNITED STATES. (TEXAS TO MAINE, INCLUDING PUERTO RICO)

by

GALIN HERNANDEZ

A Graduate Research Project Submitted to the Extended Campus in Partial Fulfillment of the Requirements of the Degree of Master of Aeronautical Science.

Embry-Riddle Aeronautical University
Extended Campus
MacDill Air Force Base Resident Center
SEPTEMBER 2000

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This Graduate Research Project was prepared under the direction of the candidate's Research Committee Member, Hal P. Henning, Adjuct Instructor, Extended Campus, and the candidate's Research Commitee Chair, Dr. William L. March, Professor, Extended campus, and had been approved by the Project Review Committee. It was submitted to the Extended Campus in partial fulfillment of the requirements for the degree of Master of Aeronautical Science

PROJECT REVIEW COMMITTEE:

Hal P. Henning
Hal P. Henning
Committee Member

William L. March
William L. March, Ph. Ed.
Committee Chair

signed

ACKNOWLEDGEMENTS

A project of this scope is difficult, if not impossible, to complete without the help of many persons. While working side by side with the persons involved in one way or another within this project, I had the fortune to begin to understand the sense of accomplishment and the frustrations they feel while doing this dangerous important job. I want to personally acknowledge Steve Raker, Steve Hill, Ronnie Ortiz, Bill Oliver, Les Robb, J.T. Studinardz, David Cruciger, Dennis Mania, Smokey Ortega, Jim Bryan, Dave O'Niell, Dan Philipps, John Fillmore, Randy Miller, Dennis DelGrosso, Darryl Stinger, Charlie Viccica, Bill Sutherland, Charles Stallworth, Steven Geron, Rob Gonzalez, Wade Koontz, Robert Smith and everyone who's name I may have omitted.

I especially want to acknowledge the untiring work and support I received from my wife Millie. Her proofreading, criticisms and suggestions permitted me to concentrate on the actual research, improving the results obtained by a magnitude unachievable without her. To all I say "Thanks and be safe out there!"

ABSTRACT

Writer: Galin Hernandez

Title: The Perceived needs of the U.S. Customs Air Interdiction System along the East coast of the United States. (Texas to Maine, including Puerto Rico)

Institution: Embry-Riddle Aeronautical University

Degree: Master of Aeronautical Science

Year: 2000

Within all economic systems, control of commodities crossing a nation's border has been a tool used by governments over the course of history. The Customs act of 1789 created the U.S. Customs Service, tasked it to collect revenues for the government in the form of tariffs and provide for protection of these revenues. Soon afterwards smugglers began introducing goods illegally into the United States. Presently, of the smuggling problems facing the United States, drug smuggling, particularly by aviation means, has become one of the biggest over the past few decades. The U.S. government countered this smuggling venue by establishing counter-drug aviation operations. The current tactical interdiction system is, for the most part, exactly as implemented in the late 1970's. It has not adapted to the ever-changing world of aviation drug smuggling and needs some basic changes.

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INTRODUCTION

STATEMENT OF PROBLEM

The U.S. Customs Service maintains and operates the most complex and largest Law Enforcement aviation drug interdiction system in the world. But the system in place was designed in the 1970's for a smuggler that has all but vanished. As demand and technology change, smugglers have adapted and so must the U.S. Customs Service. The present system has not adapted to counter the air smuggler of today. This project will research the perceived needs of the U.S. Customs Air Interdiction Program along the East Coast of the United States (Texas to Maine including Puerto Rico).

OVERVIEW

Within all economic systems, control of commodities crossing a nation's border has been a tool used by governments over the course of history. When the United States of America was born, one of the first acts of Congress was to raise money to fund the government. The Tariff Act of July 4, 1789 created the U.S. Customs Service, tasked it to collect revenues for the government in the form of tariffs and provide for protection of these revenues. Taxing and controlling the entry of commodities into the fledgling nation provided the main source of income for the U.S. until the early 1900's when Income Tax was created (U.S. Customs Service Protectors, 1984, p. 5). However, as soon as these laws were established, smuggling of goods in and out of the U.S. to avoid paying tariffs became a way of life. Just as other nations had been struggling

with this problem, the United States began its' struggle early in life (U.S. Customs Service Protectors, 1984, p. 7).

Smuggling is a very broad problem affecting all nations and covering many commodities. Over the course of history many methods for controlling or eliminating smuggling have been attempted, but few have had tangible results. Law enforcement is tasked to enforce anti-smuggling laws and has been an area of great concern for decades. But smuggling changes as technology advances and the needs of the nation changes. The reasons law enforcement succeeds or fails in controlling smuggling are varied but most are based on the commodity being smuggled and/or the prevalent economic situation.

The United States is under attack the likes of which it has never seen. This menace, the specter of illegal drug use, has grown to a point where Presidents from Nixon to Clinton have declared a "war on drugs" (Hazlett, 1993, p. 70-82) for the negative effect it has on our society. This problem is not a new one, but has been with humanity for a long time. Over the century's, governments have taken different actions to control or eliminate illegal drug abuse. Methods as diverse as the elimination of drug addicts to the treatment of them with synthetic substitutes have been tried with varying effect. An important method of control is to task law enforcement agencies with stopping the

smuggling of drugs into the nation. This requirement is the tasking of the U.S. Customs Service.

Within the last few decades the use of aviation assets to smuggle drugs has increased significantly (Interdiction Efforts GAO/NSIAD-98-30). In the 1970's use of aircraft was one of the preferred method used by smuggling organizations. The U.S. government countered this new smuggling venue by establishing counter-drug aviation operations in 1969 (Wenzalff, 1986, p. 11). This system has remained basically unchanged to this date even though smugglers have changed. This has created problems that plague the system rendering it almost ineffective.

The first identified problem faced by Law Enforcement (LE) in attempting to curtail smuggling is one of establishing a clear and definite strategic direction. Within Law Enforcement Aviation there are two distinct major functions, Enforcement and Interdiction. An understanding of how these functions interact yet can be mutually exclusive is essential towards understanding the needs of an effective anti-smuggling aviation operation. Until a clear overall strategy is established, any attempt to set up an aviation operation will lack the guidance needed for subordinates to establish subsequent procedures and actions.

Once the broad strategy is conceptualized, we then can begin establishing how the system should operate. This second identified problem is establishing

the interdiction requirements of the system. Interdiction operations are divided into three main areas. These are Air Interdiction (interdiction of aircraft), Marine Interdiction (interdiction of vessels) and Land Interdiction (interdiction of vehicles and/or pedestrians). This project is limited to the air interdiction aspect. Interdiction is sub-divided into four separate functions. They are Detection, Identification, Interception and Apprehension. (Aviation Program Five Year, 1998, p. 1) All interdiction activity starts with the detection of the drug smuggler. Therefore establishing an effective drug interdiction operation must be based upon detecting the smuggler. Herein lies the first sub-problem of the U.S. Customs Air Interdiction System. The present aviation detection system is inadequate and not designed to effectively detect the modern drug smuggling venture. A better means of initial detection must be developed in order to achieve the final goal, apprehending the drug smuggler.

The second sub-problem faced by this system is the lack of proper aircraft to complete the assigned mission. Aircraft were obtained due to their initial costs and with mission requirement a secondary concern or like Tampa PD Chief Pilot Randy Miller stated when interviewed: "We got it because it was free". Most interdiction aviation units are equipped with a mixture of assets that have been procured at the lowest possible cost. These assets are then forced to operate in a manner not conducive to their design.

The final problem identified was the measuring of effectiveness. Law enforcement aviation production cannot be measured by common methods used within other realms of the aviation community. Profit and loss measurements used by airlines depend on the generation of profit as the ultimate quantifiable indicator of production and efficiency. Using total flight hours, load factor or revenue passenger miles, commonly used in commercial aviation, do not apply. By the same token accepted LE measurement methods, seizures, arrests etc, can't be used either. The mixture of aviation and law enforcement in which these units operate many times make evaluating their effectiveness an impossibility using presently acceptable methods.

All these requirements make interdiction operations against aviation drug smuggling a complex one. But no matter how complex and sophisticated the system is there are some fundamentally basic requirements that must be considered to increase the possibility of success. This paper will attempt to provide an insight into the perceived needs of the U.S. Customs Air Interdiction System along the East Coast of the USA (Texas to Maine, including Puerto Rico). It will also attempt to identify some basic requirements for a truly workable system as identified by document research and the opinions of presently employed U.S. Customs Officers. With a well-established Air Interdiction system in place, Law Enforcement Aviation can make an impact on the "Drug War".

CHAPTER II

REVIEW OF RELEVANT LITERATURE AND RESEARCH

Of the smuggling problems faced by the United States, drug smuggling has become quite possibly the most critical one over the last few decades. The United States is under attack the likes of which it has never seen. Within the government's efforts and during the administration of President George Bush, the "Drug War" was expanded and an increased emphasis was placed on preventing drugs from entering the nation. This doctrine of preventing illegal narcotics to enter the nation, interdiction, was a radical change in national strategy (Hazlett, 1993, p. 70-82).

Although drug smuggling uses any transportation method available, within the last few decades the use of aviation assets to smuggle drugs has increased significantly (Interdiction Efforts GAO/NSIAD-98-30). In the 1960-70's, smuggling by aircraft was one of the preferred method used by smuggling organizations. The U.S. Government countered this "new" smuggling venue by establishing the U.S. Customs Air Interdiction operations in 1969 (Holden, 2000, p. 10).

This basic system developed in the 1970's is still being used today even tough today's smuggler operates very different. The present system needs to be upgraded into one that can adapt to the changing smuggler. It must provide a

basic framework capable of adapting and challenging the tactical air smuggler of today. This is the only way we can attempt to control the flow of illegal narcotics into the United States by air. The overall magnitude of this problem extends beyond the scope of a graduate research project, so this project is limited to the perceived needs of the U.S. Customs Air Interdiction System along the East Coast of the USA (Texas to Maine, including Puerto Rico).

Even though this problem is one of great magnitude and importance, there is not much published or available for research. During the document research for this project, two types of documents were eliminated from consideration. First, publications accepted for research could not delve into the philosophical argument in favor or against drug control. The argument for or against drug control is not within the scope of this project. The second parameter used was that the publication couldn't concern itself whether prevention is better than enforcement. These two basic assumptions were used throughout the project to limit the documents considered acceptable for this research. These requirements eliminated most published articles since they tended to exploit the sensational aspect of drug smuggling in order to achieve readership. Publications researched were used mainly to obtain historical information on the drug problem and technical specifications of equipment. Within researched publications there was information available in from other areas, like military operations, that can be applied in air interdiction operations.

History

Since ancient times, the use of drugs by humans as a mind-altering substance has been a problem for society. Similarly, attempts to control the spread of drugs has been a demand placed on law enforcement. As the use of drugs expanded, so did the attempt to control it. The U.S. Customs Service first entered the area of drug control when Congress authorized them to enforce the federal drug act of 1848. This law was intended to: "prevent the importation of adulterated and spurious drugs and medicines" and "inspect all imported medicines and make sure that then name of the manufacturer and the country of origin were clearly displayed on each carton (U.S. Customs Bicentennial History, 1989, p. 220). This law was not enacted to curtail the use of drugs as a mind-altering method, but to protect citizens from fake and potentially dangerous medications being imported. Congress at the time realized that since Customs was already protecting the borders and controlling imports, they were the logical choice in this drug enforcement need. The first time federal laws were enacted to curtail mind-altering drug use occurred in 1914 when Congress passed "The Harrison Narcotics Act." This act regulated all traffic in heroin, opium, cocaine, marijuana and other drugs. Once the act was put into effect, the price of heroin skyrocketed from $6.50 to $100 per ounce (Musto, 1987, p. 13). Over the next few decades federal agencies under the Secretaries of Commerce, State and Treasury entered the smuggling interdiction arena creating an ever-growing

federal bureaucracy. This bureaucracy was tested greatly from 1920 to 1934 with introduction of prohibition.

Prohibition was the term used in the attempt to stop sale of alcoholic beverages in the U.S.A. As soon as alcoholic beverages became illegal to produce, it was smuggler in. Bootleggers, the term used for liquor smugglers during this time, used all available methods of transportation to move their illegal cargo. One of the newest technological advances during this time was the airplane. During the late 1920's the U.S. Customs Service began using aircraft to combat smugglers along the Mexican and Canadian borders. These were Curtiss O-1Gs' flown by agents/pilots on an "as needed" basis against rumrunners flying expensive liquors in over inspection points. During Prohibition, the Customs air fleet consisted wholly of aircraft seized for liquor smuggling (Holden, 2000, p. 5). This made the actual capture of smugglers difficult at best since their aircraft were not as advanced as the bootleggers' aircraft were. During a 1934 meeting held by Customs Commissioner James H. Moyle, a Customs collector from San Diego California told him "We have one airplane that will go about 130 mph, but the bootleggers have three planes that will go at least 40 mph faster." Another collector from San Antonio, Texas said:

> "I have 46 cars, eight planes and two boats. Of the 46 cars, 29 of them are poor, 14 of them are fair, four are good. Of the eight planes, I have one in service, but it does not make more than 99 miles per hour."(Ingrisano, 1985, p. 22)

It was interesting to find out that even during this time the effects of politics curtailed air operation. On March 9, 1934 the Secretary of the Treasury ordered all ten U.S. Customs aircraft transferred to the Coast Guard and all Customs air operations ceased (Millspaugh, 1937, p. 171). It was not until 1969 that the U.S. Customs Service returned to air operations when Congress established the present day air program, modified in 1972 and 1974 (Wenzalff, 1986, p. 11).

