

AN EVALUATION OF THE ADVANCED MULTI-
ENGINE PILOT TRAINING PROGRAM AT
VANCE AIR FORCE BASE,
ENID, OKLAHOMA

By

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PREFACE

In January, 1950, the writer accepted the position as Educational Consultant to the Commanding Officer of the Pilot Training Program at Vance AFB, Oklahoma. The duty position of the writer was in the Training Analysis and Development Division at Vance AFB. This Division is a part of the Staff of the Commanding Officer and serves as an advisory and consultant staff to him. The specific mission of the Training Analysis and Development Division is the study and analysis of training problems and the development and improvement of the training program. Four functional areas for analysis, evaluation, and development are:

Training materials and curricula

Training equipment

Training methods and instructor training

Proficiency measurements

An interest in, as well as the necessity for the improvement of, the Pilot Training Program led to the research in this thesis.

Grateful acknowledgment is hereby given to the Training Analysis and Development Division of the United States Air Force Air Training Command at Scott AFB, Illinois, the Flying Training Command at Waco, Texas, and the Pilot Training Group at Vance AFB, Oklahoma, for the assistance and encouragement in completing this thesis.

Particular acknowledgment is given to the TA&D Officers at Vance AFB under the direction of Major Walter Bombeck, Jr, and to Lt. Col. Louis Du Montier, Director of the TA&D Division at Flying Training Air Force, for their valuable advice and assistance.

The writer wishes to express his appreciation to the staff of the Education Department of Oklahoma Agricultural and Mechanical College for their helpful advice and criticisms and especially to Dr. Morris Wallace, under whose supervision this work was carried out. Dr. Wallace has been a constant source of encouragement and guidance and has offered invaluable constructive criticisms in the writing of this paper.

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CHAPTER I

INTRODUCTION

For many years students have been trained by the United States Air Force Air Training Command. Thousands of these students have graduated from the Pilot Training Program and have become war and peace time pilots in the United States Air Force. The pilot training must have been reasonably successful for, according to Dr. Harold Benjamin of George Peabody College for Teachers, in a personal interview at Vance AFB in 1951, "The curriculum is systematic and conscientiously demonstrated in recent years in the hardest test that can be put on a military organization. They win wars."¹

Statement of the Problem. The problem undertaken in this study is the evaluation of the Advanced Multi-Engine Pilot Training Program at Vance AFB, Oklahoma.

Scope of the Study. The study was limited to the Pilot Training Program at Vance AFB. The Pilot Training Program included the Military, Academic, and Flying Training Sections.

Objective of the Study. The objective of the study is the evaluation of the Pilot Training Program, noting the strengths and weaknesses, in terms of the objective of the training program.

Need for the Study. In the evaluation of any instructional program,

¹Dr. Harold Benjamin in an interview at Vance AFB, Oklahoma, Nov. 16, 1951.

a major concern is the attainment of desired outcomes, and the various kinds of evidence indicating that such outcomes are being realized should receive attention. Evaluation of school activities involves more than determining the amount of knowledge possessed, measuring the degree of skill, and testing the scope of understanding. Among others, intangible qualities such as co-operativeness, judgment, open-mindedness, and self-reliance are highly desirable outcomes. Evaluation of such outcomes is by no means easy; for most of them there is no standard measure; therefore evaluation must necessarily be largely a matter of judgment. The difficulty of the task is no reason for avoiding it, and the importance and universality of the problems involved make it imperative that attention should be directed to the attainment of such outcomes and to their proper evaluation. The appraisal of any on-going social institution, such as a school, sets a number of problems, both theoretical and practical, that are seldom solved completely and satisfactorily in any one limited time span. Recognition of the existence of such problems and of what they imply is an important element in the carrying out of an intelligent program of appraisal.

The educational efficiency of any training program can be determined through some systematic process employing acceptable techniques for collecting and interpreting data and judging the progress toward the attainment of the objectives of the program. As far as can be ascertained, no formal, written evaluation of the Pilot Training Program at Vance AFB has previously been conducted. Because of the

nature of the Pilot Training Program at Vance AFB, the curriculum must be adaptable and sensitive to various and pertinent changes. A continuous process of evaluation must be a part of the training program in order that a determination can be made of the effectiveness of the program in meeting new needs and requirements. The pilot training authorities must be kept informed as to the quality of the course product as observed in actual use. The primary purpose of this study is to obtain pertinent information and data which will be used in determining the strengths and weaknesses of the Pilot Training Program at Vance AFB.

Limitations of the Study. Certain limitations recognized in this study included the following:

1. Training standards and specific objectives were not in existence during this study.
2. Official transfer of students subsequent to graduation from the Pilot Training Program at Vance AFB precluded further follow-up contacts.
3. The subjectivity was recognized of the answers and estimates from the respondents in the two questionnaire instruments.
4. Each questionnaire instrument did not cover the same identical areas in several instances due to the variation in the two types of follow-up techniques.

Assumptions. The assumptions underlying this study included the following:

1. The turnover of instructor personnel during this study was not likely to effect the general instructional program.

2. Variations in the course curriculum did not change appreciably during this study.

3. The personal visitation follow-up technique using the questionnaire method was the most feasible means of obtaining data in this study.

4. The flying and academic experiences of each student as obtained prior to the Pilot Training Program at Vance AFB will be similar.

5. When an individual applies for entrance into the USAF Pilot Training Program, he is subjected to a number of standardized examinations covering such aptitude areas as Mechanical, Mathematical, Verbal, Administrative, Reading, Social, and the like. In order to be accepted as a student in the Pilot Training Program he must attain an established, relatively high grade level on these examinations. Therefore, an assumption is made for this study that all students involved in this evaluation were comparable as to these general aptitude abilities.²

Definitions. In order that the reader of this study may be cognizant of the meaning of various terms used in this study, the following definitions are presented:

²Neal E. Miller, (Editor), Psychological Research on Pilot Training Report No. 8 (Washington, D. C., 1947), p. 16.

1. USAF. United States Air Force is the headquarters governing agency of all Air Force activities.

2. ATRC. Air Training Command is the governing agency of all Air Force training activities.

3. FTAF. Flying Training Air Force is the governing agency of all flying training activities.

4. TTAF. Technical Training Air Force is the governing agency of all technical training activities.

5. SAC. Strategic Air Command is the command responsible for all types of strategic bombing missions against an enemy.

6. MATS. Military Air Transport Service is the command responsible for the air transportation of all service personnel and equipment.

7. CONAC. Continental Air Command is the command responsible for the organization, training, and administration of the Reserve Forces.

8. AU. Air University is the command responsible for conducting high level service schools in many subjects pertaining to service personnel.

9. Using Agencies. Those commands within the USAF to which a graduate of any ATRC training program may be assigned.

10. Course Outline. A publication stating the main areas to be included in any ATRC training course.

11. Course syllabus. An expanded course outline listing in detail such items as subject areas, references, training aids, time, and the

like.

12. Student flow chart. A publication indicating the entrance dates, graduation dates, total number of students in each class, and holidays for any ATRC training course.

13. Student officers. USAF personnel who are commissioned officers and have been accepted as students in the Pilot Training Program.

14. Cadets. Non-commissioned USAF personnel who have been accepted as students in the Pilot Training Program.

Organization of the Thesis. The introductory chapter of this study contains the statement of the problem, the objective, needs, underlying assumptions, definitions, and scope. Chapter II deals with general and specific background information in relation to the Pilot Training Program. Chapter III reviews the literature concerning the Advanced Multi-Engine Pilot Training Program and other related Pilot Training Programs. Chapter IV describes the procedures employed in conducting the two follow-up surveys. In Chapters V and VI the data secured by means of the follow-up number one involving students' judgment and follow-up number two involving supervisors' reaction were presented. Chapter VII includes the evaluation of the Pilot Training Program based upon an analysis of the surveys and points out the strong and weak points of the Military, Academic, and Flying Training Sections. Chapter VIII presents the findings, conclusions, and recommendations growing out of this study.

Summary. Chapter I has presented the problem of this study and

shown a definite need for such an undertaking. In the next chapter, background material in relation to the Pilot Training Program is presented.

CHAPTER II

THE PILOT TRAINING PROGRAM

History of Aviation Education. The term "Aviation Education" may be interpreted to refer to those educational programs which grew out of the invention of a useful aircraft and the ramifications that this invention had upon human endeavors. These educational programs include not only the training of pilots but also the training of aeronautical engineers, administrators, and others concerned with law, medicine, schools, and related facilities and services. Such programs involve producers of aircraft, military installations, and consumers of aviation services. Aviation Education directly or indirectly affects most social institutions in all nations.

The early aviation educational programs concerned themselves mainly with vocational preparation. The results of such programs were seen in schools of aviation engineering, trade schools for the preparation of mechanics, and the training of the early pilots. As late as 1952 comparatively few public school systems had programs of aviation education.

The Bureau of Air Commerce, a part of the U.S. Department of Commerce, in the late 1920's began to stress the value and importance of ground school training to the pilot training course. Out of this interest developed the Aviation Education Division of the present Civil Aeronautics Authority. The U.S. Office of Education concerned itself

primarily with the high school aspects of the aeronautics course.

In 1939, the Civilian Pilot Training Act was passed. This Act gave impetus to the adjustment of the public schools to Aviation Education. The primary concern of the Act was the training of pilots to meet a national emergency. The courses related to pilot training which were offered by the public schools included such courses as navigation, meteorology, aircraft structures and engines, instruments, and aerodynamics. Thousands of pilots were trained through this program. Most of these pilots eventually joined the USAF for participation in World War II. Near the end of World War II, training emphasis in the public schools and colleges again turned to the general educational and cultural possibilities of aviation. The USAF and the U.S. Navy have recently increased their co-operation with many educational institutions by establishing aviation training programs for their personnel within these institutions.¹

Air Training Command Development. Originally the Air Force, as it is known today, was a branch of the U.S. Army Signal Corps. Shortly after World War I the Air Force became, in its own right, a branch of the U. S. Army. It was then designated as the U.S. Army Air Corps. During this period, the training of pilots was instigated at Randolph Field, located near San Antonio, Texas. Shortly before World War II, many new bases were given the responsibility for pilot

¹H. E. Mehrens, "Historical Sketch of Aviation Education," Informational Bulletin, 2 (Summer 1951), 57-75.

training. In 1941 the U.S. Army Air Forces, which included the Air Corps Technical Training Command, was created. In 1947, the USAF became an equal agency with the U.S. Army and the U.S. Navy in the Department of Defense.

The Air Training Command was activated on July 7, 1943, as an amalgamation of the Air Corps Technical Training Command and the Air Corps Flying Training Command with headquarters at Scott AFB, Illinois. The present Air Training Command consists of four main divisions known as Flying Training Air Force, Technical Training Air Force, Indoctrination Training Air Force, and Combat Crew Training Air Force.²

The Flying Training Air Force was given the responsibility for training all types of pilots and aerial observers for the Air Force. Vance AFB, Enid, Oklahoma, and Reese AFB, Lubbock, Texas, were the two bases given the responsibility of training advanced multi-engine pilots.

The needs of the USAF determine the course of instruction conducted by the ATRC. The USAF is confronted with a need for trained personnel whenever a new airplane, a new piece of equipment, or a new procedure is adopted. Because of the nature of its task, the USAF is subject to a high rate of personnel turnover. This turnover appears to be a necessary evil and entails a much larger training program than

²The Department of the Air Force, The Air Officer's Guide (Harrisburg, Pennsylvania, 1951), p. 38.

would otherwise be necessitated. One of the main problems of such a training program is the element of time. Especially is this true during times of national emergencies.

The Personnel Division, Headquarters USAF, has the function of predicting shortages, or forecasts of shortages, of USAF personnel. When such a personnel shortage exists or is anticipated, the ATRC is requested to establish a suitable training program aimed at alleviating this situation.

Developing Courses of ATRC Instruction. When the need arises for trained personnel, high level conferences are held to determine whether the most efficient method of obtaining these personnel would be by a training program or through a process of on-the-job training. The ATRC is then given the responsibility of instigating the proper training program or of supplying the using agency with the proper type of personnel for on-the-job training.

The ATRC then designates which one of its Air Forces will be responsible for the new training program. This Air Force designates one of its bases to be directly responsible for setting up the new training program. Personnel at this base undertake the necessary study and research to determine such things as course content, length of course, instructor requirements, training aids, and buildings necessary to accomplish the new training program.

The course outline is the next step of preparation. Included in the outline are the main areas of the new course. The course outline must

be prepared in sufficient detail so that the Air Force Headquarters can determine whether the new course will be adequate to meet the necessary requirements. When the Air Force Headquarters approves the course outline, it is reproduced and distributed to the many headquarters concerned.

After the course outline is approved, the syllabus of instruction is prepared for the new training course. The syllabus is an expanded abstract of the course of instruction, prepared in sufficient detail to permit its utilization by the base or school given the direct responsibility for the actual administration of the new course.

In addition to the syllabus and course outline, pertinent training literature is developed and compiled. Many references are already published, such as Air Force Manuals, Air Training Command Manuals, Field Manuals, and similar literature. Other literature such as instructor guides, student home-study literature, training project outlines, and schedules of instruction must be prepared by the personnel directly responsible for the instruction of the students. Student flow charts are prepared by higher headquarters and submitted to the school personnel concerned so that proper planning and administration of the school can be made.

Objective of the Pilot Training Program at Vance AFB. The main objective of the Pilot Training Program at Vance AFB is to train the students in the general skills and knowledges required of a USAF multi-engine pilot and officer. At present, no published statement

exists, other than the course syllabus, which lists the specific skills and knowledges a graduate of the Pilot Training Program should have. In the Introduction of the course syllabus, the objective of the Pilot Training Program is stated as follows:³

Objective--To prepare trainees to perform duties as junior officers upon assignment to Air Force units by providing:

- a. Flying training (Multi-Engine) of sufficient scope and quality to attain the desired proficiency in the principles of multi-engine flying, both instrument and visual.
- b. Academic training of sufficient scope to implement and facilitate the flying training presented in this course.
- c. Officer training of sufficient scope to qualify graduates to effectively assume duties as junior officers in the United States Air Force.

Growing out of this main objective can be listed several more specific objectives commonly accepted by the training personnel of the Pilot Training Program at Vance AFB. They are as follows:

1. Pilot Skills: To train the student in the various skills of pilotage such as Instrument, Formation, Navigation, and Transition flying.
2. Knowledges: To train the student in the knowledges of various subject fields necessary for pilots and officers such as Cruise Control, Weather, Navigation, Engineering, Oral Expression, AF Administration, and the like.

³Flying Training Air Force, Air Training Command, Syllabus of Instruction for Basic Pilot Training Multi-Engine (October, 1952), Introduction.

3. Traits: To train the student in various traits associated with an officer and a pilot such as Discipline, Judgment, Calmness in Emergencies, and the like.

This selected list of skills, knowledges, and traits is by no means all inclusive, nor are they listed in order of importance. This list does, however, present representative examples of what the Pilot Training Program at Vance AFB desires to accomplish as program objectives in supplying satisfactory graduates to the using agencies.

