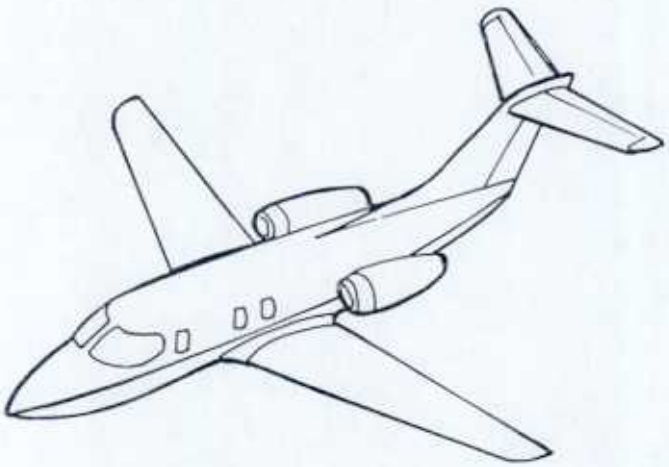
SPECIALIZED UNDERGRADUATE PILOT TRAINING AND THE TANKER-TRANSPORT TRAINING SYSTEM



History and Research Office
Headquarters, Air Training Command

SPECIALIZED UNDERGRADUATE PILOT TRAINING AND THE TANKER-TRANSPORT TRAINING SYSTEM

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HISTORY AND RESEARCH OFFICE
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Foreword

One of Air Training Command's most important tasks is to conduct undergraduate pilot training for the United States Air Force. The way we carry that out will change in 1992, when we begin the conversion from generalized to specialized undergraduate pilot training (SUPT)—a dual track program tailored to better meet the needs of the major operational commands.

This study outlines the reasons behind the most significant changes in undergraduate pilot training over the past 40 years, notably, the switch from specialized to generalized training in the 1950s and the decision to return to specialized training in the 1990s. It also examines the steps taken to acquire the tanker-transport training system aircraft, the first of three new aircraft needed to fully implement the SUPT concept.

A study such as this is designed to provide some insights into why certain paths were chosen and how we came to the place where we stand today. As we move forward with preparations for the joint acquisition with the United States Navy of a primary aircraft training system and the possible development of a new aircraft for the bomber-fighter training system, this information should prove useful to planners, program managers, and others with an interest in the continuing development of SUPT.

JOSEPH W. ASHY
Lieutenant General, USAF
Commander

Preface

This study traces the Air Force passage from generalized to specialized undergraduate pilot training. Generalized undergraduate pilot training, a system that provided all students with basically the same instruction and produced a pilot who, theoretically, could fly any of the Air Force's aircraft after a brief period of transition training, had served the Air Force well over the past three decades.

On the other hand, the idea of specialized undergraduate pilot training was not a new one. From 1939 to 1959, a period which included both World War II and the Korean War, the Air Force had followed a specialized approach, exposing students to different curricula depending on whether they would fly single-engine or multi-engine aircraft after graduation.

Changing the thrust of pilot training had far-reaching ramifications and was not a decision the Air Force made hastily. In the 1950s, and again in the 1980s, the Air Force made the decision to change the way it trained its pilots only after a deliberate and probing series of studies. In both instances, a common, central factor influencing the decision was the need for new trainer aircraft. Moreover, the studies concluded that SUPT would lower attrition and produce a higher quality, more motivated pilot at less cost than generalized UPT.

Under the specialized training concept, all student pilots would receive the same instruction on flying fundamentals in the primary phase and then enter one of two advanced training tracks tailored to meet the needs of the major operational commands. One group would follow a bomber-fighter track, and the other would follow a tanker-transport track.

The Air Force decided to initiate specialized undergraduate pilot training with the acquisition of a modified commercial aircraft for the tanker-transport track. Then, after the student pilots had completed primary training in the T-37, they would split into two groups. Those slated to fly tankers and transports would receive training in the new

aircraft, while those earmarked to fly bombers or fighters would be trained in the T-38.

Following the acquisition of the tanker-transport training system (TTTS) aircraft, ATC intended to pursue a similar strategy, i.e., purchase a modified version of a plane already in use, by procuring with the Navy the joint primary aircraft training system as a replacement for the T-37. Finally, to replace the aging T-38, the command wanted to obtain a new aircraft for the bomber-fighter training system.

This study outlines Air Force efforts to implement SUPT and emphasizes ATC's role in obtaining the TTTS aircraft. The road leading to a contract for the acquisition of the tanker-transport training system was long and winding. Despite several detours along the way, the ATC staff stayed focused on its objective—improving undergraduate pilot training.

Several members of that staff deserve special mention for their assistance in making this study possible. My thanks, in particular, go to Lt Col Stephen D. Chiabotti, Chief of the Program Management Division, DCS/Plans & Requirements and Lt Col James R. Robinson, Jr, Chief of the Resource Programming Division, DCS/Operations & Readiness. Both took the time to share their knowledge with me, to answer my many questions, and to comment on drafts of this work. Thanks also to Mr Thomas A. Manning, Chief of the History and Research Office, for his valuable suggestions on the organization and scope of this study, as well as his careful editing of the finished product.

Richard H. Emmons
Historian

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3 Nov 52	ATC began training student pilots under the four-phase program when Class 53-H entered pre-flight training at Lackland AFB, Texas.
May 56	At a conference at Craig AFB, Alabama, ATC solidified its plans for the change from conventional multi-engine training to jet single-engine training.
Oct 56	ATC turned over responsibility for transport training to the Military Air Transport Service.
21 Jan 58	ATC began using the T-37 in primary training at Bainbridge AFB, Georgia.
Mar 58	Vance AFB, Oklahoma, graduated its last multi-engine class with the B-25 and began single-engine training with the T-33 on 1 Apr 58.
1 Jul 58	ATC transferred responsibility for bomber, tanker, and fighter training to the operating commands.
15 Aug 58	Goodfellow AFB, Texas, graduated its last B-25 class.
24 Jan 59	With the graduation of the last B-25 class at Reese AFB, Texas, specialized undergraduate pilot training came to an end and generalized UPT began.
9 Feb 62	ATC introduced the T-38 in basic training at Webb AFB, Texas.

Jan 69	HQ USAF directed the Air Force Systems Command to conduct a mission analysis study of UPT program requirements.
Jan 72	In its report on future undergraduate pilot training, AFSC singled out the use of simulators as offering the most potential for improving UPT.
Sep 74	The Air Force's Deputy Chief of Staff, Personnel, Lt Gen John W. Roberts, suggested that ATC consider "some type of 'two-track' pilot training system" with a view toward producing a qualified pilot at less cost.
May 75	Gen Richard H. Ellis, Air Force Vice Chief of Staff, asked ATC to look into a suitable aircraft for multi-engine training and study the cost of specialized training compared to generalized training.
5 Mar 76	ATC published a study comparing generalized UPT to a specialized two-track program. While the study showed that the Air Force could realize cost savings and training benefits with a specialized training program, the command concluded it could not justify the purchase of a new aircraft in the prevailing austere fiscal climate.
Jul 76	Gen William V. McBride, the new Air Force Vice Chief of Staff, asked ATC to look at the possibility of replacing the T-37 and to explore every avenue for producing a better, more economically trained pilot.
17 Mar 77	As a result of the study, General Roberts, the ATC commander, informed General McBride that "the only training system that can optimize both quality and cost is a specialized training system."
Mar 78	The command submitted a general operational requirement (GOR) document for a specialized undergraduate pilot training system to HQ USAF.
Jul 78	HQ USAF published the program management directive (PMD) for a next generation trainer aircraft to replace the T-37.
26 Jun 79	The GOR for the next generation trainer was approved.

28 Jul 80	The Chief of Staff of the Air Force approved the GOR for specialized undergraduate pilot training.
Oct 80	HQ USAF issued the program management directive for specialized undergraduate pilot training.
2 Jul 82	Secretary of the Air Force Verne Orr announced that Fairchild Republic and the Garrett Turbine Engine Company had been selected to manufacture the next generation trainer, the T-46.
Feb 85	The official rollout of the T-46 took place at Fairchild Republic's facility on Long Island, New York.
Aug 85	HQ USAF published the program management directive for the tanker, transport and bomber aircraft.
Sep 85	HQ USAF informed ATC that it had deleted funding for the continued production of the next generation trainer from the FY 87 budget in order to meet congressional funding limits. That, in effect, killed the T-46 program.
Jul 86	HQ USAF approved the structural life extension program to prolong the life of the T-37 aircraft.
Jun 87	ATC forwarded a draft system operational requirements document (SORD) for the tanker,transport, bomber training system to HQ USAF.
Dec 87	ATC published a revised SORD to reflect a decision by the Chief of Staff of the Air Force to combine bomber and fighter training. The new SORD was for a tanker-transport training system.
Mar 88	HQ USAF issued the PMD for the tanker-transport training system.
Apr 88	ATC published the United States Air Force Trainer Masterplan in response to a congressional mandate for a report outlining Navy and Air Force plans for joint trainer aircraft procurement.
6 Dec 88	The Navy and Air Force signed a memorandum of understanding committing the services to cooperate in

identifying the specifications for aircraft training systems.

15 Feb 89 — Under Secretary of Defense for Acquisition Robert Costello signed and submitted to Congress the 1989 DOD Trainer Aircraft Masterplan, outlining Navy and Air Force plans for joint acquisition of trainer aircraft with emphasis on a joint program to replace the Navy's T-34C and the Air Force's T-37.

22 Feb 89 — HQ USAF issued a revised PMD for the tanker-transport training system directing AFSC to include provisions in the request for proposal (RFP) for purchase of the TTTS aircraft by the Navy.

28 Mar 89 — Aeronautical Systems Division (ASD) sent a draft RFP to prospective bidders, inviting them to provide preliminary responses.

Apr 89 — ASD issued the acquisition program baseline for the TTTS.

12 Apr 89 — ATC published ATC Programming Plan 3-88 which dealt with the implementaion of SUPT and the acquisition and deployment of the TTTS.

7 Jul 89 — ATC updated the Dec 87 SORD for the TTTS to refine some of the requirements and reaffirm the command's required aircraft delivery schedule.

27 Jul 89 — ASD released to prospective bidders a second draft request for proposal for the TTTS.

29 Aug 89 — ASD released the final RFP for the tanker-transport training system.

16 Oct 89 — The TTTS source selection team began evaluating contractors' proposals at Wright-Patterson AFB, Ohio.

21 Feb 90 — The Air Force selected a modified Beechjet 400A aircraft to provide training for student pilots going into tanker and transport cockpits. The contractor team with the winning proposal included McDonnell Douglas Corporation, Beech Aircraft Corporation, and the Quintron Corporation.

Nov 90	ATC determined the command could accomplish its mission with 191 instead of 211 T-1A aircraft and changed its requirements accordingly.
23 Feb 91	Gen Merrill A. McPeak, Chief of Staff of the Air Force, directed ATC to return to a merit assignment system that would allow student pilots to choose their own assignments based on their performance.
5 Apr 91	UPT students in Class 91-09 chose their assignments under the new merit assignment and ranking system.

SPECIALIZED UNDERGRADUATE PILOT TRAINING

EVOLUTION OF THE CONCEPT

A commonly used expression in recent years, "What goes around, comes around," aptly described the United States Air Force decision to turn to the concept of specialized undergraduate pilot training. For the past three decades the Air Force had relied on generalized undergraduate pilot training, a system which exposed all students to essentially the same curriculum and produced a pilot who, theoretically, was capable of flying any of the Air Force's aircraft after a brief period of transition training. Prior to the switch to generalized UPT in 1959, the Air Force had used variations of the SUPT concept with considerable success for the better part of twenty years, a period which encompassed both World War II and the Korean War. Changing the thrust of pilot training had far-reaching ramifications, and it was not a decision the Air Force made overnight. Nor was it a decision the Air Force could implement quickly. In that respect there was some similarity between the decision to abandon SUPT in favor of generalized UPT and the decision to resurrect SUPT decades later.[1]

Although the shift from specialized to generalized UPT did not take place until 1959, the process actually began in the early 1950s. One of the main factors that triggered an examination of the flying training program was the disturbingly high attrition rate of 53 percent experienced in the seven pilot training classes that graduated in 1950. That attrition rate translated into the loss of 1,903 potential pilots, a cause for concern under any circumstances. A study completed by HQ USAF early in 1951 showed that just over 90 percent of those who fell by the wayside (approximately 1,730 students) did so before they entered advanced training. Moreover, less than half (43.5 percent) of the students who did not complete pilot training were eliminated because of flying deficiencies.[2]

Those statistics caused HQ USAF to focus on the basic phase of training to see how to deal with the problem. At that time pilot training consisted of one month of pre-flight training, six months of basic training, and six months of advanced training (in either single or multi-engine

aircraft). The major air commands then provided whatever additional training they felt the recently graduated pilots needed to function effectively as aircrew members. Concerned not just with the number of people who didn't make it but with the costs involved in all the flying hours wasted, headquarters officials proposed a four-phase program, hoping to weed out most of those who wouldn't complete training before they entered the basic phase. The course of instruction they proposed included approximately 16 weeks of pre-flight training, 4 weeks of flight screening, 16 weeks of basic training, and 16 weeks of advanced training. In May 1951 HQ USAF asked for Air Training Command's comments on the proposed revision; the goal was to put the new program into effect by 1 July 1951.[3]

The ATC staff quickly concluded the target date was unattainable and succeeded in having implementation of the program postponed until its own Flying Training Air Force (FTAF) had a chance to look into the issue. ATC convened a board of officers for that purpose; the board members came mostly from ATC and FTAF with a few officers from the Air Staff also included. After a wide-ranging examination of the many facets of flying training, the board, in November 1951, indorsed the idea of a four-phase pilot training program—but a program slightly different from that originally suggested by HQ USAF. The ATC board favored a course consisting of an 18-week pre-flight and light plane screening phase, an 18-week primary phase, an 18-week basic phase, and a 12-week advanced phase (corresponding to crew training and using current tactical aircraft).[4]

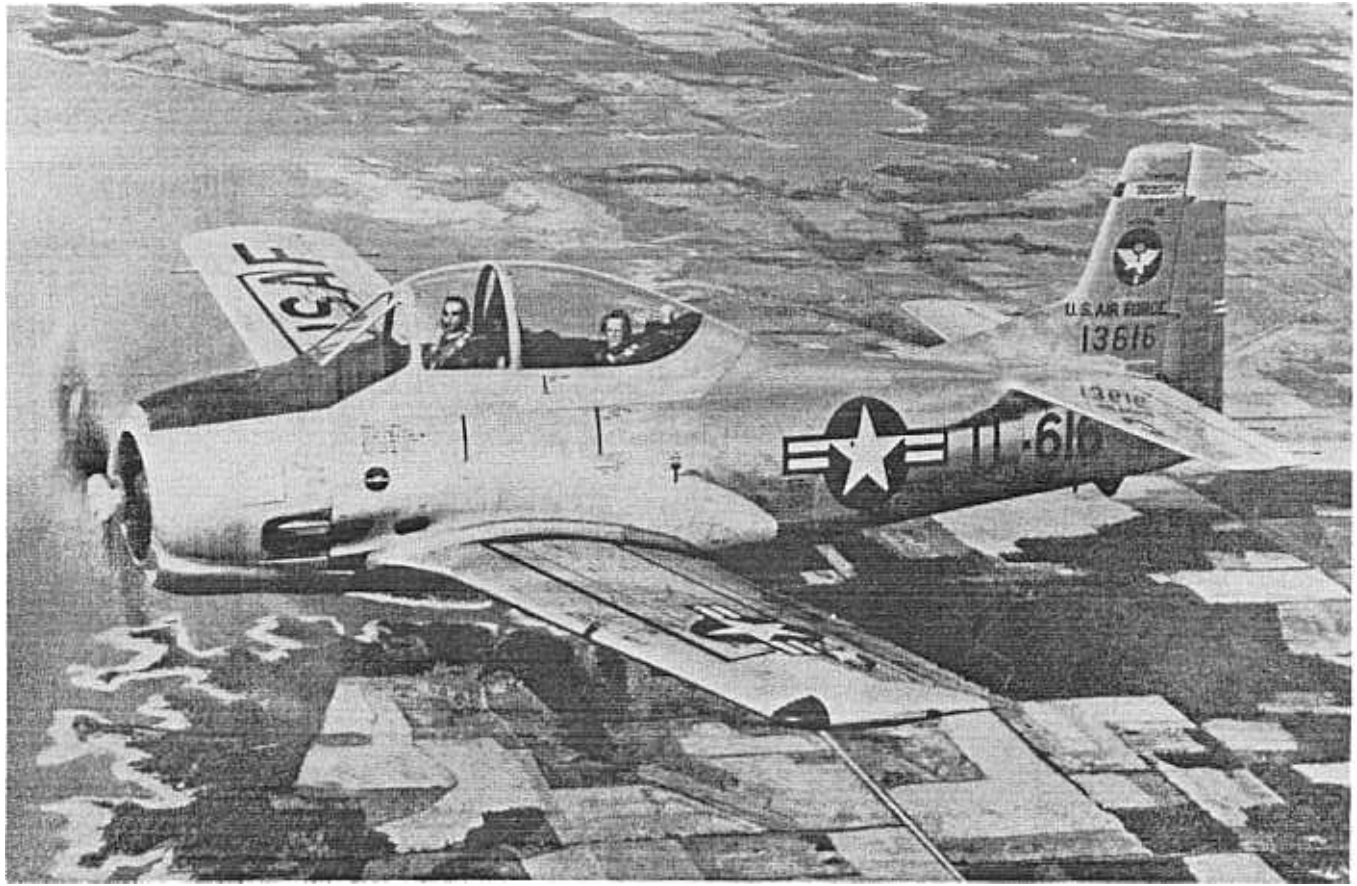
At a conference in Washington D.C. in May 1952, the principals ironed out their differences and fashioned what became the Air Force's four phase pilot training program. The conferees agreed on a pre-flight phase of 12 weeks; a primary phase totaling 24 weeks which consisted of 6 weeks of flight screening in a PA-18 (Piper Cub) light plane and 18 weeks of training in either a T-6 or T-28 (or preferably a T-34); a basic phase lasting 18 weeks which included training in either a T-6 or T-28 followed by additional training in either a T-33 or a B-25; and an advanced phase of 12 weeks. Training under the four-phase program began on 3 November 1952 when Class 53-H entered pre-flight training at Lackland AFB, Texas.[5]