The mission of this re-established Customs Air Interdiction Program were; (1) reduce the level of smuggling by aircraft; (2) increase the risk and cost of smuggling by aircraft; and (3) improve the detection and apprehension of aircraft, vessels and vehicles engaged in smuggling (Wenzalff, 1986, p. 11). With this mission description, it is clear that the main goal is one of interdicting drug smuggling aircraft creating a situation where smugglers would abandon this method of introducing their illegal cargo into the USA. During the research, the concepts of interdiction and enforcement were interchanged constantly. It is very important to identify this fundamental difference between these terms before continuing. Applying parameters from one on to the other creates the first problem researched.

STRATEGIC DIRECTION

The first major obstacle in setting up an adaptable Air Interdiction System is establishing clear parameters in which the system will operate. It is important

since extending the requirements beyond what a system is capable of providing is a sure method of failure. Within the overall scope of a "Drug War" there has got to be a clearly established strategic direction. This strategic direction provides the basic doctrine all subsequent actions need to bear in mind in order to insure that they are focused on the main objective. This cohesiveness of effort is one of the basic reasons operations and systems fail or succeed. Within US military doctrine, there must always be clearly defined requirements when attempting to accomplish any goal. When overall strategic requirements are defined, then operational and tactical requirements can be formulated (Drew & Snow 1988). Within the US Drug Control Policy, the overall strategy of interdiction was given high priority by the administration of President George Bush in the late 1970's (Hazlett, 1993, p. 70-82). Yet within this overall strategy, the U.S. Customs Air Interdiction Program does not appear to have a clear definition of what interdiction operations should accomplish. Even though the actual operation and requirements of interdiction and enforcement are significantly different, the U.S. Customs Service makes no mention of this in the last few mission statements or five year plan publications. The U.S. Customs Aviation Program Five Year Strategy, 1998-2003, defines its role as: "The Aviation Program employs a three-pronged approach in supporting the enforcement and administration of Customs laws and regulations." (1998, p. 1) Although within the document there are separate sections that talk about Interdiction and Enforcement, there is no mention within this critical document about differentiating between them. This vagueness between interdiction and

enforcement has hindered the system from defining and establishing requirements for an effective tactical interdiction system.

When viewing tactical aviation interdiction we must begin by looking at the problem as an unbreakable chain of events each of them completely dependent on the previous one. The U.S. Customs Service Air Interdiction Division Aviation Program Five Year Strategy 1998-2003 divides interdiction into four distinct and separate phases, Detection, Identification, Interception and Apprehension that must occur in this sequence. (1998, p. 1)

INTERDICTION REQUIREMENTS

Detection and Identification

Interdiction operations start with the detection and identification of the smuggling venture. Present detection of smuggling ventures is dependent on a ground based radar system developed during the 1960's and 70's for air traffic control. Mr. Willard Steven Raker reported in his graduate research project submitted to Embry-Riddle Aeronautical University that: "This current system is inconsistent because of the limited capabilities; the radar sites are each limited to a small radius and the balloons and aircraft are dependent on good weather." (1998) When a present day smuggler uses an aircraft, he uses the limitations of the ground-based radar's to his advantage. When the smuggler arrives at a pre-

determined distance from shore he then "hits the deck". The term "hitting the deck" is a common one used by pilots denoting flying low to the ground. "For the military, "hitting the deck" is 200 feet above ground level (AGL); for the smuggler, it is 15 feet AGL" (Raker, 1995, p. 18).

Since the main radar's used in the Air Interdiction program operate in the Ultra High Frequency range (UHF) their coverage is limited to line of sight. Using the scientifically accepted 4/3 Earth Curvature model this means that under normal propagation conditions the ground drops away from a radar beam at a rate that can be calculated with the following formula:

$1.23(\sqrt{Hr} + \sqrt{Ha}) = Rd$

Hr=Radar Height(ft), Ha= Aircraft Height(ft), Rd= Detection Range(Nmi)

$1.23(\sqrt{50} + \sqrt{15}) = Rd$ RADAR on 50ft tower, Aircraft at 15ft

$1.23(7.07 + 3.87) = Rd$

$1.23(10.94) = Rd$

$13.45 = Rd$

This means that under perfect theoretical conditions, a RADAR on a 50ft tower can detect an aircraft flying at 15ft only when it flies within 13.45Nmi from the radar. If the smuggler is flying beyond 13.45Nmi of the RADAR it is impossible to detect him. (Fink & Christiansen, 1982, p. 25-40) Because of the

curvature of the Earth and the line-of-sight property of air traffic control radar the smuggler can fly well below any radar coverage and avoid being detected. An anonymous survey participant statement that "If you cannot see them, you cannot catch them." confirmed this.

Aircraft carrying long range RADAR, like the E-2C Hawkeye, E-3C AWACS and the P-3AEW Orion, provide detection and first sort capability of very low flying aircraft. These aircraft are pillars of the present drug interdiction operation. Using the same formula a RADAR equipped aircraft flying at 15,000ft can detect a smuggler flying at 15ft at a distance of about 155 nautical miles, a significant increase in detection range. Additionally, they can maintain surveillance of these aircraft until it can be intercepted. This kind of capability is crucial to today's aviation drug interdiction operations if it is to succeed.

Another detection system available is the use of lighter than air vehicles carrying long range RADAR. These can provide the detection and identification of low flying aircraft at long ranges but at a significantly increased cost. U.S. Customs used a series of tethered aerostats to provide long range detection at very low altitudes. They carried a radar system similar to the E-2C Hawkeye, P-3AEW Orion and the E-3C AWACS and could stay airborne for days at a time. When they were operational they provided the ultimate in detection and identification for the Air Interdiction Program. However, these aerostats were

plagued with problems from the beginning and after several years are no longer a primary detection tool.

The main problem with an aerostat is that it can not stay airborne in adverse weather conditions. "The balloons [aerostats] are subject to damage from thunderstorms, high winds and icing..." (Holden, 2000, p. 41) Here is where the use of manned airships carrying long range RADAR becomes a viable option. Airships like the AEROS-40B (Worldwide Aeros, 1998) can maneuver away from approaching thunderstorms that ground conventional tethered aerostats. Even while away from the bad weather, they can still maintain effective coverage of the assigned area from a safe distance. The only time they will be forced to land will be if a large weather front approaches and there is no place to maneuver. These types of weather systems will also ground any prudent air smugglers. The saying amongst U.S. Customs Air Interdiction employees that: "You can fool Mother Customs, but you can't fool Mother Nature" emphasizes this.

The use of airships does not entail manning them like the present RADAR aircraft. They can be used as radar platforms with the data being transmitted to ground based operators at the U.S. Customs Air Marine Interdiction Coordination Center (AMICC). Here RADAR operators can use the data exactly like the data presently received from remote radar sensors. This would limit the size of the airship crew to just the pilots drastically reducing operating costs. Since the

weight of radar consoles and operators can be eliminated, it would extend the airborne time of the airship extending the on station time. The use of airships in this environment is not new. During the 1996 Olympics, the Atlanta police used an airship as an airborne command post. It provided a key role during this time. (Stanton, 1996, p. 12)

During the mid 1950's the U.S. Navy used manned airships carrying radar to provide low level air and surface coverage for the fleet. These airships remained aloft for days at a time without refueling and relayed radar data to ship borne operators. In a sense they were to be the same as having a radar tower 5,000ft in the air. The study reported great success at detecting diesel electric submarines on the surface, the snorkel of submerged submarines as well as low flying aircraft. The blimps ZPG-2N were eliminated from service when nuclear powered submarines entered the inventory since these did not have to surface to attack and the Magnetic Anomality Detectors (MAD) of the time were not sensitive enough to detect submerged submarines. However, during the testing they proved the airships capability as an airborne detection system for everything else above water (Rodrigues, 1996).

Another avenue towards airborne detection researched is the use of Unmanned Air Vehicles. Mostly they have not been widely used so not much information is available. The main drawback of these vehicles is their limited payload capacity. In order to provide effective detection over many hundred

miles at a time, their payload capacity has to be increased. When this is done, they approach the same limitations presently encountered by manned detection aircraft. The only advantage they presently offer is that they do not suffer from pilot fatigue if the mission extends beyond that originally planned.

Research into detection methods as well as manufacturer reports of new equipment provides alternatives to present detection equipment minimizing the effects of Earth Curvature. Ground Wave Radar and the Re-locatable Over the Horizon Radar (ROTHR) can increase radar coverage significantly over present employed systems. These radars use the properties of High frequency (HF) radio waves instead of UHF radio waves to achieve long range low level detection. (Powers & Lewandowski, 1997) The present use of ROTHR data by U.S. Customs extends the range of detection by a great deal. However, although HF RADAR can detect objects at a great distance it can not identify the object. This places a severe limitation on HF radar as an initial detection tool.

After detection, identification of the smuggling aircraft must be done. Thanks to an organized international aviation community, there is a system set up for air traffic identification. Therefore, initial identification is normally accomplished at the time of detection. If the detected aircraft can't be identified then the intercept phase is initiated.

Interception and Apprehension

After a smuggling venture is detected and identified, the interception phase occurs. Here the problems and requirements faced by military and law enforcement aircraft become very similar. Air intercepts is such an important aspect that aircraft specifically designed for this function are available. Although the basic requirements of all air interceptors are the same, the needs of defending sovereign air space from an air attack is significantly different from intercepting drug smuggling aircraft. This makes use of military interceptors ineffective in the drug interdiction role.

Looking at the operational demands of a drug interceptor aircraft gives an idea of the specifications required. Drug smuggling aircraft routinely fly at extremely low altitudes, at low airspeeds over long distances. Drug interceptor aircraft will have to quickly intercept an aircraft at ranges of over 500Nm from the point of departure, covertly track the aircraft over long distances then is able to stay behind it as it takes drastic evasive maneuvers. For this it needs to have a high subsonic dash speed (>.80Mach), a low stall speed (<90Kts) with endurance of at least six hours. The aircraft must also have enough payload capacity to carry an air to air intercept radar, an infrared tracking system, extensive communications equipment, advanced navigation equipment and a flight crew of at least three. This combination of requirements puts a severe demand on the aircraft that can accomplish it. Present military interceptors can

not fulfill these requirements with any measure of effectiveness. Since the entry of Department of Defense assets into Drug Interdiction Operations started, many different aircraft are being used in the interceptor role. The NSIAD-98-30 report on air assets flight hours through 1997 gives an idea of the many different kinds of aircraft used in interdiction activities (Table #1). Interceptors presently used by the U.S. Customs Service include the Cessna Citation II, Piper Cheyenne III and Lockheed P-3C.(Aviation Program Five Year, 1998, p. 19-21) These aircraft

JIATF-East Air Assets, 1992-1997

(Through August 1997)
(In number of flight hours)

A/C Type	1992	1993	1994	1995	1996	(to Aug 97)
C-130	417	97	0	0	0	0
C-141	268	35	0	0	0	0
E-2	4547	3608	4098	3501	3618	2288
E-3	2734	3177	1761	1125	963	882
F15/F16	574	393	455	348	266	148
KC-135	995	1233	827	800	813	360
P-3	16270	12122	9822	9811	9290	5936
S-3	1644	311	228	0	12	0
SH2	2876	1854	262	0	0	395
SH60	4611	3710	1980	2930	2751	1361
C-5	76	0	0	0	0	0
EC-130	62	0	0	0	0	0
H46	58	0	0	0	0	0
UH60	633	0	0	0	0	0
CV-10	240	0	0	0	0	0
U-2	512	0	0	0	0	0
TOTAL	36517	26540	19433	18515	17713	11370

Table #1

Source: NSIAD-98-30, TITLE: Drug Control: Update on U.S. Interdiction Efforts in the Caribbean and Eastern Pacific DATE: 10/15/97

have served the drug intercept role very well over the past decade but will soon need to be replaced. Aircraft like the S-3 Viking, the Cessna Citation V,

Lockheed P-3 and Beech Starship may be the only ones available with these capabilities.

Research has show that the initial interest and use of large commercial jets by drug smugglers provided more publicity than actual use. The few documented cases commercial jets were used to smuggle drugs failed due to the huge logistical support infrastructure needed by these aircraft. The aviation interdiction operation does not need to concentrate on stopping this perceived threat (Aviation Program Five Year, 1998, p. 21). These aircraft are better tracked and interdicted using the resources available to the AMICC. This is one area where the AMICC appears to be providing a superb deterrent against these aircraft.