The fact that objectives of a pilot training program are somewhat nebulous is presented in Report No. 8 of the Army Air Forces Aviation Psychology Program Research Reports in the following statement:⁴

Flying is a complex skill. Our scientific language does not yet contain the words and concepts for summarizing briefly and accurately the demands of such a skill. Any attempt to describe this task, therefore, confronts the dilemma of either describing an exceedingly long series of specific details or making broad generalizations which are quite inexact. Until the fundamental knowledge of the structure of the human abilities involved in complex psychomotor skills has been considerably increased, psychologists conducting research on flying will probably need to acquire by direct experience a more intimate knowledge than can be presented in words.

Basically, a graduate from the Pilot Training Program at Vance AFB is a pilot and is expected to perform, in light of his flying time, all the assigned duties of a pilot. When not performing pilot duties, in almost all cases he is assigned secondary duties such as Assistant Adjutant, Supply Officer, Safety Officer, and the like which required

⁴Neal E. Miller, (Editor), Psychological Research on Pilot Training Report No. 8 (Washington, D. C., 1947), p. 25.

the knowledges of a commissioned officer.

The Training Program at Vance AFB. Aviation Cadets and Student Officers, after completing approximately six months training in a Basic Flying School, come to Vance AFB to complete their Advanced Pilot Training which consisted of six months duration. During the period at Vance AFB the student is subjected to training in the three main sections of the Pilot Training Program. These sections are known as the Academic, Military, and Flying Training Sections. There are four complete classes, varying in size from seventy-five to 164, in attendance at Vance AFB at any one time. Each class is divided into two sections; one section attends academic training in the morning and the flying section in the afternoon. The other section of the class participates in flying training in the morning and attends academic training in the afternoon. The T-6 airplane (single engine, two-place) is used for single engine training the first part of the course and the B-25 airplane (twin engine, four-place) is used for multi-engine training during the latter part of the course.

Upon graduation, the cadets are commissioned as Second Lieutenants in the USAF and awarded their pilot wings. Student officers receive only their pilot wings upon graduation. Insofar as possible, graduates remain at the base to which first assigned for one year after graduation. Assignments may be received by the graduates to go to any command in the USAF, such as Strategic Air Command, Air Training Command, Continental Air Command, and the like. Such commands

are known as the using agencies for the graduates of the Pilot Training Program at Vance AFB.

At this point a fact of especial significance in the Pilot Training Program at Vance AFB should be emphasized. The graduate from this program must be instructed in the general fundamental skills and knowledges required of a multi-engine pilot and officer. After graduation and assignment to a using agency, specialization will be obtained in the skills and knowledges required of a multi-engine pilot and officer applicable to the command to which assigned. The wide range in skills and knowledges required of pilots and officers will be obvious when the reader of this study notes the variations in command missions as stated in the following section.

Missions of the Using Agencies. Graduates of the Pilot Training Program at Vance AFB are subject to assignment in any of the following commands of the USAF. These commands are known as the using agencies of the Pilot Training Program at Vance AFB. Stated herewith are brief and non-technical descriptions of the general missions of these using agencies.

SAC. This command flies very heavy bombers to any part of the world and such flights involve the use of high altitude knowledge, some formation flying, extremely long missions, and considerable instrument flying. Usually each airplane has approximately nine to twelve or more crewmen. The newer jet bombers involve less crewmen but more specialized knowledges per crew member.

MATS. This command flies very large transport planes to any designated part of the world and such flights consist of medium high altitude flying, long range missions, and instrument flying. MATS maintains Air Rescue Service, Flight Service, and Air Weather Service. Each airplane has approximately six to ten or more crewmen. MATS also had the responsibility for the Berlin Airlift as well as the present support of the Korean war.

ATRC. This command is responsible for the training of personnel in some phase of flying or technical training. Most flights are relatively short, low altitude, with very few high altitude flights, and are mainly concerned with principles and techniques of flying. Additional crew members are not a major concern with such flying.

CONAC. This command is responsible for the Reserve Forces and mobilization thereof. The command serves as a unit for the training of the Reserves in keeping the Reserves "current" in military and flying duties. The command also performs routine duties and flights as directed by the Chief of Staff USAF.

AU. This command conducts many high level schools and courses in the preparation of senior officers for command and staff duties. The command also maintains liaison with other major commands regarding new developments in aviation and service educational schools. Duty pilots are used for routine administrative flights.

Assignment to commands is made a few days prior to actual graduation. Specialization in any phase of training is obviously

impossible and impractical under these circumstances.

As a note of general interest, the nomenclature of the complete pilot training program underwent a change during the summer of 1952. What formerly was designated as Basic Pilot Training is now designated as Primary, and Advanced Pilot Training is now designated as Basic Pilot Training. The main subject content of these two training programs did not undergo any appreciable transition.

Summary. This chapter has presented general background information as to the Pilot Training Program as well as the objective of the program. Also presented was a description of the Pilot Training Program at Vance AFB and the possible disposition of the graduates. The next chapter takes up a review of the literature concerning Pilot Training Program evaluations.

CHAPTER III

REVIEW OF THE LITERATURE

Literature Regarding Pilot Training Programs. There is a distinct dearth of information regarding pilot training program evaluations. Extensive study of the various catalogues and indices concerning pilot training program evaluations resulted only in information that several authors made general implications to the effect that some form of evaluation should be undertaken. References were also found which suggested general investigations which were being accomplished. For example, Charles H. Gale, writing in the Yale Review, states,¹

There is no means of determining accurately in advance of actual training whether an individual will make a combat pilot, or a bombardier, or a navigator--or had better serve in some ground unit. Further studies may result in practical yardsticks but, so far, generalities must suffice. Even those are not dependable. Many an unpromising student pilot who has taken the maximum time allowed to reach the stage where he was good enough to be passed from one course to another has turned out in the end to be far more brilliant as an air man than quicker classmates. . . . Psychological as well as medical investigation being aggressively pursued may be expected to develop on this subject some highly interesting findings.

The need for pilot training program evaluation was recognized by Major General Robert W. Harper, Commanding General, Air Training Command, when he authorized in 1949 the establishment of the Training Analysis and Development Division at each ATRC base and

¹Charles H. Gale, "Training Military Pilots," Yale Review, XXXI (Spring 1942), 481.

stated the mission to include the study and analysis of training problems and the development and improvement of the training program.

A predominant portion of the published literature examined presents information regarding civilian training programs and covers such topics as Air Education in Public Schools, Social Studies Unit on the Air Age, Art of Flight Instruction, Survey of Collegiate Courses in Aviation, and the like.

In 1947, the Army Air Forces Aviation Psychology Program published a research report concerned with pilot effectiveness. This report had two related objectives as stated in the Preface²

First, an attempt will be made to present a record of the research activities of aviation psychologists in the Continental Air Forces; second, it is hoped to provide a summary of psychological research on operational training that will be of value to future research workers in this field. Additional and basic information relative to this report may be found for the most part in the files of the Psychological Branch, Officer of the Surgeon, Headquarters, Strategic Air Command, Andrews Field, Camp Springs, Maryland.

In general this Psychology Program investigated the accuracy of the predicting instruments on pilot and air crew selection.

Human Resources Research Institute under the Air University has done considerable and extensive research on the development of instruments for pilot selection and prediction of success. The results of this research have been effective with respect to the improvement of the USAF pilot training program and the reduction in elimination of unfit

²Meredith P. Crawford, (Editor), Psychological Research on Operational Training in the Continental Air Forces, Report No. 16 (Washington, D. C., 1947), Preface.

personnel from the program.

Published Research on Evaluation of the Advanced Multi-Engine Pilot Training Program. Reese AFB, Texas, which has a similar Pilot Training Program to the one at Vance AFB, in May, 1952, completed a follow-up survey of its former students. This survey by J. M. Ogle, Educational Specialist at Reese AFB, was conducted entirely by mail and was titled, "Evaluation of Former Graduates, Reese Project 52-4." The final report of this project was presented in the Reese Quarterly Report of TA&D Projects, 16 Feb 52 to 15 May 52. Mr. Ogle sent out a total of 537 questionnaires covering 100 per cent of the graduates during a selected period of classes. Of the questionnaires sent out, 243, or 45.2 per cent, were returned. Eighty-nine of the 243 questionnaires were eliminated from analysis for various reasons which resulted in using 154, or 28.8 per cent, of the original questionnaires. All questions asked on the questionnaire required a "Yes-No", "Adequate, Less than adequate, More than adequate" response. The conclusion drawn by Mr. Ogle in this survey was that³

... it has been determined that due to the poor response which makes possible conclusions of little value, such studies as this are not feasible and the cost, both monetary and in effort, are not repaid by the results obtained. Any further study of an evaluation of the program will be conducted in a different manner.

³ J. M. Ogle, "Evaluation of Former Graduates, Reese Project 52-4." Reese Quarterly Report of TA&D Projects, (16 Feb 52 to May 52), 9-9p.

Another type of pilot training program evaluation was conducted in 1950. A team of specialists, both civilian and military, from Headquarters ATRC were requested to come to Vance AFB and conduct a complete and thorough survey of the Pilot Training Program at Vance AFB. Such a survey was conducted with gratifying results. A few areas were identified as needing improvement. The general consensus was to the effect that the Pilot Training Program at Vance AFB was functioning in a very efficient manner. The main concern of the survey team, however, was with such items as physical facilities, instructional programs, testing and evaluation procedures, and the like.

An extensive study of the indices and catalogues revealed no other literature pertaining directly to an evaluation of the Advanced Multi-Engine Pilot Training Program. Contact with Headquarters ATRC revealed no further studies of such a training program.

ATRC issues an official quarterly publication titled the Informational Bulletin. The following is contained on the inside cover of the Winter 1952-53 issue of this Bulletin:⁴

This publication is an Air Training Command (ATRC) document designed primarily to facilitate an 'informational exchange' of training ideas among education and training personnel within and outside of the Air Force. Articles are selected primarily for the professional consideration of the many thousands of instructor personnel, and more than a thousand educational and training specialists and supervisors in the ATRC, as well as other interested readers.

Each quarter the Training Analysis and Development (TA&D)

⁴Training Analysis and Development, ATRC, Informational Bulletin, Vol. 3, No. 4 (Winter 1952-53), Inside front cover.

project reports of the nearly three dozen directorates throughout the ATRC are reviewed to identify potential articles for the BULLETIN.

In March, 1953, ATRC issued the TA&D Informational Bulletin Index.⁵ The Index listed all articles published in the ATRC Informational Bulletin for the issues of Spring 1950 through Winter 1952.

Several subject categories are included in the Index by functional grouping of articles. One such category was titled "Group IV Proficiency Measurements and Evaluations" which included a total of forty-two published articles. Only two articles out of the forty-two pertained directly or indirectly to the evaluation of pilot training programs. These two articles are a reproduction of the questionnaire results of follow-up number one and two which compose this present study.

Evaluations Related to Pilot Training Programs. Goodfellow AFB, Texas, (Basic Pilot Training School) has conducted a project titled "Cadet Opinion Questionnaire, Project 52-9." This project was reported as completed in Goodfellow's Quarterly Report of TA&D Projects, 15 Feb 52-15 May 52. None of the actual results were published in the project report. The following, however, is quoted from the project report.⁶

Project Objective: To revise and improve the Cadet Opinion Questionnaire, developed as a part of project GOF 51-9, for the

⁵Training Analysis and Development, ATRC, Informational Bulletin Index, Vol. 1 (Spring 1950 through Winter 1952), 14.

⁶Capt. S. J. Campbell, "Cadet Opinion Questionnaire, Goodfellow Project 52-9," Goodfellow Quarterly Report of TA&D Projects, (15 Feb 52 - 15 May 52), 15.

purpose of obtaining information on the attitude of the students toward the training program.

Interim Finding, Conclusions, and Action Taken: Some areas of weakness have been pointed out through the use of this questionnaire, and it is believed that future administration is warranted. This project is to be continuous in nature, however, for reporting purposes it is considered complete.

Mather Field, California, (Aircraft Observer School) has conducted a follow-up survey of Aircraft Observer School graduates. This project was titled "Evaluation of Graduates of the AOS Project 51-48." The project was reported at 30 per cent complete in Mather's Quarterly Report of TA&D Projects, Aug 16-Nov 15, 1952. The information contained in this project was classified above "Restricted" and consequently cannot be revealed to personnel not having a proper security clearance.

Nellis AFB, Nevada, (Fighter and Gunnery School) has conducted a project titled "Evaluation of Reese and Vance Students, Project 52-13." This project was reported as a continuing project in Nellis' Quarterly Report of TA&D Projects, 15 May-15 Aug 52.

The graduates evaluated were from a specialized short term course taught at Reese and Vance AFB's during the early months of 1952. The course was an all-through T-6 course of 100 hours duration. Students in this course were trained in the single engine fundamentals of becoming jet fighter pilots. As stated in their Quarterly Report, the project objective sought to "evaluate the proficiency level of the Vance and Reese students with the proficiency level of other training school graduates." The Planned Procedures were "to make note of the

outstanding abilities or shortcomings that the students may have and make recommendations or accommodations where deemed necessary or applicable". The Interim Findings, Conclusions, and Action taken were:⁷

As of this date the Vance and Reese graduates that are still in our combat crew training course have not advanced sufficiently to grant a proper evaluation of their proficiency. The students' throttle and formation techniques are exceptionally weak. Some of the students have experienced difficulty in checking out in the F-80A, B, & C in the transition phase.

The above quoted project was somewhat different from this study of the evaluation of the Pilot Training Program at Vance AFB due to the fact that a using agency, The Fighter School, was actually doing the evaluation of a school which contributed graduates to The Fighter School.

The U. S. Navy Pilot Training Program, which trains pilots for the Marine Corps, varies from that of the USAF. It is not a purpose of this study to compare or pass judgment upon the relative merits of the two training programs. A brief statement, however, appears to be in order at this point concerning the U. S. Navy Pilot Training Program which is divided into four separate sections, namely:

1. Pre-Flight--physical condition and aeronautical preparatory study. This lasts about twenty-two weeks.
2. Primary--primary flight training during which the cadet learns to solo. About sixteen weeks.
3. Intermediate--the application of flying to combat military

⁷Capt. Leo A. Higgins, "Evaluation of Reese and Vance Students, Nellis Project 52-13," Nellis Quarterly Report of TA&D Projects, (15 May 1952 to 15 August 1952), 32.

- tactics, and, ultimately, specialization in one of the main types of operational flying. From sixteen to twenty-four weeks.
4. Operational--intensive training in the airplane as a military weapon. From eight to twelve weeks.⁸

Carlisle gives a brief description of the U. S. Navy training program in each of the above sections. The section most nearly alike to the Multi-Engine Pilot Training Program of the USAF is the Intermediate which Carlisle describes as follows:⁹

Likewise it is in Intermediate--after several weeks of identical basic training--that the candidates branch out to their specialties. It is obvious that all fliers cannot pilot fighters, or dive bombers, or torpedo planes. So after familiarization with higher-powered airplanes, formation flying, and intensive training in instrument flying, cadets are selected for specialization in one of the four main types of naval operation flying--Carrier (CV), Patrol (VPB), Multi-engine Landplanes (VB2), or Scout-Observation (VO/VCS).

Patrol pilots transfer their training work to the twin-engine Consolidated PBV. Multi-engine landplane pilots start on Beech SNB's, while scout pilots go into the Vought OS2U, or Kingfisher, widely in use with the fleet.

Subsequent to Intermediate training, Carlisle states that the student in the U. S. Navy Pilot Training Program goes on to further specialization, both as to airplane type and pilotage skills.