Despite widespread agreement that the new program was a big step in the right direction, planners also agreed that another step was necessary. The Air Force had to identify and acquire aircraft better suited to the task at hand, i.e., the training of qualified pilots. ATC, therefore,

made plans for the step-by-step retirement of most trainer aircraft and the gradual conversion to more suitable ones. The first change ATC advocated called for the introduction of the T-34 in primary training in April 1954 to supplement the T-6 and T-28. Next, ATC wanted to retire both the T-6 and Piper Cub by July 1956 and replace the Piper Cub with the T-34 in light plane screening. By that time the command hoped to have a brand new trainer to use along with the T-28 in primary training, and to replace the T-28 in the first phase of basic training. The new trainer, identified simply as the TX at the time, turned out to be the T-37. By July 1958 the command intended to eliminate conventional aircraft in basic training and rely on two jet aircraft, the T-33 and yet another new trainer. Dubbed the TZ, the second new trainer became known as the T-38 when it entered the inventory. ATC planned to complete the conversion process by July 1959 when it would use the T-34 for light plane screening, the TX (T-37) for primary training, and the TZ (T-38) for basic training. At each step the command intended to use tactical aircraft for advanced training. However, along the way HQ USAF decided to return responsibility for most of crew training to the major commands before the introduction of generalized UPT. ATC lost responsibility for transport training in October 1956, and for bomber, tanker, and fighter training on 1 July 1958.[6]

Thus, early in 1953, ATC had spelled out its aircraft requirements for the coming years as the Air Force moved toward a predominantly jet force and laid the foundation for the switch to generalized undergraduate pilot training in 1959. The eventual decision to move to generalized UPT was no doubt buttressed by the conclusion of a special study team established in the summer of 1952 to look at a problem first identified during the previously mentioned attrition study. That problem was the lack of motivation among those who did not successfully complete pilot training—27.75 percent of those who failed to graduate did not have the desire it took to become a pilot. Unfortunately, in the two years since the original study, the attrition rate showed litle sign of improvement, so the Air Force set up Project Tiger to explore the situation. Recognizing that motivation and attitudes toward training were intangibles, the Project Tiger study team decided to rely on a psychological approach to turn things around. In presenting its findings to the Chief of Staff of the Air Force in September 1952, the study team essentially concluded that "all pilot training should be built around the assumption that each student was being trained to fly a jet fighter in combat." That message apparently fell on receptive ears, even though

Flight Screenin Aircraft



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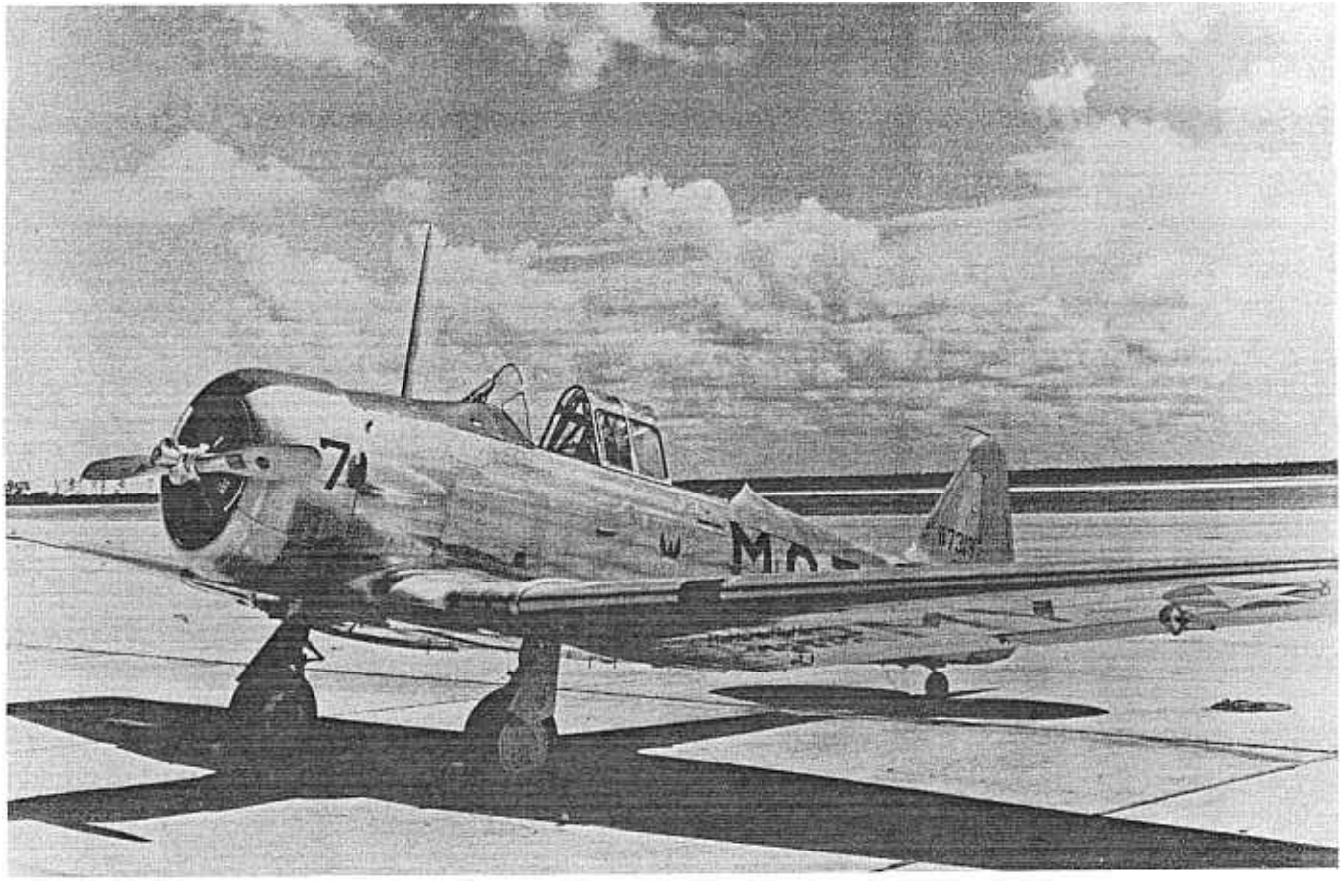


-6 Primary/Basic rainer

-34 Prima

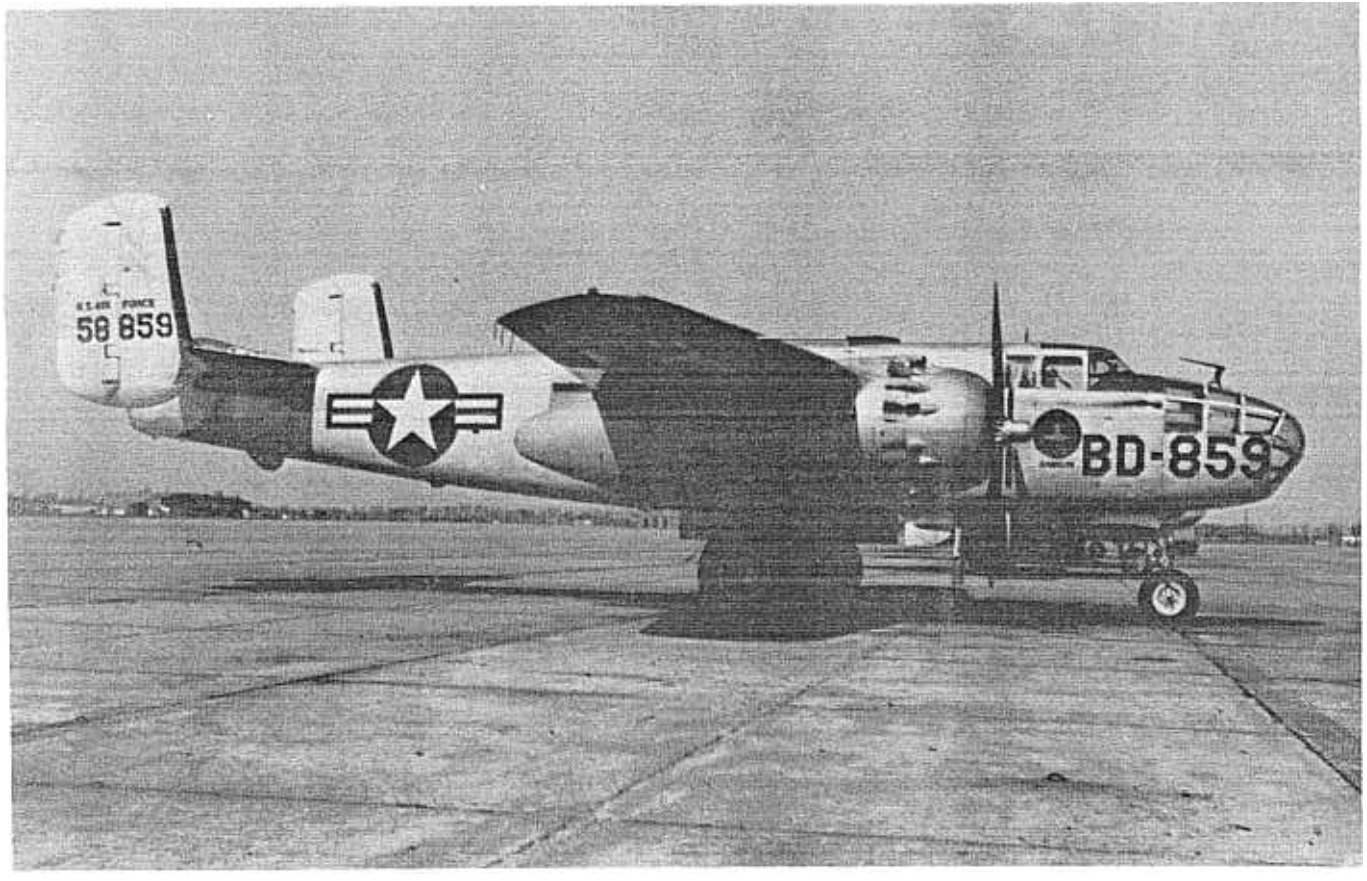
the assumption was not entirely correct (about 25 percent of the students were still going through multi-engine training).[7]

Over the next few years the Air Force moved deliberately toward its goal of upgrading ATC's fleet of trainer aircraft. At one point in time, in addition to the acquisition of the T-37 and T-38, ATC had also hoped to obtain a T-36 aircraft, a conventional multi-engine aircraft, to replace the B-25 in basic multi-engine training. However, that hope was dashed when the Department of Defense deleted funds for that purpose from the FY 54 budget because of the high cost involved. Thereafter, ATC concentrated most of its attention on the development and production of the T-37, the first major component in the command's bid to revitalize its trainer fleet and switch to a generalized UPT program. That effort paid off and ATC began using the T-37 in primary training at Bainbridge AFB, Georgia, on 21 January 1958.[8]

At a conference at Craig AFB, Alabama, in May 1956, ATC solidified its plans for the change from conventional multi-engine training to jet single-engine training. The command decided to make the transition in three phases: Phase I—upgrading key staff and supervisory personnel in the T-33 aircraft; Phase II—upgrading multi-engine instructors in the T-33; and Phase III—beginning student training. Three bases—Vance, Reese, and Goodfellow—still provided conventional multi-engine training in the B-25. According to the plan, Vance was scheduled to begin converting to single-engine training in October 1957 and complete the process in March 1958, Reese was going to start converting to the T-33 in September 1958, and Goodfellow was to follow suit in late 1959 or early 1960.[9]

As it turned out Reese became the last base to offer B-25 multi-engine training. Vance graduated its last multi-engine class on 11 March 1958 and began single-engine training on a full-time basis on 1 April 1958. Goodfellow never got to offer single-engine training. The last B-25 class graduated on 15 August 1958 and shortly thereafter, on 1 October 1958, the base transferred from ATC to the USAF Security Service. With the graduation of the last B-25 class at Reese on 24 January 1959, specialized undergraduate pilot training came to an end and generalized UPT began. The introduction of the T-38 in basic training at Webb AFB, Texas, on 9 February 1962, completed the trainer upgrading process almost 10 years after its inception.[10]

-3. Basic Single-engine raine



TB- Basic Multi-engine rainer

STUDIES AND PROPOSALS

Air Training Command's return to specialized undergraduate pilot training followed a similar but longer and more winding path. The journey began late in 1964 when HQ USAF asked Air University to forecast the Air Force's pilot training needs in the decade of the 1970s. Although nothing conclusive came out of the Air University study, it once again raised the question of which was the best path to follow—generalized or specialized undergraduate pilot training—and was the first of many such studies which various agencies conducted throughout the sixties and seventies and much of the eighties.[11]

In the 1960s alone there were a handful of major studies addressing future undergraduate pilot training concepts. The first of these, an ATC study, indicated that the Air Force would have to begin replacing the T-38 as early as FY 75 and the T-37 beginning in FY 80, given the projected demands on the airframes. A second study, termed Project FLYTE (an acronym for flying training evaluation), was directed by HQ USAF to see how pilot training could be improved in order to cope with the additional demands on the system generated by the expanding conflict in Vietnam. ATC incorporated many of the ideas contained in both studies in a required operational capability (ROC) document which called for a comprehensive study of a totally integrated, cost effective, and flexible UPT system for the 1975-1990 period. However, the continued expansion of pilot production goals—from approximately 1,900 in FY 66 to almost 3,500 in FY 69 to over 4,300 in FY 71—forced ATC to press for a system that could be operational in the 1974-75 time frame.[12]

HQ USAF reacted by directing the Air Force Systems Command in January 1969 to conduct a mission analysis study of UPT program requirements. To lay the foundation for the study, AFSC decided to seek contractor support from the Northrop Corporation and the Lockheed Aircraft Corporation. The contractors submitted markedly different recommendations to AFSC in early 1971. Northrop favored the continued use of T-37 and T-38 aircraft in a generalized UPT program. That approach would be possible, Northrop suggested, if the Air Force cut back drastically on the number of flying hours and dramatically increased the amount of simulator time each student received, thereby extending the operational life of both aircraft. Lockheed proposed that the Air Force convert to a specialized UPT course of instruction that would require the Air Force to acquire two new aircraft. Lockheed added

a slightly different twist to its proposal by advocating the use of a single aircraft for both fighter, attack, interceptor, reconnaissance (FAIR) training and tanker, transport, bomber (TTB) training. Under the Lockheed scheme, one new aircraft would take the place of both the T-37 and the T-38, and the second new aircraft would replace the T-41.[13]

After reviewing the work of the two contractors, the mission analysis study group performed some additional research and singled out the use of simulation as offering the most potential for improving undergraduate pilot training. In fact, the most important development to come out of this string of studies was an Air Force commitment to acquire state-of-the-art simulators and substitute simulator hours for flying hours in UPT; ATC prepared a ROC to initiate that process and forwarded it to HQ USAF early in 1972. The study group decided not to decide about the purchase of new aircraft or the larger issue of generalized versus specialized UPT. Before making a final report to HQ USAF in the fall of 1972, Air Force Systems Command solicited comments from the interested commands on several options the study group developed. Surprisingly, MAC and SAC lined up with Tactical Air Command, Air Defense Command, and ATC behind generalized UPT. For its part, ATC favored the generalized training option which relied on a single aircraft for both primary and basic training.[14]

As ATC prepared to procure, install, test, and maintain instrument flight simulators at the UPT bases, the question of generalized versus specialized training once again came up. This time it was raised by Lt Gen John W. Roberts, HQ USAF Deputy Chief of Staff, Personnel. In a letter to Lt Gen George H. McKee, ATC Commander, in September 1974, General Roberts stated "the Air Force goal has been to produce a universally assignable pilot from UPT; however, today's budgetary constraints may dictate that we change that policy. The logical result of such a policy change may be some type of a 'two-track' pilot training system." General Roberts went on to say that both the Office of the Secretary of Defense (OSD) and the General Accounting Office (GAO) were looking at military pilot training requirements and procedures and seriously considering alternatives such as a two-track training system. He, therefore, thought it wise that ATC take a fresh look at undergraduate pilot training with a view toward producing a qualified pilot at less cost.[15]

In response ATC came up with a proposal it labeled the Quality Improvement Program. This proposal, however, was little more than a modified version of the existing generalized UPT program. It involved

shortening UPT by 24 flying hours and then offering 24 hours of specialized instruction—in a T-38 for pilots going into fighters and in a multi-engine flight simulator (under contract with a civilian airline) for pilots going to MAC or SAC. The proposal found little support at HQ USAF.[16]

