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U.S. AIR FORCE CONSIDERATIONS IN IMPLEMENTING A SPECIALIZED PILOT PROGRAM

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

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Fort Leavenworth, Kansas
1980

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This study attempts to determine the considerations the Air Force would face in implementing a specialized pilot program. En route to this objective, one chapter of this thesis is devoted to each of five major factors. They are the importance of experience (Chapter II), warrant aviators as specialists (Chapter III), the USAF position regarding pilot specialization (Chapter IV), analysis of educational criteria (Chapter V), and USAF selection program (Chapter VI). A final chapter, Chapter

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VII, deals with summary, conclusions, and recommendations.

This research represents my interest in a House Appropriation Committee directive that mandated the Air Force allow 5% of the pilot force to specialize in aviation duties as warrant officers. It was concluded that a specialized pilot, as defined as a career aviator, was a viable and attractive option. Further examination revealed, however, that a USAF specialist system should be composed of college educated, officer pilots and not warrant officers.

U.S. Air Force Considerations in Implementing a Specialized Pilot Program

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TABLE OF CONTENTS

Chapter		Page
I.	INTRODUCTION	1
	The Problem	1
	Cause of the Problem	2
	Possible Alternative Solutions	5
	Retention	5
	Specialization	5
	Importance of the Study	6
	Purpose	6
	Importance of Experience	6
	Warrant Aviators as Specialists	6
	USAF Position Regarding Pilot Specialization	7
	Analysis of Educational Criteria	7
	USAF Selection Program	8
	Limitations	8
II.	IMPORTANCE OF EXPERIENCE	10
	Problems of the Air Force Definition	10
	Impact of Experience and Supporting Data	11
	Supporting Statistical Research	13
	System Complexities	16
	Qualitative/Quantitative Effect of Hardware "Fixes"	20
	Summary	21

Page

Chapter

III. WARRANT AVIATORS AS SPECIALISTS 25

Introduction 25

Historical Aspects of the Warrant Officer . 26

The Aviation Warrant Officer 27

Problem Areas 30

Future Possibilities 34

Summary 35

U.S. Air Force Considerations 35

IV. USAF POSITION REGARDING SPECIALIZATION . . . 38

Events Prior to 1946 38

Air Force Position on the Use of Warrants . 39

Officer Qualification 41

Position of the U.S. Navy 43

Current USAF Position and Considerations . 44

U.S. Air Force Consideration 45

V. NECESSITY OF A COLLEGE EDUCATION 49

Air Force Position 49

Discussion of the Research 50

Allied View 53

Other Opinions 54

Summary 55

Mission Requirements 56

Management Responsibilities 56

"Cockpit" Specialist 57

Page

Chapter

VI. USAF Selection Program 60

Current USAF Selection System 60

Allied Selection Program 65

Summary. 67

VII. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS . . . 71

Recommendations 75

Recommendation 1. 75

Recommendation 2. 76

Recommendation 3. 76

Recommendation 4. 76

Recommendation 5. 77

BIBLIOGRAPHY 78

CHAPTER I

INTRODUCTION

The Problem

The shortage of experienced pilots in U.S. operational fighter units throughout the world has reduced combat effectiveness to a critical level. In October 1979, F-4 and A-10 fighter aircraft in operational units were manned with 48.8% and 43.8% experienced pilots, respectively.[1] While these figures have caused concern throughout the military, their full impact on combat effectiveness has not been completely realized because, in part, the Air Force has no measurement tool to determine the actual experience level required to be combat effective. Rather, the Air Force bases its definition of experience on the number of flying hours. For example, a pilot must have 500 hours in tactical fighter aircraft or 300 hours in tactical fighters if supplemented by 1100 hours in non-tactical aircraft. The Air Force, under this definition, has determined that units must be manned at a level no lower than 38% to insure that minimum safety standards and supervisory positions are maintained.[2] When the Air Force standard of 38% experienced pilots is compared to the 43.8% experienced pilots found in A-10 units, it is apparent that many fighter units instead of being combat effective, are dangerously close to not maintaining minimum safety standards.

General B. L. Davis, Commander, U.S. Air Training Command, in an address to the Daedalian Association, confirmed the concerns of the Air Force when he stated:

> No personnel issue at the moment is more alarming, and none carries greater symbolic impact, than an Air Force that is losing its pilots. However, what concerns me most is not the loss of a pilot capable of flying a mission but the far greater loss of an irreplaceable cadre of experienced and potential leadership in middle-management ranks. That loss will eventually affect our senior leadership ranks. We can put someone into a trainer cockpit and have that person flying a mission in a year or two, but we can't replace 11 years of operational experience and skills in anytime short of 11 years.[3]

Cause of the Problem

The experienced fighter pilot shortage has been caused by high attrition combined with USAF management policies. Air Force pilots are leaving the service in record numbers. As shown in Figure 1, the retention rate for all commands was 70.6% in June 1977, 59.7% in June 1978, and 43.7% in June 1979.[4] However, the impact of the loss rate in fighter pilots cannot be realistically compared to the loss of pilots in other systems, because the time and resources required to train a fighter pilot to become combat ready far exceeds those requirements in other systems. For example, the Air Force has determined that it will require more than 2 years and $1,020,000.00 to train an F-15 pilot to become combat ready, and this figure accounts for only the cost and time required to attain initial qualification.[5]

In contrast to the expense required to train an F-15 fighter pilot, it cost only $83,150.00 to become qualified in a C-130 cargo aircraft.[6] W. A. Stewart, writing for the Rand Corporation, states:

> To be combat-effective, this is to be capable of performing reliably and accurately under the stress of combat, the pilot must have attained a level of experience (flying hours), judging from limited evidence available, such as to require about four years of flying after graduation from UPT Undergraduate Pilot Training.[7]

There is no realistic way to short-cut the system of producing a combat capable fighter pilot.

The high rate of attrition has been compounded by an Air Force management policy that requires pilots to leave the cockpit at designated intervals to fulfill professional officer obligations under the "whole man" concept. This policy views the aviator primarily as a professional officer who has flying duties attached as a subordinate obligation.[8] Consequently, a pilot, throughout his career, is required to cycle in and out of rated duties. Until recent years, this particular USAF management policy was not considered a major issue because the USAF retained a high percentage of its flighter pilots (see Figure 1). As the rate of attrition has continued to increase, however, the experienced pilot has become a critical commodity. Now, when a fighter pilot is required to fulfill extensive staff or school requirements, the loss of such a valuable resource can significantly affect a unit's combat capability.

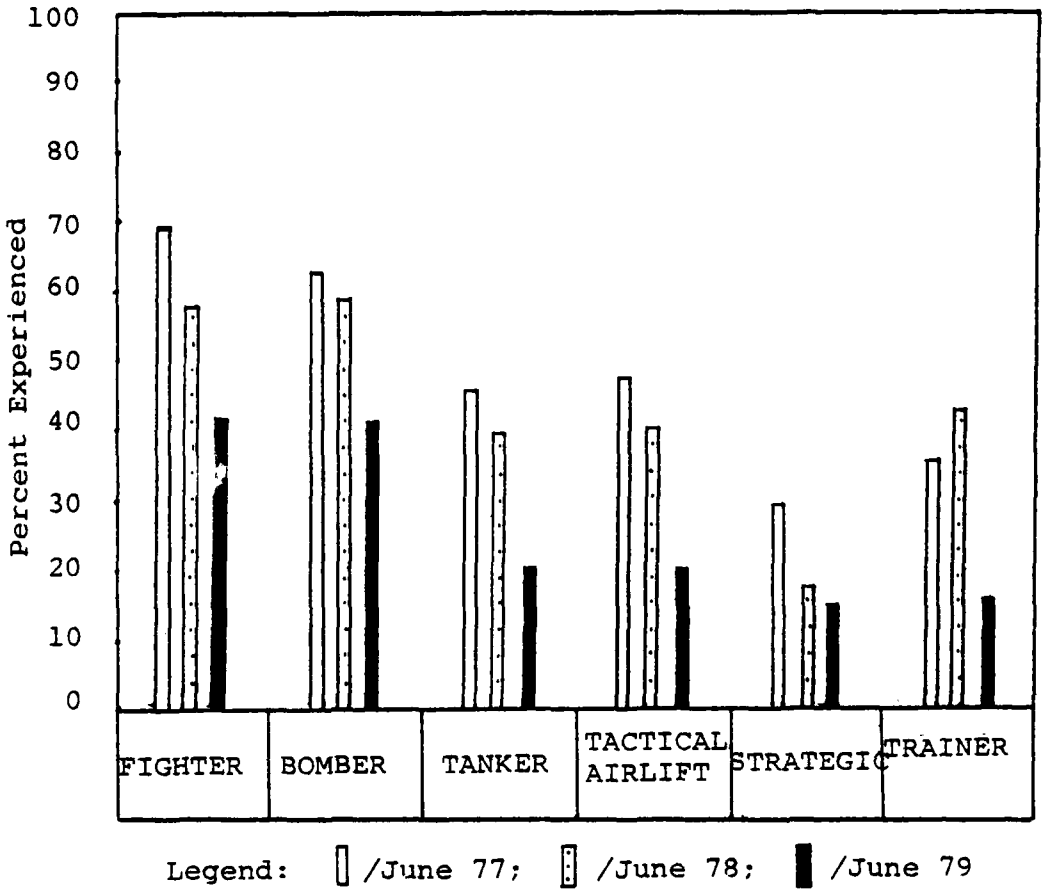

Figure 1

Pilot Retention (6-11 Year Group)

Source: Special Study Group on U.S. Air Force Retention, "Pilot Retention (6-11 year group)" (Randolph Air Force Base, Texas, Manpower and Personnel Center, October 1979), pages not numbered.

Possible Alternative Solutions

Possible solutions to the retention problem and internal pilot loss are twofold. First is to eliminate the causes for the pilot exodus from the service, and second is to allow pilots to specialize in aviation duties. A brief discussion of these possible solutions follows.