The Headquarters of the Naval Air Training Command is located at the U. S. Naval Air Station, Pensacola, Florida. In a personal letter,¹⁰ Cdr. Verne W. Lyon, Headquarters, Naval Air Training Command made the following comments concerning a follow-up of the

⁸Norman Carlisle, The Air Forces Reader (New York, 1944), p. 91.

⁹Ibid., p. 93.

¹⁰Personal letter from Cdr. Verne W. Lyon, Headquarters, Naval Air Training Command, Pensacola, Florida, 2 February 1951.

students in the U. S. Navy Pilot Training Program.

After visiting the various fleet squadrons and discussing the best manner in which such reports could be made, the enclosed questionnaires were developed--one for single engine pilots and one for multi-engine pilots. We request that a questionnaire be filled out on each new graduate three months after he has reported for fleet duty. Information provided by this questionnaire tells us something as to how well the Training Command has done its job in preparing a student for fleet responsibilities. Further, such information frequently suggests desired changes or modifications in the training syllabus. A second questionnaire is filled out on each pilot after he has been in the fleet one year. This questionnaire reflects how well the fleet has done its job in further preparing the pilot for operational assignments.

In another personal letter,¹¹ Captain L. P. Carver, Director of Training, Headquarters, Naval Air Training Command made the following comments concerning the same subject:

Questionnaires have been enclosed in the jackets of all newly designated pilots for later completion by the squadron commanders and return to the Training Command. Originally, separate questionnaires were utilized for multi-engine pilots. These were to be completed in the case of each pilot after 3 months and again one year following designation. In 1952 an analysis of those questionnaires returned resulted in the recommendations that (1) the period of time for the first report should be extended to 6 months to allow the squadron commanders to observe the aviator in all phases of his work under standard or uniform conditions and (2) construction of items be improved to make them more discriminating and to increase the value of responses to the Training Command.

As each completed questionnaire is received it is examined for any criticism that might be useful to the Training Command, and when such criticisms are found they are forwarded to the staff officer concerned. All of the questionnaires received are accumulated and subjected to periodic statistical analysis. The old type questionnaire did not lend itself well to this type of study. It is hoped that the new questionnaire will prove more useful. So far,

¹¹Personal letter from Captain L. P. Carver, Director of Training, Headquarters, Naval Air Training Command, Pensacola, Florida, 26 Mar 1953.

the comments and criticisms of the squadron commanders have been more helpful than the statistical findings based on large numbers of questionnaires. If, in the final analysis of the new type questionnaire several squadron commanders were to raise the same objection to the training of our multi-engine pilots, this fact would be utilized as a basis for a direct change in the training syllabus or as an item for consideration at our next annual training conference.

In view of the fact that all multi-engine pilot training prior to designation as a naval aviator comes under the cognizance of the Naval Air Training Command, there are no evaluations of the pilot training program conducted elsewhere.

Summary. This chapter has presented a review of the literature relating to pilot training program evaluations. Several studies of a general nature have been made of pilot training programs. However, because of the general nature of these studies, they were found to be unproductive for this study with respect to specific ideas for organization, methodology, and implementation. Evidence was presented to indicate that this was an original type of study in the evaluation of the Pilot Training Program at Vance AFB. The survey also showed that the technique of personal visitation follow-up had not been employed previously. The next chapter describes the procedures employed in this study and presents the reasons as to why the personal visitation follow-up technique was chosen.

CHAPTER IV

PROCEDURES EMPLOYED IN THIS STUDY

Various Methods Available for Training Program Evaluations. The administrator of any training program has available for use a number of methods or techniques in evaluating the effectiveness of the training program. Each method or technique has characteristic advantages and disadvantages dependent upon the desired objectives to be accomplished by the course evaluation.

Among the acceptable methods or techniques which may be used for a training program evaluation and their applicability to the evaluation of the Pilot Training Program at Vance AFB are the following:

1. Personal interviews with all former students. This method was not chosen primarily because of the number of graduates and the dispersion of location assignments. The expense and time involved would be prohibitive when related to the results.

2. Observation and analysis of the training program by a disinterested team of experts. This method contributes mainly to the analysis of the physical facilities, methods of instruction, qualification of personnel, and the like, and might or might not accumulate data as to the effectiveness of the course product in the using agencies.

3. Correlation of class rank with effectiveness in the using agencies. This method was not practical at the time of the study, since the grades given by the Flying Training Section were U, meaning

unsatisfactory and S, meaning satisfactory. Also a closely related and valid scale must be obtained to rate effectiveness in the using agencies. This method of correlation will be considered as a possibility for a future evaluation procedure, since flying grades are now computed on a T-Score basis.

4. Self-study of the training program. Such a method involves itself particularly with local features and does not provide data as to the effectiveness of the course product in the using agencies. This method is actually in effect at the Pilot Training Program at Vance AFB. Administrators and supervisors are constantly checking the training program from all possible aspects. Meetings, conferences, workshops, and the like are frequently being conducted and attended by the training personnel.

5. Personal follow-up surveys to former students and/or their immediate supervisors using a questionnaire technique to gather data. This method was chosen as being the most feasible. From the standpoint of economy, obtaining of ample data, return of completed questionnaires, ease of administration, and interpretation of results, the personal visitation follow-up survey method was believed to be the most practical in assisting in the accomplishment of the objective in evaluating the Pilot Training Program at Vance AFB. No claim is laid to the validity of the method or the questionnaire instruments devised for use in the follow-up.

6. Other methods of evaluating training programs would include

such as: (a) judging the product by comparison to a standard or criterion held to be good or desirable, (b) checklist containing various standards to be noted in a training program, (c) observation of classroom and general school procedures, (d) council by an expert on existing and possible educational and training procedures.

The above mentioned list of methods is not considered exhaustive nor listed in order of importance. Each method has its specific advantages and disadvantages and can be applicable for the evaluation of a training program dependent upon the selected objectives for the evaluation.

General consensus in educational literature is to the effect that the questionnaire is an acceptable tool for obtaining data in educational research provided the questionnaire is properly used and conforms to accepted criteria.

Contact with the Using Agencies. Upon acceptance of the follow-up method as the most feasible for this study of the Pilot Training Program at Vance AFB, plans were made to gather the data. During the early summer of 1950, permission was received from ATRC to contact the using agencies containing the former students of the Pilot Training Program at Vance AFB.

A list of the graduates and their assignments was obtained. A determination was made in each follow-up as to which former students and/or supervisors were actually to be contacted. This determination was partially based upon the following factors: (a) economy

in use of Vance AFB personnel time, (b) economy in scheduling airplanes for actual visitation, (c) number of former students assigned at any one base, (d) length of time since graduation (possibility of former student receiving a transfer), (e) cross-section sampling of assigned former students.

In each follow-up, letters were sent from Vance AFB to the using agency to be visited, requesting permission to make a personal visitation to the former students and/or their supervisors and stating the objective of the visitation. In each case full co-operation was obtained from all the personnel in the using agencies.

Follow-up Number One to the Former Students. The first follow-up contacted the former students of the Pilot Training Program at Vance AFB. The main objective of this study was to evaluate the effectiveness of the program at Vance AFB in terms of the objective of the program. Logic indicated that one of the best sources of data regarding the effectiveness of the Pilot Training Program would be the former students. The judgment of these former students regarding the strong and weak points of the training program was believed to be a significant source of data to indicate the effectiveness of the training program in providing training in the skills and knowledges necessary for the using agencies. A belief was also held that the present supervisors of the former students would be an excellent additional source of data for evaluating the program effectiveness.

Method of Constructing the Questionnaire of Follow-up Number

One. For the actual composition of the questionnaire, concern was given to principles relating to good questionnaire format construction. Extensive use was made of the literature in order to ascertain various criteria for questionnaire construction. Four sources¹ were found which presented such criteria. Obviously some duplication between the sources was encountered as to criteria suggested. Other criteria pertained to direct use in a public school situation as contrasted to the ATRC school situation. The following criteria for questionnaire construction and format were compiled and selected as those which were most generally applicable to this study:

1. Purpose. Always state clearly the purpose of the investigation.
2. Validity of Requested Data. Ask only for data which respondents can and will give.
3. Interesting Topic. Write the questionnaire on a topic in which the recipients themselves are vitally interested in knowing the answer.
4. Ease of Reply. Do not tax the interest and effort of the recipient but make it easy for him to reply.
5. Opinion Answers. When judgments or opinions are asked, the questions should be framed so as to exclude dogmatic answers based on enthusiasm and opinions and to insure reflective thinking.
6. Question Wording. Questions should be simply and clearly worded.

¹ Andrew T. Wylie, "To What Extent May We Rely Upon The Answers to a School Questionnaire?" Journal of Educational Method, 6 (February, 1927), 252-257.

Herbert H. Toops, "Predicting the Returns From Questionnaires; A Study in the Utilization of Qualitative Data," Journal of Experimental Education, 3 (March, 1935), 204-215.

Bulletin, Bureau of Education, Department of Interior, An Outline of Methods of Research with Suggestions for High School Principals and Teachers (Washington, D. C., 1926), 23-25.

Research Bulletin, National Educational Association, The Questionnaire (Washington, D. C., 1930), 18-23.

7. Sameness of Meaning. Formulate each question so that it will have identically the same meaning to everybody who answers it.
8. Shortness of Answers. Organize the questionnaire so that it can be answered by checks or by the insertion of a minimum number of words or figures.
9. Answer Tabulation. Responses should lend themselves to tabulation.
10. Ample Spacing. Be careful of the spacing. Leave enough space for the answers.
11. Clearness. Be sure that each copy is clear and readable.
12. Number of Questions. Ask a fairly large number of questions.
13. Number of Individuals. Ask the questions of a sufficiently large number of individuals.
14. Preliminary Trial. Questionnaire should be given a trial run.
15. Follow-up. Employ a vigorous follow-up technique.
16. Investigator's Name and Address. Be sure that the investigator's name and address are clearly given on the questionnaire.

Local conferences were held with appropriate training personnel in order to determine the areas of the training program to be included in the questionnaire directed toward obtaining the former students' opinions in relation to the Pilot Training Program at Vance AFB. A conference was held with the Directors of Military, Academic, and Flying Training Sections and the general plan of the follow-up was discussed.

A conference concerning the area of flying training was then scheduled with the Director of Flying, T-6 and B-25 Stage Commanders, Flight Commanders, representatives of Flying Instructors, and TA&D Officers. The conference members desired to investigate the main topics of flying and omit the smaller areas as contained in the syllabus.

Also scheduled were conferences with the Director of Military Training, Tactical Officers, and TA&D Officers. These personnel

desired to direct questions relating to military discipline and cadet status.

Another conference was scheduled with the Director of Academic Training, Academic Instructors, and TA&D Officers. These conference personnel desired an analysis concerning the main academic subjects; consequently a repeating series of three sentences and comments were chosen which were believed would cover each main subject area. These were as follows:

1. Was this information necessary for the adequate performance of your present assignment?
2. Indicate the degree of practical utilization of this information to your present assignment.
3. What is your opinion in regard to the amount of information presented in this subject?
4. Comments?

The questions which evolved from these conferences were agreed upon by the personnel as being the best available from each Section and also were based upon the previously described criteria relating to questionnaire format construction. These questions were also believed to be the best available for obtaining the former students' opinions of the Pilot Training Program at Vance AFB.

The trial questionnaire was submitted to a group of instructors and supervisors in each section. These personnel completed the questionnaire and also presented their opinions as to the adequacy of

the questionnaire. After receiving the opinions from these personnel, minor revisions were made and the final questionnaire was then reproduced by Multigraph Process.

Conducting Follow-up Number One. The TA&D Division next contacted the air force bases at which the former students to be surveyed were assigned. Appointments were made to interview personally these former students. Classes contacted were 49-A, 49-B, and 49-C, with a total of 333 graduates. Originally, 158 officers were scheduled to be contacted, and completed questionnaires from 106, or 67 per cent, were actually obtained. The remaining 33 per cent happened to be away from their bases on temporary duty outside of the United States or on permanent transfer at the time actual contact was made. No attempt was made to contact the 33 per cent remaining officers. Completed questionnaires were received from the following Commands:

ATRC	-	15
AU	-	7
MATS	-	25
SAC	-	22
CONAC	-	37

CONAC included 10 from Air Materiel Command. Air Materiel Command was combined with CONAC here because of similarity of positions and duties of the former students contacted.

On the flights to the various bases, a representative was included from the Academic, Military, or Flying Training Sections as well as representatives from the TA&D Division. Upon arriving at a base, a meeting would be held with the former students assigned to

that base. The mission and objective of the follow-up would be explained. The officers were asked to complete the questionnaire at that time. The questionnaires were then brought back to Vance AFB by the representatives of the TA&D Division. Because of circumstances beyond the control of personnel at Vance AFB, contact with the former students at Wright-Patterson, Brookley, Barksdale, and Maxwell AFB's was made by mail.

The answers to each question in the questionnaire were tallied, totalled by command, and the results computed on a percentage basis for ease of interpretation. All computations were by slide rule, resulting in the possibility of an error in some cases of plus or minus .3 in totalling each set of figures. Any pertinent comments from the former students were listed by commands at the end of each section in the questionnaire results.

The questionnaire results were distributed to Headquarters ATRC and FTAF, and all bases in the ATRC. The follow-up results were also given wide distribution to the students presently engaged in this Pilot Training Program. Through these results the students were able to gain much useful information concerning possible future assignments as well as worthwhile advice relating to conduct as new officers and pilots. These questionnaire results are kept on file in the Military Training Section, where the students presently in the program may refer to them as the need arises. Not infrequently instructors in the Academic Training Section use the material and

information contained therein as source material in their classes.

Follow-up Number Two to the Supervisors of the Former Students. The immediate supervisors of the former students of the Pilot Training Program at Vance AFB were contacted in the second follow-up. A second important source of data was believed to be the direct supervisors of the former students. This source would provide information as to the effectiveness of the Pilot Training Program in the training of personnel for the skills and knowledges necessary for the using agencies. The judgment of these supervisors would furnish data that would pin-point strengths and weaknesses in the Pilot Training Program at Vance AFB as reflected in the training of the former students. Such a follow-up appeared to be a logical sequence after follow-up number one.

Method of Constructing the Questionnaire of Follow-up Number Two. The same general procedure used with questionnaire number one was followed in composing questionnaire number two. During the summer of 1951, local conferences were held with appropriate training personnel in order to determine the nature of the questionnaire. Since contact was planned with the supervisory personnel of the former students, the conferees decided upon an approach in relation to the objectives of the course.

Several conferences were scheduled which included representatives from the Academic, Military, and Flying Training Sections as well as TA&D personnel at each conference. A number of main course

areas were decided upon as being the desired data to be obtained from the questionnaire. A decision was also reached to have the supervisor rate the former student in these course areas, using a rating scale based upon the same adjectives as those used in the Officer Effectiveness Report of the USAF. Thus similarity of rating scale interpretation would be approached even though the raters were widely dispersed, because all supervisors had been trained previously by the USAF schools in the use and meaning of the adjectives as contained in the Officer Effectiveness Report.

As with follow-up number one, adherence was made to the selected criteria proposed for good questionnaire format construction. The trial questionnaire was submitted to a group of instructors and supervisors in each section. These personnel completed the questionnaire and also presented their opinions as to the adequacy of the questionnaire. After receiving the opinions from these personnel, a few minor revisions were made and the final questionnaire was then reproduced by Multigraph Process. The final questionnaire was believed to be the best available for gathering opinions of the present supervisors regarding the effectiveness of the Pilot Training Program at Vance AFB as reflected by the former students of this course.

