THE YORK FIREFLY AND THE WICHITA MESCALERO

And the Fiasco That Ensued

By Walt Shiel

For 30 years every Air Force pilot wanna-be had to prove his or her aviating mettle in the venerable Cessna 172, christened by the Air Force the T-41 Mescalero. The T-41 served the Air Force with the same stolid dependability the 172 served the civilian community, but the time came to find a replacement -- a replacement capable of providing a more realistic introduction to military flying, better suited to screening out those unfit for its rigors, and better able to prepare fledgling aviators for their first jet experience in the T-37 primary jet trainer.

To fill this role, in April 1991 the Air Force issued a Request for Proposals for an Enhanced Flight Screening aircraft. Several teams responded, including Mooney with an aerobatic, missionized M21 EFS -- the only truly American design proposed. However, in its customarily inscrutable wisdom, the Air Force handed the lucrative contract, which could have been a much-needed stimulus for the flagging US lightplane industry, to

an international team -- long-time British glider manufacturer Slingsby Aviation Ltd. and their American partner, Northrop Worldwide Aircraft Services, Inc. (NWASI). The proven Slingsby T67 trainer was already in service with the Canadian, British, and Dutch armed forces. To meet US Air Force performance requirements, Slingsby upgraded the original four-cylinder, 160-horsepower T67 with a 260-horsepower, six-cylinder Lycoming IOE-540-D4A5, with inverted fuel and oil systems, mated to a Hoffman three-bladed, constant-speed propeller.

The $39 million contract was awarded to Slingsby/NWASI on 29 April 1992, with 113 aircraft (designated the T-3A Firefly) to be purchased in four lots, the world's largest single trainer purchase in many years, and the largest for several years to come. . .at least until the Joint Primary Aircraft Training System (JPATS) contract is awarded to replace the Air Force's 40-year-old T-37s and the Navy's venerable T-34s. In April of this year, the Air Force authorized $9.2 million for procurement of the third lot of 33 T-3A Fireflies.

The aircraft are manufactured in York, England, by Slingsby, shipped disassembled (without engines, propeller, landing gear, seats, and avionics) to the port of Houston, trucked to Hondo, Texas (40 miles west of San Antonio), and assembled by NWASI in a new hanger built for that purpose. Slingsby is the prime contractor; NWASI assembles the aircraft to Slingsby drawings under the watchful eyes of Slingsby personnel.

At Hondo, NWASI employs 62 people using the team-building methods pioneered in the auto industry. Thirty workers are deployed in five teams, each consisting of two assemblers, two electricians, one quality control inspector, and one dock chief. Each team assembles two aircraft simultaneously with ten aircraft usually in work at any one time. NWASI

flight tests each bird before offering it to the Air Force for final acceptance tests.

Thus is born a T-3A Firefly.

Once an acceptance test pilot of the Air Education and Training Command (AETC) accepts a new T-3A, it is turned over to Doss Aviation -- the civilian contractor responsible for all aircraft maintenance and most of the flight instruction.

The aircraft's main spar is made of fiberglass-encased wood, and the composite structure is glass reinforced plastic -- a low maintenance and durable composition. Unlike the T-41/C-172, adequate panels were designed-in for ready access to all removable components and for all routine maintenance operations.

The T-3As will be operated at two locations: 56 aircraft at the US Air Force Academy in Colorado Springs, Colorado, beginning in September of this year (replacing the T-41C with its mile-high compensating fuel-injected, 210-horsepower IO-360) and 57 aircraft for the 3rd Flying Training Squadron (3rd FTS) at Hondo Airport (replacing the T-41A with its normally aspirated, 145-horsepower O-300-D). The first Hondo Firefly was delivered in February 1994, with ten delivered by June 3rd. Although a few Civil Air Patrol T-41s have been offered in Trade-A-Plane, don't expect a surfeit of military 172s on the market any time soon: the retired T-41s are all destined for US Air Force aero clubs around the world.

Despite a few minor glitches with the transition, the process of assembling and delivering the new aircraft seems to be on track now. The only major problem to date has been a rash of high in-flight oil temperatures. . .caused by airflow deficiencies due to having six cylinders shoehorned into a space designed for four. Slingsby has since enlarged the cowling to correct

the deficiency. Hondo, Texas, is, so it is said, a tad warmer than York, England.

