

THE PERCEPTION OF THE P-16 IN THE UNITED STATES:  
A HISTORICAL ANALYSIS

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  
Military History

by

MATTHIAS F. SARTORIUS, LTC GS, SWISS ARMED FORCES  
B.S., Swiss Military College at the Federal Institute of Technology, Zurich, 2001

Fort Leavenworth, Kansas  
December 2006

Approved for public release; distribution is unlimited.

**REPORT DOCUMENTATION PAGE**Form Approved  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.**

<b>1. REPORT DATE (DD-MM-YYYY)</b> 15-12-2006		<b>2. REPORT TYPE</b> Master's Thesis		<b>3. DATES COVERED (From - To)</b> Feb 2006 - Dec 2006	
<b>4. TITLE AND SUBTITLE</b>  The Perception of the P-16 in the United States: A Historical Analysis				<b>5a. CONTRACT NUMBER</b>	
				<b>5b. GRANT NUMBER</b>	
				<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b>  Sartorius, Matthias F., LTC				<b>5d. PROJECT NUMBER</b>	
				<b>5e. TASK NUMBER</b>	
				<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD 1 Reynolds Ave. Ft. Leavenworth, KS 66027-1352				<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>				<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>	
				<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>	
<b>12. DISTRIBUTION / AVAILABILITY STATEMENT</b>  Approved for public release; distribution is unlimited.					
<b>13. SUPPLEMENTARY NOTES</b>					
<b>14. ABSTRACT</b> The Swiss firm Flug und Fahrzeugwerke AG (FFA) developed a combat aircraft for the Swiss Air Force. The aircraft, known as the P-16, first flew in April 1955 and achieved supersonic flight for the first time in August 1956. The Swiss government was sufficiently impressed that an order for one hundred airframes was placed in 1958. Unfortunately, the crash of two prototypes caused the order to be suspended. While the cause of the accident was a relatively minor defect in the hydraulic system that was easily corrected, the Swiss government remained convinced that the design was faulty and cancelled the order. The Swiss government used the crashes to cancel the project. In reality, the Swiss government did not mention all the other causes affecting the cancellation. The P-16 became victim of a change of the Swiss concept of aerial warfare. This cancellation of the P-16 led to the inability to develop a jet airplane by the Swiss aircraft industry. The P-16 led later to the success of the business jet called Learjet. This study analyzes changes of the Swiss concept of aerial warfare, the procurement politics of the Military Department, and the United States perception of the P-16.					
<b>15. SUBJECT TERMS</b> P-16, Learjet, AJ-7, Swiss Air Force, Caroni, Lear, Rihner					
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b>
<b>a. REPORT</b>	<b>b. ABSTRACT</b>	<b>c. THIS PAGE</b>			<b>19b. TELEPHONE NUMBER (include area code)</b>
Unclassified	Unclassified	Unclassified	UU	95	

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

Name of Candidate: LTC Matthias F. Sartorius

Thesis Title: The Perception of the P-16 in the United States: A Historical Analysis

Approved by:

\_\_\_\_\_, Thesis Committee Chair  
Sean N. Kalic, Ph.D.

\_\_\_\_\_, Member  
Mr. Marlyn R. Pierce, M.A., M.M.A.S.

\_\_\_\_\_, Member  
Lieutenant Colonel William T. Pugh, M.P.A.

Accepted this 15th day of December 2006 by:

\_\_\_\_\_, Director, Graduate Degree Programs  
Robert F. Baumann, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

## ABSTRACT

THE PERCEPTION OF THE P-16 IN THE UNITED STATES: A HISTORICAL ANALYSIS by Lieutenant Colonel Matthias F. Sartorius, Swiss Army, 95 pages.

The Swiss firm Flug und Fahrzeugwerke AG (FFA) developed a combat aircraft for the Swiss Air Force. The aircraft, known as the P-16, first flew in April 1955 and achieved supersonic flight for the first time in August 1956. The Swiss government was sufficiently impressed that an order for one hundred airframes was placed in 1958. Unfortunately, the crash of two prototypes caused the order to be suspended. While the cause of the accident was a relatively minor defect in the hydraulic system that was easily corrected, the Swiss government remained convinced that the design was faulty and cancelled the order. The Swiss government used the crashes to cancel the project. In reality, the Swiss government did not mention all the other causes affecting the cancellation. The P-16 became victim of a change of the Swiss concept of aerial warfare. This cancellation of the P-16 led to the inability to develop a jet airplane by the Swiss aircraft industry. The P-16 led later to the success of the business jet called Learjet. This study analyzes changes of the Swiss concept of aerial warfare, the procurement politics of the Military Department, and the United States perception of the P-16.

## ACKNOWLEDGMENTS

I would like to thank Dr. Sean Kalic for his assistance and guidance during the course of this work. This thesis would not have been completed without his encouragement and sound advice. Being a full-time instructor and conducting his own research, he would at any hour take the time to assist me with my project.

Mr. Marlyn Pierce and Lieutenant Colonel William Pugh deserve special recognition as not only my second and third reader, but as providers of invaluable guidance on organization and research. Their easygoing manner and understanding in aerial and language issues was exceptionally helpful.

Helen Davis provided expert advice and experience, as the final draft became a meaningful document.

I also thank my three interviewees Don Grommesh, Bill Lear, and Paul Spalinger for their openness, the given insights, and their readiness to be available for my different questions.

Finally, but not last in importance, I would like to thank my wife, Irene, and my children, Daniel, Deborah, Tabea, and Michael, for their understanding and patience during long days and nights at my desk.

## TABLE OF CONTENTS

	Page
MASTER OF MILITARY ART AND SCIENCE THESIS APPROVAL PAGE .....	ii
ABSTRACT .....	iii
ACKNOWLEDGMENTS .....	iv
ACRONYMS .....	vii
IMPORTANT PERSONS MENTIONED IN THIS THESIS .....	ix
CHAPTER 1. INTRODUCTION .....	1
State of Research .....	4
CHAPTER 2. HISTORICAL OVERVIEW .....	7
CHAPTER 3. CONCEPTION OF THE SWISS AERIAL WARFARE .....	20
Introduction.....	20
The Rihner Era (1944–1952) .....	21
Employment of the Air Force .....	23
Evaluation of the Rihner Era .....	25
The Primault Era (1953–1964) .....	26
The Discussions Held at the LVK.....	28
Evaluation of the Primault Era.....	35
CHAPTER 4. PROCUREMENT POLITICS OF THE MILITARY DEPARTMENT (EMD) .....	42
CHAPTER 5. PERCEPTION OF THE AIRCRAFT AND VEHICLE WORKS ALTENRHEIN (FFA) .....	55
Introduction.....	55
Historical Background .....	55
Cooperation between the Swiss Government and FFA .....	58
The Commission for Military Aircraft Procurement (KMF).....	60
Cooperation between William Lear Sr. and FFA .....	61
Summary .....	63
CHAPTER 6. UNITED STATES INTEREST IN THE P-16/AJ-7 .....	66
CHAPTER 7. CONCLUSION.....	74

BIBLIOGRAPHY.....	79
INITIAL DISTRIBUTION LIST .....	83
CERTIFICATION FOR MMAS DISTRIBUTION STATEMENT .....	85

## ACRONYMS

AG	Aktiengesellschaft (Corporation)
AGF	Arbeitsgruppe fuer Flugzeugbeschaffung (Working Group for Aircraft Procurement, called formerly KMF)
ASMZ	<i>Allgemeine Schweizerische Militaerzeitschrift</i> (General Swiss Military Magazine)
BAR	Bundesarchiv (Federal Archive)
BG	Brigadier General
BR	Bundesrat (Federal Councilor)
CHF	Schweizer Franken (Swiss Francs)
COL	Colonel
DMV	Direktion der Militaerverwaltung (Military Administration)
DVD	Digital Video Disc (DVD)
EMD	Eigenoessisches Militaerdepartement (Federal Military Department)
ETHZ	Eidgenoessische Technische Hochschule, Zuerich (Swiss Federal Institute of Technology, Zurich)
F+W	Eidgenoessisches Flugzeugwerk, Emmen (Federal Aircraft Work, Emmen)
FFA	Flug- und Fahrzeugwerke Altenrhein (Aircraft and Vehicle Works Altenrhein)
Inc.	Incorporated
KKdt	Korpskommandant (Lieutenant General)
KMF	Kommission fuer militaerische Flugzeugbeschaffung (Commission for Military Aircraft Procurement)
KTA	Kriegstechnische Abteilung, spaetere GRD (War Technical Department, called later GRD)
LTC	Lieutenant Colonel

LTG	Lieutenant General
LVK	Landesverteidigungskommission (National Defense Commission)
MG	Major General
MMAS	Master of Military Art and Science
NATO	North Atlantic Treaty Organization
NR	Nationalrat (National Council)
<i>NZZ</i>	<i>Neue Zuercher Zeitung</i> (New Zurcher Newspaper)
SAAC	Swiss American Aircraft Corporation
SR	Staenderat (Council of States)
TF	Taktische Fuehrung (Troops Guidance)
USA	United States of America
USD	United States Dollar

## IMPORTANT PERSONS MENTIONED IN THIS THESIS

The dates show the term of office of the mentioned person.

### Military Department (EMD)

1941-1954 Federal Councilor Karl Kobelt, Chief of Military Department, LVK  
1955-1966 Federal Councilor Paul Chaudet, Chief of Military Department, LVK  
1939-1945 General Heinri Guisan, Commander in Chief of Swiss Armed Forces  
1945-1957 LTG Louis de Montmollin, Chief of General Staff, LVK  
1958-1964 LTG Jakob Annasohn, Chief of General Staff, LVK  
1945-1953 LTG Hans Frick, Chief of Instruction, LVK  
1958-1965 LTG Robert Frick, Chief of Instruction, LVK  
1944-1952 MG Friedrich Rihner, Commander of Air Force and Air Defense, LVK  
1953-1964 MG Etienne Primault, Commander of Air Force and Air Defense, LVK  
1965-1973 LTG Eugen Studer, Commander of Air Force and Air Defense, LVK  
1948-1952 COL Hugo Karnbach, Commander of Air Force  
1943-1962 BG René von Wattenwyl, Chief of War Technical Division  
1943-1958 Professor Dr. Jakob Ackeret, President of KMF

### Flugzeug- und Fahrzeugwerke Altenrhein (FFA)

1948-1984 Dr. Claudio Caroni, Director and Proprietor of FFA  
1948-1963 Dr. Hans Studer, Chief Engineer of FFA  
1950-1988 Dr. Paul Spalinger, Chief Engineer of FFA

### Swiss American Aircraft Corporation (SAAC)

1960-1962 William P. Lear Sr., Director of SAAC  
1960 William P. Lear Jr., P-16 testpilot  
1962 Donald J. Grommesh, Chief of Technical Engineering SAAC

### United States Air Force

1962 LTG Thomas P. Gerrity, Deputy Chief of Staff, Systems and Logistics

## CHAPTER 1

### INTRODUCTION

The Swiss firm Flug- und Fahrzeugwerke Altenrhein Aktiengesellschaft (FFA) developed a combat aircraft called P-16 for the Swiss Air Force.<sup>1</sup> The aircraft first flew in April 1955 and achieved supersonic flight for the first time in August 1956. The Swiss government was sufficiently impressed that an order for one hundred airframes was placed in 1958. Unfortunately, the crash of two prototypes caused the order to be suspended. While the cause of the accident was a relatively minor defect in the hydraulic system that was easily corrected, the Swiss government remained convinced that the design was faulty and cancelled the order.

The field manual *Tactics (TF 51)* was at the announcement of the P-16s development in effect and still valid. However, the National Defense Commission (LVK) had already overhauled the doctrine for the possible employment of the Air Force. Existing NATO concepts had a substantial influence on this overhaul. In the middle of 1958, the LVK defined that “Counter Air Operations” would be the future of the Air Force. These operations would lead to executing missions beyond the Swiss border and the possibility of nuclear missions. It is understandable that the LVK called for a fighter which would be able of carrying atomic weapons. Since this call came after the P-16, the FFA developed the P-16 for air superiority and close air support, not for carrying atomic weapons.

On 5 June 1958, Federal Councilor Paul Chaudet, the head of the Federal Department of Defense, only acknowledged technical reasons for the cancellation.<sup>2</sup> He

never mentioned that the Swiss concept of aerial warfare had shifted from close air support to counter air operations.

A further element which led to the cancellation of the P-16 was the change of members of the LVK. Lieutenant General Georg Zueblin, commander of the 3rd Mountain Corps and Member of the LVK, had significant influence.<sup>3</sup> He was one of the fathers of the “Mobile Defense” for which the P-16 was unsuitable.<sup>4</sup> After the first crash of a P-16 on 31 August 1955, the second crash on 25 March 1958 came at an opportune time for the cancellation.<sup>5</sup> Also, because of the pressure to replace the aging Vampire, the Federal Council decided to buy one hundred airplanes that could be used for ground combat. The Swiss government selected the Hawker Hunter Mk 6, a ground attack aircraft with limited air-to-air capability.<sup>6</sup>

In Switzerland, procurement of a new military aircraft was a long process which the author analyzed in an earlier thesis. The Swiss did not have a clear long-term concept for aircraft procurement. Procurement politics between 1946 and 1972 were a zigzag course. The manufacturers created unrealistic expectations regarding the material and developing costs. The distribution of the development potential of three aircraft plants was not suitable for creating a breakthrough for the Swiss aircraft industry.<sup>7</sup>

This distribution failure was due to a lack of cooperation among the three Swiss aircraft manufacturers: the Eidgenoessische Flugzeugwerk (F+W) in Emmen, the FFA in Altenrhein, and Pilatus in Stans. Particularly, the attempts at cooperation failed because of Dr. Claudio Caroni.<sup>8</sup> Caroni was the head of FFA, which had the mission to develop and, later, manufacture the P-16. From the beginning, cooperation between the FFA and the Department of Defense (EMD) was difficult, because of Caroni’s management style.

In 1947, the Federal Council realized that a successful commission for military aircraft procurement was necessary and demanded the intensified integration of industry, science, finance, and economics. This is why the Commission for Military Aircraft Procurement (KMF) consisted of military and civilian members. The KMF had favored the P-16 and had an open view as far as future airplanes were concerned. Unfortunately, the Federal Council did not take this commission deep enough into consideration. In summary, the author made the following conclusions. The P-16 became victim of a change of the Swiss concept of aerial warfare. The Swiss assigned the development of the P-16 without correct product requirement specifications. Also, Federal Councilor Chaudet never discussed the true reasons for cancellation before the parliament. The cancellation of the P-16 led to the inability to develop a jet airplane by the Swiss aircraft industry.

After the failure in 1959, Mr. William Lear recruited a group of Swiss aircraft designers and engineers to transform the P-16's wing and basic fuselage design into the cornerstone of a revolutionary aircraft the Swiss American Aircraft Corporation (SAAC)-23 and later the Learjet 23 Continental. The SAAC began the work on Lear's latest invention, a private luxury jet aircraft with the flexibility to fly passengers and freight to small airports around the world. Lear undertook this bold gamble without the benefit of a market survey to evaluate the consumer demand for such an aircraft, relying instead on pure intuition. Problems with suppliers and production tooling in Switzerland compelled Lear to shift assembly of the new aircraft to Wichita, Kansas (under the new name of Learjet Industries). In Wichita the prototype Learjet 23 made its first flight on 7 October 1963, nine months after work had begun on the project.

This thesis will mainly focus on the following questions: Was the cancellation of the P-16 treated differently in the United States? Chapter 2 will discuss the detailed history of the P-16 project and introduce the controversy of the period. The focus of chapter 3 is the question of the conception of the Swiss air doctrine in order to explain the different opinions held after the Second World War. Chapter 4 will analyze the procurement politics of the Military Department. Chapter 5 discusses the perception and the collaboration with the FFA. In chapter 6 the author focuses on the United States Air Force's interest in the P-16. How serious was the interest of the United States Air Force about the P-16 named AJ-7? Specifically, what was known about the P-16? The answers to these questions will provide the basis for the conclusions.

#### State of Research

After doing some research on the P-16, the author mainly discovered technical reports. The author could not find any comprehensive work about the P-16. In 1975 the Swiss Transportation Museum in Lucerne published a special publication about Swiss jets. Georges Bridel discussed in his publication the history of the development of the P-16 briefly. Meier, the editor of the Swiss Air Force newspaper, also wrote a concise chronicle. Meier also wrote another article "40 Years Ago the Sound Barrier Had Been Broken" in the *The Swiss Air Force*. Also, Hans Rudolf Kurz, a Swiss reporter, wrote pieces on the P-16 for his own books, but no comprehensive work on the program.

The author wrote a thesis "Zum Schweizer Flugzeugprojekt P-16" (The Swiss Aircraft Project P-16). Prior to this thesis, there were no meaningful public histories of the P-16 project.<sup>9</sup> The same situation also applied to the questions concerning procurement politics. In order to deepen and consolidate the research for this Master of

Military Art and Science (MMAS) thesis, the author has examined *Jane's All the World Aircraft*. In addition to this source, the author discovered some interesting literature about Mr. Lear and the Learjet. Each of these sources discussed the P-16 in different ways. The author interviewed Mr. William P. Lear Jr., who flew the P-16 several times and convinced his father to use the design. In order to learn more about the aircraft manufacturer FFA, the author also interviewed Mr. Donald J. Grommesh, who was the chief of the technical engineering of the Learjet and worked with the employees of FFA in Altenrhein, Switzerland. This thesis will provide a deeper insight into the controversial and fascinating history of the P-16.

---

<sup>1</sup>Flug- und Fahrzeugwerke Aktiengesellschaft (Aircraft and Vehicle Works Corporation).

<sup>2</sup>Federal Councilor Paul Chaudet was born on 17 November 1904, citizen of Corsier sur Vevey. He represented in the parliament the Canton Vaud from 16 December 1954. He was the head of the Military Department from 1955 to 1966. He resigned on 28 November 1966 and gave over the office on 31 December 1966. Paul Chaudet died on 7 August 1977.

<sup>3</sup>Lieutenant General Zueblin was the commander of the 3rd Mountain Corps. All the lieutenant generals were members of the Commission for National Defense.

<sup>4</sup>Lieutenant General Zueblin developed the Mobile Defense. The idea was that the Swiss Army was becoming mobile instead of a stationary homeland defense. As a consequence the army had to become more mobile by implementing Tank Brigades.

<sup>5</sup>Hanspeter Strehler, *Der Schweizer P-16* (Emmenbruecke: Eigenverlag, 2005), 58.

<sup>6</sup>William P. Lear Jr., *Fly Fast...Sin Boldly. Flying, Spying and Surviving* (Lenexa: Addax Publishing Group, Inc., 2000), 373; Bill Lear Jr. about the Hawker Hunter “the Hawker Hunter fighter was a superb aircraft, but had a serious pitch stability problem at high speed. I had previously visited Hawker Siddeley in England, attempting to sell them our Lear electronic pitch-damper, which would have corrected this deficiency. When I proposed this improvement to Sir Sidney Camm, designer of the Hunter, he became very defensive and told me in no uncertain terms that his aircraft designs required no artificial

aerodynamic stabilization. (He was wrong. I had seen film of Hunter high-speed passes at low-level, and the aircraft was bobbing up and down like a yo-yo.) I was summarily dismissed.”