The last phase of drug interdiction is the apprehension phase. Although some of the aircraft smuggling drugs actually land to deliver their cargo, most only air drop the drugs to awaiting vessels, vehicles or persons at a remote location. This makes the use of a helicopter an absolute requirement. However, the need for apprehension aircraft to operate at distances over 500Nm, and endurance of over six hours, a high dash speed yet still carry an apprehension team of at least four armed law enforcement officers is formidable at best.

These requirements can not be filled with presently available helicopters. At this time only the Sikorsky UH-60 BlackHawk, (Blackhawk, 2000) the Boeing

CH-47 Chinook, (Boeing Rotorcraft, (2000) and the Aerospatiale Super Puma, (Super Puma, (2000) can only come close to covering these needs. Their main drawback is speed. None of them can approach speeds of 200 Kts with top speeds at about only 180Kts. This puts apprehension aircraft at a disadvantage when they have to travel long distances. With this, the only aircraft that can fill all the apprehension needs is the V-22 Osprey Tilt Rotor or a derivative. With its high dash speed, payload capability and helicopter like hover, it is the only alternative to the helicopters available (Osprey On-Line, 1998).

Presently Bell Corporation is developing a smaller version of the V-22 for commercial use. There are many firm orders placed for the Bell 609, mostly by oil producing companies. Military Tilt Rotor aircraft will be outfitted to carry FLIR as part of the requirements and the Bell 609 may benefit from this need. The Bell 609 might be the one airframe that can truly become a multi mission drug interdiction aircraft. Other helicopters presently used (AS-350 AStar, Hughes 500, BK-117) although excellent for the drug enforcement role are just not capable of filling drug interdiction needs.

Measuring Effectiveness

Measuring interdiction effectiveness was the final area researched for this project. Unlike most aviation fields, law enforcement aviation production can not be measured by common methods used within the aviation community. Profit

and loss measurements used by airlines depend on the generation of profit as the ultimate quantifiable indicator of production and efficiency.

The only way efficiency and productivity can be increased is by knowing how efficient / inefficient you are at a given starting point (Baseline Measurement) then improve on this. However, if we look at the different aspects of law enforcement aviation we will find that establishing this baseline is significantly harder than most other aspects of aviation.

During the late 1980's the U.S. Customs Service attempted to quantify aviation law enforcement productivity and efficiency. The Booze-Allen Corporation was commissioned to study the situation and develop a production analysis method. Senior Special Agent Charles Viccica, U.S. Customs, spearheaded this project. Booze-Allen developed a baseline number from which to measure law enforcement activity. This baseline was established by taking into account a series of reported activities for the five years prior to the 1986 study being commissioned. These activities were given a mathematical weight based on how important law enforcement officers felt that activity was. By entering data from years prior to the study a baseline was determined to evaluate future information. This model was used to guide strategic decisions for several years until the goal was achieved according to SS/A Viccica. A main problem with this method was that it did not account for events not detected. Although this method attempted to factor out inconsistencies within data analysis, it did not

factor inconsistencies within data reporting. How data is reported can paint a totally different picture of how productive an aviation operation is. This is where, how the data is reported becomes as important as the reported data itself, another significant problem.

Since quantifying the effectiveness of aviation interdiction is not easily adapted to common statistical methods, it is also prone to falsely report the effects of interdiction on the drug problem. The U.S. Government has decreased the budget for drug interdiction to a fraction of its original amount over the past decade based on statistical analysis of reported data (Senate Committee, 1995). Use of aviation assets is an expensive and complex one not easily understood by non-aviation professionals. The Senate Committee on Judiciary in a 1995 report stated:

> "By cutting back on drug interdiction, the federal government has permitted the importation of vast quantities of illegal drugs, helping to ensure the creation of a new generation of addicts and complicating the job of every federal, state and local law enforcement officer trying to push back the tide of violent crime generated by the drug trade."

In another congressional report, JIATF East stated:

> "Between 1993 and the first six months of 1995, the transit zone disruption rate - the ability of the United States forces to seize and otherwise turn back drug shipments - dropped 53 percent from 435.1 kilograms per day to 205.2 kilograms."

This report is significant since this same interdiction operation is still in place today. It also shows how the data being reported and analyzed does not reflect the situation under scrutiny. All this data is based on law enforcement parameters and does not take into consideration the difference between enforcement and interdiction. This shows the inter-relationship between the areas within the interdiction arena. A change in one creates a situation affecting the others.

SUMMARY

The drug smuggling problem is one that touches every portion of our society, trying to establish anything that might impact on it can only benefit us. The U.S. Customs Service implemented an effective Air Interdiction system in the 1970's that became a victim of its own success. After reducing the smuggling as it was designed to do, it stagnated into a system that kept looking for a now non-existing threat.

The U.S. Customs Service Aviation Interdiction system needs to be upgraded into one that has a chance of succeeding. It must provide the basic framework capable of adapting and challenging the tactical air smuggler of today. The tactical aviation interdiction mission must be specifically identified and separated from the much needed enforcement mission. Advances in detection, identification, interception and apprehension equipment must be implemented to

deal with a changing smuggler. Finally, a method of measuring and reporting interdiction effectiveness must be implemented to prevent the present situation from re-occurring.

This research has shown that the U.S. Customs Air Interdiction System has not adapted to counter a more sophisticated and changed air smuggler. The officers surveyed and document researched point to a tactical drug interdiction system that hasn't adapted to today's smuggling threat. The U.S. Customs Air Interdiction System along the East Coast of the USA (Texas to Maine, including Puerto Rico), needs to change.

Chapter III

RESEARCH METHODOLOGY

Research Techniques

For this project two main research methods were used. Published documents were researched to obtain historical, technical and doctrinal data used within the project. Secondly, a modified Delphi Survey was be conducted to obtain perceived views of actual Aviation Interdiction officers. The officers' replies provided an insight into the problems they confront while performing their jobs. Additionally, several Law Enforcement officers were interviewed to obtain their view. (Appendix E) The U.S. Customs Service Air and Marine Interdiction Division gave permission to survey their employees and provided information not obtainable by other methods.

Research Design

For a document to be included in the research the following criteria was be applied. Historical information concerning the drug smuggling problem was obtained from official government publications, congressional records or books written by accredited historians. Accepted into the research were sworn congressional testimony, congressional reports, and official government agency reports, trades publications, previous research and published reference books.

New research completed for this project consisted of a modified Delphi Survey of U.S. Customs Air and Marine Interdiction Division officers as well as interviews. The Delphi survey was conducted in 3 parts and was answered by a select group of officers. The data was analyzed and the results presented in chapter IV of the research project.

Survey Population

The modified Delphi Survey used to obtain data for the project included only personnel having experience within the U.S. Customs Air and Marine Interdiction Division and in the area of concern. This limitation was established in order to obtain an insider's view of the problems faced. The U.S. Customs Service Air Interdiction program has a total of 832 employees of which 565 are

DISTRIBUTION OF
U.S. CUSTOMS AVIATION OPERATIONS EMPLOYEES

Job Description	Total
All Employees	832
Support	267
Operations	565
Pilot	344
Air Interdiction/Enforcement Officers	44
Detection Systems Specialist	98
Aviation Analysts	17
Management	62

(Appendix G)

Table #2

directly engaged in aviation operations. The remaining 267 are administrative

support and maintenance personnel (Appendix G). The survey used in this research was distributed to 62 operations personnel, based on job description. Table #2 shows the distribution of operational personnel surveyed. Within each job description, the number surveyed was based on the percentage of total aviation operations employees. Administrative and maintenance support personnel were not surveyed.

Sources of Data

Data was obtained for the project from different sources. Governmental reports, congressional reports, congressional hearings, and congressional decisions, presidential directives and manufacturers technical information was obtained via the INTERNET. Within the documents researched, use of the INTERNET was extensive. This provided much historical and doctrinal information used throughout the project.

Non-electronic documents used in the research include official history guides and brochures published by governmental agencies, historical accounts published by accredited historians and articles written in professional journals. Additionally, recorded court testimony and sworn statements by convicted smugglers was used.

Other non-electronic publications used included military publications and doctrinal writings. These were obtained from the MacDill AFB, Tampa, Florida library as well as the on-line library of the Air Command and Staff College, Maxwell AFB, Alabama. This provided a wealth of strategic and doctrinal data applicable to the problem. These writings and theories were viewed with a Law Enforcement point of view, providing possible remedies and courses of action. Many of the problems and situations revealed with the research are similar in nature to those faced my military strategist and planners.

The Data Gathering Instrument

For the modified Delphi Survey a series of questionnaires was sent to participants starting on May 12, 2000. Question #1 (Appendix A) was a general question providing the participant an opportunity to identify any situation deemed

SELECTION OF DELPHI SURVEY PARTICIPANTS

Job Description	Total	%of 565	Surveyed
All Employees	832		
Support	267		
Operations	565		
Pilot	344	60.9%	12
Air Interdiction/Enforcement Officers	44	7.8%	3
Detection Systems Specialist	98	17.3%	3
Aviation Analysts	17	3.1%	1
Management	62	11.0%	3
			(Appendix G)

Table #3

important. 62 initial questionnaires were sent with 33 replies. Table #3 shows a breakdown of how participants were selected. Four were rejected for no

experience within the area of concern. Six were rejected for arriving past the closeout date. One reply was rejected since the participant replied with a survey of his co-workers opinions on the subject instead of his personal opinion.

Twenty Two persons were selected to continue the survey based on their job description and experience within the area of concern. All identified situations were complied, similar situations were grouped together and the answer that most described the situation was used as the title. All answers were then attached to the questionnaire verbatim to help clarify what was meant with each situation. Appendix B contains the questionnaire and the clarifications sent on May 26, 2000.

Questionnaire #3 was used to inform the participants of the results and provide them an opportunity to re-butt any situation. Since there was one situation with a significantly different opinion from one participant, it gave an opportunity for participants to give their opinion on the two diverging views. Appendix C contains the questionnaire as sent on June 12, 2000.

Distribution Method

The modified Delphi Survey questionnaires was distributed via e-mail since all U.S. Customs Service employees assigned to the Air and Marine Interdiction Division have this capability. All surveys were returned to the researcher by e-mail since this significantly reduced response time. The first

questionnaire was sent on May 12, 2000. Returned questionnaires were compiled and analyzed between 24 May - 25 May 2000. Questionnaire number two was sent on May 26, 2000. Returned questionnaires were compiled and analyzed between 9 June – 10 June 2000. Questionnaire #3 was sent on June 12, 2000. Returned questionnaires were compiled and analyzed between 19 June – 21 June 2000.

Reliability

Others using the same methods can replicate this research and obtain the same results. The documents to be used within the research are readily available to the general public. Other documents available but not used, that meet the research data admissibility criteria, can be used to replicate this research and the same results will be obtained.

Content

The content of documents to be used within the research was validated prior to being used in this project. Research papers and trade journal articles were scrutinized prior to publishing for accuracy. Further scrutiny was provided after publishing by the readers and at times by independent agencies.

The content of the answers to the questionnaires was never in question. The officers surveyed are the experts in Tactical Air Interdiction Operations. They are faced day to day with these situations and have accepted to risk their lives in the performance of their duties. Whatever they perceive as a situation that might increase a risk they must take or decrease their overall effectiveness is something that must be taken into consideration. There is no substitute for experience.

Treatment of Data and Procedures

The modified Delphi Survey questions were analyzed over a period of several days per questionnaire. Questionnaire #2 data was grouped according to perceived importance. Perceived importance was determined by giving a score, from ten being most important to one being least, in one-half point increments and statistically analyzing the scores. On several responses, there were issues that the participant deemed were of equal importance. In these cases, the score were added, divided by the number of equal importance, and this new score was given to each issue. This same method was used to establish a score when the participant did not respond with ten answers. The sum of the remaining scores was added and divided by the number of remaining issues. The new score was given to all remaining issues. These scores were then statistically analyzed to obtain the average, mean and standard deviation. Appendix D contains the data obtained by this method.

All identified issues were then ranked from 1 to 19, based on the statistical average of the scores given. The issues ranked in the top ten were then selected for further analysis. Although there were no bipolar answers, one issue had an opinion that was significantly different from the general consensus. Questionnaire #3 was used to provide a forum to agree or rebut the dissenting opinion.

Chapter IV

RESULTS

While researching information for this project it became quite clear that the problem was significantly greater than originally anticipated. Even though I had a good idea of the problems, having worked in the program for over eight years, I was surprised by the results. The passion and genuine concern surveyed officers displayed when answering proves that when your life depends on the environment you work in, you become interested in what happens.

Within the study of Drug Interdiction Aviation a myriad of situations and problems became evident. Most of these were concerned with tactical decisions affecting the day to day operation while only a few dealt with major strategic concerns. Within the scope of this project the strategic concerns were emphasized since these will ultimately decide the main course of action to be taken under day to day operations. By looking at basic strategic concepts, a better idea can be obtained as to what a system of this nature should approximate. Research provided a number of documents available that can be used to obtain information and base decisions on. These documents pointed to some basic ideas and concepts that need to be stressed if a flexible system is to be set up. Also, historical information provided the background needed to understand the situation faced by present day anti smuggling efforts as well as

what not to do in future system design. Additionally, a modified Delphi survey was conducted of selected U.S. Customs Aviation Officers to provide views as to their perceived needs and correlate these to the results obtained by document research. The results provided an interesting view into how accurate the overall view of these law enforcement officers' view the system and how close these views correlate to the document research results.

