

06-30-2009 Eagan, Minnesota

Machete Evolution: Building A Better COIN Aircraft

The Machete is not a trainer that has been modified for light combat. The Machete is not an Agricultural Spray Plan adapted for Counter-Insurgency. Counter-Insurgency is Not Dust'n Crops. The Machete is a thoughtfully conceived series of combat aircraft that have evolved to arrive at a family of aircraft designed from the onset to provide a superior solution for COIN, CAS, FAC, ADF, APT and even ISR. The Machete has evolved into a Common Affordable Light Weight Fighter that will be produced in three principal variants, each optimized for specific missions.

There are reasons why the Machete is the way it is. The aircraft had a distinct design history, beginning as a COIN variant of the Sleek sportplane only to evolve into a unique design of its own driven by mission requirements.

The Early Days

The original Machete design was conceived in 2000 in response to an inquiry by a potential military customer who was impressed by the SM-26 Sleek as a military trainer and wondered if the same aircraft could be equipped with light weapons to satisfy the COIN/light attack role. The Sleek design of that era was a single engine, two seat tandem aircraft powered by a 600 Hp Supercharged V-8. Based on our study of COIN platforms such as the OV-10, A-37 and IA-58, we began exploring what a COIN variant of the Sleek would look like and the Machete was born.

The first Machete design studies focused upon an aircraft that was similar to P-51D Mustang/ Cavalier Mustang in terms of size and capability. The aircraft would be powered by a PT6A-68B Turboprop with approximately 1,200 to 1,600 SHP and have up to six external hardpoints to carry around 2,500 lbs of external stores. Initial Machete concepts were compact with a 39 ft wing span, 29 ft length and 145 sq ft of wing area, and with a gross weight of approximately 5,000 lbs, a 265 KTAS maximum level speed, and a climb rate of 3,600 ft/min at sea level. The initial COIN concept was envisioned as a very low cost GA derivative aircraft that could perform light attack. This early Machete was very much like a heavily armored Siai-Marchetti SF.260W, yet with greater performance and capability. At that time, Stavatti studied the SF.260 and had two aircraft from a nearby "Top Gun" combat simulation company available for hands-on analysis.

The early Machete designs were very nice, compact, highly affordable lightweight strike aircraft. However, they were essentially a general aviation lightplane equipped for bushwars. It was not a dedicated combat aircraft. Paying close attention to lessons learned in World War II, Korea and the Vietnam War, Stavatti became a student of Close Air Support, Counter-Insurgency and Irregular Warfare. We began reviewing famed attack aircraft such as the P-47, A-1H, A-26, T-28D, A-4, A-7, OV-10, A-37 and countless others. We studied the Falklands War and reviewed lessons learned from the IA-58 Pucara. We studied the Rutan Model 151 ARES. And we began an exhaustive overview of what COIN was and how military aircraft could best be applied to win a ground-war.

The conclusions of our study resulted in what became the first "official" Machete configuration, designated SM-27 in November 2000 and projected as a \$4 Million aircraft. The SM-27 Machete built upon the Sleek airframe, yet was conceived for air-to-ground combat. Viewed as a potential successor to the OV-10, this first Machete configuration was powered by a PW127 turboprop with 2,750 SHP, giving it significantly greater power than a T-6A or PC-9. With a 39 ft wingspan and 29 ft length, the SM-27 was still the size of a Sleek, but with a much higher gross weight of 14,500 lbs to mirror that of the A-37. The Machete

was armed with a fixed 30 mm Oerlikon KCA cannon to provide anti-armor capability. The SM-27 with a maximum level speed of 420 KTAS, a stall speed of 100 KTAS and a 350 nm tactical radius, was more capable than a Texan II or Super Tucano, yet was still within their class and price-range. The Machete had become the Stavatti answer to JPATs and the ALX. Armed with a 30mm cannon and a 5,000 lb warload, the first Machete design offered more capabilities than the AT-6B at a competitive price. The SM-27 could be a light attack aircraft or an advanced trainer with its Martin Baker MKUS.16L ejection seats. From 2000 until 2003 Stavatti concentrated upon this initial Machete design which would serve both as a combat aircraft and the basis for the civilian Sleek line.