<sup>7</sup>Switzerland had at that time three aircraft manufacturers. One was the Eidgenoessische Flugzeugwerk (F+W) in Emmen, the FFA in Altenrhein, and Pilatus in Stans.

<sup>8</sup>Claudio Caroni, born on 20 January 1907 Locarno, Switzerland, died in 1984, Dr. jurist, advocate. Caroni became in 1948 the CEO of Dornier-Works in Altenrhein (buy in 1952) and led the company in the name of Flug- und Fahrzeugwerke Altenrhein to produce airplanes, railway wagons for the Schweizerische Bundesbahnen (SBB, Swiss Federal Railways), busses, cable railway cabins, and military products.

<sup>9</sup>The documents of the Federal Archive until the 1990s were still classified and not accessible. The sources of the Swiss Federal Archive are kept the following way. The files contain the signature and the title of the provenience inventory. As an example E 5001 (F) • Direction of the Federal Military Administration or the hint to the pertinence inventory E 27 (-). Within the different chapters are more detailed references regarding the different records. These references are split up in different file numbers, for example, number 19150–19161. Different time frames show the creation of the corresponding sources. Example: E 27 / 18879, vol. 2, The Swiss Aircraft Industry in connection with our airplane procurement. General Staff, Chief of Material Section, LTC GS Kuenzy, August 1947, Bern, Switzerland.

## CHAPTER 2

### HISTORICAL OVERVIEW

In 1935, Professor Dr. Jakob Ackeret, the president of the KMF, and Hans Luzi Studer, the future Chief designer of the P-16, built the world's first supersonic wind tunnel at the Swiss Federal Institute of Technology in Zurich (ETHZ).<sup>1</sup> During the Second World War on 25 April 1945 due to lack of fuel, a Messerschmitt ME 262 A of the German Luftwaffe landed on the Swiss airbase of Duebendorf. Technicians of the Swiss Air Force examined the intact airplane. The machine remained in Switzerland until the end of the war. Afterwards it was put on display at the German Museum in Munich.<sup>2</sup>

After the Second World War Swiss technicians investigated the behavior of arrow-shaped wings at high speeds and looked at fundamental aspects of jet propulsion. With the end of the war, the pressure for mass production of military aircraft belonged to the past. Technicians became intensively concerned with new technology. Foreign companies made their research reports accessible. The F+W in Emmen began the draft of an experimental tailless glider.<sup>3</sup>

In a note dated 3 July 1945, the commanding officer of the Swiss Air Force and Air Defense Division, Major General Fritz Rihner, underlined the importance of jets to the KTA.

Jet-propelled airplanes will, due to its good grade ability and high airspeed, have a great importance in defending our air space. In spite of all these difficulties we have to deal with the issue "airplanes with jet propulsion" immediately. We are about to set up product requirement specifications for the development of jet-propelled airplanes.<sup>4</sup>

This illustrates that Rihner observed the airplane's development very closely. For him the modernization of the Air Force was of the highest importance. In 1946, the LVK

supported his opinion and demanded the development of jets. In the same year the FFA received the order to engineer the fuselages. On 4 April 1946, the F+W formulated for its part “Suggestions on Regulations for Military Jets,” which fixed minimum values for flight duration, range, and maximum values for the fuel consumption. The KTA gave the company Sulzer a preorder to develop a jet engine. On 25 July 1946, Rihner judged the achievements promising and recommended development with all means available.

In October 1946 the Basic Commission submitted requirements to the KMF for the development of a new military aircraft.<sup>5</sup> The commission placed the current project on a uniform basis. Dr. Ackeret insisted in developing more than one project for future jets. Based on the requirements of the commission, Rihner submitted the “Requirements for a Future Combat Aircraft of the Swiss Air Force for the Period 1951-1956.”<sup>6</sup> These product requirement specifications led to an extraordinary wealth of ideas for future development of jet aircraft.

The LVK feared that the financial means were only sufficient for the development of one Swiss jet, although it desired to pursue more than one project. Lieutenant Colonel Kuenzy, the Chief of the Material Section of the General Staff, criticized in a memorandum dated August 1947, “The Swiss Aircraft Industry in Connection With Our Airplane Procurement:”

That much too much and too high demands are made for these new types of aircraft. The difficult technical nature will be almost unsolvable. Considering the small number of airplanes we can maintain, we have to give up some tasks, and the purchase of a larger number of an airplane from a foreign country might be more appropriate than the unprofitable, expensive development of an own military aircraft industry.<sup>7</sup>

This statement shows the controversy between “military autarky” versus “foreign purchase” and “neutrality protection” versus “ground combat” after World War 2. On 23

September 1947 and 24 March 1949 the Swiss parliament decided to buy 175 De Havilland Vampire combat aircraft. Despite this foreign procurement, the KMF supported the advancement of the tailless, swept-wing airplane, the N-20, on 15 July 1949.<sup>8</sup> Additionally, the FFA received the assignment to pursue the development of a cheaper single engine jet. Four days later, the FFA got the corresponding order. On 22 August, Caroni, director of the FFA, expressed in a letter to the Chief of the Military Department (EMD) doubts about the fuselage and the engine conception of the N-20. He stressed the importance of further development. Five days later, the FFA got the project order to develop a single jet. The Sulzer Company started design work on the D-90 engine.<sup>9</sup> National Councilor T. Eisenring, the legal adviser of the FFA, repeated doubts about the N-20 project and demanded that parliament reduce the order given to F+W.

On 24 October 1949, the EMD submitted a report about the development of the N-20 to the financial delegation of the National Council. It underlined the absolute necessity for having a Swiss aircraft industry and underlined the basic conditions for a new combat aircraft.<sup>10</sup>

On 26 November 1949, the FFA submitted to the KTA “Project Investigations on Single Engine Jets P-14, P-15, and P-16” and as a consequence the KTA calculated the costs. Rihner declared in a statement that the P-16 project was of great interest to the Air Force.<sup>11</sup>

In order to have the requested 400 combat aircraft, the Swiss government negotiated with De Havilland to purchase one hundred DH-112 Venom in 1950. The goal was to have some jets in the Air Force until the Swiss program was ready. The KTA decided that the P-16 and N-20 should be pursued, in order to be independent from allies

in times of war. On 22 January 1951, the FFA submitted a complete report on the P-16 to the KMF. The aircraft had attained production readiness and the LVK approved the request of the KMF.<sup>12</sup> Caroni studied the early experiences of the United States Air Force in Korea, and he was persuaded that the P-16 conception was the right choice for the Swiss Air Force.

On 1 February 1952, the EMD signed the contract for the completion of two prototypes.<sup>13</sup> Due to a cost comparison of the KTA, the Federal Council decided on 9 January 1953 to abort the N-20 project. The comparison of the estimated costs for a series of one hundred airplanes resulted in 228 million Swiss Francs for the P-16 and 340 million Swiss Francs for the N-20.<sup>14</sup> As a consequence of the price, the Chief of the EMD forbade the first flight of the N-20 on 21 September 1953. One year later a federal resolution for the procurement of one hundred De Havilland Venom airplanes became a reality. On 28 April 1955, test pilot Hans Haefliger flew the first flight in the P-16. The *Neue Zuercher Zeitung* (NZZ) reported a month later with enthusiasm “the P-16 proved its outstanding flight characteristics, great agility and the possibility for very high and extremely slow speeds.”<sup>15</sup>

Additionally, Major General Etienne Primault, the successor of Rihner, wrote in a letter to the KTA about readying the P-16’s production “testing runs positively, there is no reason not to produce the P-16, and the estimated costs will be in the range of foreign airplanes of this category.”<sup>16</sup>

If not for the following two incidents, testing would have run very smoothly. On 4 July 1955, in the presence of press representatives, the jet went off the runway due to a brake failure and the undercarriage broke off.<sup>17</sup> One month later, on 31 August 1955, a P-

16 crashed on its twenty-second test flight due to a fatigue fracture at the tank pressure pipe which was located behind the cockpit wall. The accident report given at the thirty-second meeting of the KMF from 6 July 1956 stated:

After the flight control had instructed pilot Haefliger to try an emergency landing in the area of Frauenfeld he decided to land on the lake. At 12:46 P.M. the pilot announced that he had decided to leave the jet and informed thirty-five seconds later about the probable scene of the accident - and operated the ejection seat.<sup>18</sup>

The resulting investigation found that:

This break is because of the stability of the selected material (light alloy), and the attenuation of the material in an overheated tube by soldering, and the possible influence of a local pre-loaded assembly and an additional oscillation when in service.<sup>19</sup>

The *Neue Zuercher Zeitung* (NZZ) from 6 October 1956 determined:

At that time only a few (such as Caroni, Ackeret and Studer) knew that such incidents and risks must be taken with the development of such a high-performance aircraft. For a country like Switzerland they are considered being more hurtful than abroad, because the result is a considerable delay of development. Due to limited available financial means the Swiss ordered only two prototypes, where for example in England ten and in the United States twenty machines are ordered.<sup>20</sup>

Eight months after the cancellation of the P-16 order, when the ad hoc Commission for Questions of the Aircraft Industry (KFI) met at its ninth meeting, the former president of the KMF, Dr. Ackeret, on 26 February 1959 noted “possibly the first P-16-crash could have been avoided.”<sup>21</sup>

On 20 September 1955 this crash led National Councilor Walther Bringolf and twenty-three co-signatories to request explanations of the Federal Council about the P-16 accident.

The National Council and the Commissions questioned the rationale of the Swiss national program. Despite national criticism, the KMF remained dedicated to the P-16

and suggested a further series of four prototypes. Before the end of the year, the Federal Council submitted a message concerning procurement of prototypes of the P-16.

With today's conditions of the development of the P-16 the costs for the requested building of a test series cannot be completely overlooked. Due to today's valid cost documents the necessary amount of the credit for the procurement of a test series must be calculated with an estimated extent of 17.6 million Francs, with the assumption that with the development no disturbances and exceeding difficulties occur. These dates are only kept, when the Swiss Parliament gives the grant for the procurement of the suggested test series and the necessary credits by the end of March 1956.<sup>22</sup>

On 15 March 1956, the Swiss Parliament formulated the appropriate Federal Resolution for the procurement of further series of four prototypes. Three months later the second prototype of the P-16 with Sapphire engines started its first flight.<sup>23</sup> In the summer of the same year, a P-16 broke through the sound barrier over Duebendorf for the first time. The *Neue Zürcher Zeitung* newspaper wrote with admiration “now the P-16 has achieved with its supersonic flight a new confidence and new sympathy.”<sup>24</sup> The Swiss population's perception of the P-16 was a very positive one.

One year later in February and March 1957 field testing of the P-16 took place. Pilots characterized the plane's cannons, the brake assembly, and the servo control as insufficient.<sup>25</sup> In addition, the technical service determined “that the P-16 is not ready for production.”<sup>26</sup> As a consequence, the engineers improved the servo control and the cannon's position. In the same year, the first flight of the third P-16 took place. Several times the pilots broke through the sound barrier, even with rockets attached.<sup>27</sup> On 22 May 1957, the FFA submitted a report to the commanding officer of the Air Force and Anti-Aircraft Division, Major General Fritz Rihner, with the following notes, “The performance corresponds to expectations, the flight characteristics are very good, the

shooting platform has outstanding characteristics, and the armament exceeds other airplanes.”<sup>28</sup>

Starting in August, the FFA completed test flights, rocket firing, and wobbling tests. The KTA verified these tests. On 29 January 1958, a Federal Resolution placed an order to buy Hundred Hunter Mark 6 jets as replacement for the first series De Havilland Vampires. Two days later, the Swiss parliament discussed producing one hundred P-16s as replacements for the second series of the Vampire. After hefty discussion, the National Council agreed with 111 against 36 votes on 7 March to produce the P-16 by the FFA.<sup>29</sup> National Councilor Matthias Eggenberger pointed out that for a domestic development of an airplane there exist higher hurdles than for a foreign one. They agreed on the purchase of the Hunters without testing, but demanded testing continues on the P-16.<sup>30</sup>

On 25 March 1958, just six days after the Federal Resolution, a second P-16, crashed into Bodensee. A disturbance occurred in the control system due to material fatigue at the hydraulic pump, and the associated loss of large quantities of hydraulic oil led to the crash.<sup>31</sup>

Dr. Willy N. Frick explained in the magazine *Cockpit* that the second crash of the P-16 was “because the flight altitude was too low in order to trim the airplane with the mechanical emergency control, there was no other possibility for the young pilot Lieutenant Brunner to leave the plane with the ejection seat and a second P-16 disappeared in the Bodensee.”<sup>32</sup>

Only one day later, as a consequence of this crash, the Federal Council ordered the precautionary cancellation of the purchase order.<sup>33</sup> On the occasion of its meeting on 10 April, the KMF requested from the EMD that the completion of the test series of the

P-16 be done without delay. Furthermore, they requested a credit of five million Swiss Francs to be released in order to continue the work until the end of June 1958.<sup>34</sup>

On the thirty-ninth meeting of the KMF, the Commander of the Air Force Major General Primault seemed to be mainly concerned about the remarkable similarity of the two accidents of the P-16.<sup>35</sup> He stated:

One can assume if the pilots had landed immediately (after the occurrence of certain alarm signs) one or both airplanes could have been saved, in both cases. The flickering of warning signs was in a certain way not taken serious enough by the pilots. However, that should not be a reproach to the pilots. It would have been more careful, having an older and experienced flight controller on the ground, that would have been able to think and act like a pilot. An experienced flight controller and pilot should be on the airfield, which would have given in case of smallest doubts the instructions to the pilots for immediate landing. Today, we have the public angry against the company because of this accident; however the main cause of the accident is because of the insufficient conduct of the test flights.<sup>36</sup>

This statement shows that technical reasons were not the only reasons for the cancellation. On 2 June 1958, the Federal Council decided not to order the P-16. The president of the KMF, Dr. Jakob Ackeret, submitted his resignation. Federal Councilor Chaudet responded to the resignation, "I know that your perception of the resolution taken by the Federal Council regarding the P-16 is incorrect and fatal. I cannot share this view, because it carries too many technical, scientific and economic arguments."<sup>37</sup>

Three days later Chaudet explained to the National Council the decision of the Federal Council:

The decision of the Federal Council had to consider technical, military, economical, social, psychological and political aspects. A change and an improvement of the failed control system of the P-16 could have only been fixed after months. However the KMF considers the technical improvements as feasible and suggests that the work on the P-16 should be continued. Because of the repeatedly nasty and defamatory statements from certain sides in the whole debate around our airplane procurement and the statement that the responsible authorities would have completely lost their independence in a cold war of economic

interests I felt the need to leave no doubt over this point. The experts came at the end to the disappointing conclusion that for the P-16 a today's safety demands fulfilling flight control system is not available and has not been suggested yet. This will result in an extension of deadline of approximately two years. The Federal Council renounces much with largest regret on the P-16.<sup>38</sup>

On 21 July 1958, the Federal Council approved and opened a resolution to adjust the damages due to KTA's cancellation of the contract with FFA. On 10 August the EMD decided to delegate the responsibility for future military aircraft procurement to the Chief of General Staff. On the 21st the Federal Council took notice of the final report on the crash of the P-16.<sup>39</sup>

Despite the cancellation, the FFA continued developing the P-16 at its own expense and revised the faulty servo in such a way that it corresponded to the construction specifications. In July 1959, the first flight of the second machine took place with the factory serial number 04. After successful testing, the FFA entertained hopes for further evaluation. In June 1960 Chaudet smashed these hopes. He wrote to the FFA "that a procurement whatever the results of the new testing may be for different reasons such for example which have resulted in the course of the planning of the reorganization of our army, cannot be considered anymore."<sup>40</sup>

The positive characteristics of the P-16 did not remain hidden from the international professional world. The P-16's recognition led to a development order by William P. Lear in 1960. Lear ordered the development of a business aircraft with jet propulsion.<sup>41</sup> The Learjet inherited different construction features like the aerodynamics of the wings, the original interpretation of the tail unit, and the fuel system from the P-16. Dr. Hans Studer designed and developed to a large extent the Learjet. Because of a variety of differences between Caroni and Lear, Lear moved the construction of the

Learjet to Wichita, Kansas. The first flight of the Learjet took place in Wichita on 7 October 1963.

Parallel to the development of the Learjet at SAAC, FAA designed a machine labeled 05 of the P-16. On 24 March 1960 the first flight of 05 took place. FFA made different tests with maximum combat load due to interest in the P-16 by Austria, United States, and the United Kingdom.<sup>42</sup> This interest led in 1966 to the resurrected debate in the press about the P-16. In the United States a new military strategy called “Flexible Response” had led to the increase of the conventional armed forces.<sup>43</sup> Dr. Harold Brown, the director of Defense Research of the Department of Defense explained that high speed aviation would soon belong to the past and future jets have to have the ability to fly longer distances in a low-altitude flight profile rather than at Mach one. Future high-performance aircraft would be indispensable for strategic long-range reconnaissance and for carrying nuclear weapons. Since the FFA continued developing the P-16 at its own expense Caroni looked for customers other than European Air Forces. The history of the P-16 is a perfect example of force management. Additionally, it shows how up and downs in aircraft development can affect the parliament and the public opinion.

---

<sup>1</sup>Dr. Hans L. Studer, 1907-1971. From October 1935 he was a coworker of Professor Dr. J. Ackeret (the later president of the KMF) of the Institute for Aerodynamics at the ETHZ. On October 1948, he took over the position of the Chief engineer of FFA (successor of the Dornier Works AG).

<sup>2</sup>Felix Meier, *Chronik der Entwicklungsgeschichte des P-16* (Bern: Dok D KFLF, 1995), 2.

<sup>3</sup>Ibid., 3.

<sup>4</sup>E 27 / 18879, vol. 1, Airplane Procurement, Answer to the KTA from Major General Rihner from 3 July 1945, Bern, Switzerland.

<sup>5</sup>E 27 / 18879, vol. 3, Bases for the Development of Airplanes of the Swiss Air Force. Interim report on the recent results of the Basic - Commission from 24 October 1946, Bern, Switzerland.

<sup>6</sup>E 27 / 18879, vol. 3, Requirements of a Combat Aircraft for Switzerland. Air Force from 20 November 1946, Bern, Switzerland.

<sup>7</sup>E 27 / 18879, vol. 2, Swiss Aircraft Industry in Connection with our Airplane Procurement. General Staff, Chief of Material Section, LTC Kuenzy, August 1947, Bern, Switzerland.

<sup>8</sup>The N-20 Aiguillon (Sting) was ordered by the Military Department in May 1948. The F+W in Emmen began work on this ambitious, radically innovative new fighter. The N-20 was a tailless, swept-wing airplane reminiscent of the United States Navy's Vought F7U. A three-fifths scale demonstrator flew successfully in 1951. The Federal Council decided due to problems with its engines, to cancel the development in 1952.