Conducting Follow-up Number Two. As with follow-up number one, personal visitations to the appropriate bases were scheduled and accomplished. Representatives from Academic, Military, and Flying Training Sections, as well as TA&D Officers, participated in these

visitations.

Classes contacted in this follow-up were 50-A through 51-A, with a total of 854 graduates. Original plans were made to contact the supervisors of 211 former students. Because of temporary duty outside the United States and permanent transfers of the former students or their supervisors, only 167 questionnaires, or 79 per cent, were actually completed by the supervisors. No attempt was made to contact the students or supervisors of the 21 per cent remaining. Completed questionnaires were received from the following Commands:

ATRC	-	50
AU	-	7
CONAC	-	21
MATS	-	49
SAC	-	40

Upon arriving at a base, the follow-up representatives held meetings with the present, immediate supervisors of the former students. The mission and objective of the follow-up were explained. The supervisors were then asked to complete the questionnaire and mail it back to Vance AFB through the use of self-addressed envelopes. This mailing procedure was adopted so that the supervisors could contact other base personnel who might have a knowledge of the former student and thus contribute to the completion of the questionnaire. After completing the meetings, the supervisors were engaged in a questioning session in which they were encouraged to express their opinions of the training program and products evolving therefrom. The resulting comments in the form of "Advice to Present Students" were incorporated

in the questionnaire results.

The results of the questionnaires were tallied, averaged, and depicted graphically in order that the reader, at a glance, might obtain a complete summary of the outcomes in all main subject areas. The average from each subject area, by command, was reported through the use of bar graphs. The bar graphs were constructed upon averages obtained by weighting each rating adjective as follows:

<u>ADJECTIVE</u>	<u>ABBREVIATION</u>	<u>WEIGHT</u>
Superior	Sup.	5
Excellent	Ex.	4
Very Satisfactory	V. S.	3
Satisfactory	S.	2
Unsatisfactory	U. S.	1

Summary. This chapter has presented some of the various methods available for the evaluation of any training program. The reason was given for the selection of the personal visitation involving the use of questionnaires. Also included was a detailed explanation concerning the composition of the two questionnaires used and a description as to how each follow-up was conducted. The next chapter will present and analyze the data obtained from follow-up number one.

CHAPTER V

PRESENTATION OF FINDINGS FOR FOLLOW-UP NUMBER ONE

Presentation and Analysis of the Data. In the analysis of the data as presented in this chapter, the reader must be cognizant of the fact that the data is presented in percentages and, because the number of questionnaires was not the same from each command, any averages would not be statistically sound. Furthermore, when reference is made in this analysis to the percentages in two or more commands, a comparison as such between the commands is not implied. The intention of such references is to draw the reader's attention to the percentages as based upon the number of questionnaires from one command and make comparison to similar data from the second command. Thus, statistical comparisons are not inferred, but relative opinions between commands are noted. The numbers in parenthesis at the head of each column in Tables I through X (follow-up number one) refer to the number of completed questionnaires received from each command, i. e., ATRC (15) indicates that the figures in that particular column were based upon fifteen questionnaires from ATRC. The elements of the training program included in the questionnaire are listed on the left side of each table in Tables I through X and the results from the respondents in each using agency are listed in tabular form on the right side of each table in Tables I through X. Recognition is made that a high degree of consensus from the respondents indicates, but

not definitely establishes, that whatever is being judged is true.

Throughout the analysis of these data the reader's attention is also drawn to the fact that all analyses are in relation to the type of missions conducted by each using agency. The analysis of the percentage figures as noted in the respective columns of Tables I through X must be continually based upon the various types of missions of the using agencies. More specifically, any percentage figure for one command should be interpreted in relation to the percentage figures from other commands in that same subject as well as to the mission of each command.

The establishment by the writer or through the use of a juror technique of a percentage scale and corresponding adjective phrases to serve as a criterion in the data analysis was considered but not used for several reasons, namely:

1. The subjectiveness of the ratings was recognized as a limitation of this study.
2. A selected percentage range used in the "Information necessary?" data would not necessarily have a similar meaning for the "Practical utilization?" or "Amount presented?" data. The antithesis would also hold true. A similar reasoning was held between certain questions in Tables I and II (Flying and Military) and the questions in Tables III through X (Academic).
3. In some instances a figure of 70 per cent, for example, would indicate a relatively high rating when compared to others in the

identical category, whereas, in other data a figure of 70 per cent may be relatively high on the percentage scale but low in comparison to other data rating 100 per cent.

4. The use of various terms in this analysis indicating relative percentage values pertains to the practical utilization of the subject in consideration to other command ratings when based upon the respective missions.

In relation to Tables III through X (Academic), the reader should be cognizant of the following. In analyzing the "Practical Utilization?" data the figures listed after the words "Average" and "Considerable" may be thought of as a unity since their combined indications would be in contrast to the "Very little" data. Similar reasoning may be applied to the "Amount presented?" data whereby the figures listed after the words "Adequate" and "Less needed" may be thought of as a unity since their combined indications would be in contrast to the "More needed" data. Relatively high percentage indications in the "Very little" and "More needed" would appear to indicate weaknesses in the subject matter section and should be interpreted in relation to the mission of the using agency so indicating.

In the Flying Training Section, Transition and Formation data as contained in Table I, each command indicated that Day and Night Transition, Single Engine Procedures, and Emergency Procedures were apparently allotted adequate time with ratings ranging from the low 70's to 100 per cent. In Transition, student self-activity rated

TABLE I

OPINIONS OF 196 FORMER STUDENTS
AS TO FLYING TRAINING

	SAC (22)	ATTC (15)	CONAC (37)	WATS (25)	AU (7)
A. Transition.					
1. Adequate time for:					
Day. Yes	*100.0	100.0	100.0	94.3	100.0
No	0	0	0	5.7	0
Night. Yes	81.9	100.0	61.5	70.6	100.0
No	18.2	0	38.5	29.4	0
2. Adequate time for single engine procedures?					
Yes	91.0	100.0	92.6	94.3	100.0
No	9.0	0	7.4	5.7	0
3. Allowed sufficient self activity?					
Yes	23.8	53.4	61.5	88.5	85.8
No	76.2	46.7	38.5	11.4	14.3
4. Enough emphasis on emergency procedures?					
Yes	72.8	73.4	74.1	77.1	85.8
No	27.2	26.7	25.9	22.9	14.3
5. When soloed, could you handle emergencies?					
Yes	91.0	73.4	88.5	91.2	100.0
No	9.0	26.7	11.5	8.8	0
B. Formation (Day)					
1. Amount of time?					
Sufficient	81.9	86.7	85.2	83.5	71.5
Not enough	18.2	0	14.8	11.4	28.6
Too much	0	13.2	0	0	0
2. Allowed sufficient self activity?					
Yes	95.5	100.0	74.1	97.1	71.5
No	4.5	0	25.9	2.9	28.6
3. Enough time on larger formations?					
Yes	40.9	33.3	37.0	31.4	0
No	59.0	66.7	62.9	68.5	100.0
4. High altitude formation?					
Sufficient	45.5	60.0	77.8	63.1	28.6
Not enough	54.5	40.0	22.2	36.9	71.5
Too much	0	0	0	0	0
C. Formation (Night)					
1. Flown any night formation since graduation?					
Yes	0	66.7	0	0	0
No	100.0	33.3	100.0	100.0	100.0

*All figures in percentages

TABLE I (Continued)

	SAC	ATRC	CONAC	MATS	AU
	(22)	(15)	(37)	(25)	(7)
D. Navigation					
1. Proper time allotted?					
Yes	*95.5	86.7	77.8	91.4	100.0
No	4.5	13.2	22.2	8.6	0
2. Practical application sufficient?					
Yes	59.0	73.4	46.2	71.4	85.8
No	40.9	26.7	53.9	28.6	14.3
3. Sufficient self activity?					
Yes	91.0	100.0	70.4	91.0	100.0
No	9.0	0	29.6	9.0	0
4. Emphasis on navigation?					
More	86.4	100.0	92.6	94.3	100.0
Less	13.6	0	7.4	5.7	0
5. Training qualify you for flight duties?					
Yes	72.8	100.0	85.2	68.5	100.0
No	27.2	0	14.8	31.4	0
E. Instruments					
1. Training sufficient?					
Yes	95.5	100.0	83.5	79.5	85.8
No	4.5	0	11.5	20.6	14.3
2. Enough time given?					
Yes	81.9	100.0	92.6	94.3	71.5
No	18.2	0	7.4	5.7	28.6
3. Receive a weather flight?					
Yes	72.8	66.7	57.7	70.6	85.8
No	27.2	33.3	42.4	29.4	14.3
4. Enough time on following?					
**ADF. Yes	81.9	100.0	85.2	76.5	85.8
No	18.2	0	14.8	23.5	14.3
VAR. Yes	27.2	33.3	46.2	25.7	71.5
No	72.8	66.7	53.9	74.3	28.6
ILS. Yes	36.4	21.4	32.0	15.1	14.3
No	63.6	78.5	68.0	85.0	85.8
CCA. Yes	31.8	100.0	74.1	74.3	71.5
No	68.2	0	25.9	25.7	28.6
RO. Yes	86.4	100.0	85.2	82.9	100.0
No	13.6	0	14.8	17.3	0
ID. Yes	81.9	93.4	55.5	71.4	71.5
No	18.2	6.7	44.4	28.6	28.6
LA. Yes	72.8	100.0	51.8	68.5	71.5
No	27.2	0	48.1	31.4	28.6

*All figures in percentages

**Abbreviations: ADF-Automatic Direction Finder; VAR-Visual Aural

Range; ILS-Instrument Landing System; CCA-Ground Controlled Approach;

RO-Range Orientation; ID-Let Down; LA-Low Approach.

relatively low, 33.8 to 88.5 per cent. All commands indicated an apparent need for more time to be spent on large formation flying. More time on High Altitude Formation flying was indicated by SAC and AU. Such requests for more time were understandable from SAC, MATS, and ATRC when considered in light of their missions but were difficult to understand from AU with the possible explanation that the former students assigned to AU actually desired more time to be given to this subject. Certainly the main type of missions flown by AU would not justify such additional time request. All commands indicated, 73.4 to 100 per cent, that the flying training received assisted them in handling any emergencies when flying solo.

With respect to the data on Navigation and Instrument flying as presented in Table I, all questions pertaining to Navigation indicated apparent command-wide satisfaction. Practical application of Navigation received favorable ratings from all commands, but a need for more emphasis on practical application of Navigation was shown since the percentages ranged from 46.2 to 85.8 per cent. All commands indicated a fairly high agreement, 79.5 to 100 per cent, upon the sufficiency of the Instrument training. Enough time, apparently, was devoted to Instrument training, and most of the former students received a weather flight. The effectiveness of the training given in some instrument flying aids was doubtful. For example: VAB (Visual Aural Range) is practically non-existent in the USAF. ILS (Instrument Landing System) has not been used in the past, since very few air force

bases are so equipped. More emphasis recently (1952) is being placed upon this system, and there will probably be an increase in the need for, as well as training for, the ILS. ADF (Automatic Direction Finding) is used mainly overseas, and in some emergencies in the United States. Effectiveness of training in these various instrument flying aids obviously varied with use in the commands. Training in some of these aids was given for familiarization only.

As to the Military Training Section data listed in Table II, all commands indicated that they had been subjected to a "Moderate" or "Strict" cadet class system. Each command, however, recommended that future cadet classes be given the same type of class system to which they believed they had been subjected. The data indicated that apparently not all cadets were given the opportunity to be a cadet officer or actually to serve as a cadet officer. All commands appeared to be in agreement that little opportunity was given to make decisions or be trained in making decisions. In relation to the class system, all commands indicated, 78.5 to 100 per cent, that the discipline received as a cadet was adequate. The former students in all commands were apparently honest in stating that "Open Post" privileges should not be allowed every night, but that week-end privileges were ample. All commands indicated, 91.0 to 100 per cent, their desire for a course on the subject of "New Officer Etiquette" for students.

In the Academic Training Section with regard to Aircraft Engineering, Normal and Emergency Operation of the Airplane, Engine

TABLE II

OPINIONS OF 106 POLICE STUDENTS
AS TO MILITARY TRAINING

	SAC (22)	ATRC (15)	CONAC (37)	MAIS (25)	AU (7)
A. Class System.					
1. Type class system on your class?					
None or little	*0	14.3	3.7	2.9	0
Moderate	23.8	42.8	40.7	67.7	14.3
Strict	76.2	42.8	55.5	29.4	85.8
2. Which type class system you recommend?					
None or little	0	7.2	7.4	0	0
Moderate	42.8	28.6	48.1	65.6	42.9
Strict	57.2	64.2	44.4	34.3	57.2
B. Officer Opportunity.					
1. Given opportunity to be a Cadet Officer?					
Yes	57.2	93.0	51.8	48.6	71.5
No	42.8	7.2	48.1	51.4	28.6
2. Actually serve as a Cadet Officer?					
Yes	52.4	93.0	33.3	17.3	42.9
No	47.6	7.2	66.7	82.9	57.2
C. Discipline.					
1. Opportunity to make decisions?					
Yes	33.3	35.6	33.3	22.9	14.3
No	66.7	64.4	66.7	77.1	85.8
2. Discipline received as a cadet?					
Too much	14.3	0	11.1	11.4	0
Too little	4.8	21.4	7.4	2.9	0
Adequate	81.0	78.5	81.5	85.9	100.0
D. Discipline.					
1. "Open Post" privileges?					
Every night	0	0	5.1	0	0
Not at all	0	0	0	0	0
Week ends only	70.0	82.5	64.0	81.0	70.0
None for lower class	30.0	17.5	30.8	19.0	30.0
2. Need a course in "New Officer Etiquette"?					
Yes	91.0	100.0	92.6	91.4	100.0
No	9.0	0	7.4	8.6	0

*All figures in percentages

Systems, and Propeller, Weight and Balance, and Operational Problems as shown in Table III, most commands rated relatively high, varying their need of the information contained in these subjects from 76.2 to 100 per cent. ATRC and AU indicated relatively little, 13.2 to 28.6 per cent, necessity of the information of Weight and Balance, whereas CONAC, SAC, and MATS rated rather high, 76.2 to 100 per cent, the need of this information. Such indications are understandable when concern is given to the varying missions of the commands.

The practical utilization and amount presented in the four subjects of Aircraft Engineering referred to in Table III were highly rated by all commands with the above noted exceptions of ATRC and AU in Weight and Balance. SAC indicated only 52.4 per cent very little practical utilization of Weight and Balance. Such a rating may be due to the fact that in almost all cases the engineer on a SAC crew is responsible for all Weight and Balance calculations, thus relieving the pilot of such duties. Both ATRC and AU indicated that more Operational problems should have been presented.