Mid-Development

In 2003 Stavatti learned of a potential requirement for 24 COIN aircraft for the Colombian Air Force (FAC). A study of this requirement resulted in a review and enhancement of the Machete design, resulting in the release of a new configuration in late 2003. This new Machete built upon the 2000 design, but increased the overall size of the aircraft to accommodate more sophisticated sensors and avionics while having unreclined, upright ejection seats. The 2003-2006 Machete featured a longer, 43 ft wingspan and an overall length of 34 ft. Wing area was increased to 196 sq ft and the more powerful 2,920 SHP PW127G turboprop was selected. The new Machete was heavier at 15,500 lb gross weight, with the addition of more dedicated armor and superior integrated avionics. This Machete configuration was maintained as standard through 2004 and was the basis of all proposals submitted to FAC.

In 2004 we considered that the Machete and Sleek had always been pusher aircraft, featuring an aft fuselage mounted powerplant. Although turboprop powered versions of both aircraft had been contemplated, it wasn't until 2004 that the design for such an aircraft was seriously undertaken. While there are many benefits to the Machete's pusher arrangement, the most valuable justification of the configuration came with the ability for the aircraft to be produced in either turboprop or turboprop configurations requiring only aft-of-the-firewall modifications. The Machete was and currently is the only COIN/CAS aircraft that can be offered in prop or pure jet configurations, resulting in the creation of at least two distinct product lines to meet specific mission needs.

The first Jet Machete, the SM-27J, was based upon the Turboprop Machete airframe, but included lateral fuselage air intakes and an aft mounted PW308C jet engine that would deliver 7,000 lbs of thrust. Offering a maximum level speed of over 460 KTAS, the original SM-27J of 2004 was really quite similar to the turboprop in terms of fuel, warload, and general specifications.

The Machete was a modular aircraft which had a fuselage suitable for supersonic flight. In 2004 Stavatti also began work on Light Weight Fighter (LWF) variant featuring a Forward Swept Wing known as the Super Machete, powered by a non-afterburning GEAE F404/F1D2. The Super Machete was intended to be a low cost successor to F-5s which could super-cruise. This FSW configuration led to the realization that the Machete series need a Fly-By-Wire flight control system while resulting in a desire to develop a new horizontal stabilizer platform.


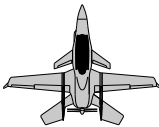
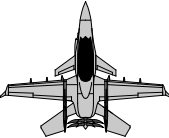
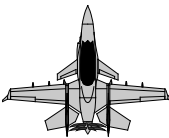
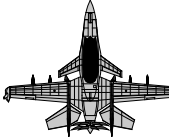
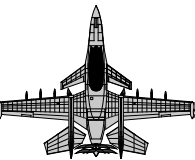
From May through September of 2005 Stavatti began discussions with Pentagon based USAF planning offices as well as Air Warfare Battlelabs focused upon new irregular warfare solutions. During this timeframe, which included a Project Air Force study by the Rand Corporation, Stavatti began a significant redesign of the Machete to incorporate both a more compact, trapezoidal, close-coupled horizontal stabilizer as well as a dedicated four channel digital Fly-By-Wire (FBW) flight control system. Prior to 2006, the Machete design was to have a mechanical, direct-force-feedback flight control system. Machete gross weight was increased to 16,000 lbs and the port fuselage mounted KCA cannon was replaced by a fixed, ventrally mounted 30mm GD GAU-13/A derived from the GAU-8 Avenger cannon used on the A-10. This switch to the GAU-13 and a new horizontal stabilizer configuration resulted into a new weapon system focused upon net-centric warfare with an anti-armor emphasis. These design changes were applied across-the-board to the Turboprop, Turboprop and Super Machete variants, resulting in new versions of each model for 2005-2006.