<sup>9</sup>Felix Meier, *Chronik der Entwicklungsgeschichte des P-16* (Bern: Dok D KFLF, 1995), 4.

<sup>10</sup>Additionally, the EMD required starting and landing on very short runways.

<sup>11</sup>E 5001 (F) / 1, vol. 56, Statement of the Air Force about the Combat Aircraft Draft P-16 and Remarks Concerning the Airplane Procurement of Rihner to the Head of the Defense Department, 28 January 1950, Bern, Switzerland.

<sup>12</sup>Ibid.

<sup>13</sup>*Jane's All the World's Aircraft* (1952-1953), 167. The magazine could not publish any details of this aircraft

<sup>14</sup>E 5560 (C) / 1975/46, vol. 276, Explanation about the Affair of the Aircraft N-20 by the Commanding Officer of the Air Force, Major General Primault, 23 December 1953, Bern, Switzerland.

<sup>15</sup>*Neue Zuercher Zeitung* (Zuerich), 6 July 1955.

<sup>16</sup>E 5460 (A) / 6, vol. 169, The Preparation of the Manufacturing of the P-16. Letter of the Commanding Officer of the Air Force, Major General Etienne Primault to the KTA of 11 June 1955, Bern, Switzerland.

<sup>17</sup>E 5560 (C) / 1975/46, vol. 273, Minutes of the 30th Meeting of the KMF from 12 July 1955, Bern, Switzerland.

<sup>18</sup>E 5560 (C) / 1975/46, vol. 273, Minutes of the 32nd Meeting of the KMF for military airplane procurement from 6 July 1956, Duebendorf, Switzerland.

<sup>19</sup>Ibid.

<sup>20</sup>*Neue Zuercher Zeitung* (Zuerich), 6 October 1956.

<sup>21</sup>E 5560 (C) / 1975/46, vol. 271, Minutes of the 9. Meeting of the Ad Hoc Commission for Questions of the Aircraft Industry from 26 February 1959, Bern, Switzerland.

<sup>22</sup>E 5460 (A) /1967/58, vol 189, Message of the Federal Council to the Parliament Concerning the Procurement of a Test Series of the Combat Aircraft P-16 from 23 December 1955, Bern, Switzerland.

<sup>23</sup>*Jane's All the World's Aircraft*, (1956-1957), 222.

<sup>24</sup>*Neue Zuercher Zeitung* (Zuerich), 6 October 1956.

<sup>25</sup>Felix Meier, *Chronik der Entwicklungsgeschichte des P-16* (Bern: Dok D KFLF, 1995), 7.

<sup>26</sup>Ibid.

<sup>27</sup>Ibid.

<sup>28</sup>Ibid.

<sup>29</sup>“Swiss Vote for P.16 as 2nd-Stage Fighter,” *Aviation Week*, 24 March 1958, 65.

<sup>30</sup>National Councilor Eggenberger on the occasion of the message and the resolution draft from 31 January 1958.

<sup>31</sup>*Neue Zuercher Zeitung* (Zuerich), 26 March 1958.

<sup>32</sup>Willy N. Frick, “The development of military aircrafts in Switzerland: The ground combat aircraft P-16 of FFA Altenrhein,” *Cockpit*, February 1958, 21-26.

<sup>33</sup>Felix Meier, *Chronik der Entwicklungsgeschichte des P-16* (Bern: Dok D KFLF, 1995), 8.

<sup>34</sup>E 5560 (C) / 1975/46, vol. 271, Resolution of the KMF to the EMD on Occasion of the Meeting from 10 April 1958, Bern, Switzerland.

<sup>35</sup>Major General Etienne Primault was since 1 January 1953 the Commander of the Air Force.

<sup>36</sup>E 5560 (C) / 1975/46, vol. 273, Minutes of the 39th Meeting of the KMF on 10 April 1958, Bern, Switzerland.

<sup>37</sup>E 5560 (C) / 1975/46, vol. 273, Acknowledgment of Receipt by the Chief EMD Concerning the Resignation of the KMF President Professor Ackeret from 6 June 1958.

<sup>38</sup>E 5802 (-) / 1983/57, vol. 31, Explanations of the Chief EMD to the P-16 question from 5 June 1958, to the parliament, Bern, Switzerland.

<sup>39</sup>Felix Meier, *Chronik der Entwicklungsgeschichte des P-16* (Bern: Dok D KFLF, 1995), 8.

<sup>40</sup>E 5560 (C) / 1975/46, vol. 271, Letter Chaudet's to the FFA of 1 June 1960, Bern, Switzerland.

<sup>41</sup>Swiss American Aviation Corporation (SAAC) with seat in St. Gallen was dissolved in 1962 and the production was moved to the Learjet Corporation, Wichita/Kansas, United States.

<sup>42</sup>Hanspeter Strehler, *Der Schweizer P-16* (Emmenbruecke: Eigenverlag, 2005), 142.

<sup>43</sup>*Wirtschaftspolitik* (Zuerich), 4 February 1966.

## CHAPTER 3

### CONCEPTION OF THE SWISS AERIAL WARFARE<sup>1</sup>

A deeper investigation is needed because the P-16 was a victim of a change in the concept of aerial warfare. In the following chapter, the author will reflect on the “Rihner era,” discuss the inventory of airplanes and the thoughts on the employment of the Swiss Air Force. In the second part of the chapter the author will assess the “Primault era” in which the transformation of Air Force Doctrine played a major role for the procurement of the P-16. This transformation and the main ideas thereof led to the *Study III*. Because of atomic weapons, the Air Forces of the 1950s worked on fundamental issues concerning the weapons and delivery systems. The development of an atomic bomb for tactical employments, which did not happen until the mid 1950s, made the formulation of a new aerial warfare concept even more difficult. Therefore it is of interest to know how LVK defined the missions for the Swiss Air Force in the years 1946-1959. This would have been crucial for the definition of the requirements for a future combat aircraft, such as the P-16.

#### Introduction

In 1946, the Commander in Chief of the Swiss Army, General Henri Guisan, determined the following in his *Final Report* about the active service. “We suffered under the consequences that we were missing a real air doctrine.”<sup>2</sup> This statement shows that uncertainties existed in the concepts of aerial warfare before World War 2. Nevertheless, in 1947 Rihner judged the employment of the Air Force positively:

Only the Air Force and Anti-Aircraft Division was engaged with protecting the neutrality. Due to the limited means on one hand and the short

approach distances of the enemy airplanes on the other hand it was not able to keep the air space completely enemy free.<sup>3</sup>

This statement characterizes the “Rihner era,” whose term of office lasted from 1944 to 1952. It is evident from the sources in the Swiss Federal Archives that Rihner shaped the Swiss concept of aerial warfare. Rihner’s engagement was reflected in the second chapter of the field manual *Tactics* from 1952 (TF 51).<sup>4</sup>

### The Rihner Era (1944–1952)

In order to understand the Rihner Era, it is important to consider the inventory question.<sup>5</sup> In 1946 and 1947 the LVK and the Federal Council held intensive discussions about the future missions and purposes of the Swiss Air Force. Rihner had to fight for the existence of the Air Force. At the Conference of Commanding Officers in 1946, the commanding officers of the general staff requested to examine if the number of airplanes could be reduced.<sup>6</sup> Rihner justified the existence of the Air Force by pointing to the success in World War 2. Rihner argued, “The success against the Germans should be reason enough to maintain the Air Force in the future.”<sup>7</sup> Rihner was convinced with a reduction from 200 airplanes down to one hundred the Air Force “would lose meaning as well as combat strength.”<sup>8</sup> The Air Force calculated based on the existence of twenty-six squadrons and a reduction of one hundred airplanes, that they needed a total of 500 combat aircrafts.<sup>9</sup> In addition Rihner explained that “the LVK called several times in relation to the army the necessity of an existence of 500 airplanes,” and that “only the LVK has the competence to decide a reduction.”<sup>10</sup> As late 1948 the LVK decided due to *Our Memorandum* on the need of 500 airplanes.<sup>11</sup> However, as the outcome of these discussions on financial considerations and the defense budget forced the Swiss Air Force

to rationalize on to a need for 400 airplanes. The aircraft engineers estimated the life expectancy of combat aircraft to be ten years.<sup>12</sup>

In 1946 Rihner formed a commission to develop “basis for the future airplanes of the Swiss Air Force.” This commission met for the first time in September 1946. Among the members were Rihners successor, Lieutenant Colonel Etienne Primault and Dr. Hans Studer, the future designer of the P-16.<sup>13</sup> In a later meeting that took place in 1947, Lieutenant Colonel Kuenzy, the Chief of the Material Section of the General Staff, was also invited. This led Kuenzy to make the following statement “again this meeting left a number of impressions, which causes me to raise the problem of the airplane procurement.”<sup>14</sup> He wrote in his report called *Future Tasks of our Air Force*:

Neutrality protection, supervising of axis of advance and their interruption by destruction of railway stations, bridges and structures, operations against opposing forces, in particular accumulations of tanks, and battles against air landing operations.<sup>15</sup>

For the fulfillment of these tasks the commission required a single-seat combat airplane with a large number of tactical requirements that Kuenzy listed as “shortest possible roll times, large climbing and fall speeds, large combat height (15'000 m), action radius (200-250 km), armoring of the airplane for pilot protection, elevator conditioned cabin and the armament.”<sup>16</sup> Kuenzy doubted whether such an all-around solution could be found, “whether we not generally committing the error of requiring too many different capabilities of this airplane, due to our limited financial possibilities.”<sup>17</sup> Also, Kuenzy feared “that much too much, and too high requirements are asked for in these new types of aircrafts.”<sup>18</sup>

Concerning the P-16, the doubt arose from these demands about the existence of the need for product requirement specifications. In a letter of the Swiss Attaché of Defense in Washington to the KTA stated, “That the Air Force does not set up minimum requirements.”<sup>19</sup> Lieutenant Colonel Schäfer, a member of the Basic Commission confirmed the complexity of this particular armament business:

Product requirement specifications for the development of new combat aircraft were set up in October 1946 by the so-called Basic Commission, consisting representatives of the Air Force, the KTA and the aircraft industry. Product requirement specifications for the P-16 could never be set up from our part because with each new engine variant the performances changed again.<sup>20</sup>

Formulating product requirement specifications at this period was very difficult. The main reason was the rapid progress in aircraft technology. This led to new jet engines and new inventions which made dated specifications obsolete.

### Employment of the Air Force

Rihner on the future employment of the Air Force stated:

First of all, the Air Force would have to be ready to receive the task to show our will to defend our neutrality in the air. The task (support of ground troops) is the primary task of our Air Force and secondly it will not always be possible to orient the Air Force in time over attacks on our ground troops. For this task the Air Force requires modern airplanes, which are on one hand capable for the interference to ground combat and on the other hand to be able to a successful aerial combat.<sup>21</sup>

Rihner mentions in this article two missions, the defense of neutrality and close air support. In 1951 these missions supported the field manual *Tactics* (TF 51). Colonel Hugo Karnbach, later commander of the Air Force (1948-1952), explained concerning the question of the airplane procurement that:

A success in the employment against airborne targets (aircraft interception) is very doubtful, whereby our Air Force will be used up very rapidly

and uselessly. For a small country the success of a fighter mission becomes very doubtful, than the speeds of the airplanes increase.<sup>22</sup>

For Karnbach the existence of a powerful Air Force for the Armed Forces was a necessity and he held the opinion that “a successful employment, which is worth the expenditure, can only be close air support.”<sup>23</sup> Karnbach did not support multirole aircraft. Concerning the type of aircraft he held that “each airplane which was created for a certain purpose, used for completely different missions, and must be transformed accordingly.”<sup>24</sup> Karnbach was not alone in his beliefs. Many officers of the Swiss Air Force held the opinion that raid-type operations for the Air Force were disproportionate and would involve heavy losses and therefore the main mission would be close air support.

Rihner’s solution was a “single-seat airplane for close air support.”<sup>25</sup> Interestingly enough the doubt was not pursued, because the term “single-seat airplane for close air support” expanded the concept:

If we tend to procure single-seat airplanes only, which are used in the first ten years as interceptors as long as they have the same performance like foreign airplanes - later however for other tasks like interference into ground combat and reconnaissance for which a maximum performance is not necessary, then we use our airplanes maximally.<sup>26</sup>

This statement shows that concerning the doctrine a paradigm change began to appear. On 26 December 1951, the Federal Council approved the field manual *Tactics* (TF 51). This manual outlined the Air Force’s tasks:

- Number 148. Our Air Force must be limited to tactical co-operation with the ground troops. Besides it must fulfill also the task of long-range reconnaissance . . . and reconnaissance. The employment to aerial combat is only applicable, when it serves to fulfill the major task.
- Number 149. . . Our Air Force uses for the fight only light, fast and agile airplanes, which can be used as hunters and against ground targets as well.

- Number 156. . . . Surprising occurrence and simultaneous attack of strong forces on expanded area targets as artillery emplacements and large assemblies of troops or on a number of homogeneous single targets.
- Number 158. Generally our jets will not look for the aerial combat. Nevertheless it must be considered.<sup>27</sup>

These tasks determined future airplanes of the Swiss Air Forces. Since these tasks demanded different capabilities it is not surprising that the uncertainty increased which as to airplane to procure.

### Evaluation of the Rihner Era

Since the Air Force's primary task was close air support, the Air Force demanded a close air support aircraft. The LVK, however, determined that the neutrality protection and raid-type operations should also have to be covered. This fact left space for further discussions and led to uncertainties in the interpretation of *TF 51*. The following questions may be raised to the different paragraphs. Did the Air Force have to protect the neutrality (148)? Further, as far as the aerial combat was concerned, numbers 148 contradicted number 158.<sup>28</sup> As of now, one thing can be underlined that the rapid development in airplane technology overhauled *TF 51*. These uncertainties and contradictions were the reasons which finally broke the neck of the P-16.

The involved parties in the P-16 deal judged these requirements compiled by the Basic Commission as clear. Therefore the involved commissions ordered the P-16 without explicit product requirement specifications. In 1950 there existed uncertainties concerning the procurement of a future airplane and their employment. The Basic Commission prejudged Rihner's statement. In 1960 the newspaper *Neue Zuercher Zeitung* (NZZ) underlined these facts and determined:

In 1949, the P-16 was in development as a high-performance fighter; 1958 it could, because of delay, only be presented as a fighter and ground attack aircraft. At a press conference (4 February 1958) the new Chief of the General Staff threw himself courageously into the battle he stressed out regarding the P-16 that above all he could not repeat enough that Switzerland needs a ground combat aircraft and not a so-called fighter.<sup>29</sup>

The following two statements are significant to the conclusion of this chapter. First of all, the aerial warfare conception revealed uncertainties during the evolution period of the P-16. Secondly the War Technical Department ordered the P-16 without actual product requirement specifications. This fact is important, because the FFA developed an airplane without any clear requirement profile. Therefore, FFA tried to develop an airplane in order to meet the basic requirements of 1947. The technical progress in aircrafts made these requirements practically obsolete.

#### The Primault Era (1953–1964)

Major General Etienne Primault was Rihner's successor.<sup>30</sup> He was a member of the Basic Commission, whose task was to compile *Basis for the Development of Airplanes of the Swiss Air Force*.<sup>31</sup> As a lieutenant colonel he had already worked on the development of the doctrine under his predecessor and he had fundamental knowledge of the air doctrine and the discussions held by the Basic Commission.

In April 1955, Primault formed a military committee called "Future Problems" which had the mission to study "certain future problems toward an increase of the airplane quantity of our Air Force and their reorganization."<sup>32</sup> The committee produced *Studies I - III on the Enlargement of Our Air Force*. These studies had fundamental influence on the doctrine and the substantial points of the *Study III* and will be examined in dept later.<sup>33</sup> The Hungary crisis and the perceived threat of the Soviet Union kindled

the discussions in the LVK and Air Force regarding an enlargement of the Air Force. In December 1956, the Federal Council communicated that they would provisionally procure forty French Mystère combat aircraft, because the P-16 would not be ready for production until 1960. Nevertheless, the National Council rejected the Mystère and granted a credit of twenty Million Swiss Francs for the development of the P-16.

In 1957, the LVK tasked Major General Primault to present a study on future issues of the Swiss Air Force. *Study III* had a major impact to the P-16. Article 7 of *TF 51* stated, “The army must be able to protect the integrity of our area and air space against violations of the borderline, and the country as a whole from an attack.”<sup>34</sup>

From May 1954 to 1956, the provisional instructions interpreted this doctrine in the *Employment and Conduct of Operations of the Air Force*. The first mission mentioned was neutrality protection.<sup>35</sup> The second and third mentioned were pure aerial warfare and the support of the ground troops.<sup>36</sup> Further, the *Employment and Conduct of Operations of the Air Force* stated as fourth and fifth figure reconnaissance and transport.<sup>37</sup>

In 1957, the regulation *Employment and Conduct of Operations of the Air Force* took these provisional instructions under advisement. This regulation edited by the Air Force was a supplementation to *TF 51*. The Air Force sought to “create a uniform view about the employment of the Air Force.”<sup>38</sup> Compared to the Rihner era a reorientation in the weighting of tasks took place. *TF 51* stated that the support of ground troops as the third task after neutrality protection and aerial warfare. Therefore the Air Force conceived the P-16 as ground combat aircraft. The tasks mentioned below in *Study III* were the main problem for evaluating the airplane.

The airplane needed for neutrality protection had to be a fighter with a top speed of Mach 1.5 - 2 and a climbing ability up to 12,000 meters in two minutes with a ceiling of 15,000 meters.<sup>39</sup> Additionally, the jet must be able to carry atomic bombs and support the ground troops with conventional weapons.<sup>40</sup>

For air warfare there are basically the same performance characteristics as for neutrality protection. The same airplane can be used successfully for both tasks. If we will eventually be equipped with nuclear weapons, these airplanes could be used to conduct not only an active air defense but also an offensive one.<sup>41</sup>

Principally for the support of the ground troops two different field tasks had to be distinguished. One task was for securing local air superiority, and the other one was close air support. The requirements of such an aircraft were Mach 1.0, climb ability in 5 minutes to 10,000 meters, radius of action in low-altitude flight to 300 kilometers, complete blind flight equipment, and armament of air-to-air rockets.<sup>42</sup> For close air support additional equipment as a fighter-bomber would be needed. For reconnaissance missions the same airplanes could be used.<sup>43</sup>

Due to its technical design, the P-16 was an airplane for ground attack. The P-16 was unsuitable for neutrality protection because it had no air-to-air capability. This study weighted the tasks for future aircraft procurements. The author concludes that primarily a fighter attack aircraft should have been evaluated, which was capable of carrying atomic bombs.