Retention. At this time the Air Force has focused on the retention problem, and multiple programs have been initiated to reverse the present situation. In September 1979, a special unit was established at the USAF Military Personnel Center to study the retention problem. Their purpose was "to maximize the USAF mission capability and flexibility through the motivation and retention of a quality officer and enlisted force."[9] Numerous surveys were conducted and causes for the pilot exodus were identified as the Air Force began to face the pilot retention problem on a full scale level. Yet, as shown in Table 1, the pilot exodus has continued to increase.

Specialization. Current Air Force management policy does not permit pilots to specialize in aviation duties even though specialization does provide attractive options. The specialist is able to devote full time to aviation duties while not facing the turbulence of constant assignment changes. However, burgeoning exodous of experienced pilots has brought about a decrease in fighter unit combat effectiveness. Consequently, the USAF may be

inclined to reevaluate its aviation management policy and consider a specialized pilot program. For the purpose of this paper, specialization refers to the assignment of a pilot to aviation only duties.

Importance of the Study

As pilot attrition continues to eliminate experienced aviators at an alarming rate, the USAF must maximize its available resources. Any possible solution that may contribute to an increase in fighter combat effectiveness must be considered. This includes maintaining experienced pilots in cockpit duties.

Purpose

The purpose of this study is to investigate the considerations the Air Force would face in implementing a specialized pilot program. In pursuit of this objective, one chapter of this thesis is devoted to each of five major factors. The factors are:

Importance of Experience (Chapter II). Before a specialized pilot program is considered, it is essential to determine if high experience significantly increases a fighter unit's combat capability. Otherwise, any argument pertinent to developing a specialist program would be strickly academic.

Warrant Aviators as Specialists (Chapter III). In 1979, the House Appropriations Committee directed the Air

Force to allow 5% of the pilot force to specialize in aviation duties. The directive was vague as to rank, composition, and qualifications of the specializing individuals, but the committee envisioned that the program would be similar to the Army Aviation Warrant program. That is, the pilots would function with a separate rank and not be designated as either officer or enlisted.[10] The Air Force was opposed to such a program and under law was not bound to initiate the study. However, since the U.S. Army currently uses a specialized pilot, in the form of a warrant officer, a similar program could be applicable to the U.S. Air Force.

USAF Position Regarding Pilot Specialization (Chapter IV). Currently, the USAF does not use specialized aviators. An understanding of the reasons the Air Force has refused to adopt a specialist system is essential to any consideration of instituting a specialized pilot program. An examination of the background may negate or confirm considerations of the directive by the House Appropriations Committee.

Analysis of Educational Criteria (Chapter V). After analyzing the data in Chapter IV, it is apparent that the continual increase in educational criteria was instrumental in obstructing the creation of a USAF specialized pilot program. That issue is analyzed to determine if past considerations remain applicable in contemporary times.

USAF Selection Program (Chapter VI). Specialization within the fighter force involves full-time career pilots. It can be expected that those pilots would have significant impact on the fighter force as they would be highly specialized and oriented to fulfill career slots in aviation units. Because of the far-reaching implications of designating specialists to provide the nucleus of fighter experience, the USAF can ill afford to select the wrong individuals. As a result, this final chapter evaluates the current USAF selection program to determine if present methods of choosing pilots would be applicable to a specialist system.

Limitations

Two limitations of this study are as follows:

1. Pilot specialization could be accomplished by officer, enlisted, and warrant pilots or a combination of all these. Therefore, to determine the force composition, extensive research into areas such as cost factors, national security policies, percentage of specialized pilots in the total force, grade limitations, and the like, should be examined. The complexity of these individual areas is beyond the scope of this paper.

2. No attempt was made to determine a solution to the retention problem because the USAF Manpower and Personnel Center is presently investigating this issue.

CHAPTER I

FOOTNOTES

[1]Statement by Capt. Jerry Throius, MPC/ROR, Air Force Manpower and Personnel Center, Randolph AFB, Texas, phone conversation on 17 October 1979.

[2]Joseph W. Ashy and James S. Allen, "The Fighter Pilot Shortfall: An Examination of the Problem and Alternative Solutions," research paper, Air War College, April 1979, pp. 22-23.

[3]"Davis to Daedalians: Pilot Loss Alarming," Air Force Times, 19 November 1979, p. 8.

[4]Unpublished study by Special Study Group on U.S. Air Force retention at Manpower and Personnel Center, Randolph AFB, Texas, October 1979.

[5]Ashy and Allen, p. 9.

[6]Statement by Capt. Mac Hansen, Military Airlift Command, DOTF, 18 March 1980.

[7]Pilot Management Policy and Pilot Training Rates, by W. A. Stewart, quoted by Wallace W. Prophet, Long Term Retention of Flying Skills: A Review of the Literature, Rand Corporation, Santa Monica, California, March 1971, p. 20.

[8]U.S. Department of the Air Force, Career Advisory News, March 1978, p. 1.

[9]Unpublished study by Special Study Group, op.cit.

[10]U.S., Congress, House, Appropriations Committee, Congressional Quarterly Weekly Report, Vol 37, Number 39, 29 September 1979, p. 2143.

CHAPTER II

IMPORTANCE OF EXPERIENCE

The primary characteristic of a specialist system is that it should increase the experience level in operational fighter squadrons. The intent of this chapter is to demonstrate that experience equates to combat effectiveness. To provide a common reference point, it is first shown that the USAF definition of experience, as presented in Chapter I, does not accurately address combat effectiveness. The remainder of the discussion centers on establishing a case for experience, providing supporting statistical research, acknowledging the requirement to deal with complex systems, and illustrating that quantitative and qualitative "fixes" are not acceptable substitutes for experience.

Problems of the Air Force Definition

Under the "whole man" concept, personnel turnover has become a by-product of the U.S. aviation system due to the requirement that officers fulfill aviation duties. Because of the management problems this turnover rate causes, not only has the experience level in the fighter squadrons been drastically reduced but two administrative methods of determining experience levels mask the true situation. An example

of the first administrative method is that the experience level of a USAF fighter pilot is a product of his total flying time. In this writers opinion, the procedure of equating total flying hours to experience projects a false picture of the actual combat capability of a squadron, because the important factor of flight currency is ignored. As a result, disregarding the loss of experience incurred in completing extensive non-cockpit professional officer duties of as much as five years conceals a realistic experience level. Second, no difference exists between experience obtained in flying air-to-air missions as opposed to ground attack missions. Consequently, cockpit assignments are not based on specific missions but on the availability of an individual as a universal fighter pilot. The problem with this system is that a pilot with an extensive air-to-air background may be assigned to an air-to-air squadron and be considered experienced based on total flying time. Yet, in actuality, he is experienced only in the unit's mission.

Impact of Experience and Supporting Data

Since experience levels have caused great concern throughout Congress and the Air Force, while still not revealing the true picture, the question then remains: What impact does low experience, caused primarily by high turnover, have on the capability of fighter units?

During the Vietnam War, experience levels were seen as having a direct impact on the combat capability of the Air Force to function as a viable combat organization. The following excerpt from the Commander's Digest puts the situation in perspective.

> It is in our best interest to reduce excessive personnel turnover because experienced people are more productive than new people, and a smaller percentage of our force will be employed in receiving and conducting training. Military units function best when their members serve together long enough to develop unit identification, a sense of personal security, and job proficiency. Excessive personnel turbulence undermines morale, weakens discipline, and lowers the effectiveness of the military organization.[1]

While the Commander's Digest outlined the overall problem, Edgar Ulsamer, in the magazine, Air Force, focused this upon the main issue:

> Our pilots are the best trained in the world. But we have today a younger group of pilots fighting in Vietnam, and it is going to take a little bit more time for these pilots to mature and, subsequently, for the kill ratio to climb. It must be recognized that the young pilots today do not have the experience level of the group of pilots who fought the 1965-68 campaign.[2]

Ulsmer's concern for maintaining a high experience level was supported by Weiss. After analyzing numerous combat statistics, he discovered that a pilot's chances of surviving in combat dramatically increased if he survived his initial engagement. Weiss also concluded that a pilot's ability to win subsequent engagements was increased as his combat exposure increased. Kahn and Strawbridge furnished additional support for maintaining high experience levels

when they stated: "The amount of jet flying time appears to be one of the strongest variables influencing combat effectiveness."[4]

In an effort to ascertain how the United States could maintain a credible combat capability, McDonald Douglas Aircraft Company conducted a study. Its final analysis was:

> Any air-to-air pilot can tell you how to improve air-to-air combat effectiveness - find a good way to select a man for air-to-air, give him specialized training and keep him in the cockpit. The Isralies do it this way and claim a 60-1 kill ratio. The kill ratio of the United States pilots in SEA Southeast Asia was about 2.5-1. We believe that it would be prudent to very seriously consider the changes that the fighter pilots recommend.[5]

While McDonald Douglas Company reinforced the emphasis placed on experience, it also identified specialized training as a vital factor in maintaining combat readiness. It concluded:

> If we send pilots to combat without adequate specialized air-to-air combat training against an enemy with good flyers, then we must anticipate high attrition, poor combat effectiveness, or both, to occur. If Weiss' analysis of the air war of World War II is prophetic of future conflicts, and if we can select and train our pilots to high air-to-air readiness, then we can expect to sustain high kill ratios against any opponent without an equally effective selection, training, and pilot management system.[6]