When the first completed T-3A hit the ramp, Northrop's chief test pilot quickly checked out six military instructors and one civilian instructor in the new bird. These seven then formed the initial cadre to train the remaining military and civilian instructor pilots. As of June 3rd, there were 13 military and 21 civilian instructor pilots qualified or in training. The first class of student pilots entered the Flight Screening Program in March.

How does the performance of the T-3A compare to that of the T-41A? About the way a Ford F-150 compares to a Mazda Miata. The T-3A cruises at 150 KTAS at 8500 feet, climbs at 1000+ feet-per-minute through 6500 feet and 800+ feet-per-minute through 9000 feet, is aerobatic with +6g/-3g limits, has sticks rather than control wheels, and is light and responsive to the touch. Typically, a T-3A can reach 9500 feet from a standing start in about seven-and-a-half minutes. Try that in your 172. And the Firefly is air conditioned -- a welcome luxury on those jalape_o-hot South Texas afternoons.

The Air Force made some major changes in the training syllabus to capitalize on the new aircraft's capabilities. The old T-41 syllabus allotted 12.8 flying hours with only one solo and nothing but the basics: steep turns, stalls, slow flight, and lots of landings. The new T-3A syllabus allots 21.5 flying hours (26 for Air Force Academy training) with two solo flights (one in the pattern and one to the practice area) plus loops, Immelmanns, chandelles, cloverleaves, lazy eights, and spins. Over-the-top maneuvers can be completed easily with about a 4-g pull-up and an entry speed of 130-140 KIAS. Spins are relatively nose-low and quick with a stable, predictable recovery. The airplane is intended for formation training but, at present, there is no formation

orientation in the syllabus.

Pilot candidates enrolled at the Air Force Academy complete their Flight Screening in Colorado Springs. All other prospective Air Force pilots must have a college degree and be accepted for Officer Training School (OTS), or be enrolled in their college's Air Force Reserve Officer Training Corps (AFROTC). They must pass the Air Force Officer Qualification Test (AFOQT) and a relatively new computerized test battery (the Basic Attribute Tester, or BAT). The BAT is designed to test a candidate's grasp of spatial relationships, basic psychomotor skills, and multiple tasking and information handling abilities. BAT results are combined with the AFOQT scores in a test processing station at Randolph Air Force Base, San Antonio, to produce a percentile grade used as a success predictor.

According to Major Dave Perry, Chief of the Pilot Selection Research office at Brooks Air Force Base, San Antonio, they are constantly evaluating the validity of the BAT methodologies and "predictors" to refine and update the tests. Major Perry says the BAT's lineage can be traced back to the electro-mechanical psychomotor tests first developed by the Army Air Corps during World War II.

After the BAT and the AFOQT, accepted candidates are sent to Lackland Air Force Base on the southwest side of San Antonio for OTS or entered into a college AFROTC program. Either during OTS or during an AFROTC summer break candidates are handed over to the T-3A Flight Screening Program. Two hurdles still have to be cleared before slipping into a T-3A cockpit: a three-day physiological screening at Brooks and, if despite the doctors' best efforts the candidate is still declared fit, a week of academics at Hondo (where, at least, you'll be able to watch and listen to airplanes flying).

The physiological screening is a much more in-depth examination than the Air Forces's standard Flying Class I physical, which is still the first step to confirm a candidate's fitness. Lieutenant Colonel (Doctor) Gerald Saboe, Chief of Professional Services in the Clinical Sciences Division at the Armstrong Laboratory, Brooks Air Force Base, says that the Class I physical was a "reasonable screening test. . .but some things weren't tested" due to the required time and expense. With the advent of the Enhanced Flight Screening Program, the Air Force decided to try to identify those sub-clinical physical conditions, such as valvular heart disease or coronary artery disease, that may not provide early symptoms but which may become a later problem when flying high-performance aircraft capable of sustaining nine gs indefinitely. The new tests include an echo cardiogram (for "a lot of good dynamic information," Dr. Saboe says) and corneal topography (detailed mapping of the cornea). In addition, the neuro-psychiatric evaluation is used "to baseline cognitive skills" of the candidate so that, if he or she later sustains a head injury, the medicos can compare post-injury tests to the baselines before deciding on return to flying status. There are some optional tests (the candidate's option -- how unmilitary) intended only to develop baseline data for the future -- such as the Neo-Personality Inventory and the Personal Characteristics Inventory.