By 2006 the Machete consisted of a family of modular aircraft designed around a common fuselage and

empennage core. 2006 to 2007 was a time when the Machete series was designed to ensure that aircraft within the family maintained 60% commonality with the SM-27S/T and SM-27J/L sharing wings, fuselage, empennage and landing gear while the SM-47S/T shared the SM-27J/L fuselage, air intakes and landing gear. During this time the Sleek sportplane was considered to be a demilitarized Machete which would be produced in single engine piston, single engine jet and “supersonic” variants. Envisioned as a very high performance sportplane for the wealthiest aviation connoisseur, the Sleek had drifted far from its original market focus.

Current Design





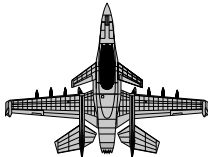
From 2007 to 2009 Stavatti engaged in a complete ground-up redesign of the Machete. This redesign was not conducted in a vacuum, but was based upon feedback of our 2006/2007 design as given by current and former USAF and USN pilots, operators, supporters, mission planners and commanders. When the Machete project began, it was intended to satisfy the light attack needs of friendly allies. By 2007 the Machete mission was to provide real irregular warfare capability while satisfying a host of missions using three core variant aircraft. By 2009 the new Machete weighed a gross weight 10,000 lbs higher than the original concept from back in 2000. To provide a clear understanding of the dramatic changes and enhancements made to the Machete concept over the past eight years, the following summary tables document the evolution of the Machete design:

TURBOPROP MACHETE EVOLUTION 2000-2009					
AIRCRAFT CONCEPT YEAR STATUS	SM-27 MACHETE 2000 Retired in 2003	SM-27S/T MACHETE 2003 Retired in 2006	SM-27S/T MACHETE 2006 Retired in 2007	SM-27S/T MACHETE 2007 Retired in 2009	SM-27S/T MACHETE 2009 Present Design
					
Crew	1	1 to 2	1 to 2	1 to 2	1 to 2
Powerplant(s)	1 x PW127	1 x PW127G	1 x PW127G	1 x PW127G	1 x PW127G
Max Power (SHP)	2,750	2,920	2,920	2,920	2,920
Span (ft)	39.0	43.0	43.0	43.0	50.0
Length (ft)	29.75	34.0	33.0	33.0	38.0
Height (ft)	9.75	12.0	12.0	12.0	12.75
Wing Area (sq ft)	169	196	198	218	280
MTOW (lbs)	14,500	15,500	16,000	17,825	24,104
Empty Weight (lbs)	6,350	7,120	7,120	8,542	11,200
External Warload (lbs)	5,000	5,250	5,250	5,720	6,500
Internal Fuel (lbs)	2,600	2,600	2,600	2,600	5,000
Internal Fuel (USG)	400	400	400	400	770
Stores Stations (No.)	7	7	7	6	8
Internal Gun	1 x 30mm KCA	1 x 30mm KCA	1 x 30mm GAU-13/A	1 x 30mm GAU-13/A	1 x 30mm GAU-13/A
Max Speed @ SL (Kts)	360	350	350	375	315
Max Speed @ ALT (Kts)	420	403	403	400	375
Max Cruise @ ALT (Kts)	360	360	360	380	330
Stall Speed @ SL (Kts)	100	97	81	98	101
Max Climb Rate (ft/Min)	4,500	4,300	4,100	4,050	3,900
Service Ceiling (ft)	35,000	40,000	44,000	45,000	45,000
Radius, Internal Fuel (nm)	352	419	419	416	750
Range, Internal Fuel (nm)	846	900	900	950	1,600
Max Range, Ex. Tanks (nm)	1,988	2,115	2,115	2,232	3,700
Wing Loading (lbs/sq ft)	86	79	81	82	88
Power-To-Weight (lbs/SHP)	5.3	5.3	5.5	6.1	8.4
Load Limits (g)	7.5	7.5	7.5	7.5	7.5
Takeoff Distance (ft)	-	676	812	1,310	2,442
Landing Distance (ft)	-	1,369	1,469	720	1,099
Flyaway Cost (\$ USD)	\$4 M	\$6 M to \$9 M	\$6 M to \$10 M	\$8 M to \$11 M	\$15 M to \$17 M