Historical Information

Since ancient times, the use of drugs by humans as a mind-altering substance has been a problem for society. Similarly, attempts to control the spread of drugs has been a demand placed on law enforcement. As the use of drugs expanded, so did the attempt to control it. The U.S. Customs Service first entered the area of drug control when Congress authorized them to enforce the federal drug act of 1848. This law was intended to: "...prevent the importation of adulterated and spurious drugs and medicines" and "inspect all imported medicines and make sure that then name of the manufacturer and the country of origin were clearly displayed on each carton (U.S. Customs Bicentennial, 1989, p. 220)".

This law was not enacted to curtail the use of drugs as a mind-altering method, but to protect citizens from fake and potentially dangerous medications being imported. Congress at the time realized that since Customs was already

protecting the borders and controlling imports, they were the logical choice in this drug enforcement need. The first time federal laws were enacted to curtail mind-altering drug use occurred in 1914 when Congress passed "The Harrison Narcotics Act." This act regulated all traffic in heroin, opium, cocaine, marijuana and other drugs. Once the act was put into effect, the price of heroin skyrocketed from $6.50 to $100 per ounce (Musto, 1987, p. 13). Over the next few decades federal agencies under the Secretaries of Commerce, State and Treasury entered the smuggling interdiction arena creating an ever-growing federal bureaucracy. This bureaucracy was tested greatly from 1920 to 1934 with introduction of prohibition.

Prohibition was the term used I the fight to stop the sale of alcoholic beverages in the U.S.A. As soon as alcoholic beverages became illegal to produce, it was smuggler in. Bootleggers, the term used for liquor smugglers during this time, used all available methods of transportation to move their illegal cargo. One of the newest technological advances during this time was the airplane. During the late 1920's the U.S. Customs Service began using aircraft to combat smugglers along the Mexican and Canadian borders. These were Curtiss O-1Gs' flown by agents/pilots on an "as needed" basis against rumrunners flying expensive liquors in over inspection points. During Prohibition, the Customs air fleet consisted wholly of aircraft seized for liquor smuggling. (Holden, 2000, p. 5) This made the actual capture of smugglers difficult at best since their aircraft were not as advanced as the bootleggers aircraft were. During a 1934 meeting held by Customs Commissioner James H. Moyle, a

Customs collector from San Diego California told him "We have one airplane that will go about 130 mph, but the bootleggers have three planes that will go at least 40 mph faster." Another collector from San Antonio, Texas said:

> "I have 46 cars, eight planes and two boats. Of the 46 cars, 29 of them are poor, 14 of them are fair, four are good. Of the eight planes, I have one in service, but it does not make more than 99 miles per hour (Ingrisano, 1985, p. 22).

It was interesting to find out that even during this time the effects of politics curtailed air operation. On March 9, 1934 the Secretary of the Treasury ordered all ten U.S. Customs aircraft transferred to the Coast Guard and all Customs air operations ceased (Millspaugh, 1937, p. 171). It was not until 1969 that the U.S. Customs Service returned to air operations when Congress established the present day air program, modified in 1972 and 1974 (Wenzalff, 1986, p. 11).

STRATEGIC DIRECTION

The mission of the Customs Air Interdiction Program in 1969 was to; (1) reduce the level of smuggling by aircraft; (2) increase the risk and cost of smuggling by aircraft; and (3) improve the detection and apprehension of aircraft, vessels and vehicles engaged in smuggling (Wenzalff, 1986, p. 11). Although not specifically using the term interdiction, this was clearly the assigned mission. The interdiction of drug smuggling aircraft would create a situation where smugglers would abandon this method of introducing drugs into the USA. This

was the main strategic concern Congress mandated the program take when implemented.

The 1998 U.S. Customs Service Aviation Program Five Year Strategy defines its' role as:

> "Maintain border security against the air smuggling threat; Support the anti-smuggling investigative and enforcement activities of Customs and other Federal, state and local enforcement agencies that support the Customs mission; Support the President's International Drug Control Strategy...".

In this definition there is no mention of interdiction operations for the aviation program, a significant departure from the 1969 statements. Maintaining border security can be construed to mean Interdiction but it is not specifically stated. However, the enforcement mission is specifically stated. This sentiment was summarized by Aviation Group Supervisor John Studinartz during the Delphi Survey when he stated: "What was a clearly defined mission to interdict the smuggling of contraband into the United States via aircraft has expanded into a foreign mission, which is foggy at best." Within the U.S. Customs Service Aviation Program Five Year Strategy there are multiple areas where interdiction is identified, defined and stressed. Its' importance has not been minimized in any way, just merged into the overall enforcement concept. Applying parameters from one on to the other creates the first identified sub-problem, separating enforcement and interdiction operations to provide mission direction.

Enforcement is defined as "the act or process of enforcing" while enforce is defined as "to put or keep in force; compel obedience to: *to enforce laws strictly.*" (Random House College Dictionary [RHCD], 1979) Within this definition and legal concerns, state and local law enforcement aviation units are mostly involved with enforcement. They provide aviation support for ground operations to a limited number of agencies within a relatively small area. The radius of operation will seldom extend beyond 75 miles from a main location, except in sparsely populated states. This makes the need for speed and endurance a lower factor in aircraft specifications. By the same token, these agencies are normally under jurisdictional restraints.

A good example of a law enforcement aviation unit is the Tampa Police Aviation Unit. Tampa PD Chief Pilot Randy Miller informed that it consists of five pilots, four observers and six aircraft. The aircraft include a C-172 and Piper Navaho airplane and four helicopters. These include one purchased MD-500E and three U.S. Army Surplus OH-6A helicopters. FAA licensed civilian mechanics perform the maintenance and these are employed by the Tampa PD. Even though they operate a small numbers of aircraft, this unit still uses a significant portion of the total Tampa police budget. The Tampa PD operates out of the International Airport, patrols an area of about 110 square miles with the furthest distance about 15 miles away. Their main mission is the support of ground law enforcement operations. They provide airborne cover for hazardous situations like hostages, vehicular chases, escaped felons and serious traffic

situations. They are also tasked with routine patrols, transporting evidence and moving agents from one location to another, if needed. On rare occasions they may be tasked to insert a high-risk entry team affecting a search/arrest warrant. They maintain a 24hour alert posture and can be airborne, on scene, within about 15 minutes of being alerted. (R. Miller, personal communication, Sep 19, 1999)

Pilot Rob Gonzalez (Pinellas County Sheriff) and Sergeant Darryl Stinger (Sarasota County Sheriff) reported that although their respective departments are responsible for a larger area, the aviation units are not much larger than the Tampa PD unit. They both use light helicopters as the main enforcement aircraft augmented by a few light airplanes. This combination of aircraft fits the tasking quite well and maintains operating costs reasonably in control. Law enforcement agencies operating in sparsely populated large areas will have the same basic requirements with the main difference being they will have a few long-range helicopters in the inventory (R. Gonzales, personal communication, Sep 22, 1999; D. Stinger, personal communication, Sep 21, 1999).

A light enforcement helicopter can easily provide the flexibility, speed and endurance required for most drug enforcement activity. Combined with the multi-mission capability, it can be the only airframe needed by a local police force. With light helicopters like the Eurocopter AS-350 AStar, the Bell 206,

Hughes 500, and lately the Robinson R44 available, advances in this field will mirror that in the civilian world.

Interdiction is a different situation. Interdiction is defined as "the act or an instance of interdicting" while interdict is defined as "to forbid; prohibit, to impede." (RHCD, 1979) This means that enforcement is geared to dealing with the drugs after it has arrived while interdiction is geared to impeding the entry of drugs.

Interdiction operations can extend well beyond 1,000 nautical miles, include many agencies and even different countries. Whereas the mission of drug enforcement can be accomplished effectively with a multi-mission aircraft, interdiction demands are so extensive several airframes are needed.

Within the Delphi Survey conducted as part of this project, the officers identified “Mission Direction” one of the situations hindering the program. Mission Direction can be correlated to the strategic direction of the entire program and can be treated as the same. Two participants ranked this as the most significant problem facing the Air Interdiction program while another ranked it as second most important. Of the 19 identified situations, only two others had more #1 votes. These were the problems that ranked first and second overall in the survey. Mission Direction received an average score of 6.23 with a standard deviation of 2.37 when all answers were tabulated. One of the officers, Customs

Pilot Steven Geron, summarized the importance of this issue and how it has affected the overall strategy during the Delphi Survey by stating:

> "The main objective in the war on drugs has always been unclear and not spelled out. This presents a multitude of interpretations by all players involved which can set an artificial level of success and claim periodic victories during budget fights".

If this is truly a "war" then the same basic strategic doctrines used by the military can be applied. Military publications and writings state that within the scope of any war there has to be a clearly established overall doctrine. This doctrine provides guidance that all subsequent actions need to bear in mind in order to insure that actions are focused on the main objective. Lack of this cohesiveness of effort is one of the basic reasons operations and systems fail. Within US military doctrine, there must always be clearly defined requirements when attempting to accomplish any goal. When overall strategic requirements are defined, then operational and tactical requirements can be formulated (Drew & Snow, 1988). Identifying the main goals of a system provides the framework to guide tactical and operational decisions.

Even though within U.S. Drug Control Policy the overall strategy of interdiction was given high priority by the administration of President George Bush in the late 1970's (Hazlett, 1993) there has not been a clear definition of what interdiction attempts to achieve within the U.S. Customs Service. This

vagueness between interdiction and enforcement has hindered the interdiction program from defining and establishing requirements for an effective tactical interdiction system. This lack of strategic direction has contributed towards lack cohesiveness within the program and splintered efforts to guide the program in the proper direction. Tactical and operational decisions are not always made with the strategic direction in mind since this direction is vague. As one officer that requested anonymity during the Delphi Survey stated "We can't defend the border against smuggling if we are sent thousands of miles away to support a foreign government." This lack of cohesiveness also manifests itself in the other identified problem areas beginning with overall interdiction requirements.

INTERDICTION REQUIREMENTS

Drug interdiction operations are divided into three main types. These areas are Air Interdiction (interdiction of aircraft), Marine Interdiction (interdiction of vessels) and Land Interdiction (interdiction of vehicles/pedestrians). These areas can be further sub-divided into four separate functions. They are detection, identification, interception and apprehension. (Aviation Program Five Year Strategy, 1998, p. 1) All interdiction activity starts with the detection of the drug smuggler. This basic problem is so important that it renders the rest of the program ineffective. As an anonymous Officer stated during the Delphi Survey: "If you cannot see them, you cannot catch them."

Detection

Within air interdiction operations, several methods are being used to address this problem. These include ground radar, airborne radar and human intelligence. Within the ground-based radars the most used are the Federal Aviation Administration (FAA) air traffic control radars. The information from these radars is transmitted to the Air Marine Interdiction Coordination Center (AMICC) located in Riverside California. Additionally, military and mobile radar data from Puerto Rico, Central and South America is also transmitted to the AMICC. The radar information presently provided to the operators is greatly enhanced by airborne radar data from tethered aerostats, the U.S. Customs P-3AEW, US Navy E-2C and the US Air Force E-3C AWACS (Holden, 2000, p. 75). Unfortunately, operational costs prohibit use of these assets over the entire border on a continuous. This radar blanket is the first line of defense against aviation drug smuggling activities. However, this system has one basic fundamental flaw in that it is hindered by the physical capabilities of ground based radar.

Since the main radar's used in the Air Interdiction program operate in the Ultra High Frequency range (UHF) their coverage is limited to line of sight. Using the scientifically accepted 4/3 Earth Curvature model this means that under normal propagation conditions the ground drops away from a radar beam at a rate that can be calculated with the formula $1.23(\sqrt{Hr} + \sqrt{Ha}) = Rd$ where Hr=Radar Height(ft), Ha= Aircraft Height(ft), Rd= Detection Range(Nmi)

This means that under perfect theoretical conditions a RADAR on a 50ft tower can detect an aircraft flying at 15ft only when it flies within 13.45Nmi from the radar.

$1.23(\sqrt{50} + \sqrt{15}) = Rd$ RADAR on 50ft tower, Aircraft at 15ft

$1.23(7.07 + 3.87) = Rd$

$1.23(10.94) = Rd$

$13.45 = Rd$

If the smuggler is flying beyond 13.45Nmi of the RADAR it is impossible to detect him. (Fink & Christiansen, 1982, p. 20-45) Because of the curvature of the Earth and the line-of-sight property of air traffic control radar the smuggler can fly well below any radar coverage and avoid being detected. If he is not detected he can not be interdicted.

Aircraft carrying long range RADAR, like the E-2C Hawkeye, E-3C AWACS and the P-3AEW Orion, provide detection and first sort capability of very low flying aircraft. These aircraft are pillars of the present drug interdiction operation. Using the same formula, a RADAR equipped aircraft flying at 15,000ft can detect a smuggler flying at 15ft at even when 155.39 nautical miles away. A significant increase in detection range.