With respect to Weather, Surface Weather Map Analysis, Use of Weather Reports and Forecasts, and Map Problems as presented in Table IV, all were rated quite favorably by the commands, ranging from 75 to 100 per cent, as necessary information. In fact, all commands were very strong in rating the above three subjects as not only necessary for the adequate performance of their present assignments

TABLE III

OPINIONS OF 106 FORMER STUDENTS
AS TO AIRCRAFT ENGINEERING

	SAC (22)	ATRC (15)	CONAC (37)	MATS (25)	AU (7)
1. Operation of Airplane and Engine Systems					
a. Information necessary? Yes	*86.4	100.0	96.3	100.0	85.8
No	13.6	0	3.7	0	14.3
b. Practical utilization?					
Very little	22.7	6.7	7.4	11.4	28.6
Average	31.8	20.0	40.7	51.4	57.2
Considerable	45.5	73.4	51.8	37.1	14.3
c. Amount presented?					
More needed	18.2	26.7	33.3	26.5	14.3
Adequate	77.4	73.4	62.9	73.5	85.8
Less needed	4.5	0	3.7	0	0
2. Normal & Emergency Operation of the Propeller					
a. Information necessary? Yes	95.5	100.0	100.0	94.3	85.8
No	4.5	0	0	5.7	14.3
b. Practical utilization?					
Very little	23.8	0	7.4	8.8	28.6
Average	57.2	60.0	66.7	64.7	57.2
Considerable	19.0	40.0	25.9	26.5	14.3
c. Amount presented?					
More needed	9.5	6.7	3.7	3.3	0
Adequate	90.5	93.4	92.6	96.7	100.0
Less needed	0	0	3.7	0	0
3. Weight and Balance					
a. Information necessary? Yes	76.2	13.2	100.0	100.0	28.6
No	23.8	86.7	0	0	71.5
b. Practical utilization?					
Very little	52.4	73.4	3.7	0	100.0
Average	23.8	26.7	18.5	20.0	0
Considerable	23.8	0	77.8	80.0	0
c. Amount presented?					
More needed	14.3	6.7	40.7	26.5	50.0
Adequate	81.0	93.4	59.2	76.5	50.0
Less needed	4.8	0	0	0	0
4. Operational Problems					
a. Information necessary? Yes	81.0	86.7	96.3	94.1	100.0
No	19.0	13.2	3.7	5.8	0
b. Practical utilization?					
Very little	42.8	20.0	11.1	6.1	0
Average	47.6	60.0	62.9	60.6	85.8
Considerable	9.5	20.0	25.9	33.3	14.3
c. Amount presented?					
More needed	23.8	50.0	18.5	31.2	50.0
Adequate	71.5	50.0	77.8	68.7	50.0
Less needed	4.8	0	3.7	0	0

*All figures in percentages

TABLE IV

OPINIONS OF 106 FUTURE STUDENTS
AS TO WEATHER

	SAC (22)	ATRC (15)	CONAC (37)	MAIS (25)	AU (7)
1. Surface Weather Map Analysis					
a. Information necessary? Yes	86.4	100.0	92.6	94.3	100.0
No	13.6	0	7.4	5.7	0
b. Practical utilization?					
Very little	36.1	0	18.5	8.6	0
Average	28.6	40.0	44.4	48.6	85.8
Considerable	33.3	60.0	37.0	42.9	14.3
c. Amount presented?					
More needed	4.5	6.7	11.5	11.4	0
Adequate	86.4	93.4	84.6	88.5	100.0
Less needed	9.0	0	3.8	0	0
2. Use of Weather Reports and Forecasts					
a. Information necessary? Yes	95.0	100.0	100.0	100.0	100.0
No	5.0	0	0	0	0
b. Practical utilization?					
Very little	30.0	0	11.1	0	0
Average	35.0	53.4	29.6	22.9	100.0
Considerable	35.0	46.7	59.2	77.1	0
c. Amount presented?					
More needed	9.5	20.0	14.8	23.5	14.3
Adequate	85.8	80.0	85.2	76.5	85.8
Less needed	4.8	0	0	0	0
3. Map Problems					
a. Information necessary? Yes	75.0	86.7	85.2	77.1	100.0
No	25.0	13.2	14.8	22.9	0
b. Practical utilization?					
Very little	38.1	13.2	22.2	31.4	0
Average	61.9	40.0	59.2	37.1	100.0
Considerable	0	46.7	18.5	31.4	0
c. Amount presented?					
More needed	0	0	3.7	5.8	14.3
Adequate	95.0	100.0	92.6	94.1	85.8
Less needed	5.0	0	3.7	0	0

*All figures in percentages

TABLE IV (Continued)

	SAC (22)	ATRC (15)	CONAC (37)	MAIS (25)	AV (7)
4. Upper Air Analysis					
a. Information necessary? Yes	*80.0	33.3	57.7	71.4	57.2
No	20.0	66.7	42.4	28.6	42.8
b. Practical utilization?					
Very little	38.1	66.7	61.6	32.4	57.2
Average	42.8	33.3	30.8	53.0	42.9
Considerable	19.0	0	7.7	14.7	0
c. Amount presented?					
More needed	23.8	6.7	3.8	5.8	28.6
Adequate	76.2	80.0	88.5	91.2	71.5
Less needed	0	13.2	7.7	2.9	0
5. Atmospheric Cross Sections					
a. Information necessary? Yes	80.0	40.0	74.1	68.5	42.9
No	20.0	60.0	25.9	31.4	57.2
b. Practical utilization?					
Very little	45.0	60.0	42.4	40.0	71.5
Average	30.0	40.0	46.2	48.6	28.6
Considerable	25.0	0	11.5	11.4	0
c. Amount presented?					
More needed	9.5	6.7	0	5.7	14.3
Adequate	85.8	86.7	88.9	91.4	85.8
Less needed	4.8	6.7	11.1	2.9	0
6. Flight Problems					
a. Information necessary? Yes	90.0	86.7	96.3	94.3	85.8
No	10.0	13.2	3.7	5.7	14.3
b. Practical utilization?					
Very little	35.0	6.7	3.7	11.4	28.6
Average	55.0	53.4	66.7	51.4	42.9
Considerable	10.0	40.0	29.6	37.1	28.6
c. Amount presented?					
More needed	14.3	13.2	25.9	6.1	0
Adequate	85.8	86.7	74.1	94.0	100.0
Less needed	0	0	0	0	0

*All figures in percentages

but highly practical in their present assignments.

In relation to Weather, Upper Air Analysis, Atmospheric Cross Sections, and Flight Problems referred to in Table IV, once again most commands indicated the necessity for the above three subjects in the performance of their present assignments. Atmospheric Cross Section information rated as low as 40.0 per cent by ATRC and was not too necessary for the adequate performance of present assignments in CONAC and AU. ATRC also indicated a low, 33.3 per cent, necessity for Upper Air Analysis with CONAC, and AU indicated only a slightly higher necessity of this subject. Even though the practical utilization of Upper Air Analysis and Atmospheric Cross Sections was low, the amount of subject matter presented was adequate for all commands. Such reasoning is understandable when concern is given to the missions of these commands. Flight Problems were rated as a necessity by all commands and were also put to practical utilization. The amount of subject matter presented was very adequate.

In reference to Navigation, E-6B Computer, Radio Aids to Navigation, and Use of Radio Compass, Lines of Position, Bearings, and Fixes as noted in Table V, all commands rated relatively high these subjects as information necessary for the adequate performance of their present assignments, the lowest rate being 57.2 per cent by SAC on the E-6B Computer. General consensus was also to the effect that these subjects were practically utilized in their present assignments and, in fact, more information was requested in several cases

TABLE V

OPINIONS OF 106 FOREIGN STUDENTS
AS TO NAVIGATION

	SAC (22)	AZRC (15)	CGTAG (37)	HAAS (25)	AJ (7)
1. Review of the E-6B Computer					
a. Information necessary? Yes	57.2	93.4	92.6	100.0	100.0
No	42.8	6.7	7.4	0	0
b. Practical utilization?					
Very little	90.5	6.7	7.4	0	0
Average	9.5	60.0	33.3	17.3	100.0
Considerable	0	33.3	55.5	82.9	0
c. Amount presented?					
More needed	0	0	3.7	3.3	0
Adequate	95.5	100.0	92.6	96.7	100.0
Less needed	4.5	0	3.7	0	0
2. Radio Aids to Navigation					
a. Information necessary? Yes	95.3	100.0	100.0	100.0	100.0
No	4.8	0	0	0	0
b. Practical utilization?					
Very little	23.8	0	0	0	0
Average	42.8	40.0	14.8	5.7	100.0
Considerable	33.3	60.0	85.2	94.3	0
c. Amount presented?					
More needed	9.5	6.7	37.0	50.0	14.3
Adequate	90.5	93.4	62.9	50.0	85.8
Less needed	0	0	0	0	0
3. Use of Radio Compass, Lines of Position, Bearings, Fixes					
a. Information necessary? Yes	71.5	93.4	77.8	100.0	100.0
No	28.6	6.7	22.2	0	0
b. Practical utilization?					
Very little	52.4	20.0	22.2	0	0
Average	42.3	53.4	48.1	62.9	100.0
Considerable	4.8	26.7	29.6	37.1	0
c. Amount presented?					
More needed	5.0	6.7	25.9	19.2	0
Adequate	95.0	93.4	74.1	81.9	100.0
Less needed	0	0	0	0	0

All figures in percentages

as noted by CONAC and MATS in Radio Aids to Navigation. SAC did not rate as high as the other commands the practical utilization of all three of these subjects. This may be due to the fact that a SAC crew always has a navigator in addition to the pilots, and the use of navigational techniques does not always belong to the duties of the pilot.

Referring to Table V, which includes the subjects of High and Low Level Navigational Procedures, Night Navigational Procedures, and Chart Problems, all commands, with the exception of SAC and for the reason explained above, rated these subjects relatively high as being necessary for the adequate performance of their present assignments. General consensus, ranging from 71.5 to 100 per cent was evident as to the adequacy of the amount of information presented in these three subjects. MATS rated the degree of practical utilization of Night Navigational Procedures rather high, 48.6 per cent, and understandably so with reference to its missions.

With respect to Flight Planning, Flight Rules and Regulations, Flight Service Facilities, and Base Operations and Weather Office Facilities data as presented in Table VI, all commands rated these three subjects very high, with ratings from 81 to 100 per cent, indicating necessity of this information. Utilization and amount presented received high ratings, indicating the importance of these three subjects in the using agencies.

In relation to Navigation, Use of Radio Facility Charts, and Pilot Procedures for GCA (Ground Controlled Approach) referred to in

TABLE VI

OPINIONS OF 106 FORTH STUDENTS
AS TO FLIGHT PLANNING

	SAC (22)	ATTC (15)	CONAC (37)	MATS (25)	AU (7)
1. Flight Rules and Regulations					
a. Information necessary? Yes	95.3	100.0	100.0	97.1	100.0
No	4.8	0	0	2.9	0
b. Practical utilization?					
Very little	28.6	0	0	0	0
Average	14.3	40.0	40.7	11.4	100.0
Considerable	57.2	60.0	59.2	88.5	0
c. Amount presented?					
More needed	36.4	40.0	40.7	45.7	28.6
Adequate	59.0	60.0	59.2	54.3	71.5
Less needed	4.5	0	0	0	0
2. Flight Service Facilities					
a. Information necessary? Yes	95.3	93.4	96.3	100.0	100.0
No	4.8	6.7	3.7	0	0
b. Practical utilization?					
Very little	28.6	13.2	11.1	2.9	0
Average	33.3	53.4	51.8	31.4	100.0
Considerable	38.1	33.3	37.0	65.6	0
c. Amount presented?					
More needed	23.8	6.7	18.5	25.7	14.3
Adequate	71.5	93.4	74.1	74.3	85.8
Less needed	4.8	0	7.4	0	0
3. Base Operations & Weather Office Facilities					
a. Information necessary? Yes	81.0	86.7	100.0	100.0	100.0
No	19.0	13.2	0	0	0
b. Practical utilization?					
Very little	33.3	13.2	0	0	0
Average	19.0	46.7	59.2	22.9	100.0
Considerable	47.6	40.0	40.7	77.1	0
c. Amount presented?					
More needed	42.8	26.7	22.2	22.9	0
Adequate	57.2	73.4	77.8	77.1	100.0
Less needed	0	0	0	0	0

*All figures in percentages

TABLE VI (Continued)

	SAC (22)	ATRC (15)	COMAC (37)	EMTS (25)	AU (7)
4. Use of Radio Facility Charts					
a. Information necessary? Yes	95.0	100.0	100.0	100.0	100.0
No	5.0	0	0	0	0
b. Practical utilization?					
Very little	9.5	6.7	0	0	0
Average	36.1	60.0	25.9	5.7	71.5
Considerable	52.4	33.3	74.1	94.3	28.6
c. Amount presented?					
More needed	14.3	6.7	37.0	17.3	14.3
Adequate	85.8	93.4	62.9	82.9	85.8
Less needed	0	0	0	0	0
5. Pilot Procedures in Use of GCA					
a. Information necessary? Yes	100.0	86.7	100.0	100.0	85.8
No	0	13.2	0	0	14.3
b. Practical utilization?					
Very little	14.3	13.2	3.7	2.9	28.6
Average	36.1	60.0	33.3	42.9	71.5
Considerable	47.6	26.7	62.9	54.3	0
c. Amount presented?					
More needed	42.9	13.2	30.3	14.3	28.6
Adequate	57.2	86.7	68.4	85.9	71.5
Less needed	0	0	0	0	0

*All figures in percentages

Table VI, all commands again rated these two subjects very high, 85.8 to 100 per cent, in necessity of this information to the performance of present assignments. AU indicated Pilot Procedures of GCA as being of little, 28.6 per cent, practical utilization to their present assignments. Perhaps these former students assigned to AU have not been required to use GCA, which is a blind landing aid in extreme adverse weather conditions, and thus rated in the manner indicated.