Supporting Statistical Research

Combat kill statistics during World War II support the preceding analysis that experience and specialization have a direct impact on combat effectiveness. As a result,

a remarkably small number of highly experienced pilots, flying specialized missions, accounted for a startling number of kills. For example: the top 10 German pilots accounted for 2,568 kills[7] while 300 other German pilots accounted for over 3,000 Russian aircraft.[8] In the Eighth Air Force, 5.2% of the American pilots accounted for 40% of the German aircraft.[9] Again, in the Korean War, the same phenomenon was repeated. Only 4.8% of the pilots became aces while 53% of the pilots had at least 25 counter-air missions.[10] While different interpretations can be inferred from these statistics, it seems that in the final analysis that (1) the individual pilot was the great equalizer in the aerial battlefield; (2) in a combat environment, the Air Force would be hard pressed to support a "whole man" concept that requires pilots to be primarily professional officers rather than professional pilots. This analysis supports data by Strawbridge and Kahn (1955) when staff experience proved to be an insignificant variable in predicting combat performance.[11] This conclusion was corroborated by Torrance (1957) as personality characteristics and experience were the dominant factors in combat effectiveness and not the amount of professional officer expertise.[12] Also little correlation between staff performance and simulated combat performance was found by Helme and Grafton (1975).[13]

Since the current training environment does not allow for such vivid examples of combat capability as was

found in World War II and Korea, a comparison between Air National Guard (ANG) and Active Air Force operational units (AAF) does provide a limited but contemporary indication of the value of experienced specialized pilots. In a bombing competition, the Air National Guard 162nd TAC FGT Group flew 8 antiquated F-100s, against 8 A-7s, one of the most sophisticated bombing aircraft in the world. In events involving 30° medium dive bomb, 15° low angle dive bomb, and gunnery, the circular error accuracy (CEA) and straffe percentages were as follows:

Events	Results	
	AAF	ANG
30° medium dive bomb (CEA)	44 ft	34 ft
15° low angle dive bomb (CEA)	43 ft	44 ft
Gunnery (Straffe Percentage)	68%	68%

Individual overall winners in their respective events are as follows:

Top Straffe - Air National Guard
Top 15° - Air National Guard
Top 30° - Air National Guard
Top Gun (Overall Best Pilot) - Air National Guard

In another competition, 4 F-100s of the 114th National Guard TAC FTR Group flew against 20 F-4s from the 49th TFW from Holloman AFB. Again, as shown below, the TAC operational unit was defeated:

Events	Results AAF	Results ANG
30° medium dive bomb (CEA)	44 ft	34 ft
15° low angle dive bomb (CEA)	43 ft	44 ft
Gunnery (Straffe Percentages)	68%	68%

Individual overall winners in their respective events are as follows:

Top Straffe - Air National Guard
Top 15° - U.S. Air Force
Top 30° - Air National Guard
Top Gun (Overall Best Pilot) - Air National Guard[14]

The results may be startling to those who perceive the National Guard simply as "weekend warriors" who fly antiquated aircraft, however, a brief inspection of the National Guard system indicates that while the Guard generally does fly older aircraft, they compensate for this deficiency by the efficient utilization of their aircrews. Guard pilots are not required to matriculate out of flying duties and may remain in the same units, flying the same mission for their entire flying career. In effect, this stability insures that the Guard creates and maintains highly experienced, specialized aircrews. This effective pilot management system simply cannot be matched by operational units under the current Air Force "whole man" policy.

System Complexities

Although historical statistical evidence provides

an illuminating view of the advantages of highly experienced specialized pilots, considerations that are peculiar to future developments should also be considered. For example: With the exploding technological advances in modern weapon systems, can a pilot afford to be divorced from the complex fighter environment for extended periods of time?

In the past, with uncomplicated weapon systems, time absent from the cockpit did not seem to be a great problem. However, with present Mach 2+ advanced aircraft, combined with the current extraordinarily lethal battlefield, the "whole man" pilot can be viewed with increased skepticism. In an article in the 1960 Airscoop magazine written when weapon systems were relatively uncompli ated compared to 1980 aircraft, this issue was addressed.

> . . . (generalization) was an acceptable concept when the equipment we flew was simple and static. We had time. Time to learn the equipment thoroughly and time to learn and perform other duties . . . but today, because the equipment is so complex . . . we contend that the professional aircrew must spend all his time - every-day - learning and practicing his job. We believe, therefore, that aircrew membership is a profession in itself - a career in itself - and the career opportunities should be provided in the form of position, authority, responsibility and rank.[15]

The TAC Speaker's Guide also identified the problems of the modern pilot.

> The fighter pilot of today has changed considerably from the youthful, white scarfed and crumpled-hat tiger who was the symbol of the hot pilot during World War II and Korea. The present day's Mach 2 fighter requires a mature individual with a keen sense of responsibility and judgment. The complexities of modern day aircraft coupled with the limitations of the single pilot impose severe demands of mental and physical stamina.

> The fighter pilot's life is a lonely one; he must act as a radio operator, navigator, and weaponeer in addition to his normal duties as pilot. He must be capable of flying thousands of miles over vast expanses of water, rendezvousing with tanker aircraft and through the technique of air refueling remain aloft for as long as 12 hours, accomplishing his mission under all types of adverse weather conditions.
>
> This is only a prelude to his primary task - to develop the skills and knowhow of performing a variety of combat functions. He must be capable of delivering the full spectrum of explosives; from firing 20 MM guns to attacking targets with thermonuclear megaton bombs. To establish a high degree of proficiency in all phases of the TAC mission requires a rigorous and continuous training schedule. The tactical fighter pilot must fire air-to-air and air-to-surface missiles, guns and rockets; develop the technique of glide, dive and skip bombing with conventional bombs and master specialized delivery techniques for nuclear weapons.[16]

From the description of the tasks required of the fighter pilot, it is evident that the fighter business is a demanding full time occupation. It is little wonder, therefore, that when an officer returns to flying duty after fulfilling staff responsibilities, he is at a severe disadvantage when compared to the specialized pilot. However, the contention that the loss of combat proficiency can be a permanent liability is not universally shared since the Air Force has adopted the attitude that flying skill can be quickly recovered with limited training. As could be expected, this debate directly impacts on the discussion of the benefits of the specialized pilot for it a pilot's skill can be retained over an extensive period of nonflying, a major benefit of the specialized pilot quickly diminishes. Therefore, it is imperative that the long term effects of a pilot's skills be discussed.

Retention of pilot skills in the 60's and 70's was not a major problem, for pilots routinely maintained limited flying currency throughout their staff tours. However, as aircraft became limited and fuel prices escalated, most proficiency flying programs were terminated. Since proficiency flying had traditionally been thought to be essential, the cancellation of currency flying created a wide range of options. Numerous studies were conducted on the effects of long periods of nonflying duties and the conclusions generally accepted that routine pilot skills could be easily retained. However, due to the complexity of testing and evaluating combat skills, limited data have been obtained on a pilot's ability to retain the demanding skills necessary to win in combat. Working for the Human Resource Organization, Prophet, in a review of the literature of the long term retention of tactical flight skills, summarized the research with the following statement:

> The extent and manner of degradation of tactical flight skills and higher order flight skills over nonflying periods are largely unknown. While it is likely that such skills can be reinstated satisfactorily through retraining for most pilots, the cost and nature of such retraining and the proportion of Air Force pilots for whom such retraining will be cost effective are not known.[17]

He further states that "decrement was greatest for tasks involving the information volume and rate with simultaneous motor control task requirements.[18] In fighter pilot terms, this statement means that combat skills show the greatest decline. This analysis is confirmed by Altich and Speros.

They concluded that in highly technical weapon systems, a reduction of flying training hours and use of the "whole man" concept decreases a pilots combat effectiveness.[19]

Qualitative/Quantitative Effect of Hardware "Fixes"

As experience levels continue to decline in United States Tactical forces, the question may then be posed: Can "hardware" fixes of aircraft quality and quantity offset this management dilemma? Quantitatively, there seems little hope that the United States will choose to match the Soviets in numbers of aircraft, as the Russians already hold a commanding lead.

In the past, many civilian leaders have shown little concern with this unfavorable ratio, since the belief existed that United States qualitative superiority could more than offset the Soviet's numerical advantage. However, recent developments have begun to cast doubt upon such a total reliance on United States technological superiority. The Research and Development Subcommittee of the House Armed Services Committee has maintained that United States technological superiority is illusory in part due to the long lead time necessary for the United States to field major weapon systems. For example, to design and field a fighter aircraft, the United States requires about 12 years lead time as opposed to 7 years for the Soviet Union. As a result of this time differential, the technological lead enjoyed by the United States at the outset of a project is negated by the

time the system becomes operational.[20] General John R. Guthrie, Army Material Development and Command, also voices the skepticism over the supposed United States technological superiority. He was quoted in the Air Force Times (February 1980), as saying:

> Without immediately moving significant numbers of new weapons into the field, our forces are and will be facing Soviet equipment of the late 1960's and 1970's with (United States) equipment of the 1950's and early 1960's technology.[21]

If United States technological supremacy has been overrated and the Soviets maintain a substantial qualitative edge in fighter aircraft, what is the equalizer? General Dixon, previous TAC Commander, expresses the solution clearly. "We (USAF) must offset our numerical inferiority with technology expressed in a higher kill ratio . . . it is imperative . . . to increase to the utmost the combat readiness and effectiveness of the command . . ."[22] It is important to note that the key phrase is "increased combat readiness"; yet, this statement is easier to express than accomplish, especially since experience levels continue to decline.

Summary

The four inferences that follow can be made on the basis of the research reported in Chapter II.

(1) The experience level in fighter units is extremely important, as demonstrated by combat/peacetime statistics.

(2) A fighter pilot's combat capabilities are maximized if he is assigned as a "cockpit only" aviator.

(3) The United States technological lead may not be sufficient to offset the commanding numerical advantage of the Soviet Union; consequently, the United States must maximize its combat forces.

(4) The fighter occupation has become an extremely demanding full-time job. Consequently, the staff officer is at a tremendous disadvantage upon returning to the cockpit, especially since most proficiency flying programs have been eliminated.

Of the numerous problems identified, one basic factor was present among each issue. That factor is that each individual fighter pilot has a direct effect on a unit's combat capability. Therefore, the discussions in Chapters III, IV, V, and VI are seen as major considerations in implementing a specialized pilot program.