After passing the poke-and-probe tests, students are turned over to Captain Ron Hall, Chief of T-3A Academics, for real aviation training from the three military instructors. According to Captain Hall, the 14-hour academic course includes:

- Physiology of Flight (such as g-awareness, anti-g maneuvers, and spatial disorientation);
- T-3A Aircraft Systems;
- Basic Applied Aerodynamics;

- Flying Fundamentals (navigation, map reading, weather hazards, and local area procedures); and
- A 75-question exam with a minimum 85% passing score.

Captain Tim Marks, one of two T-3A acceptance test pilots and the Assistant Operations Officer for the 3rd FTS, says that, although the syllabus was increased to accommodate aerobatics and the additional solo, he has been pleased to find that "students are getting about double the landings now." Why? The T-3A is able to complete a 180-degree pull-up to a closed downwind followed by a typical fighter-style 180-degree turn to final. . .all in roughly two minutes. The T-41's rectangular pattern took four minutes. With faster climb and cruise speeds, the T-3A gets to and from the training areas quicker as well. Captain Marks would not be surprised if the syllabus-mandated flying hours are eventually reduced. Not bad. . .improved training, increased efficiency, and more fun. (After all, if you're doin' aerobatics and you ain't havin' fun, then you ain't doin' it right!)

James Campbell, Doss Aviation's General Manager at Hondo, is a retired Air Force pilot and has been a civilian instructor in the Flight Screening Program since 1979. The advent of the T-3A has forced him to find new sources for instructors and to demand different qualifications. With the T-41, a civilian instructor pilot candidate required only 200 hours total time and a CFI. Now, they must have a CFI plus 11 years of operational Air Force flying experience and have been an AETC instructor pilot (in either the T-37 or the T-38) within the past four years. Campbell says he's been receiving "applications from a lot of pilots furloughed from the airlines" -- all with recent AETC experience.

The new contract allowed Campbell to retain up to 50% of his previously qualified T-41 instructor force, most of whom were ex-military.

The Doss instructor cadre now includes ex-Air Force pilots with widely diverse flying backgrounds, from T-37s and T-38s to F-16s, U-2s, and even the E-4 "Looking Glass" airborne command post aircraft. Although the basic syllabus consists of 21.5 flying hours, Campbell pointed out that foreign students (training under the Security Assistance Training Program) receive up to 30.9 flying hours with provisions for proficiency advancement -- the extra hours compensate for the challenges of training in English.

Royce Maples, Doss Aviation's Maintenance Supervisor, is a retired Air Force Master Sergeant who worked five years as an Air Force Quality Assurance Evaluator for the T-41 maintenance contracts at Hondo and at the Air Force Academy. After retiring, he helped develop the Doss Aviation proposal for the T-3A operations and maintenance contract. Maples has 14 technicians working right now, with six A&Ps and one IA. He calls the international T-3A a "NAFTA airplane." The original design is French (based on the Fournier motorglider); a British company manufactures it; an American company assembles it; an American engine powers it; and a German propeller hauls it through the skies.

Maples says it takes about half as long to complete the 50- and 100-hour inspections on the T-3A as it did on the T-41 -- significant due to the high utilization rate of the aircraft. The T-3As are flying four and five times per day, with the high-timer accumulating almost 100 hours per month. Maples admits to one surprise: the T-3A tires are lasting hundreds of hours between changes -- even with all those student landings!

As of 1 February 1995, the 3rd FTS has 26 of its eventual 57 aircraft and is training 20-25 students per class (with the overlapping classes there are 40-50 in training at any one time). The US Air Force Academy began replacing its fleet of T-41s in September 1994 and had 27 T-3A aircraft on its

roster by February, with the full complement of 56 scheduled to be in-place by July 1995. . .when they will have 200+ students in training.

There is now a new military designation to add to the lexicon of military aircraft. The T-3A Firefly will be providing the initial exposure to the "military way" of flying to new generations of Air Force pilots for many years to come.

The Mescalero has retired! Long live the Firefly!

