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Counterinsurgency Aircraft Procurement Options

Processes, Methods, Alternatives, and Estimates

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Foreword

It is my great pleasure to present another of the *Wright Flyer Papers* series. In this series, the Air Command and Staff College (ACSC) recognizes and publishes our best student research projects from the prior academic year. The ACSC research program encourages our students to move beyond the school's core curriculum in their own professional development and in "advancing air and space power." The series title reflects our desire to perpetuate the pioneering spirit embodied in earlier generations of Airmen. Projects selected for publication combine solid research, innovative thought, and lucid presentation in exploring war at the operational level. With this broad perspective, the *Wright Flyer Papers* engage an eclectic range of doctrinal, technological, organizational, and operational questions. Some of these studies provide new solutions to familiar problems. Others encourage us to leave the familiar behind in pursuing new possibilities. By making these research studies available in the *Wright Flyer Papers*, ACSC hopes to encourage critical examination of the findings and to stimulate further research in these areas.

JIMMIE C. JACKSON, JR.
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Abstract

A call is being made for an aircraft dedicated to the counterinsurgency (COIN) mission within military academic circles and the special operations community. Support for a COIN aircraft needs hard numbers, given the Air Force's budget constraints brought on by the dedication to the F-22A. Building on Arthur Davis's COIN aircraft advocacy paper, this research doesn't focus on further advocacy, but on a process and method for COIN aircraft procurement. The acquisition focus is on United States Special Operations Command's (USSOCOM) acquisition authority to couple its global war on terrorism (GWOT) mission responsibility with commercial-off-the-shelf aircraft procurement to specifically address the need for an airborne COIN capability.

The performance, schedule, and cost information associated with Raytheon's T-6A NTA and Stavatti's SM-27 are reviewed and compared beyond the acquisition process. Additionally, acquisition and operations, maintenance, and support cost estimates are produced for both alternatives. The estimates reflect respective acquisition costs of approximately $211 million and $426 million; and maintenance, and support costs of $38 million and $47 million, respectively. The latter two costs are stated in fiscal year (FY) 2007 dollars.

The analysis of alternatives yields a recommendation based on the three key acquisition areas of performance, schedule, and cost. The T-6A NTA platform possesses demonstrated performance, immediate availability, and lower costs, and is recommended by this analysis.

Acknowledgments

Dr. William Dean was instrumental in introducing me to this topic. During an early course at Air Command and Staff College (ACSC), and later in his Small Wars seminar, officially entitled "Small Wars and Counter-insurgencies: From Algeria to Afghanistan," I became interested in determining the costs of procuring a COIN aircraft.

The topic was of interest to many in the academic and special operations fields. Whenever airpower in small wars was mentioned, someone inevitably stated that prop aircraft were sufficient—even an advantage for loiter and escort—and an inexpensive alternative.

A paper by a former ACSC student, Arthur Davis, outlined the argument for buying a COIN aircraft. Advancing his study involved looking at a method to actually procure the type of aircraft Davis and others advocated. I have tried to do just that . . . provide an understanding of the processes involved; identify a purchase method; present detailed aircraft alternatives; and finally generate cost estimates for such a procurement.

Production of the estimates found in the appendices would have been far more difficult without the kind assistance of Tecolote Research, Inc., Montgomery, AL. They granted me free access to their sophisticated cost estimating software package, which I refer to as a cost engine. Without their assistance, far more time would have been spent on the meticulous aspects of inflation adjustments and basic math applications. Permission to use their Automated Cost Estimator Integrated Tools package clearly improved the quality of my work.

Additionally, I would like to thank Chris Beskar, president and CEO [chief executive officer], Stavatti Aerospace, and Doug Scott, director, Strategy and Business Development, Raytheon Aircraft Company. The men provided written product information and granted interviews that aided my research.

Introduction

Aircraft have shown to be effective in small wars, particularly comparatively slower, lower technology platforms. The United States Air Force (USAF) currently possesses no counter-insurgency (COIN) aircraft of the type advocated by many students of small wars. Given the Air Force's preoccupation with the F-22A advanced fighter aircraft procurement, little attention is placed on obtaining a COIN operations platform. However, within academic circles and the special operations community, the need for a "low-tech" airborne participant in COIN operations is gaining traction.

Acquiring a weapons system platform is serious business, with meticulously defined processes and authorities. By examining opportunities to turn ideas into aircraft, this analysis identifies specific authorities, processes, requirements, and methodologies for quickly procuring an aircraft for COIN operations. In addition to discussing some of the specifics of the Department of Defense (DOD) weapon systems acquisition business, an alternative method for COIN aircraft platform procurement will be discussed, as will the specific performance attributes, schedule details, and costs associated with two airborne platform options.

Backdrop . . . or Basis for this Analysis

In his Air Command and Staff College thesis, Maj Arthur D. Davis proposed an aircraft solution specifically for COIN.[1] His paper serves as the backdrop for the current analysis, and sets the initial conditions for this appraisal of COIN aircraft purchase options. Davis's study forms the stepping off point for investigating a possible avenue and estimating the cost of procuring an aircraft platform specifically for the modern COIN and/or counterterrorism mission. By delving into the specifics of procuring a COIN aircraft, this analysis serves to advance Davis's work.

Davis provided a recommendation on the type and specifications of a COIN aircraft. He looked at the nature of insurgency, how aircraft were used to suppress insurgents, the Iraqi situation, and specifically the aircraft in use today.

To add credence to his call for a different type of aircraft, Davis presented two case studies in COIN, where the T-6

Texan and A-1 Skyraider aircraft had validated successes in thwarting insurgents in the Algerian and the Vietnamese experiences.[2] Davis used this examination of the types and roles of the aircraft to address airpower and countering modern insurgent and terrorist groups.

From his examination, Davis proposed a low-tech solution —abdicating the desire to have all the latest technological advances, and retaining the advantages of slower, proven aspects of good COIN platforms. "Instead of fast, expensive turbojets, we need reliable, propeller-driven aircraft designed to work in the environment favored by the insurgent."[3] To this end, Davis proposed:

> Such an aircraft should have the following characteristics: (1) off-the-shelf technology; (2) long range and loiter capability; (3) short take-off and landing (STOL) capability; (4) ability to operate from austere airfields; (5) diverse weapons-carrying capability; (6) good navigation and fire-control systems; (7) good pilot visibility; (8) speed and maneuverability at low-to-medium altitudes; and (9) ability to absorb ground fire with a high degree of survivability. Of special importance, the aircraft should be inexpensive and suited to the type of support expected of it. As a corollary, it should lend itself well to training pilots from "lesser-developed" nations that will eventually assume responsibility for internal security against insurgent factions.[4]

Based on an examination of both historical and current COIN demands, Davis recommended the T-6A Texan II as a possible replacement for the Skyraider's role.[5] Taking Davis's recommendation and looking beyond, this analysis explores the best avenue for COIN aircraft procurement, and then estimates the costs of buying and maintaining such a platform.

United States Special Operations Command

The most likely opportunity to quickly procure an inexpensive[6] aircraft platform, meeting the characteristics identified by Davis, is through the United States Special Operations Command's (USSOCOM) acquisition agility. Acquisition agility means it has Title 10 procurement authority (the only unified command empowered therewith), its own budget line from Congress in the appropriation process, and it is chartered to purchase non-mainstream military equipment.[7]

The acquisition flexibility provided by USSOCOM is associated with its role in the global war on terror (GWOT). The mission of USSOCOM includes leading the GWOT,[8] which involves "the planning and synchronization of DOD activities

in support of the GWOT."[9] The extent to which USSOCOM has embraced its role in the GWOT is evidenced by the emphasis placed on this role in both its mission and vision statements. The command's mission statement reads:

> USSOCOM leads, plans, synchronizes, and as directed, executes global operations against terrorist networks. USSOCOM trains, organizes, equips and deploys combat ready special operations forces to combatant commands.[10]

The command's vision is:

> To be the premier team of special warriors, thoroughly prepared, properly equipped, and highly motivated: at the right place, at the right time, facing the right adversary, leading the Global War on Terrorism, accomplishing the strategic objectives of the United States.[11]

Further, the command's annual report states, "In order to remain decisive on the battlefield of today and posture for success in the future, our priorities remain (1) the Global War on Terrorism, (2) Readiness, and (3) Future Special Operations Forces (SOF)."[12] Leveraging the assigned mission and number-one priority of USSOCOM, one could argue that a COIN aircraft would add significant capability to address all three priorities.

The GWOT is a war against insurgency, as the global terrorists' networks will not meet US forces on a traditional field of battle. USSOCOM, as the "nation's lead command for planning and executing the GWOT,"[13] focuses on the GWOT and the special operations-peculiar equipment necessary to confront the enemy.

To buy such equipment, USSOCOM possesses its own budget authority. The Cohen-Nunn Amendment to the DOD Authorization Act of 1987, amending the Goldwater-Nichols Reorganization Act of 1986, created USSOCOM as a unified combatant command for all special operations forces, and vested it with its own budget. This budget, identified as a major force program 11 (MFP-11), is specifically for special operations forces. Use of MFP-11 is limited to special operations–peculiar equipment and operations, not to augment the budgets of the military services. The role of the service's responsibilities is clearly specified, with support arrangements and categories for common support to all forces and bases.[14]

The law requires the secretary of defense to submit a separate request in the budget for special operations forces

training with foreign forces.[15] Additionally, the legislative intent calls for the special operations command budget proposal to "include requests for funding for—(1) development and acquisition of special operations-peculiar equipment; and (2) acquisition of other material, supplies, or services that are peculiar to special operations activities."[16]

Special operations–peculiar items and materials are the only things authorized for purchase with MFP-11 funding.

> Equipment, material, supplies, and services required for special operations mission support for which there is no broad conventional force requirement. This includes standard items used by other . . . Department of Defense (DOD) forces but modified for special operations forces (SOF); items initially designed for, or used by, SOF until adapted for use as Service-common by other DOD forces; and items approved by the Commander in Chief, US Special Operations Command (USCINCSOC) [*sic*] as critically urgent for the immediate accomplishment of a special operations mission but not normally procured by USCINCSOC [*sic*].[17]

USSOCOM's budget authority would logically apply to an aircraft designed specifically for COIN operations and/or to enhance foreign internal defense (FID) training with allies and partners in the GWOT.