CHAPTER II

FOOTNOTES

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CHAPTER III

WARRANT AVIATORS AS SPECIALISTS

> The young warrant officer referred to at the beginning of my talk, wears the silver star and two purple hearts. He possesses courage typical of the roughly 22,300 aviators in the Army today of whom about 11,700, a little more than one-half are flying warrants - the real work horse of aviation.[1]
>
> General Bruce Palmer
> Vice Chief of Staff, USA

Introduction

The warrant officer has become the backbone of Army aviation. He fulfills the majority of cockpit requirements and provides the necessary experience to conduct the Army's aviation program consisting of helicopter/fixed wing aircraft operations, safety, and maintenance. Yet, while the Army is firmly committed to the flying warrant, the USAF, USN, and the U.S. Marines have declined to currently employ the warrant aviator in their flying programs. Why has the Army decided to rely so heavily on the warrant officer when the other services have shown little interest in the program? Simply stated, the program works for the Army and without the warrant, today's Army aviation program would be severely crippled.

Because the specialized aviator has enjoyed outstanding success in the Army, it is important that the flying warrant be examined in detail to determine if aspects

of the Army's program would be applicable to the USAF. Since the warrant officer in the Army covers almost all the specializations found in that service, it is necessary to first discuss the historical background of the warrant officer to gain a perspective of this program. Following the background examination, the discussion of the warrant officer will then be limited to the aviation warrant. Main topic areas will include; a historical review of the Army's aviation program and its reliance on the warrant as a specialized aviator, and a discussion of problems encountered by the Army in implementing a specialist system.

Historical Aspects of the Warrant Officer

The warrant officer program has been a part of the Army since 1916. Since the program has undergone constant change, the warrant officer and the program composition have varied with the requirements brought about by World War II, Korea, and Vietnam. When the warrant officer programs were created, little thought was given to future management problems. Prior to World War II, the warrant officer promotion was used primarily as a reward for excellent performance; however, with no general guidelines, the program soon experienced severe problems. Therefore, in 1949 competitive exams were administered and Table of Organization and Equipment (TOE) positions were created as the warrant officer position was used as an incentive.

The number of warrant officers continued to increase as they became an integral part of the Army. However, after the Korean War, the Army was required to decrease its forces and the warrant officer program was almost entirely eliminated due to budget considerations. During this austere era, the Army found itself in an extremely difficult position which was culminated with no warrant appointments during 1953. The missile age had begun, yet the Army was severely short of technical missile and aviation specialists. To combat the deficiencies, in 1953 the Army reexamined the warrant program, and clearly defined the warrant's position.

> The warrant officer is a highly skilled technician who is provided to fill positions above the enlisted level which are too specialized in scope to permit the effective development and continued utilization of broadly, trained, branch qualified, commissioned officers.[3]

How does the aviation warrant fit into the entire warrant officer program?

The Aviation Warrant Officer

Modern Army aviation began in 1942. During that era, the aircraft was beginning to demonstrate its capability, but it could not yet be fully proven as a weapon that could alter the balance of power in the world. Aircraft were relatively uncomplicated and their military importance was not understood by many in the Army. Consequently, flying was viewed simply as a collateral skill which did not justify the requirement that a pilot be an officer.[4] Because of the prevailing philosophy, the aviator corps was designated to be composed basically of

enlisted personnel supervised by a limited number of officers - the same principle applied to other Army skills. However, the Army, realizing that it had no experience with aviation or pilot selection on a large scale, looked at civilian aviation and adopted the same selection criteria to pick pilots. The result was that the enlisted aviator qualifications were significantly superior to those of other Army enlisted personnel. Consequently, the expected thing happened; within limited time, these superior enlisted personnel were given battlefield commissions and the Army soon had to abandon its original goal of having 80% enlisted and 20% officers in its flying program.[5]

In the late 1940's, Army forces were rapidly decreasing and the remaining active duty officers were forced to look at their career prospects. To fulfill the promotion requirements, the aviator officer was required to cycle back into ground jobs throughout the various branches and arms. This internal upheaval brought about by the Army's version of the "whole man" concept, began to cause an experience drain in the aviation field - just at a time when aircraft were becoming more complicated. The Army quickly realized that current policy indicated through empirical data that pilots should not remain in the cockpit idefinitely in order to be promoted. This phenomenon was taking place at a time when low experience levels were becoming critical. Therefore,

it became necessary to view aviation and pilot specialty as a unique requirement; as a result, the aviation warrant officer program was born.[6]

The significant aspect of the initial aviation warrant officer program was that the Army, by a unique set of circumstances, initiated the warrant officer program at just the right time. During the period following World War II, all the services were decreasing their manning requirements. By 1949-1950, numerous highly qualified pilots were unemployed and trying to find flying jobs in a flooded civilian market. While many did secure civilian aviation employment, many combat pilots preferred military life and desired to remain in military aviation. The Army was left in the enviable position of having a ready-made experienced pilot cadre to choose from to begin its aviation warrant program. Consequently, the Army had no difficulty filling the warrant officer ranks with highly competent and experienced aviators who had all been commissioned officers. The result was that from the beginning, the aviator warrant obtained a high degree of respect and superior status within the Army.[7]

Initially, the new warrant officers flew only cargo helicopters; however, it was not long before they integrated into all the types of fixed wing aircraft and helicopters found in the Army.[8] The program became a success, because the warrant aviator solved the experience drain within the aviation field and for the first time, aviation was manned

by a truly specialized force. However, the true test of the program came in Vietnam when Army aviation underwent the largest expansion in its history. In a period of only four years, the number of warrant aviators in the Army increased from 2000 to 13000.[9]

The large increase in training requirements caused staggering training problems. However, the Army succeeded in meeting the tremendous challange due to the cadre of experienced warrant officers who provided the majority of flight instruction.[10] These old, experienced warrants, while a valuable commodity in combat, became indispensible in the training environment. With years of flying behind them, they were able to provide the young aggressive pilots with the best possible instruction in a limited time. The warrant officer had met the challenge and succeeded.

Problem Areas

While the warrant officer was becoming the major force in Army aviation, the program was not without difficulties, as could be expected with a flight system that segregated pilots into officer and enlisted ranks even though both performed similar flight duties. The area that caused the major problem was the inability of the Army to integrate the warrant specialist into a viable career pattern. Throughout the warrant aviation history, promotion criteria and career progression were inconsistent with the concept of requiring the warrant to function simply as a

specialized aviator. For example, in Army pamphlet 660-1, the warrant was viewed as the general aviation expert and was described as follows:

> Because of the warrant officer's continuous and repetitive use in aviation and related assignments, the individual will generally acquire a much greater depth of aviation expertise and technical skills than will the more broadly trained commissioned aviator who is developed to be a Commander, policy maker and multifunctional manager.[11]

In applying this concept, the warrant was considered the aviation professional and was required to handle the gamut of aviation tasks. He would perform instructor and flight examiner duties along with assuming major responsibility for flight safety and aircraft maintenance.[12] In short, the warrant was the aviation expert while the commissioned officer provided the necessary leadership.

It was apparent from this philosophy that if commissioned officers were to provide the broad leadership, it would then be necessary for the warrants not only to handle the bulk of hands-on-flying but also fulfill middle management functions. This particular situation created major problems for career planning because there was no consensus within the Army if warrants should be rated as specialists or as middle managers. While many warrants desired to remain aviation specialists, to do so meant that promotion and career goals were limited, even though flying was the incentive that brought them into the Army. Shelburne and Graves, in their book, Education in the Armed Forces, reaffirmed

the dilemma as they stated that the specialist would always have difficulty with career progression for there were no accepted criteria to justify a promotion unless job responsibility or job criteria were changed.[13] They further explained that the specialist was caught in a paradox as an employer would inevitably require increased job responsibility to justify promotions which would ultimately defeat the primary advantage of hiring a specialist.

Initially the Army did not address the problem. The result was that the warrants attempted to fulfill a variety of roles by attaining qualification in every aircraft that was available. Consequently, in Vietnam, the differences between the warrant officer and the commissioned officer became minimal because neither fulfilled a particular specialist role. Then in 1972, the Army addressed the career problem and the aviation warrant was, for the first time, given a career pattern. The significant aspect of the plan was the way in which the selection process and career objectives of the aviation warrant differed from those of the nonflying warrant. The aviator was to be directly recruited to fulfill the aviation specialty primarily, in contrast to the nonflying warrant who was selected by past expertise and technical competence on the job. Upon graduation from flight training, the new trainee was then appointed WO1 and was required to train and fly in the same aircraft for his initial obligation. Upon completion of his initial obligation, he then had a

choice to remain in the Army - subject to the Army's concurrence - or leave the service. If he stayed in the Army, he continued to remain in aviation duties but could choose a career plan from three career fields: operational/ training, flight safety, or maintenance. From that decision, the remainder of his career was built around a specialty.[14]

The result of this career projection plan was that the warrant was considered primarily a specialist in his early career; however, he would matriculate into the middle management role and eventually fill a technical advisor or specialty manager position in later years. While the Army's career projection for the warrant spelled out the requirements for career advancement, the promotion criteria for the established warrant began to parallel closely those of the commissioned officer, because both systems considered managerial capabilities.[15]

In a letter of instruction to the 1977 promotion board, the Army clearly announced its position on warrant officer promotion criteria. The letter stated that,

> The Department of the Army's basic concept of fully qualified is: In determining whether a warrant officer under consideration is fully qualified for promotion, selection boards should satisfy themselves that the warrant officer is qualified professionally and morally, has demonstrated integrity and is capable of performing the duties expected of him in the next higher grade.[16]

The implications of this policy impacted on both the Army and the individual warrant because the Army had created an unusual situation. The Army had established a

flying warrant position to correct a severe lack of specialists in the aviation field; yet, in actuality, the warrant specialist was required to assume the duties of a middle manager, a task that many were neither capable of or interested in accomplishing. The result of this situation was that in 1977, 152 warrant aviators and 129 nonaviators were twice passed over for promotion and were forced to leave the service. While these figures are significant in terms of experienced personnel lost to the Army, a better indication of the loss reflects that if past percentages were utilized in FY 78, the projected loss of aviation warrants would amount to 53% of the total FY 78 aviation training output.[17]

Future Possibilities

Even though the Army has recognized that the loss of these experienced aviators has come as a direct result of the current promotion system that has relied heavily upon management performance, little has been done to correct the condition. In fact, management tasking seems certain to increase in importance. In April of 1979, the Army Chief of Staff reaffirmed the importance of the aviation warrant in fulfilling supervisory positions when he announced a program that would transfer over 300 commissioned officer positions to warrant positions.[18] The implication of this and other recent Army policies is that the concept of the purely specialized pilot has been replaced by an aviation

specialist. Consequently, the aviator will be required to fulfill an even greater variety of jobs involving management responsibilities.