When a present day smuggler uses an aircraft, he uses this limitation to his advantage. When the smuggler arrives at a pre-determined distance from shore he then "hits the deck". The term "hitting the deck" is a common one used by pilots denoting flying low to the ground. "For the military, "hitting the deck" is 200 feet AGL; for the smuggler, it is 15 feet AGL." (Raker, 1995, p. 18) On smuggling flights to Puerto Rico, it was common for the drug smuggling aircraft to complete the entire trip of over 800 nautical miles and never climb above 50 feet AGL.

The officers surveyed as well as documented information provided by convicted drug smugglers confirmed this situation. Mr. Willard Steven Raker reported in his graduate research project submitted to Embry-Riddle Aeronautical University that: "This current [radar] system is inconsistent because of the limited capabilities; the radar sites are each limited to a small radius and the balloons and aircraft are dependent on good weather. " (1998, p. iii)

Within the Delphi Survey conducted as part of this project, the officers identified "Radar Limitations" as the most important situation hindering the interdiction program. Of the 19 participant, 10 identified it as the most important of all. No other single situation had more #1 votes. Radar Limitations received an average score of 8.38 with a standard deviation of 2.14 when all answers were tabulated. This area was considered so important by most participants that most expanded greatly on the factors causing it. Leslie Robb, an ex Air

Interdiction Officer and ex Detection System Specialist stated during the Delphi Survey:

"It doesn't matter if the radar operator knows where the smuggling route is but can't see the smuggling aircraft because it is 50 feet above ground level in a valley in New Mexico. No detection, no launch."

Customs Pilot Wade Koontz stated during the Delphi Survey:

"What I do know is that quite often when we are out flying (300-500ft agl) the AMICC will not have radar coverage of us. This would lead me to believe that a knowledgeable smuggler could cross the border undetected. (especially when an aerostat is down)."

The general feeling of all participants was summarized by Branch Chief Ronaldo Ortiz whit the statement during the Delphi Survey: "The USCS no longer has a net of reliable radars that could detect any low altitude air traffic trying to penetrate the interdiction defenses"

Another detection system available is the use of lighter than air vehicles carrying long range RADAR. (Wordwide Aeros, 2000) These can provide the detection and identification of low flying aircraft at long ranges but at a significantly increased cost over the ground based radar. U.S. Customs used a series of tethered aerostats to provide long range detection at very low altitudes. They carried a radar system similar to the E-2C Hawkeye, P-3AEW Orion and the E-3C AWACS and could stay airborne for days at a time. When they were operational they provided the ultimate in detection and identification for the Air Interdiction Program. However, these aerostats were plagued with problems

from the beginning and after several years were all but decommissioned as a primary detection tool. (Holden, 2000, p. 41)

The main problem with an aerostat is that it can not stay airborne in adverse weather conditions. "The balloons [aerostats] are subject to damage from thunderstorms, high winds and icing..." (Holden, 2000, p. 41) Here is where the use of manned airships carrying long range RADAR becomes a viable option. Airships like the AEROS-40B (Worldwide Aeros, 1998) can maneuver away from isolated thunderstorms that ground conventional tethered aerostats. Even while away from the bad weather, they can still maintain effective coverage of the assigned area from a safe distance. The only time they will be forced to land will be if a large weather front approaches and there is no place to maneuver. These types of weather systems will also ground any prudent air smugglers. The saying amongst U.S. Customs Air Interdiction employees that: "You can fool Mother Customs, but you can't fool Mother Nature" emphasizes this.

The use of airships does not entail manning them like the present RADAR aircraft. They can be used as radar platforms with the data being transmitted to ground based operators at the U.S. Customs Air Marine Interdiction Coordination Center (AMICC). Here RADAR operators can use the data exactly like the data presently received from remote radar sensors. This would limit the size of the airship crew to just the pilots drastically reducing operating costs. Since the

weight of radar consoles and operators can be eliminated, it would extend the airborne time of the airship extending the on station time. The use of airships in this environment is not new. During the 1996 Olympics, the Atlanta police used an airship as an airborne command post. It provided a capability never before experienced by law enforcement. (Stanton, 1996, p. 12)

During the mid 1950's the U.S. Navy used manned airships carrying radar to provide low level air and surface coverage for the fleet. These airships remained aloft for days at a time without refueling and relayed radar data to ship borne operators. In a sense they were to be the same as having a radar tower 5,000ft in the air. The study reported great success at detecting diesel electric submarines on the surface, the snorkel of submerged submarines as well as low flying aircraft. The blimps, ZPG-2N, were eliminated from service when nuclear powered submarines entered the inventory since these did not have to surface to attack and the Magnetic Anomality Detectors (MAD) of the time were not sensitive enough to detect submerged submarines. However, during the testing they proved the airships capability as an airborne detection system for everything else above water. (Rodrigues, 1996)

Another avenue towards airborne detection researched is the use of Unmanned Air Vehicles. Mostly they have not been widely used so not much information is available. The main drawback of these vehicles is their limited payload capacity. In order to provide effective detection over many hundred

miles at a time, their payload capacity has to be increased. When this is done, they approach the same limitations presently encountered by manned detection aircraft. The only advantage they presently offer is that they do not suffer from pilot fatigue if the mission extends beyond that originally planned.

Research into detection methods as well as manufacturer reports of new equipment provides alternatives to present detection equipment minimizing the effects of Earth Curvature. Ground Wave Radar and the Re-locatable Over the Horizon Radar (ROTHR) can increase radar coverage significantly over present employed systems. These radars use the properties of High frequency (HF) radio waves instead of UHF radio waves to achieve long range low level detection. (Powers & Lewandowski, 1997) The present use of ROTHR data by U.S. Customs extends the range of detection by a great deal. However, although HF RADAR can detect objects at a great distance it can not identify the object. This places a severe limitation on HF radar as an initial detection tool.

Identification

Often accomplished at the same time of detection, identification is the second phase of drug interdiction. Thanks to an organized international aviation community, there is a system set up for air traffic identification. Therefore, the RADAR accomplishing initial detection of an aircraft has a method to start the identification process. Identifying the aircraft becomes a concern after the

RADAR detects the suspect aircraft. Except for the Air Traffic Control traffic identification system, there is no method of determining if an aircraft is engaged in smuggling except to actually intercept it. Since this is so costly, most initial identification is left to database search and previous activities. Here is a position where a lack of real-time intelligence is needed.

The officers surveyed correlated this to a lack of support or interest in aviation smuggling amongst U.S. Customs Investigators. It ranked 5th in importance with an average score of 6.88 and a standard deviation of 2.17. Two participants ranked this in the top two most significant issues affecting the program. Aviation Group Supervisor John Studinartz summed up the feeling by stating during the Delphi Survey:

> "In the case of air interdiction our intelligence relies almost exclusively on technology. Yes, we do have Special Agents within the Office of Investigations who investigate and develop sources of information but we no longer have them co-located within aviation. The average Special Agent is not concerned with aviation smuggling and has little knowledge in the field of aviation. The result is that their investigations and sources of information almost rarely concern aviation. ...Without this knowledge, developed on the ground through individual contact at local aviation facilities, our effectiveness is diminished"

The present system still attempts to detect and identify a smuggler that has all but disappeared from the scene without much human intelligence information. The smuggling profiles and methods of delivery have changed over the years yet as Air Interdiction Officer Sebastian Ortega stated during the Delphi

Survey: "We must also reexamine the way in which we sort [identify] our targets. The smuggling aircraft profile needs to be changed in order to keep up with the current trends".

This research indicates that detection and identification, the cornerstones of the entire interdiction process, appear to be the weakest link and the one most in need of correction. If identification can not be accomplished, the third phase, intercept starts.

Interception

The third phase of drug interdiction is the well-publicized intercept phase. Air intercepts is such an important aspect that aircraft specifically designed for this function are now the norm. Although the basic requirements of all air interceptors are the same, the needs of defending sovereign air space from an air attack is significantly different from intercepting drug smuggling aircraft. This makes use of military interceptors ineffective in the drug interdiction role.

Looking at the operational demands of a drug interceptor aircraft gives an idea of the specifications required. Drug smuggling aircraft normally fly at extremely low altitudes, at low airspeeds over long distances. The future drug interceptor aircraft will have to quickly intercept an aircraft at ranges of over 500Nm from the point of departure, covertly track the aircraft over long distances

then is able to stay behind it as it takes drastic evasive maneuvers. For this it will need to have a high subsonic dash speed (>.80Mach), a low stall speed (<90Kts) with endurance of at least six hours. The aircraft must also have enough payload capacity to carry an air to air intercept radar, an infrared tracking system, extensive communications equipment, advanced navigation equipment and a flight crew of at least three. This combination of requirements puts a severe demand on the aircraft that can accomplish it.

Aircraft are designed with one main thing in mind, to fly. Once the basic flight is designed into them then the mission requirements take over the design philosophy. Since LE aviation is so wide, the commercial market is not big enough to provide an incentive for a LE specific airframe design. Aircraft manufacturers and operators constantly look for ways to use existing designs to reduce total costs. It makes more economical sense to take an already designed airframe then modify it to perform the new mission. This hinders optimization of aircraft based on the LE mission.

The types of aircraft offered to drug interdiction agencies for use is staggering. The range and types of mission required from interdiction aviation result in just about every type of aircraft being offered in one form or another. Providing the right aircraft to the mission is a critical strategic management decision that can make the difference in mission completion. With the exception of the C-550, UH-60 and the P-3AEW, the aircraft procured and in use by U.S.

Customs were obtained due to their initial cost with mission requirements a secondary concern.

Surveyed officers reported aircraft and equipment as the second most significant problem affecting the Air Program. Proper Aircraft / Modernization of Aircraft received a score of 8.31 with a standard deviation of 1.91 the second smallest. Four participants ranked this situation as the most important while eight ranked it as second in overall importance. Based on comments provided by survey participants, it was evident that this is a sensitive issue amongst them and one that invokes great passion in their perceptions.

Customs Pilot Daniel Philipps expanded on this situation by stating during the Delphi Survey:

> "Lack of proper and modern equipment - - still trying to get 1960 - - 70 - - 80 - - &90 technology (sensors) to talk to each other installed in 20 year old aircraft not built for the specific mission. And when we look for new equipment we allow those who know nothing about the job to make the decisions what is right for the mission."

Customs Pilot Robert Smith reported during the Delphi Survey: "Getting antiquated aircraft (C-12) to replace another antiquated aircraft (NOMAD). The pilots and Air Interdiction Officer's (AIO's) said it would not work – CNAC's response was Well, This is what your getting"

Customs Pilot Steven Geron responded during the Delphi Survey with:

> "The enforcement aircraft used for drug interdiction by the Customs Service are outdated and old aircraft pas[t] their useful life. The aircraft and equipment used for fighting the drug war should be state of the art aircraft and sensor equipment."

These statements reflected the passionate opinions regarding proper aircraft selection and one that needs further research.

Research has show that the initial interest and use of high-speed commercial jets by drug smugglers provided more publicity than substance. Documented cases of high-speed commercial jets to smuggle massive quantities of drugs failed due to the logistical support infrastructure needed by these aircraft. There appears to be no need for an interceptor aircraft to stop this threat. This interceptor was named "High Point", however: "Although anecdotal information indicates that this method may still be employed, since November 1995 there have been no documented new detection's of this type target." (Aviation Program Five Year, 1998, p. 14) These aircraft are better tracked and interdicted using the resources available to the AMICC. Here the AMICC is providing a superb deterrence against this smuggling threat. The U.S. Customs Five Year Strategy 1998-2003 stated: "Given the low frequency of this dormant smuggling threat and the high cost of a suitable interceptor, it is not advisable to pursue "High Point" at this time."(Aviation Program Five Year, 1998, p. 15)

Apprehension

The last phase of drug interdiction is the apprehension phase. Although some of the aircraft smuggling drugs actually land to deliver their cargo, most only air drop the drugs to awaiting vessels, vehicles or persons at a location where no aircraft can land. This makes the use of a helicopter a requirement. However, future helicopters will have to operate at distances over 500Nm from the departure point, and endurance of over six hours, a high dash speed yet still carry an apprehension team of at least four armed law enforcement officers. These requirements are difficult to fulfill with most helicopters. At this time only the Sikorsky UH-60 BlackHawk and the Aerospatiale Super Puma are available to cover these needs. Even the UH-60 has one major drawback that although it is the second fastest helicopter in the US, its top speed is still only about 165Kts. (Blackhawk, 2000) This puts the apprehension aircraft at a disadvantage if it has to travel a long distance. With this, the only future airframe that can fill the apprehension needs is the V-22 Osprey Tilt Rotor or a derivative. (Osprey On-Line, 1998) With its high dash speed, cargo capability and helicopter like hover, it is the only alternative to the UH-60 available.

Presently the Bell Corporation is developing a smaller version of the V-22 for commercial use. There are many firm orders placed for the Bell 609, mostly by oil producing companies. The V-22 will be outfitted to carry FLIR as part of the

requirements and the Bell 609 may benefit from this need. The Bell 609 might be the one airframe that can truly become a multi mission drug interdiction aircraft. Other helicopters presently used (AS-350 AStar, Hughes 500, BK-117) although excellent for the drug enforcement role are just not capable of filling completely the drug interdiction needs of the future.