In reference to Radio Communications, Operation of VHF Command Sets and Homing Adapter, Operation of IFF Set, and Operation of Interphone Equipment and Dinghy Radio Set as noted in Table VII,

TABLE VII

OPINIONS OF 106 FORMER STUDENTS
AS TO RADIO COMMUNICATIONS

	SAC (22)	ATEC (19)	CONAC (57)	WATS (25)	AM (4)
1. Operation of VHF Command Set & Honing Adapter					
a. Information necessary? Yes	95.0	100.0	96.3	100.0	85.8
No	5.0	0	3.7	0	14.2
b. Practical utilization?					
Very little	19.0	0	3.7	2.9	14.3
Average	28.6	66.7	62.9	42.9	71.5
Considerable	52.4	13.2	33.3	54.3	14.3
c. Amount presented?					
More needed	19.0	0	14.8	14.3	42.9
Adequate	76.2	100.0	81.5	85.9	57.2
Less needed	4.8	0	3.7	0	0
2. Operation of the IFF Set					
a. Information necessary? Yes	57.2	0	40.7	14.7	14.3
No	42.8	100.0	59.2	85.4	85.8
b. Practical utilization?					
Very little	71.5	100.0	88.9	78.8	100.0
Average	4.8	0	7.4	15.1	0
Considerable	23.8	0	3.7	6.1	0
c. Amount presented?					
More needed	23.8	33.3	7.7	12.1	42.9
Adequate	71.5	66.7	73.0	85.0	42.9
Less needed	4.8	20.0	19.2	3.3	14.3
3. Operation of Interphone Equipment & Dinghy Radio					
a. Information necessary? Yes	90.5	60.0	66.7	45.7	85.8
No	9.5	40.0	33.3	54.3	14.3
b. Practical utilization?					
Very little	19.0	50.0	59.2	79.5	28.6
Average	52.4	28.6	40.7	20.6	71.5
Considerable	28.6	21.4	0	0	0
c. Amount presented?					
More needed	19.0	6.7	0	6.1	14.3
Adequate	81.0	80.0	92.6	91.0	85.8
Less needed	0	13.2	7.4	3.3	0

*All figures in percentages

TABLE VII (Continued)

	SAC (22)	ATRC (15)	CONAC (37)	MATS (25)	AU (7)
7. Operation of Radio Compass					
a. Information necessary? Yes	*95.3	100.0	100.0	100.0	100.0
No	4.8	0	0	0	0
b. Practical utilization?					
Very little	19.0	6.7	3.7	0	0
Average	47.6	60.0	40.7	14.3	71.5
Considerable	33.3	33.3	55.5	85.9	28.6
c. Amount presented?					
More needed	4.8	0	14.8	5.7	14.3
Adequate	95.3	100.0	85.2	94.3	85.8
Less needed	0	0	0	0	0
8. Standard Interphone Pro- cedures & Review of Radio Telephone Procedures					
a. Information necessary? Yes	95.3	93.4	100.0	82.9	100.0
No	4.8	6.7	0	17.3	0
b. Practical utilization?					
Very little	4.8	6.7	3.7	17.3	0
Average	52.4	46.7	51.8	25.7	85.8
Considerable	42.8	46.7	44.4	57.2	14.3
c. Amount presented?					
More needed	10.0	13.2	14.8	2.9	14.3
Adequate	90.0	86.7	85.2	94.1	85.8
Less needed	0	0	0	2.9	0
9. Security Measures					
a. Information necessary? Yes	95.5	35.6	77.8	60.0	100.0
No	4.5	64.4	22.2	40.0	0
b. Practical utilization?					
Very little	13.6	72.0	29.6	51.4	14.3
Average	27.2	21.4	59.2	42.9	71.5
Considerable	59.0	7.2	11.1	5.7	14.3
c. Amount presented?					
More needed	42.8	7.7	18.5	11.4	28.6
Adequate	57.2	84.5	81.5	88.5	71.5
Less needed	0	7.7	0	0	0

*All figures in percentages

all commands varied in their ratings of these three subjects. SAC and MATS indicated considerable practical utilization, 52.4 and 54.3 per cent respectively, of VHF Command Sets and Homing Adapter, and all commands rated quite high, 85.8 to 100 per cent, the necessity of the information of these radios. The VHF (Very High Frequency) is the main radio used in cross country flights in relation to position reports, weather requests, and the like. Because of the missions of SAC and MATS, the reason for the high utilization is obvious. All commands except SAC, 57.2 per cent, indicated a relatively low need for the IFF Set. This was understandable because SAC, being the only direct combat command, used the IFF Set. IFF is the abbreviation for Identification Friend or Foe, which is an automatic code radio for the identification of aircraft during combat missions. SAC also indicated a relatively high rating, 23.8 per cent, in contrast to the other commands as to the degree of practical utilization of the IFF Set. In the Operation of Interphone and Dinghy Radio Set, an apparent discrepancy existed in considering the use of this equipment in relation to the mission of MATS. MATS gave a relatively low rating, 45.7 per cent, as to the necessity of this information for the adequate performance of their present assignments. Actually the rating by MATS indicating the necessity of this equipment was almost evenly divided, with a slight balance in favor of "No."

With regard to Radio Communication, Operation of Liaison Set, Operation of ILS and GCA, and Familiarization with VAR, VOR, and

VHF Radio Ranges as shown in Table VII, variation in ratings was again evident. The Liaison Set is a radio set with exceptionally long distance ability and is used primarily in combat service or any other situation where long distance contact must be made. The reason for the relatively high ratings as to the necessity of the information on the Liaison Set by SAC, 66.7 per cent, and MATS, 91.4 per cent, is then readily understandable, but not by CONAC with a rating of 77.8 per cent. An explanation could be to the effect that the pilots surveyed in CONAC have had some need to use the Liaison Set in their particular flights and thus indicated so in answer to the question. The ratings by all commands were relatively high, 73.4 to 100 per cent, in necessity for information on the ILS and GCA training. VAR (Visual Aural Range), VOR (Visual Omni Range), and VHF (Very High Frequency) Radio Ranges received fairly high ratings from all commands except ATRC, 33.3 per cent, as to the necessity of this information. VAR is used mainly in airline type operation flights, and this was reflected mainly in the rating from MATS, 77.1 per cent, and also from CONAC, 68.4 per cent.

With respect to Radio Communications, Operation of Radio Compass, Standard Interphone Procedures and Review of Radio Telephone Procedures, and Security Measures as presented in Table VII, all commands indicated a high, 77.8 to 100 per cent, need for information in the above three subjects with the exception of ATRC and MATS, with ratings of 35.6 and 60.0 per cent, as to the need of Security Measures

information necessary for the adequate performance of their present assignments. The ATRC former students (Flight Instructors) contacted in this follow-up survey would have very little practical utilization, 72.0 per cent, for, or access to, secret information in the function of their assignments. In contrast, SAC indicated considerable, 59.0 per cent, practical utilization of Security Measures information. Such a rating is obvious when related to the mission of SAC.

Referring to Table VIII, which included the subject of Fundamentals of Cruise Control; Factors Affecting Airplane, Engine, and Propeller Efficiency; Use of Flight Operating Charts; and Solution of Cruise Control Problems, the ratings again varied in relation to command mission. In Fundamentals of Cruise Control all commands rated high, 76.2 to 100 per cent, the need for this information in the adequate performance of their present assignments. ATRC, which teaches Cruise Control, and MATS, which uses it extensively, rated the practical utilization relatively high, 46.7 and 40.0 per cent. SAC, which would always have an engineer to operate the engines, agreed that Cruise Control was necessary, 76.2 per cent, but actually utilized it very little, 57.2 per cent. All commands were very high in their ratings as to the necessity of a practical utilization for the Factors Affecting Airplane, Engine, and Propeller Efficiency, as this information may be applied to any conventional aircraft. The need for the information in Use of Flight Operating Charts was rated fairly high, 60.0 to 96.2 per cent, by all commands. The Solution of Cruise

TABLE VIII
OPINIONS OF 106 FORMER STUDENTS
AS TO CRUISE CONTROL

	SAC (22)	ATRC (15)	CONAG (37)	MATS (25)	AV (7)
1. Fundamentals of Cruise Control					
a. Information necessary? Yes	*76.2	93.4	92.6	85.9	100.0
No	23.8	6.7	7.4	14.3	0
b. Practical utilization?					
Very little	57.2	13.2	11.1	14.3	0
Average	14.3	40.0	59.2	45.7	100.0
Considerable	28.6	46.7	29.6	40.0	0
c. Amount presented?					
More needed	14.3	13.2	11.1	0	28.6
Adequate	85.8	86.7	88.9	97.0	71.5
Less needed	0	0	0	2.9	0
2. Factors Affecting Airplane, Engine, & Prop. Efficiency					
a. Information necessary? Yes	90.5	100.0	88.9	94.3	100.0
No	9.5	0	11.1	5.7	0
b. Practical utilization?					
Very little	23.8	0	14.8	8.6	0
Average	61.9	66.7	70.4	77.1	85.8
Considerable	14.3	33.3	14.8	14.3	14.3
c. Amount presented?					
More needed	19.0	13.2	11.1	8.8	42.9
Adequate	81.0	86.7	81.5	91.2	57.2
Less needed	0	0	7.4	0	0
3. Use of Flight Operating Charts					
a. Information necessary? Yes	85.0	60.0	96.2	71.4	85.8
No	15.0	40.0	3.8	28.6	14.3
b. Practical utilization?					
Very little	47.6	46.7	11.5	28.6	14.3
Average	23.8	40.0	77.0	60.0	85.8
Considerable	28.6	13.2	11.5	11.4	0
c. Amount presented?					
More needed	19.0	7.2	11.5	2.9	28.6
Adequate	76.2	93.0	88.5	97.1	71.5
Less needed	4.8	0	0	0	0
4. Solution of Cruise Control Problems					
a. Information necessary? Yes	60.0	40.0	81.5	60.0	85.8
No	40.0	60.0	18.5	40.0	14.3
b. Practical utilization?					
Very little	66.7	60.0	37.0	48.6	14.3
Average	19.0	33.3	51.8	42.9	71.5
Considerable	14.3	6.7	11.1	8.6	14.3
c. Amount presented?					
More needed	9.5	0	11.1	2.9	42.9
Adequate	85.8	93.4	88.9	91.4	57.2
Less needed	4.8	6.7	0	5.7	0

*All figures in percentages

Control Problems was indicated by all commands, 60.0 to 85.8 per cent, as necessary information for the performance of their present assignments except by ATRC, 40.0 per cent. The ATRC former students were all Flight Instructors. As such, these instructors do not have to teach Cruise Control Problems but merely supervise the student in the practical application of these problems and as such would not utilize this subject extensively. SAC also indicated very little practical utilization, 66.7 per cent, of this subject, probably due to the use of a flight engineer on each crew.

In reference to Electronics and Radar; Fundamentals of Electricity; Magnetic Fields and Generators; Ohm's Law, Alternating Current, and Principles of Vacuum Tubes; Fundamentals of Radio Receivers, Radio Transmitters and Radar Equipment; Function and Use of Various Types of Radar Sets as noted in Table IX, all the commands were not in close agreement, probably because of the variance in missions, as to the utilization and necessity of the above subjects. Shortly after this follow-up survey was completed, the subjects of Electronics and Radar were transferred to the Basic Pilot Training Schools. Since the subjects are not now being taught at Vance AFB, analysis of this section was not made, as such analysis would serve no practical purpose to the present Pilot Training Program at Vance AFB. General consensus was to the effect that these subjects were not utilized extensively in the performance of their assignments. The results are included in this study, however, for general information and reference.

TABLE IX
OPINIONS OF 106 FORMER STUDENTS
AS TO ELECTRONICS AND RADAR

	SAC (22)	ATRC (15)	CONAC (37)	MATS (25)	AU (7)
1. Fundamentals of Elect., Magnetic Fields & Generators					
a. Information necessary? Yes	85.8	60.0	59.2	54.3	71.5
No	14.3	40.0	40.7	45.7	28.6
b. Practical utilization?					
Very little	52.4	66.7	44.4	64.7	42.9
Average	33.3	33.3	51.8	35.3	57.2
Considerable	14.3	0	3.7	0	0
c. Amount presented?					
More needed	30.0	13.2	22.2	5.8	42.9
Adequate	65.0	86.7	55.5	85.4	57.2
Less needed	5.0	0	22.2	8.8	0
2. Ohm's Law, Alternating Current, & Vacuum Tubes					
a. Information necessary? Yes	52.4	40.0	48.1	25.7	42.9
No	47.6	60.0	51.8	74.3	57.2
b. Practical utilization?					
Very little	85.8	86.7	67.9	85.4	85.8
Average	9.5	13.2	37.0	14.7	14.3
Considerable	4.8	0	0	0	0
c. Amount presented?					
More needed	14.3	0	7.7	2.9	14.3
Adequate	66.7	86.7	61.6	76.5	85.8
Less needed	19.0	13.2	30.8	20.6	0
3. Fundamentals of Radio Rec's, Radio Trans. & Radar Eq.					
a. Information necessary? Yes	90.5	73.4	62.9	82.9	85.8
No	9.5	26.7	37.0	17.3	14.3
b. Practical utilization?					
Very little	47.6	46.7	48.1	26.5	14.3
Average	38.1	53.4	48.1	64.7	85.8
Considerable	14.3	0	3.7	8.8	0
c. Amount presented?					
More needed	14.3	6.7	7.4	11.8	42.9
Adequate	85.8	80.0	70.4	79.5	57.2
Less needed	0	13.2	22.2	8.8	0
4. Function & Use of Radar Sets Used in the AF					
a. Information necessary? Yes	81.0	26.7	55.5	37.1	14.3
No	19.0	73.4	44.4	62.9	85.8
b. Practical utilization?					
Very little	52.4	80.0	62.9	75.8	85.8
Average	23.8	13.2	33.3	21.2	14.3
Considerable	23.8	6.7	3.7	3.3	0
c. Amount presented?					
More needed	52.4	21.4	40.7	25.0	28.6
Adequate	47.6	72.0	48.1	62.5	57.2
Less needed	0	7.2	11.1	12.5	14.3

*All figures in percentages

With regard to Physiological Training; Physiological Effects of Altitude, Physiological Effects of Acceleration, Night Vision, and Sensory Illusions of Flight as shown in Table X, all commands rated fairly high, 60.0 to 100 per cent, the necessity of these subjects with the exception of Physiological Effects of Acceleration, 28.6 to 57.2 per cent. Effects of Acceleration were included in the syllabus primarily for information, since such effects pertain predominately to jet aircraft and unusual situations in conventional airplanes. SAC logically desired more information than the other commands on Altitude Effects, as the practical utilization of this subject in SAC was considerable. The information presented in the subjects of Night Vision and Sensory Illusions of Flight as shown by the data in Table X, appeared to be necessary to all commands for the practical performance of the present assignments. Such ratings are understandable because all pilots are required to perform certain types of flying which include night or instrument flying.

With respect to Physiological Training, Physiological Effects of Speed, Emergency Procedures, Oxygen Equipment, and Pre-Chamber Flight Indoctrination as presented in Table X, as could be expected, most commands indicated a low need, 26.7 to 71.5 per cent, for the Effects of Speed. Such a subject was included in the syllabus primarily for indoctrination and information rather than for practical utilization, except in emergency conditions, in all assignments. All commands rated relatively high, 73.4 to 100 per cent, the necessity for

TABLE X

OPINIONS OF 106 FORMER STUDENTS
AS TO PHYSIOLOGICAL TRAINING

	SAC (22)	ATRC (15)	CONAC (37)	MATS (25)	AU (7)
1. Physiological Effects of Altitude					
a. Information necessary? Yes	*95.3	60.0	85.2	80.0	71.5
No	4.8	40.0	14.8	20.0	28.6
b. Practical utilization?					
Very little	14.3	64.4	22.2	37.1	28.6
Average	23.8	28.6	62.9	60.0	71.5
Considerable	61.9	7.2	14.8	2.9	0
c. Amount presented?					
More needed	28.6	0	14.8	5.7	0
Adequate	71.5	100.0	77.8	91.4	85.8
Less needed	0	0	7.4	2.9	14.3
2. Physiological Effects of Acceleration					
a. Information necessary? Yes	42.8	40.0	37.0	28.6	57.2
No	57.2	60.0	62.9	71.4	42.9
b. Practical utilization?					
Very little	71.5	80.0	70.4	82.4	57.2
Average	23.8	20.0	29.6	17.6	42.9
Considerable	4.8	0	0	0	0
c. Amount presented?					
More needed	0	0	0	2.9	0
Adequate	90.0	86.0	88.9	94.1	100.0
Less needed	10.0	14.0	11.1	2.9	0
3. Night Vision					
a. Information necessary? Yes	90.5	100.0	92.6	94.3	85.8
No	9.5	0	7.4	5.7	14.3
b. Practical utilization?					
Very little	9.5	13.2	25.9	8.6	14.3
Average	71.5	60.0	62.9	60.0	85.8
Considerable	19.0	26.7	11.1	31.4	0
c. Amount presented?					
More needed	4.8	20.0	11.1	0	0
Adequate	90.5	80.0	85.2	100.0	100.0
Less needed	4.8	0	3.7	0	0
4. Sensory Illusions of Flight					
a. Information necessary? Yes	95.3	93.4	88.9	97.1	71.5
No	4.8	6.7	11.1	2.9	28.6
b. Practical utilization?					
Very little	9.5	20.0	22.2	5.7	28.6
Average	76.2	73.4	66.7	74.3	71.5
Considerable	14.3	6.7	11.1	20.0	0
c. Amount presented?					
More needed	0	0	3.7	0	0
Adequate	100.0	100.0	92.6	100.0	100.0
Less needed	0	0	3.7	0	0