In addition to straight procurement authority—funds authorized in an annual budget to buy things—recent defense budget supplementals have included "temporary authority to use O&M [operations and maintenance] funds for combat or contingency construction projects outside the United States, subject to certification of certain requirements and notification to Congress."[18] USSOCOM could request such authority for COIN aircraft procurement if such an aircraft was immediately necessary in the GWOT. This avenue for requesting funds would be much faster than the normal budget process. If approved by Congress, supplemental funds could be used to purchase a COIN aircraft, thus speeding the asset into the inventory and saving procurement dollars.[19]

If USSOCOM chooses not to request such temporary procurement authority via an O&M supplemental funding request, or if Congress refuses to grant such authority, the normal acquisition and budget processes remain available. While the established acquisition processes take time, USSOCOM does possess special agility that can expedite critical acquisition requirements. However, before one can

appreciate USSOCOM's special acquisition position, a perfunctory understanding of the formal process is beneficial.

Acquisition Process Requirements

Three principles about the acquisition process should be understood before discussing the specific requirements associated with a platform. First, the total cost of the procurement—research, development, test, evaluation, and production costs—determines the acquisition category assigned to the project; and sometimes merely interest in a program will garner it acquisition category status. Second, the level of acquisition category designation also determines the requirement and approval levels for a single acquisition management plan (SAMP). Finally, the milestone decision authority (MDA) is determined by the program's acquisition category (ACAT). Table 1 summarizes the fiscal thresholds for ACAT designation and the associated decision authority. Adjusted for inflation, the ACAT I thresholds are about $441.5 million for research, development, test, and evaluation (RDT&E) and over $2.408 billion for production in fiscal year (FY) 2006. The FY 2006 equivalents for RDT&E and production are over $153.9 million and $725.8 million, respectively, for the ACAT II thresholds.

The USSOCOM acquisition program office is too small to handle large programs, so the services currently execute ACAT I programs for USSOCOM.[20] If USSOCOM pursues the purchase of a COIN aircraft platform, the command would have to keep the total procurement costs below the ACAT I threshold or face turning it over to Air Combat Command (ACC) for program execution. USSOCOM could manage the program execution, as the general consensus is that ACC would oppose the introduction of a non-jet platform for the COIN mission.

The ACAT level determines the need for a SAMP. "A SAMP is required for all non-space ACAT I and ACAT II acquisition programs. For non-space ACAT III programs, SAMPs may be prepared at the discretion of the MDA."[21] Figure 1 illustrates the operational structure for SAMP development,[22] while its development process is shown in figure 2.[23] "The SAMP results from the collaborative efforts of a multifunctional team. In many respects, the process used to develop the SAMP is as important

as the document itself. All stakeholders must be active participants in this process."[24]

Table 1. Description and decision authority for ACAT I–III programs

Acquisition Category	Reason for ACAT Designation	Decision Authority
ACAT I	• Major Defense Acquisition Program (MDAP) (10 United States Code [USC] 2430, reference [n]) ○ Dollar value: estimated by the Undersecretary of Defense (Acquisition, Technology, and Logistics [USD[AT&L]) to require an eventual total expenditure for RDT&E of more than $365 million in FY 2000 constant dollars or, for procurement of more than $2.190 billion in FY 2000 constant dollars ○ MDA designation • MDA designation as special interest	ACAT ID: USD(AT&L) ACAT IC: Head of the DOD Component or, if delegated, the DOD component acquisition executive (CAE)
ACAT II	• Does not meet criteria for ACAT I • Major system ○ Dollar value: estimated by the DOD Component Head to require an eventual total expenditure for RDT&E of more than $140 million in FY 2000 constant dollars, or for procurement of more than $660 million in FY 2000 constant dollars (10 USC 2302d, reference [o]) ○ MDA designation (10 USC 2302[5], reference [p]) • MDA designation as special interest	DOD CAE or the individual designated by the CAE
ACAT III	• Does not meet criteria for ACAT II or above	Designated by DOD CAE at the lowest level appropriate

Adapted from DOD Instruction 5000.2, *Operation of the Defense Acquisition System,* 21**.**

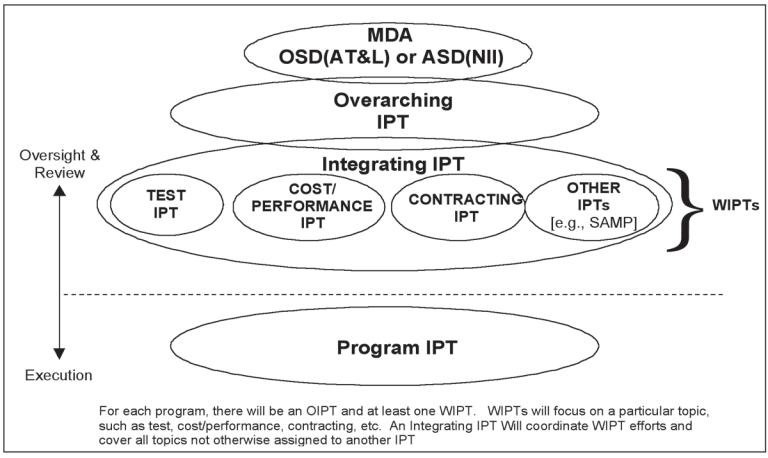


Figure 1. DOD IPT Operational Structure. Reprinted from the Air Force Single Acquisition Management Plan Guide, 3.

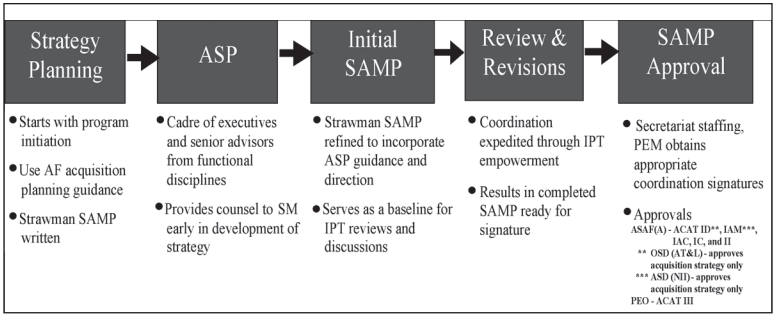


Figure 2. SAMP Development Process. Reprinted from Air Force Single Acquisition Management Plan Guide, 5.

Developing an executable acquisition plan is critical to a program's success. "The nature of the stakeholders' involvement in the SAMP process depends primarily on the size and complexity of the program."[25]

> Each of the program's stakeholders must be involved in the SAMP preparation process. This includes representation from all staff levels (Secretariat, Air Staff, AFOTEC [Air Force Operational Test and Evaluation Center], and OSD) as well as the local Center staff. In addition, representation from other participating service agencies should be involved for joint programs. [Single Managers] SMs should contact the

> cognizant Program Element Monitor (PEM) to identify which agencies from Headquarters Air Force, OSD, and AFOTEC should participate. Representatives from these organizations should be identified according to the appropriate ACAT level of the program. Additionally, since industry also plays to a great extent an equally important role in managing and executing program requirements, SMs may find it beneficial to engage them in the SAMP development process. Early and continuous involvement with industry has proven to enhance a cooperative relationship and maximize the opportunity for a successful program.[26]

This structure and process lays out the basics for good program management. Due to the size and complexity of large acquisition projects, this oversight is typically needed, but does slow down decisions with its inherently bureaucratic nature. An approval process accompanies the structure. For ACAT I and II designated programs, the SAMP must be processed as shown in figure 3.[27]

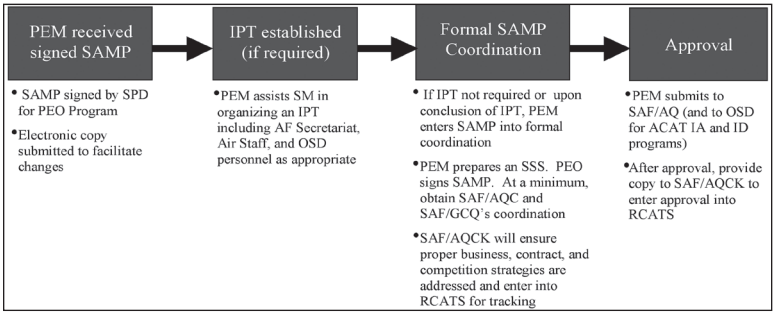


Figure 3. Air Force SAMP Processing. Reprinted from Air Force Single Acquisition Management Plan Guide, 6.

The final aspect of the acquisition process involves MDA and timing. If programs are sufficiently large enough to fall into the ACAT I category, a great deal of MDA is lost to the secretary of the Air Force for acquisition (SAF/AQ) and the office of the secretary of defense (OSD). If kept below the ACAT I and II thresholds, the acquisition can be managed at lower levels, even the acquisition center level.[28]

USSOCOM manages its ACAT II and below programs within the combatant command, with less outside scrutiny than with the ACAT I programs. Additionally, the command's location, outside the Washington, DC, area, translates into

less oversight from OSD. USSOCOM's separate budget and acquisition authorities—the only unified command with acquisition authority—enable it to move faster on development and equipment purchases. Reduced external oversight fits in with the rapid acquisition concept that permits the command to quickly meet the needs of the troops engaged in operations.[29]

With regard to the SAMP process, USSOCOM Directive 70-1, *USSOCOM Acquisition Management Procedures*, is the command's tailored process guide for streamlined acquisition. Collocation of approval authorities precludes the long timeframes typically associated with attaining higher headquarters signatures, and serves to streamline USSOCOM acquisition efforts.[30]

USSOCOM's acquisition authority was granted specifically to overcome the cumbersome acquisition processes.[31] In this regard, the processes at USSOCOM predate and fuse nicely with the Air Force's Air Force Smart Operations (AFSO) 21 effort to "seek to constantly give value to our 'customers.'"[32] In keeping with the spirit of AFSO 21, if the special operations or other community within the services values a COIN aircraft, the Air Force should work with this customer community to see that it receives what it values.

Acquisition Alternatives

Several alternatives exist in procuring an aircraft especially for the COIN mission. Four alternatives, of which numbers one and four are somewhat interrelated, are readily apparent: (1) do nothing; (2) stand up an organic systems program office, and develop a COIN platform from scratch; (3) buy a commercially developed airframe suited for the counterterrorist and COIN missions; or (4) continue to fill the COIN mission with *ad hoc* platforms.

If nothing specific is done, either no COIN platform will be available, or a grouping of mixed and ill-suited platforms will serve in the role. Either way, the requirement to provide COIN aircraft for the missions associated with the GWOT is under-equipped at best and at worst, the requirement is simply not met.

Choice two seems unlikely since the people and dollars required to staff and fund such an effort simply do not exist.