#### The Discussions Held at the LVK

The discussions held at the LVK had a major impact on the P-16's procurement. Members of the LVK were the Chief of the Military Department (EMD), the Chief of the General Staff, the Chief of Training, the commanders of the Army Corps and the

commanding officer of the Air Force.<sup>44</sup> The latter one had only an expert function and therefore had no right to vote, because the Air Force was not yet an independent service. The minutes of the meetings held in 1957-1958 show that the LVK members discussed the issues about procurement of combat aircraft in this period in a very controversial way. These discussions were decisive for the P-16.

The LVK members discussed if the task of neutrality protection could be done in the future by air defense rockets. On 22 May 1957, the request to the EMD took place in order to strengthen the Air Force by 500 airplanes. The reason for this request was that for neutrality protection the airplane was the only available mean at this time.<sup>45</sup>

In November 1957, a delegation under the direction of Colonel Willi Frei traveled to the United States, France, and Sweden to find out “which role the fighter should play in a future war.”<sup>46</sup> The Swiss flew the French Mystère IV, the American F-86 D/F Sabre, and the British Hunter Mk 6, so they could compare performance with that of the P-16. At the same time the aim was to examine aircraft types acceptable to Switzerland. In their reports the officers raised on this mission the problem of the changes and the corresponding lack of clarity in doctrine and had asked the Federal Council in regard with the associated airplane procurement “to make a decision.”<sup>47</sup> Primault reported about his stay in the United States to the LVK:

Air defense for the American territory exists since 1950 and special fighter units are reserved for this task. Air patrols have to hinder non-identified airplanes in continuing their flight. The discussions about defending the Swiss air space showed that Switzerland would have to defend its own air space and that a co-operation of airplanes and air defense is necessary. Switzerland cannot count on support for air defense by other countries. Concerning replacing airplanes by guided weapons, nobody had spoken about a substitution of airplanes. The United States still use fighters and bombers steered by humans.<sup>48</sup>

This report shows that this delegation tried to find a solution as far as an air defense was concerned. Further, NATO expected that Switzerland in case of a war would protect its own air space. The Swiss delegation learned from the United States and NATO that air defense and sufficient fighters would be necessary for a strong defense. Chaudet feared that this report would create unfavorable conditions for further debates in parliament. He stated that this “report requires airplane politics in the long term and a trailblazing guideline for all future airplane models.”<sup>49</sup> Primault, who was comparing the newest aircraft types on the market with the P-16, meant that “the P-16 comes to some extent late, is expensive, and we want airplane which is more modern. We are only in favor of the P-16, because it is of a Swiss construction.”<sup>50</sup> Because of pressure from politicians and the public, Primault supported the P-16 and underlined that this “is a good airplane and it corresponds to our needs, although it cannot be considered very modern anymore.”<sup>51</sup> Chaudet had another opinion:

The delivery of the P-16 will take too much time and is burdened with financial conditions. The P-16 prevents us from buying foreign airplanes. If we first buy foreign airplanes, the decision about the P-16 would be postponed, which would mean, that we would practically do without it.<sup>52</sup>

In November 1957, Chaudet worried about the future of the P-16 for political reasons. Chaudet made different statements showing that he was more and more against the P-16. Under pressure, Primault wanted the deal to be settled. Since the total of airplanes would be under 400 airplanes, Primault formulated the following request, “I propose to maintain the former proposal to acquire, in 1958 and 1959 one hundred Hunter Mark 6s and order another one hundred P-16s, to deliver in the years 1959 to 1961.”<sup>53</sup> The Chief of the General Staff for his part wanted to procure one hundred

Hunters. He said, “We must plan to do it later without the P-16 without expressing ourselves definitely today.”<sup>54</sup> The LVK decided to request to the Federal Council the procurement of one hundred Hunters and one hundred P-16s.<sup>55</sup> Although the LVK discussed changing the doctrine, they held on to buying the P-16 and retaining the existing doctrine.

At the LVK meeting in November 1957, Chaudet said that “the Federal Council intended to decide in short time on the fate of the P-16.”<sup>56</sup> Primault had a bad feeling. He criticized that “we do not have sufficient confidence in the P-16.”<sup>57</sup> Primault’s bad feeling was not astonishing, because the new LVK members were present for the first time in this meeting.<sup>58</sup> Primault feared that the new LVK members could take a position against the P-16. Indeed, the future Commander of the third Mountain Corps, Lieutenant General Georg Züblin, engaged in his first LVK meeting.<sup>59</sup> He did not share the opinion of the LVK members and sought to expand the use of the Air Force. He said at the meeting that “everybody always speaks of ground combat, without saying what kind of targets have to be fought. In the past five years a transformation regarding the ground targets occurred. In the foreground stands the fight against the enemy’s nuclear weapons.”<sup>60</sup> According to his opinion, airplanes would have to destroy the enemy’s rocket-launching pads outside of Switzerland. Additionally, the airplanes have to be able to extract themselves from the enemy’s fighters. In this regard Züblin spoke about the Saab Draken, which he rated as a “very interesting airplane” because the Draken was capable of carrying remote-guided weapons. He questioned, “Whether we should take the Draken and should let the P-16 fall.”<sup>61</sup>

Primault pushed towards a decision. According to him, “the Draken is an air-to-air fighter with some ground attack capabilities, the P-16 a fighter-bomber. No time is available to examine the Draken.”<sup>62</sup> The Chief of the General Staff, Louis de Montmollin, had the opinion, that the P-16 should be treated in the Federal Council because “we have to discuss with the Federal Council whether our conception is to be maintained or not. We also have to submit the problem of “fighter-bombers carrying heavy ammunition” or “rapid fighters.”<sup>63</sup> This statement of the Chief of the General Staff shows where the confusion derived from. Where upon Primault asked, “What do we require of this airplane?”<sup>64</sup> The Chief of the General Staff believed that the P-16 corresponded to the needs of the doctrine, as long as Switzerland did not possess nuclear weapons.

The LVK criticized the P-16. The most important reasons were the ambiguity of the doctrine and the order to purchase one hundred Hawker Hunters. Moreover, new members of the LVK brought new opinions to the commission. Züblin demanded more mobility and higher firepower from the armed forces. He called the corresponding doctrine “mobile defense.” The P-16 did not support mobile defense.

On 25 March 1958 another P-16 crashed. On 28 May 1958 the LVK decided to cancel the program. The experts of the KMF and KTA still fought in favor of the P-16 and had the opinion that closer cooperation between aircraft plants of Emmen and Altenrhein (FFA) was necessary. Despite the accident and the related delivery delay from six to twelve months, the KMF recommended continuing the work on the P-16. After the representatives of the KMF and the KTA had left the meeting, the LVK members discussed the P-16 issue. The two Lieutenant Generals Nager and Thomann held the

opinion to hold on to the P-16. Züblin advocated stopping work on the P-16. He said, “From the beginning I was not a fan of the P-16 because this airplane did not appear modern to me.”<sup>65</sup> Major General Frick, who was the future Chief of Instruction, and Lieutenant General Gonard, the Commander of the 1st Corps, likewise held the opinion to give up the P-16. Primault came back to the fact that for him “the P-16 is still the most suitable airplane for interventions on the ground.”<sup>66</sup> The Chief of the General Staff Lieutenant General Jakob Annasohn criticized the delivery delay status. This “reason is enough to give up the P-16.”<sup>67</sup> Therefore Annasohn requested not to build the P-16 and to manufacture if possible another airplane under license. Federal Councilor Chaudet and other members of the LVK followed Annasohn’s opinion. As a consequence of the long discussions about different aspects regarding the procurement of the P-16, the LVK decided to request the cancellation of the production of the P-16. Thereby it is of importance that the commander of the Air Force had a contrary view.<sup>68</sup>

On 2 June 1958, the Federal Council cancelled the order of one hundred P-16s.<sup>69</sup> Since each of the seven Federal Councilors had to discuss requests of their departments, Chaudet had to discuss the request with his fellow Councilors. Federal Councilor Markus Feldmann’s record show that Swiss air doctrine was not discussed.<sup>70</sup> According to Feldmann, the decisive points for the cancellation of the P-16 were:

The reason for the request of the Military Department (EMD) is, that after the behavior of the management of FFA in Altenrhein the Military Department lost all its confidence into the loyalty of its business partner. It would have been careless to hold on an order for pure prestige reasons which the responsibility could not be taken for our pilots anymore.<sup>71</sup>

Federal Councilor Chaudet listed technical issues as his reason for the cancellation of the P-16.<sup>72</sup> After this action by the Federal Council it is not surprising that

at parliament on 5 June 1958, Chaudet did not mention the concept of aerial warfare as the reason for the cancellation of the P-16.

On 1 July 1958, the members of the LVK discussed the concept of aerial warfare based on *Green book I* which outlined the future doctrine of the Swiss Armed Forces.<sup>73</sup> Since Chaudet based his support for canceling the P-16 on technical issues, he wanted to make sure that “we have to prevent that the doubt arises that we gave up the P-16 because of tactical reasons.”<sup>74</sup> This statement was a very profound. Only in this committee Chaudet communicated the true reason for the cancellation of the P-16. Lieutenant General Gonard, the Commander of the 1st Corps, questioned, “Whether it still would make sense, to buy airplanes or whether we should turn to guided missiles.”<sup>75</sup> Züblin held the point of view that the Swiss air doctrine had become outdated.<sup>76</sup> Due to these realizations, Primault received the order to write a new study on the Swiss air doctrine which he submitted to the LVK on 14 June 1958. Therein the Swiss Air Force explained that the most important targets of an air defense were attacks against airplanes on the ground, rocket missiles launching pads, radar stations, and the infrastructure for these systems.<sup>77</sup> He was convinced that a defender would have to destroy hostile airborne targets before they penetrated into the Swiss air space. The consequence for Switzerland was that it started to consider the concept of forward air defense over the enemy’s territory. Primault requested the procurement of a multipurpose fighter, like the Mirage III.

Primault added these considerations to the *Green Book II* which appeared in December 1958 after the rejection of the *Green Book I* by the Military Delegation of the Federal Council.<sup>78</sup> Therein the Military Department (EMD) reported to the Federal

Council “The Transformation of the Army to the Requirements of Modern Warfare.”<sup>79</sup>

This report treated the threat by air and the air defense. This document revealed the real reasons for the cancellation of the P-16.

### Evaluation of the Primault Era

The Primault era characterized a profound change. The outcome of rapid technical development of airplane technology led to a change in the existing doctrine. This change was not found in any army doctrinal manual up to 1958. The P-16 became a victim. The second crash of a P-16 acted as a catalyst for cancellation by the EMD. Moreover, with the order of the one hundred Hawker Hunter, the EMD had already selected an airplane which could be used in the same role as the P-16.

In summary, big uncertainties existed regarding the aerial warfare concept which also underlined the different missions of the Air Force abroad. Existing NATO concepts affected the decision makers. The realization that the enemy had to be fought before he entered the country called for a new doctrine. The fact that the Swiss Air Force had to destroy targets which were located outside of Switzerland underlined the call for other types of aircraft. The aircraft should have been capable of carrying nuclear weapons. Because of its conception the P-16 could not fulfill this mission. In his cancellation speech on 5 June 1958, Chaudet avoided mentioning Swiss air doctrine. Instead, he indicated that the government had lost confidence in the technology of the airplane. He never communicated the doctrinal reasons. Since the EMD’s top management seemed to be indecisive concerning what kind of airplane that would best for the Swiss Air Force’s needs, Chaudet was only concerned about political issues.

<sup>1</sup>The concept of the future aerial warfare was the formulated realization of the nature and the regularities of the air war and the consequences for the planned procurement and use of the own air war means, which can be derived from it.

<sup>2</sup>Four-star generals in Switzerland are only appointed in wartime. General Henri Guisan was the Commander in Chief of the Swiss Army during World War Two. Up to the end of 2003 the Commander of the Swiss Army was during peacetimes a three-star general called the Chief of the General Staff: Guisan H.: Report of General Henri Guisan to the Parliament about the 1939-1945 active service, 1946, p. 114.

<sup>3</sup>Fritz Rihner, "Do we need an Air Force?" *ASMZ*, January 1947, 6-12.

<sup>4</sup>Swiss Army, Field Manual 51.20 d, *Tactics* (TF 51), The Field Manual *Tactics* was a manual that was used from the company level up to division level. This manual contained all the necessary explanations, sketches and leadership issues in order commanders were able to take decisions for any different kind of future battles.

<sup>5</sup>After World War Two the Swiss Air Force had as inventory a total of 500 airplanes.

<sup>6</sup>E 27 / 18879, vol. 8, Reduction of the Air Force. Letter of Rihner to the Chief of Education from 18 November 1946, Bern, Switzerland.

<sup>7</sup>Fritz Rihner, "Do we need an Air Force?" *ASMZ*, January 1947, 6-12.

<sup>8</sup>E 27 / 18879, vol. 8, Reduction of the Air Force. Reply of Rihner to the Chief Instruction from 18 November 1946, Bern, Switzerland.

<sup>9</sup>E 27 / 18879, vol. 2, Airplane Procurement for the Air Force. Department of the Air Force and Air Defense, without indication of the author, July 1946, Bern, Switzerland.

<sup>10</sup>E 27 / 18879, vol. 8, Reduction of the Air Force. Letter of Major General Rihner to the Chief of Instruction, Lieutenant General Frick, from 18 November 1946, Bern, Switzerland.

<sup>11</sup>E 27 / 18879, Bd. 8, Datas concerning the Equipment of our Air Force with Airplanes, Weapons and Ammunition (without night operations) of the Air Force to the LVK from 20 June 1950, Bern, Switzerland.

<sup>12</sup>E 27 / 18879, vol. 2, Airplane Procurement for the Air Force. Department for Air Force and Air Defense, without indication of author, July 1946, Bern, Switzerland.

<sup>13</sup>E 27 / 18879, vol. 8, Bases for the Development of Airplanes of the Swiss Air Force: Interim report on the past results of the Basic - Commission. Chairman Brigadier Magron, 24 October 1946.

<sup>14</sup>E 27 / 18879, vol. 2, the Swiss Aircraft Industry in Connection with our Airplane Procurement. General Staff, Chief Material Section, LTC Kuenzy, August 1947.

<sup>15</sup>Ibid.

<sup>16</sup>Ibid.

<sup>17</sup>Ibid.

<sup>18</sup>Ibid.

<sup>19</sup>E 5460 (A) / 6, vol. 168, Letter of the Chief KTA regarding Questions for Airplanes to the Attaché of Defense in Washington from 4 October 1955, Bern, Switzerland.

<sup>20</sup>E 5460 (A) / 6, vol. 169, reply to Major R. Kissling from Erlenbach, Zurich, of LTC Schäfer from 16 November 1955.

<sup>21</sup>Fritz Rihner, “Do we need an Air Force?” *ASMZ*, January 1947, 6-12.

<sup>22</sup>E 27 / 4195, Rihner about the Question of Colonel Karnbach regarding the Airplane Procurement for our Army, 18 October 1946, Bern, Switzerland.

<sup>23</sup>Ibid.

<sup>24</sup>Ibid.

<sup>25</sup>E 27 / 18879, vol. 2, Letter of the Chief of the Air Force to the Chief Military Department, Federal Councilor Dr. Kobelt from 8 October 1947, Bern, Switzerland.

<sup>26</sup>E 27 / 4260, Statement on the Report of Colonel Vacano about the Reorganization of the Air Force by Rihner at Federal Councilor Kobelt, 21 July 1950, on the occasion of the LVK meeting from 28 October 1950.

<sup>27</sup>Swiss Army, *Reglement 51.20.d Taktische Fuehrung 51* (Bern: EDMZ, 1951).

<sup>28</sup>E 5560 (C) / 1975/46, vol. 39, studies 2 “The Enlargement of the Air Force” from Primault 4 September 1957, Bern, Switzerland.

<sup>29</sup>*Neue Zuercher Zeitung* (Zuerich), 22 October 1960.

<sup>30</sup>Due to the Mirage affair the Federal Council decided on 7 October 1964 to fire Primault. The Chief of the General Staff Annasohn withdrew voluntarily, so did Federal Councilor Chaudet.

<sup>31</sup>E 27 / 18879, vol. 8, Bases for the Development of Airplanes for the Swiss Air Force: Interim Report on the past results of the Basic - Commission. Chairman Brigadier Magron, 24 October 1946.

<sup>32</sup>E 5460 (A) / 6, vol. 169, Future Challenges, Invitation for the Studying Committee of Future Challenges of Major General Primault from 21 April 1955, Bern, Switzerland.

<sup>33</sup>E 5460 (A) / 1967/58, vol. 188, Study III: The enlargement of the Air Force of the studying committee for future challenges (secret) of 31 March 1957, Bern, Switzerland.

<sup>34</sup>Swiss Army, *Reglement 51.20.d Taktische Fuehrung 51* (Bern: EDMZ, 1951), 2.

<sup>35</sup>Explanations in the field manual 56.3d *Employment and Conduct of Operations of the Air Force* regarding neutrality protection. It means the use of Air Force units to destroy airplanes which violate our air space or to force them to land on our territory. If necessary this task has to be fulfilled with use of arms.

<sup>36</sup>Pure aerial warfare means warlike encroachments from the air, without enemies' ground forces attacking our country and usually without declaration of war. Support of the ground troops means the tasks of the Air Force in co-operation with the ground troops are fire support, reconnaissance, transports and communications. The fire support of the ground troop by the Air Force can be indirect or direct. The indirect support represents the normal case and concerns actions of the Air Force against targets, which are not located in the operations zone of the enemy ground troops. The direct support covers actions of the Air Force against targets, which are in the operations zone

<sup>37</sup>Reconnaissance may take place via eye or photo reconnaissance on the battlefield and in the rear area of the enemy. Transport and connection are only to be used in urgent cases and for goods to a limited extent.

<sup>38</sup>*Ibid.*, 5.

<sup>39</sup>E 5460 (A) / 1967/58, vol. 188, *Study III*: The enlargement of the Air Force by the studying committee of future challenges of 31 March 1957, Bern, p. 3.

<sup>40</sup>*Ibid.*, 4.

<sup>41</sup>*Ibid.*, 7.

<sup>42</sup>*Ibid.*

<sup>43</sup>*Ibid.*

<sup>44</sup>The commanding officer of the Air Force was allowed to participate in the LVK meetings after the Second World War. General Guisan noticed in his report of 1946 on page 119 to the Federal Assembly about the active service of 1939-1945 “if however this air strategy is to be pursued and to be forged to a necessary tool, then we have to be consistent; the commander of the Air Forces has to be able to speak out his opinion: the most elementary condition for that is, that the commander of the Air Force is a full member of the national defense commission.”

<sup>45</sup>E 9500,52 / 1984/122, vol. 10, draft of the report of the Swiss Military Department to the Federal Council concerning the transformation of our army to the requirements of a modern conduct of operations of 10 May 1957, discussed at the LVK meeting of 22 May 1957, Bern, Switzerland.

<sup>46</sup>E 9500,52 / 1984/122, vol. 12, minutes of the meeting of the LVK of 4/5 November 1957, Bern, 499.

<sup>47</sup>Ibid., 499.