Not long afterward, in May 1975, General Richard H. Ellis, the Air Force Vice Chief of Staff, directed ATC to undertake another study, focusing this time on the identification of a suitable aircraft for multi-engine training, the use of flight simulators, and the cost of specialized training compared to generalized training. The Air Staff was eager to settle on a final position on the type of UPT program the Air Force wanted so it could respond to increasing pressure from several directions—from the GAO, OSD, and congressional committees—to consolidate its flight training with that of other military services.[17]

After completing its research, ATC circulated a draft study to other interested commands for their comments, before formally submitting the results to HQ USAF. ATC received a mixed response from the MAJCOMs. For the most part they came out in favor of specialized UPT. Most commands felt specialized UPT offered good potential for savings in both fuel and training costs, and, more importantly, for producing better quality pilots. While acknowledging the SUPT concept had its strong points, SAC and TAC did not believe the Air Force should abandon generalized training. Both commands voiced strong objections to the idea, citing especially their reluctance to surrender the flexiblity generalized UPT gave the Air Force—flexibility that had proved its worth during the United States' long involvement in Southeast Asia.[18]

The study ATC delivered to HQ USAF early in 1976 compared the existing generalized training program to a specialized two-track program—one track preparing pilots for assignment to fighter, attack, and reconnaissance (FAR) aircraft and the other track preparing pilots to fly tanker, transport, and bomber (TTB) aircraft. Data presented in the study showed that the Air Force could realize cost savings and training benefits by adopting a specialized training program, provided it could purchase a new multi-engine aircraft with improved fuel consumption. Other factors intervened, however, and the study concluded that:

> **. . . the purchase of a new aircraft to support specialized training cannot be justified in view of today's austere budget, programmed low UPT production and the resulting aircraft fleet-life extension this affords, and MAJCOM acceptance of the current, high-quality UPT graduate.**

Therefore, ATC recommended the Air Force retain the current UPT system of generalized pilot training that produced a universally assignable pilot.[19]

Even though the new Vice Chief of Staff, General William V. McBride, accepted ATC's recommendation, the SUPT concept seemed to have taken on a life of its own; it would not die. In July 1976 General McBride asked ATC to make yet another study, this one to focus on finding a replacement for the command's T-37 trainers that had already been in use for over 15 years. At the same time, General McBride charged General Roberts, who had taken over as ATC commander, to explore every avenue for producing a better, more economically trained pilot. ATC initially formed two study groups to carry out General McBride's instructions, but their work overlapped so much that the command eventually merged them into a single body. By the time that body had fininshed its work, the appeal of SUPT was so powerful that ATC, which had several times rejected the concept, now came out in favor of it. In summarizing the results of the study for the Vice Chief, General Roberts wrote: " . . . the only training system that can optimize both quality and cost is a specialized training system."[20]

Personally, General Roberts was a strong supporter of the specialized approach. In an interview several years later, he candidly shared his views about dropping generalized undergraduate pilot training in favor of SUPT:

> **I had a personal feeling when I was in the Pentagon, as well as after I got to the Air Training Command, that sending everybody through the same training program was wrong . . . . It doesn't make a lot of sense . . . . We actually train people to be fighter pilots . . . . We motivate them all through training to be a fighter pilot, and then all of a sudden, only 25 percent of them get to fly fighters, and we have 50 to 75 percent disappointed . . . . I suggest that we are doing it backwards. We ought to recruit people to fly airplanes by type before they ever step in a trainer aircraft . . . . We will get to that type of training someday. We have to for economy reasons, but also we can do a lot better job of training by training in that manner.[21]**

DETAILED PLANNING

Having crossed the Rubicon on the future shape of undergraduate pilot training, ATC energetically pressed for the adoption of SUPT. The

command advocated a parallel-track UPT program that required the use of three aircraft: a new primary trainer, the XT-1, to replace the T-37; a second new trainer, the XT-3, for the TTB track; and the T-38 for the FAR track. General Roberts favored the use of the term parallel-track over dual-track since he thought the proposed system would work best if the prospective pilots were selected for the FAR and TTB tracks before they started flying training. While the parallel-track concept encountered some opposition at HQ USAF, the prospect of converting to specialized training did not. It seemed that specialized undergraduate pilot training was an idea whose time had finally come.[22]

Even so, that did not mean that transforming SUPT from a concept to a reality would be an easy matter. There was still a complicated maze of documentation, coordination, and approvals to negotiate. Once again the SAC and TAC commanders spoke out against the idea, reiterating their previous positions. After submitting a general operational requirement (GOR) document for a specialized undergraduate pilot training system to HQ USAF in March 1978, ATC learned that the Air Staff thought it best to separate the T-37 paperwork from the overall GOR package in order to expedite replacement of the aging trainer, and as a precautionary measure, just in case the SUPT proposal failed to gain approval. Acting on that notion, in July 1978 HQ USAF published a program management directive (PMD) for a next generation trainer (NGT) aircraft which required AFSC to establish a System Program Office (SPO) to begin planning actions. The PMD projected the initial funding would come on line in FY 80 and estimated the total cost of the program would be about $1.6 billion for approximately 600 aircraft. PMD milestones called for ATC to take delivery of the first production aircraft in October 1986.[23]

Over the course of the next few years, ATC prepared a series of documents to gain approval for various facets of the SUPT system. On 26 June 1979, the Defense Department approved the GOR for the next generation trainer. With that out of the way, the next hurdle was to secure permission to proceed with the overall SUPT package. ATC received that permission on 28 July 1980 when the Air Force Chief of Staff approved the GOR for specialized undergraduate pilot training. In August 1980, ATC forwarded a draft program management directive to HQ USAF for the SUPT system. In October, the Air Staff issued the SUPT PMD and directed ATC to prepare an SUPT implementation plan. ATC complied with this directive in December 1980 when it forwarded an outline of the TTB syllabus, estimates of construction and

manpower requirements, a discussion of basing alternatives, and an implementation schedule to the Air Staff. In the fall of 1981, HQ USAF put out a program management directive for the tanker/transport/bomber trainer and a new PMD for SUPT. With that, AFSC's Aeronautical Systems Division (ASD) was able to begin the process of identifying a suitable business jet for use as the TTB trainer.[24]

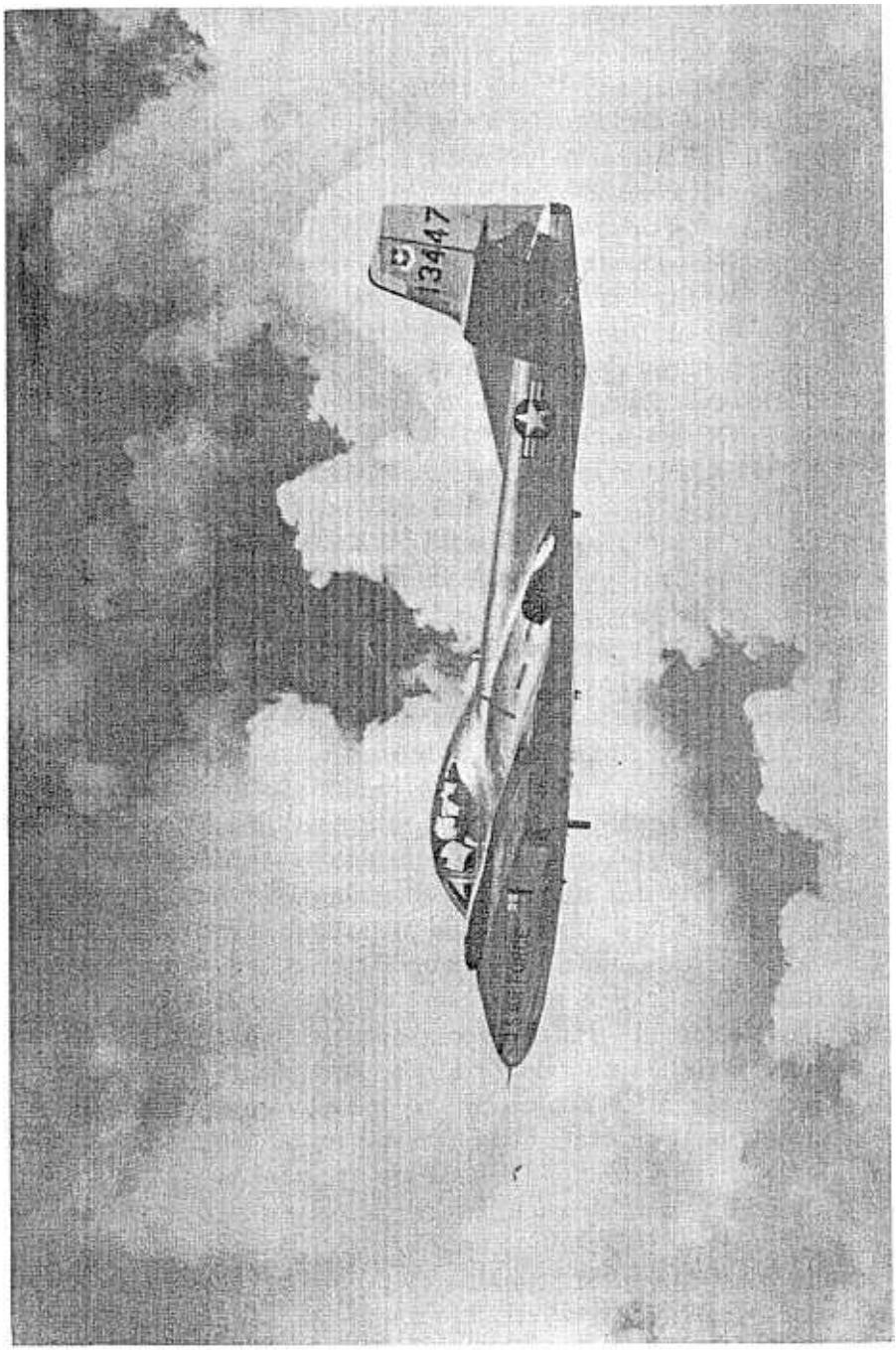
Two vitally important questions—where to base the aircraft and how to select pilots for the different tracks—still had to be addressed. As far as aircraft basing was concerned, three possibilities suggested themselves: a return to separate basing, an approach the Air Force had adopted when it last used SUPT, with only one type of aircraft at each base; two aircraft at each base, the next generation trainer and either the T-38 or the TTB trainer, depending on the track to be followed; or all three aircraft at each base. Guided by criteria which discouraged opening new UPT bases, reducing pilot production, or budgeting large sums for construction, ATC planners supported placing two types of aircraft at each base—the least costly option. Under the plan favored by ATC officials, each of five bases would conduct primary training using the next generation trainer, with three bases—Columbus, Reese, and Vance—then offering basic phase training with the TTB trainer, and the other two bases—Laughlin and Williams—conducting basic phase training for the FAR track with the T-38.[25]

There were actually two parts to the track selection question—when should it happen and how should it happen. Most of those with an interest in the process, i.e., the using commands and certain Air Staff agencies, grew up with the existing system and were content with it. They, therefore, leaned toward track selection at or near the end of primary training when the decision could be based,in part, on demonstrated student capabilities. The Air Force Human Resources Laboratory, which was already working on screening tests for pilot selection and was slated to develop some of the psychological and psychomotor tests for track selection, attempted to link the two, but that would have forced track selection to precede pilot training, and neither ATC nor the using commands were comfortable with that idea. Similarly, ATC and the using commands stated their preference for sticking with the familiar Advanced Training Recommendation Board (ATRB) as the vechicle for determining who should pursue which track. This process would include the results of tests developed by AFHRL, as well as more traditional criteria such as student performance and student preference.[26]

In April 1984, after three years of studying various leasing and buying options for a TTB trainer and several changes in direction influenced by congressional actions, HQ USAF decided to purchase the trainer. Shortly afterwards, HQ USAF included the TTB aircraft buy as an initiative in the Air Force FY 86 program objective memorandum. Acquiring the TTB aircraft had taken on an added sense of urgency since projections indicated the aging T-38 fleet could have trouble meeting the demands placed upon it as early as FY 86. If SUPT could be implemented about then, the reduced requirements for T-38s would permit the existing aircraft fleet to support fighter, attack, and reconnaissance training past the turn of the century. The POM initiative originally called for ATC to achieve an initial operational capability (IOC) with the TTB trainer in 1989. However, budget cuts announced in April 1985 caused the still unspecified IOC date to slip to 1991.[27]

Once HQ USAF issued a new program management directive in August 1985, ATC lost no time in drafting an updated System Operational Concept (SOC) for the TTB aircraft and setting up a SUPT implementation working group to integrate planning and programming activities. The working group found that ATC would have to purchase approximately 215 commercially available jets to meet TTB training requirements and, following a 1986 basing study, concluded that ATC should station all three aircraft at each of the five UPT bases, a significant change from the command's previously held position. A major consideration behind this change in basing strategy was the group's conclusion that an additional runway would not be needed at each base, a finding that made this option affordable instead of prohibitively expensive (as previous studies had suggested). The change would also allow a smoother flow of student pilots through training by eliminating PCS moves for some students following the primary phase, as split basing (with track classification taking place at the end of primary training) would have required . Finally, the group identified the fourth quarter of 1991 as a realistic start date for SUPT.[28]

Meanwhile, ATC seemed to be making good progress toward obtaining its next generation trainer, the aircraft scheduled to replace the T-37 as the command's primary trainer. In response to an Aeronautical Systems Division request for proposals, five contractors—Cessna, Ensign, Fairchild Republic, Gulfstream American, and Rockwell—had submitted proposals by the end of 1981. On 2 July 1982, Secretary of the Air Force Verne Orr announced that Fairchild Republic and the Garrett Turbine Engine Company had been selected to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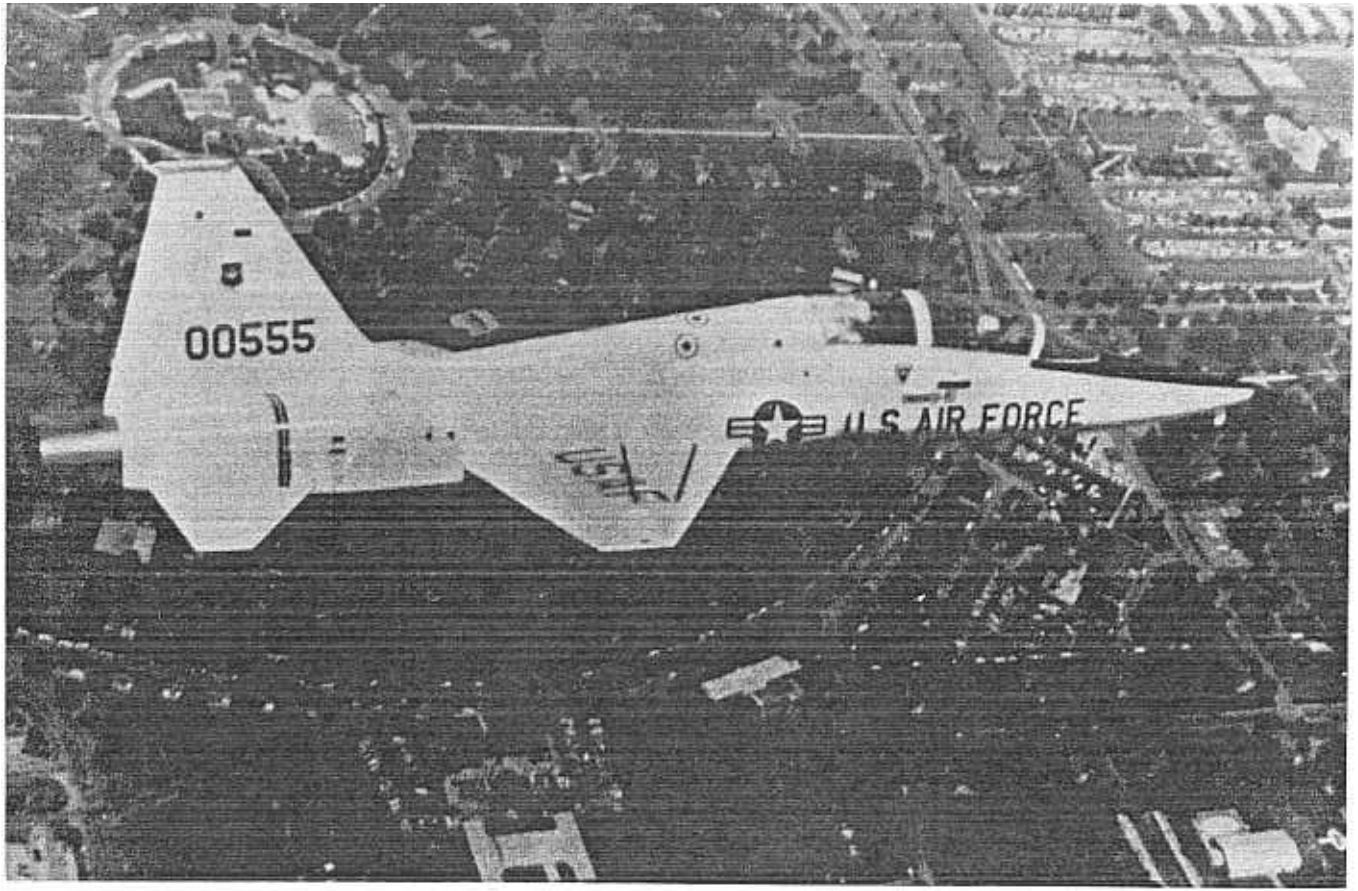