The Machete design has evolved from a compact aircraft in the \$4 million price range to a very sophisticated, well armed and armored configuration in the \$15 million class. The empty weight of the SM-27S/T has grown from 6,350 lbs to 11,200 lbs that included the addition of over 1,500 lbs of discrete advanced titanium, Kevlar and ceramic armors. The internal fuel capacity has grown from 2,600 lbs to 5,000 lbs

resulting in an aircraft that now has a tactical radius in excess of 750 nm. Driven by customer requests for a long-range aircraft with significant loiter time, the Machete design grew to accommodate the real-world needs of maritime surveillance, ISR, FAC and CAS. As range and endurance increased, so did warload. The total number of external hardpoints has increased from 6 to 8 while internal fixed armament has centered about a powerful 30mm cannon with ample ammunition to complete the OA-10A anti-armor mission. While the powerplant and mission has remained the same, the turboprop Machete has evolved from an aircraft that was generally similar in size and capability to an AT-6B into a much larger, more capable aircraft that is a 21st century A-1H Skyraider designed for Super-COIN.

The Turbofan powered SM-27J/L has experienced a similar evolution, growing from a light-weight attack aircraft powered by an executive jet turbofan into one of the most capable, military turbofan powered attack jets conceived. Capable of nearly exceeding the speed of sound in level flight with a full compliment of external stores, the Turbofan Machete will have the highest thrust-to-weight ratio of any attack jet in its class.


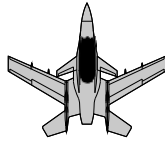

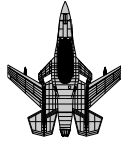
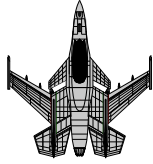
TURBOFAN MACHETE EVOLUTION 2004-2009				
AIRCRAFT CONCEPT YEAR STATUS	SM-27J/L MACHETE 2004 Retired in 2006	SM-27J/L MACHETE 2006 Retired in 2007	SM-27J/L MACHETE 2007 Retired in 2009	SM-27J/L MACHETE 2009 Present Design
				
Crew	1 to 2	1 to 2	1 to 2	1 to 2
Powerplant(s)	1 x PW308C	1 x PW307A	1 x PW308C	1 x F414 NA
Max Thrust (lbs)	7,000	6,405	7,002	14,756
Span (ft)	43.0	43.0	43.0	50.0
Length (ft)	34.0	33.0	33.0	38.0
Height (ft)	12.0	12.0	12.0	12.8
Wing Area (sq ft)	196	198	219	280
MTOW (lbs)	15,000	17,000	18,453	27,605
Empty Weight (lbs)	6,800	7,216	8,311	12,202
External Warload (lbs)	5,000	5,500	5,720	8,000
Internal Fuel (lbs)	2,600	3,000	3,000	6,000
Internal Fuel (USG)	400	462	462	882
Stores Stations (No.)	7	6	6	8
Internal Gun	1 x 30mm KCA	1 x 30mm GAU-13/A	1 x 30mm GAU-13/A	1 x 30mm GAU-13/A
Max Speed @ SL (Kts)	460	550	573	594
Max Speed @ ALT (Kts)	360	525	549	576
MaxCruise @ ALT (Kts)	360	480	480	500
Stall Speed @ SL (Kts)	98	114	101	102
Max Climb Rate (ft/Min)	6,000	6,400	6,340	17,752
Service Ceiling (ft)	50,000	40,000	45,000	50,000
Radius, Internal Fuel (nm)	600	800	695	735
Range, Internal Fuel (nm)	1,200	1,750	2,230	1,550
Max Range, Ex. Tanks (nm)	3,400	3,900	4,775	2,400
Wing Loading (lbs/sq ft)	77	85	81	100
Thrust-to-Weight Ratio	0.47	0.38	5.5	0.53
Load Limits (g)	9.0	7.5	7.5	7.5
Takeoff Distance (ft)	1,800	1,067	2,115	1,307
Landing Distance (ft)	2,200	1,668	1,501	1,354
Flyaway Cost (\$ USD)	\$8 M to \$12 M	\$9 M to \$13 M	\$9 M to \$14 M	\$16 M to \$18 M