<sup>48</sup>Ibid., 500.

<sup>49</sup>Ibid., 510.

<sup>50</sup>Ibid.

<sup>51</sup>Ibid.

<sup>52</sup>Ibid., 511.

<sup>53</sup>Ibid., 519.

<sup>54</sup>Ibid., 518.

<sup>55</sup>Ibid.

<sup>56</sup>E 9500,52 / 1984/122, vol. 12, minutes of the meeting of the LVK of 18/19 November 1957, Bern, 554.

<sup>57</sup>Ibid., 556.

<sup>58</sup>Until December 1957, the members of the LVK were Federal Councilor Chaudet, the LTGs de Montmollin (Chief of the General Staff), Corbat (Chief Instruction), Gonard (Commander of the 1st Corps), Nager (Commander of the 2nd Corps), Frey (Commander of the 3rd Corps), Thomann (Commander of the 4th Corps) and Primault (Commander of the Air Force). At the end of 1957 de Montmollin, Corbat and Frey got replaced by LTG Annasohn (Chief of the General Staff), Frick (Chief Instruction) and Züblin (Commander of the 3rd Mountain Corps). The new members

were: MG Jakob Annasohn (future Chief of the General Staff), MG Robert Frick (future Chief Instruction) and Georg Züblin (future Commander of the 3rd Mountain Corps).

<sup>59</sup>Already before 1939 Züblin demanded the need of “to the enemy equal weapons, i.e., mechanized forces and a strong Air Force. But to conduct with our infantry against hostile tanks an encounter battle contradicts to the reality.” Already in 1948 he expressed himself for the *Mobile Defense*. He held the point of view that without superior tank forces and without sufficient area protection by own airplanes the *Mobile Defense* would not be a success. The Military Delegation of the Federal Council rejected in 1957 the described doctrine in the *Green Book I* of 20 July 1957. The LVK provided until December 1958 a corrected edition called the *Green Book II*. The number of airplanes had to be lowered from 500 down to 400 pieces. The issue was, if the responsibility could be taken for a reduction of the different combat instruments in regard of the new employment doctrine. Despite all these doubts the LVK held to its doctrine. The high point of the conception controversy was in 1960 when the decision over the P-16 was already taken. That is why the author will not discuss deeper in detail the context of issue in his thesis. See Alfred Ernst, *The Conception of the Swiss National Defense 1815-1966* (Frauenfeld and Stuttgart: Huber, 1971).

<sup>60</sup>E 9500,52 / 1984/122, vol. 12, minutes of the meeting of the LVK of 18/19 November 1957, Bern, 557.

<sup>61</sup>Ibid., 558.

<sup>62</sup>Ibid., 562.

<sup>63</sup>Ibid.

<sup>64</sup>Ibid.

<sup>65</sup>E 9500,52 / 1984/122, vol. 14, minutes of the meeting of the LVK of 28 May 1958, Bern, 190.

<sup>66</sup>Ibid., 194.

<sup>67</sup>Ibid., 196.

<sup>68</sup>Ibid., 198.

<sup>69</sup>Federal Councilor Markus Feldmann was at the time Federal Councilor when Chaudet was Federal Councilor. Feldmann was Federal Councilor from 1951 up to 1958.

<sup>70</sup>J I. 3 (-) vol. 77, recording by Federal Councilor Markus Feldmann from 2 June 1958, 17.30.

<sup>71</sup>Ibid.

<sup>72</sup>*Neue Zuercher Zeitung* (Zuerich), 5 June 1958.

<sup>73</sup>See endnote regarding “Mobile Defense.”

<sup>74</sup>E 9500,52 / 1984/122, vol. 14, minutes of the meeting of the LVK from 1 July 1958, Bern, 217.

<sup>75</sup>*Ibid.*, 203.

<sup>76</sup>*Ibid.*, 213.

<sup>77</sup>E 9500,52 / 1984/122, vol. 14, study of Primault, air defense from 14 June 1958, Bern, Switzerland.

<sup>78</sup>The LVK called this report the *Green Book II* because it was at the time secret and got no further title.

<sup>79</sup>E 9500,52 / 1984/122, vol. 17, report of the Military Department to the Federal Council concerning the transformation of the army to the requirements of modern warfare from December 1958, Bern, Switzerland.

## CHAPTER 4

### PROCUREMENT POLITICS OF THE MILITARY DEPARTMENT (EMD)

On 2 June 1958 the Federal Council decided, upon the request of the LVK, to cancel the development of the P-16, although the Parliament had approved the procurement of one hundred items. This decision was the final renunciation of the capability of Switzerland to develop a combat aircraft. Therefore this chapter will contain a discussion of the procurement politics of the Military Department, its different commissions, and the commanding officers of the Air Force. The back and forth discussions show naivety in the commissions in procurement politics.

The Second World War pointed out serious weaknesses in Swiss procurement practices of flight material. The efforts to purchase airplanes of newer construction from foreign countries failed. The United States and Great Britain explained that they could hardly manufacture sufficient airplanes for themselves and that if they had surplus they would have to supply their allies. Germany was the only exception, delivering just before the beginning of the Second World War eighty-nine Messerschmitt Me-109Es to Switzerland.<sup>1</sup> In June 1940, the German Air Force violated Swiss neutrality in the northwestern part of the country. It suffered losses from being shot down by Swiss airplanes. This is the reason why the German side did not deliver the urgently needed reserve material to Switzerland. Therefore, the Swiss built up their aircraft industry in great haste. After World War Two Swiss authorities discussed what type of airplane would fit for the Air Force's needs best. In principle, three airplane procurement possibilities were open: (1) domestic development and building of suitable airplanes, (2)

from foreign developed airplanes built domestically (manufactured under license), and (3) buy the desired airplanes from abroad.

The experiences of the Second World War led to the development and construction of airplanes domestically. In order to discuss the procurement politics of the Military Department, Major General Rihner, the commanding officer of the Air Force, is of central importance. He wrote many statements regarding the Swiss aircraft industry. However, from his successor, Primault, no writings could be found other than some expressions on the LVK.

On 8 October 1947, Rihner presented the situation of the aircraft industry to Federal Councilor Kobelt as follows:

Presently we have a well developed aircraft industry of national and private nature, which is in the situation to manufacture appropriate airplanes and is able to compete with foreign production. However, some engineers, technicians, and skilled workers have moved away, either abroad or into other industries, because a better situation was presented to them, or because they distrusted the further development in their own country.<sup>2</sup>

Three aircraft plants, the Swiss Federal Aircraft Plant (F+W) in Emmen, which had been created in 1940, the FFA (Flug- und Fahrzeugwerke Altenrhein), and the Pilatus Aircraft Plant in Stans, constituted this “well developed aircraft industry.” F+W was a federal enterprise which was held as a public company of KTA. Although the war had ended just two years earlier, these companies were already struggling against the loss of qualified personnel.

Also, foreign workers were applying for jobs in Switzerland. On 25 September 1946 the political section of the Swiss federal military administration advised not to employ Germans at military enterprises. On the occasion of the application of a retired German major named F. Jilg, KTA stated, “It is well-known that at the present the allied

states are suspicious and that the German specialists of military aviation are seeking a safe heaven in Switzerland, in order to train themselves and be able to better take up their activity in Germany again.”<sup>3</sup>

This statement shows that due to the uncertainty in the aircraft construction sector the workers of countries surrounding Switzerland looked for challenges abroad. Since the neighboring aircraft industry abroad was largely destroyed, the foreign specialists were concerned about surviving. In order to maintain the domestic workers, appropriate orders were needed. Also, it was necessary to obtain additional know-how within the range of research and development. In a special report about the Swiss Air Force, Rihner believed that:

The attitude of having our own efficient airplane industry is an absolute necessity, even at the risk that the airplanes of this industry become more expensive than foreign ones. This however does not exclude that occasionally licenses or even series of airplanes are to be procured from abroad. In order to make our airplane industry more efficient a led and determined concentration of forces is a must - if necessary a national steered development.<sup>4</sup>

Rihner did not hide the possibility that having a domestic aircraft industry could become expensive for the Confederation. It is understandable why Rihner desired to have a domestic aircraft industry. Independence from foreign manufacturers would allow production of tailor-made aircraft to Swiss conditions. Rihner noticed that foreign aircraft development abroad did not cope with Swiss interests. Above all, he focused his attention on the limited length of the runways, tightness of the mountain valleys, and dangerous meteorological conditions. These issues shaped airplane construction, which were different from those of other countries.

Rihner also had reservations to manufacture under license. Drawing on the situation in the Second World War, he believed that licenses for airplanes of newer

construction were not released. He took the Vampire DH-100 Mk 1 as example which was produced under license in 1949. "How long production under license is possible is difficult to foresee. In my judgment the main reason for this readiness, is to a large extent, to be looked for in the need of foreign exchange."<sup>5</sup>

From his point of view there were few reasons against a Swiss domestic aircraft industry. For Rihner, the most serious cause of impediment was "that a domestic production will always be very expensive. This could not be avoided, because in Switzerland small series can be only built."<sup>6</sup> In a letter from Rihner to Kuenzy on 29 September 1950 he demonstrated his attitude clearly by stating that:

In view of today's situation it seems to me that everything must be done to accelerate the production of war material, particularly of airplanes, with the purpose of becoming independent of the allies, because it is really not a pleasing thing to be dependent on God's grace.<sup>7</sup>

The Chief of the KTA Brigadier Rene von Wattenwyl stressed at the LVK meeting of 6 March 1947 that "we cannot change our opinion every year."<sup>8</sup> He was convinced that a definite decision had to be made.<sup>9</sup> He agreed "with the report of the Chief of the Air Force, in all regards, on the question of the development and the production of military airplanes in Switzerland."<sup>10</sup> At a presentation of an Air Force exhibition at "Comptoir Suisse" von Wattenwyl said, regarding financial considerations, "The question for the Federation is in each case, whether the expenditures stand in correct relations to the expected achievements."<sup>11</sup> Therefore the procurement and the development of an airplane were not allowed to cost an unlimited sum. His opinion regarding the skilled worker question was "if, however, the principle of producing airplanes in Switzerland has to be given up, then the consequences of the loss of specialized skills in the aircraft industry are probably also of a quite long-range impact

for the Air Force.”<sup>12</sup> These long-term consequences were also well known to the KMF. This is why the KMF requested “co-operation between the F+W and the FFA and to move parts of the production of the P-16 to Emmen.”<sup>13</sup> The attitude of the KTA was the same as that of the KMF. In both committees, technology-inspired members were positive about the P-16. Professor Dr. Jakob Ackeret's sympathy to the P-16 was strengthened by his friendly relationship with its technical designer Dr. Hans Studer, with whom he had built the world's first supersonic wind tunnel at the Swiss Federal Institute of Technology in Zurich (ETHZ) in 1935.<sup>14</sup> Different committee members and airplane experts supported the P-16 and the Swiss aircraft industry.

In 1946, the LVK stressed that the development of jets was the top priority. Subsequently, the F+W received the order to draft a military jet. The FFA received a pre-order for the project engineering of the fuselage. KTA gave Sulzer a preorder for a jet engine design. In 1947, the LVK again, discussed the development of a Swiss jet and believed that the financial means were only available for the further pursuit of a single project, even though more than one would be desired. Since the government could not afford two projects at the same time, it gave up the N-20 project because of financial reasons in 1953.<sup>15</sup>

The Military Department (EMD) underlined its interest in the preservation of the domestic aircraft industry, as in its message to the Parliament of August 1957 stating that the aircraft industry could not survive on maintenance and repair orders of the Air Force only. The different commissions did not thoroughly discuss the possible impact of cancellation of the P-16 project on the domestic aircraft industry. At a meeting in November 1957, Primault put forth that domestic built airplane improvements could be

made more easily than by manufacturing under license. He stressed that in each case the licensors must be consulted.<sup>16</sup> He held the opinion that if the government canceled the P-16, it would destroy the Swiss aviation industry. In turn, the Swiss would have to buy newer jets, which were more expensive. The Chief of the KTA, Rene von Wattenwyl, said, “We have to realize that a license production would not save the Swiss aircraft industry.”<sup>17</sup> After the second P-16 crashed, Wattenwyl supported the request of the KMF that cooperation between the F+W and the FFA should be intensified.<sup>18</sup> The P-16 got cancelled, even though the assumption was that this decision would have extensive impact on the Swiss aircraft industry.

The divergences in attitude between the two Military Department heads Kobelt and Chaudet have been pointed out. In particular, Kobelt, who was the Department head from 1941 to 1954, was more concerned and gathered information from Rihner on issues regarding the Swiss aircraft industry. In October 1949, the Federal Council affirmed the absolute necessity for a domestic aircraft industry. Kobelt personally attended, whenever possible, the meetings of the KMF and the KTA.<sup>19</sup> His successor Federal Councilor Paul Chaudet let himself be represented in such committees by the Director of Management of the Military Administration (DMV), Arnold Käch.<sup>20</sup> A confirmation of the uncertainty in this matter is evident in the creation of an “ad hoc commission for questions regarding the aircraft industry (KFI)” in 1958. This commission studied the “economic consequences of local development of airplanes, the manufacturing of airplanes under license, and the complete cancellation of aircraft construction.”<sup>21</sup> By the time this commission delivered its report, the Federal Council had already announced the decision against the P-16. The commission came to the conclusion:

Giving up local development means cancellation of the optimum adjustment of combat aircraft to our special needs and the loss of experiences and deeper insights into a particularly progressive field of technology, which is militarily and, in the long term also, economically unfavorable.

By the P-16 not only the self-development was hurt, but even the license production was strongly made more difficult, if not; for a longer period, impossible. Today, most of the destroyed bases for the self-development have to be rebuilt by giving orders.<sup>22</sup>

These realizations were not new. Rihner already held this position for ten years.

After the cancellation of the P-16, Chaudet came under pressure. In December 1958 the FFA inquired, that “concrete measures and temporary solutions were not met, in order to retain the specialists in the manufacturing department.”<sup>23</sup> One week later Chaudet wrote back, that he was “not able to request such credits only for the purpose of holding out their manufacturing department.”<sup>24</sup> On the copy to the Chief of the General Staff there was the handwritten note, “We have to come to a final decision.”<sup>25</sup> Additionally, the Chief of the General Staff, Lieutenant General Louis de Montmollin got the mission to examine an increased purchase of spare parts for Vampires and Venoms. To summarize, Chaudet was not conscious of the consequences of the cancellation. The cancellation of the P-16 condemned the Swiss aircraft industry.

The point of view of the Chief of Education, Lieutenant General Hans Frick, was documented in a statement from 19 June 1950. Regarding developing an aircraft by the domestic aircraft industry, Frick feared over-straining Swiss resources:

The self-development is to be stopped, because the expected results, the expenses, in particular the many remaining problems waiting for solutions, are not justified. But the capability to development modern war airplanes under license has to be maintained. This solution guarantees the most that we have in case of possible outbreak of war, war-suited airplanes.<sup>26</sup>

Indeed, the question of how to finance such a project was a large political issue.

Therefore it is very surprising that the Federal Council stopped the work on the N-20

project in January 1953. The KTA estimated the costs of one hundred P-16 at 228 million CHF and of one hundred N-20s at 340 million CHF.<sup>27</sup> Because of financial reasons, the Swiss Government could not afford to pursue two projects simultaneously.

Lieutenant General Louis de Montmollin stressed, as Chief of the General Staff, “it is undeniable that we need to have the ability to produce aircraft in Switzerland.”<sup>28</sup> He was more reserved concerning the development of airplanes. He considered the possibility of the success or failure of the N-20 project fundamental for the ability for the Swiss to develop jet aircraft in the future. The Chief of the Material Division of the General Staff, Lieutenant Colonel Fred Kuenzy, took a clear position in his note called “The Swiss Aircraft Industry in Connection with our Airplane Procurement.”<sup>29</sup> He considered that “it had been extremely difficult to interest the industry in an airplane development.”<sup>30</sup> The industry generally required large financial securities and took development orders only with the promise of later orders. After long negotiations only the FFA and the Sulzer AG took preorders. Since the Military Department owned the F+W aircraft plant in Emmen, the situation was different. As a national public utility, F+W had the largest interest in such development orders because its existence depended upon it. This is why, from the economic point of view, Kuenzy held the opinion that certain conditions on the feasibility should be attached “on one hand financial independence without national subsidization and on the other hand the possibility of export.”<sup>31</sup> Kuenzy, convinced that the possibilities for the development of a Swiss aircraft industry, purely from a technical point of view, was doubtful, especially without large national support.<sup>32</sup> Regarding the political situation in Europe, Kuenzy asked “whether in today's constellation of forces in Europe, the British would be interested, in

equipping the Swiss Army with modern war material.”<sup>33</sup> Kuenzy found Swiss development “as unprofitable” and “financially not feasible” because the 30 million CHF annual budget of the Air Force was not sufficient “to keep 300 airplanes in existence.”<sup>34</sup> Kuenzy’s judgment on the profitability of producing military aircraft by Swiss aircraft companies raised important questions. For him the development of the Swiss aircraft industry was of strategic consequence, “That neither the armed forces (LVK, General Staff, Air Force or KTA) nor the KMF are able to make the final decision.”<sup>35</sup> For this reason he proposed the creation of a War-Technical National Defense Commission. Consequently, it would be possible to discuss such important questions among the Armed Forces, industry, scientific community, financial institutions, and economy interests.

Different commissions held the opinion, in procurement politics, that the Swiss aircraft industry should be able to develop and manufacture airplanes independently of foreign countries. Nobody knew exact extent of the required financial expenditures. The belief that the aircraft industry needed sufficient continuity in placed orders to prosper did not exist in Switzerland as compared to Sweden. The back and forth course resulted from the strong political commitment of the most diverse economic, military, and regional groups of interests. The Swiss did not have a clear long-term concept in aircraft development. The Swiss did not prepare the necessary financial means, and at the occurrence of these setbacks they made too hasty resolutions. The *NZZ* tried to explain the setbacks:

At that time only a few knew that such incidents and risks must be taken with the development of such a high-performance aircraft. Incidents and risks are considered more hurtful in Switzerland than abroad, because they are connected with considerable delays of development. In consideration of the limited financial

means, only two prototypes were ordered, where today in England ten and in the United States twenty machines are ordered.<sup>36</sup>

The manufacturers had unrealistic expectations concerning the development costs in material and the time issues. In the case of the N-20 and the P-16, the manufacturers and the concerned commissions did not promote an understanding to political authorities of the extraordinary problems of airplane development. The allocation of the development potential of the three enterprises in Emmen, Altenrhein, and Stans did not support a breakthrough for the Swiss aircraft industry. Kurz pointed to an important aspect of the whole problem in a note to Chaudet, “The opinion is wrong if we think that we can buy, in times of increased danger of war from abroad, modern airplanes or licenses. What we do not prepare in peacetime, will be missing in case of an emergency.”<sup>37</sup>

---

<sup>1</sup>Hanspeter Strehler, *Der Schweizer P-16* (Emmenbruecke: Eigenverlag, 2005), 13.