TECHNICAL DATA

Unit Cost	$302,000 (US)
Manufacturer	Slingsby Aviation Ltd.
Engine	Lycoming AEIO-540-D4A5, 260 HP
Crew	Student & Instructor, side by side
Length	24 ft 10 in
Height	7 ft 10 in
Wingspan	34 ft 9 in
Maximum Takeoff Weight	2,565 lb
Range (with reserves)	352 nm
Service Ceiling	12,000 ft
Maximum Speed	195 KIAS
Stall Speed, Zero Flaps	58 KIAS
Stall Speed, Full Flaps	52 KIAS
Cruise Speed, 8500 feet	150 KTAS
Fuel Capacity	42 gal (US)

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TO SWAT A FIRELY

USAF Timidity and a Waste of Taxpayer Funds

By Walt Shiel

You would think that the world's most capable air force would be able to operate a civilian lightplane without major problems. You would think the US Air Force could procure a simple prop-driven trainer aircraft without screwing it up. Even if such an airplane developed problems, you would think the biggest, baddest, most technologically advanced air force in the world could fix it quickly and get it back in the air.

Well, you would think so.

But you would be very, very wrong. And, if you're an American, kiss about $60 million dollars of taxpayer funds goodbye.

Throughout its entire 34-year, 600,000+ flying hour operational history, the T-41 (precursor to the T-3A) experienced a Class A accident rate of 1.47 per 100,000 flying hours, with only two fatalities (instructor and student in the same airplane at Hondo in 1974).

However, the T-3A could not deliver the same reliability and safety in the Enhanced Flight Screening Program.

On 22 February 1995, barely a year after the USAF began T-3A operations, Captain Daniel Fischer and Cadet Second Class Mark Dostal launched in a T-3A for a routine student training mission from the US Air Force Academy's airfield. They did not return. Not knowing for sure what had happened, USAF temporarily suspended all T-3A flying operations. Not being able to identify any particular aircraft problem, USAF very soon canceled the suspension. The accident board report concluded, "While working in the area, the mishap crew entered a planned, syllabus-directed spin…impacted the ground in a right spin, 47 degrees nose low, with full aft stick and full right (pro-spin) rudder…Captain Fischer's spin academic instruction, flying training, and error analysis experience did not adequately prepare him to recognize his improper rudder application. His lack of exposure to misapplication of controls (rudder) during a spin led to confusion and futile attempts to counter the abnormal stick forces and high rotation rate using elevator controls only. Performance data indicates the mishap crew experienced at least 17 spins prior to impact."

On 30 September 1996, Captain Clay Smith and Cadet First Class Dennis Rando failed to return from another routine student training mission at USAFA. This time, the accident board determined that the accident "was caused by a stalled condition from which the instructor pilot was unable to recover prior to ground impact, and that the engine quit for an unknown reason prior to the stall entry."

Far too much negative publicity attached itself to these two accidents that took the lives of two instructor pilots and two USAFA cadets, the USAF's "best and brightest." USAF initiated a major review of the T-3A and the entire Enhanced Flight Screening Program. At USAFA, the flying squadron commander allowed instructors and students to opt not to fly if they did not feel comfortable about it. By year's end, operations returned to more-or-less normal.

The situation, however, did not go away.

On 25 June 1997, Captain Glen Comeaux and Cadet First Class Pace Weber spun out of control and crashed under the outside downwind leg of the USAFA traffic pattern. Both were killed instantly. USAF stood down the Firefly fleet for a few days. The accident board report stated, "During the turn from crosswind to downwind of the flight pattern, the aircraft stalled and subsequently entered a spin, impacting the ground in a nearly level pitch attitude and with negligible forward velocity…The aircraft departed controlled flight for an unknown reason…The mishap IP's failure to recognize this departure and take immediate positive corrective action is the primary cause of this accident."

On 23 July 1997, another USAFA T-3A experienced an unexplained inflight engine failure. The instructor landed safely. Five days later, General Lloyd "Fig" Newton, commander of the Air Education and Training Command, announced a temporary suspension of T-3A flying operations until all safety concerns could be evaluated and resolved. General Newton stated that the T-3A would not resume flight operations until he had flown one himself.

During the T-3A's short operational history in the USAF, 59 ground and nine inflight engine failures had been reported at Hondo and USAFA. Most of these occurred during the first year and only three involved an engine that would not respond to throttle commands inflight. Shortly after release of the third fatal accident report, Whitten Peters, acting Secretary of the Air Force, ordered a "Broad Area Review" of the T-3A and its operations at Hondo and USAFA on 5 January 1998. Lieutenant General Richard Swope, the Air Force Inspector General, was tasked with leading the review to scrutinize the entire EFS program, "including the history of procurement, operational testing, training and current operational procedures."