Choice three provides the ideal option for COIN aircraft procurement. This choice offers the opportunity to acquire the performance characteristics desired for a COIN aircraft, with a schedule much shorter than organic development, and at a cost far lower than anticipated in an organic effort.[33]

Five different airframe possibilities—the EMB-314, Super Tucano/A-29 ALX by Embraer, the PC-21/PC-9M Turbo Trainer by Pilatus, the T-6A/T-6B Texan II by Raytheon, the KT-1/KO-1 Woongbee by Korea Aerospace Industries, and the SM-27S/SM-27T by Stavatti—were looked at as a commercial off-the-shelf (COTS)[34] alternative for an effective COIN aircraft. Two platforms, the T-6A NTA Raytheon variant and the Stavatti Machete, were chosen for their respective distinctions of ready availability and specific design as a COIN/close air support (CAS) aircraft.

The T-6A NTA is a weaponized T-6A, the latter currently in production as the USAF's trainer of choice. This weaponized variant was previously built and sold to Greece for use by the Hellenic air force. "The T-6A NTA was originally developed for the Hellenic air force to serve in a dual role as pilot trainer and inexpensive counter-insurgency aircraft."[35] Greece demonstrated the platform's effectiveness by conducting 24-hour airborne security over Athens during the 2004 Olympic games.[36] Given that the aircraft is in production, its performance characteristics are well defined, as are its production schedule and costs.

The T-6A NTA two-seater aircraft has been produced and flown, and its weapon stores qualified in five configurations.[37] The platform is not a design on paper, but a physical finished product with demonstrated performance characteristics. Providing the COIN characteristics that many experts desire, the platform is sufficiently armed to protect ground troops, promote deterrence missions, or engage in punitive strikes. Furthermore, and perhaps most important, the aircraft provides "long endurance for extended loiters"[38] over areas of interest or concern. The five weapon stores configurations currently tested and approved for the T-6A NTA are shown in figure 4. Weapons employment qualification from these store configurations was done at Eglin AFB's Air Armament Center.[39]

In order for an aircraft to provide the traits for good COIN operations, a balance must be achieved between weaponry,

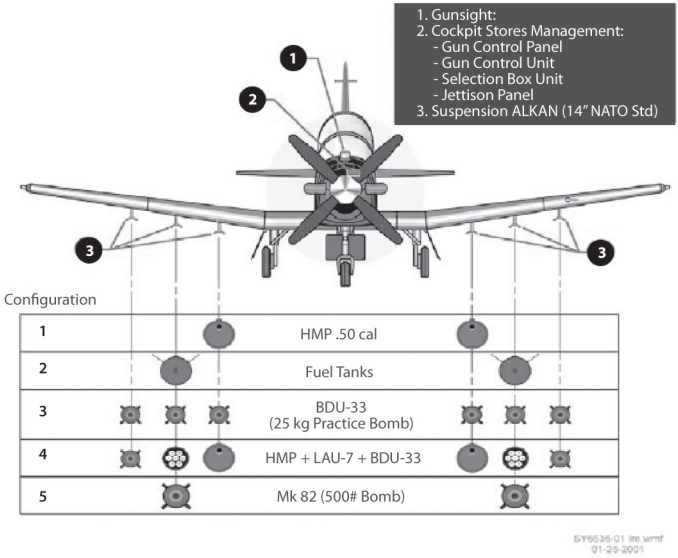


Figure 4. Typical T-SA NTA Stores Configuration. Courtesy of the Raytheon Aircraft Company, Response to Request for Information Fixed Wing Plaform Procurement for the Iraqi Air Force, 8.

weight, and fuel consumption. The T-6A trainer possesses an approximate range of 900 nautical miles (nm). The T-6A NTA weaponized version has a range of about 450 nm, with a much longer reach with the use of external tanks (see figure 5). However, external tanks do reduce the number of pylon hard points available for weapons.

Depending on the ingress and egress times, and the extent to which the T-6A NTA is weaponized, it must possess the capability to loiter for over four and one half hours at 25,000 feet. Loiter time falls significantly with weapons load coupled with activity at lower altitudes.[40] Without weapons, or minimally armed—possibly machine gun only—the T-6A NTA becomes an observation platform with an over 1,100-mile range and nine hours of loiter time. Figure 5 depicts the range and altitude tradeoffs for both the unarmed and weaponized T-6A NTA.[41]

An additional positive performance trait is the T-6A's ability to operate out of short, austere airfields or even off roadways. The aircraft's takeoff requirement is 1,775 feet and it

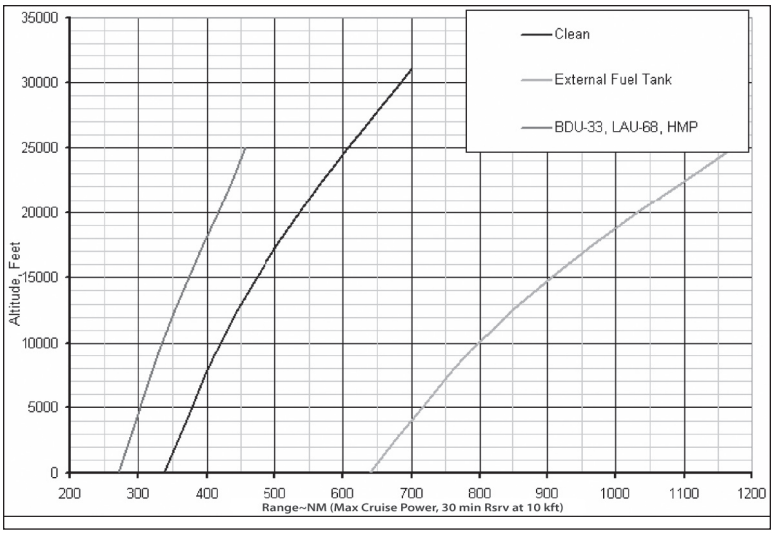


Figure 5. T-6A NTA Range versus Altitude Comparison of Clean, EFT, and HMP/LAU-68/BDU Configurations. Courtesy of the Raytheon Aircraft Company, Response to Request for Informatio Fixed Wing Platform Procurement for the Iraqi Air Force, 7.

can land in as little as 1,900 feet, making it ideal for use in small base operations or for contact with ground troops via primitive roads or open fields. Further performance specification and capabilities can be found in table 4.

The fact that the T-6A NTA is a production aircraft with qualified weapons stores and tested performance should bode well for its consideration as a COIN platform. The demonstrated performance characteristics of long loiter capability, in conjunction with the ability to carry weapons, provide a positive effect on production schedules.

In terms of production timelines and delivery schedules, the T-6A NTA provides an almost immediate response to the need for a COIN aircraft. Since this variant has been produced for the Hellenic air force, spin-up and production time are minimal. Currently, the T-6A production line is 40 aircraft ahead of schedule for the USAF's trainer replacement program, so schedule capacity exists for this platform, and the production design is mature.

Based on Raytheon's demonstrated production performance and experience in actually building T-6A NTAs, the production facilities can produce five T-6A NTA aircraft per month.[42] In this analysis, three aircraft per month was the fastest production schedule examined, under the assumption of USSOCOM standing up a squadron of 36 COIN aircraft. Additionally, a yearly buy schedule of 36 of these aircraft leaves excess production capacity for US allies and partners to simultaneously purchase the same aircraft.

In addition to its highly definitized schedule, the T-6A NTA alternative offers its known purchase costs as another advantage. The commercial cost, known from the Greek production line, is $5,500,000.[43] The total cost, in FY 2007 dollars, to buy 36 of these platforms would be approximately $211.2 million (see table A-1 in appendix A). The low purchase price makes the T-6A NTA an attractive alternative for COIN.

The price for a squadron of 36 T-6A NTAs is far below the ACAT I or II limits, and thus easily within the purview of USSOCOM's acquisition authority and ability to manage. Given that the operations and support costs for 36 aircraft eclipse their purchase price within five years, a good deal of time went into estimating these annual sustainment costs.

The operating costs of the USAF T-6A trainer was used as an analogous system to estimate the total costs of the T-6A NTA to the US military. Using data contained in the Air Force total ownership cost (AFTOC) database, table 2 shows the total FY 2005 costs for the T-6A platform. The T-6A fleet's total cost of $132,673,358 can be divided into the total inventory of 192 T-6A's at the end of FY 2005 for an individual aircraft average cost of $691,007 per year. These costs, displayed in the format required by the cost analysis improvement group (CAIG), show costs associated with unit personnel, unit operations, maintenance, sustaining support, continuing system improvements, and indirect support. Blank cells associated with a CAIG element indicate that no costs were incurred in that area for the platform in FY 2005. However, one must note that with significant contractor logistics support, some elements are aggregated as contract costs and not disaggregated into the level of detail intended by the CAIG structure. For example, under CAIG element 3.1, the contractor provides maintenance under

Table 2. T-6A Operations and Maintenance Costs (FY05)

Level 2 CAIG Data for the T-6A Texan II		
CAIG Element	**CAIG Description**	**Total**
1	Unit Personnel	$31,315,166
1.1	Operations Personnel	$28,935,735
1.2	Maintenance Personnel	$1,432,861
1.3	Other Direct Support Personnel	$946,571
2	Unit Operations	$4,131,662
2.1	Operating Material	$4,131,662
2.2	Support Services	
2.3	TDY	
3	Maintenance (Mx)	$54,652,564
3.1	Organizational Mx and Support	$54,652,564
3.2	Intermediate Mx	
3.3	Depot Mx	
4	Sustaining Support	$26,592,227
4.1	System Specific Training	$26,481,565
4.2	Support Equipment Replacement	
4.3	Operating Equipment Replacement	
4.4	Sustaining Engineering and PM	$110,662
4.5	Other Sustaining Support	
5	Continuing System Improvements	
5.1	Hardware Modifications	
5.2	Software Mx and Modifications	
6	Indirect Support	$15,981,738
6.1	Installation Support	$15,886,580
6.2	Personnel Support	$86,721
6.3	General Training and Education	$8,437
Total	Total Expenditures	$132,673,358

Notes:
a. In Then Years Dollars
b. Slight addition errors may occur in totals due to rounding.

one all-encompassing contract; thus the intermediate and depot maintenance distinction is lost to the database and estimators trying to delineate costs at such a level.[44]

The costs of operating, maintaining, and supporting the munitions must be included to arrive at an adequate, rough order-of-magnitude estimate for the weaponized T-6A costs. For the purposes of this analysis, the munitions costs associated with the 23d Fighter Group, a stand-alone group of A-10s with their own munitions storage area, were deemed analogous to the munitions costs expected of the weaponized T-6A (see table 3). The $4,340,466 total munitions associated costs amounted to an average of $104,590 per A-10 aircraft in FY 2005.