-38 Basic rainer

-46 N Generation rainer

manufacture the NGT. The new aircraft, designated the T-46, had twin-engines and side-by-side seating and met or exceeded all the required performance standards. Production contracts provided options for a total fleet of 650 aircraft. ATC expected to take delivery of the first operational aircraft in April 1986, and the command expected to achieve an initial operational capability with the T-46 in August 1987.[29]

After a number of modifications and production delays—not entirely unexpected with the development of a new aircraft—the official rollout of the T-46A took place on 11 February 1985 at Fairchild Republic's facility on Long Island, New York. Following more production delays, the first flight took place on 15 October 1985. ATC's optimism, diluted somewhat by all the delays, soon turned to despair. The previous month HQ USAF had informed ATC that it had deleted funding for the continued production of the T-46A from the FY 87 budget, as the Air Force searched for ways to meet increasingly tighter congressional funding limits. That, in effect, sounded the death knell for any hopes ATC had of fielding the T-46A for the specialized undergraduate pilot training program—a touch of irony, considering the acquisition of the next generation trainer had been separated from the SUPT package in the first place to insure its passage.[30]

The slippage in the IOC date for the TTB training system, followed closely by the loss of funding for the next generation trainer, dealt a severe, but not a mortal blow to SUPT. This twin setback forced ATC to revamp its entire SUPT implementation plan. That meant a slip of almost five years in the implementation schedule—and additional years of continued use for the T-37 fleet. To make that possible, in July 1986 HQ USAF approved a program to prolong the life of the T-37 through a rigorous inspection and modification program that included the replacement of structural members and some control surfaces. Known as the Structural Life Extension Program (SLEP), the new program would extend the service life of the aircraft to approximately 30,000 hours and delay T-37 insufficiency until 1999. The Air Force estimated that refitting the entire fleet would cost approximately $196.6 million. ATC expected Pacer Classic—a similar program, begun in 1982 to improve the reliability and maintainability of the T-38's J85 engine and later expanded to include the airframe, flight control components, and avionics—to extend the T-38's service life past the turn of the century. Estimated costs for fleetwide Pacer Classic modifications amounted to $315.2 million. With the breathing room afforded by these two

modification programs, ATC intensified its efforts to reintroduce specialized undergraduate pilot training.[31]

The next step in the process was to set forth the concept of operations for the tanker, transport, bomber training system (TTBTS). ATC, therefore, drafted a system operational requirements document (SORD) for the TTBTS and coordinated it with the Air Staff and appropriate MAJCOMs in June 1987. As outlined in the draft SORD, ATC envisioned that all student pilots would receive common primary phase flight training in the T-37 to develop their fundamental flying skills. Toward the end of primary training the students would be selected to pursue one of two courses in the advanced phase; they would then enter either the tanker, transport, bomber track or the fighter, attack, reconnaissance track. Which track they pursued would depend on such traditional factors as demonstrated flying skills, individual student preferences, and, of course, the needs of the Air Force. Students selected for the TTB track could expect to receive follow-on assignments with SAC or MAC, while those in the FAR track would go to the tactical air forces. With the TTB aircraft, ATC would be able to offer much more realistic training in such areas as low level navigation, air refueling rendezvous, precontact air refueling positioning, simulated low altitude cargo drops, and aircrew coordination. As for aircraft basing, ATC, still in agreement with the position advocated in the 1986 SUPT basing study, intended to conduct primary training and both tracks of advanced training at each of the command's five main undergraduate pilot training bases—Laughlin, Reese, Columbus, Vance, and Williams.[32]

SAC, which had not favored the SUPT concept from the beginning, once again expressed its reservations. In a September 1987 message to the Chief of Staff of the Air Force, SAC's Commander-in-Chief, Gen John T. Chain, Jr., presented his case. Basically, he was concerned that SUPT would magnify the differences between fighter pilots and multi-engine pilots and create the perception that tanker, transport, and bomber pilots were second class citizens, since they had not shared "the same tough challenges encountered by their fighter, attack, recce counterparts." Historically, the standard of excellence in undergraduate pilot training had been making the FAR cut. Since SUPT promised to widen the gulf between FAR training and TTB training, General Chain's concern was understandable. In addition, CINCSAC had questions about the Air Force's ability to operate in an extended conflict, if it no longer could rely on a universally assignable pilot.[33]

At the fall 1987 Corona Conference of the Air Force's senior leadership, General Chain had a chance to argue his case in person. With approximately 25 percent of the total pilot force assigned to SAC, General Chain's opinion carried a lot of weight. Besides the points already raised, General Chain contended that the B-1 and other advanced strategic aircraft handled more like fighters than multi-engine aircraft and advocated that bomber pilots should, therefore, go through the fighter track. SAC bomber pilots comprised only about five percent of the total force, so it would be no problem to include them in the fighter track. To accommodate them, ATC would not have to adjust the fighter curriculum for specialized UPT; the bomber pilots would simply follow the new fighter syllabus. The assembled MAJCOM commanders and senior members of the Air Staff agreed with that recommendation and made several other changes that significantly altered the makeup of the proposed SUPT package.[34]

As a result of the decisions made at the Corona Conference, ATC had to revise the SORD to account for the realignment of SUPT to a bomber-fighter (BF) track and a tanker- transport (TT) track. Having made the fundamental decision to link bomber training with fighter training, the conferees went one step further and changed the proposed SUPT basing structure back again so that bomber-fighter training would be conducted at two bases—Williams and Laughlin—and tanker-transport training would be conducted at three bases—Reese, Vance, and Columbus. Presumably, the senior commanders believed this would help the student pilots identify more closely with the major weapons systems they were slated to fly and assist in dispelling the notion that multi-engine pilots were second class citizens. The last major change made at the fall Corona was to move the track classification point from near the end of the T-37 primary phase up to the beginning of undergraduate pilot training. More precisely, track classification was to take place before the student ever began pilot training. That eliminated demonstrated jet flying ability from the classification criteria and placed heavier reliance on such factors as student preference, interviews, and psychological and psychomotor testing. With pre-track classification the student would have more of a say about what type of aircraft he would eventually fly and would know from the beginning which track he would follow. Since Public Law prohibited female pilots from flying combat aircraft, all female students had to follow the tanker-transport track, save for a few who would become T-38 IPs.[35]

The revised SORD, which ATC published in December 1987, spelled out what steps the Air Force had to take to bring what was now called the tanker-transport training system (TTTS) on line and begin operating under the SUPT concept. ATC expected to begin SUPT operations in December 1991 and have the entire command converted by July 1996. To do that the command planned to acquire a fleet of 211 commercially available, multi-engine business jets, with such features as the seating and avionics suites modified so that they were representative of current operational MAC and SAC mission aircraft. In addition to aircraft, the SORD also covered the simulators, aircrew training devices, training course materials, program management support elements, and logistics support systems needed for the TTTS. ATC defined the IOC date as the time when it had 17 aircraft, four simulators, and the associated training and support systems in place and ready for the first class at Reese AFB. The command would declare full operational capability (FOC) when it had all 174 primary aircraft authorized (PAA), 9 backup aircraft authorized (BAA), 28 backup aircraft inventory-attrition reserve (BAI-AR), plus 14 simulators and the required training and support systems in place and operational. In March 1988, the Department of the Air Force issued the program management directive for the tanker-transport training system. This document formally tasked the Air Force Systems Command to continue planning for the acquisition of a tanker-transport training system to implement specialized undergraduate pilot training in Air Training Command.[36]

USAF TRAINER MASTERPLAN

Before the Air Force could initiate SUPT, Congress wanted to see a masterplan outlining how the Air Force intended to proceed. Following the FY 88 Defense Authorization Joint Conference, Congress directed the Secretary of Defense to submit a plan which specifically addressed such factors as equipment requirements, estimated costs, the projected implementation schedule, and the Air Force aquisition strategy. The Congress further required that the plan address the most cost effective means of meeting Air Force undergraduate pilot training requirements, including the feasibility of joint service programs. The responsibility for preparing this roadmap fell, naturally enough, on Air Training Command.[37]

In April 1988 ATC produced the United States Air Force Trainer Masterplan to satisfy the mandates of Congress and coalesce Air Force thinking about the direction of pilot training into the early 21st century. The USAF Trainer Masterplan compared the relative merits and shortcomings of four variations of an improved UPT program and described in detail the course of action advocated by the Air Force, including a proposed acquisition stategy. Key to the successful implementation of any of the alternatives under consideration were two modification programs mentioned earlier, the structural life extension program for the T-37 and the Pacer Classic program for the T-38. These programs were needed to buy time and to insure the planes remained airworthy.[38]

Against that backdrop the Trainer Masterplan considered the four most promising options for improving the undergraduate pilot training program. One option, modernized undergraduate pilot training (MUPT), retained the single track generalized UPT concept. Under MUPT the Air Force would first replace the T-38 with a more modern aircraft with a FY 93 IOC and then replace the T-37 with the primary aircraft training system and achieve IOC with that aircraft in FY 99. A second option, the all-through trainer system (ATTS), also retained the single track generalized UPT concept. The ATTS option called for replacing both the T-37 and T-38 with a single aircraft for use in both the primary and advanced phases of training. The target IOC for ATTS was FY 93. The third option, alternate specialized undergraduate pilot training (ASUPT), began with the aquisition of the tanker-transport training system with an IOC in FY 92. This permitted the conversion from generalized to specialized UPT and simultaneously relieved the wear and tear on the T-38 fleet. Then, the T-37s and the remaining T-38s (in use in the bomber-fighter advanced track) would be replaced with a single aircraft with an IOC of FY 99. The final option, specialized undergraduate pilot training, also provided for the acquisition of the TTTS aircraft with an FY 92 IOC to permit the conversion from generalized to specialized UPT and relieve the burden on the T-38 fleet. Following that, the Air Force hoped to replace the T-37 with the PATS aircraft with IOC in FY 99 and the T-38 with the reconnaissance, attack, fighter training system (RAFTS) aircraft with IOC in FY 05.[39]

The Trainer Masterplan analyzed the costs involved, as well as reliability and maintainability factors, and concluded:

> **While there are any number of ways the Air Force can train pilots, all approaches are not equal. They are not equal in the quality of**

> **training . . . . Some produce a more qualified, better trained pilot than others. Nor are all approaches equal in their procurement and subsequent operating and support costs. Some are cheaper to acquire. Some are cheaper to operate. It is rare that one has the option of acquiring a system that is simultaneously best in all respects. Of all the options examined, SUPT promises to provide the highest quality graduates. SUPT is also the least costly training system to acquire and to operate.[40]**

The Air Force expected SUPT to produce a much improved operational training environment. In the primary phase SUPT would provide a common core of flying fundamentals for all students, before they moved into the advanced phase of their respective tracks. Students following the tanker-transport track would receive training in flight deck procedures, asymmetric thrust, crew coordination, cockpit resource management, cell formation, airborne rendezvous, International Civil Aviation Organization procedures, and mission-oriented low-level procedures. Those pursuing the fighter-bomber track would receive instruction in such areas as advanced aircraft handling, mission information management, three-dimensional situational awareness, advanced formation flying, element and flight management, and mission-oriented low-level skills. Upon graduation, the new pilots could expect an assignment corresponding to their advanced track or they could remain in ATC as first assignment instructor pilots (FAIPs). A FAIP would instruct either in the primary phase or in the advanced track from which he or she had just graduated. As decided at the fall 1987 Corona Conference, ATC would conduct bomber-fighter training at Williams and Laughlin AFBs and tanker-transport training at Reese, Vance, and Columbus.[41]

Among the many benefits the Air Force expected to reap with the conversion to SUPT was an increase in flying time for the student pilots. Under SUPT all students were scheduled to receive 89.0 flying hours during the primary phase, compared to 80.9 hours under the existing 52 week syllabus. The difference in the advanced tracks was even more pronounced, with those in the BF track getting 119.2 flying hours and those in the TT track accumulating 128.5 hours, compared to 108.8 hours in the existing syllabus. In addition, students in the TT track logged 109.5 hours of observer time in the third seat in the TTTS aircraft. Other benefits the Air Force expected to realize were increased reliability and maintainability (16.5 percent fewer aircraft needed to produce the same number of flying hours), accompanied by decreased operations and

support costs (20 percent savings in fuel and maintenance costs) when the entire program was on line. Moreover, ATC believed it could deliver a better trained graduate to the MAJCOMs following SUPT. ATC reasoned that the track classification process fostered an early identification with a weapon system through greater exposure to major weapon system instructors and close affiliation with like-minded student pilots, and these factors resulted in a better operational MAJCOM awareness. With the students' operational orientation starting earlier and the pilots gaining more experience in mission-related skills, ATC anticipated the MAJCOMs would be free to concentrate more on combat skills and less on the basics.[42]

The Trainer Masterplan addressed the major components of SUPT in broad outline. The first component, which would actually get SUPT off the ground, was the acquistion of the tanker-transport training system. As noted earlier, ATC intended to purchase 211 modified business jets to serve as tanker-transport trainers. With simulators, training devices, and other associated requirements, ATC estimated the entire TTTS program would cost in the vicinity of $1.5 billion. The final amount would depend in large measure on the aircraft selected. Manufacturers of seven aircraft showed interest in the program. Their aircraft ranged in price from $3-5 million apiece. The aircraft were the Beechjet (formerly the Mitsubishi Diamond), the Cessna Citation S II, the Lear 31, the Israeli Aircraft Industry Astra, the Falconjet 100 (formerly the Dassault Falcon), the British Aerospace 125-800, and the Sabreliner Sabre 65. Whichever aircraft the Air Force selected, even if it were of foreign design, would be manufactured in the United States. ATC anticipated significant supportability improvements with the introduction of the TTTS—savings in fuel costs of 40 percent over the T-38 and savings approaching 25 percent in the number of maintenance man hours required to produce each flying hour. The acquisition schedule called for a draft Request for Proposal (RFP) by March 1989 and the final RFP by July 1989, with the contract award in October 1989. ATC hoped to take delivery of the first aircraft in March 1991, achieve IOC in 1992, and FOC in 1997.[43]

The second major acquisition component of the carefully drafted roadmap was the primary aircraft training system, a replacement for the aging T-37. To bring PATS on line as quickly and cheaply as possible, ATC decided to follow the same route as it had with the TTTS, that is, instead of designing and building a trainer from scratch, the command wanted to buy a commercially available aircraft that could be modified

to suit its purpose. ATC expected to buy a fleet of 538 aircraft at an estimated price of $3.2 million per plane; the candidate aircraft ranged in price from $2-4 millon. The entire PATS program had a tentative price tag of $3.6 billion. All the companies initially interested in obtaining the PATS contract were foreign, but they were all seeking pairing arrangements with US companies. ATC planned to release the Request for Proposal in February 1994 and award the contract later that year in October. The command anticipated taking delivery of the first aircraft sometime in 1995, reaching IOC in 1999, and attaining FOC in 2004.[44]

The final element needed to complete the SUPT initiative was bringing the bomber-fighter training system (BFTS)—originally known as the reconnaissance, attack, fighter training system—on line, as a replacement for the T-38. ATC intended to purchase 417 aircraft at an approximate cost of $6-9 million per aircraft and $4.3 billion for the entire BFTS program. These amounts were a little more speculative than the figures for the TTTS and PATS buys, since it was likely some developmental costs would be involved. With the BFTS the command hoped to combine the performance characteristics of modern fighters with improved supportability. However, before beginning the formal acquisition process ATC had a lot of homework to do. Toward that end the command planned to undertake preconcept studies and a program analysis effort from 1988-2002, with an eye toward awarding the contract in 2003. Following that, ATC hoped to achieve IOC in 2005, and realize FOC in 2013. With that, the Air Force would have its first completely upgraded trainer fleet in over five decades.[45]

DOD TRAINER MASTERPLAN

After reviewing the USAF Trainer Masterplan, the Congress, in the National Defense Authorization Act for FY 1989, Report 100-989, directed the Office of the Secretary of Defense to submit a report to the House and Senate Armed Services Committees which outlined DOD's plans for future training aircraft for the Navy and the Air Force. In the wording of Report 100-989:

> **It is imperative that this report, to the maximum extent possible, outline a plan that will lead to the Navy and Air Force procuring similar trainer aircraft and take advantage of the associated cost savings of joint-service procurement and development . . . .**

A joint conference committee authorized $14.0 million for the T-37 SLEP and $9.6 million for the TTTS program for FY 89, but expressed skepticism about Air Force plans for replacing the T-37 and T-38 trainers. The conferees noted that if the Air Force reversed its acquisition strategy it could obtain a variant of the Navy's T-45 as a replacement for the T-38 and take advantage of the cost savings associated with continuing a warm production line. Furthermore, the Air Force could then develop a PATS aircraft in concert with the Navy to replace both the T-34 and T- 37 trainers.[46]

Dr. Robert B. Costello, Under Secretary of Defense for Acquisition, directed the Air Force to take the lead in developing a report to comply with congressional instructions. The final product, the DOD Trainer Aircraft Masterplan , differed in several respects from the original Air Force plan. One of the most significant differences was in the T-37 structural life extension program. A durability and damage tolerance analysis (DADTA) study performed by the Cessna corporation under Air Force contract indicated that there was a better, cheaper way to keep T-37s flying during the lengthy transition to a follow-on trainer. The DADTA data showed that instead of having to replace six fatigue-critical T-37 components in toto, the Air Force could replace only two components outright and three others as needed; a two phase inspection program, one accomplished at field level and the other done at depot level, would determine what was needed. Best of all, the Air Force could save approximately $85 million by following this new procedure. The estimated cost of adopting the new SLEP procedures came to $113.8 million as compared to the previous estimate of almost $200 million.[47]