Measuring Effectiveness

Unlike most aviation fields, law enforcement aviation production can not be measured by common methods used within the aviation community. Profit and loss measurements used by airlines depend on the generation of profit as the ultimate quantifiable indicator of production and efficiency. The only way efficiency and productivity can be increased is by knowing how efficient / inefficient you are at a given starting point (Baseline Measurement) then improve on this. However, if we look at the different aspects of law enforcement aviation we will find that establishing this baseline is significantly harder than most other aspects of aviation. A very The interesting aspect of this research is that I found very little actual documentation on measuring law enforcement aviation effectiveness or production. Many articles were found on other aviation productivity, but none addressed law enforcement aviation specifically. For this reason I used the information obtained during personal interviews as the main focus of this part of the research. During the interviews I used the basic question format depicted in Appendix E. This created a method of insuring the same

questions were asked to the participants making analysis of the answers possible. Although the questions were open ended, and therefore not quantifiable, it provided the forum needed. The interviewees were able to express their concerns and ideas without being limited by my biases and notions. Although the specific wording was not the same for any specific answer, the idea and chain of thought was similar enough on several questions to draw conclusions.

The results of the research show there is no standard measuring formula for law enforcement aviation productivity. The main reason for this is the fact that law enforcement aviation provides a service difficult to quantify. If you can not quantify your activities, how do you measure your effectiveness? After much research and many interviews, a few common arguments emerged. First, all agencies realize that law enforcement aviation is divided into two major areas of operation, direct support and deterrence. These areas are very similar to Enforcement and Interdiction identified here as Strategic Direction. Second, analysis of statistics is highly subjective and can change drastically by how data is reported. Finally, production within law enforcement aviation is something that can not be easily quantified and/or measured.

During the late 1980's the US Customs Service attempted to quantify aviation law enforcement productivity and efficiency. The Booze-Allen Corporation was commissioned to study the situation and develop a production

analysis method. Senior Special Agent Charles Viccica, US Customs, spearheaded this project. The finished product was very unique.

Booze-Allen developed a baseline number from which to measure law enforcement activity. Senior Special Agent Vicicca reported this baseline was established by taking into account a series of reported activities for the five years prior to the 1986 study being commissioned. These baseline activities were given a mathematical weight based on how important law enforcement officers felt that activity was. The formula included number of unknown aircraft detected by radar, stolen aircraft, apprehensions, aircraft crashes caused by smuggling activities and other significant events. It did not include any human intelligence information since law enforcement officers thought this data was too unreliable to quantify. The resulting formula was used for the next few years to track how efficient the US Customs Aviation program was. By using this baseline data and entering the information over the next five years the US Customs Service attempted to measure the production and effectiveness of its aviation operation. Their goal was to obtain a statistical reduction of 50% in criminal activity within five years after 1986. This model was used to guide strategic decisions for several years until the goal was achieved. The main problem with this method was that it did not account for events not detected. Although this method attempted to factor out inconsistencies within data analysis, it did not factor inconsistencies within data reporting. How data is reported can paint a totally different picture of how productive an aviation operation is. This is where, how

the data is reported becomes as important as the reported data itself. (C. Vicicca, personal communication, Sep 9, 1999)

A prime example of this is when a light helicopter is used to fly above an undercover meeting where $100,000.00 of narcotics is being sold to undercover agents. As soon as this operation terminates, the statistics will show that for a few hours of relatively inexpensive flight time, a significant activity occurred. This kind of activity is regularly reported as a highly productive mission. But, the activity would have occurred with or without the aviation asset overhead. This violates a basic idea that the mission would not have happened had not the aircraft been there (J. Fillmore, personal communication, Sep 1999). By the same token, being able to fly above the situation as it occurs and relaying information to the rest of the participants made the helicopter an invaluable asset. Add to this, the idea that if anything went wrong, having the helicopter available to evacuate any injured person or follow a fleeing suspect is worth more than any statistic. Just ask any undercover officer in this same situation. But is this situation a more productive and efficient use of aviation assets than flying a large helicopter over unpopulated desert searching for possible drug smugglers?

A large helicopter like the UH-60A BLACKHAWK can cost several thousand dollars an hour to operate on a mission like this without ever directly engaging any criminal activity. If both missions are measured by the same rule, light helicopters would be wrongly classified as superbly efficient while

helicopters like the BLACKHAWK be wrongly classified as inefficient. For this reason, the methods and data used to measure productivity must differ depending on the main mission on the aviation unit. If the unit is primarily tasked to support ground based law enforcement officers, information like response time, surveillance flight hours, stolen vehicles recovered, apprehensions and flight hours in support of other agencies can be used to measure productivity and effectiveness. However, these factors can not be used if the main mission is the interdiction, of criminal activity. Factors that can be used to measure efficiency and productivity here include percent of flight hours versus flight hours on patrol, number of confirmed activities within the area of responsibility, attributable seizures and apprehensions and number of activities initiated by aviation operations. Even with these limitations, some deterrence operations can be quantified.

Most agencies with law enforcement aviation engage in some kind of demand reduction missions. These can range from simply landing at schools, businesses and civic activities to actually putting on full anti-crime lectures. The US Customs Service has a highly visible crime reduction/deterrence mission named PROJECT OUTREACH. (Aviation Program Five Year, 1998, p. 19) The Sarasota County Sheriffs Department, as well as the Tampa Police have a similar program named DARE. (R. Miller, personal communication, Sep 1999; D. Stinger, personal communication, Sep 1999) You can measure how many flight

hours were spent on these missions, but there is no way of quantifying how effective this is.

SUMMARY

After researching this topic, I could not find an accurate way to measure production and efficiency within aviation drug interdiction. If you divide the different requirements placed on law enforcement aviation you can get an idea of how productive it is, but not by a objective method. Eventually, a subjective analysis will have to be done and the decision made by a qualified person on whether the unit is meeting the production and efficiency goals.

Chapter V

DISCUSSION

The U.S. Customs Service operates the largest aviation law enforcement operation in the world with 832 employees and 118 aircraft. (Appendix H) With these aircraft and the supporting operational structure, the U.S. Customs Service must patrol and defend the entire border of the United States against all airborne smuggling threat. Quite a task considering the border is more than 96,000 miles long (U.S. Customs Service Protectors, 1984, p. 10). This system has developed and evolved over the last three decades based on the actions of drug smugglers. As we enter the next century, development and change will continue but it needs to be proactive. The needs and requirements of such a complex and demanding program must anticipate what will happen and implement corrections before they are needed. The smuggler has the same advantage of a guerrilla warrior. They decide when, where and with what weapon to strike at the defenses. Given the changing tactical environment and the strategic thinking used to design the system, it would seem an impossible task. However, when basic doctrine is matched to the requirements, corrective action can be implemented to increase the chances of success.

While working within the aviation operation system, I felt we were approaching the smuggling threat in the wrong manner. Not the general idea of

how to stop a specific smuggling venture, but on how the system was designed. This feeling was shared by most of my colleagues and provided passionate debates on the subject at the time. It was very evident during my research that the passion felt by the officers engaged in air interdiction had not diminished. This was also what drove me to research the problem in a logical manner and provide possible ideas that might be used to increase the system's efficiency. It quickly became evident was that the same problems that earlier hindered my actions when I was engaged in aviation drug interdiction were still there. The officers surveyed and interviewed felt the same in the year 2000 as I felt in 1990. It seems that although much has changed, what matters, has stayed the same.

It is impossible to correct all situations and problems faced by an operation of such magnitude and complexity, but the framework in which problems are viewed can be corrected. Herein lay the greatest challenge for this research project. Defining the situations that most affect and hinder the program. If these situations can be identified, the first step towards solving them has occurred. Although many situations were identified that hinder the U.S. Customs Air Interdiction Operation System, most of them are directly related to a few main issues. Once these few issues are addressed and corrected the others have a reasonable chance of being corrected. This is why the survey of Customs Officers after document research was so important. The survey would either validate the findings or completely discredit them. Unfortunately, I had forgotten to taken into consideration the passion felt on this subject by survey participants.

I had expected a very poor response to my request for survey participants. I was amazed at how many and how fast they responded to my questions. What did not amaze me was the frankness and sincerity of their answers. These officers were genuinely concerned about the workplace they operate in and truly want to make a difference.

I had expected no more than five to eight major problems to be identified, but instead 19 were presented. Of these the ones I considered most important were not only identified but also ranked within the top ten. The closeness of the answers proved these perceived needs were almost universal amongst the participants even though great care was taken to isolate the participant's answers from each other. None of the participants knew what the documents researched had shown or did they have access to the answers by other participants. Yet they mostly felt the same and it showed in the data analysis. Also, the data generated by the research was so much, reducing it into a manageable amount became a problem. It was soon evident only three major problems could be adequately researched. Of all the situations identified Strategic Direction, Interdiction Requirements and Measuring Effectiveness became the scope of this research.

Strategic Direction was placed first since it determines the direction all subsequent actions must take. The general perception was that the U.S.

Customs Air Interdiction Program basic direction is flawed. The main idea of the system is to interdict smuggling. This means to stop the drugs before they enter the nation. The conceptual difference between interdiction and enforcement is not only lacking in the writings of the U.S. Customs Air Program; it is also lacking in the day to day operations. Both types of aviation operations can fall under one program, but their guidance must be separate. Attempting to use enforcement standards towards an interdiction operation will only serve to further hinder the program. Interdiction operations must be established and measured using interdiction requirements. Enforcement operations must be established, if local assets can not cover these needs, and measured using enforcement requirements.

Interdiction operations can extend well beyond 1,000 nautical miles, include many agencies, states and even different countries. The large scale (area based) of interdiction operations does not lend itself to a structure based on local needs. Such operations can not be encumbered by traditional lines of responsibilities and must be free to engage the smuggler wherever he goes in the nation. Areas of local responsibilities blur when dealing with aviation smuggling. The basic organization of the U.S. Customs Air Interdiction Program reflects this basic need. The Air and Marine Interdiction Division does not report to any local U.S. Customs office but directly to the Commissioner of Customs. Interdiction branches must remain outside local enforcement organizational structure and operate independent of their needs. This does not reduce in any

way the symbiotic relationship between the air branches and the local Special Agent In Charge (SAIC). They must cooperate extensively and coordinate activities when operating in each other's area.

Unfortunately, within the existing organizational structure, interdiction branches are tasked to enforce and interdict at the same time. Enforcement units must support local actions and react to their needs, quite different from interdiction branches. The enforcement units must be free of the interdiction requirements and equipped accordingly. Within basic military doctrine, the statement: "Air... power is intrinsically different from either land or sea power, and its employment must be guided by axioms different than those of surface forces."(Air Force Basic Doctrine. 1997, p. 21) identifies this difference. This situation becomes critical when trying to evaluate how effective the system is.

The effectiveness of each operation must be viewed independent of each other. Measuring interdiction effectiveness against enforcement effectiveness is a sure method of failure. This is a situation where one situation has a direct impact on the other. Measure the two systems independent of each other and a better idea of how effective each is will be obtained.

Once the basic difference between Enforcement and Interdiction functions is firmly engrained, allocating proper resources can be done. The problem of detecting a smuggling venture is the single most important problem after the

force structure. Using the present ground radar blanket, the possibility of detecting a low flying smuggler is remote at best. A ground based radar system may be cheaper to operate but it can not accomplish the mission. However, the system does perform an important task. The ground based radar system denies smugglers the use of the airspace above 5,000ft AGL. This forces the smuggler to concentrate their flying to very low altitudes. Even though the present system can't detect a very low flying smuggler, it can not be discarded. We can't permit the smuggler-unchallenged use of the entire airspace. Now that above 5,000ft has been denied to the smuggler, we must concentrate on denying the use of airspace below 5,000ft. Airborne radar systems must be implemented in order to cover the low-level radar coverage problem being exploited by smugglers. These systems are expensive but are the only methods presently available that correct this situation. The first move towards a complete airborne radar blanket was the use of lighter than air ships. However, the use of these ships did not appear to be completely thought out. The use of blimps instead of tethered aerostats would have been a much better decision. Instead of viewing a blimp as a complete radar package with operators and scopes, blimps should have been used as free flying aerostats. The data transmitted to ground based operators would have eliminated low-level gaps. Weather problems, one of the major problems hindering their operation, can be minimized. This would also free critical law enforcement officers to do what they are trained for, interdict and enforce. These officers need to fly aboard the interceptor / apprehension airframe. The aircraft should be a variant of the V-22/Bell 609 Tilt rotor. This

would provide the speed and range needed for interdiction operations with one airframe, not the many in use today. It will also provide the payload needed for sensors and apprehension officers to follow the smuggler and interdict them. The V-22/Bell 609 might be more expensive to operate than present interceptors might, but it can provide a total interdiction airframe.