Summary

Thirty years ago the Army created the aviation warrant position in response to the need for a cadre of specialized aviators. The program has been an outstanding success because the warrant aviator has:

1. Solved the experience drain caused by the requirement that commissioned aviators meet professional obligations.
2. Been primarily responsible for the Army's ability to train the tremendous influx of new aviators required during the Vietnam build up.
3. Provided the bulk of aviation combat experience during the Vietnam conflict.

U.S. Air Force Consideration

If the U.S. Air Force initiates a specialized pilot program, regardless of its personnel composition, significant administrative problems could be expected. In the Army, it has been clearly demonstrated that the employment of a pure pilot specialist is an attractive option to maintaining experience in aviation units; however, a "cockpit-only" specialist could not be justified due to budget and manpower constrictions. As a result, the Army has adopted an aviation specialist as a compromise solution to the two

extremes of a "cockpit - only" aviator versus the professional officer pilot. This compromise seems to have definite application for the Air Force. However, a wholesale adoption of the Army aviation specialist program, especially using the warrant as the specialist aviator, should be approached with extreme caution since Air Force aviation differs greatly from Army flying. For example: An Air Force fighter such as the F-15 presently costs 26 million dollars and may be used to project national policy throughout areas in the world. Other fighters carry nuclear weapons and as a result are responsible to national security restrictions and policies. The speed and range of modern fighters make it possible to overfly the airspace of many countries in Europe and the Middle East in a single sortie. Such flexibility carries with it extrodinary responsibility for the individual pilot.

Because of these considerations, it would seem that the Air Force would find it difficult to support using warrant officers as Air Force aviators. Rather, a more likely scenario applicable to the Air Force would incorporate an aviator officer specialist. By using an officer as an aviation specialist, the necessary fighter experience would be retained but not at the expense of decreasing personnel standards.

CHAPTER III

FOOTNOTES

[1]U.S. Department of the Army, Headquarters, Aviation Warrant Officer Program and Enlisted Aviator Study, Chapter 2, Section 1, p. 2.

[2]U.S. Dept of the Army, p.3.

[3]Ibid.

[4]James C. Shelburne and Kenneth J. Graves, Education in the Armed Service, (New York: Center for Applied Research in Education, Inc., 1965), p. 58.

[5]U.S. Department of the Army, op.cit., pp.1-2.

[6]Ibid.

[7]Ibid.

[8]Col. Thomas E. Anderson, "A New Career Pattern," United States Army Aviation Digest, July 1972, pp. 3-9.

[9]Ibid.

[10]U.S. Department of the Army, op.cit.

[11]U.S. Department of the Army, op.cit., pp. 6-19.

[12]Ibid.

[13]Shelburne, op.cit., p. 110.

[14]Bradford M. Brown, Capt., USA, "The Army Warrant Officer Career: Toward Manager or Technician?", masters thesis, U.S. Army Command and General Staff College, 1976, pp. 19-20.

[15]Ibid.

[16]U.S. Department of the Army, op.cit., p.2.

[17]U.S. Department of the Army, op.cit., p. 4.

[18]Lt. Col George A. Morgan, "A New Aviation Career Pattern", United States Army Aviation Digest, April 1979, p.8.

CHAPTER IV

USAF POSITION REGARDING SPECIALIZATION

In Chapter III, the Army's aviation warrant officer program was reviewed in detail. Historically, this specialized aviation program has been extremely successful. Its obvious appeal leads to the question: If the system has worked for the Army, why has the Air Force not adopted a similar specialized pilot program? The question cannot be answered in a simple statement. The Air Force resolve not to employ specialists has been the result of an evolutionary process that combined a series of decisions which came about at different times and for different reasons.

To understand the USAF position, this chapter examines five aspects of the historical framework surrounding the USAF reluctance to adopt a specialist program. They are: (1) Events prior to 1946, (2) Air Force position on the use of warrants, (3) Officer qualification, (4) Position of U.S. Navy, (5) Current USAF position on specialization.

Events Prior to 1946

In 1941, the Aviation Service Act authorized the Army Air Corps to train pilots as aviation cadets. The cadets were required to have two years of college or equivalent training prior to entering the program and upon

graduation, were commissioned 2d Lieutenants. The college education requirement was short lived as World War II created a shortage of college trained men; consequently, academic standards were reduced. To provide adequate manpower, the Army Air Corps began to train enlisted personnel to supplement the aviation forces. Even though the new program was successful in providing personnel, by 1942, two major difficulties emerged. Many pilots were overqualified for enlisted duties and many newly produced aviators were not of officer quality. The result; a third rank, termed flight officer, was created for those enlisted pilots who were superior to their enlisted counterparts and those aviation cadets who were not of officer quality. This condition lasted until 1946 when the program was terminated in the drawdown of forces following World War II. Upon establishment as a separate service, the Air Force leadership decided that the service could afford to demand the two year college requirement as a prerequisite for commissioned officer status and as a result mandated that the Air Force use only commissioned officers as pilots.[1]

Air Force Position on the Use of Warrants

The decision to require college trained, officer pilots was not formally challenged by either military or civilian authorities for 8 years. In 1954, however, Congressional leaders questioned the advisability of an all college educated, officer aviation force because they deemed that the

high standards were a luxury and not a necessity. It was their opinion that the USAF should adopt a warrant aviation system similar to the Army's. General Bell, who was the Air Force representative to the 90th Congress, responded that warrants were not used because technological developments required highly educated commissioned aviators.[2]

General Bell's statement reflected the Air Force's public position on the use of the warrant grade; however, there is evidence that additional pressures were also responsible for the Air Force decision to oppose such a grade structure. Ironically, this opposition was brought about by another Congressional requirement--the Officer Grade Limitation Act (OGLA). Under the OGLA, Congress established a ceiling on the total number of officers that each service could employ. The significant feature of this act was that officers of all ranks, i.e. general, field grade, company grade, and warrants were included in the total number. Consequently, if for example, the number of warrants was increased to provide specialized aviators, the commissioned force would be proportionally decreased.[3] The Air Force viewed this legislation with such concern that in June 1959, a formal study was conducted addressing the implications of the act on long range officer force structure planning. The study group concluded that the USAF could not afford to risk a reduction in its officer force. As a result, the Air Force dropped all discussion of the warrant officer aviator program and transferred many of its validated

enlisted grades into newly created super enlisted grades.[4]

Officer Qualification

As the Air Force was developing extensive long range plans for the composition of its pilot forces, the qualifications necessary to become a commissioned officer were also becoming a major issue. In the late 1950's, the Air Force was expressing the need for an all college trained commissioned officer force to handle the technological developments; yet, the educational qualifications for Air Force officers were substantially lower than the other services. During 1959, for example, the Air Force totaled less than 59% of its officers with degrees, yet 57% of the Army officers, 70% of the Naval officers, and 59% of the Marine officers held degrees. Upon discovering that Air Force officers were on the bottom of the educational ladder, the Air Force began to make a concerted effort to upgrade its educational requirements.[5] It is not known if the drive was spirited by a true educational need or a desire to "beat" the other services, but in an Air War College study, Davis stated, "the release of this statistic appears to have been instrumental in motivating the Air Force to establish possession of a college degree as a goal for all its officer candidates."[6]

While the Air Force was committing itself to an all degree commissioned aviator force, the Aviation Cadet program was being phased out through pilot attrition, even

though this organization had provided the greatest number of officers for the Air Force. For example, during the post Korean War era, in 1963, the aviation cadet accounted for 40.4% of the total number of commissions, followed by ROTC with 23.6%, direct 10.6%, enlisted 9.6%, OCS 6.5%, and the academies with 3.72%.[7] To replace the loss of aviation cadets with college educated personnel, the Air Force was assisted by the world situation. The Vietnam conflict began drawing thousands of men into the Armed Forces and many college graduates joined the Air Force, in part to avoid Army duty. Consequently, the law of supply and demand enabled the Air Force to achieve its goal of an all degree commissioned officer force. In a report of the President's Commission on the all-volunteer armed force, the board members particularly addressed this situation and claimed that the all degree force was not necessarily based on need. Instead, the arbitrary decision was brought about by the availability of the large numbers of college graduates entering the services.[8]

The Air Force decision to increase the academic criteria was not without problems. By the late 1960's, there was a definite discrepancy between the promotion selection of the college versus non-college officer. The non-college officer was not as competitive as his degree bearing counterpart even though, at one time, they had been equal. The seeds of the "whole man" concept were

beginning to take shape because the college degreed officer began outpacing his counterpart who was without a degree. This situation was evident during an educational board in 1964. The Air Force confirmed what many officers were seeing in the promotion statistics:

> After careful study, it has been confirmed that the levels of knowledge and understanding as related in the earning of a baccalaureate degree, while not absolutely necessary to perform basic crew duties, are essential for an officer to progress successfully to leadership and staff positions through the operations career field. Therefore, full one hundred percent degree requirements must be considered a firm goal for newly procured officers.[9]

This report was significant because it demonstrated the direction the Air Force was heading on the educational requirements and it also implied that the "whole man" concept would receive inordinate attention. Management, staff, leadership, and education became the important criteria for promotion. As a result, the hard core pilot, who only wanted to become an ace, was rapidly replaced. The specialized pilot concept, even in its limited form was obsolete.