<sup>2</sup>E 27 / 18879, vol. 2, letter of Rihner to Federal Councilor Kobelt with the title Air Force from 8 October 1947, Bern, Switzerland.

<sup>3</sup>E 27 / 18879, vol. 2, dossier retired Major F. Jilg, answer of the Chief of KTA R. v. Wattenwyl to the EMD from 3 September 1945, Bern, Switzerland.

<sup>4</sup>E 27 / 18879, vol. 6, special report about the Air Force, Rihner, from 25 April 1946, Bern, Switzerland.

<sup>5</sup>E 27 / 18879, vol. 2, letter Rihners to Federal Councilor Kobelt concerning airplane procurement from 8 October 1947, Bern, Switzerland.

<sup>6</sup>*Ibid.*, 4.

<sup>7</sup>E 5460 (A) / 1, vol. 127, letter concerning production of airplane to Colonel GS Kuenzy, Chief of the material division of the General Staff, 29 September 1950, Bern, Switzerland.

<sup>8</sup>E 27 (-) / vol. 4204, the question of the own aircraft industry. Paper of the Chief KTA, Colonel Brigadier von Wattenwyl, at the meeting of the National Defense Commission of 6 March 1947 in Bern, Switzerland.

<sup>9</sup>Ibid.

<sup>10</sup>E 5001 (F) / 1, vol. 56, self-development and production of war airplanes in Switzerland. Statement of Wattenwyl to the Exposé Rihners of 23. May 1950, Bern, Switzerland.

<sup>11</sup>J I. 203 (-) / vol. 5, paper of the Chief KTA on the occasion of the day of the Swiss aircraft industry in Lausanne, Comptoir Suisse from 21 September 1955.

<sup>12</sup>E 5460 (A) /6, vol. 178, letter regarding airplane questions to the department for aviation and air defense in Bern, C KTA R. v. Wattenwyl, 1 September 1955, Bern, Switzerland.

<sup>13</sup>E 9500,52 / 1984/122, vol. 14, minutes of the LVK meeting of 28 May 1958, Bern, Switzerland, 180.

<sup>14</sup>Dr. Hans L. Studer, 1907-1971. From October 1935 he was a coworker of Professor Dr. J. Ackeret (the later president of the KMF) of the Institute for aerodynamics at the ETHZ. On October 1948, he took over the position of the Chief engineer of FFA (successor of the Dornier Works AG).

<sup>15</sup>The N-20 Aiguillon (Sting) was ordered by the Military Department in May 1948. The F+W in Emmen began work on this ambitious, radically innovative new fighter. The N-20 was a tailless, swept-wing airplane reminiscent of the United States Navy's Vought F7U. A three-fifths scale demonstrator flew successfully in 1951. The Federal Council decided due to problems with its engines, to cancel the development in 1952.

<sup>16</sup>E 9500.52 / 1984/122, vol. 12, minutes of the meeting of the LVK of 4. /5. November 1957, Bern, Switzerland, 508.

<sup>17</sup>Ibid., 514.

<sup>18</sup>E 9500.52 / 1984/122, vol. 14, minutes of the meeting of the LVK of 28 May 1958, Bern, Switzerland, 180.

<sup>19</sup>Kobelt had as a former Chief of staff of a Corps and as an engineer military and civilian knowledge.

<sup>20</sup>E 5560 (C) / 1975/46, vol. 271, minutes of the 9. ad hoc meeting of the KFI of 20 March 1959 in Bern, Switzerland.

<sup>21</sup>E 5560 (C) / 1975/46, vol. 271, mandate inquiry of Chaudets to Dr. Hans Mötteli, professor at the Commercial College St. Gallen for the commission for questions of the aircraft industry of 6 March 1958, Bern, Switzerland.

<sup>22</sup>E 5560 (C) / 1975/46, vol. 271, report of the ad hoc KFI to the Chief of the Military Department of 12 September 1958.

<sup>23</sup>E 5560 (C) / 1975/46, vol. 271, letter of the FFA to the Military Department regarding holding out of our aircraft factory from 12 December 1958, Altenrhein, Switzerland.

<sup>24</sup>E 5560 (C) / 1975/46, vol. 271, Letter of Chaudet to the FFA over holding out their aircraft factory from 19 December 1958, Bern, Switzerland.

<sup>25</sup>Ibid., 1. Chaudet wrote probably this remark in German, because the Chief of the General Staff was Swiss-German.

<sup>26</sup>E 5460 (A) / 1, vol. 127, Self-development and production of war airplanes in Switzerland, letter to the Chief EMD of Frick from 19 June 1950, Bern, Switzerland.

<sup>27</sup>E 5560 (C) / 1975/46, vol. 276, information in the affair of the aircraft type N-20 by the commander of the Air Force, Major General Rihner, 23 December 1953, Bern, Switzerland.

<sup>28</sup>E 5460 (A) / 1, vol. 127, Answer of the Chief of the General Staff regarding the question of the development and the production of war airplanes in Switzerland to the EMD from 15 June 1950, Bern, Switzerland.

<sup>29</sup>E 27 / 18879, vol. 2, The Swiss aircraft industry in connection with our airplane procurement. General Staff, Chief of Material Section, Lieutenant Colonel Kuenzy, August 1947, Bern, Switzerland.

<sup>30</sup>Ibid., 3.

<sup>31</sup>Chapter 3 focuses on the military point of view, Ibid., 4.

<sup>32</sup>Ibid., 9.

<sup>33</sup>Ibid., 5.

<sup>34</sup>Ibid., 8.

<sup>35</sup>E 27 (-) / vol. 4204, The question of an own aircraft industry. Presentation of the Chief KTA, Brigadier von Wattenwyl, at the meeting of the National Defense Commission of 6 March 1947 in Bern, Switzerland.

<sup>36</sup>*Neue Zuercher Zeitung* (Zuerich), 6 October 1956.

<sup>37</sup>J I.203 (-) vol. 849, Note to Federal Councilor Chaudet to the question of the development of the aircraft construction in Switzerland of Kurz, 3 February 1956, Bern, Switzerland.

## CHAPTER 5

### PERCEPTION OF THE AIRCRAFT AND VEHICLE WORKS ALTENRHEIN (FFA)

#### Introduction

Federal Councilor Chaudet explained to his fellow councilors that “after the behavior of FFA’s management, the Military Department did not trust the loyalty of its business partner.”<sup>1</sup> Why did the Military Department lose its trust in FFA?<sup>2</sup> Could the work ethics of FFA have an influence on the cancellation? Was the composition of the Commission for Military Aircraft Procurement (KMF) another reason for the cancellation?

#### Historical Background

Historically, FFA’s roots go back to Dornier Flugzeugwerke AG (Dornier Aircraft Works Corporation), Germany. After World War One, as a former aircraft builder, Dornier was prohibited from building military aircraft and related machinery due to the terms of the Treaty of Versailles. This Treaty allowed German companies to build civilian aircraft only. In order to circumvent the impositions Dornier sought and founded an aircraft plant outside of Germany in Altenrhein, Switzerland. This is where Caroni entered the Dornier plan and Claude Dornier and Caroni became friends. Caroni was made the president of the company.

After World War Two had broken out in 1939, the Dornier Company increasingly carried out licensed productions for the Swiss Air Force at Altenrhein. The factory was renamed *Dornier Werke AG* (Dornier Works Corporation).

In 1946, Dornier began to look around for new industrial endeavors. Caroni noticed that many Swiss regions required large public transportation vehicles, such as trolley buses and tram cars. Dornier realized his firm could be used to manufacture rail cars within the Swiss Federal Railroad system. In 1948, Dornier sold his company (FFA Altenrhein) to Caroni. The transition to a purely Swiss enterprise, by changing the name to FFA, Flug- und Fahrzeugwerke AG, located at the Altenrhein facility was accomplished by the end of 1948. Caroni began to build up the firm into a commercial success. The Swiss Air Force demanded a plane capable of high transonic speeds, short takeoff and landing capability from high altitude fields, good maneuverability, and a rapid climb rate when loaded for combat. That is why the company gained fame for new inventions for the P-16 like the novel wing style pod and the Krueger landing flaps. FFA's developed wing was also of very simple and inexpensive construction, combining an innovative and efficient layout of very few ribs, multiple spars, and a thick skin.

In 1958, the Swiss Federation brought a halt to FFA's aircraft production, so the facility began producing railroad trains, buses, aerial tram cabs, military technical products, and communication equipment. In the spring of 1959 FFA founded AFA "Aktiengesellschaft für Flugzeugunternehmungen Altenrhein" to continue the development of the P-16 on its own as a way to manufacture, sell, test, repair and maintain the P-16. AFA took over from FFA the aircraft including those in process of construction. In the light of the accident investigation, the AFA slightly modified the P-16 Mk. III for production.<sup>3</sup> Later, in the 1965 to 1968 issues, *Jane's All the World's Aircraft* reported that AFA still had the P-16 available for export. The AFA changed the P-16 name, because of different engine versions, to FFA AA-7/AJ-7/AR-7. *Jane's All the*

*World's Aircraft* explained that the reason for the development of more powerful versions of the P-16 was “to follow the Mirage fighter production in Switzerland.” AFA had two prototypes of the P-16 Mk III available for modification as test and demonstration aircraft.

In 1960, Mr. William P. Lear Sr., former Chairman of Lear, Inc., of America, learned about FFA’s capabilities and formed the Swiss American Aircraft Corporation (SAAC) in Altenrhein to manufacture a high-speed twin-jet executive aircraft known as the SAAC-23. Lear Sr. expected lower production costs than in the United States and the use of the engineering leadership of Dr. Hans Studer to design the SAAC-23. Designed under the direction of Studer, he copied the same podlike wing for his own small business-class jet aircraft development. The aim was to manufacture the first twenty-five SAAC-23 in Europe, with manufacture of the rear fuselage, tail surfaces, and engine nacelles by Heinkel in Germany and to produce the forward fuselage and wings by AFA, who was also responsible for final assembly. SAAC manufactured most of the tooling for production of the SAAC-23 in Europe. In 1962, Lear Sr. transferred all production to a new plant in Wichita, Kansas, United States, and he changed the company’s name to Lear Aircraft, Inc.<sup>4</sup>

This shows that FFA had a long tradition in building aircraft. Dornier was very famous for his aircraft built for the German Luftwaffe during World War 2. Caroni could build on this foundation. FFA was at the time a financially solid entity which had all means available to develop the P-16. FFA’s continuation to develop the P-16 on its own confirms the financial prosperity of FFA.

## Cooperation between the Swiss Government and FFA

A company like FFA had to be a reliable business partner. Therefore confidence and trust were of vital importance in a project like the P-16. Relations were important between FFA and the Swiss Government, mainly the EMD and its different commissions. In the P-16 deal between the Swiss Government and the FFA, the sources reveal that the War Technical Department (KTA) was not entirely content with the cooperation with FFA. In 1954 KTA judged that “the longer the development lasts the more it costs, and FFA gets more profit.”<sup>5</sup> The KMF requested from the KTA to try “to agree on more favorable conditions for the continuation on the P-16 project and to reach this goal by negotiations or by cancellation of the contract.”<sup>6</sup> The KTA could manage to change some of the financial regulations without cancelling the contract. Two years later the Chief of KTA, Brigadier General Rene von Wattenwyl, was “moved with regret” because he believed that:

Unfortunately it is the case, that FFA and its boss, Dr. Caroni, have a way of doing business which cannot be accepted. The company does not take serious their time-limit obligations. Since 1954, we have been waiting for a delivery of a plant to the development contract, which was signed in fall 1952. All interventions were without success. Caroni threatened to lose interest in the work of the P-16, if he does not get the order of the unrestricted assembly of all airplanes. This demand stands in the clear contrast to the signed contract.<sup>7</sup>

Von Wattenwyl wrote “to request to stop the work on the P-16 until the company decides to a correct behavior against the order placing authority.”<sup>8</sup> The FFA felt very safe in its situation. KTA questioned the trustworthiness of the company years before the cancellation. The EMD noticed that the FFA did not hold to the agreed dates. In particular, the sources highlight that Caroni was an unpleasant business partner, which

the different business parties involved underlined.<sup>9</sup> This fact supports Chaudet's explanation, that the EMD lost its confidence in FFA because of Caroni's management.

On the occasion of the ninth meeting of the ad hoc Commission for Questions of the Aircraft Industry, the former president of the KMF, Professor Dr. Jakob Ackeret, took a position about the experiences of KMF. He said about the cooperation with FFA:

The relationship to Dr. Caroni was not always easy. He is lawyer and of Swiss Italian provenance, which seems to be an unfortunate combination. The confidence in FFA was questionable. The KTA's attempt was to save the P-16 project by common interests of the different airplane plants Pilatus Stans – Sulzer – FFA and F+W Emmen but unfortunately without success. The FFA exceeded dates. However, most of the time the reasons for the delays were additional troop desires. The production dates were honest and feasible.<sup>10</sup>

These statements of the KTA members confirm that working with Caroni was unpleasant. Also Major General Etienne Primault, the Commander of the Air Force, had reservations regarding Caroni. At the tenth meeting of the KFI it was his opinion that "Caroni as a director of the FFA was a principal mistake of the P-16."<sup>11</sup> These different points of view show why the Department Head of the Military Department, Federal Councilor Chaudet, explained that "after the behavior of the management of the FFA in Altenrhein the Military Department did not trust the loyalty of its business partner."<sup>12</sup> Generally, Chaudet's statements, the sources of KTA and KMF blamed FFA for the delays. Ackeret's opinion was different "however, most of the time the reasons for the delays were modifications requested by the customer" and these modifications created delays in the P-16's progress. This was the first time that somebody confessed that it was not only FFA's fault. Ackeret worked on a daily basis with FFA. Therefore Chaudet did not entirely speak the truth at his cancellation speech of 5 June 1958 by blaming only FFA.

### The Commission for Military Aircraft Procurement (KMF)

Another important commission was the Commission for Military Aircraft Procurement (KMF). The KMF was at the disposal to the Chief EMD as advisor for important decisions on airplane procurement.<sup>13</sup> Because the KMF had many members with diverse backgrounds, cooperation with the EMD and the General Staff became more and more difficult. As a result, the military players reduced the KMF in its activity. Ackeret confirmed that the KMF tried to prevent a discussion of the concept. The KMF agreed with the opinion of the LVK that the Air Force would have to support the Infantry. After the cancellation of the KMF by the Federal Council, Ackeret withdrew from his office as president. Professor W. Daenzer, Director of the Business Administration Institute of the ETHZ, at the occasion of his investigation report about the P-16 and Mirage deal:

Unfortunately, under the presidency of Prof. Dr. H.C. J. Ackeret, the KMF was cancelled during this important period (during the military evaluation period). The KMF was the only commission, which consisted of first class authorities outside of the Military Department.<sup>14</sup>

After the KMF's cancellation the Military Department founded the Arbeitsgruppe für Flugzeugbeschaffung (AGF), Working Group for Aircraft Procurement. Members of industry and science did not have access to this committee. The committee consisted of three members of the Military Department, who reported directly to the Chief of the General Staff. This allowed the Chief of the General Staff to keep the new created working group on a shorter leash. Since the AGF was composed of EMD members, civilian specialists could not bring in their opinions. The Swiss aircraft industry, especially, could not contribute on future military aircraft. The change from KMF to

AGF led to the decoupling of military and civilian agreement regarding aircraft procurement. More so, it led to an EMD centered decision-making process.

#### Cooperation between William Lear Sr. and FFA

In 1960, Mr. William Lear Sr. established the Swiss American Aircraft Company (SAAC) in Switzerland and consulted with Dr. Hans Studer, chief designer at FFA, the Swiss company building the P-16 fighter. Problems with suppliers and production tooling motivated Lear Sr. to move the company to the United States in 1962. Most of the SAAC contractors were employees of FFA and worked on the SAAC-23 project. This move to Wichita led to the question of how the work ethics of the employees of FFA were at the time. Lear Sr. had first set up shop at Altenrhein, beside FFA, in 1960. FFA's aircraft plant was available, and labor and talent could be had for less than in the United States. Lear Sr. contracted various companies to produce the Learjet. FFA would do the tooling in Altenrhein as well as make the wings and wing tanks; Heinkel of Germany, the fuselage and tail; Thommen of Switzerland, the hydraulic items and undercarriage; and Saurer of Switzerland, the auxiliary power turbines. Alcoa would supply the brakes and Lear, Inc., the navigation instruments. FFA would assemble the prototype in Altenrhein and build the first few airplanes.<sup>15</sup> Mutual antagonism quickly flared as the hard-driving Lear came up against the leisurely ways of the Swiss engineers, whose notion of energetic performance at the drafting board was to make a line, then sit and read while the ink dried.<sup>16</sup> Also, in Switzerland seemed to be more holidays than workdays.<sup>17</sup> With Americans, British, French, and Swiss working side by side, with subcontracting of factories in Germany and Switzerland, with cultural differences and diverse work styles, with language problems and unfamiliar customs, SAAC was up to its blueprints in

confusion.<sup>18</sup> Donald J. Grommesh, Lear's chief engineer, spent three months in Switzerland, explaining that he was responsible in Switzerland to find out what they had done and to gather all the reports of the P-16 wings in order to build the Learjet. The idea was to use the wing construction from FFA, the wing data and the wing aerodynamics. For Grommesh's perspective the FFA did a great job developing the P-16. He rated Dr. Hans Studer as a very intelligent person. Grommesh confirmed to the author that the engineers were not very efficient on the drafting board, but they did beautiful work.<sup>19</sup> In addition he mentioned that every time he went into the drawing room that the engineers would cover what they were drawing.<sup>20</sup> By doing so, it was very difficult for him to gather the necessary data in order to work on the jet's wings. After a month he knew the workers were not cooperative and that the Learjet could never be built in Switzerland.

Moreover, Lear Sr. and Caroni had never signed a contract because neither had trusted the other. Grommesh argued Caroni and Lear Sr. disagreed with each other, and Grommesh underlined that nothing was positive in the way that SAAC and FFA were working together.<sup>21</sup> When Lear Sr. moved the company to Wichita he screamed, "Hire ten of the best attorneys in Europe and sue the son of a bitch for every hour, every week, and every month of delay."<sup>22</sup> A deal was finally struck. Lear Sr. gave Caroni 50,000 USD as a final settlement together with an agreement to give honorable mention to FFA and the P-16 as the model from which the Learjet at least partially evolved.<sup>23</sup> Lear Jr. doubts that the clever Caroni got hit to badly in his pocketbook, because the Swiss Government had largely financed the P-16 development. It was Caroni's pride that was damaged when he lost the Learjet project.

The experiences of Lear Sr. show that the assessment of the Swiss Government was not wrong. At SAAC, the Americans experienced the same delays and discussions with Caroni.

### Summary

In summary the cooperation between the FFA and EMD was due to Caroni not being easy. In 1954, EMD threatened to cancel the contract. This proves that the loss of confidence and the cancellation was not so surprising for the FFA. Further it was not only FFA's fault for the delivery delays. EMD requested many changes during the project which delayed the development as well.