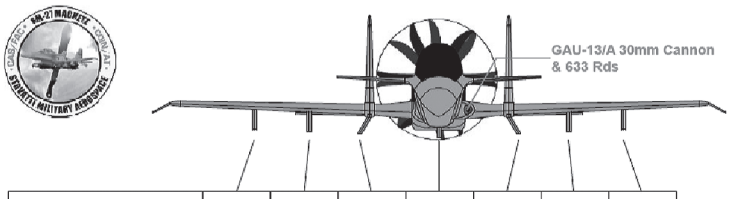
Table 3. Training munitions and expendable stores costs (FY05)

Level 3 CAIG Data for the A-10 Thunderbolt II at Pope AFB		
CAIG Element	**CAIG Description**	**23d Fighter Group**
2.1.2	Training Munitions and Expendable Stores	$4,340,466
2.1.2.1	Ammunition	$2,613,084
2.1.2.2	Bombs	$799,657
2.1.2.3	Rockets	$395,679
2.1.2.4	Training Missiles	
2.1.2.5	Sonobuoys	
2.1.2.6	Pyrotechnics	$532,046

In the cost estimates for a weaponized Raytheon platform, the level three CAIG elements for 23d Fighter Group munitions and stores were incorporated into the T-6A AFTOC data reflected in table 2. Both data sets were normalized for number of aircraft, adjusting the T-6A data from 192 primary aircraft authorization (PAA) and the A-10 data from 41.5 PAA to the 36 COIN aircraft inventory assumption used in this analysis. Data normalization took place simultaneously with the embedding of the munitions costs into the overall estimate for the T-6A NTA.[45] Table A-1 in appendix A (rows 18 through 24) shows the embedding of the munitions and stores costs into the T-6A platform's total costs.[46]

The Machete SM-27, a design aimed at building a platform specifically for CAS and COIN missions, is a proposed product of Stavatti Aerospace. The research and development phase remains incomplete, and no SM-27s are in production.[47]

The SM-27 design calls for a large weapons store, with multiple configurations (see figure 6). None of these configurations have been qualified, and some configurations could be eliminated as a result of weapons qualification testing.



STATION NUMBER	1	2	3	4	5	6	7
AIM-9 Sidewinder	X	X				X	X
AGM-65 Maverick	X	X	X		X	X	X
GBU-38 JDAM/Mk.82	2	2	1	2	1	2	2
GBU-32 JDAM/MK.83	1	1	1	1	1	1	1
GBU-31 JDAM/Mk.84		1	1		1	1	
GBU-24 PAVEWAY III		X	X		X	X	
CBU-105/115 SFW	1	2	1	1	1	2	1
CBU-107 PAW	1	2	1	1	1	2	1
AGM-154 JSOW	1	1	1		1	1	1
LAU-131/A Rocket Pod	2	2	1		1	2	2
M134D Gun Pod	1	1	1	1	1	1	1
ALQ-184(V)9 ECM Pod	1	1	1	1	1	1	1
150 U.S. Gallon Tank		1	1		1	1	
230 U.S. Gallon Tank		1	1		1	1	
Hardpoint Rating @ 7.5g	1,000 lbs	2,500 lbs	2,500 lbs	1,000 lbs	2,500 lbs	2,500 lbs	1,000 lbs

Figure 6. SM-27 Stores Configuration. Courtesy of Stavatti Aerospace, SM-27S/T Turboprop Machete.

The design of the SM-27 is well suited for CAS and COIN, with a balance between weaponry, weight, and fuel consumption, and will provide a tactical radius of 700 nm and an over 1,500 nm ferrying range. However, external tanks do reduce the number of stations available for weapons. A long loiter time is expected, but the large weapons store might significantly reduce loiter capability. Loiter time falls significantly with weapons load at lower altitudes, but the specifications data for the SM-27 would indicate impressively long loiter times when armed solely with its built-in cannon. The tactical radius and weapons payload tradeoffs are illustrated in figure 7.

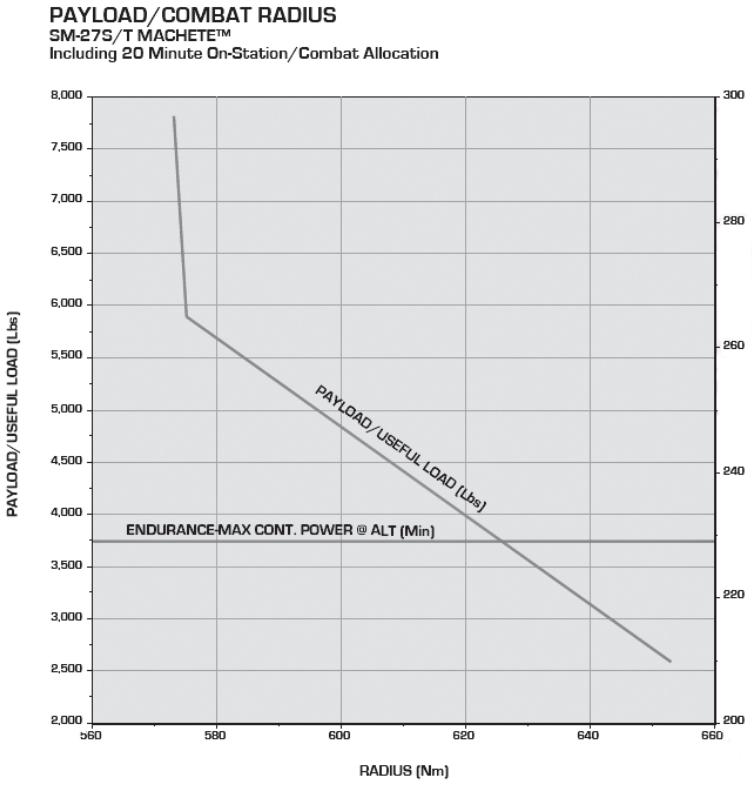


Figure 7. Payload/Combat Radius. Courtesy of Stavatti Aerospace, SM-27S/T Machete, 7.

The SM-27s short takeoff and landing capability is one other performance characteristic. The Machete's capability to take off in a distance of only 1,678 feet, and land in 2,081 feet, enables the airplane to operate in austere environments, under less than optimal conditions—possibly without the necessity of a landing strip—depending on the particular circumstances.

The SM-27 version drives the planned production schedule, with plans to produce 17 two-seater SM-27Ts and 33 one-seat SM-27Ss annually.[48] Due to the long lead time in beginning production, these production plans are assumed to be adjustable.

Any attempt by USSOCOM to quickly obtain 36 aircraft effectively crowds out any allied purchase for the first two years of production. If USSOCOM tries to build a squadron, while encouraging other countries to join in purchasing these aircraft for compatibility of training, there simply will not be enough to go around in the near term—2010 through 2014. Production rates of 12 SM-27Ts, and 18 and 12 SM-27Ss, respectively, are shown in tables B-3, C-2, and C-3 in appendices B and C.

The respective costs of both the T and S variants of the SM-27 are approximately $10,300,000 and $9,500,000. Thus, the total purchase price for the SM-27T is over $426.1 million, and the SM-27S amounts to a little more than $388.9 million (see tables A-2 and A-3 in appendix A). The schedule constraints of 17 SM-27Ts and 33 SM-27Ss each year contribute to cost growth beyond the mere price difference between the variants. Spreading the production runs over two years for the SM-27S and three years for the SM-27T incurs an inflation cost increase of $46.9 million and $55.3 million, respectively. These inflation costs worsen if production is further extended to allow for allied purchases (see appendices B and C).

The SM-27s acquisition costs for 36 aircraft come in significantly under the ACAT II threshold. In order to trigger the requirement for a SAMP, nearly double the number of SM-27s is required.

The costs associated with airframe purchase are the most problematic, with the operating and support costs more manageable. To generate the operations and maintenance costs for the SM-27, several assumptions—the nature of

overall operations and support costs; and that the variants incur the same maintenance costs—were required, as the Machete program office at Stavatti has not yet delved into these costs.[49]

For this analysis, the SM-27s operations and support costs were derived from the T-6A operating and support costs documented in the AFTOC database. This assumption was made based on the reality that commercial aircraft design and production utilize common materials and processes. Therefore, specific adjustments in the estimates for fuel consumption and maintenance requirements were used.[50] All other costs remain the same as for the T-6A (see appendix A, table A-2, rows 68 and 84, for the estimated costs associated with SM-27 fuel consumption and maintenance).

Evaluation/Analysis of Alternatives

Performance is in the eye of the beholder. The T-6A NTA and the SM-27 provide long loiter and/or extended range. However, the SM-27 is designed to carry a heavier weapons load. Table 4 contains a detailed look at the specifications and capabilities of the two aircraft profiled, as well as the often referenced A-1 Skyraider and the Air Force's current CAS airframe, the A-10 Thunderbolt II.[51]

The T-6A NTA is a single-engine, front-mounted, propeller-driven aircraft; while the SM-27, a single-engine, propeller-driven aircraft, is powered by a rear-mounted turboprop that pushes the plane, much like a swamp boat. The SM-27s six-blade propeller system is a Pratt and Whitney design made of modern composites. While the propulsion system on the T-6A NTA is of a proven design, the SM-27 propulsion method is new. The design serves to make the Machete's appearance more "jet-like."