Interoperability has been the driving element behind the Turbofan Machete. Benefiting from a non-afterburning derivative of the F/A-18E/F Super Hornet F414 turbofan, the SM-27J/L can be supported by any military qualified depot equipped to service the F/A-18E. With eight hardpoints, a 30mm cannon and the ability to carry 8,000 lbs of external stores while maneuvering at 7.5 g, the SM-27J/L has evolved to provide extraordinary low-level attack performance while remaining a stable aircraft with superb low-speed handling. With its 102 KTAS stall speed at MTOW, the jet Machete needs only a 1,500 ft runway.

The SM-27J/L has become a high performance aircraft that in many respects can perform the A-10C/OA-10A mission with greater efficiency and operational readiness. While an A-10 may theoretically carry up

to 16,000 lbs of external stores, typical warloads do not exceed the 8,000 lb maximum external warload of the SM-27J/L. The compact SM-27J/L is able to travel faster and further than the A-10 while consuming less fuel. It offers a smaller logistical footprint than the A-10 while offering comparable survivability with respect to aircraft armor, vulnerability, and systems survivability.

The SM-47S/T Super Machete has seen a transformation from a very lightweight strike fighter to an aircraft designed to compete head-to-head with the JAS 39 Gripen and other 5th generation light multi-role fighters.

SUPER MACHETE EVOLUTION 2004-2009				
AIRCRAFT CONCEPT YEAR STATUS	SM-47 SUPER MACHETE 2004 Retired in 2005	SM-47 SUPER MACHETE 2005 Retired in 2007	SM-47 SUPER MACHETE 2007 Retired in 2009	SM-47 SUPER MACHETE 2009 Present Design
				
Crew	1 to 2	1 to 2	1 to 2	1 to 2
Powerplant(s)	1 x F404/F1D2	1 x F404/F1D2	1 x F414 NA	1 x F414-GE-400
Max Thrust (lbs)	10,540	10,540	14,756	22,000+
Span (ft)	40.0	28.0	28.0	36.0
Length (ft)	34.0	33.0	33.0	40.0
Height (ft)	12.0	9.9	12.0	12.8
Wing Area (sq ft)	244	177	180	310
MTOW (lbs)	25,500	26,000	27,500	33,616
Empty Weight (lbs)	7,940	8,930	10,830	14,478
External Warload (lbs)	10,000	10,000	11,170	11,000
Internal Fuel (lbs)	6,500	6,500	5,500	7,250
Internal Fuel (USG)	1,000	1,000	850	1,115
Stores Stations (No.)	9	5	6	8
Internal Gun	1 x 30mm GAU-13/A	1 x 30mm GAU-13/A	1 x 30mm GAU-13/A	1 x 20mm M61A2
Max Speed @ SL (Mach)	1.13	1.13	1.15	1.21
Max Speed @ ALT (Mach)	1.25	1.4	1.80	1.85
MaxCruise @ ALT (Mach)	0.85	0.85	0.85	0.85
Stall Speed @ SL (Kts)	110	130	123	127
Max Climb Rate (ft/Min)	11,700	11,700	19,750	34,702
Service Ceiling (ft)	55,000	55,000	55,000	60,000
Radius, Internal Fuel (nm)	475	475	650	760
Range, Internal Fuel (nm)	1,000	1,000	1,434	1,520
Max Range, Ex. Tanks (nm)	2,650	2,650	2,162	2,700
Wing Loading (lbs/sq ft)	105	147	154	110
Thrust-to-Weight Ratio	0.41	0.40	0.54	0.64
Load Limits (g)	9.0	9.0	9.0	9.0
Takeoff Distance (ft)	2,300	2,500	1,434	1,320
Landing Distance (ft)	3,000	3,200	2,162	1,777
Flyaway Cost (\$ USD)	\$15 M to \$18 M	\$15 M to \$20 M	\$18 M to \$21 M	\$23 M to \$27 M