Other changes outlined in the DOD Masterplan included a different approach to funding aircraft acquisition, additional emphasis on UPT production goals, and a shift in the SUPT basing strategy that had been outlined in the Air Force Training Masterplan. An idea that originated on the Air Staff and appealed to congressional staff analysts led the Air Force to seek level funding for its three aircraft acquisition programs at a relatively constant $400 million per year (in 1987 dollars). The prevailing feeling was that this approach would facilitate annual approval of appropriations within the normal budgetary process. In the DOD Masterplan, the Air Force emphatically stated that any delays in securing new trainers, especially the TTTS, would limit its ability to meet rated requirements. One of the ways the Air Force tried to offset the pilot retention problem was to increase pilot production to beef up the size of the rated force. However, the ability to do that was tied directly to

the availability of trainer aircraft, and the possibility of delays raised by a General Accounting Office audit of the USAF Trainer Masterplan prompted the Air Force to press home that point.[48]

Also related to pilot producton was the SUPT basing posture set forth in the Trainer Masterplan. Dedicated basing, i.e., conducting bomber-fighter training at two bases and tanker-transport training at the other three UPT bases, hampered ATC's ability to increase pilot production on demand. With the BF bases already operating at almost full capacity, ATC could increase production only if the Air Force wanted more tanker-transport pilots. Integrating all three trainer aircraft at each of the five UPT bases would give ATC a greater surge capability and a broader maintenance base and would permit a smoother transition to SUPT with no loss in pilot production. Based on the increased flexibility offered by integrated basing, the Air Force Chief of Staff, in December 1988, decided to adopt that basing posture for SUPT.[49]

The DOD Trainer Masterplan then turned to the larger issue of joint-service acquisition and the Congressional notion that reversing the T-37 and T-38 acquisition strategies would ultimately lead to the Air Force and Navy having similar primary and advanced trainer aircraft. While there was little doubt that would be the eventual outcome if the Air Force reversed its plans, DOD, and the Air Force in particular, expressed considerable doubt about the wisdom of pursuing such an option. However, neither the Department of Defense nor the individual services had any quarrel with the concept of joint-service acquisition. "The key to joint-service acquisition," as DOD saw it, was in the "joint specification of requirements far enough in advance to meet the projected needs of the parties involved." Based on that premise, the DOD Masterplan presented the alternatives, weighed them, and recommended a timetable that would create opportunities for joint-service acquisition of trainer aircraft.[50]

The whole matter hinged on the feasibility and desirability of introducing a variation of the Navy's T-45A as a replacement for the T-38. Such a move would require the Air Force to postpone replacing the T-37 and, in the process, provide an opportunity for the Air Force and Navy to develop a common PATS aircraft as a replacement for both the T-37 and T-34C. Beginning in 1990 the U.S. Navy planned to replace two aircraft with the T-45A and convert its strike track (the equivalent of the Air Force bomber-fighter track) from a three-aircraft to a two-aircraft system. That development, incidently, would set the stage for joint acquisition programs between the two services. The Navy

viewed the purchase of the T-45A in much the same light as the Air Force looked at the T-38 modification program, i.e., as a means of sustaining training operations until early in the 21st century, when it anticipated the next generation of advanced training technology would be commercially available. And, for the Navy, it made sense. Besides bridging the gap, the T-45A offered the Navy significant savings in such areas as fuel and maintenance costs.[51]

If the Air Force purchased the T-45A toward the end of the production line (beginning in 1994), it would achieve the Congressional goal of commonality with the Navy in advanced bomber-fighter training. But that, basically, was all that would be accomplished. The small cost avoidance benefits associated with capitalizing on a warm production line would be offset by the cost of retiring the T-38 early—after a sizable investment in the modification program and before the T-38 reached the limits of its useful service life. More importantly, the T-45A did not offer the Air Force the same advantages it provided the Navy. The Air Force estimated that whatever fuel savings it would realize by replacing the T-38 with the T-45 would be more than offset by the higher cost of maintaining the T-45. Furthermore, the Air Force would actually be taking a step backward, since the T-45A was less capable than the T-38 in most regimes. Additionally, from a DOD perspective, when it came to aircraft designed for carrier operations (as the T-45A was), it was more costly for the Air Force to follow the Navy in the procurement process than the other way around. That was because the Navy had to have a heavier nose gear for catapult launches, along with reinforced main gear and wing structures, and an aft section with a tail hook to withstand the stress of carrier landings. All these features added to both the cost and weight of the aircraft. That left DOD, and the Air Force, in the position of having to pay more money to eliminate these features from the production line or having to pay a penalty in terms of reduced performance and increased fuel consumption due to the extra weight. Either way, that was a losing proposition in DOD's eyes.[52]

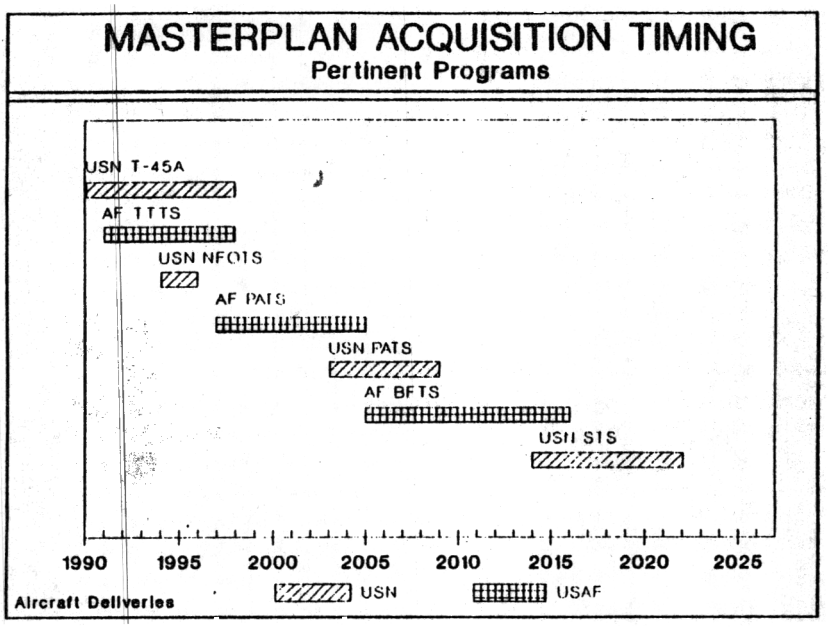
There were several other penalties the Defense Department would have to pay, if it reversed the order of trainer aircraft acquisition. For one thing, it would force the Air Force to undertake a second structural life extension program around 2006 to prolong the useful life of the T-37. Besides the expense involved in carrying out the SLEP, the Air Force would be faced with the dilemma of retaining the T-37 for an even longer period in order to amortize the modification investment or squandering the investment and replacing the T-37 soon afterwards to take advantage

of the opportunity to jointly acquire a PATS aircraft with the Navy. A second penalty DOD would have to pay was the procurement of an additional trainer aircraft to meet Air Force needs for a third generation BFTS trainer. The Air Force still needed a trainer which incorporated many of the technological advances of the last half of the 20th century and would prepare pilots to fly advanced aircraft expected to come on board during the early years of the 21st century, a need the T-45A did not meet.[53]

Under the plan favored by the Air Force and Navy, the two services would each acquire three major aircraft systems between CY 1992 and 2025. The Air Force would gain TTTS, PATS, and BFTS, and the Navy would get the T-45, PATS, and the strike training system (STS)—possibly a BFTS variant. The Navy also hoped to acquire a new naval flight officer training system (NFOTS), but in comparison to the other systems it was small in scale with only 20 aircraft involved. (Planned sequencing of the various programs is illustrated in Figure 1.) On the other hand, under the reversal option suggested by Congress, the Air Force would need four major new aircraft systems—TTTS, T-45, PATS, and BFTS—to do the same job; the Navy would still require T-45, PATS, and STS. (Planned sequencing for this option is shown in Figure 2.)[54]

On 6 December 1988 the Navy and Air Force signed a memorandum of understanding (MOU) committing the services to cooperate in identifying the specifications for three aircraft training systems: one to meet Air Force tanker-transport training system and Navy naval flight officer training system needs; one to meet Air Force and Navy primary aircraft training system needs; and one to meet Air Force bomber-fighter training system and Navy strike training system needs. The Air Force was continuing with its plans to acquire the TTTS aircraft between 1990-1997, and the Navy had already demonstrated a strong interest in buying approximately 20 variants of the trainer starting in 1994. As far as the PATS was concerned, the Air Force intended to take delivery of the T-37's replacement from 1997 to 2004. If the aircraft selected for that purpose proved acceptable to the Navy, then the Navy would begin replacing the T-34C with the new system about 2003. Further down the line, between 2005 and 2015, the Air Force wanted to replace the T-38 with an aircraft having a cockpit layout representative of 21st century fighters and capable of pulling high G-forces for a sustained period of time, an aircraft that could have variants compatible with both the Navy and Air Force training environment. The replacement aircraft would also have a limited weapons delivery capability to accommodate Air Force

1


MASTERPLAN ACQUISITION TIMING
Pertinent Programs
USN T-45A
AF TTTS
USN NFOTS
AF PATS
USN PATS
AF BFTS
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1990
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Aircraft Deliveries
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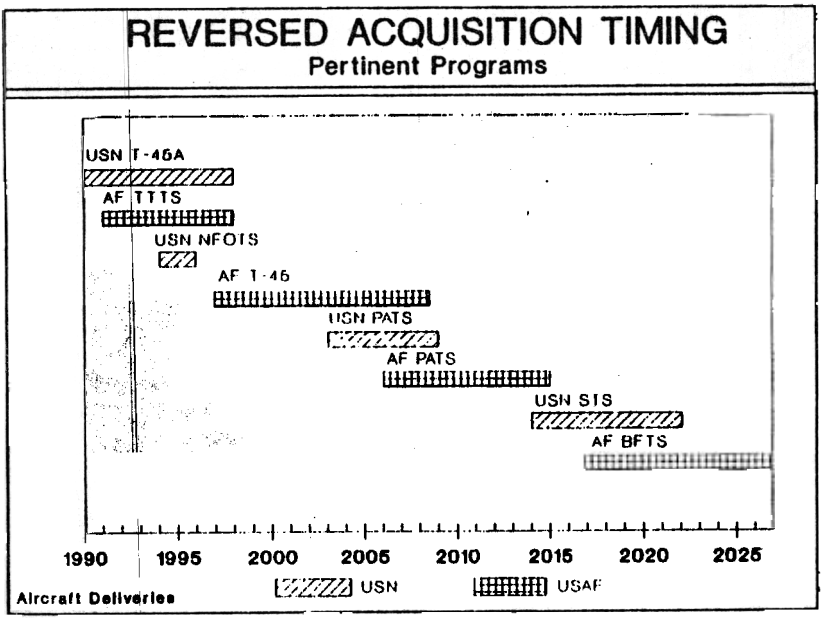
REVERSED ACQUISITION TIMING
Pertinent Programs
USN T-45A
AF TTTS
USN NFOTS
AF T-45
USN PATS
AF PATS
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1990
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Aircraft Deliveries
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lead-in fighter training and Navy air combat maneuvering requirements. With the service life of the T-45A expected to run out around 2015, the Navy was interested in looking at a variant of the BFTS for its strike training system.[55]

In creating and formalizing these opportunities through the MOU, the services reaffirmed their belief that joint-service acquisition represented sound defense policy. DOD hoped that the arguments assembled in the DOD Trainer Masterplan would convince the Congress that reversing T-37 and T-38 acquisition strategies was not appropriate. DOD was also optimistic those same arguments would rebut a GAO audit of the USAF Trainer Masterplan, an audit which recommended a five-year slip in all trainer procurement programs. The Defense Department came out strongly in favor of the Air Force's modified T-37 SLEP proposal, level acquisition funding, and the USAF/USN proposal for joint specification of requirements and joint procurement of aircraft training systems. DOD was especially adamant in urging that the Air Force purchase of the tanker-transport training system go ahead as planned. "The TTTS represents the linchpin for both Air Force Specialized Undergraduate Pilot Training (SUPT) and joint service procurement because it provides the means for the former while triggering the timetable for the latter," the Masterplan concluded. "In the Department's opinion, execution of the ATC Acquisition Masterplan . . . is essential to satisfy the rated requirements of the Air Force, both in the very critical near-term, as well as into the 21st century."[56]

TANKER-TRANSPORT TRAINING SYSTEM—THE FIRST STEP

PROGRAM MANAGEMENT DIRECTIVE

As 1989 began, the Air Force stepped up its efforts to acquire the tanker-transport training system. On 22 February 1989 HQ USAF issued a revised program management directive which incorporated for the first time instructions directing AFSC to include in the request for proposal "priced options for additional TTTS aircraft to be procured and used by the U.S. Navy." While the Navy had not yet programmed funds for the purchase of TTTS aircraft, Navy officials had discussed the joint acquisition of the trainer with their Air Force counterparts and asked that the Air Force make tentative provisions for that eventuality.[57]

The Navy was looking at the TTTS aircraft as a replacement for its T-39 mission support aircraft and as a trainer for the Undergraduate Naval Flight Officer Training (UNFOT) program. In all, the Navy was considering the purchase of 25 aircraft for the mission support role and another 25 planes for the flight officer training program. As outlined in the PMD, the Navy would acquire five TTTS aircraft each year from FY 94 through FY 98 to replace the T-39s. To support the flight officer training program the Navy would buy ten aircraft in FY 94, another ten in FY 95, and the final increment of five aircraft in FY 96. Such planning for the joint acquisition of trainer aircraft was unprecedented. But it did not stop there. The PMD also provided for the purchase of three TTTS aircraft by the National Aeronautics and Space Administration (NASA), one each in FY 92, 93 and 94.[58]

Additionally, the program management directive called upon the Air Force Logistics Command (AFLC) to get involved with AFSC and ATC in preparing cost estimates for maintenance and supply activities associated with the TTTS aircraft. ATC intended to use a two-tiered maintenance concept, centered around the use of contractors, to support the TTTS aircraft fleet. To perform relatively minor maintenance that could be accomplished either on the aircraft or at flightline docks, the command would use either contractors or in-house civil service workers. Just who would do the work could vary from base to base depending on the results of cost comparison studies to determine the most economical way to proceed. To do major repairs ATC planned to rely on contractor logistics support. Work that could be accomplished on base in component repair shops would be handled through a contractor operated and managed base supply (COMBS) organization. More extensive repairs would be done off base at facilities certified by the Federal Aviation Administration (FAA).[59]

Finally, the program management directive provided a funding profile geared to existing plans for the acquistion of the entire TTTS package—211 aircraft plus the required simulators, courseware, and contractor logistics support—over a period of seven years. All but $10.5 million of an estimated $1.49 billion earmarked for the TTTS program consisted of procurement (3010) funds; the $10.5 million consisted of research, development, test, and evaluation (3600) funds. HQ USAF, mindful that the eventual shape of the acquisition budget would be molded by future Air Force, DOD, and congressional decisions, cautioned the MAJCOMs involved that the amounts cited were for planning purposes only. The amounts (in millions of dollars) indicated

in Figure 3 are in then year dollars (existing costs adjusted to account for programmed inflation):[60]

Fig. 3

TTTS Funding Profile-February 1989

Funding Category	FY 89	FY 90	FY 91	FY 92	FY 93	FY 94	FY 95
3600	4.5	3.6	2.4				
3010	9.5	147.9	177.3	302.7	298.8	300.4	248.7

DRAFT REQUEST FOR PROPOSAL

Just a month after HQ USAF released the PMD, Aeronautical Systems Division was ready with a draft request for proposal (RFP). On 28 March 1989 ASD sent the draft to prospective bidders, describing the capabilites the Air Force was looking for in the tanker-transport training system, asking some specific questions of the companies involved, and inviting them to provide preliminary responses to the draft RFP. In the draft RFP the Air Force informed industry representatives that it intended to let three major contracts in bringing the tanker-transport training system on line: one for TTTS hardware and courseware, one for contractor logistics support for off-equipment aircraft maintenance, and one for simulator operations and maintenance. In soliciting industry responses to the draft request for proposal, ASD hoped to promote discussions between its own government program office and each of the prospective bidders in order to refine the formal RFP. To do that ASD asked the potential bidders to answer questions dealing with eight functional areas: cost, contracting, engineering, testing, logistics, management, manufacturing, and safety. ASD anticipated releasing the formal RFP in July 1989.[61]

In the meantime ASD arranged visits to Randolph AFB and Reese AFB to acquaint the potential contractors with existing flying training procedures and facilities. The interested parties visited Randolph from 17-21 April and Reese from 24-28 April. At Randolph ATC and ASD representatives held tehnical discussions with industry officials on the

time related instructional management (TRIM) system and gave them a tour of the training system support center. At Reese industry representatives had a chance to view the entire spectrum of flying training operations from the classroom to the flightline with special attention devoted to maintenance and ground based training system facilities. Furthermore, each of the companies had a chance to meet privately with Air Force representatives to explore at length various facets of the TTTS infrastructure.[62]

Six major contractors participated in these site visits: General Dynamics, Hughes, McDonnell Douglas, Flight Safety, Rockwell International, and the Sabreliner Corporation. A seventh company, Canadair, cancelled at the last minute, in effect signalling its withdrawal from the competition. Only Sabreliner manufactured its own candidate aircraft; the other corporations were part of teams put together to bid on the wide-ranging TTTS contracts. Thus, General Dynamics was paired with Cessna, Hughes with the Israeli Aircraft Industry, McDonnell Douglas with Beechcraft, Flight Safety with Learjet, and Rockwell International with British Aerospace. (Before the formal request for proposal was issued several months later, Sabreliner and Hughes would drop out of the race; Rockwell dropped out shortly afterward.)[63]