*All figures in percentages

TABLE X (Continued)

	SAC (22)	ATRC (15)	CONAC (37)	MATS (25)	AU (7)
5. Physiological Effects of Speed					
a. Information necessary? Yes	*52.4	26.7	33.3	37.1	71.5
No	47.6	73.4	66.7	62.9	28.6
b. Practical utilization?					
Very little	57.2	86.7	73.0	70.6	14.3
Average	42.8	13.2	26.9	29.4	85.8
Considerable	0	0	0	0	0
c. Amount presented?					
More needed	0	0	3.7	0	0
Adequate	90.0	93.0	88.9	97.0	100.0
Less needed	10.0	7.2	7.4	2.9	0
6. Emergency Procedures					
a. Information necessary? Yes	85.8	73.4	96.3	97.0	100.0
No	14.3	26.7	3.7	2.9	0
b. Practical utilization?					
Very little	19.0	26.7	18.5	23.5	0
Average	42.8	53.4	55.5	64.7	71.5
Considerable	38.1	20.0	25.9	11.8	28.6
c. Amount presented?					
More needed	28.6	20.0	29.6	17.6	33.3
Adequate	71.5	80.0	70.4	82.4	66.7
Less needed	0	0	0	0	0
7. Oxygen Equipment					
a. Information necessary? Yes	90.5	33.3	100.0	80.0	100.0
No	9.5	66.7	0	20.0	0
b. Practical utilization?					
Very little	14.3	73.4	11.1	28.6	42.9
Average	33.3	26.7	70.4	65.6	57.2
Considerable	52.4	0	18.5	5.7	0
c. Amount presented?					
More needed	42.8	7.2	11.1	11.4	14.3
Adequate	57.2	93.0	88.9	88.5	85.8
Less needed	0	0	0	0	0
8. Pre-Chamber Flight Indoc- trination					
a. Information necessary? Yes	68.5	14.3	45.8	33.3	0
No	31.5	86.0	54.2	66.7	100.0
b. Practical utilization?					
Very little	42.2	93.0	45.8	71.0	100.0
Average	36.8	7.2	54.2	29.0	0
Considerable	21.0	0	0	0	0
c. Amount presented?					
More needed	42.1	14.3	12.5	6.9	28.6
Adequate	52.6	78.5	79.2	93.1	71.5
Less needed	5.3	7.2	8.3	0	0

*All figures in percentages

Emergency Procedures (Bail-out procedures). ATRC, in contrast to the other commands, indicated that Oxygen Equipment information was not too necessary, 33.3 per cent, for the performance of their present assignments. ATRC makes very few high altitude flights requiring the use of oxygen. All commands, except SAC, 68.5 per cent, rated relatively low, 0 to 45.8 per cent, the necessity of Pre-Chamber Flight Indoctrination. SAC, and in some cases, CONAC and MATS, fly pressurized cabin airplanes, and the need for the information in this subject is then apparent. By way of explanation, the nomenclature "Chamber Flight" refers to training in the high altitude pressure chamber where high altitude conditions are simulated.

In relation to Physiological Training, Pre-Flight Briefing and Type I Chamber Flight, Pre-Flight Briefing and Type II Chamber Flight, and Leadership, Discipline, and Customs referred to in Table X, SAC again indicated, for the reasons given above and in contrast to the other commands, a high, 81.2 and 84.6 respectively, necessity of Type I and Type II Chamber Flights. Type I Flight ascends to 35,000 feet and stresses the importance and indications of the lack of oxygen in the body. Type II Chamber Flight ascends to 40,000 feet and stresses decompression sickness, reduced pressure symptoms, and explosive decompression. Both Type Flights train the students in the function, operation, and use of oxygen equipment. With the exception of SAC, all commands indicated little practical utilization of the two Chamber Flights. As to Leadership, Discipline, and Customs in Table

X, all commands rated very high, 91.0 to 100 per cent, the necessity of this subject. The practical utilization was rated relatively high, and all commands indicated a need for more information in these subject areas. In fact, the information presented in these subject areas has now become separate and distinct subject matter units in the syllabus of the Pilot Training Program.

As a general analysis of the data, evidence was indicated that the students should have been allotted more self-activity by the flying instructors on the training flights. The instrument training was shown to be very satisfactory. In analyzing the Academic Training Section, mention should be made of such situations as follows: CONAC and MATS both indicated a high need for Weight and Balance as well as a practical utilization of such information. In contrast, AU indicated definitely that such information was not necessary for the adequate performance of its present assignments and, in addition, indicated no utilization of Weight and Balance in its present assignments. Again, ATRC, AU, and SAC indicated a definite need for the Physiological Effects of Altitude. However, ATRC indicated that little utilization was made of this subject matter whereas, in contrast, SAC indicated considerable utilization. SAC further indicated that more Effects of Altitude were needed; but, in contrast, ATRC and AU indicated a satisfaction as to the amount of this subject.

When such situations as described above exist, as they do, in the results of these data, it would be hazardous as well as fallacious to

make specific recommendations toward course revision on this basis alone. The results from only one follow-up study should not be logically used as an iron clad criteria for course revision but should serve as a guide and support to other data covering the same training program. Data from all the subject fields must be individually analyzed in view of such things as the mission of each command, relationship of the subject matter to the mission of each command, and how the subject matter contributes to the general skills and knowledges of the Vance AFB graduate of the Pilot Training Program who can be assigned into any command. Therefore, the graduate must be given the basic skills and knowledges which will adequately prepare him for further specialized training. Reference is again directed to the presented data which served to emphasize the complete adequacy, in light of the Pilot Training Program objective, of the Pilot Training Program at Vance AFB in furnishing such graduates to the using agencies.

Summary. This chapter has presented the data of follow-up number one and analysis thereof in light of the missions of the using agencies. The next chapter presents the same information in relation to follow-up number two, which contacted the immediate supervisors of the former students of this Pilot Training Program.

CHAPTER VI

PRESENTATION OF FINDINGS FOR FOLLOW-UP NUMBER TWO

Presentation and Analysis of the Data. The questionnaire for follow-up number two included five main sections, which were Officer Qualities, Pilot Abilities, Personal Qualities, Administrative Abilities, and Supervisor Preference. Each main section included a number of sub-headings related to the main section. Proper analysis of these data should again be made with full cognizance of the various types of missions of the using agencies. Recognition is made that a high degree of consensus from the respondents indicates, but not definitely establishes that whatever is being judged is true.

In the Officer Qualities Section as noted in Figure 1, each supervisor was requested to base his rating of the former student concerned upon the following statement: "Considering the length of time this officer has been under your jurisdiction, check the rating which best describes his OFFICER QUALITIES in each of the following." The sub-headings included in this section will be noted in Figure 1. Initiative from AU and CONAC rated relatively low or close to Very Satisfactory. This may have been due to the predominance of administrative duties in those two commands compared to pilot duties. The former student may not have been as sure of his ability in the Initiative area as compared to his ability in the general pilot training area, since emphasis in the Pilot Training Program was placed on Pilot Abilities. A similar

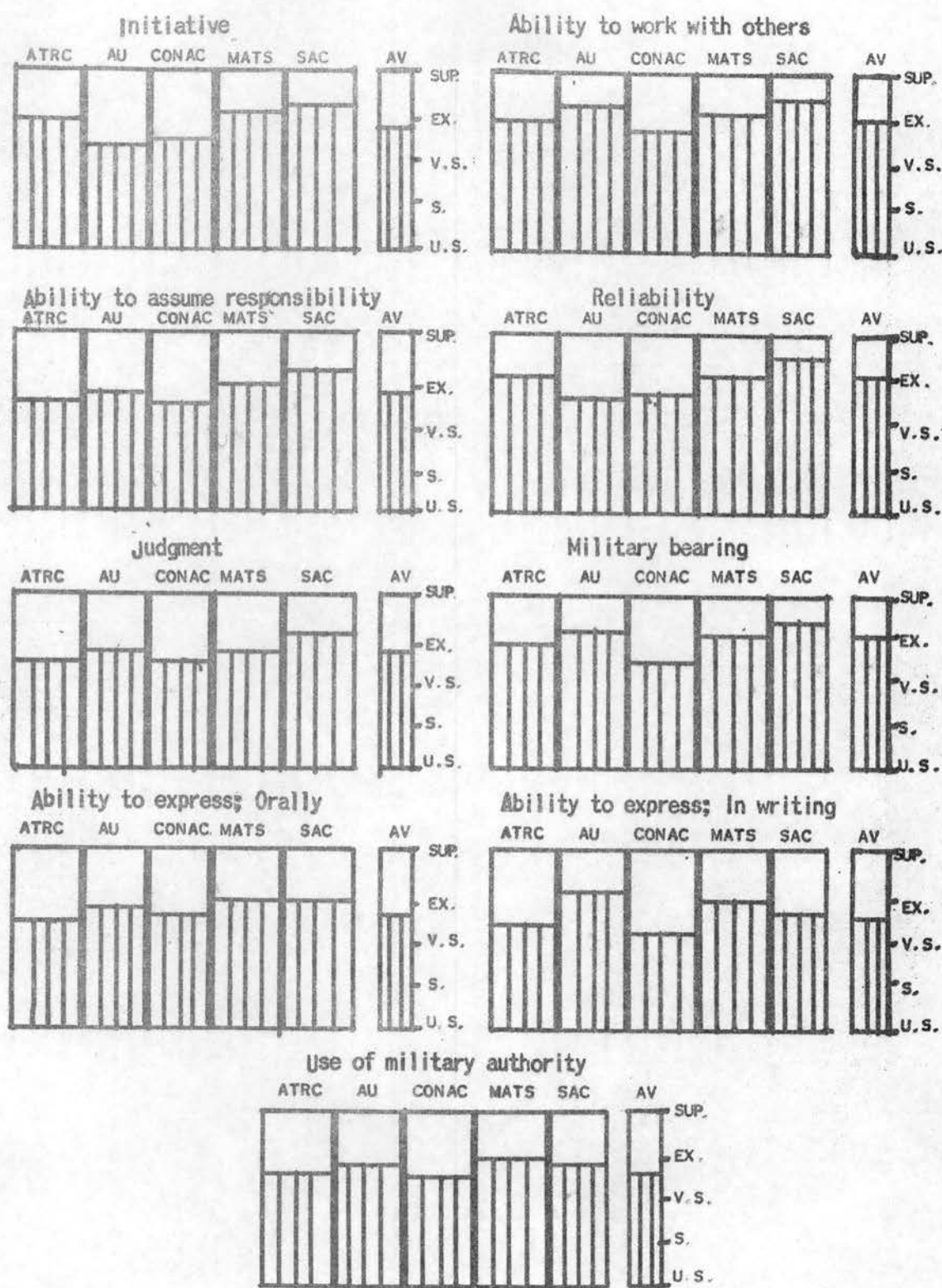


FIGURE 1

AVERAGE RATINGS OF 167 SUPERVISORS BY COMMANDS
AS TO OFFICER QUALITIES OF
FORMER STUDENTS

reasoning for AU and CONAC may also be applied to the Reliability area. The Use of Military Authority, Judgment, Ability to Work With Others, Ability to Assume Responsibility, and Military Bearing data in Figure 1 appeared to be somewhat similar in rating among commands, even considering minor variations. The relatively low average of Use of Military Authority may be due to the lack of opportunities in that area afforded a newly commissioned officer. Ability to Express: Orally appeared to be in agreement among commands; however, Ability to Express: in Writing varied somewhat among commands, and was relatively lower in the general average. The latter may be due to the more exacting and definite standards demanded by written materials, thus providing the rating supervisor with more factual data upon which to base the rating.

With respect to the Pilot Abilities Section as noted in Figure 2, each supervisor was requested to base his rating of the former student concerned upon the following statement: "Considering the length of time this officer has been under your jurisdiction, check the rating which best describes his PILOT ABILITIES in each of the following." In all sub-headings of this section the commands appeared to be quite consistent among themselves in the ratings of the former students with the exception of AU and SAC, which agreed and were consistently higher than the other commands. No obvious explanation can be given for the consistently higher ratings by AU. The consistently higher ratings by SAC will be explained later in this analysis, as will the