Regarding the KMF, the composition of three civilian members contributing to the aircraft procurement was very positive. In 1947, in order to treat complex armament procurement questions, Kuenzy demanded to intensify the integration of industry, science, finance, and economics. In 1958, the General Staff dissolved the KMF and founded the AGF. This action laid the cornerstone for the Mirage debacle.

As discussed in chapter 2, the N-20, which the aircraft plant F+W developed, got cancelled. F+W was located in the Canton Lucerne, which is in the central part of Switzerland. Because the N-20 got cancelled the central Cantons fought the P-16 project, because FFA resided in the Canton of St. Gallen in the eastern part of Switzerland. This fight took place because of prestige and occupational reasons. The realization of a project of this order would have created many new jobs. The Cantons would have profited by collecting more taxes. This is why the central Swiss politicians fought the P-16 in the parliament. Caroni held, until April 1958, to the opinion that the P-16 had to be produced in Altenrhein only. One month later when Caroni realized that the Swiss Government

might cancel the P-16, he was ready to cooperate with the aircraft plant F+W in Emmen. The fact that it did not cooperate earlier with both enterprises facilitated the cancellation of the P-16.

If Caroni had agreed on this issue, Chaudet had granted this goodwill. This is why Chaudet explained to his fellow Councilors that “after the behavior of FFA’s management the Military Department did not trust in the loyalty of its business partner.”<sup>24</sup> Moreover, if the FFA changed its work ethics it would have been capable of completing the P-16 in a shorter time. This action would have shown some will to cooperate. Since the Swiss Government did not see any goodwill from FFA and had to accept more than one delay, it is understandable that patience was lost. The Federal Council cancelled the P-16 not “because of tactical reasons only.”<sup>25</sup>

---

<sup>1</sup>J I. 3 (-) vol. 77, recording by Federal Councilor Feldmann from 2 June 1958, 17.30.

<sup>2</sup>E 9500,52 / 1984/122, vol. 14, minutes of the meeting of the LVK from 1 July 1958, Bern, 217.

<sup>3</sup>*Jane’s All the World’s Aircraft*, (1959-1960), 236.

<sup>4</sup>*Jane’s All the World’s Aircraft*, (1962-1963), 113.

<sup>5</sup>E 5560 (C) / 1975/46, vol. 274, Proposition of the chief KTA to EMD to change the contract with FFA from 26 November 1954, Bern, Switzerland.

<sup>6</sup>*Ibid.*, 1.

<sup>7</sup>E 5460 (A) / 6, vol. 169, The airplane P-16. Letter of the chief KTA to EMD from 23 November 1956, Bern, Switzerland.

<sup>8</sup>*Ibid.*, 2.

<sup>9</sup>E 5560 (C) / 1975/46, vol. 271, minutes of the 9th meeting of the KFI from 6 February 1959. Bern, Switzerland.

<sup>10</sup>Ibid.

<sup>11</sup>Ibid.

<sup>12</sup>J I. 3 (-) vol. 77, recording by Federal Councilor Feldmann from 2 June 1958, 17.30.

<sup>13</sup>The commission had as member from the military side the Commander of the Air Force and Air Defense, the Director of Military Airfields, the Chief KTA, the Director of F+W and a representative of the civil aviation, the private aircraft industry and of the science.

<sup>14</sup>EMDDOK no. 187/1086, Commission of three in order to investigate the Mirage procurement. Report of 10 February 1965, Zurich and Olten.

<sup>15</sup>Richard Richard, *Stormy Genius* (Boston: Houghton Mifflin Company, 1985), 221.

<sup>16</sup>Victor Boesen, *They Said It Couldn't Be Done* (New York: Doubleday and Company, Inc., 1971), 44.

<sup>17</sup>Ibid., 44.

<sup>18</sup>Richard Rashke, *Stormy Genius* (Boston: Houghton Mifflin Company, 1985), 228.

<sup>19</sup>Donald J. Grommesh of Wichita, interview by author, 26 June 2006, Wichita, tape recording, home of Grommesh, Wichita.

<sup>20</sup>Ibid.

<sup>21</sup>Ibid.

<sup>22</sup>William P. Lear Jr., *Fly Fast...Sin Boldly. Flying, Spying & Surviving* (Lenexa, KS: Addax Publishing Group, Inc., 2000), 235.

<sup>23</sup>Ibid., 385.

<sup>24</sup>J I. 3 (-) vol. 77, recording by Federal Councilor Feldmann from 2 June 1958, 17.30.

<sup>25</sup>E 9500,52 / 1984/122, vol. 14, minutes of the meeting of the LVK from 1 July 1958, Bern, Switzerland, 217.

## CHAPTER 6

### UNITED STATES INTEREST IN THE P-16/AJ-7

Lear's oldest son, Bill Jr., who had been running Lear, Inc., sales and service operations in Switzerland became a fan of the P-16.<sup>1</sup> Bill Jr. knew that the P-16 was a sturdy aircraft and had a wing design very close to what his father wanted for his own business jet. Caroni asked Bill Jr., whom he respected as a discerning pilot, to test-fly the P-16.<sup>2</sup> "Somehow they [Caroni and Studer] struck upon the idea of having an American pilot fly and evaluate their little beauty."<sup>3</sup> So, Lear decided to fly the P-16 in March 1960. Lear reported with excitement about his P-16 experience, and he was very surprised about the capabilities of the P-16:

Once I had throttled up to takeoff power I released the brakes. It was like being shot out of a cannon. I rapidly accelerated to 190 kilometers per hour – about 120 mph. What a delight to fly this superb aircraft. Well I'd blown the pro's at FFA out of the tub and I was feeling pretty damned proud of myself being able to fly this marvelous piece of Swiss craftsmanship by the numbers the first time at bat.<sup>4</sup>

This first report must have been encouraging for the disappointed engineers and employees of FFA, because these test flights proved that there was nothing wrong with the P-16. Again Lear:

On subsequent flights I had the time of my life because the P-16 was such a joy to fly. I marveled at how Dr. Studer, a non-pilot, could have possibly contrived the astonishing control harmony this aircraft possessed. Having flown a number of jet fighters, while in the Air Force on active duty, in the Air National Guard, and USAF Reserve, I can unequivocally state that the P-16 was the finest, strongest, safest and best performing jet fighter, in its class, that I have ever been privileged to pilot.<sup>5</sup>

On following flights Lear explored the high-speed performance of the P-16. On one of five separate occasions he had the airplane at supersonic speed (Mach 1.05) in a

dive from 40,000 feet. The aircraft was equipped with a recording system to measure all flight parameters and they later determined that Lear had pulled 8.5 Gs at 750 miles per hour indicated airspeed, far in excess of the aircraft design limits. Lear proved the airplane to be, without doubt, near of indestructible. After Lear had flown five successful test flights he came to the conclusion that there was nothing wrong with the airplane and summarized that the Swiss Government cancelled the P-16 “due to the mentally-challenged press and the bureaucratic stupidity of the Swiss Parliament.”<sup>6</sup>

Concerning the two accidents with the P-16, “Caroni explained that these happened because of pilot error.”<sup>7</sup> Additionally Lear learned that FFA had been using Swiss military pilots in their flight test program and that none of them had more than 1,000 hours total flying time are only limited jet fighter experience. He realized that the two accidents demanded further exploration. Lear became convinced that pilot experience and not the P-16 was the culprit.<sup>8</sup> This assessment offended the two test pilots Hans Haefliger and Jean Brunner in such a manner that Lear decided to apologize for the statements he made.<sup>9</sup> He wrote a letter of apology to these pilots and in addition to this formulated an apology in April 2006 on his self-produced digital video disc (DVD) about the P-16.<sup>10</sup>

In July 2006 the author interviewed Lear in Daytona Beach.<sup>11</sup> The author wanted to know if Lear had any information about the United States Air Force’s interest in the P-16. He did not. Regardless, Lear, as a contractor of the CIA in Switzerland, did not inform the United States Air Force or other American companies about the existence of the P-16.<sup>12</sup> Nevertheless some of the Swiss know-how and some features of the P-16 found its way to the United States. Lear wrote in his autobiography:

Many good things unfolded from the FFA experience. It is a common misconception, however, that the Learjet was a derivative of the P-16. This is patently false. We did have a very high regard for Dr. Studer's innovative designs, especially in high-strength wing construction. The P-16 utilized a multi-spar (8) fail-safe box-type wing design that we adapted to the Learjet wing. The P-16 wing airfoil was superb, and we did use a modified version of this as well. The fuselage and tail, however, were totally different, the P-16 having a cruciform tail while the Learjet had a "T" tail. That's about the extent of similarity. The Learjet was a totally new design using a few of the best features of the P-16. I was thrilled that I had been able to fly and evaluate the P-16, and proud that I was able to draw my father's attention to this outstanding Swiss aircraft, my contribution to what was to become the world's most famous business jet.<sup>13</sup>

After his father had built all these components into the Learjet 23, the first prototype made its first flight on 7 October 1963, from Wichita's Mid-Continent Airport, nine months after work had begun on the project.

During the author's further research into the United States' interest on the P-16, he found the following article in the journal *Politik und Wirtschaftspolitik* (Politics and Economic Policy) of 4 February 1966:

In the opinion of the Americans, the Swiss jet P-16 met all United States requirements. An American Air Force general expressed in the Pentagon that in the United States a sample series of approximately 30 jets is already produced, later thousands of these machines will follow. The American P-16 carries the Name AJ-7 and will be particularly used by the Navy for the employment from aircraft carriers. According to NATO the AJ-7 is presently the best existing ground combat aircraft.<sup>14</sup>

This statement leads to questions if a United States company ever produced the AJ-7. In January 1965, General Electric on paper built the engine of the F-104G Super Starfighter into the P-16 fuselage. Simultaneously, the FFA changed the name of the plane to the AJ-7. FFA intended the aircraft for direct air support for ground forces. The price of the plane was calculated at 4.5 million Swiss Francs.<sup>15</sup> General Electric calculated very positive capabilities of the plane and the protocols reported:

- high armament capacity
- high stability in all flight conditions throughout the speed and altitude rang
- sophisticated aerodynamic construction
- easy maintenance
- high reliability
- excellent flight stability in all different situations
- excellent gun platform: mean hit 60% average and 80%+ maximum<sup>16</sup>

In March 1965, a meeting was held in the Pentagon about the AJ-7 which existed at the time on paper. The AJ-7 was, as already mentioned, equipped with a General Electric engine, and was an evolution of the P-16 Mk III.<sup>17</sup> FFA's P-16 Mk III was virtually unchanged, with modifications limited mainly to the installation of a new power plant and revised equipment and armament. The FFA studied three alternative versions, two with afterburning engine and one without.<sup>18</sup> Caroni and Dr. Paul Spalinger, who was the Chief engineer of FFA, met United States Air Force Lieutenant General Thomas P. Gerrity, who was the Deputy Chief of Staff for Systems and Logistics at the headquarters of the United States Air Force, in Washington, D.C.<sup>19</sup> Caroni said after the meeting, "The Americans are very interested in airplanes of this generation. We could figure out, that the Americans have similar ideas like the Europeans. But we are still in the beginning of our negotiations. No decision has been taken about a joint development of a prototype. We do not know yet what the outcome will be."<sup>20</sup> Unfortunately, the official histories of Systems and Logistics for 1965 make no mention of the meeting, of the aircraft, or any of the other named individuals. Also, Gerrity did not retire his personnel papers to the archives of the Air Force Historical Research Agency.<sup>21</sup> Apparently, the United States Air Force found the AJ-7 interesting, but did not want to make a decision. In order to learn more about this meeting the author called Dr. Paul Spalinger at his home in

Switzerland.<sup>22</sup> Spalinger mentioned that the meeting lasted half of a day. In order to present the AJ-7, Caroni and Spalinger brought technical information and plans from Switzerland to the United States. Spalinger explained that General Electric never physically built an engine into an AJ-7 fuselage. Subsequently, the information of the journal *Politik und Wirtschaftspolitik* was false. The AJ-7 never flew and existed only on paper. Spalinger explained that the United States authorities expected that FFA would have to be able to deliver the airplanes almost “right away” which was not possible.<sup>23</sup>

Later in Switzerland, in 1972, after the Swiss had bought fifty-seven Mirage III s interceptors, the EMD decided that the next aircraft generation would be for close air support. Different press articles suggested the EMD took the P-16 into consideration.<sup>24</sup> FFA continued developing the P-16 at its own expense. After the different versions AA-7 and AJ-7, FFA called the last one AR-7. FFA equipped the AR-7, on paper, with a Rolls-Royce engine type RB 168 25.<sup>25</sup> Compared with the other types the AR-7 advantages were the ability to fly longer distances and a better tactical range. The *Tagwacht* reported on 25 June 1969 that it would be possible to have the AR-7 ready for the Swiss Air Force within two years.<sup>26</sup> After a long evaluation, the EMD requested the Federal Council to buy forty United States Navy A-7G Corsairs.<sup>27</sup> On the 9th of September 1972, the Federal Council decided not to buy the jet and ordered the EMD again to examine the doctrine of aerial warfare. As a result of this decision the commander of the Air Force Lieutenant General Eugen Studer retired out of disappointment.<sup>28</sup> Since the FFA stopped the development of the P-16 by 1969 the Parliament looked for another reasonable solution. In order to fill the gap, the Parliament procured in 1973 a second series of thirty Hawker Hunter airplanes.

This decision shows that if the P-16, now called AR-7, was still available in 1973 the EMD would probably have taken that jet into consideration. Since the FFA stopped work on the P-16 in 1969, a reconsideration was not at all possible.

In summary, the P-16 got limited attention by the Americans. Lear Jr. was impressed by the P-16's performance. This positive impression led him to introduce the airplane to his father Lear Sr. Lear Sr. used a few ideas to develop the Learjet. This shows that Federal Councilor Chaudet did not know enough to justify the quality of the P-16. The cancellation of the P-16 was due to an incompetent parliament, ignorant politicians, and selfish lobbyists and not because of design faults or pilot errors. Since Caroni was convinced that the P-16 was an excellent jet with great capabilities for the support of ground troops, he and his engineers tried to sell the P-16 in different countries. This is why Caroni met Lieutenant General Gerrity in Washington, D.C. in 1965. Six years later, the Swiss on their side got interested in an airplane they had cancelled fourteen years earlier.

---

<sup>1</sup>William P. Lear was the president of Lear SA from 1956-1962. The European Headquarter of that company was located in Geneva, Switzerland. Lear SA was selling automation pilots, integrated flight systems, and other aircraft related products.

<sup>2</sup>Donald J. Porter, *Learjets: The World's Executive Aircraft* (Blue Ridge Summit, PA: TAB Books, 1990), 11.

<sup>3</sup>William P. Lear Jr., *Fly Fast...Sin Boldly. Flying, Spying & Surviving* (Lenexa, KS: Addax Publishing Group, Inc., 2000), 377.

<sup>4</sup>Ibid., 378.

<sup>5</sup>Ibid., 379.

<sup>6</sup>Ibid., 374.

<sup>7</sup>William P. Lear, Jr. of Port Orange, interviewed by author, 12 July 2006, Port Orange, tape recording, 1780 Doolittle Court, Port Orange FL.

<sup>8</sup>Ibid., 375.

<sup>9</sup>William P. Lear Jr. of Port Orange, interviewed by author, 12 July 2006, Port Orange, tape recording, 1780 Doolittle Court, Port Orange FL.

<sup>10</sup>William P. Lear Jr., *Swiss P-16 March 1960 Altenrhein, Switzerland*, prod. And dir. William P. Lear, Jr., 10 min., Self-published, 2006, DVD.

<sup>11</sup>William P. Lear Jr. of Port Orange, interviewed by author, 12 July 2006, Port Orange, tape recording, 1780 Doolittle Court, Port Orange FL.

<sup>12</sup>Ibid.

<sup>13</sup>William P. Lear Jr., *Fly Fast...Sin Boldly. Flying, Spying & Surviving* (Lenexa, KS: Addax Publishing Group, Inc., 2000), 379.

<sup>14</sup>J I.203 (-) vol. 5, P-16 closes the cap. Spk, 4 February 1966, Bern, Switzerland.

<sup>15</sup>Hanspeter Strehler, *Der Schweizer P-16* (Emmenbruecke: Eigenverlag, 2005), 158.

<sup>16</sup>Ibid., 159.

<sup>17</sup>*Jane's All the World's Aircraft*, 1965, 125.

<sup>18</sup>Ibid., 125.

<sup>19</sup>Lieutenant General Thomas Patrick Gerrity was born at Harlowton, Montana, December 8, 1913. He was a student at the Armor Institute, Chicago, Illinois, and in the Advanced Management Program at Harvard. He was commissioned Second Lieutenant, United States Army Air Corps and advanced through the grades to Lieutenant General, United States Air Force, 1962. He served as a bomber pilot in the Southwest Pacific during World War II, 1941-42, Chief, Aircraft Bureau, Air Material Command, 1943-1950, Wing Commander, Strategic Air Command, 1950-53, Director of Procurement and Production, Headquarters, U.S. Air Force, Washington, 1953-55, Assistant, Production Programming, DSC Material, 1955-57, Commander, Oklahoma City Air Material Area, 1957-60, Commander, Ballistic Systems Division, Inglewood, California, 1960-62, Deputy Chief of Staff, Systems and Logistics, Washington, D.C., 1962. He died on February 24, 1968 and was buried in Section 30 of Arlington National Cemetery.

<sup>20</sup>Hanspeter Strehler, *Der Schweizer P-16* (Emmenbruecke: Eigenverlag, 2005), 156.

<sup>21</sup>Answer of the Air Force Studies Office (AFHSO) research of 28 July 2006.

<sup>22</sup>Paul Spalinger of Heiden Switzerland, interviewed by author, 29 June 2006, Fort Leavenworth, phone call.

<sup>23</sup>The first A-7A with an 11,350 lb. thrust Pratt and Whitney engine flew in September 1965. The A-7s operational career began and ended under fire, the first squadron equipped with the aircraft logging missions over Vietnam in 1967 and the final two A-7-equipped units ending the aircraft's flying days in the sky over Iraq during Operation Desert Storm in 1991. In between they logged combat missions over Libya, Lebanon, Grenada, and the Persian Gulf.

<sup>24</sup>*Tagwacht* (Bern), 25 June 1969.

<sup>25</sup>*Ibid.*

<sup>26</sup>*Ibid.*

<sup>27</sup>Walter Duerig, *Veranstaltung 50 Jahre P-16 vom 17. November 2005* (Duebendorf: Flieger und Flab Museum, 2005), 5.

<sup>28</sup>LTG Eugen Studer was the commander of the Air Force from 1 January 1965 and retired on 30 June 1973. He was the successor of MG Etienne Primault.

## CHAPTER 7

### CONCLUSION

On 2 June 1958, the Federal Council decided, at the request of the EMD, not to order one hundred P-16s.<sup>1</sup> Doctrinal and political reasons led to this decision. This leads to the conclusion that political and doctrinal reasons provoked the cancellation of the P-16.