Overall, the SM-27 is more capable than the T-6 NTA, but its weight disadvantages it. The T-6A NTA has a better thrust-to-weight ratio and a shorter landing distance. Both platforms have some advantages over the A-10, which is not particularly suited for the COIN mission. In keeping with Davis' nine characteristics for a COIN aircraft,[52] the T-6A NTA and the SM-27 measure up. Both alternatives (1) are COTS; (2) provide long range and loiter; (3) possess

Table 4. Platform specifications/Capabilities

MANUFACTURER AIRCRAFT PROFILED	**STAVATTI** SM-27 MACHETE™	**RAYTHEON** T-6A TEXAN II	**DOUGLAS** A-1E SKYRAIDER	**FAIRCHILD** A-10A THUNDERBOLT II
Crew	1 to 2	2	1	1
Powerplant(s)	1 x PW127G	PT6A-68	1 x R-3350-26WB	2 x TF34-GE -100
Max Power (SHP)/Thrust (lbs.)	2,920 SHP	1,100 SHP	3,050 HP	18,130 lbs
Span (ft)	43.0	33.4	50.8	57.5
Length (ft)	34.0	33.3	38.8	53.3
Height (ft)	12.0	10.7	15.8	14.7
Wing Area (sq ft)	194	175.3	400	506
MTOW (lbs.)	15,500	6,500	25,000	50,000
Empty Weight (lbs.)	7,120	4,709	12,313	24,959
External/War Load (lbs.)	5,250	2,300	8,000	16,000
Internal Fuel (lbs.)	6,600	1,163	NO DATA	10,700
Internal Fuel (USG)	400	164	NO DATA	1,646
Stores Stations (No.)	7	6	15	11
Internal Gun	1 x 30mm KCA	None	4 x 20 mm	1 x 30mm G-8
Maximum Speed @ SL (Kts)	350	316	276	381
Maximum Speed @ ALT Kts)	403	316	297	380
Maximum Cruise @ALT (Kts)	360	230	164	336
Stall Speed @SL (Kts)	97	74	NO DATA	NA
Max Climb Rate @ SL (ft/min)	7,050	4,500	2,300	6,000
Service Ceiling (ft)	44,000	35,000	31,168	45,000
Tactical Radius, Internal Fuel (nm)	700	400+	NO DATA	540
Ferry Range, Internal Fuel (nm)	1,530	900	1,300	2,130
Max Range, External Tanks (nm)	3,600	1,125	NO DATA	2,454
Wing Loading (lbs/sq ft)	75	37.1	62.5	99
Power/Weight or Thrust/Weight	5 lbs/SHP	5.9 lbs/SHP	8.1 lbs/HP	0.37 to 1
Load Limits (g)	7.5	7.5	NO DATA	7.33
Takeoff Distance (ft)	1,678	1,775	NO DATA	4,000
Landing Distance (ft)	2,081	1,900	NO DATA	2,000
Flyaway Cost (Millions USD)	6 to 9	4 to 7	NO DATA	18

STOL capability; (4) advertise austere airfield ability; (5) provide diverse weapons loads—albeit the Machete touts more; (6) are designed for navigation and fire-control; (7) provide great visibility, with a second seat for an observer; (8) possess sufficient speed; and (9) lack ground–fire absorption capability.[53]

As for the corollary requirement to "lend itself well to training pilots from 'lesser developed' nations,"[54] the costs of both aircraft fit well into USSOCOM's FID mission. However, the T-6A NTA costs approximately 45 percent less than the SM-27, likely making it the more attractive alternative to cash-strapped nations. Having a common aircraft in the United States and foreign inventories facilitates joint training; and politically, the United States looks better in the eyes of its allies when flying in identical platforms.

The political element is important in the FID role. USSOCOM benefits by possessing aircraft identical to what the ally can afford. USSOCOM and allied COIN pilots would be in a better position to collaborate and fight as integrated units in GWOT engagements. To ensure allied access to common COIN aircraft, the production schedules of the alternatives become relevant to the decision.

Delivery dates and quantities provide the T-6A NTA with a decided advantage over the SM-27. The old adage "a bird in the hand is worth two in the bush" applies. Raytheon could have put their COIN design in the hands of USSOCOM pilots in 2007. The earliest realistic date for SM-27 delivery is 2010. The T-6A NTA provides COIN aircraft capability three to four years in advance of the SM-27.

Beyond delivery dates, and serving to further eclipse the SM-27, Raytheon can produce almost twice the number of aircraft per year—60 versus 50—for both Stavatti variants. This production capability would allow allied nations to concurrently purchase the same platform. Before Stavatti produced its first SM-27, Raytheon could manufacture approximately 180 of its T-6A NTA aircraft—a deficiency Stavatti has no plans to overcome.

The purchase price of both options is well below ACAT I and II thresholds for high-level oversight; and equally important, within the acquisition authority and management ability of USSOCOM. Although there is an approximately $200 million difference between the Raytheon and Stavatti

alternatives, the cost considerations in this analysis address the cost-per-flying-hour differences, based on an annual total of 18,000 flying hours.

The operation, maintenance, and support cost estimates associated with each alternative aircraft—the T-6A NTA and the SM-27—are based on the costs of the T-6A Texan II airframe and the munitions costs associated with the 23d Fighter Group's A-10s. The incremental costs of transforming a T-6A into a T-6A NTA are the increase in fuel consumption and some added maintenance. The SM-27 estimate was adjusted for the Stavatti projected fuel and maintenance costs not already in the T-6A data.

Table 5 shows the resulting total costs and cost per flying hour. The fiscal years differ, but they do not work contrary to first impressions when viewing the data. As expected, the weaponized T-6A NTA and the SM-27 are more expensive per flying hour to operate and maintain than the T-6A. Although the T-6A NTA and SM-27 costs are in FY 2013 dollars, they remain far lower than the FY 2005 amount for the 23d Fighter Group's A-10s at Pope AFB.[55]

Little difference exists in comparing the costs per flying hour for the T-6A NTA and the SM-27—$340 per flying hour. Analysis of the cost input data supports that the T-6A NTA possesses the lower operating costs, in that the incremental costs of fuel and maintenance for the SM-27 are greater than that for the T-6A NTA. Therefore, when adding allowances for these two incremental costs within the analogous system, the SM-27 with the higher incremental costs remains the more expensive airframe to operate, support, and maintain.

Using the data in table 5 and the cost estimate provided in table A-1 of appendix A, the cost of quickly standing up a squadron of 36 T-6A NTAs involved an initial procurement investment of $211.2 million in FY 2007. The associated annual operations costs run approximately $38 million. The procurement costs to set up an SM-27 squadron run $426.2 million for the SM-27T and $388.9 million for the SM-27S. These costs are spread over the FYs 2010–13, and have associated annual operations costs of approximately $50 million beginning in FY 2013.

Table 5. Operation and support costs comparison

	T-6A Texan II	T-6A NTA Texan II	SM-27 Machete	A-10/OA-10 (Pope) Thunderbolt II	A-10/OA-10 (Fleet) Thunderbolt II
Total costs	$132,673,358	$44,038,200	$50,158,800	$126,201,549	$1,303,169,482
Flying hours	83,919	18,000	18,000	21,305	111,825
Cost per flying hour	$1,581	$2,447	$2,787	$5,924	$11,654

Recommendation

Bringing together the performance, schedule, and cost aspects of each alternative, which alternative best provides a COIN aircraft solution? While the SM-27 Machete has selection advantages in performance, it falls far short of the T-6A NTA in the areas of cost and schedule. The Machete is a more powerful aircraft, and arguably more aesthetically pleasing—looking more "jet-like." However, the performance characteristics exist only on paper. Therefore, the perhaps less appealing, but demonstrated capability of the T-6A NTA should not be discounted vis-à-vis the SM-27's concept design.

Moving from performance to schedule, the T-6A NTA is far ahead of the SM-27. The T-6A NTA is in production, and 60 aircraft per year will be produced. The SM-27 is at least three years from first production and will only produce 50 aircraft per year, beginning in 2010. This discrepancy in production disadvantages the United States to quickly address the need for a COIN aircraft platform. Further, the difference in production start and annual totals creates a problem for encouraging allies to operate the same aircraft.

As with a USSOCOM purchase decision, allied participation is also tied to aircraft costs. The $5,500,000 per copy T-6A NTA costs about half of the SM-27. Coupled with the $340 cost-per-flying-hour differential, the T-6A NTA is significantly less expensive to purchase and operate. These savings alone should not be the decisive factor in USSOCOM choosing to purchase the T-6A NTA rather than the SM-27. On a side note, the T-6A NTA is an affordable option for less wealthy, allied nations as they engage with the United States

in the GWOT. Any decision to purchase aircraft should focus on value, not solely on price.

The performance characteristics, delivery schedules, and costs differences clearly indicate which alternative to choose. The T-6A NTA is similar to the SM-27 in performance capability, while it completely outclasses the SM-27 in both schedule and cost considerations. Therefore, USSOCOM should select the T-6A NTA as the United States' COIN aircraft. The schedule advantages and cost savings of the T-6A NTA far outweigh the minor performance benefits of the SM-27. The T-6A NTA provides immediate availability of a demonstrated capability at a cost clearly within the budget.

Conclusion

Analysis of the cost estimates, schedule analyses, and performance evaluations indicates the T-6A NTA is the best aircraft option for COIN air operations. The decision resulted from a detailed evaluation of the two alternatives, involving each aircraft's performance, schedule, and cost variables. The acquisition alternatives available to USSOCOM, with regard to the call for a COIN aircraft, were investigated; as were the requirements of the formal acquisition process. Additionally, the streamlined nature of the USSOCOM acquisition process was generally presented, with close attention paid to the ACAT thresholds. The quick tour of acquisition requirements and peculiarities served to educate the reader on the responsibilities inherent in any USSOCOM decision to pursue COIN aircraft procurement. Some discussion was dedicated to USSOCOM's missions as codified in Title 10 and embraced by the command, as well as the command's unique acquisition agility. This agility offers an opportunity to provide an aircraft particularly suited for the COIN/counterterrorism role associated with the GWOT.

Increasingly, advocates within the traditional military services and the special operations community believe that an airborne participant in COIN operations is needed. Historically, aircraft have certainly proven effective in small wars.

Notes

(All notes appear in shortened form. For full details, see the appropriate entry in the bibliography.)

1. Davis, *Back to the Basics*.
2. Ibid., 8–14.
3. Ibid., 2.
4. Ibid., 17.
5. Ibid., 19.
6. The use of *inexpensive* is relative. The cost of buying a propeller-driven aircraft is inexpensive relative to the cost of modern, fourth-generation jet aircraft. In fact, there is an order–of–magnitude difference—$20 million vis-à-vis $200 million.
7. Register, former United States Special Operations Command (USSOCOM) contracting officer, e-mail to author, 14 February 2006.
8. Brown, *Statement of General Bryan D. Brown*, 22 April 2005.
9. Ibid.
10. USSOCOM mission statement.
11. USSOCOM vision statement.
12. USSOCOM Annual Report 2005, 3.
13. Ibid.
14. DOD Instruction (DODI) 4000.19, *Interservice and Intragovernmental Support*; DOD Directives 5100.1, *Functions of the Department of Defense and Its Major Components*, and 5100.3, *Support of the Headquarters of Combatant and Subordinate Joint Commands*.
15. Title 10, *United States Code (USC)*, subsection 166(c).
16. Ibid., subsection 167(f).
17. Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 397.
18. Hughes, "Uses and Abuses of Operations and Maintenance (O&M) Funded Construction,"14–15.
19. Title 10, *USC*, subsection 2805(c); Thomas, Air Force Readiness and Emergency Management; and Hughes, "Uses and Abuses of O&M Funded Construction," 14–15.
20. Johnson, "Program Manager Interviews Gary Smith," 6.
21. Assistant secretary of the Air Force for Acquisition (SAF/AQ), "Air Force Single Acquisition Management Plan Guide," 1.
22. Ibid.
23. Ibid., 5.
24. Ibid., 3.
25. Ibid.
26. Ibid., 4.
27. Ibid., 6.
28. Ibid.
29. Johnson, "Program Manager Interviews Gary Smith," 6.
30. Register, e-mail, 13 and 16 February 2006.
31. Johnson, "Program Manager Interviews Gary Smith," 62.
32. Wynne, Air Force Smart Operations 21, 8 March 2006.
33. The commercial route precludes "gold plating," which typically accompanies organic development, and the tendency to alter the design every

time a new capability becomes available. Additionally, commercial purchase prevents redesign for every recognized threat manifestation. Thus commercial off-the-shelf (COTS) protects schedule and costs and will also guard against performance degradation due to initial design overload.