The most dramatic evolution of the Machete design, the SM-47S/T has become a highly maneuverable, Air Defense Fighter with an afterburning turbofan which has the range, endurance, maximum level speed and tactical warload of an F/A-18E Super Hornet while consuming half the fuel of the F/A-18E. It is an extremely capable DACT aircraft. the Super Machete may be produced in unarmed two seat tandem SM-47T variants to satisfy the need for a dedicated T-38 Talon successor/Advanced Pilot Trainer (APT).

Our Coming-of-Age

Through a review of the Machete design history, it is quite clear that the aircraft has gone through a major evolution. Beginning with an aircraft that was largely similar to a T-6A Texan II, an entirely new series of aircraft has been developed which more appropriately address the mission needs associated with COIN, CAS and ADF/APT.

In 2003 Stavatti could have focused upon the development, prototyping, and production of what was then the Turboprop Machete, which could be at full rate production today, satisfying immediate COIN needs.

While it would definitely generate revenue, what it would not have is the armament, armor, range, or a host of other capabilities which were gradually incorporated into the Machete as a greater understanding of mission needs was realized. Recognizing that having a solid conceptual design is the key to a successful aircraft program, Stavatti used the original Machete configuration as a foundation upon which to begin asking the question of, "What was really needed?". Stavatti went through a large number of design iterations before settling upon the final Machete series configurations.

What was learned? A trainer class aircraft is an inadequate solution to COIN/CAS. The weaponized trainer approach, which has resulted in the ALX and AT-6B, produces an aircraft capable of moderate COIN, however, that approach is nothing new. It was the basis for the T-28D Nomad which was provided to South Vietnam as part of Farm Gate during the early 1960s. Understanding that the T-28D was a fine aircraft, but was not an A-1 Skyraider, Stavatti made a conscious and thoughtful decision to transform the Machete from being a trainer class light attack aircraft to a true A-1 Skyraider. While this transformation resulted in a Machete which is at least twice as expensive as an AT-6B or ALX one must also consider the price difference between a T-28D and an A-1H Skyraider and the relative greater mission effectiveness provided by the latter.

Stavatti has always been committed to providing affordable solutions. A significant element in measuring affordability, however, is Value. Stavatti decided to create an aircraft that is first and foremost a weapon platform, rather than develop and produce a weapon system in the AT-6B class that is unable to carry a significant warload, provide adequate armor protection for the crew and critical aircraft systems, or incorporate well over one thousand pounds of advanced avionics, sensors and electronic warfare equipment,

Like the A-10, the SM-27 is designed around its fixed, ventrally mounted 30mm Gatling cannon. The cannon is not mounted within a detachable pod, but is integrated within a permanently fixed streamlined fairing. The cannon system alone, including the cannon, ammunition drum, feed system, armor plating and ammunition, weighs more than over half the maximum external warload of the AT-6B while serving as a tremendously potent precision weapon of choice.

Also like the A-10, the SM-27 features multiple wing-mounted hardpoints that are mounted high enough off the ground to allow the loading of a variety of large stores, such as the GBU-24, and also multiple-ejector racks. Equipped with ejector racks derived from the F-16 and A-10, the Machete is a large enough aircraft to be easily armed with standard stores handling equipment. This is a major factor that most aircraft marketing to satisfy COIN missions totally overlooks. The wings of all Machete aircraft are no less than 62 inches above the ground with an average 45-inch ground clearance between the bottom of stores ejector racks and the ground. The wing is high enough to easily arm, yet low enough to easily inspect.

The Machete pusher configuration provides not only the basis for both turboprop and turbofan aircraft, but also the foundation for the only turboprop light attack aircraft that may be equipped with a comprehensive sensor suite including air-to-ground and SAR capable radar. Unlike the AT-6B or ALX, the SM-27 may be equipped with radar, including the APG-67 and advanced compact AESAs such as the Northrop Grumman Scalable Agile Beam Radar (SABR). It has a large avionics bay and ample volume for a diverse array of sensors. The Machete has been designed with an open architecture that welcomes electro-optics and radar alike.