ACQUISITION PROGRAM BASELINE

By the end of April the AFSC and ATC staffs had agreed on the acquisition program baseline, another major step on the road toward specialized undergraduate pilot training. The idea behind the baseline document was to promote program stability and control cost growth by providing a framework within which the implementing, operating, and supporting commands could operate. To make sure all the principals were playing from the same musical score, the baseline document discussed the Air Force's operations and maintenance concepts for the TTTS, specified training and testing requirements, outlined the main technical and operational performance parameters, and provided a tentative procurement schedule. Included as an integral part of the tanker-transport training system was the ground based training system (GBTS). The ground based portion of the overall system consisted of courseware, a mix of training media including the required simulators, a training system support center, and a training management system.[64]

Among the characteristics the Air Force sought in the TTTS aircraft was an airframe that could provide 20 years of operation at the utilization rate required for the fleet to sustain at least 158,000 flying hours a year. The Air Force also desired an airplane with sufficient range to complete the required mission profiles and still have a 250-300 mile divert capability with the necessary fuel reserves. That airplane should have a maximum low level operating speed of 330 knots at 500 feet mean sea level (MSL) and 95 degrees Fahrenheit. The TTTS aircraft also had to be able to maintain a cruise speed of 0.70-0.75 mach at an altitude of 35,000 feet MSL. Obviously, the aircraft had to be able to take-off and land at all the ATC pilot training bases. To do that the TTTS aircraft had to be capable of operating from an 8,000 foot runway in 95 degree temperatures at 3500 feet altitude.[65]

The accompanying ground based training system had to provide for up to 14 simulators, as well as part-task trainers, computer based instruction systems, and related items, as determined by contractor-conducted front end analysis. As specified in the baseline document, the training management system for the GBTS should have capabilities at least equal to ATC's time related instructional management (TRIM) system. Another desirable feature of the GBTS was a training system support center that could provide software maintenance and modification, hardware modification, and various configuration management tasks for the system. The GBTS, according to projections, should be capable of handling a maximum student load of about 1,275 students a year.[66]

Planners developed the procurement schedule based on the premise that through FY 93 there would be an 18 month lag between the time the Air Force paid for an aircraft and the time it to ok delivery. Thereafter, ATC expected to switch to multi-year procurement and reduce the lag to 12 months. If the schedule held firm, ATC could start training the instructor pilot cadre in April 1992 and begin student pilot training in June 1992. The baseline procurement schedule is depicted in Figure 4:[67]

Fig. 4

Baseline Procurement Schedule-April 1989

Fiscal yr	89	90	91	92	93	94	95	96	97
A/C Buy	1	14	28	46	45	37	40		
A/C Del	0	0	5	14	29	64	50	45	4
Sim Buy		4	2	4	4				

AIRCRAFT REQUIREMENTS

In the summer of 1989 the pace of preparations for the acquisition of the TTTS quickened considerably. On 7 July 1989 ATC published a revised system operational requirements document (SORD) for the TTTS. Essentially, this was simply an update of the December 1987 SORD. It refined some of the previously stated requirements and reaffirmed ATC's required aircraft delivery schedule. That schedule called for the contractor to deliver one aircraft to the Air Force early in 1991 for qualification operational test and evaluation (QOT&E) purposes. Then, beginning in June 1991, ATC expected to receive one aircraft per month through December 1992, after which the numbers would increase slightly until Reese had received all its aircraft. Most of the early aircraft would be used for testing, evaluation, and training puposes. For example, ATC needed aircraft for technical order verification and validation (TOV&V), formative evaluation, follow-on operational test and evaluation (FOT&E), and maintenance training, before the command could begin transition training for IPs. Therefore, adherence to the delivery schedule was important, if the command was going to be able to implement SUPT on time.[68]

On 27 July 1989 Aeronautical Systems Division released a second draft request for proposal to the prospective bidders. This version, although it was not much different from the first, triggered an almost immediate reaction from potential contractors concerning the aircraft delivery schedule. As crunch time approached, i.e., when the Air Force released the formal RFP and the contractors had to respond with a formal offer, several contractors apparently had second thoughts about their ability to meet the demands of the schedule and decided it was time to voice their concern and attempt to get the Air Force to change its position. All this happened between 31 July and 3 August in a series of phone conversations between industry officials and representatives from ASD's Systems Program Office (SPO).[69]

Out of this flurry of conversations came a request from ASD for ATC to revise its initial aircraft requirements. ATC reluctantly complied but pointed out in a 4 August 1989 letter to the SPO that the modified schedule represented the command's "*minimum* requirement" so it could still meet an IP transition training start date of 1 June 1992 and a student start training date of 1 September 1992. For the command to meet those start dates it needed 14 aircraft for IP training and 17 aircraft for student training. But sheer numbers were not the answer; ATC needed some of

those aircraft far enough in advance that it could complete various tests, evaluations, and training before the start dates.[70]

ATC determined that it could get by with the delivery of two aircraft instead of five in FY 91. The command wanted the first aircraft in May 1991 so it could begin the QOT&E process and the second aircraft in June 1991 for TOV&V purposes. ATC also needed two aircraft in October 1991 and another in January 1992 so it could conduct the required FOT&E. In order to conduct the requisite maintenance training, ATC would need two more TTTS aircraft in February 1992. Altering the delivery schedule in this fashion left little time to correct any problems uncovered in the various tests and evaluations. It also meant the contractor would have to deliver eight aircraft between April and June 1992 to meet the desired start training date.[71]

Less than a week later, on 10 August 1989, ASD informed ATC that even these adjustments were not sufficient. All but one of the four prospective bidders flatly stated they couldn't provide the test aircraft as early as ATC would like. On the other hand all but one said they could provide the 14 aircraft needed to achieve the June 1992 instructor training start date, if—and it was a big if—the Air Force would permit them to deliver just one TTTS aircraft in FY 91 and cluster the delivery of the remaining 13 aircraft between January and June 1992.[72]

ASD apparently felt there was no other option. If the Air Force did not again alter the required aircraft delivery schedule to accommodate the potential bidders ASD envisioned four possibilities, all of them bad from ATC's point of view. First, ASD saw one or more of the contractors lodging a protest with senior DOD and congressional officials about unrealistic Air Force requirements. Such action would undoubtedly force the Air Force to postpone either releasing the formal RFP or awarding the TTTS contract. Second was the possibility that all but one of the contractors might drop out of the competition leading to a sole source procurement situation, which neither DOD nor the Congress were likely to bless. Third, it was conceivable that some of the industry teams might propose what they believed to be realistic schedules, but schedules which did not conform to the RFP requirements and would result in the elimination of those contractors from the competition. The final possibility was that a bidder might propose an unrealistic schedule (read the ATC schedule) which it probably could not meet if awarded the contract. In any event the results promised to be the same—there was no way ATC would be able to acquire the TTTS on time, and the SUPT timetable would suffer accordingly.[73]

In light of this dreary assessment, ASD felt it had no choice but to modify the delivery schedule once more to bring it into line with the contractors' avowed capabilities. ASD acknowledged the increased risks involved by cutting back on the time available to fix deficiencies discovered during testing, but concluded it was the best available alternative. Not to make that move would be self-defeating and would inevitably lead to delays. ASD, therefore, proposed a delivery schedule that didn't require the contractor to deliver the first aircraft until September 1991. Thereafter, the new schedule called for the delivery of three aircraft in January 1992, two each in February and March, and six aircraft in May 1992. Presumably, this was a schedule the contractors could live with.[74]

ATC, however, was not sure it could live with the latest revision. Command officials were displeased with this turn of events and tried to get ASD to change its stance. ATC even dispatched a team to Wright-Patterson AFB on 14 August 1989 to persuade ASD to reverse its position, but to no avail. The systems program office maintained that the time for negotiating had passed, that it was time to solidify the delivery schedule. Since prolonging the matter would almost surely result in delays further down the road, ATC agreed to go along. Within a matter of days ASD had a revised RFP ready to reflect the modified aircraft delivery schedule. Aside from the changes noted above, this latest version remained remarkably faithful to the original baseline, to the SORD, and to the previous draft RFP, as shown in Figure 5:[75]

Fig. 5

TTTS Aircraft Delivery Schedule

Document	FY 91	92	93	94	95	96	97
APB (27 Apr 89)	5	14	29	64	50	45	4
SORD (7 Jul 89)	5	12	29	64	50	45	6
RFP (27 Jul 89)	5	14	32	65	49	43	3
RFP (16 Aug 89)	1	17	32	65	49	43	4

FINAL REQUEST FOR PROPOSAL

The latest aircraft delivery schedule didn't remain firm for very long. When ASD released the formal request for proposal on 29 August 1989, ATC was surprised to find some drastic changes. Without consulting with the command, ASD had mistakenly factored in an 18 month lag time from aircraft buy to aircraft delivery across the entire delivery schedule. That differed substantially from the position in the acquisition program baseline which provided for an 18 month lag during the first few years of production and then switched to a 12 month lag beginning in FY 94. The most obvious consequence of this change was that from FY 94 on ATC wouldn't get the number of aircraft it needed to meet the SUPT conversion milestones. The specific differences between the APB and the formal RFP are shown in Figure 6:[76]

Fig. 6

RFP Aircraft Delivery Schedule

Document	FY 91	92	93	94	95	96	97
APB (27 Apr 89)	5	14	29	64	50	45	4
RFP (29 Aug 89)	1	22	27	48	42	40	31

While the RFP delivery schedule would not affect the the desired training start date (barring any serious problems during the testing cycle), the diminished deliveries in the out years would definitely delay the command's conversion to SUPT. Stretching out aircraft deliveries from FY 94 through FY 97 meant that the last three bases slated to receive the new TTTS aircraft would experience delays ranging from three to seven months. ATC projected that would cause Laughlin to be three months late in switching to the tanker-transport track; Vance, six months; and Columbus, nine months. The command anticipated a corresponding slip in the graduation date of the last UPT class from August 1996 to June 1997. ATC was not happy with this development, but the RFP was finally on the street, and the command believed it could still begin student training in September 1992. Contractor proposals were due back in 45 days, and then ASD could begin the source selection process.[77]

Meanwhile, the command had another pressing problem to deal with—funding for the TTTS. The first signs of trouble surfaced early

in the year when the Air Staff pared almost $3.5 million from ATC's FY 89 request for TTTS funding. While the amount was modest, the total request was only $17.5 million, and ATC feared that, if the loss was not restored, the first aircraft delivered might not be in the configuration the command desired. More worrisome by far was the action taken by the House Appropriations Committee when, on 21 July 1989, it slashed just over $73 million in 3010 (procurement) funds from the FY 90 request, roughly half the amount the command had programmed. Such a sizable slice in procurement funds so early in the acquisition process would, of course, have a profound impact. Without that money the command could not buy enough aircraft to begin training in September 1992. ATC speculated that, if the House action was upheld, it would have to slip the student start training date nine or ten months into late FY 93. Fortunately, it never came to that. The Senate Appropriations Committee supported ATC's funding request and, in mid-November, ATC learned that the two committees had reached agreement and authorized full funding for TTTS in FY 90.[78]

With that obstacle hurdled the funding outlook for TTTS was bright but by no means secure. Over the life of the TTTS acquisition cycle, i.e., FY 89-FY 97, ATC estimated the total cost at just over $2 billion, broken down as follows: $10.5 million ($10.5 million approved) for research, development, test and evaluation purposes; $1,572.2 million ($1,531.6 million approved) to procure the aircraft itself and another $131.7 million ($22.4 million approved) to purchase the initial spares needed; $32.3 million ($29.9 million approved) for military construction projects; $235.4 million ($115.1 million approved) in operation and maintenance funds for such things as contractor logistics support, site activation task forces, and follow-on operational test and evaluation; and $24.4 million ($14.1 million approved) for military pay. ATC's two main concerns were securing funds for contractor logistics support and for the initial aircraft spares.[79]

In the meantime, by mid-October three contractor teams had responded to the request for proposal with formal offers to provide the tanker-transport training system for the Air Force. Even before receiving the offers ATC had begun early in October to prepare for its role in the source selection process. The command chose approximately 40 personnel from the headquarters and the flying training wings as members of the source selection team. All training of team members was completed by 14 October and the team joined SPO personnel in evaluating the contractors' TTTS proposals on 16 October 1989 at Wright-Patterson

AFB. The competing contractor teams and their candidate aircraft were General Dynamics/Cessna with the Cessna 552, McDonnell Douglas/Beechcraft with the Beechjet 400A, and Flight Safety/Learjet with the Learjet 31. For the remainder of the year the source selection team poured over the contractors' proposals and performed detailed maintenance and operational evaluations of the candidate aircraft. ATC expected the contract award to take place in late February or early March 1990.[80]

PROGRAMMING PLAN

With the evaluation of the three TTTS proposals proceeding apace, it fell to ATC to develop the programming plan that would permit an orderly transition from generalized to specialized undergraduate pilot training. The command drew encouragement from a General Accounting Office report issued in late March. In the final report the GAO dropped a recommendation, present in an earlier draft version, that the Air Force postpone acquisition of any new aircraft for five years. In dropping the recommendation, the GAO said it was deferring to the DOD Trainer Masterplan which presented the case for going forward with SUPT. ATC breathed a sigh of relief, and on 12 April 1989 the command published ATC Programming Plan 3-88, which dealt with the implementation of SUPT and, in particular, with the acquisition and deployment of the tanker-transport training system. ATC planners had decided early on to make the conversion to SUPT one base at a time, so the plan reflected a very deliberate approach with heavy emphasis on the training needed to prepare for the advent of the tanker-transport training system.[81]

The command geared its planning toward initiating SUPT in mid-1992 and achieving an initial operating capability with the TTTS early in 1994. In doing so ATC acknowledged the obvious—that the implementation schedule depended directly upon the delivery schedule of the TTTS aircraft. To achieve IOC the TTTS had to go through an operational readiness verification process once the system had reached maturity. (System maturity was defined as six months of operations after the first base had received its full complement of PAA aircraft.) The verification process would consist of a two month long intensive flying program, using a representative number of high time aircraft.[82]

Beginning in June 1991, the first complement of TTTS aircraft was scheduled to go to Reese AFB where ATC planned to introduce specialized undergraduate pilot training. By July 1993 Reese would have

the bulk of its aircraft on hand and Randolph, where the command was going to set up a new course for prospective TTTS instructor pilots, would begin receiving its allocation. (See below for the special arrangements made to train the first batch of TTTS IPs at Reese.) Thereafter, the schedule provided for staggered deliveries with Williams (Nov 93), Laughlin (Jun 94), Vance (Feb 95), and Columbus (Nov 95), receiving the TTTS aircraft in that order. The number of aircraft slated to go to each base depended on the pilot production capacity of the base; those numbers are shown in Figure 7:[83]

Fig. 7

TTTS Aircraft Totals By Base

Base	PAA[a]	BAA[b]	BAI[c]	Total
Reese	30	2	4	36
Randolph	16	1	0	17
Williams	35	2	5	42
Laughlin	33	2	5	40
Vance	31	2	5	38
Columbus	31	2	5	38
Total	176	11	24	211

[a] Primary Aircraft Authorization—Aircraft needed to meet mission requirements.
[b] Backup Aircraft Authorization—Aircraft to accommodate downtime for unscheduled depot level maintenance actions.
[c] Backup Authorized Inventory-Attrition Reserve—Aircraft to take into account the loss of aircraft to accidents.