34. If contracting to this extent, give serious consideration to turning over total system performance responsibility (TSPR) to the contractor. Just as the COTS purchase can eliminate the need for an Air Force standing systems program office, TSPR can remove the requirement for an organic Air Logistics Center function. COTS with TSPR allows the private sector marketplace to provide an end-to-end solution for a COIN aircraft. Such simple solutions, supportable in the marketplace, can provide critical capability, an affordable cost, and are ideally suited for the situation at hand.

35. Raytheon Aircraft Company, "Response to Request for Information," 11.

36. Ibid.

37. Ibid., 20.

38. Downs, "Unconventional Airpower," 23.

39. Raytheon Aircraft Company, "Response to Request for Information," 20.

40. Scott, interview, 26 February 2006.

41. Raytheon Aircraft Company, "Response to Request for Information," 7.

42. Ibid., 2.

43. Ibid., 43.

44. This would be the case for either aircraft alternative examined in this study, if TSPR is sought and approved.

45. This study used the Automated Cost Estimator–Integrated Tools (ACE-IT) cost engine, a product of Tecolote Research, Inc.

46. Each of the estimates generated for the T-6A NTA and SM-27 alternatives uses the T-6A and 23d Fighter Group A-10 costs as an analogy. See appendices A through C.

47. Beskar, interview with author, 27 February 2006.

48. Stavatti Military Aerospace, "Machete RDT and E," 28 June 2005.

49. Sugarman, interview, 24 February 2006.

50. Stavatti Military Aerospace, Cost per Flying Hour Datasheet, SM-27T, 1.

51. Air Force Fact Sheet, http://www.af.mil/library/factsheets/; Military Factory, http://www.militaryfactory.com/aircraft_comparison.asp; Raytheon Aircraft Company, "Response to Request for Information;" and Stavatti Military Aerospace, "Machete RDT and E."

52. Davis, *Back to the Basics*,17.

53. Raytheon Aircraft Company, "Response to Request for Information;" and Stavatti Military Aerospace, "Machete RDT and E."

54. Davis, *Back to the Basics*,17.

55. Interesting to note is the large O&M cost difference between the A-10 and the alternatives presented. If one of the alternatives was considered as an A-10 replacement, the Air Force could fulfill two desires simultaneously–acquire a COIN aircraft and decommission on the A-10, while reducing its total ownership costs.

Appendix A

Estimates

Table A-1

	A	B	C	D	E
1	**Cost by CAIG Element ($K)**	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**
2					
3	**T-6A NTA Aircraft System**	$230,631	$39,692	$40,525	$41,376
4					
5	T-6 Texan II EMD System	No EMD. Aircraft already in production.			
6					
7	T-6 Texan II Production System	$211,193			
8	COTS Purchase Price	$211,193			
9					
10	T-6 Texan II Operations & Support Phase	$19,438	$39,692	$40,525	$41,376
11	Unit Personnel	$3,091	$6,311	$6,444	$6,579
12	Operations Personnel	$2,856	$5,832	$5,954	$6,079
13	Maintenance Personnel	$141	$289	$295	$301
14	Other Direct Support Personnel	$93	$191	$195	$199
15	Unit Operations	$4,472	$9,132	$9,324	$9,520
16	Operating Material	$700	$1,429	$1,459	$1,490
17	Fuel	$700	$1,429	$1,459	$1,490
18	Training Munitions & Expendable Stores	$1,982	$4,047	$4,132	$4,219
19	Ammunition	$1,193	$2,436	$2,488	$2,540
20	Bombs	$365	$746	$761	$777
21	Rockets	$181	$369	$377	$385
22	Training Missiles	No Analogy Costs reflected in AFTOC			
23	Sonobuoys	No Analogy Costs reflected in AFTOC			
24	Pyrotechnics	$243	$496	$507	$517
25	Other Operational Material	$1,791	$3,656	$3,733	$3,812
26	Support Services	$192	$392	$400	$409
27	Purchased Services	$172	$352	$359	$367
28	Transportation	$20	$40	$41	$42
29	Other	No Costs reflected in AFTOC database			
30	TDY	$605	$1,236	$1,262	$1,288
31	Maintenance	$5,394	$11,015	$11,246	$11,482
32	Organizational Maintenance & Support	$5,394	$11,014	$11,246	$11,482
33	Intermediate Maintenance	$0	$0	$0	$0
34	Depot Maintenance	No Costs reflected in AFTOC database			
35	Sustaining Support	$3,543	$7,235	$7,387	$7,542
36	System Specific Training	$3,485	$7,116	$7,265	$7,418
37	Support Equipment Replacement	No Costs reflected in AFTOC database			
38	Operating Equipment Replacement	No Costs reflected in AFTOC database			
39	Sustaining Engineering & Prog Mgmt	$58	$119	$121	$124
40	Other Sustaining Support	No Costs reflected in AFTOC database			
41	Continuing System Improvements	No Costs reflected in AFTOC database			
42	Hardware Modifications	No Costs reflected in AFTOC database			
43	Software Maintenance & Modifications	No Costs reflected in AFTOC database			
44	Indirect Support	$2,141	$4,371	$4,463	$4,557
45	Installation Support	$2,091	$4,269	$4,359	$4,450
46	Personnel Support	$46	$93	$95	$97
47	General Training & Education	$4	$9	$9	$10

Table A-2

	A	B	C	D	E
52	**Cost by CAIG Element ($K)**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
53					
54	**Machete Aircraft System (SM-27T)**	$210,093	$237,119	$71,050	$50,159
55					
56	Machete EMD System	EMD costs embedded in purchase price.			
57					
58	Machete Production System	$198,782	$202,957	$24,379	
59	COTS Purchase Price	$198,782	$202,957	$24,379	
60					
61	Machete Operations & Support Phase	$11,311	$34,163	$46,671	$50,159
62	Unit Personnel	$1,579	$4,769	$6,515	$7,002
63	Operations Personnel	$1,459	$4,407	$6,020	$6,470
64	Maintenance Personnel	$72	$218	$298	$320
65	Other Direct Support Personnel	$48	$144	$197	$212
66	Unit Operations	$2,905	$8,775	$11,987	$12,883
67	Operating Material	$978	$2,953	$4,035	$4,336
68	Fuel	$978	$2,953	$4,035	$4,336
69	Training Munitions & Expendable Stores	$1,013	$3,058	$4,178	$4,490
70	Ammunition	$610	$1,841	$2,515	$2,703
71	Bombs	$187	$563	$770	$827
72	Rockets	$92	$279	$381	$409
73	Training Missiles	No Analogy Costs reflected in AFTOC			
74	Sonobuoys	No Analogy Costs reflected in AFTOC			
75	Pyrotechnics	$124	$375	$512	$550
76	Other Operational Material	$915	$2,763	$3,775	$4,057
77	Support Services	$98	$296	$405	$435
78	Purchased Services	$88	$266	$363	$391
79	Transportation	$10	$30	$41	$45
80	Other	No Analogy Costs reflected in AFTOC			
81	TDY	$309	$934	$1,276	$1,371
82	Maintenance	$3,516	$10,619	$14,507	$15,591
83	Organizational Maintenance & Support	$2,756	$8,323	$11,371	$12,221
84	Intermediate Maintenance	$760	$2,295	$3,136	$3,370
85	Depot Maintenance	No Analogy Costs reflected in AFTOC			
86	Sustaining Support	$1,810	$5,467	$7,469	$8,027
87	System Specific Training	$1,780	$5,377	$7,346	$7,895
88	Support Equipment Replacement	No Analogy Costs reflected in AFTOC			
89	Operating Equipment Replacement	No Analogy Costs reflected in AFTOC			
90	Sustaining Engineering & Prog Mgmt	$30	$90	$123	$132
91	Other Sustaining Support	No Analogy Costs reflected in AFTOC			
92	Continuing System Improvements	No Analogy Costs reflected in AFTOC			
93	Hardware Modifications	No Analogy Costs reflected in AFTOC			
94	Software Maintenance & Modifications	No Analogy Costs reflected in AFTOC			
95	Indirect Support	$1,094	$3,303	$4,513	$4,850
96	Installation Support	$1,068	$3,226	$4,407	$4,736
97	Personnel Support	$23	$70	$96	$103
98	General Training & Education	$2	$7	$9	$10

Table A-3

	A	B	C	D	E
102	**Cost by CAIG Element ($K)**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
103					
104	**Machete Aircraft System (SM-27S)**	$377,579	$77,301	$49,127	$50,159
105					
106	Machete EMD System	EMD costs embedded in purchase price.			
107					
108	Machete Production System	$355,901	$33,034		
109	COTS Purchase Price	$355,901	$33,034		
110					
111	Machete Operations & Support Phase	$21,678	$44,267	$49,127	$50,159
112	Unit Personnel	$3,026	$6,180	$6,858	$7,002
113	Operations Personnel	$2,796	$5,710	$6,337	$6,470
114	Maintenance Personnel	$139	$283	$314	$320
115	Other Direct Support Personnel	$92	$187	$207	$212
116	Unit Operations	$5,568	$11,370	$12,618	$12,883
117	Operating Material	$1,874	$3,827	$4,247	$4,336
118	Fuel	$1,874	$3,827	$4,247	$4,336
119	Training Munitions & Expendable Stores	$1,941	$3,963	$4,398	$4,490
120	Ammunition	$1,168	$2,386	$2,648	$2,703
121	Bombs	$358	$730	$810	$827
122	Rockets	$177	$361	$401	$409
123	Training Missiles	No Analogy Costs reflected in AFTOC			
124	Sonobuoys	No Analogy Costs reflected in AFTOC			
125	Pyrotechnics	$238	$486	$539	$550
126	Other Operational Material	$1,753	$3,580	$3,973	$4,057
127	Support Services	$188	$384	$426	$435
128	Purchased Services	$169	$345	$382	$391
129	Transportation	$19	$39	$44	$45
130	Other	No Analogy Costs reflected in AFTOC			
131	TDY	$593	$1,210	$1,343	$1,371
132	Maintenance	$6,738	$13,760	$15,270	$15,591
133	Organizational Maintenance & Support	$5,282	$10,785	$11,969	$12,221
134	Intermediate Maintenance	$1,457	$2,974	$3,301	$3,370
135	Depot Maintenance	No Analogy Costs reflected in AFTOC			
136	Sustaining Support	$3,469	$7,084	$7,862	$8,027
137	System Specific Training	$3,412	$6,968	$7,733	$7,895
138	Support Equipment Replacement	No Analogy Costs reflected in AFTOC			
139	Operating Equipment Replacement	No Analogy Costs reflected in AFTOC			
140	Sustaining Engineering & Prog Mgmt	$57	$117	$129	$132
141	Other Sustaining Support	No Analogy Costs reflected in AFTOC			
142	Continuing System Improvements	No Analogy Costs reflected in AFTOC			
143	Hardware Modifications	No Analogy Costs reflected in AFTOC			
144	Software Maintenance & Modifications	No Analogy Costs reflected in AFTOC			
145	Indirect Support	$2,096	$4,280	$4,750	$4,850
146	Installation Support	$2,047	$4,180	$4,639	$4,736
147	Personnel Support	$45	$91	$101	$103
148	General Training & Education	$4	$9	$10	$10