The T-3A had racked up a Class A accident rate of 3.39 in just under 90,000 flying hours over 42 months. Not bad for a fighter aircraft, terrible for a basic training aircraft.

Meanwhile, USAF issued a contract to Science Applications International Corporation (SAIC) for a complete analysis of the T-3A airplane at a cost of several million dollars. SAIC's report recommended a $6.2 million program of 10 modifications, mostly in the fuel system, for the T-3's AEIO-540-D4A5 engine, which included enlarging and rerouting the fuel lines and relocating the fuel pump.

On 27 March 1998, USAF announced that a T-3A, incorporating the SAIC-recommended modifications, would be flight tested at the Air Force Flight Test Center at Edwards AFB, California, following approval of the formal flight test plan.

Years before the USAF took delivery of its first T-3A, many other countries had been successfully flying Slingsby T67 in both the 160 horsepower and 200 horsepower variants. These countries include the United Kingdom, Canada, Netherlands, Norway, Japan, Switzerland, Hong Kong, and Turkey.

The IG's Broad Area Review of the Enhanced Flight Screening Program was released on 28 March 1998. The report issued 48 recommendations that encompassed all aspects of the EFS Program, from acquisition to testing to instructor training to supervision to aircraft acceptability. These recommendations can be read in their entirety at the end of this article.

Meanwhile, in March 1998, a Combined Test Force convened at Edwards AFB to initiate a four-phase comprehensive testing program. The CTF completed just over 50% of the planned flight tests by 24 July, totaling 52 test flights. The planned testing phases were:

1. Unmodified but instrumented aircraft at Edwards AFB
2. Modified aircraft at Hondo
3. Modified aircraft at USAFA
4. One-year evaluation concurrent with training operations

The CTF summarized its conclusions in five categories: engine and fuel system, inadvertent departures, spins, advanced handling, and overall.

After flying 22 idle power descents from 13,000 feet to full stop landings, the team could not duplicate the engine failure problem and the engine showed no hesitation tendencies even with abrupt throttle movements. The only way they could induce a failure was following sustained slow speed flight with an aggressive out-of-control maneuver and loss of fuel flow.

The CTF concluded that the T-3A was easy to recognize and recover from inadvertent departures from controlled flight. The pilot has to severely overcontrol during a stall and not recognize the incipient departure.

Definite pilot actions were required to induce a spin and the spin recovery procedures in the pilot's flight manual consistently recovered the aircraft even from a fully developed spin.

The CTF recommended that AETC institute snap roll training for all instructor pilots and expand the existing spin recognition, prevention, and recovery training.

Overall, the CTF concluded that the T-3A was safe for flight operations with reliable power under even extreme conditions and exhibits not adverse handling characteristics. They recommended:

- Immediate return to limited flight operations with unmodified aircraft, primarily to requalify the instructor pilots and then to restart student training;
- Treat the SAIC-developed fuel system modifications as a routine improvement that does not require grounding or emergency treatment;
- CTF complete thorough testing of a modified aircraft before the rest of the fleet is modified.

Despite these results and recommendations, on 10 September 1998, AETC announced it would place the fleet in minimal maintenance status while flight testing and aircraft modifications continue. USAF also noted that it had

initiated a study to determine the feasibility of installing a crew recovery system (ejection seat) prior to resuming EFSP operations, recognizing that installation of such a system would take at least two years. With the fleet in minimal maintenance status, most of the remaining civilian instructor and maintenance staff for the T-3A fleet were released.

USAF also admitted that the lack of the T-3A and EFSP had contributed to rising attrition rates in Specialized Undergraduate Pilot Training, reducing AETC's ability to produce the pilots needed to meet Air Force mission requirements. To reduce this attrition, AETC announced it would begin an interim program by sending pilot candidates to civilian flight schools at locations throughout the country to gain flight experience prior to entering student undergraduate pilot training (the Introductory Flight Training program). This is almost identical to the ROTC Flight Indoctrination Program USAF operated back in the '60s and '70s, a program that did not achieve its goals. In fact, problems with FIP led to the original T-41 Flight Screening Program and, later, to EFSP and the T-3A. As Spock on Star Trek might say, to expect different results from the same program is not logical.