Predicated on the aircraft delivery schedule remaining firm, ATC planned to start the conversion to SUPT with the entry of class 93-07 at Reese in April 1992. That class would be composed of students who would follow the tanker-transport track. It would be followed three weeks later by class 93-08, composed entirely of students who would pursue the bomber-fighter track. The idea was to have the students identify from the first day with the track they would eventually pursue. The training implementation schedule for each of the SUPT bases is depicted in Figure 8:[84]

Fig. 8

SUPT Training Implementation Schedule

Base	Track Class	T-37 Start	BF/TT Start	First SUPT Graduates
Reese	TT 93-07	Apr 92	Sep 92	Apr 93
	BF 93-08	May 92	Sep 92	Apr 93
Williams	TT 94-13	Sep 93	Feb 94	Aug 94
	BF 94-14	Sep 93	Mar 94	Sep 94
Laughlin	TT 95-08	May 94	Sep 94	Apr 95
	BF 95-09	Jun 94	Oct 94	May 95
Vance	TT 96-04	Feb 95	Jun 95	Jan 96
	BF 96-05	Mar 95	Jul 95	Feb 96
Columbus	TT 96-14	Sep 95	Mar 96	Sep 96
	BF 96-15	Oct 95	Apr 96	Sep 96

The conversion from UPT to SUPT was not going to be easy. It was not a clearcut matter of stopping UPT one day and starting SUPT the next. Instead, the two training programs would exist side by side for approximately six months at each base, as each base moved from the old to the new, and the entire conversion process would stretch out for almost five years. All the while numerous factors—airspace, ramp space, maintenance support, availability of aircraft and instructor pilots, et cetera—would be making their influence felt and affecting the progress of the conversion process. Absolutely vital to the successful implementation of SUPT were two instructor pilot training programs. One had to do with the transition of experienced ATC IPs to the new aircraft as the command inaugurated tanker-transport training at each base. The other had to do with the gradual transformation of pilot instructor training (PIT) at Randolph from a two-aircraft to a three-aircraft program.[85]

ATC's first concern was to make sure the introduction of tanker-transport training at Reese went smoothly. As part of a three phase transition program, ATC planned first to select a cadre of 23 experienced, highly qualified instructor pilots to serve as the foundation upon which the command would build its TTTS instructor force. This group would be trained by the TTTS contractor—at the contractor's facilities and using

contractor aircraft. After that, the cadre would go through an in-house checkout program at Reese to upgrade them to full fledged tanker-transport instructor pilots. The in-house program would focus on the profiles outlined in the TTTS syllabus and the specific duties required of an instructor pilot in the tanker-transport track. A few of the group would also be certified as flight examiners. Once trained the cadre would initiate phase two of the transition training program.[86]

In phase two the cadre would train the other experienced ATC IPs who would constitute the tanker-transport instructor force at Reese. The method ATC intended to use to accomplish this was a 45 training day course that would provide each IP with 42 flying hours in the new aircraft and 10 simulator missions. This was to be an on-going process that would begin before the first SUPT class entered the tanker-transport track and would continue until all the Reese TTTS IPs (approximately 80-100 pilots) had been trained. Once that was done, ATC planned to phase out the transition training course at Reese and transfer it to Randolph.[87]

At Randolph ATC planned to conduct phase three—centralized TTTS instructor pilot transition training. ATC hoped to insert an option in the TTTS contract that would allow the command to have another contingent of 11 experienced IPs trained by the contractor. This nucleus would then pick up the responsibility for conducting the formal 45 training day transition course. Three categories of IPs would require that training: those slated to be tanker-transport instructor pilots as the remaining bases converted to SUPT; those scheduled to become instructors in the TTTS pilot instructor training program at Randolph; and staff flyers at HQ ATC who would be working with the TTTS. The command planned on continuing the centralized IP transition training course until all bases had converted to SUPT.[88]

As noted earlier, another key to the successful conversion to SUPT involved a major change in the command's pilot instructor training program. The switch from two to three trainer aircraft without any interruption in pilot production required careful planning and precise timing. As SUPT came on line the size of the T-37 IP force would remain relatively stable, while the T-38 force would gradually shrink until it was about half its original size. At the same time, ATC would be creating a TTTS IP force whose growth would be synchronized with the drawdown of the T-38 force, until both groups were about equal in size.[89]

ATC anticipated only minor turbulence in the T-37 PIT program. Most of that would stem from the use of T-37 IPs to form the initial contingent of TTTS IPs who would be involved in student training (as

opposed to the cadre who would be involved in IP transition training). The command planned not to place any students in some programmed classes in order to free the IPs for transition training. That approach would also permit the transition further down the line of some T-38 IPs to the tanker-transport track. The turbulence in the PIT program would come from the need to replace T-37 IPs who became tanker-transport instructors. However, the numbers were relatively small and the surges would be short-lived. Once SUPT was established, the command expected to turn out about 290 new IPs a year through the T-37 PIT program, up just slightly from the 275 PIT graduates in 1988.[90]

The T-38 PIT program would, of course, be affected quite a bit. ATC's main concern here was to make the transition as orderly as possible. It was not so much a matter of numbers as of timing. The command was committed to using only experienced IPs to bring the TTTS on line, so that meant it had to carefully control the influx of PIT graduates into those wings about to begin the conversion process. ATC intended, therefore, to stop assigning recent T-38 PIT graduates to each wing some six to eight months before the wing started its tanker-tansport track. By the time the last wing converted to SUPT the command expected the downward curve of T-38 PIT production to level off at approximately 143 IPs a year, down from 238 in 1988.[91]

Because the initial batch of TTTS IPs at each base would be products of the transition course at Randolph, the PIT course wouldn't begin until the conversion was well underway. In fact, the command even planned to extend some of the original TTTS IPs at each base in order to provide the experience and stability needed to ease the switch to a new training system. Ultimately, by the time the conversion was completed in FY 97, production from the TTTS PIT program would reach approximately 142 IPs per year.[92]

All these preparations were geared toward producing a total of 1,695 new pilots a year under SUPT (allowing for an attrition rate of 20 percent). Based on known requirements, ATC projected that 53.1 percent of the SUPT graduates would go into tanker-transport cockpits and 46.9 percent into bomber-fighter cockpits. The goal of 1,695 SUPT graduates a year included Air National Guard, Air Force Reserve, and foreign pilots as indicated in Figure 9:[93]

Fig. 9

SUPT Pilot Production Goals

Source	TT Track	BF Track	Total
USAF	812	653	1465
ANG	41	94	135
AFRES	38	12	50
Foreign	9	36	45
Total	900	795	1695

To accommodate the tanker-transport training system ATC would have to modify a variety of maintenance and support facilities and, in some cases, construct new facilities. Toward that end the command identified a number of military construction (MILCON) projects needed to allow each base to make the conversion to SUPT. Although there were some slight differences in what was needed, most of the bases had common requirements. These included constructing of a contractor operated and managed base supply warehouse, instrument flight simulator modifications, new taxi stripes, tiedown anchors, and converting electrical power for the centralized aircraft support system. All the bases also needed to alter their squadron operations buildings to support the command-wide switch from two to five flying training squadrons in each wing. Williams and Laughlin would need new maintenance hangars, but the rest of the bases could get by with modifications to hangar door openings and the electrical power available. Providing that funding was approved on time, ATC intended to begin work on these projects at Reese in January 1991 and complete the work at Columbus by January 1995.[94]

PARALLEL DEVELOPMENTS

All the while ATC was preparing for the acquisition of the TTTS, the staff was also involved with other projects that would play a vital role in the successful conversion to specialized undergraduate pilot training. The development of a new pilot selection and classification system (PSACS) was one such project. PSACS was the vehicle ATC

was going to rely on to help it determine, first of all, who should enter pilot training and, secondly, what type of aircraft the prospective pilots should fly. While ATC, in concert with the Air Force Human Resources Laboratory, had performed a great deal of research over the years in the area of pilot selection, pilot classification was pretty much unexplored territory. For years the command had not decided what kind of cockpit a student pilot would go into until shortly before graduation, and that decision was based almost exclusively on the student's flying proficiency. As far as screening was concerned, ATC hoped that refinements in the process would make it easier to identify career motivated pilot candidates who were most likely to complete pilot training. The main challenge for the command, however, was to develop the criteria and evaluation tools that would allow the Air Force to make the classification decision up front, before a student entered the primary phase of pilot training.[95]

A central feature of the new system was a battery of computer administered basic attributes tests. ATC intended to use the results of those tests, designed to provide insights into a candidate's mental capacity, motor skills, and motivation, in both the selection and classification processes. The candidates selected for pilot training would go through a flight screening program, and their demonstrated aptitude for flying would be factored into the final classification decision. The command also intended to introduce candidate interviews with active duty pilots to provide yet another basis for evaluation. In addition, the candidates themselves would have a direct input into the classification process. After receiving detailed information on each of the major weapon systems, every candidate would declare in order of preference the category of aircraft—tanker, transport, bomber, or fighter—he or she would like to fly.[96]

ATC had to work at a fast pace to convert this conceptual framework into a reliable pilot selection and classification system before the switch to SUPT took place. Working closely with AFSC's Human Systems Division, ATC developed a three phase acquisiton strategy for PSACS. Phase I covered a proof-of-concept study including identification of the appropriate hardware and software for the basic attributes tester (BAT); phase II covered full scale development (with delivery of 25 prototype BATs for testing purposes); and phase III covered hardware production for 135-200 BATs. In June 1989 HSD awarded a contract for the proof-of-concept study. A few months later, in November 1989, ATC received word that Congress had approved research and development funding for FY 90. Then, shortly before the TTTS contract award in February 1990, ATC forwarded the draft System Operational Requirements Document

to the major commands for comment. ATC hoped to award the full scale development contract in April 1990 in order to achieve an initial operational capability with PSACS in April 1991.[97]

Despite the excellent progress being made, there was one aspect of PSACS that still troubled some of ATC's senior staff—the role of the flight screening program in the classification process. As matters stood this was the only flying most candidates would have experienced before the classification decision would be made. Depending on the commissioning source, that flying experience differed markedly. Candidates from the Air Force Academy went through something called the pilot indoctrination program, which consisted of 18.5-21.5 hours of flying in a specially modified Cessna 172 (T-41C) aircraft at the academy. Candidates from OTS and AFROTC, on the other hand, went through a 14-hour flight screening program in a Cessna 172 (T-41A) aircraft at Hondo, Texas, except for those who already held a private pilot's license; they were exempt. Aside from the differences in the programs, the real problem was that the flight screening procedures did not provide the Air Force enough feedback to make an informed classification decision, and they did not give the candidates the right types of experiences upon which they could base an informed decision about what type of aircraft they wanted to fly.[98]

To overcome those deficiencies, ATC advocated an enhanced flight screening (EFS) program that would provide all pilot candidates with the same flying experience. That experience, ATC felt, should include aerobatics, flying overhead traffic patterns, and exposure to moderate G-loading. With exposure to those types of maneuvers, a candidate would be in a better position to judge what kind of plane he or she would like to fly. The other side of that coin was that the Air Force would have a chance to see how the candidate handled the more challenging program and would be in a better position to decide which track he or she should follow. Since the T-41 was not certified for aerobatics, and the aircraft couldn't be used to fly overhead patterns—its high wing configuration created a visibility problem when banking the aircraft and constituted a safety hazard—the EFS program ATC wanted to institute required a new aircraft.[99]

Toward that end ATC developed a statement of need (SON) to initiate enhanced flight screening. The SON called for the lease of an aircraft capable of aerobatics, with a contractor providing the aircraft, instructors, flight examiners, aircrew training devices, logistics support and related services. ATC would furnish the syllabus and quality

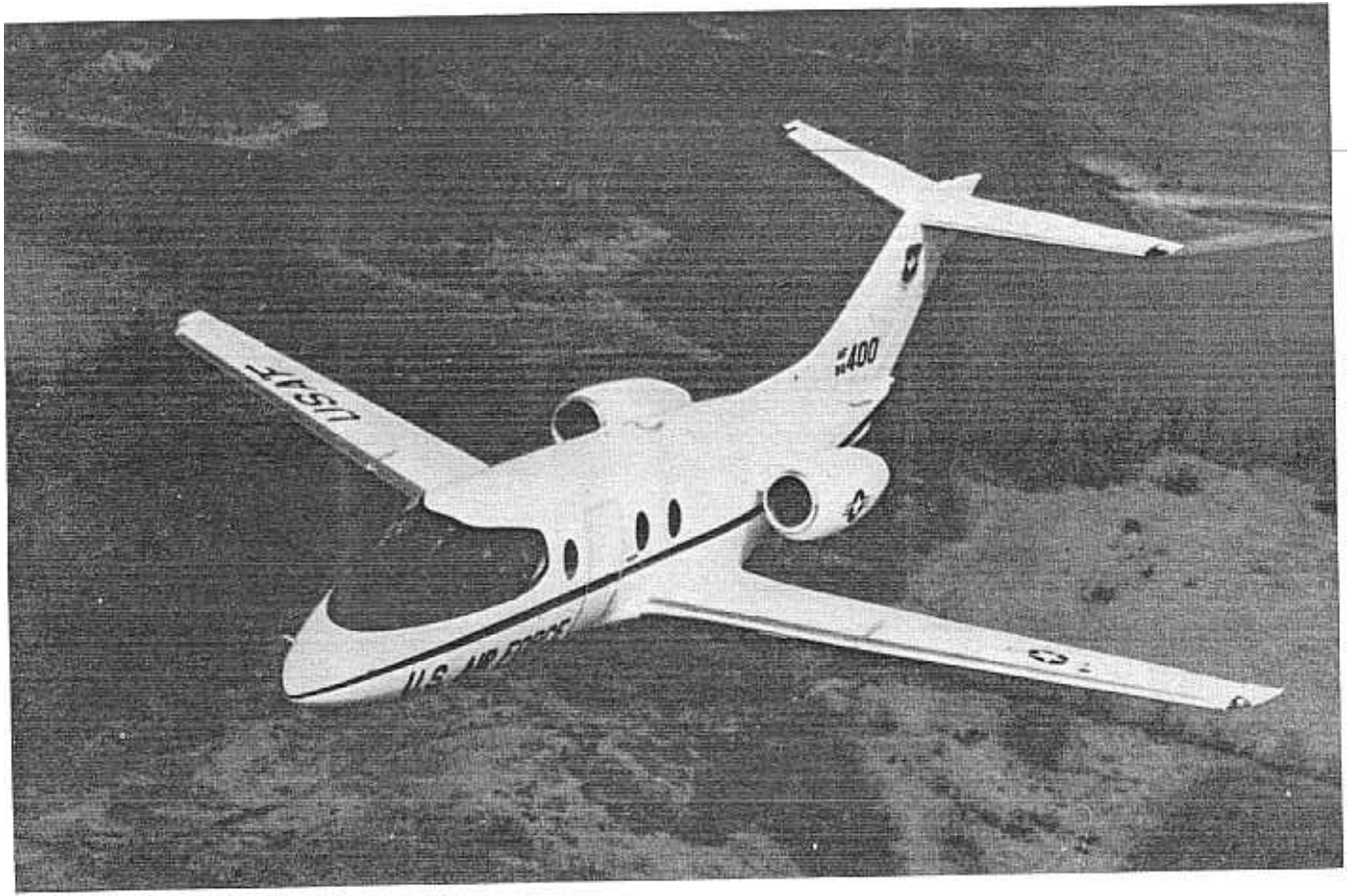
T-41 Flight Screening Aircraft

assurance evaluators and would make the final screening decisions. In addition, ATC proposed increasing the flight screening syllabus from 14 to 21.5 flying hours, to expose the candidates to at least six hours of aerobatics and other flight profiles. ATC coordinated the draft SON with the Air Staff and other MAJCOMs late in 1989, and General Oaks approved it on 22 January 1990. However, within a matter of weeks it became clear that congressional opposition to such leasing arrangements would make EFS difficult, if not impossible to fund. ATC, convinced that enhanced flight screening was vital to the success of PSACS and the conversion to SUPT, decided to go forward with the idea and seek approval to purchase, instead of lease, the aircraft it needed.[100]

CONTRACT AWARD

With the future of enhanced flight screening still very much in question, ATC moved a big step closer to SUPT on 21 February 1990 with the announcement that the Air Force had awarded a contract for the tanker-transport training system. After months of studying proposals and conducting operational and maintenance tests, the Air Force selected a modified Beechjet 400A aircraft (see photograph below) to provide training for student pilots with assignments to tanker and transport cockpits. The contractor team with the winning proposal included McDonnell Douglas Corporation, Beech Aircraft Corporation, and Quintron Corporation. McDonnell Douglas would provide overall management, courseware, and systems integration for the TTTS effort, while Beech would manufacture the aircraft and provide logistics support through Beech Aircraft Service Industries, and Quintron would provide the simulators. The initial contract, worth approximately $8.8 million, called for the contractors to deliver one aircraft, technical and management data, and engineering drawings and courseware. It also contained options for up to 211 aircraft and associated ground-based training systems. The Air Force exercised the second option (for 14 aircraft) on 16 March 1990.[101]

The aircraft chosen would be modified as the Beechjet 400T and would be known in the Air Force as the T-1 "Jayhawk." With positions for two students and an instructor, the Beechjet would allow student pilots to train in a flight-deck environment similar to the operational aircraft they would fly after graduation. The Beechjet, powered by two



T-1 Tanker-Transport Trainer

Pratt and Whitney JT15D-5 turbofan engines, had a top speed of 330 knots at low level and .75 mach at high altitude. It had a range of 1,930 nautical miles without refueling and a maximum certified altitude of 41,000 feet. With a gross takeoff weight of 15,780 pounds the Beechjet could take off in just 3,950 feet; its maximum payload was 2,355 pounds.[102]

It had taken ATC a long time to come this far. It was just over 31 years since the command had dropped specialized undergraduate training in favor of generalized training. And it was almost 13 years since the day in March 1977 when General Roberts, the ATC commander, had advocated a return to SUPT. Along the road the command had encountered many twists and turns. As noted earlier, ATC had come this far once before—in July 1982 the Air Force had awarded a contract to Fairchild Republic and the Garrett Company for the development of the T-46, the next generation trainer which was supposed to replace the T-37. However, that attempt to modernize the UPT system was scuttled in 1985 when the Air Staff cut further funding for the T-46 because of fiscal constraints and production problems. That caused ATC to turn to the structural life extension program to prolong the useful life of the T-37, and led the command to attempt to initiate SUPT with the acquisition of the tanker, transport, and bomber training system. Later, ATC also had to alter those plans somewhat when the Air Force's senior leadership decided to combine bomber and fighter training in the same track. Moreover, each change in direction, no matter how minor, had seemed to trigger a change in the SUPT basing posture. Through it all the command had remained flexible and, most importantly, had stayed focused on its objective of improving undergraduate pilot training.

With the TTTS contract award, ATC officials were enthusiastic about the prospects of beginning the conversion to SUPT in just over two years. Their enthusiasm was tempered, however, by the knowledge that there was still much work to be done and, inevitably, more changes to be endured. The acquisition of the tanker-transport training system was only the beginning. It would be years before the modernization of UPT would be complete. Still to come were the acquisition of the joint primary aircraft training system to replace the T-37 a few years down the road and the acquisition of the bomber-fighter training system to replace the T-38 after the turn of the century. Nonetheless, the letting of the TTTS contract on 21 February 1990 was a major milestone, an important first step on what was sure to be a long and winding road.