Appendix B

Estimates

Table B-1

	A	B	C	D	E
1	**Cost by CAIG Element ($K)**	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**
2					
3	**T-6A NTA Aircraft System**	$115,315	$137,583	$40,525	$41,376
4					
5	T-6 Texan II EMD System	No EMD. Aircraft already in production.			
6					
7	T-6 Texan II Production System	$105,596	$107,814		
8	COTS Purchase Price	$105,596	$107,814		
9					
10	T-6 Texan II Operations & Support Phase	$9,719	$29,769	$40,525	$41,376
11	Unit Personnel	$1,545	$4,733	$6,444	$6,579
12	Operations Personnel	$1,428	$4,374	$5,954	$6,079
13	Maintenance Personnel	$71	$217	$295	$301
14	Other Direct Support Personnel	$47	$143	$195	$199
15	Unit Operations	$2,236	$6,849	$9,324	$9,520
16	Operating Material	$350	$1,072	$1,459	$1,490
17	Fuel	$350	$1,072	$1,459	$1,490
18	Training Munitions & Expendable Stores	$991	$3,035	$4,132	$4,219
19	Ammunition	$597	$1,827	$2,488	$2,540
20	Bombs	$183	$559	$761	$777
21	Rockets	$90	$277	$377	$385
22	Training Missiles	No Analogy Costs reflected in AFTOC			
23	Sonobuoys	No Analogy Costs reflected in AFTOC			
24	Pyrotechnics	$122	$372	$507	$517
25	Other Operational Material	$895	$2,742	$3,733	$3,812
26	Support Services	$96	$294	$400	$409
27	Purchased Services	$86	$264	$359	$367
28	Transportation	$10	$30	$41	$42
29	Other	No Costs reflected in AFTOC database			
30	TDY	$303	$927	$1,262	$1,288
31	Maintenance	$2,697	$8,261	$11,246	$11,482
32	Organizational Maintenance & Support	$2,697	$8,261	$11,246	$11,482
33	Intermediate Maintenance	$0	$0	$0	$0
34	Depot Maintenance	No Costs reflected in AFTOC database			
35	Sustaining Support	$1,772	$5,426	$7,387	$7,542
36	System Specific Training	$1,742	$5,337	$7,265	$7,418
37	Support Equipment Replacement	No Costs reflected in AFTOC database			
38	Operating Equipment Replacement	No Costs reflected in AFTOC database			
39	Sustaining Engineering & Prog Mgmt	$29	$89	$121	$124
40	Other Sustaining Support	No Costs reflected in AFTOC database			
41	Continuing System Improvements	No Costs reflected in AFTOC database			
42	Hardware Modifications	No Costs reflected in AFTOC database			
43	Software Maintenance & Modifications	No Costs reflected in AFTOC database			
44	Indirect Support	$1,070	$3,278	$4,463	$4,557
45	Installation Support	$1,045	$3,202	$4,359	$4,450
46	Personnel Support	$23	$70	$95	$97
47	General Training & Education	$2	$7	$9	$10

Table B-2

	A	B	C	D	E
52	**Cost by CAIG Element ($K)**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
53					
54	**Machete Aircraft System (SM-27T)**	$210,093	$237,119	$71,050	$50,159
55	Machete EMD System	EMD costs embedded in purchase price.			
56					
57	Machete Production System	$198,782	$202,957	$24,379	
58	COTS Purchase Price	$198,782	$202,957	$24,379	
59					
60	Machete Operations & Support Phase	$11,311	$34,163	$46,671	$50,159
61	Unit Personnel	$1,579	$4,769	$6,515	$7,002
62	Operations Personnel	$1,459	$4,407	$6,020	$6,470
63	Maintenance Personnel	$72	$218	$298	$320
64	Other Direct Support Personnel	$48	$144	$197	$212
65	Unit Operations	$2,905	$8,775	$11,987	$12,883
66	Operating Material	$978	$2,953	$4,035	$4,336
67	Fuel	$978	$2,953	$4,035	$4,336
68	Training Munitions & Expendable Stores	$1,013	$3,058	$4,178	$4,490
69	Ammunition	$610	$1,841	$2,515	$2,703
70	Bombs	$187	$563	$770	$827
71	Rockets	$92	$279	$381	$409
72	Training Missiles	No Analogy Costs reflected in AFTOC			
73	Sonobuoys	No Analogy Costs reflected in AFTOC			
74	Pyrotechnics	$124	$375	$512	$550
75	Other Operational Material	$915	$2,763	$3,775	$4,057
76	Support Services	$98	$296	$405	$435
77	Purchased Services	$88	$266	$363	$391
78	Transportation	$10	$30	$41	$45
79	Other	No Costs reflected in AFTOC database			
80	TDY	$309	$934	$1,276	$1,371
81	Maintenance	$3,516	$10,619	$14,507	$15,591
82	Organizational Maintenance & Support	$2,756	$8,323	$11,371	$12,221
83	Intermediate Maintenance	$760	$2,295	$3,136	$3,370
84	Depot Maintenance	No Costs reflected in AFTOC database			
85	Sustaining Support	$1,810	$5,467	$7,469	$8,027
86	System Specific Training	$1,780	$5,377	$7,346	$7,895
87	Support Equipment Replacement	No Costs reflected in AFTOC database			
88	Operating Equipment Replacement	No Costs reflected in AFTOC database			
89	Sustaining Engineering & Prog Mgmt	$30	$90	$123	$132
90	Other Sustaining Support	No Costs reflected in AFTOC database			
91	Continuing System Improvements	No Costs reflected in AFTOC database			
92	Hardware Modifications	No Costs reflected in AFTOC database			
93	Software Maintenance & Modifications	No Costs reflected in AFTOC database			
94	Indirect Support	$1,094	$3,303	$4,513	$4,850
95	Installation Support	$1,068	$3,226	$4,407	$4,736
96	Personnel Support	$23	$70	$96	$103
97	General Training & Education	$2	$7	$9	$10

Table B-3

	A	B	C	D	E
102	**Cost by CAIG Element ($K)**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
103					
104	**Machete Aircraft System (SM-27S)**	$205,909	$234,292	$49,127	$50,159
105					
106	Machete EMD System	EMD costs embedded in purchase price.			
107					
108	Machete Production System	$194,128	$198,204		
109	COTS Purchase Price	$194,128	$198,204		
110					
111	Machete Operations & Support Phase	$11,782	$36,088	$49,127	$50,159
112	Unit Personnel	$1,645	$5,038	$6,858	$7,002
113	Operations Personnel	$1,520	$4,655	$6,337	$6,470
114	Maintenance Personnel	$75	$231	$314	$320
115	Other Direct Support Personnel	$50	$152	$207	$212
116	Unit Operations	$3,026	$9,269	$12,618	$12,883
117	Operating Material	$1,019	$3,120	$4,247	$4,336
118	Fuel	$1,019	$3,120	$4,247	$4,336
119	Training Munitions & Expendable Stores	$1,055	$3,231	$4,398	$4,490
120	Ammunition	$635	$1,945	$2,648	$2,703
121	Bombs	$194	$595	$810	$827
122	Rockets	$96	$295	$401	$409
123	Training Missiles	No Analogy Costs reflected in AFTOC			
124	Sonobuoys	No Analogy Costs reflected in AFTOC			
125	Pyrotechnics	$129	$396	$539	$550
126	Other Operational Material	$953	$2,919	$3,973	$4,057
127	Support Services	$102	$313	$426	$435
128	Purchased Services	$92	$281	$382	$391
129	Transportation	$10	$32	$44	$45
130	Other	No Analogy Costs reflected in AFTOC			
131	TDY	$322	$986	$1,343	$1,371
132	Maintenance	$3,662	$11,217	$15,270	$15,591
133	Organizational Maintenance & Support	$2,871	$8,792	$11,969	$12,221
134	Intermediate Maintenance	$792	$2,425	$3,301	$3,370
135	Depot Maintenance	No Analogy Costs reflected in AFTOC			
136	Sustaining Support	$1,886	$5,775	$7,862	$8,027
137	System Specific Training	$1,855	$5,680	$7,733	$7,895
138	Support Equipment Replacement	No Analogy Costs reflected in AFTOC			
139	Operating Equipment Replacement	No Analogy Costs reflected in AFTOC			
140	Sustaining Engineering & Prog Mgmt	$31	$95	$129	$132
141	Other Sustaining Support	No Analogy Costs reflected in AFTOC			
142	Continuing System Improvements	No Analogy Costs reflected in AFTOC			
143	Hardware Modifications	No Analogy Costs reflected in AFTOC			
144	Software Maintenance & Modifications	No Analogy Costs reflected in AFTOC			
145	Indirect Support	$1,139	$3,489	$4,750	$4,850
146	Installation Support	$1,113	$3,408	$4,639	$4,736
147	Personnel Support	$24	$74	$101	$103
148	General Training & Education	$2	$7	$10	$10