Procurement of a new aircraft is, especially in a small country like Switzerland, a complex issue. Since the Swiss authorities considered buying aircraft from abroad, they opened the field for not supporting the P-16. Because the Swiss Air Force did not have enough airplanes available, it quickly purchased one hundred Hawker Hunter Mk 6 in 1958.<sup>2</sup> The Swiss parliament purchased the Hunter knowing that this airplane had problems with stability at high speeds and was an unstable shooting platform.<sup>3</sup>

Federal Councilor Chaudet, different commissions, and the commander of the Air Force mentioned several times that cooperation with the FFA was difficult. After interviewing Grommesh, this reason for cancellation becomes a more important factor. Grommesh, who worked with employees of FFA as contractors of SAAC, mentioned that the engineers did very beautiful work but slow. The reason why the engineers were so slow was that they made their drawings in ink. Drawings in ink took much more time than with pencil. So every time they drew something in ink they had to wait until it was dry. Additionally, the work ethics of the FFA contractors was not the way the Americans were used to working. The FFA employees showed up around eight in the morning, worked till noon, took a one and one half hour lunch break, and around four went home.

This way of working shows that the employees of FFA did not feel any pressure to finish work on time.

After the second crash of the P-16, the Federal Council was convinced that the P-16 had problems that needed corrected. The Federal Council feared that the necessary improvements of the P-16 would take about two years in order to buy this airplane. Not only had the government complained about the delays of the FFA, but also the new SAAC leadership. After the Swiss Government cancelled the P-16, the FFA contractors continued to work the same way with SAAC. If the FFA had worked in a more efficient way, like the Americans, the issue of delays probably would never have been an issue. Work ethic was the third reason which disrupted the confidence of the government to the FFA and Caroni. Caroni himself felt the P-16 deal was very safe. He was convinced that the P-16 was a good product.<sup>4</sup> Moreover, he thought that he held a monopoly in producing jet fighters, and he thought that the Swiss Government would buy the P-16 at any circumstances.

Different commissions held the opinion that the Swiss aircraft industry should be able to develop and manufacture airplanes independently from foreign countries. Since these commissions and the Swiss aircraft manufacturers had no experience in producing a jet aircraft, nobody knew the extent of the financial expenditures. The manufacturers created unrealistic expectations regarding the material and developing costs. In order to prosper, the manufacturers needed enough orders to insure continuity. Compared to Sweden this need in Switzerland for an aircraft industry did not exist. The Swedish government provided some funding to the aircraft industry. This fact enhanced the ability of the Swedish aircraft industry to survive in rough times. For the Swiss aircraft industry

the distribution of the development potential of three aircraft plants was not suitable for creating a breakthrough.<sup>5</sup> This resulted from the strong political commitment of the most diverse economical, military, and regional group interests. It is not surprising that after international experience the inevitable breakdowns and setbacks in developing a combat aircraft were overestimated. These breakdowns led to hasty resolutions when they occurred. Because of inexperience, the political authorities and the public did not understand the extraordinary problems of airplane development. Hans Rudolf Kurz, a Swiss reporter, pointed out an important aspect to the whole problem in a note to Chaudet in which he said “it is wrong to think that we can buy modern airplanes from abroad or licenses in times of a threat. What we do not prepare in peacetime will be missing in war.”<sup>6</sup> The decision of the Federal Council taken on 2 June 1958 to stop the work on the P-16 led to the destruction of the Swiss aircraft industry. The Swiss authorities destroyed the ability to develop a domestic combat aircraft.

At the statement to the parliament on 5 June 1958 Federal Councilor Chaudet gave only technical reasons for the cancellation.<sup>7</sup> After Mr. Lear Jr. flew the P-16 in 1960, it was known that these reasons were questionable. The P-16 as a product was a very good airplane, and Mr. Lear Jr. as an experienced pilot has stated so.<sup>8</sup> There was fundamentally nothing wrong with this airplane. Its performance was above average and absolutely competitive with similar aircraft. This is why Caroni tried to sell the P-16 at the Pentagon. General Electric’s technical evaluation of the P-16/AJ-7 was very positive.<sup>9</sup> Additionally, the unusual fighter had not escaped the attention of Lear Sr. in the United States. He was particularly impressed by the design's unswept, thin, high aspect ratio wing designed both for high subsonic cruise speeds and low landing speeds.

The wing was also of very simple and inexpensive construction, combining an innovative and efficient layout of very few ribs, multiple spars, and a thick skin. This construction convinced Lear Sr. to use it for his business jet the Learjet. This letter written by Donald J. Grommesh to Bill Lear Jr. in February 2005 summarizes the American perception of the P-16:

Dear Bill,

After reviewing the video of you flying the P-16 Swiss fighter aircraft in March 1960, which brought back so many memories, I thought it was high time to send you a thank you note for the contributions you made toward the success of the Learjet.

As Chief Engineer during the development of the first Learjet, Model 23, I always knew that if it hadn't been for your flight-testing the P-16 aircraft, the Learjet might have never had a change to be completed and become one of the finest business jets ever developed and certified.

During my employment with your dad in Switzerland, I am probably the only one who recognized at that time, due to our limited resources, that without the engineering test data from the P-16 program we would have never been able to afford the high speed wind tunnel testing so necessary for the development of the Learjet.

The intent of this letter, is to acknowledge and thank you for having flown the P-16 and recommending to your dad that this was a good aircraft and that these people did a magnificent engineering job on that aircraft. As a result of this, as you know, a relationship was developed between FFA and your dad, which allowed us to use their engineering and especially the high speed wind tunnel data that allowed us to come up with the Learjet wing as we know it today.

And so, although I am retired, I shall never forget the courage that you displayed in flying an aircraft that the Swiss government was not willing to accept and your recognition that it was something that would eventually help us develop the Learjet.

This may have taken a long time in coming, but after many years now in retirement, it is time to thank those who contributed so much to my wonderful career with Lear and the development of such a great line of aircraft that will always be remembered as one of the best.

With great admiration and appreciation, I am sincerely grateful.

Donald J. Grommesh<sup>10</sup>

In the United States the P-16 is virtually unknown, even among aviation experts.

The overall perception of the P-16 is very positive in the United States as compared to

Switzerland. The P-16 got its fame from the Learjet 23. Therefore, it is not surprising that technical reasons for the cancellation given by the Swiss Government are in direct contradiction to the perception of the P-16 in the United States.

---

<sup>1</sup>E 5802 (-) / 1983/57, vol. 31, Explanations of the Chief EMD to the P-16 question from 5 June 1958, to the parliament, Bern, Switzerland.

<sup>2</sup>“Swiss Vote for P.16 as 2nd-Stage Fighter,” *Aviation Week*, 24 March 1958, 65.

<sup>3</sup>William P. Lear Jr., *Fly Fast...Sin Boldly. Flying, Spying & Surviving* (Lenexa, KS: Addax Publishing Group, Inc., 2000), 373.

<sup>4</sup>Hanspeter Strehler, *Der Schweizer P-16* (Emmenbruecke: Eigenverlag, 2005), 120.

<sup>5</sup>Switzerland had at that time three aircraft manufacturers. One was the Eidgenoessische Flugzeugwerk (F+W) in Emmen, the FFA in Altenrhein and Pilatus in Stans, Switzerland.

<sup>6</sup>J I.203 (-) vol. 849, Note to Federal Councilor Chaudet to the question of the development of the aircraft construction in Switzerland of Kurz, 3 February 1956, Bern, Switzerland.

<sup>7</sup>E 5802 (-) / 1983/57, vol. 31, Explanations of the Chief EMD to the P-16 question from 5 June 1958, to the parliament, Bern, Switzerland.

<sup>8</sup>William P. Lear Jr., *Fly Fast...Sin Boldly. Flying, Spying & Surviving* (Lenexa, KS: Addax Publishing Group, Inc., 2000), 378.

<sup>9</sup>Hanspeter Strehler, *Der Schweizer P-16* (Emmenbruecke: Eigenverlag, 2005), 159.

<sup>10</sup>Donald J. Grommesh, Wichita, to William P. Lear Jr., Port Orange, 16 February 2005, transcript by computer of Donald J. Grommesh, Special Collections, William P. Lear Jr., Port Orange, Florida.

## BIBLIOGRAPHY

### Books

- Boesen, Victor. *They Said It Couldn't Be Done*. New York: Doubleday and Company, Inc., 1971.
- Boyne, Walter J. *The Leading Edge*. New York: Stewart, Tabori, and Chang, 1986.
- Bridel, Georges. *Schweizerische Strahlflugzeuge und Strahltriebwerke*. Luzern: Verlag Verkehrshaus der Schweiz, 1975.
- Christy, Joe. *The Learjet*. Blue Ridge Summit, PA: Tab Books, 1979.
- Ernst, Alfred. *Die Konzeption der schweizerischen Landesverteidigung 1815 bis 1966*. Frauenfeld und Stuttgart: Huber Verlag, 1971.
- Jane's All the World's Aircraft, 1952-1953*. New York: Franklin Watts, 1953.
- Jane's All the World's Aircraft, 1956-1957*. New York: Franklin Watts, 1957.
- Jane's All the World's Aircraft, 1959-1960*. New York: Franklin Watts, 1959.
- Jane's All the World's Aircraft, 1962-1963*. New York: Franklin Watts, 1963.
- Jane's All the World's Aircraft, 1965*. New York: Franklin Watts, 1965.
- Learjet Corporation. *Annual Report*. Wichita, KS: Learjet Corporation, 1960-1969.
- Lear, William P. *The Reminiscences of William Lear*. New York: Columbia University oral history collection, 1960.
- Lear, William P., Jr. *Fly Fast... Sin Boldly*. Lenexa, KS: Addax Publishing Group, Inc., 2000.
- Meier, Felix. *Chronik der Entwicklungsgeschichte des P-16*. Bern: DOK D KFLF, 1995.
- Pattillo, Donald M. *A History in the Making: 80 Turbulent Years in the American General Aviation Industry*. New York: McGraw-Hill, 1998.
- Porter, Donald J. *Learjets: The World's Executive Aircraft*. Blue Ridge Summit, PA: TAB Books, 1990.
- Rashke, Richard. *Stormy Genius*. Boston: Houghton Mifflin Company, 1985.
- Schweizerische Armee. *Truppenführung (TF) 51*. Bern: EDMZ, 1951.

Schweizerische Armee. *Einsatz und Kampfführung der Flugwaffe 1957*. Bern: EDMZ, 1957.

Strehler, Hanspeter. *Der Schweizer P-16*. Emmenbrücke: Eigenverlag, 2005.

Government Documents of the Federal Archive, Bern, Switzerland

Training Division

E 27 (-) / Bd. 4195, Oberst Vacano.

E 27 (-) / Bd. 4204, Flugzeugbeschaffung.

E 27 (-) / Bd. 4260, Oberst Vacano.

E 27 18879, Bd. 2 – 9, Flugzeugbeschaffung.

DMV

E 5001 (F) / 1, Bd. 56, Flugzeugbeschaffung.

Division for Air Force and Antiaircraft

E 5460 (A) / 1, Bd. 127, Fabrikation von Kriegsflugzeugen.

E 5460 (A) / 6, Bd. 168, Flugzeugfragen.

E 5460 (A) / 6, Bd. 169, P-16.

E 5460 (A) / 1967/58, Bd. 188, Vergrößerung der Luftwaffe.

E 5460 (A) / 1967/58, Bd. 189, Flugzeug P-16.

Group for Administration of the General Staff

E 5560 (C) / 1975/46, Bd. 39, Abteilung für Flugwesen und Fliegerabwehr. Allgemeines (1951–1960).

E 5560 (C) / 1975/46, Bd. 271, Flugzeugbeschaffung.

E 5560 (C) / 1975/46, Bd. 273, KMF.

E 5560 (C) / 1975/46, Bd. 276, Flz MB 326, F-104, N-156F.

Federal Councilor Chaudet

E 5802 (-) / 1983/57, Bd. 31, Erklärung des Vorstehers des EMD zur "P-16"-Frage.

Protocols of Commission for National Defense (LVK)

E 9500,52 / 1984/122, Bd. 1-22, Protokolle der Sitzungen der LVK (1955–1960).

Federal Councilor Feldmann

J I. 3 (-) Bd. 77, Aufzeichnungen vom Juni 1958.

HR Kurz

J I. 203 (-) / Bd. 5, Referat des C KTA vom 21. September 1955.

J I. 203 (-) / Bd. 849, Notiz für BR Chaudet.

Periodicals

*Neue Zuercher Zeitung* (Zuerich), 6 July 1955.

*Neue Zuercher Zeitung* (Zuerich), 6 October 1956.

*Neue Zuercher Zeitung* (Zuerich), 26 March 1958.

*Neue Zuercher Zeitung* (Zuerich), 5 June 1958.

*Neue Zuercher Zeitung* (Zuerich), 22 October 1960.

*Neue Zuercher Zeitung* (Zuerich), 11 September 1969.

*Neue Zuercher Zeitung* (Zuerich), 6 October 1969.

*Tagwacht* (Bern), 25 June 1969.

*Wirtschaftspolitik* (Zuerich), 4 February 1966.

Frick, Willy N. "The Development of Military Aircrafts in Switzerland: The Ground Combat Aircraft P-16 of FFA Altenrhein." *Cockpit*, February 1958, p 21-26.

Rihner, Fritz. "Brauchen wir eine Flugwaffe?" *ASMZ*, January 1947, p 6-12.

"Swiss Vote for P.16 as 2nd-Stage Fighter," *Aviation Week*, 24 March 1958, p 65.

## Interviews

Grommesh, Donald, Chief of the technical engineering of the Learjet. Interview by author, 26 June 2006, Wichita, KS. Tape recording.

Spalinger, Paul, Chief Engineer of FFA. Telephone interview by author, 29 June 2006, Fort Leavenworth, KS.

Lear, William, Jr., Test pilot of the P-16. Interview by author, 12 July 2006, Port Orange, FL. Tape recording.

## INITIAL DISTRIBUTION LIST

Combined Arms Research Library  
U.S. Army Command and General Staff College  
250 Gibbon Ave.  
Fort Leavenworth, KS 66027-2314

Defense Technical Information Center/OCA  
825 John J. Kingman Rd., Suite 944  
Fort Belvoir, VA 22060-6218

Dr. Sean N. Kalic  
DMH  
USACGSC  
1 Reynolds Ave.  
Fort Leavenworth, KS 66027-1352

Mr. Marlyn R. Pierce  
DMH  
USACGSC  
1 Reynolds Ave.  
Fort Leavenworth, KS 66027-1352

LTC William T. Pugh  
DJMO  
USACGSC  
1 Reynolds Ave.  
Fort Leavenworth, KS 66027-1352

Embassy of Switzerland  
Major General Urban Siegenthaler  
Defense, Military, Naval and Air Attaché  
2900 Cathedral Ave, NW  
Washington, D.C. 20008

Lieutenant General Christophe Keckeis  
Chief of the Swiss Armed Forces  
Postfach  
CH-3003 Bern/Switzerland

Major General Edwin Ebert  
Kdt LVb Uem/FU 1  
Kaserne  
CH-8180 Buelach/Switzerland

William P. Lear  
1780 Doolittle Court  
Port Orange, FL 32128

Donald J. Grommesh  
3101 E Wilma St  
Wichita, KS 67211-3859

CERTIFICATION FOR MMAS DISTRIBUTION STATEMENT

1. Certification Date: 15 December 2006

2. Thesis Author: LTC Matthias F. Sartorius

3. Thesis Title: The Perception of the P-16 in the United States

4. Thesis Committee Members: \_\_\_\_\_

Signatures: \_\_\_\_\_  
 \_\_\_\_\_

5. Distribution Statement: See distribution statements A-X on reverse, then circle appropriate distribution statement letter code below:

A B C D E F X      SEE EXPLANATION OF CODES ON REVERSE

If your thesis does not fit into any of the above categories or is classified, you must coordinate with the classified section at CARL.

6. Justification: Justification is required for any distribution other than described in Distribution Statement A. All or part of a thesis may justify distribution limitation. See limitation justification statements 1-10 on reverse, then list, below, the statement(s) that applies (apply) to your thesis and corresponding chapters/sections and pages. Follow sample format shown below:

EXAMPLE

<u>Limitation Justification Statement</u>	/	<u>Chapter/Section</u>	/	<u>Page(s)</u>
Direct Military Support (10)	/	Chapter 3	/	12
Critical Technology (3)	/	Section 4	/	31
Administrative Operational Use (7)	/	Chapter 2	/	13-32

Fill in limitation justification for your thesis below:

<u>Limitation Justification Statement</u>	/	<u>Chapter/Section</u>	/	<u>Page(s)</u>
_____	/	_____	/	_____
_____	/	_____	/	_____
_____	/	_____	/	_____
_____	/	_____	/	_____
_____	/	_____	/	_____

7. MMAS Thesis Author's Signature: \_\_\_\_\_

STATEMENT A: Approved for public release; distribution is unlimited. (Documents with this statement may be made available or sold to the general public and foreign nationals).

STATEMENT B: Distribution authorized to U.S. Government agencies only (insert reason and date ON REVERSE OF THIS FORM). Currently used reasons for imposing this statement include the following:

1. Foreign Government Information. Protection of foreign information.
2. Proprietary Information. Protection of proprietary information not owned by the U.S. Government.
3. Critical Technology. Protection and control of critical technology including technical data with potential military application.
4. Test and Evaluation. Protection of test and evaluation of commercial production or military hardware.
5. Contractor Performance Evaluation. Protection of information involving contractor performance evaluation.
6. Premature Dissemination. Protection of information involving systems or hardware from premature dissemination.
7. Administrative/Operational Use. Protection of information restricted to official use or for administrative or operational purposes.
8. Software Documentation. Protection of software documentation - release only in accordance with the provisions of DoD Instruction 7930.2.
9. Specific Authority. Protection of information required by a specific authority.
10. Direct Military Support. To protect export-controlled technical data of such military significance that release for purposes other than direct support of DoD-approved activities may jeopardize a U.S. military advantage.

STATEMENT C: Distribution authorized to U.S. Government agencies and their contractors: (REASON AND DATE). Currently most used reasons are 1, 3, 7, 8, and 9 above.

STATEMENT D: Distribution authorized to DoD and U.S. DoD contractors only; (REASON AND DATE). Currently most reasons are 1, 3, 7, 8, and 9 above.

STATEMENT E: Distribution authorized to DoD only; (REASON AND DATE). Currently most used reasons are 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.

STATEMENT F: Further dissemination only as directed by (controlling DoD office and date), or higher DoD authority. Used when the DoD originator determines that information is subject to special dissemination limitation specified by paragraph 4-505, DoD 5200.1-R.

STATEMENT X: Distribution authorized to U.S. Government agencies and private individuals of enterprises eligible to obtain export-controlled technical data in accordance with DoD Directive 5230.25; (date). Controlling DoD office is (insert).