EPILOGUE

In the course of the next 13 months ATC got an inkling of just how winding that road would be. During that time the command had to alter plans affecting both the tanker-transport training system and specialized undergraduate pilot training. In addition, ATC had to contend with a proposal which surfaced as part of the Defense Management Review (DMR) process that recommended dropping altogether Air Force plans to acquire the T-1A aircraft and associated simulators and courseware that constituted the TTTS. That, in effect, meant the postponement, if not the cancellation of a return to SUPT.[103]

ATC first learned of the DMR proposal to cancel the T-1A procurement in late August 1990. As part of a review of military training, the Office of the Secretary of Defense, Force Management and Personnel (OSD/FM&P), determined reductions in force size would result in reduced pilot training requirements. It followed, therefore, that: "Since the current UPT system meets Air Force needs, the investment of $2.15 billion for TTTS aircraft appears unnecessary." Instead, OSD/FM&P suggested that ATC take over the 118 AT-38Bs that TAC had been using to conduct lead-in fighter training (LIFT) and retrofit them for the flying training mission. (The Air Force intended to inactivate the 479th Tactical Training Wing at Holloman AFB, the unit that conducted LIFT, in FY 1992.) OSD maintained that even though the AT-38s could not be used for copilot training (which could be accomplished in the T-1A) "this training is not considered crucial for training to fly cargo or tanker aircraft. This portion of the training could be accomplished elsewhere, as it has for the past 30 years." The AT-38Bs, OSD noted, had completed the Pacer Classic modification program which extended their useful service life.[104]

ATC reacted almost immediately to this unexpected threat to the TTTS and SUPT. Within a matter of days the command marshalled its arguments against such a drastic action and delivered them to personnel officials at HQ USAF to help the Air Staff prepare a reply to OSD. To begin with, cancelling the TTTS and SUPT would invalidate the 1989 DOD Trainer Aircraft Masterplan, a joint acquisition roadmap which spelled out Air Force and Navy intentions to modernize their aging trainer fleets in the most logical and cost-effective way (and a plan only recently approved by OSD and, in its funding of the T-1A, endorsed by the Congress.)[105]

Brig Gen Michael D. McGinty, ATC's Deputy Chief of Staff for Plans and Requirements, noted that cancellation of the T-1A and SUPT would save some money in the near term but "would be significantly more expensive in the long term." Eventually, when the Air Force had to replace the T-38 as the single advanced trainer, it would have to buy a larger number of a more expensive aircraft. Total T-1A program acquisition costs, General McGinty observed, amounted to $907 million in FY 89 dollars for 211 aircraft. Down the road, to do the same job as the 211 T-1As, it would take 321 additional fighter-type aircraft at a cost of $2.9 billion to replace the T-38. So, instead of saving money, the Air Force would wind up spending $2 billion more for trainers during the 30-year Masterplan schedule. Moreover, the T-1A was cheaper to operate than the T-38; it cost $630 per hour to fly the T-1A and $996 per hour to fly the T-38. General McGinty calculated it would cost the Air Force $1.3 billion more in operations and support costs over a 20-year span to operate the T-38. Taken together, acquisition and operating costs would be $3.3 billon more with the T-38 than with the T-1A.[106]

Harder to quantify but important nonetheless was the improvement in training ATC expected to realize with the conversion to SUPT and the use of the T-1A. With 60 percent of the pilot training graduates scheduled to fly tankers or transports, that was no small matter. Through the use of a training aircraft which approximated the flying characteristics of tankers and transports, students could learn about such things as flight deck procedures, crew resource management, air refueling rendezvous procedures, and cell formation while still in UPT. The use of the T-1A would also provide students with 110 hours of airborne observer time. The more instruction ATC could offer in relatively inexpensive trainer aircraft, the less follow-on training the using commands had to give in frontline aircraft that were more expensive to operate. MAC, for instance, had to spend $1,467 per flying hour to operate a C-130H and $4,783 per hour to fly the C-5B.[107]

ATC was optimistic its position would prevail. Other than an adjustment in the total aircraft buy later in the year, funding for the acquisition of the T-1A and the implementation of specialized undergraduate pilot training remained on track. In November 1990, ATC officials, aware of a projected decrease in pilot production and attuned to the fiscal realities connected with a shrinking DOD budget, took another hard look at total T-1A requirements and determined the command could accomplish its mission with 191 instead of 211 T-1A aircraft. Having made that determination, command representatives

worked with the Air Staff to develop a new procurement schedule that would interfere as little as possible with the implementation of SUPT. The results of that effort are shown in Figure 10:[108]

Fig. 10

Revised Procurement and Delivery Schedule

Fiscal yr	89	90	91	92	93	94	95	96	97
A/C Buy (Old)	1	14	28	46	45	37	40		
A/C Buy (New)	1	14	28	37	37	37	37		
A/C Del (Old)	0	0	1	28	24	48	42	40	28
A/C Del (New)	0	0	1	28	32	37	37	37	19

The winter Corona Conference of the Air Force's senior leadership on 23 February 1991 brought other important changes that affected SUPT. There, during a review of the Pilot Selection and Classification System, Gen Merrill A. McPeak, Chief of Staff of the Air Force, expressed his concern about UPT graduates' lack of satisfaction with their assignments. After some discussion, the Chief of Staff told Lt Gen Joseph W. Ashy, ATC commander, that he wanted the existing UPT assignment process modified "so people can do what they want to do." To make that happen, he directed ATC to return to a merit assignment system (a system used prior to 1972) that would allow students to choose their own assignments based on their performance, i.e., their rank order within the class.[109]

Upon General Ashy's return, the ATC staff immediately set out to revise the current UPT assignment process. The goal was to come up with a system that was standardized, understandable, and equitable; a system that emphasized flying, provided incentive, and rewarded performance; in short, a system that improved student satisfaction. Fortunately, ATC had done some research along those lines as recently as 1989 when it developed a standardized rating system using the student management computer system. The objective at the time was to strengthen the Advanced Training Recommendation Board assignment process. However, the implementation of the new system was overcome by events when the command placed student assignments in the hands of the wing commanders in the spring of 1989. In any event, with that foundation

to build on, ATC was able to develop a merit assignment system in fairly short order.[110]

ATC developed a merit system that included separate but parallel criteria to measure student performance in the T-37 and T-38 phases of training. In both phases, 70 percent of the students' rating would depend on their flying performance, 10 percent on academic performance, and 20 percent on flight commander evaluations of their military performance and potential. In measuring flying performance, the command further decided that 50 percent of the rating should depend on checkride maneuver scores and 20 percent on daily flight performance (with those percentages again applying to both phases of training). Finally, ATC decided that student performance in the T-38 phase should count more heavily (75 percent to 25 percent) in compiling the final class standings. More detailed information on the values assigned various segments of the UPT merit assignment system is presented in Figure 11.[111]

The new assignment process was geared to provide students with the incentive to perform well so they could shape their future by choosing their own assignments. That meant not just a choice of aircraft but a choice of location, as well. The merit system came to a peak seven to eight weeks before graduation when the Air Force Military Personnel Center (AFMPC) provided ATC's Deputy Chief of Staff, Personnel (ATC/DP), the full block of assignments for all the graduates at the five UPT bases. That block would be based on an equitable distribution of programmed annual assignments. ATC/DP, in turn, would forward the full block to each UPT wing to allow the students to review what was available. Then, just prior to assignment day, the wing would rank order the graduating class. In order to compete for an assignment, each student had to have completed all three checkrides (contact, basic instruments, and formation), a requirement laid on by General Ashy during a briefing on the merit assignment system at a conference at Randolph on 2 March 1991. This requirement prompted a change in the T-38 syllabus to add a basic instrument checkride.[112]

The mechanism ATC intended to use to allow the students to select assignments very much resembled a pro sports draft, only here the players got to pick the team they wanted to play for. On assignment day, approximately seven to five weeks before graduation, all the students would assemble at their various bases for a teleconference chaired by the ATC/DP. For each UPT class, a lottery would be held to determine which base would choose first and then the other bases would follow in alphabetical order. For example, if Reese won the lottery, the order

Fig. 11

MERIT ORDER FACTORS
T-37

- FLYING — 70%
  - CHECKRIDE MANEUVER SCORES — (50%)
    - MID PHASE CONTACT — (10%)
    - CONTACT — (20%)
    - INSTRUMENT — (20%)
  - DAILY FLIGHT PERFORMANCE — (20%)
    - DAILY MANEUVER SCORES — (15%)
    - FLIGHTLINE TESTS — (5%)
- ACADEMICS — 10%
- FLIGHT COMMANDER RATING — 20%
  - MILITARY PERFORMANCE
  - OFFICERSHIP POTENTIAL

MERIT ORDER FACTORS
T-38 AND CLASS STANDING

- FLYING — 70%
  - CHECKRIDE MANEUVER SCORES — (50%)
    - CONTACT — (20%)
    - INSTRUMENT — (10%)
    - FORMATION 2-SHIP — (20%)
  - DAILY FLIGHT PERFORMANCE — (20%)
    - DAILY MANEUVER SCORES — (15%)
    - FLIGHTLINE TESTS — (5%)
- ACADEMICS — 10%
- FLIGHT COMMANDER RATING — 20%
  - MILITARY PERFORMANCE
  - OFFICERSHIP POTENTIAL

- FINAL CLASS STANDING FOR ASSIGNMENT CHOICE
  - T-37 PHASE — 25%
  - T-38 PHASE — 75%

of selection in the first round would be Reese, Vance, Williams, Columbus, and Laughlin. The top ranked student at the base winning the lottery would select an assignment and would be followed, in order, by the number one students at the other bases. Thereafter, in order to insure that the students in each wing had an equitable selection opportunity, regardless of class size, ATC inserted byes in some selection rounds. That was to prevent the lowest ranked student in a small class, for instance, from having an unfair advantage over students in larger classes. In that way, the lowest ranking student in a class of 17 or 18 would make an assignment selection in the same round as the lowest ranking student in a class of 22 or 25. The ATC/DP would note each student's choice and forward the results of the selection process to AFMPC to complete the assignment cycle.[113]

The entire process described above was a marked departure from the old system where each wing commander independently decided what factors to weigh in making student assignments. While the wing commanders had considered such things as a student's daily performance, instructor inputs, checkride scores, academic scores, military peformance, and student preference, there was no formula that prescribed values for each of these factors, and hence, there was no standardization among the wings. Since the two systems were so different, command officials thought it prudent to run an operational test and evaluation (OT&E) before initiating the merit system. The test, conducted at Laughlin AFB from 2-9 March 1991, included what was termed a sensitivity analysis, i.e., an evaluation of the validity of the values assigned to various segments of the merit system, surveys of students and flight supervisors, inputs from Deputy Commanders for Operations at the UPT wings, and a correlation of the actual ranking of a graduating class (91-06) at Laughlin with the ranking the students would have received using the merit assignment system.[114]

The test results were uniformly positive. Command officials were satisfied as a result of the sensitivity analysis that the scoring process used in the merit system discriminated appropriately among the students. Student responses to the survey were very upbeat. Every one of them thought the new assignment system was readily understandable, 89 percent felt it would standardize the assignment process, 85 percent indicated it was equitable, 81 percent believed it would improve student satisfaction with assignments, and 70 percent felt it would provide an incentive for improved performance. Also encouraging was the outcome of the comparison between the ranking of class 91-06 by supervisors at

Laughlin and the ranking that resulted from the application of merit assignment system standards to the same group. (Technically, there was no class ranking of class 91-06, so wing supervisors went back after the fact and came up with a class ranking based on their knowledge of the students and the assignment matches made by the wing commander.) The correlation was quite strong. In the words of the OT&E final report "Of 22 total students, the rankings matched exactly for nine, including the top two and the bottom five. Six differed by only one." In just one instance did the rankings differ by more than five slots; one student was ranked 17 by the wing and 9 by the merit system. It happened that the student scored very high on the T-38 checkrides (which were weighted heavily in the merit assignment system), and that accounted for the wide variation. Buoyed by the test results, the command wasted little time and introduced the merit assignment ranking system at the beginning of April 1991 when students in class 91-09 chose their own assignments.[115]

Consistent with his philosophy of letting people have more of a say about their own future, General McPeak also indicated that he wanted the students, once SUPT was initiated, to be able to make the track classification decision. He, therefore, directed that classification take place at the end of the T-37 primary phase rather than before training began. At that point, based upon their class rank, the students could choose from available slots in either the tanker-transport track or the bomber-fighter track. Then, depending on their overall class standing at the completion of SUPT, the students would be able to choose the specific aircraft assignments and locations they wanted. In any given graduating class, 8 percent of the students could expect to go into bombers, 27 percent into fighters, 25 percent into tankers, and 40 percent into transports.[116]

Placing classification at the end of the T-37 phase was not a new idea. Several years earlier when the SUPT concept was still in the developmental stage that was the placement ATC had advocated. Interestingly, it was at a previous Corona Conference (in December 1987) that a former Chief of Staff made the decision to move track classification from the end of the T-37 phase up to the beginning. It was mainly in response to that decision that ATC began developing the Pilot Selection and Classification System as a vehicle to help the command draw some important distinctions between candidates before training began. With the return of track classification to the end of T-37 training and especially with the classification decision in the hands of the students, ATC set aside the classification portion of PSACS and focused on the creation of a merit assignment system for SUPT. That system would place a high

premium on flying performance and make it the single most important factor in determining which tracks students would follow and which assignments they would get.[117]

In place of PSACS, the command came up with what amounted to a pilot selection and assignment system. The new system capitalized on the research that went into the development of PSACS and retained intact the selection portion of the process. Thus, in addition to such traditional factors as AFOQT scores, grade point averages, and the results of physical examinations, selection boards would also have available considerably more information as a result of the use of basic attributes testers and interviews of the candidates by experienced instructor pilots. The selection boards would convene several times a year to evaluate candidates from ROTC and OTS, as well as those already on active duty. Air Force Academy cadets, unless medically disqualified, were assumed fit for selection. Following selection, and sometime before they entered the T-37 phase, all pilot candidates would go through an enhanced flight screening program—ROTC, OTS, and active duty candidates at Hondo and USAFA cadets at the Academy. In short, ATC intended to go ahead with the plans already made, as far as the selection of pilot candidates was concerned.[118]

The ATC staff devised a merit assignment system for SUPT at the same time it revised existing UPT assignment procedures. It came as no surprise, therefore, that the two systems that emerged bore a striking resemblence to one another. The SUPT system allocated the same weights to flying performance (70 percent), academics (10 percent), and flight commander ratings (20 percent), in both the T-37 and T-38 phases of training, as the UPT system did. The command also elected to break down the evaluation of flying performance in the same way with 50 percent of the rating coming from checkride maneuver scores and the remaining 20 percent from students' daily flight performance. When it came to determining final class standings, the SUPT merit assignment system again mirrored the UPT procedures, inasmuch as the final phase of training—either T-38 or T-1A—counted more heavily (75 percent to 25 percent) than the T-37 phase. Aside from variations in the weights assigned to checkride maneuver scores, the most pronounced difference between the two was the fact that the SUPT merit assignment system allowed students to make their choice of tracks based on their ranking at the end of the T-37 phase. Additional information on the values assigned various segments of the SUPT assignment system is presented in Figure 12.[119]

Fig. 12

MERIT ORDER FOR TRACK CHOICE - SUPT T-37

- FLYING 70%
  - CHECKRIDE MANEUVER SCORES (50%)
    - MID PHASE CONTACT (7.1%)
    - CONTACT (14.3%)
    - INSTRUMENT (14.3%)
    - FORMATION (14.3%)
  - DAILY FLIGHT PERFORMANCE (20%)
    - DAILY MANEUVER SCORES (15%)
    - FLIGHTLINE TESTS (5%)
- ACADEMICS 10%
- FLIGHT COMMANDER RATING 20%
  - MILITARY PERFORMANCE
  - OFFICERSHIP POTENTIAL

NOTE: T-37 SCORE ALSO USED FOR ASSIGNMENT CHOICE AT END OF PROGRAM

MERIT RATING FOR ASSIGNMENT CHOICE - SUPT T-38 & T-1A

- FLYING 70%
  - CHECKRIDE MANEUVER SCORES (50%)

T-38		T-1A	
• CONTACT	(12.5%)	• CONTACT	(16.7%)
• INSTRUMENT	(12.5%)	• INSTRUMENT	(16.7%)
• FORMATION 2-SHIP	(12.5%)	• LOW LEVEL	(16.7%)
• FORMATION 4-SHIP	(12.5%)		

  - DAILY FLIGHT PERFORMANCE (20%)
    - DAILY MANEUVER SCORES (15%)
    - FLIGHTLINE TESTS (5%)
- ACADEMICS 10%
- FLIGHT COMMANDER RATING 20%
  - MILITARY PERFORMANCE
  - OFFICERSHIP POTENTIAL

- FINAL CLASS STANDING FOR ASSIGNMENT CHOICE
  - T-37 PHASE 25%
  - T-38/T-1A PHASE 75%

So, as ATC inched closer to acquiring the T-1A and initiating SUPT at Reese in September 1992, things continued to change. In the 13 months following the awarding of the T-1A contract, ATC had withstood a potentiallly serious challenge to the acquisition of the T-1A and the whole concept of specialized undergraduate pilot training; had reduced the number of T-1A aircraft it planned to obtain from 211 to 191; had moved the track classification decision for SUPT to the end of the T-37 phase of training; and had created a merit assignment system for SUPT students. No doubt other changes loomed over the horizon, but there matters stood in the spring of 1991.

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