Today's Machete is a heavy, expensive and highly capable aircraft. It offers more useable internal volume than any aircraft in its class, and due to its unique, close-coupled three surface arrangement (canard-wing-empennage), has very little vacant volume. Every cubic inch of the Machete is sensors, avionics, armament, fuel, armor, crew station, or growth volume. There is no wasted space. Designed for autonomy, the Machete has self-start capability and stand-alone ground power generation. It has an A-6 Intruder style integral boarding air-stair and standard in-flight refueling capability.

The rugged Machete will have stronger, thicker material construction than any COIN/CAS aircraft in production or service today, combining titanium wings, a graphite titanium fuselage, a bullet resistant clam-shell canopy that is over one inch thick polycarbonate, an advanced armor cockpit crew protection module ("bathtub"), Kevlar/Spectra fuselage skins, and OBIGGs pressurized self-sealing fuel tanks. By any

measure, pound for pound, the Machete can deliver more firepower over a longer tactical radius for a greater duration of time at a lower direct operating cost than any lower-priced COIN competitor.

The AT-6B and ALX are legacy systems that have been in production since the late 1970s. They are less expensive to procure and operate than the Turboprop Machete, yet they provide less value and are less efficient. They were never designed to be dedicated combat aircraft. The Machete is.

In studying the OV-10 and considering the prospect of a new production OV-10X, Stavatti spent a great deal of time reviewing the success of the OV-10 as a COIN, FAC, CAS platform. The result of the analysis was that the OV-10 was significantly underpowered and overburdened by the incorporation of an aft cargo/personnel compartment. Transformation of the OV-10 into a truly capable COIN platform would in essence result in the creation of a larger aircraft whose mission could be more appropriately satisfied by two smaller single engine aircraft that were capable of carrying the same warload. Consequently, Stavatti concentrated on ensuring that the turboprop Machete could carry a greater warload than the OV-10, with greater range, speed, and overall ability.

The mission of the Machete program is to provide a family of highly effective air weapons. Somewhere in the conceptual design process a decision has to be made regarding the most effective way to accomplish the mission. The design of the Machete has become an exercise in economies of scale: the realization that while a small light aircraft may be less expensive to procure, if it is not sufficiently armed, armored and equipped, it simply will not be able to perform its mission effectively, much less offer sufficient flexibility to address missions not yet imagined.

Preparing for the Mission

In times of peace, even the best defense planners and contractors cannot anticipate the true demands of full scale combat against equipped and capable adversaries. That being the case, it is best to procure an aircraft that has the flexibility and capability to handle the addition of greater armament, armor, and capability than originally specified under contract. The B-17 was such an aircraft and we won the war because of it. The first B-17Bs that entered production did not have tail-guns. They did not have ventral ball turrets or chin guns or dorsal turrets. The first production B-17s had a total of seven machine gun stations. Once B-17s began entering combat during the Second World War, it was realized that guns have value. They are necessary. By the time the B-17G entered production the aircraft had been transformed into a true Flying Fortress, harboring 13 gun stations.

At this point in modern warfare, the need for new, dedicated COIN aircraft is just beginning to be recognized. A low cost solution, immediate is to introduce a thin-skinned trainer equipped with lightweight armor, electro-optical sensors to deliver weapons such as hell-fire missiles and GBU-12s to the battlefield, hoping that the lessons learned by the Soviet Union which lost a significant number of better equipped Su-25s and Mil-24 Hinds to insurgents with shoulder launched missiles and Enfield Rifles are not repeated. What is needed in the long-run is an aircraft that can thwart Frogfoot, Hind and Stinger alike while packing a punch that can render T-90 tanks null and void.

For that, Stavatti proudly provides the Machete.

Chris Beskar
Chairman & CEO
Stavatti