In January 1999, AETC received a supplemental type certification for the T-3A modifications from the FAA's Southwest Region Airplane Certification Office, the first step to returning the Firefly to operational flying. According to officials at the time, the next steps would include ensuring the fuel system fits as designed, verifying the installation instructions, updating the design drawings, finalizing production kits, and completing the kit installation on the 110 aircraft. Officials estimated a minimum of 18 to 24 months before the T-3A could be back in full operation.

On 12 October 1999, USAF announced termination of the Enhanced Flight Screening program and all flight operations of the T-3A Firefly. At the same time, the announced an expanded Introductory Flight Training program as a replacement. The expanded IFT increases flying time from 40 hours to 50 and requires additional solo flights and requires candidates to earn a

private pilot's license. This is little more than reinventing the wheel – in this case, a square wheel.

Additionally, service officials said the IFT program would save approximately $16 million annually over the Enhanced Flight Screening program. The EFS program cost about $26 million to operate, while the IFT program is expected to cost about $10 million per year. Of course, this does not include the approximately $60 million in sunk costs from the initial procurement of the T-3A, facilities improvements, and additional flight testing and modifications development.

Nor does this "savings" take into account the reasons USAF bought the T-3A and started its EFSP. Back in the early '90s, USAF determined it needed an aircraft capable of aerobatics, formation, and military overhead traffic patterns to adequately screen and prepare students for the more expensive SUPT. With the advent of the T-3A, they dispersed their fleet of capable but unexciting Cessna T-41 aircraft (your basic '60s-vintage Cessna 172). If they had done nothing, they would still have a fleet of T-41s that are paid for and would not need this "new" IFT program.

One of the primary reasons for any kind of military operated flight screening program is for standardization of training, to ensure that students are indoctrinated into the military approach to flying from the get-go. This has been lost as a result of canceling the EFSP and returning to the proven unsuccessful IFT approach. There is no doubt that AETC will be able to demonstrate, statistically, that IFT has reduced pilot attrition in SUPT. They'll do it the same way they have always done it – students who otherwise would have washed out of SUPT will be given additional flight training until they can be passed and the resulting marginal student will become the problem of the gaining operational unit. It has happened before, and it will surely happen again.

Why did USAF cancel the T-3A when its own test force amply demonstrated that the airplane is safe and recommended that EFSP training be resumed? Because three of its USAFA instructor pilots and three cadets died

in the airplane. Because USAF simply cannot publicly admit that its experienced pilots cannot safely operate a basic civilian lightplane. And they can't do it because their military training and lack of lightplane experience left them unqualified to fly an aerobatic lightplane safely.

The civilian instructors at Hondo had no such problems. Why not? Because, although they were mostly ex-military instructor pilots, they all had lightplane experience and Certified Flight Instructor ratings. The IPs at USAFA, on the other hand, were mostly ex-heavy aircraft (transports and tankers) pilots with almost no lightplane experience and no CFI ratings. No such problems occurred with the T-41 program because the airplane had less performance potential, was more forgiving, and the syllabus did not include aerobatics or other high performance maneuvers.

American taxpayers have paid for this USAF fiasco. USAF should be called on the carpet in front of Congress and the American people to explain how they completely screwed up what should have been a simple program.

The fault lies with politics and bureaucracy, not the airplane or the flight screening program.

I predict that, within five years, USAF will be pleading for another flight screening program and aircraft. Let's hope somebody in the five-sided puzzle palace on the Potomac remembers the Firefly and applies its lessons.

I, for one, will be watching closely.

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BROAD AREA REVIEW RECOMMENDATIONS

1. AETC revise spin and Simulated Forced Landing (SFL) training to include reinstating the student spin demonstration and SFL training to an altitude which allows realistic landing simulation.

2. AETC control and track change requests until resolved, and provide feedback to the originator throughout the process.

3. AETC and Air Logistics Center improve the process to incorporate technical data into the Flight Manual in a timely manner.

4. AETC publish comprehensive guidance on takeoff and landing data, spins, aircraft departure characteristics, and common student errors.