Position of the U.S. Navy

During this time, the educational requirement as a principal element of the "whole man" concept was not just an Air Force phenomenon. In 1968, the Navy experienced a pilot retention problem because of the hazardous flying and long-term family separations. In hearings before the

House Subcommittee on Appropriations, use of the warrant officer/specialized aviator and the necessity of requiring a college degree to perform flying duties were debated. Admiral Semmes, who was the naval representative, stated:

> The Navy pilot training program considers the overall career of the Naval Officer in requiring the baccalaureate degree qualification. The young officer pilot would be expected to progress from operational cockpit assignments to command and staff of increasing importance and responsibility. The Navy believes there is an inherent overall advantage in seeking the officer pilot input with further training and career advancement, when viewed in the light of the substantial investment necessary to produce a qualified pilot.[10]

The admiral further explained that the Navy had previously used both warrant and enlisted pilots and due to the disparity of pay and position when all pilots took the same changes, the system did not work.[11] The Congressional leaders did not challenge Admiral Semmes and the issue never became a major concern. The warrant officer debate was consequently shelved.

Current USAF Position and Considerations

During the years that followed the Vietnam War, the specialized pilot and aviation warrant officer were not again considered until 1979. At that time, the severe pilot retention problem threatened to reduce combat effectiveness in fighter units throughout the country. As a result, adoption of a warrant officer as a specialist was reintroduced by Congressional action. The USAF rejected the Congressional proposal because Air Force policy required all pilots to be

commissioned officers and to have college degrees. This left little room for modification of the aviation system.

U.S. Air Force Consideration

If the U.S. Air Force initiates a specialized pilot program, regardless of its personnel composition, significant administrative problems can be expected. In the Army, as discussed in Chapter III, it was demonstrated that the employment of a pure pilot specialist is an attractive option to maintaining experience in aviation units. A "cockpit only" specialist, however, could not be justified due to budget and manpower constraints. As a result, the Army adopted an aviation specialist as a compromise solution to the two extremes of a "cockpit only" aviator versus the professional officer pilot. This compromise seems to have definite application for the Air Force. A wholesale adoption of the Army aviation specialist program, however, especially using the warrant as the specialist aviator, should be approached with extreme caution since Air Force aviation differs greatly from Army flying. For example: An Air Force fighter such as the F-15 presently costs 26 million dollars and may be used to project national policy throughout areas in the world. Other fighters carry nuclear weapons and, as a result, are responsible to national security restrictions and policies. The speed and range of modern fighters make it possible to overfly the airspace of many countries in Europe and the Middle East in a single sortie. Such flexibility carries

with it extraordinary responsibility for the individual pilot that may require a broad educational background.

Because of the considerations discussed above, it seems the Air Force would find it difficult to support the use of warrant officers as Air Force aviators. Rather, a more likely scenario applicable to the Air Force would incorporate an aviator officer specialist. By using an officer as an aviation specialist, the necessary fighter experience would be retained but not at the expense of decreasing personnel standards.

From the preceeding analysis, it is apparent that educational requirements played a significant role in the USAF decision not to implement a specialist aviation program. Because of the inordinate importance attached to the academic issue, Chapter V will analyze the educational issue to determine the validity of the USAF position.

CHAPTER IV

FOOTNOTES

[1]U.S. Department of the Army, Headquarters, Aviation Warrant Officer Program and Enlisted Aviator Study, November 1977, Attachment 1.

[2]U.S., Congress, House, Committee on Appropriations, Subcommittee on Defense, Subcommittee Hearing on Manpower Appropriations, Hearings 90th Congress, 1st Session, (Washington: U.S. Government Printing Office, 1961), p. 1370.

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[4]*U.S. Department of the* Air Force, Warrant Officers AD Hoc Committee, Staff Study, Warrant Officer Requirement, (Washington, 23 June 1959), pp. 1-7 as cited by Lt. Col. Paul P. Coroneos, "The Warrant Officer in the Volunteer Force," research paper, Army War College, January 1973, p. 1.

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[9]U.S. Air Force Educational Requirements Board, Report of Qualitative Educational Requirements for the Operational Career Field, (Maxwell AFB, Alabama, 9 June 1965), p. 6, as found in Charles H. Davis, "Pilot Resource Procurement and Management Concept," research paper, Air War College, April 1972, p. 26.

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[11] IBID.

CHAPTER V

NECESSITY OF A COLLEGE EDUCATION

Chapter IV revealed that the escalation of educational requirements was a principal reason blocking the formulation of a specialist system. The following question, then becomes pertinent; In todays' Air Force, is a college education required to perform pilot duties? Chapter V addresses this issue by first explaining the USAF position. After establishing a base position, the available research relating to education and the employment of military skills are analyzed. A selection of pertinent opinions follows a brief resume of the educational criteria of two allied countries.

Air Force Position

Major General Morris expressed, in a letter to Brigadier General Sweet (U.S. Army), the official Air Force position on the necessity of the college graduate to pilot Air Force aircraft. He wrote:

> . . . The potential flexibility for future utilization and development of a pilot trainee who has a college degree is significantly higher than the potential for the one without a degree. Completion of the degree is predictive of the probability of completing training in highly complex systems as well as the ability to cope with the demanding decision/judgment, multitask environment of a pilot in today's weapons systems. Additionally, the college trained officer has a higher management potential as a senior officer. Pilot/navigator training for noncollege graduates would increase training costs through increased attrition;

> would decrease the quality of our combat force; and would adversely impact our ability to generate future managers.[1]

Under the "whole man" policy and requirement that Air Force officers fulfill increasingly higher level staff positions, the college degree requirement expressed by General Morris, seems to substantiate the need for pilots to be college graduates. The available research, however, offers little conclusive evidence to support or reject that position. Current studies simply have not addressed the academic qualifications necessary to pilot fighter aircraft or determined that a college degree is actually a predictor of pilot success.

The literature can be categorized into 3 areas: (a) Academic performance correlated with pilot success; (b) Intelligence scores compared with successful completion of flight training; and (c) Combat performance evaluated against college performance. No research specifically addressed the request for pilots to be college graduates. It is, therefore, understandable that a college requirement elicits considerable controversy because limited concrete results are available to support either a positive or negative position.

Discussion of the Research

Air Force fighter aircraft utilize some of the most sophisticated equipment in the world. To operate this equipment, the fighter pilot must possess the intellectual

capacity to assimilate extremely complex data. This statement confirms the findings of the Air Force school of medicine when it demonstrated that Air Force pilots were found to be intellectually bright.[2] This study was further substantiated in additional research that placed the service pilot in the upper level of the bright normal scale.[3] Even though this information is not particularly surprising, because all pilots are university graduates, an interesting question is raised. If the tasks that pilots perform require an intellectually bright individual, what role does the completion of college play in identifying the prospective pilot?

The Air Force uses the college degree as the basic criterion for admittance to flight school. By requiring the college degree, the Air Force essentially narrows the prospective candidates into a specifically defined group; one that the Air Force assumes possesses a higher degree of intelligence than the normal population. The Air Force further refines the group by administering a qualifying test, called the AFOQT, along with a battery of pilot related tests. In September, 1969, Upes and Miller working for the Personnel Research Division at Lackland AFB, found that between the freshman and senior years AFOQT scores increased by an average of 20 to 30 points.[4] While these test results offer no particular conclusion, it could be inferred that college training is a predictor of increased academic performance. This analysis supports the Air Force view that a

college degree is a valuable aid in predicting performance in high technology areas.

Research in the area of academic grades also offer difficulties in obtaining meaningful results. In 1973, Bale, Rickus, and Amber attempted to determine if academic grades could predict success in flight training. The research revealed that a positive correlation existed between a student pilot's grade point average and his success in pilot training.[5] It would be a mistake, however, to draw definitive conclusions from these data. For example, in 1973, the Air Force was using academic grades as a major factor to determine a student pilot's standing in class. By obtaining high academic grades, a student's grade point average correspondingly increased and he was able to place higher in the final class ranking. As a result, a successful class standing could have been the result of academic grades as opposed to exceptional flying performance.

Additional studies also have focused upon academic grades in Undergraduate Pilot Training (UPT) as a predictor of success in subsequent tra ning. The results, however, are mixed. For example, in an Air Command and Staff Study, Cooper, obtained a positive correlation of .30 with flight grades in RTU. When other factors were considered, he concluded that UPT academic grades could not accurately predict Replacement Training Unit (RTU) flying capabilities.[6] In a study for the Human Resources Laboratory it was found that

academic grades in UPT were not a factor in predicting flying success.[7]

Even though tangible conclusions were not obtained on the value of academic grades as a predictor of success, definite opinions were found on the necessity of pilots being required to obtain college degrees. The Rand Symposium on pilot training and pilot career declared that college students did not make better aviators than non-college students. On the contrary, they actually concluded that high school students may actually improve pilot quality because the lack of a college degree would limit their career options. As a result, the high school educated pilot would be motivated to become a skilled aviator. They further concluded that if the college requirement were eliminated, a greater number of candidates could be evaluated which would assist in the selection process.[8]

Allied View

Allied Services have also expressed concern with college degree requirements, even though their educational prerequisites are less than for U.S. pilots. In a survey of 1129 selection cases for the Royal Canadian Air Force (RCAF), there were indications that the best students came from:

> Junior and senior matriculation and that the highest wastage rates were found among university graduates. This suggests, and other evidence exists to support this, that university graduates applying for enlistment as aircrews represent a low sample of university graduates.[9]