Appendix C

Estimates

Table C-1

	A	B	C	D	E
1	**Cost by CAIG Element ($K)**	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**
2					
3	**T-6A NTA Aircraft System**	$77,006	$98,470	$107,427	$41,376
4					
5	T-6 Texan II EMD System	No EMD. Aircraft already in production.			
6					
7	T-6 Texan II Production System	$70,398	$71,876	$73,385	
8	COTS Purchase Price	$70,398	$71,876	$73,385	
9					
10	T-6 Texan II Operations & Support Phase	$6,609	$26,594	$34,041	$41,376
11	Unit Personnel	$1,051	$4,228	$5,413	$6,579
12	Operations Personnel	$971	$3,907	$5,001	$6,079
13	Maintenance Personnel	$48	$194	$248	$301
14	Other Direct Support Personnel	$32	$128	$164	$199
15	Unit Operations	$1,521	$6,119	$7,832	$9,520
16	Operating Material	$238	$957	$1,225	$1,490
17	Fuel	$238	$957	$1,225	$1,490
18	Training Munitions & Expendable Stores	$674	$2,712	$3,471	$4,219
19	Ammunition	$406	$1,632	$2,090	$2,540
20	Bombs	$124	$500	$640	$777
21	Rockets	$61	$247	$316	$385
22	Training Missiles	No Analogy Costs reflected in AFTOC			
23	Sonobuoys	No Analogy Costs reflected in AFTOC			
24	Pyrotechnics	$83	$332	$426	$517
25	Other Operational Material	$609	$2,450	$3,136	$3,812
26	Support Services	$65	$263	$336	$409
27	Purchased Services	$59	$236	$302	$367
28	Transportation	$7	$27	$34	$42
29	Other	No Costs reflected in AFTOC database			
30	TDY	$206	$828	$1,060	$1,288
31	Maintenance	$1,834	$7,380	$9,447	$11,482
32	Organizational Maintenance & Support	$1,834	$7,380	$9,446	$11,482
33	Intermediate Maintenance	$0	$0	$0	$0
34	Depot Maintenance	No Costs reflected in AFTOC database			
35	Sustaining Support	$1,205	$4,847	$6,205	$7,542
36	System Specific Training	$1,185	$4,768	$6,103	$7,418
37	Support Equipment Replacement	No Costs reflected in AFTOC database			
38	Operating Equipment Replacement	No Costs reflected in AFTOC database			
39	Sustaining Engineering & Prog Mgmt	$20	$80	$102	$124
40	Other Sustaining Support	No Costs reflected in AFTOC database			
41	Continuing System Improvements	No Costs reflected in AFTOC database			
42	Hardware Modifications	No Costs reflected in AFTOC database			
43	Software Maintenance & Modifications	No Costs reflected in AFTOC database			
44	Indirect Support	$728	$2,929	$3,749	$4,557
45	Installation Support	$711	$2,860	$3,661	$4,450
46	Personnel Support	$16	$63	$80	$97
47	General Training & Education	$2	$6	$8	$10

Table C-2

	A	B	C	D	E
52	**Cost by CAIG Element ($K)**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
53					
54	**Machete Aircraft System (SM-27T)**	$148,328	$175,502	$187,539	$50,159
55					
56	Machete EMD System	EMD costs embedded in purchase price.			
57					
58	Machete Production System	$140,317	$143,264	$146,272	
59	COTS Purchase Price	$140,317	$143,264	$146,272	
60					
61	Machete Operations & Support Phase	$8,012	$32,238	$41,267	$50,159
62	Unit Personnel	$1,118	$4,501	$5,761	$7,002
63	Operations Personnel	$1,033	$4,159	$5,323	$6,470
64	Maintenance Personnel	$51	$206	$264	$320
65	Other Direct Support Personnel	$34	$136	$174	$212
66	Unit Operations	$2,058	$8,280	$10,599	$12,883
67	Operating Material	$693	$2,787	$3,567	$4,336
68	Fuel	$693	$2,787	$3,567	$4,336
69	Training Munitions & Expendable Stores	$717	$2,886	$3,694	$4,490
70	Ammunition	$432	$1,737	$2,224	$2,703
71	Bombs	$132	$532	$681	$827
72	Rockets	$65	$263	$337	$409
73	Training Missiles	No Analogy Costs reflected in AFTOC			
74	Sonobuoys	No Analogy Costs reflected in AFTOC			
75	Pyrotechnics	$88	$354	$453	$550
76	Other Operational Material	$648	$2,607	$3,338	$4,057
77	Support Services	$70	$280	$358	$435
78	Purchased Services	$62	$251	$321	$391
79	Transportation	$7	$29	$37	$45
80	Other	No Analogy Costs reflected in AFTOC			
81	TDY	$219	$881	$1,128	$1,371
82	Maintenance	$2,490	$10,021	$12,827	$15,591
83	Organizational Maintenance & Support	$1,952	$7,854	$10,054	$12,221
84	Intermediate Maintenance	$538	$2,166	$2,773	$3,370
85	Depot Maintenance	No Analogy Costs reflected in AFTOC			
86	Sustaining Support	$1,282	$5,159	$6,604	$8,027
87	System Specific Training	$1,261	$5,074	$6,496	$7,895
88	Support Equipment Replacement	No Analogy Costs reflected in AFTOC			
89	Operating Equipment Replacement	No Analogy Costs reflected in AFTOC			
90	Sustaining Engineering & Prog Mgmt	$21	$85	$109	$132
91	Other Sustaining Support	No Analogy Costs reflected in AFTOC			
92	Continuing System Improvements	No Analogy Costs reflected in AFTOC			
93	Hardware Modifications	No Analogy Costs reflected in AFTOC			
94	Software Maintenance & Modifications	No Analogy Costs reflected in AFTOC			
95	Indirect Support	$775	$3,117	$3,990	$4,850
96	Installation Support	$757	$3,044	$3,897	$4,736
97	Personnel Support	$17	$67	$85	$103
98	General Training & Education	$2	$7	$8	$10

Table C-3

	A	B	C	D	E
102	**Cost by CAIG Element ($K)**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
103					
104	**Machete Aircraft System (SM-27S)**	$137,430	$164,374	$176,178	$50,159
105					
106	Machete EMD System	EMD costs embedded in purchase price.			
107					
108	Machete Production System	$129,418	$132,136	$134,911	
109	COTS Purchase Price	$129,418	$132,136	$134,911	
110					
111	Machete Operations & Support Phase	$8,012	$32,238	$41,267	$50,159
112	Unit Personnel	$1,118	$4,501	$5,761	$7,002
113	Operations Personnel	$1,033	$4,159	$5,323	$6,470
114	Maintenance Personnel	$51	$206	$264	$320
115	Other Direct Support Personnel	$34	$136	$174	$212
116	Unit Operations	$2,058	$8,280	$10,599	$12,883
117	Operating Material	$693	$2,787	$3,567	$4,336
118	Fuel	$693	$2,787	$3,567	$4,336
119	Training Munitions & Expendable Stores	$717	$2,886	$3,694	$4,490
120	Ammunition	$432	$1,737	$2,224	$2,703
121	Bombs	$132	$532	$681	$827
122	Rockets	$65	$263	$337	$409
123	Training Missiles	No Analogy Costs reflected in AFTOC			
124	Sonobuoys	No Analogy Costs reflected in AFTOC			
125	Pyrotechnics	$88	$354	$453	$550
126	Other Operational Material	$648	$2,607	$3,338	$4,057
127	Support Services	$70	$280	$358	$435
128	Purchased Services	$62	$251	$321	$391
129	Transportation	$7	$29	$37	$45
130	Other	No Analogy Costs reflected in AFTOC			
131	TDY	$219	$881	$1,128	$1,371
132	Maintenance	$2,490	$10,021	$12,827	$15,591
133	Organizational Maintenance & Support	$1,952	$7,854	$10,054	$12,221
134	Intermediate Maintenance	$538	$2,166	$2,773	$3,370
135	Depot Maintenance	No Analogy Costs reflected in AFTOC			
136	Sustaining Support	$1,282	$5,159	$6,604	$8,027
137	System Specific Training	$1,261	$5,074	$6,496	$7,895
138	Support Equipment Replacement	No Analogy Costs reflected in AFTOC			
139	Operating Equipment Replacement	No Analogy Costs reflected in AFTOC			
140	Sustaining Engineering & Prog Mgmt	$21	$85	$109	$132
141	Other Sustaining Support	No Analogy Costs reflected in AFTOC			
142	Continuing System Improvements	No Analogy Costs reflected in AFTOC			
143	Hardware Modifications	No Analogy Costs reflected in AFTOC			
144	Software Maintenance & Modifications	No Analogy Costs reflected in AFTOC			
145	Indirect Support	$775	$3,117	$3,990	$4,850
146	Installation Support	$757	$3,044	$3,897	$4,736
147	Personnel Support	$17	$67	$85	$103
148	General Training & Education	$2	$7	$8	$10

Appendix D

2005 actuals adjusted for inflation

Table D-1

	A	B	C	D	E
152	**Cost by CAIG Element ($K)**	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**
153					
154	**A-10 Aircraft System (Pope AFB, ACC)**	$132,858	$135,648	$138,497	$141,405
155	**23 Fighter Group O&S Costs Only**				
156					
157	Unit Personnel	$70,096	$71,568	$73,071	$74,606
158	Operations Personnel	$18,122	$18,502	$18,891	$19,287
159	Maintenance Personnel	$48,490	$49,508	$50,548	$51,609
160	Other Direct Support Personnel	$3,485	$3,558	$3,633	$3,709
161	Unit Operations	$28,010	$28,598	$29,198	$29,812
162	Operating Material	$26,225	$26,775	$27,338	$27,912
163	Support Services	$390	$398	$407	$415
164	TDY	$1,395	$1,424	$1,454	$1,485
165	Maintenance	$22,343	$22,812	$23,291	$23,780
166	Organizational Maintenance & Support	$22,343	$22,812	$23,291	$23,780
167	Intermediate Maintenance	No Costs reflected in AFTOC database			
168	Depot Maintenance	No Costs reflected in AFTOC database			
169	Sustaining Support	$550	$561	$573	$585
170	System Specific Training	$537	$548	$559	$571
171	Support Equipment Replacement	$13	$14	$14	$14
172	Operating Equipment Replacement	No Costs reflected in AFTOC database			
173	Sustaining Engineering & Prog Mgmt	No Costs reflected in AFTOC database			
174	Other Sustaining Support	No Costs reflected in AFTOC database			
175	Continuing System Improvements	No Costs reflected in AFTOC database			
176	Hardware Modifications	No Costs reflected in AFTOC database			
177	Software Maintenance & Modifications	No Costs reflected in AFTOC database			
178	Indirect Support	$11,860	$12,109	$12,363	$12,623
179	Installation Support	$10,586	$10,809	$11,036	$11,267
180	Personnel Support	$1,274	$1,301	$1,328	$1,356
181	General Training & Education	$0	$0	$0	$0

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