5. AETC approve student syllabus which decreases EFS aerobatic sorties.

6. AETC approve EFS waivers to candidates with a Private Pilot's License (PPL) and 100 flying hours as required.

7. SAF/AQ incorporate lessons learned from T-3A anthropometric deficiencies into future COTS acquisitions.

8. AETC implement academic changes in the proposed T-3A PIT syllabus.

9. AETC improve current egress guidance and explore the requirement for alternate egress systems.

10. AETC perform planned formal operational testing to review and evaluate T-3A performance data, handling qualities, and engine modifications.

11. Air Logistics Center integrate the aircraft manufacturer into the FOT&E testing effort to expedite changes to the flight manual.

12. AETC open a dialogue/exchange with other Firefly users.

13. AETC continue to NOT require EFS IPs obtain and maintain instrument qualification.

14. Hondo and USAFA continue to emphasize safety concerns with airspace and pattern congestion through continuation training meetings, and community involvement.

15. USAFA convert the EFS program to contractor operations, and immediately reassign permanent party personnel to operational billets.

16. USAFA leadership implement policy supporting attached IP flying duties in the EFSP.

17. AETC evaluate current Doss IP flying event policies for safety and training effectiveness considerations.

18. USAFA investigate and implement methods to emphasize the importance of the EFS program while reducing competing Academy demands during the semester to an acceptable level.

19. USAFA add a third screening period during the summer.

20. AETC pursue agreements to secure suitable quarters for students near Hondo without delay.

21. AETC reinstate student solo sortie. (This was eliminated following the second fatal accident.)

22. AETC evaluate programmed sortie turn times to ensure adequate debrief time is available.

23. AETC implement the revised Pilot Instructor Training (PIT) syllabus.

24. AETC reinstate SFL training to realistic altitude.

25. AETC evaluate options to improve brief/debrief times during PIT.

26. AETC keep PIT at Hondo, and add a syllabus sortie to IP training that emphasizes high altitude handling characteristics.

27. AETC improve the IP training program at USAFA by focusing on high altitude operations.

28. AETC improve IP training programs at both locations emphasizing realistic training.

29. AETC publish a standardized T-3A Instructor Techniques Manual.

30. AETC and Air Logistics Center evaluate the need to exercise an option in the maintenance contract to purchase more spare engines before awarding a new maintenance contract.

31. AETC emphasize the need for squadron schedulers to widen the distribution of airframe flight hours when planning the daily flying schedule.

32. AETC and Air Logistics Center review the engine management plan to evaluate possible efficiencies by placing engines into overhaul with less than the maximum 1,800 hours.

33. 19th AF return the Flight Manual update process to Air Logistics Center.

34. Air Logistics Center and AETC review and update the discrepancy report process guidance to ensure it addresses deficiencies to be reported, responsibilities, timelines, and required feedback.

35. AETC increase T-3A program low-cost safety modification funding to cover expected requirements.

36. Air Logistics Center continue implementing fuel system modifications.

37. AETC define and establish a measurable standard for engine stoppages.

38. Air Logistics Center and AETC ensure that the deficiency and safety reporting process tracks both recoverable and unrecoverable engine stoppages to increase visibility into possible endemic problems.

39. Air Logistics Center pursue an effective engine-out warning system.

40. AETC evaluate requirements for an ELT which activates when acceleration ("g-force") exceeds established thresholds in multiple axes.

41. Air Logistics Center continue their efforts, in cooperation with the FAA, to address potential non-compliant items.

42. Air Logistics Center clarify flight manual electrical fuel pump operating procedures and limitations.

43. Hondo and USAFA ensure their standard instructions adhere to new flight manual procedures for electrical fuel pump operation.

44. Air Logistics Center replace current flight manual engine starting procedures with those recommended by the engine manufacturer.

45. USAF IG perform an acquisition management review of the Air Force's Commercial and Non-Developmental Item acquisition strategies and guidance to identify pitfalls and lessons learned which may be applied to future programs.

46. USAF establish Commerical Off-the-Shelf/Non-Developmental Item (COTS/NDI) guidance to keep strategies focused on conducting realistic operational testing which reflects the mission environment. Conduct test and evaluation prior to buy or fielding decisions when possible.

47. AETC and Air Logistics Center establish a process to document deviations and include the OEM in their review.

48. AETC and Air Logistics Center schedule appropriate maintenance manual validation and approval before flying operations resume.