They concluded that,

> There is no reason to believe that any relationship exists between officer quality, and the more technical skills required to pilot or navigate an airplane or to discharge the technical skills of a radio operator. Such technical duties can in all likelihood be adequately discharged by NCO's who lack some of the qualities associated by tradition with the officer. Nonetheless, present policy is that all aircrew members be officers, and many arguments may be argued to justify this policy.[10]

The French also support this view. They stated "in the present population of student pilots, the intellectual and academic level is thus no longer a factor of success in fighter training, at any stage."[11] They further concluded that "requirements for basic pilot training and for specialization are becoming more nearly alike, already noted in 1960 and 1965, each confirmed and even found to be accentuated during recent years."[12]

Other Opinions

Charles Davis, in a paper for the Air University, obtained data that refute the requirement for pilots to be university graduates. In his research he made the point that "agencies commissioned by the government to study pilot training consistently question the wisdom of the Air Force policy of requiring pilot candidates to be college graduates."[13] He further quotes from the Air University Review in which LTC Gilster stated that "there is little or no evidence to support the contention that college graduates make better pilots than non-college graduates."[14]

These studies tend to focus more on the importance of academic skills relating to peacetime requirements while research by King and Katler attempted to determine if academic performance could be equated to combat effectiveness. For example, among West Point graduates, high academic grades had little bearing on combat performance.[15] This study supports findings by Katler and Holman in 1954 because they also concluded that academic standing did not show a positive correlation in predicting combat performance.[16]

Summary

The importance of requiring pilots to possess college credentials seems to be inconclusive. Research, such as the Rand study, does support the position that a college education is not necessary to pilot fighter aircraft. From an operator's standpoint, therefore, it could be argued that the Air Force could drop its college requirement without a loss in combat capability. Other factors, however, must be considered in this issue. For example: Is there a correlation between the motivation and discipline necessary to complete college versus completing flight school? Or, would a non-college graduate be sufficiently educated to handle highly technical management tasks in, just to name a few, avionics, weapons employment/effects, and nuclear procedures? Questions of this nature simply have not been answered through comprehensive studies that are necessary to help in this decision. Also, little data are available that

addresses the complexity of future equipment and the required academic background necessary to use this equipment. Until questions such as these are answered, there seems little prospect that the Air Force would reduce its educational prerequisite.

On the basis of information presented in this chapter, if the USAF should adopt a specialized pilot program, would a university education be mandatory? The answer seems to hinge on three variables: (a) the unique mission requirements of USAF fighter units; (b) the ability of the non-college graduate to pilot fighter aircraft; and (c) the management responsibilities of the aviation specialist.

Mission Requirements. The unique mission requirements (summary, Chapter II), of the USAF necessitates that pilots be highly responsible individuals. While the "hell and be damned" image associated with World War II fighter pilots seemed incongrous with a university graduate, the tenuous world political situation requires that a modern day fighter pilot exercise extraordinary judgment in a variety of situations. A strong case, therefore, can be made for employing highly educated individuals to pilot fighter aircraft.

Management Responsibilities. If the specialized pilot is used as an aviation specialist, involving pilot duties and certain aviation management positions, a university graduate would be better prepared to handle both tasks. As a result, an aviation specialist approach would tend to favor a university graduate.

"Cockpit" Specialist. As evidenced in this chapter, there are no conclusive data to support a university requirement to pilot fighter aircraft. For a strictly "cockpit" aviator, therefore, the university requirement seems to be a luxury and not a necessity.

It is apparent from the previous discussion that the educational situation involves a myriad of issues other than strictly piloting aircraft. All these issues, however, have one basic factor in common: College degree provision has been used as a major element in the Air Force pilot selection process. Since the educational criteria have played such a significant role in selecting pilots, are there other, more significant issues that should be used to select prospective aviators? Chapter VI examines this question.

CHAPTER V

FOOTNOTES

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CHAPTER VI

USAF SELECTION PROGRAM

The long range success of a specialized pilot program is predicated upon innovative personnel management decisions. The importance of rank structure, force composition, and career opportunities have been discussed in previous chapters, however, the primary concern in implementing a successful specialist program is the selection of a quality pilot. With this in mind, the Air Force must be cognizant of this essential element of the program and must answer the following question: Can a specialized fighter pilot be chosen under the current selection process? Because pilot quality would be essential to the success of a specialized pilot program, this chapter explores the current USAF assignment method to determine the advisability of selecting a specialized pilot under the present methods. To establish a common base of understanding. the current USAF selection program is analyzed and major deficiencies are noted. In addition, a brief discussion of three Allied selection programs is presented for the reader who might desire to make a comparative analysis.

Current USAF Selection System

The USAF flight training program was designed on the hypothesis that any Air Force pilot, given adequate training,

could fly the gamut of Air Force aircraft. This flight system has been termed the "Universal Pilot" program, as every pilot candidate receives identical flight training throughout UPT. Upon graduation from UPT, follow-on assignments cover the spectrum of Air Force aircraft--from cargo to fighters. In this assignment selection process, there is little attempt to match personality characteristics to a particular aircraft because all pilots are capable of flying all aircraft under the USAF aviation program.[1]

Even though the "Universal Pilot" concept is not a current policy change, past assignment practices enabled the fighter pilot cadre to be screened somewhat because aircraft selection was determined on the basis of class ranking. This situation no longer exists. The USAF Manpower and Personnel Center (MPC) currently apportions pilot assignment on the basis of a broad set of impersonal Air Force guidelines; consequently, demonstrated performance, motivation, and aggressiveness are of minimum concern.

An impersonal assignment process has created extensive controversy, as could be expected. For example, the following statement, extracted from a McDonnell Douglas Company pilot opinion survey, represents the position taken by many fighter pilots:

> The Universal Pilot is a fine 'whole man' who will be be able to impress the poor specialized S.O.B. who is shooting him down with the fact that he (the 'whole man') has a PHd in management, has completed Air Command and Staff School and would be capable of flying a C-141 with

> a minimum of training, if it weren't for the fact that he will be dead in the next 30 seconds. The Universal Pilot is the universal target.[3]

H. Weiss, in an analysis of limited war, identified major differences between individuals. He concluded that success or failure in combat would ultimately be predicated upon those differences. He built upon this analysis by stating that combat effectiveness was a measure of a few top individuals rather than a measure of the entire force. To support this analysis, Weiss constructed a model that identified two types of fighter pilots--hawks and doves. He concluded that if precombat training and screening process could discriminate between Hawks and Doves, in a combat environment, the Hawks would have a 10:1 combat advantage.[4]

McDonnell Douglas Company also found glaring discrepancies in the USAF selection process and it attributed those discrepancies to a reduced combat capability in USAF fighter squadrons. For example, McDonnell Douglas identified 45 selection factors that could have a direct effect on a pilot's combat effectiveness, yet, they concluded that the USAF evaluated on only ten of these areas. The interesting point is that the 35 areas that were not currently assessed, consisted primarily of predictors of psychological traits that could be assessed with available testing techniques.[5]

Why has the Air Force chosen to make little use of psychological evaluations? There seems to be no available explanation. During World War II, the Army Air Corps was

extremely interested in the benefits of psychological screening. As a result, significant pilot psychological evaluations were first conducted by the Army Air Force Psychology Department during World War II and eventually over a million prospective aviators received qualifying examinations.[6] Further tests were constructed to determine a pilot's suitability for different types of aircraft because individual characteristics were thought to be extremely important in predicting success or failure in particular aircraft.[7] From these rather unsophisticated tests, characteristics peculiar to fighter pilots versus bomber pilots were identified.[8] While the testing results seemed to provide a positive correlation of matching personality traits to aircraft requirements, cost factors forced discontinuance of the program to be discontinued. It was not until the Korean War that a comprehensive study of aviation psychological evaluation received any substantive attention. During that time F. P. Torrance performed an analysis of 100 fighter pilots who served in Korea. His findings were significant. He determined that not only did personality differences exist between pilots, but within the fighter pilot corps there were striking differences between the ace and the average pilot.[9] This analysis offered the first indication that life experience factors such as aggressiveness, risk taking, motivation, and independence could be utilized to predict combat effectiveness.

In 1955, Strawbridge and Kahn analyzed the factors that enabled a small number of fighter pilots to become aces

while others proved to be relatively ineffective. As predicted, Strawbridge and Kahn identified that flying experience, age, and rank were significant predictors of success. They also concluded, however, that the essential elements of success were found in psychological factors identified by Torrance in 1955.[10] Additional research was conducted by Torrance in 1957 and he discovered that a successful fighter pilot exhibited specific personality traits. His results demonstrated that the ace, as opposed to the standard fighter pilot, exhibited fewer childhood neurotic behavior patterns, was better socially adjusted, participated in a greater number of games involving risk and strategy, exhibited more of the press-the-limits or trouble making behavior and was required to exhibit a greater degree of independence as a youth.[11]

Even though the Torrance and Strawbridge and Kahn studies could be credited with creating the major impact on prediction of pilot combat effectiveness, a wealth of related research was being conducted into pilot characteristics and performance during the Korean War era by Deqaugh and Knoell in 1954; Knoell and Stice in 1954; Knoell, French, and Stice in 1953; and Tupes in 1957.[12] Following the 1950's, however, little work was accomplished in the U.S. to discriminate between fighter pilots and bomber/transport pilots. As a result, the U.S. selection criteria began to de-emphasize the difference between individuals with respect to personality, motivation, and desire.