Chapter VI

CONCLUSION

The results obtained by this research did not come as a surprise. The same basic system that has been in place for many years is still in effect today. Many of the situations that made the U.S. Customs Air Interdiction System effective in the past are still valid today as they were in 1969. However, the one thing that has changed significantly is the smuggling threat it attempts curtail. The air smuggler of years gone past has all but vanished from the skies and a newer more tactically advanced smuggler are at work. This change in smuggling tactics has come about due to the success of the U.S. Customs Air Interdiction program in denying the smuggler use of the majority of the skies. It is all but suicidal for any smuggler to attempt a smuggling venture at any altitude but the very lowest. However the new smuggler is very adept at using low altitudes to accomplish this destructive activity. Just as the smuggler has adapted to this new environment, so must the U.S. Customs Air Interdiction program. Of the many areas identified within this research that need changing, several were of such magnitude they deserved special attention. The first area that needs attention is the strategic direction of the entire program.

Strategic Direction determines the direction all subsequent actions must take. There is a general feeling of a lack of overall direction within the Air Interdiction Program. The main idea of the system is to interdict smuggling and all

survey participants were very much in agreement with this. However, they felt this main mission was not what was being asked of them. The conceptual difference between interdiction and enforcement is not only lacking in the writings of the U.S. Customs Air Program; it is also lacking in the day to day operations according to survey participants. Both types of aviation operations can fall under one program, but their guidance must be separate. Attempting to use enforcement standards towards an interdiction operation will only serve to further hinder the program. Interdiction operations must be established and measured using interdiction requirements. Enforcement operations must be established, if local assets can not cover these needs, and measured using enforcement requirements.

The large scale (area based) of interdiction operations does not lend itself to a structure based on local needs. They can not be encumbered by traditional lines of responsibilities and must be free to engage the smuggler wherever he goes in the nation. Areas of local responsibilities blur when dealing with aviation smuggling. The organization of the U.S. Customs Air Interdiction Program reflects this basic need. The Air and Marine Interdiction Division does not report to any local U.S. Customs office but directly to the Commissioner of Customs. Interdiction branches must remain outside local enforcement organizational structure and operate independent of their needs. This does not reduce in any way the symbiotic relationship between the air branches and the local Special Agent in Charge (SAIC). They must cooperate extensively and coordinate activities when operating in each other's area.

Unfortunately, within the existing organizational structure, interdiction branches are tasked to enforce and interdict at the same time. Enforcement units must support local actions and react to their needs, quite different from interdiction branches. Just because both areas use aircraft to complete their mission does not mean they must have the same leadership and structure. Aviation enforcement units should be subordinate to local enforcement offices and also become the liaison between aviation enforcement and aviation interdiction operations. The enforcement units must be free of the interdiction requirements and equipped accordingly. This situation becomes critical when attempting to evaluate how effective the system is.

The effectiveness of each operation must be viewed independent of each other. Measuring interdiction effectiveness against enforcement effectiveness is a sure method of failure. This is a situation where one situation has a direct impact on the other. Measure the two systems independent of each other and a better idea of how effective each is will be obtained. The program must resist the efforts to measure their effectiveness using standards that are inapplicable to the main mission, interdiction. The actual efficiency method of measurement must be a subjective evaluation of the entire system without attempting to rely on law enforcement statistics.

Once strategic direction of the program is clearly understood and the method of measuring it is accepted, the following issues can be corrected.

The problem of detecting a smuggling venture is the single most important problem identified by the research conducted. Using the present ground radar blanket, the possibility of detecting a low flying smuggler is remote at best. Airborne radar systems must be expanded in order to cover the low-level radar coverage problem being exploited by smugglers. These systems are extremely expensive but are the only methods presently available that correct this situation. The use of manned blimps instead of aircraft to provide low-level radar coverage is a viable solution to this problem. Instead of viewing a blimp as a complete radar package with operators and scopes, blimps should be used as free flying aerostats transmitting data to ground based operators. Weather problems, a severe problem hindering tethered aerostat operations, are minimized. The piloting and maintenance of these blimps could be contracted out to reduce costs. This will free critical law enforcement officers to do what they are trained for, interdict drugs.

These officers need to fly aboard an advanced interdiction aircraft. The only aircraft that can fulfill the needs of an air interdiction program will be a variant of the V-22/Bell 609 Tilt rotor. This airframe can provide the speed, range and payload needed for officers to follow the smuggler and interdict them. A tilt-rotor aircraft is more expensive to operate than present interceptors or helicopters, but it

can provide a total interdiction airframe. The need for UH-60's, C-550's PA-42's, P-3C and C-12's can be eliminated significantly increasing the funds available for a tilt rotor fleet. Add to this the lower operating costs of blimp-based radar versus the P-3AEW and overall program cost may become achievable. Using a mixture of this type, interdiction operations can be reduced to two airframes of which law enforcement officers must man only one.

The U.S. Customs Air Interdiction Program has had great success over the years. It is staffed by some of the most dedicated and professional officers of any agency in the world. The demands placed on them are more than what most citizens are willing to accept. These men and women not only accept the demands; they go above and beyond their requirements. The professionalism, courage and dedication are only exceeded by their passion to get the job done. The interdiction program will evolve into one capable of fulfilling all its requirements. The officers within the program are constantly looking for methods to increase their effectiveness and they are headed in the right direction. It is just a matter of time and funds until they get there.

Chapter VII

RECOMMENDATIONS

Upon completion of this project, many identified areas were left without even being touched. Not because they lacked importance, but because the scope of this projects simply could not provide for their research. When researching this topic, it became evident that only a small portion of the problem would be addressed. Even while researching the small portion of the problem only the proverbial "tip of the iceberg" was touched leaving much to be researched. The strategic direction, interdiction requirements and measuring the effectiveness of a system as complex as this one is can only be accepted after more research on these issues are completed.

Within the strategic direction research needed, it must establish clear differences between interdiction and enforcement operations. Research must take into consideration the needs of the entire national drug policy and then transmit the results to all officers with the program. It must also establish what exactly is demanded from air interdiction operations and establish a proper method to measure its' effectiveness based on mission requirements. This study is needed even if the program is to remain unchanged and will be a difficult task.

Also, significantly more research is needed to establish the viability of newly identified aircraft to enter the U.S. Customs inventory. A blimp based radar platform as well as a tilt-rotor interdiction airframe needs to be researched

in much greater detail. This research needs to be done with the idea of correcting the low-level radar coverage situation and providing the program with a true interdiction aircraft without significantly altering the budgetary needs of the U.S. Customs Service Air Interdiction Program. This too is a significant task.

Stemming the flow of drugs is a task that affects the very foundation of our society. Anything we can do towards this goal will be greatly appreciated by our nation. I only hope others will use the information presented in this project to research other areas of counter drug aviation operations. We must provide the men and women engaged in the dangerous job of drug interdiction operations every chance to succeed.

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APPENDIX A

DELPHI SURVEY QUESTIONNAIRE #1

Hi!

I haven't talked to you in a while and hope everything is OK. I am bugging you cause I could use your help. I have obtained permission from HQ US Customs OAMI to contact you and see if you want to help me with some research. Customs is paying for my Masters in Aviation Management and I am researching what hinders the Customs Air Interdiction System in effectively stopping tactical air smuggling east of Brownsville, Texas.

As part of my research I am conducting a Modified Delphi survey of experts within air interdiction. I am required to use only recognized experts on the issue and I don't know anybody with more experience or knowledge about this than you do. The chairperson of my project review committee agrees wholeheartedly. So, since you are a recognized EXPERT on this subject I need your opinion(s).

The survey won't take much time to complete and would really help. It will consist of 3 questionnaires and should take about 10 minutes each to complete. There will be NO sensitive information requested or accepted. I will be surveying about 20 persons getting their views and opinions. Let me know if you can participate in this survey.

Thanks for any help you can give me and remember;
BE SAFE OUT THERE!

/Galin

QUESTION #1

In your opinion, what is/are the situation(s) hindering the Air Interdiction System East of Brownsville Texas in stopping smuggling by aircraft into the USA? Rank them from most important being #1 to least being #10. PLEASE limit the list to no more than 10.

You can reply to this by cc.Mail

APPENDIX B

DELPHI SURVEY QUESTIONNAIRE #2

Your Position:
Present USCS Duty Station:
Years at present Duty Station:
Previous USCS aviation station:
Years previous USCS aviation station:
Years Law Enforcement experience:
Years Aviation Experience:

Survey participants identified the following 19 items as affecting the U.S. Customs Air Interdiction system east of Brownsville, Texas. Rate them from most important (#1) too least important (#19) according to YOUR OPINION and make any comment you feel pertinent. Your answer(s) and/or comments are confidential and will not be attributed to you unless specifically authorized by you in writing.

The order in which they are presented does not reflect any order of importance.

a) Proper Aircraft/Modernization of Aircraft
b) RADAR limitations/Timely Detection
c) Lack of Resources
d) Aircrew Availability
e) Communications
f) Investigations
g) Proactive Patrols
h) Our Own Success
i) Lack of a deterrent to smuggling pilots
j) Interagency Coordination/Cooperation/Jealousy
k) Government/Management doesn't really care
l) Hiring Practices (Local Hire)
m) Morale/Enthusiasm
n) Politics
o) Lack of Flexibility
p) Mission Direction
q) lack of "Law Enforcement Mentality" within Customs Air
r) Zero Tolerance
s) Training

For clarification on what is meant by each situation, see the attached document in

WORD95 format. Please return your answers to me via cc.Mail by June 9, 2000.

APPENDIX B (Cont.)

These are, word for word, how survey participants clarified the situations they identified. No attempt has been made to edit or interpret the meaning of any opinion stated. Identical responses were combined to save space.

a) Proper Aircraft/ Modernization of Aircraft

Lack of proper and modern equipment---still trying to get 1960—70—80-& 90's technology (sensors) to talk to each other installed in 20 year old aircraft not built for the specific mission. Sensor systems have not been up graded for years. When we look for new equipment we allow those who know nothing about the job to make the decisions what is right for the mission. Lack of an aircraft/system for search short of the P-3 and the increasing age of the interdiction fleet. Aircraft need to be replaced. Maintenance needs on average 10 hours for every flight hour. Lack of aircraft, too slow, small and short range.

b) RADAR limitations/Timely Detection

The lack of any real time and effective detection systems along the border. Lack of a reliable detection system. We should concentrate on those things, which help us DETECT, IDENTIFY, INTERDICT and APPREHEND violators. The USCS no longer has a net of reliable RADAR that could detect any low altitude air traffic trying to penetrate the interdiction system. No more dedicated radar operators at scopes in the FAA centers. (They possessed local area knowledge of air traffic routes and A/C by tail # and registered owners). Lack of radar capabilities to track all the way from origin country. Lack of the most modern radar and FLIR equipment for trackers and marine equipment. The current balloon system is not only inadequate but also completely ineffective. If the administration were serious about this we would have look down satellite Intel and wouldn't need the expensive P3s. Lack of a detection facility (aerostats, ground Radar's, ROTHR). Old and outdated sensor equipment onboard to keep up with newest and more sophisticated tactics used by smugglers. Aerostat down time excessive since the military took over the program from Customs. No low level RADAR coverage from South Carolina to Bangor Maine. Removal of the aerostat from the Bahamas.

c) Lack of Resources

Lack of proper manning. The USCS interdiction forces are not properly manned. Funding for operations—We need to displace crews and equipment not only to avoid and confuse the counter surveillance—but also to cover areas not often looked at... move a UH60, C550, C-12M and a portable RADAR and operate for two weeks at a time. Most Air Smuggling is done via airdrops to vessels. With limited marine resources it is very difficult to interdict an airdrop and follow it to an endgame. Flight time limits and additional missions – i.e. Southcom

APPENDIX B (Cont.)

commitments. Giving money to other countries such as Mexico and Colombia versus us. Lack of personnel to operate aircraft and boats. Lack of boats, too small, short range. Lack of a plan to integrate air/marine operations.

d) Aircrew Availability

Past initiative to attrit Air Interdiction Officers / Criminal Investigators; professional RADAR operators and add their duties to Customs Pilots duties. Attrition of the Air Branches and Units with no replacements. Lack of enough personnel to fulfill the entire mission from beginning to end. Inability to keep experienced personnel (salary and compensation not good enough to compete with the airlines). Lacks of personnel—Not only are we short of pilots and AEOs countrywide but everyone needs more admin. Staff to look after the personnel side of the house. This organization needs to have the slots allocated redone from Branch Chief to janitor. Lack of personnel, which result in overwork and lack of motivation. Attrition due to other outside factors (better jobs, benefits such as more days off and more $). Air branches can not staff a 7X24 operation due to foreign deployments. Eliminating the AIO position was a cripling blow to the efficiency and morale of the air program.

e) Communications

No effective/efficient radio communications. I.e.; between all Customs and other agency assets. Lack of modern communications equipment – one which all agencies can use and are interfaced together – and our own boats can talk reliably to the aircraft. – with a secure capability again with DOD, CG, DEA, USCS and FBI etc all on the same codes - SATCOM Smugglers are more sophisticated. Their communications are better than ours are.