Allied Selection Program

While the United States was resorting to an impersonal type of assignment policy, Allied services were attempting to focus attention on psychological traits. The Swedish Air Force, for example, became extremely interested in the quality control of their combat pilots. To decrease the pilot attrition rate, the Swedish government devised a battery of psycomotor, intelligence and mechanical tests. Evaluations were also conducted by experienced clinical psychologists. Within 3 years, their pilot attrition decreased by 33%.[13]

The German Air Force was also concerned with their selection process because they ascertained that insufficient pilot selection criteria were responsible for the high accident rate of the F-104.[14] While comprehensive selection programs were in the developmental stage in Europe, the Israeli program was already using a selection process that was, in part, responsible for the remarkable combat kill ratio of 60 enemy destroyed to 1 Israeli. The entire comprehensive program centered around identifying traits of the individual pilot. J. A. Cook, in an Air University study, describes the Israeli program succinctly, in the following statement:

> What the Israelis have learned is that in an Air Force, numbers are not important . . . quality is the deciding factor. Major General Ezer Weizman, former Air Force Chief wrote prophetically in 1962 that numbers don't count; only effective missions do . . . In an age of sophisticated weapons we try to make the man in the cockpit count above everything. . . . The screening process

> is extremely rigorous; although the Israelis have neither confirmed nor denied it, several observers have reported that only 1 out of 300 applicants actually becomes an Israeli pilot. Much of the screening is based on intense psychology testing on the ground, personally observed by instructor pilots as well as psychologists . . .[15]

It is evident from Cook's analysis that psychological testing plays an integral part in the Israeli selection and evaluation process. For example, Aviation Week Magazine stated that even though the initial Israeli evaluations consisted of intelligence tests and basic comprehensive examinations, clinical psychologists play an overwhelming part in the evaluation program because the psychologists extended ratings to applicants on the basis of 40% personality, 30% perceptual motor and 30% background variables.[16] Following this evaluation, recruits were given a 10 day field exercise that was designed to test their motivation, ability to innovate, and aggressive traits. Approximately 50% of the new recruits were eliminated upon completion of these tests.[17] However, the emphasis on psychological evaluations was not decreased after the initial selection process, because personality and leadership characteristics were stressed throughout the entire training program. In effect, the Israeli Air Force believes that in combat a pilot's personality may be more important than his individual flight skills.[18]

Even though this opinion may not be universally shared, the 60 to 1 kill ratio of the Israeli pilots lends instant credibility to a selection process that strongly emphasizes psychological factors. It is not surprising, therefore, that the Israeli selection process closely

approximates a program described by over 100 aces that were surveyed by McDonnell Douglas Company. The aces concluded that determination, desire, motivation, and aggressiveness were the essential qualities required to be successful in combat.[19] However, as explained earlier, the U.S. program makes little provision to evaluate those traits. It is little wonder that independently contracted studies conclude that the USAF selection process does not adequately predict success in operational flying units.

Summary

This chapter attempted to determine if specialist pilot's should be chosen by the current USAF selection process. En route to this objective, it was discovered that the U.S. program did not adequately address psychological traits required by fighter pilots. McDonnell Douglas Company, among others, severely critized this deficiency because statistical data confirm that psychological traits have a direct bearing on a pilot's combat effectiveness. The research also pointed out that a comprehensive selection process was largely responsible for the Israelis phenomenal combat kill ratio.

It is possible for the USAF to develop a comprehensive selection system that could predict a pilot's combat effectiveness? According to McDonnell Douglas, the technology is available but the issue is so complex that such a system could

take approximately five years and cost as much as a current fighter. However, the research indiciates that the financial commitment is cost-effective because an effective selection program can result in totally unacceptable losses.[20]

CHAPTER VI

FOOTNOTES

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[17]D.A. Brown, "Israel Spurs Pilot Training," Aviation Week and Space Technology, Volume 104, no. 7, 16 Feb. 1976, p. 18.

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[19]Youngling, pp. 3-90 - 4-3.

[20]Youngling, p. 8-1.

CHAPTER VII

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This paper has examined the considerations that would be involved if the USAF adopted a specialized fighter pilot program. The research was conducted because this writer believed that a solution must be found to counteract the drastic reduction of experienced fighter pilots in operational units. The experience drain was brought about by the high attrition rate of USAF crew members and the Air Force policy that required pilots to cycle in and out of cockpit duties. The result: The combat capability of operational fighter squadrons has likewise been drastically reduced.

The first step in addressing this complex situation was to separate the problem into two areas: retention and USAF policy. Retention was not discussed because the USAF is already actively facing this problem. Flight management policy, however, was addressed, specifically, the policy that requires pilots to perform professional officer duties. Duties of this type often result in the degradation of a fighter unit's combat capability. Thus, it was hypothesized that if the USAF were to designate a select number of officers as career pilots, the experience level within operational fighter squadrons would increase.

To validate the hypothesis, it was necessary to assess the value of experience in combat aircraft. Two major findings emerged in Chapter II. First, the more fighter experience an aviator possesses, the greater is his combat effectiveness, both to survive and to kill. Second, an overwhelming percentage of enemy kills have been attained by a highly select group of experienced pilots.

Chapter III provides an analysis of the U.S. Army Aviation program. That program was selected because, currently, it is the only U.S. specialized pilot system and it provided foundation for studying an operational program.

One of the significant findings was that over a period of many years of actual application, the Army was forced to alter its concept of the specialist. Initially, the Army viewed the specialist aviator as a "cockpit only" pilot; however, that did not prove cost effective. The compromise resulted in an aviation specialist who presently fulfills cockpit duties as a primary task but also accomplishes essential middle management aviation staff positions. The program was not without problems. For example, promotions and personnel management difficulties continually plagued the system primarily because the Army was unable to establish a viable career pattern for the specialist. The Air Force could expect to encounter similar problems.

The major lessons of this aspect of the research are:

a. The employment of a specialist can infuse much needed experience into a squadron.

b. Specialization, as a purely "cockpit only" occupation, is probably not a realistic concept.

c. Specialists will focus on cockpit duties as their primary career goal; however, they will also be required to fulfill middle management aviation positions.

Chapter IV examined the USAF historical aviation background to ascertain why the Air Force does not currently use specialists. No one issue was singularly responsible for what? The USAF objection to specialization was based on combinations of decisions that were established over a 30-year time frame. Two main issues emerged. First, after the USAF was created as a separate service, educational prerequisites were increased to the point that a university degree has become mandatory for all aviators. Second, all references to specialization came in conjunction with warrants' performing specialists duties. A specialized pilot program was never seriously considered because specialization per se was relegated to a secondary role and the proponents of a specialist system never advanced beyond the inhibiting factor of the personnel issue.

Chapter V analyzed the validity of requiring pilots to possess a bachelor's degree. Little research has been conducted into the amount of education that is actually required to operate present and future sophisticated weapons systems. Almost no data were available that tested the value of a university education in complex aerial combat events in

conjunction with high technological systems. In essence, the field of educational requirements relating to the employment of military skills is in desperate need of current research.

Another educational issue revealed in Chapter V does not relate directly to aviation skills but is extremely important. When the USAF determined that advanced education for pilots was desirable, combat effectiveness actually played only a small role in the decisionmaking process. Other reasons for the degree criterion involved what appeared to be peripheral considerations; nevertheless, those issues were actually extremely important. For example, the Air Force obtains many of its leaders from the pilot corps. By increasing educational requirements, the Air Force has been able to select its future leaders and managers from a broad base of well-educated officers. National policy considerations also contributed to the increased educational requirements. The range, flexibility, and diverse mission of the modern-day fighter has resulted in fighter units that are currently used as projections of national power, due in part to worldwide deployments and strategic weapon missions. The result has been a significant increase in the responsibilities required of the individual fighter pilot. Because of these external considerations, it has not been expedient for the USAF to justify a lowering of its educational requirements. External issues are of vital concern to the Air Force and show little sign of abating in importance. Correspondingly, the complexity

of future weapon systems will certainly increase. As a result, it seems unlikely that the Air Force will adopt a program that would reduce the educational requirements of the fighter pilot.

Chapter VI discussed the current pilot selection process. The research revealed that selection is the key issue in implementing a specialist program. Unless prospective fighter pilots could be properly identified, a specialist system would be severely degraded. The current selection system is inadequate to select a specialist aviator. The USAF program does not discriminate on the basis of personality traits. The implications of this type of selection system are profound. Under the present system a fighter pilot can be selected for a career in fighter aircraft; yet, his personality traits--desire, aggressiveness, motivation, and independence--may not be compatible with the combat environment.

Recommendations

Considering the research reported that the limitations of the study, five appropriate recommendations can be justified. The rational for each recommendation is also included.

Recommendation 1. Specialization is a viable and necessary solution to the experience problem. As a result, I recommend that the Air Force immediately adopt a specialist system. Without specialization, the experience drain will decrease the combat capability of operational fighter squadrons to the point where defeat becomes possible. The task of the

fighter pilot has been drastically altered as the days of the white-scarfed aviator have become history. Fighter operations have become a full-time career occupation and are dependent on dedicated, highly skilled individuals. The USAF can't afford to accept the huge turnover in personnel brought about by the requirement for all pilots to fulfill professional officer duties.

Recommendation 2. The USAF should continue to require a college degree for all pilots. This recommendation is based on the importance of secondary issues and the predicted complexity of future systems. The educational issue remains a difficult area; consequently, the USAF should ascertain the academic background necessary for the performance of future weapon systems.

Recommendation 3. The USAF should employ commissioned officers as specialist pilots. The non-college educated warrant cannot be expected to possess the combination of educational background, maturity, and responsibility required of the modern-day USAF fighter pilot. Even though the commission requirement may seem superfluous in comparison to other aviation programs, i.e., some United States allies, the unique missions of USAF fighter units demand that a commissioned aviator be used.

Recommendation 4. The USAF should devote extensive research to ascertaining the composition and career development of the specialist. A specialist program will create major personnel problems. Because no available data address

an officer specialist program, promotion levels, career progression, percentage of specialists, and responsibility levels should be studied.

Recommendation 5. The Air Force should alter its selection program. With or without the adoption of a specialist program, the current pilot selection system is inadequate when choosing fighter pilots. Future developments should identify psychological factors such as aggressiveness, motivation, and the ability to improvise. Unless the Air Force alters its current program, it can expect to possess a number of inferior fighter pilots who will be ineffective in combat.

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