f) Investigations

De-emphasis of the importance of investigations/ lack of incentives for Air Enforcement Officers. Not many Special Agents work air cases and since Air personnel do not work cases anymore it is hard to obtain good CI information like we used to in the past. Professional jealousy between Air Branches/ SAIC offices hindering investigations. OI does not allow air to do any investigations, therefore INTEL on air smuggling is at an all time low. Due to sheer number of aircraft coming into the US in South Florida not all aircraft are inspected.

g) Proactive Patrols

Lack of proactive RADAR patrolling utilizing appropriate search aircraft

APPENDIX B (Cont.)

h) Our Own Success

Our own successes at reducing air smuggling through prosecution and our sheer numbers and presence.

i) Lack of a deterrent to smuggling pilots

Can't force airplanes down

j) Interagency Coordination/Cooperation/Jealousy

Lack of sharing information by all collectors of human tactical intelligence. Lack of interagency cooperation. i.e.; Customs, FBI, Coast Guard, DEA, JIATF. All agencies too concerned about stats, inhibits good flow of info in a timely manner. No centralized drug fighting control over all the different agencies. All agency abilities are not used together in their best ways. (using each other's strengths to cover each other's weaknesses). interagency Turf battles – We only let the other know about "our Intel" when we have to or something hoes wrong – If the system just gave all credit no matter who was involved might work better Lack of USCS control at JIATF-East. Competition with other agencies for interdiction resources. Assets are given to agencies that lack the experience and knowledge to effectively interdict any air traffic coming into the US.

k) Government/Management doesn't really care

Not enough emphasis placed by USCS upper management in the development of the air interdiction program. The highest level of government really doesn't want to stop the flow of drugs. The lack of management concern and/or knowledge of the extent of the smuggling in that area (or for that matter along the entire border). Lack of a "plan of attack" or operations plan (the just go out and fly attitude). Lack of upper level support from Customs Management. Lack of government support to the areas that are more affected by smuggling activities. Government bureaucracy / politics when it is time to make a decision that will affect the Air Program. No national will to stop drugs.

l) Hiring Practices (Local Hire)

USCS needs to re-look the way we hire people. We need local hire back! No one wants to wait 6 months to a year before getting hired. Especially pilots in today's environment. Because of attrition, it takes over a year to bring a new hire up to speed and by that time he/she is looking for another job.

APPENDIX B (Cont.)

m) Morale/Enthusiasm

Lack of enthusiasm or morale in the interdiction ranks (many don't care enough about the job to do it well).

n) Politics

Political motivated decisions to support others instead of our own agency.

o) Lack of flexibility
The USCS interdiction program lacks the flexibility to relocate personnel or assets where it's mostly needed.

p) Mission Direction
There is no differentiation between our interdiction mission and enforcement "SAIC Support) mission. We are tasked with operations we shouldn't be doing.

q) Lack of "Law Enforcement Mentality" within Customs Air
Professional pilots that have little interest in law enforcement. Not enough professional police flying as pilots for the Customs air program. Overly restrictive rules holding us back. Why can't we fly UH60's over water and really go after the go-fast? We have become a flying club without a purpose.

r) Zero Tolerance
If the users knew they faced mandatory sentences of at least one year in jail for first time offense, you would bring the drug trade to a screeching halt. You will always have the street drug addicts, but the drug trade is geared more for the middle and upper class drug user. If you had no one wanting to buy their cocaine, the price of the drug would plummet and the reason to import drugs (to make lots of money) would cause the smugglers to find other avenues for their efforts.

s) Training
Lack of proper training and proficiency. Without proper training, the utilization of equipment is affected to a point that successful interdiction of drug smugglers is not possible.

APPENDIX C

DELPHI SURVEY QUESTIONNAIRE #3
AREA OF CONFLICTING OPINIONS

1. RADAR limitations/Timely detection

General Opinion:
The lack of any real time and effective detection system. The USCS no longer has a net of reliable RADAR that could detect any low altitude air traffic trying to penetrate the interdiction system. No more dedicated radar operators at scopes in the FAA centers. (They possessed local area knowledge of air traffic routes and A/C by tail # and registered owners). The current balloon system is not only inadequate but also completely ineffective. The dead spots in the coverage are well known to the smuggler community.

Dissenting Opinion:
Whoever made the comment in regards to "no dedicated radar operators at scopes in FAA centers" is living in the past. Years ago we moved out of the centers because we found that center only RADAR just don't cut it for observing low altitude aircraft penetrating our borders. Additionally the amount of data that is available to the RADAR operator has been vastly expanded and improved. The Customs RADAR facility in California is often called upon by the FAA to conduct flight plan searches of aircraft which exceed FAA capabilities after 36 to 48 hours. AMICC archives all general aviation flight plan data. The dedicated operators who staff a RADAR position are normally in training for 10 months before they are certified to work on their own. They must know the terrain, smuggling routes, cities, towns, radio/radar locations, etc. for each operating position (there are nine positions to be mastered).

APPENDIX D

STATISTICAL DATA OBTAINED DURING
DELPHI SURVEY

Delphi Survey Statistical Data

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	Total Points
10.0	9.5	6.5	9.0	6.0	8.5	7.0	3.0	2.0	4.5	4.0	2.5	7.5	3.5	5.5	5.0	8.0	1.0	1.5	104.5
9.5	10.0	8.5	8.0	9.0	7.5	2.0	1.0	1.5	4.0	3.5	6.5	7.0	3.0	4.5	5.0	5.5	2.5	6.0	104.5
5.0	10.0	9.0	8.0	7.0	1.5	6.0	2.5	2.0	4.0	1.0	9.5	3.0	4.5	8.5	7.5	5.5	6.5	3.5	104.5
9.0	10.0	6.5	7.0	8.5	8.0	6.0	3.0	3.0	7.5	3.0	3.0	3.0	3.0	9.5	3.0	3.0	3.0	5.5	104.5
9.5	8.5	9.0	10.0	8.0	7.0	6.5	7.5	3.0	4.5	2.0	3.5	5.5	1.5	6.0	5.0	4.0	1.0	2.5	104.5
9.5	10.0	9.0	8.5	7.5	7.0	3.0	3.0	3.0	3.0	3.0	5.5	8.0	6.5	3.0	6.0	3.0	3.0	3.0	104.5
6.5	6.0	3.5	4.0	4.5	8.5	5.5	7.0	3.0	9.0	1.3	5.0	7.5	8.0	2.5	9.5	10.0	2.0	1.3	104.5
9.5	9.5	6.0	8.5	7.8	4.5	3.5	4.0	2.8	2.8	9.5	6.5	5.5	7.8	4.5	2.0	1.8	1.8	6.8	104.8
6.5	10.0	6.0	5.5	9.0	5.0	1.0	4.5	2.0	8.5	8.0	3.0	2.5	9.5	7.5	7.0	3.5	1.5	4.0	104.5
4.0	9.5	3.0	7.0	2.5	6.0	3.5	4.5	5.0	1.5	9.0	5.5	8.5	8.0	6.5	7.5	10.0	2.0	1.0	104.5
9.0	6.5	7.0	6.0	5.5	8.0	5.0	1.5	1.0	7.5	4.5	2.5	3.0	4.0	3.5	10.0	2.0	9.5	8.5	104.5
9.5	9.0	10.0	7.0	4.5	8.5	5.0	1.0	2.0	8.0	7.5	1.5	6.5	2.5	3.3	6.0	5.5	3.3	4.0	104.5
8.5	10.0	6.5	8.0	6.0	9.5	7.5	4.0	3.5	5.5	7.0	5.0	1.0	9.0	1.5	4.5	3.0	2.5	2.0	104.5
10.0	3.8	3.8	9.5	3.8	9.0	8.5	7.0	3.8	3.8	3.8	3.8	3.8	3.8	8.0	7.5	3.8	3.8	3.8	104.5
7.0	7.5	5.5	6.0	8.0	6.5	9.0	1.0	1.5	8.5	3.0	2.0	2.5	3.5	9.5	10.0	5.0	4.0	4.5	104.5
10.0	8.0	9.0	9.5	6.5	4.0	3.5	2.5	3.0	8.5	7.5	1.5	6.0	7.0	2.0	5.5	5.0	1.0	4.5	104.5
2	**1**	**5**	**3**	**6**	**4**	**11**	**17**	**19**	**8**	**14**	**15**	**12**	**10**	**9**	**7**	**13**	**18**	**16**	**AvgRnk**
8.31	**8.61**	**6.80**	**7.59**	**6.50**	**6.81**	**5.16**	**3.56**	**2.63**	**5.69**	**4.84**	**4.17**	**5.05**	**5.31**	**5.36**	**6.31**	**4.91**	**3.02**	**3.89**	**AVERAGE**
1.91	**1.84**	**2.17**	**1.65**	**1.95**	**2.15**	**2.29**	**2.14**	**1.00**	**2.48**	**2.80**	**2.19**	**2.36**	**2.59**	**2.67**	**2.32**	**2.53**	**2.23**	**2.08**	**STDEV**

APPENDIX E

LAW ENFORCEMENT AVIATION
PRODUCTIVITY QUESTIONNAIRE

Name:_____ Title/Position_____

Agency:_____ Experience: L/E:__ AL/E:__ Present Position:____

Mission of agency / aviation program:

Manning:

Number of aircraft:

Type of aircraft:

Does your agency measure law enforcement aviation productivity? How?

Does your agency measure law enforcement aviation efficiency? How?

What are the difficulties of measuring productivity for your mission?

How would YOU measure law enforcement productivity/efficiency

APPENDIX F

AUTHORIZATION TO SURVEY
AIR INTERDICTION OPERATIONS PERSONNEL

Author: MARY J ZUPANOVIC at HQ-3_PO
Date: 5/10/00 7:09 PM
Priority: Normal
Receipt Requested
TO: NANCY G HARPER at HQ-3_PO, GALIN HERNANDEZ at SAC-TAMPA-1
Subject: Re: Survey Assistance
----------Message Contents----------

Nancy, Please provide Galin with the information he needs..Thanks...Mary

_____ Forward Header _____

Subject: Re: Survey Assistance
Author: CHARLES E STALLWORTH at HQ-3A-PO Date: 5/10/00 3:47 PM

I approve.--Charlie

_____ Reply Separator _____

Subject: Survey Assistance
Author: MARY J ZUPANOVIC at HQ-3A-PO Date: 5/9/00 8:41 AM

FYI, I haven't answered him pending your approval...tnxs...Mary

_____ Forward Header _____

Subject: Survey Assistance
Author: GALIN HERNANDEZ at SAC-TAMPA-1 Date: 5/4/00 10:05 AM

Ms Zupanovic;

I am a Special Agent here in Tampa Florida (ex Air Interdiction Officer) and finishing my Masters degree in aviation with Embry-Riddle Aeronautical University. I was given your name by a good friend of mine, Bill Sutherland (HQ/OAMI) as somebody that can help me. As part of my degree I am required to complete a Graduate Research Project on an aviation related situation/problem. Since the US Customs Service is paying for my degree via the tuition assistance program and I am very interested in Air Interdiction, I am concentrating on the Customs Air Interdiction System.

As part of this project I would like to conduct a modified Delphi survey of a select group of US Customs Air Interdiction employees. This survey will help me identify solutions to possible problems as viewed by the people doing interdiction in the field. The survey will not cover any sensitive information and will consists basically of their ideas and views. The finished project will be subject to scrutiny by a panel of Doctoral level professors and available for use by the US Customs Service if interested.

Your help in this project will be greatly appreciated.

Thanks;

Galin Hernandez
Box 1486

Oldsmar Florida, 34677-1468
(813)814-9219

To start my survey I need to know how many of the following are presently employed by US Customs in the Air Interdiction office.

TOTAL NUMBER OF EMPLOYEES:
TOTAL NUMBER OF PILOTS:
TOTAL NUMBER OF AIO:
TOTAL NUMBER OF DSS:
TOTAL NUMBER OF INTELLIGENCE ANALYST: TOTAL NUMBER OF AVIATION ANALYST:
TOTAL NUMBER OF MANAGERS:

APPENDIX G

AIR INTERDICTION PROGRAM MANNING

Author: NANCY G HARPER at HQ-3_PO
Date: 5/11/00 9:13 AM
Priority: Normal
TO: GALIN HERNANDEZ at SAC-TAMPA-1
CC: MARY J ZUPANOVIC at HQ-3A-PO
Subject: Your Request for AMID Personnel Data
----------Message Contents----------

Galin:

I am responding to your ccmail to Mary Zupanovic which requested certain personnel data related to the Air and Marine Interdiction Division for use in a survey. The totals below are the onboard counts (as opposed to authorized) for each category as of this morning per the HQ personnel database.

Total Number of Employees:	832
Total Number of Pilots:	344
Total Number of AIO/AEOs:	44
Total Number of DSSs (incl Airborne):	74*
Total Number of Intel Research Analysts:	17**
Total Number of Aviation Ops Analysts:	17
Total Number of Managers:	62***

*We also have 24 SDSSs (incl Airborne)

**We also have 1 Intel Ops Specialist

***Includes branch chiefs, AGSs, CNAC and AMICC directors, HQ managers