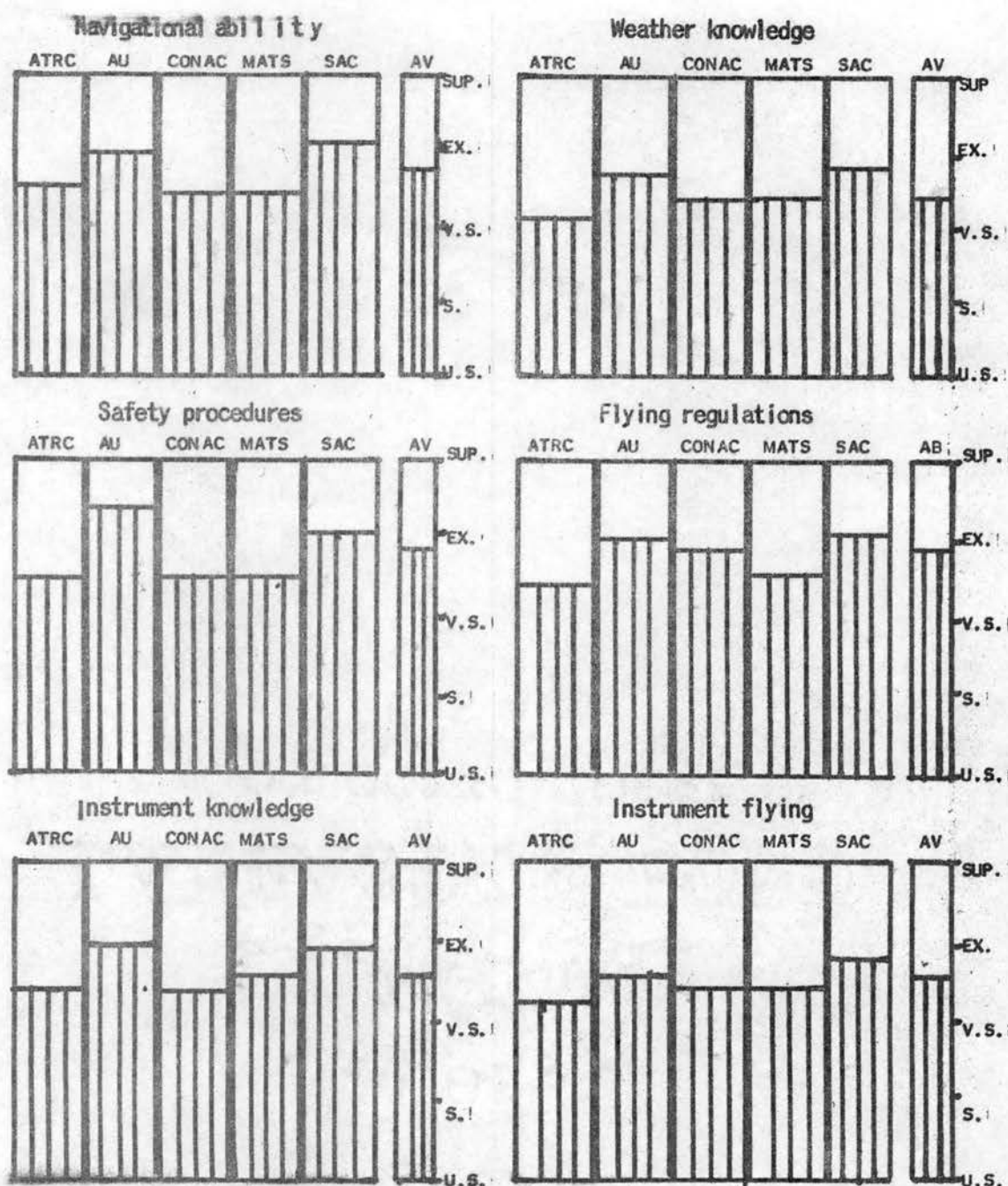


FIGURE 2

AVERAGE RATINGS OF 167 SUPERVISORS BY COMMANDS
AS TO PILOT ABILITIES OF
FORMER STUDENTS

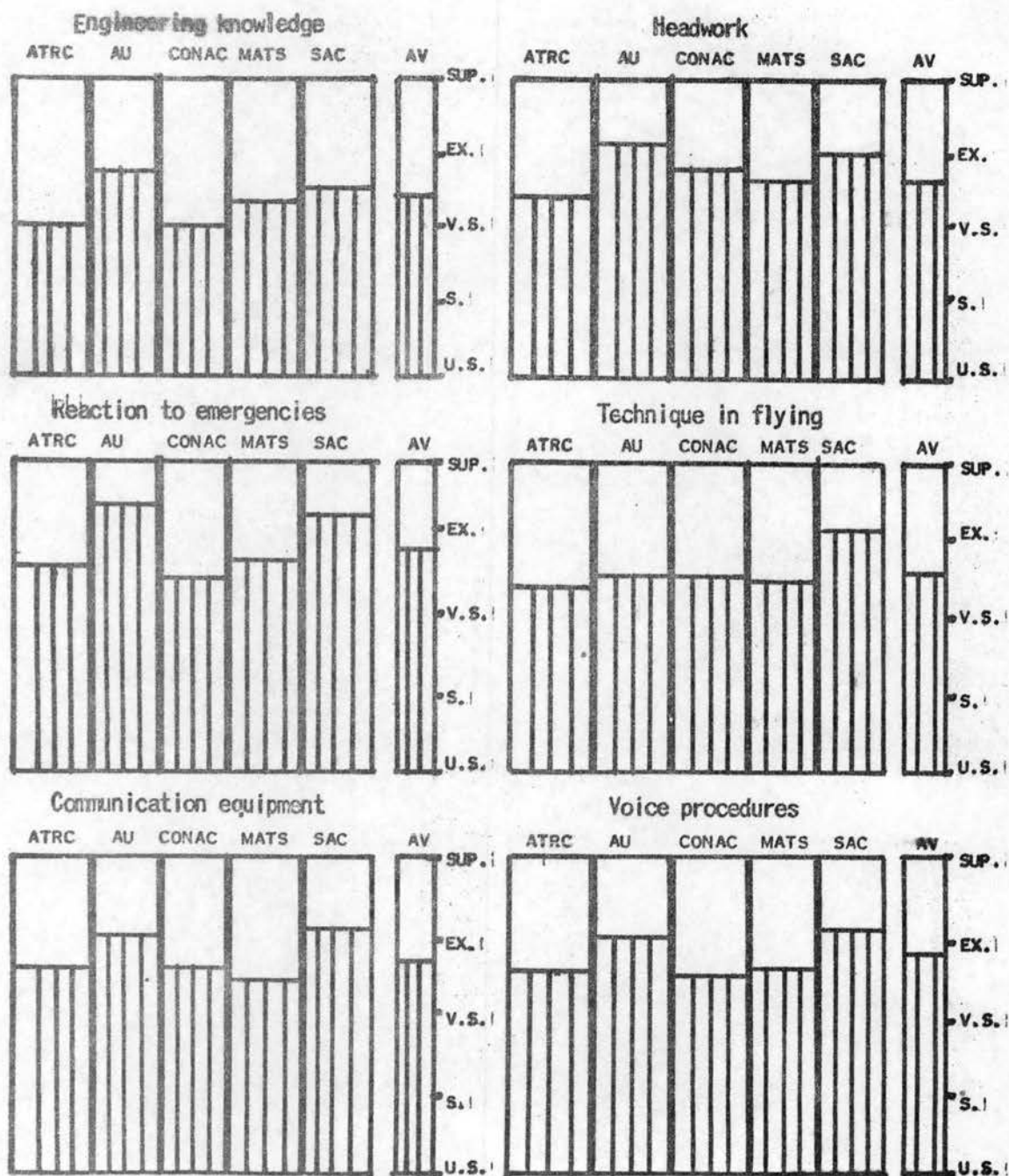


FIGURE 2 (Continued)

consistently lower ratings by CONAC. The averages in each phase of Pilot Abilities varied between Very Satisfactory and Excellent. Since the Pilot Training Program emphasized Pilot Abilities, this is a relatively low average as compared, for example to the Personal Qualities in Figure 3, which were above Excellent. The ratings in Pilot Abilities, as in the other sections, were subjective in nature. However, the supervisors making the ratings would logically be experienced pilots, who, by nature of their experience, would be apt to set higher standards and rate lower if a new pilot did not adequately come up to expectations. Actually the Pilot Abilities averages compared favorably with the averages in all the other sections, with the exception as mentioned previously.

Referring to Figure 3, which included the Personal Qualities Section, each supervisor was requested to base his rating of the former student concerned upon the following statement: "Considering the length of time this officer has been under your jurisdiction, check the rating which best describes his PERSONAL QUALITIES in each of the following." The general averages for the sub-headings were all very favorable and were very close to Excellent in most cases. The graduate had new uniforms to wear, realized he had to be on his "good behavior" in a new officers' club, and the like. Since Personal Qualities would be in daily evidence, logic indicates probability of a higher than normal rating. The low rating of AU in this section was not readily explained. The relatively higher ratings of SAC could be explained by the fact of crew

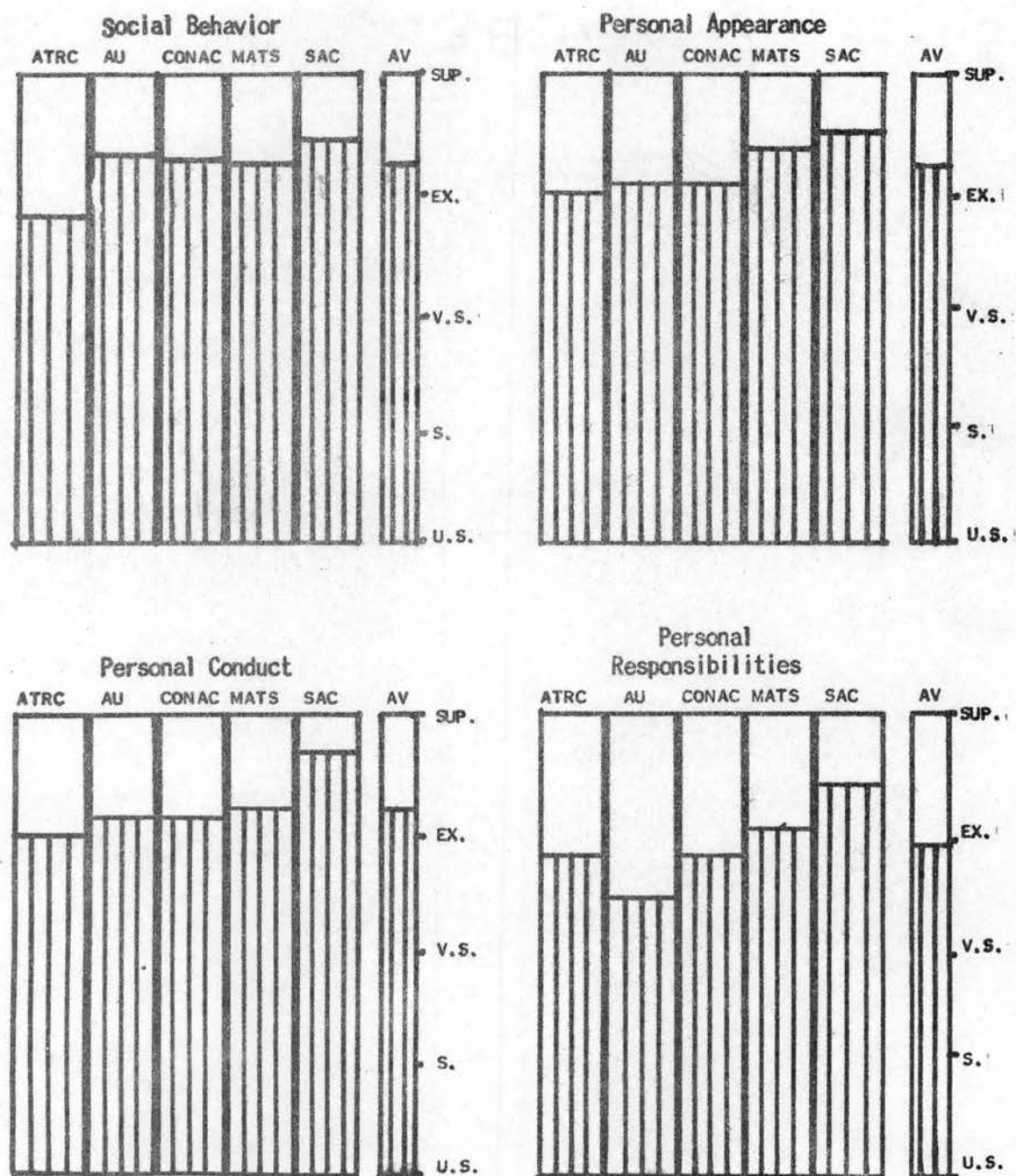


FIGURE 3

AVERAGE RATINGS OF 167 SUPERVISORS BY COMMANDS
AS TO PERSONAL QUALITIES OF
FORMER STUDENTS

association, which is described in more detail later in this analysis.

In the Administrative Abilities Section as contained in Figure 4, each supervisor was requested to rate the former student concerned in accordance with the following statement: "Considering the length of time this officer has been under your jurisdiction, check the rating which best describes his ADMINISTRATIVE ABILITIES in each of the following." Some variations in the sub-headings existed among the commands, with the exception of General Administration, which was rated relatively consistent. Supply Duties ratings were relatively low, and this rating is probably explained by the fact that, as students, very little practical opportunity was furnished in the actual duty of a supply officer. Mess Duties and Squadron Administration ratings were relatively consistent among commands, with the exception again of CONAC. Crew Duties ratings varied considerably. An explanation for the high ratings of ATRC and AU could be that considerable crew duty requirements were not associated with these two commands. Whenever crew duties were required by these two commands, in all probability a very small crew existed. Thus any action by the former student not detrimental to crew duties could be associated with a fairly high rating. The high rating by SAC would be explained by the close association of crew members. A more detailed explanation is offered later.

With regard to Supervisor Preference Section as noted in Figure 5, each supervisor was requested to rate the former student concerned in accordance with the following statement: "If you could select your

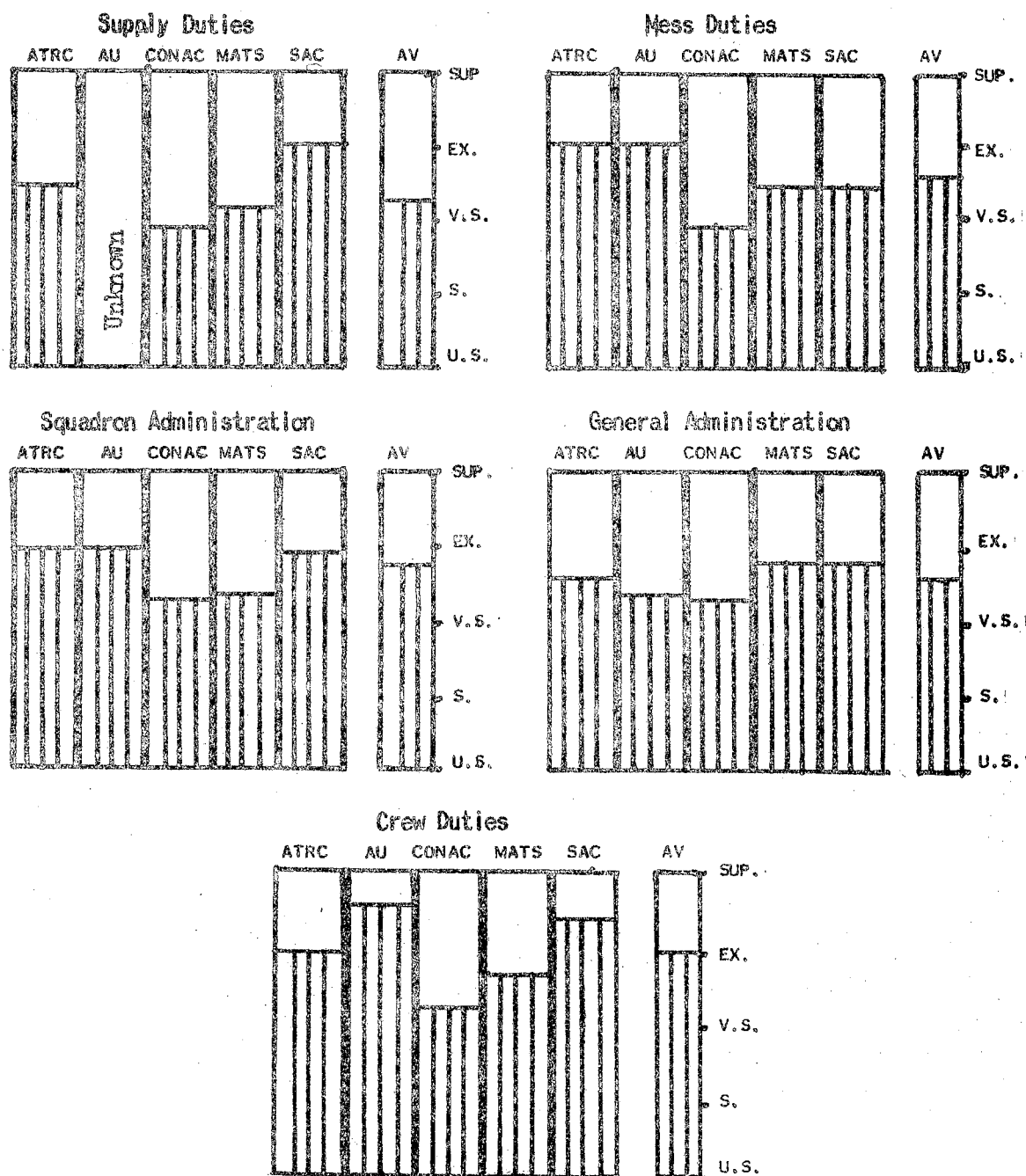


FIGURE 4

AVERAGE RATINGS OF 167 SUPERVISORS BY COMMANDS
AS TO ADMINISTRATIVE ABILITIES OF
FORMER STUDENTS

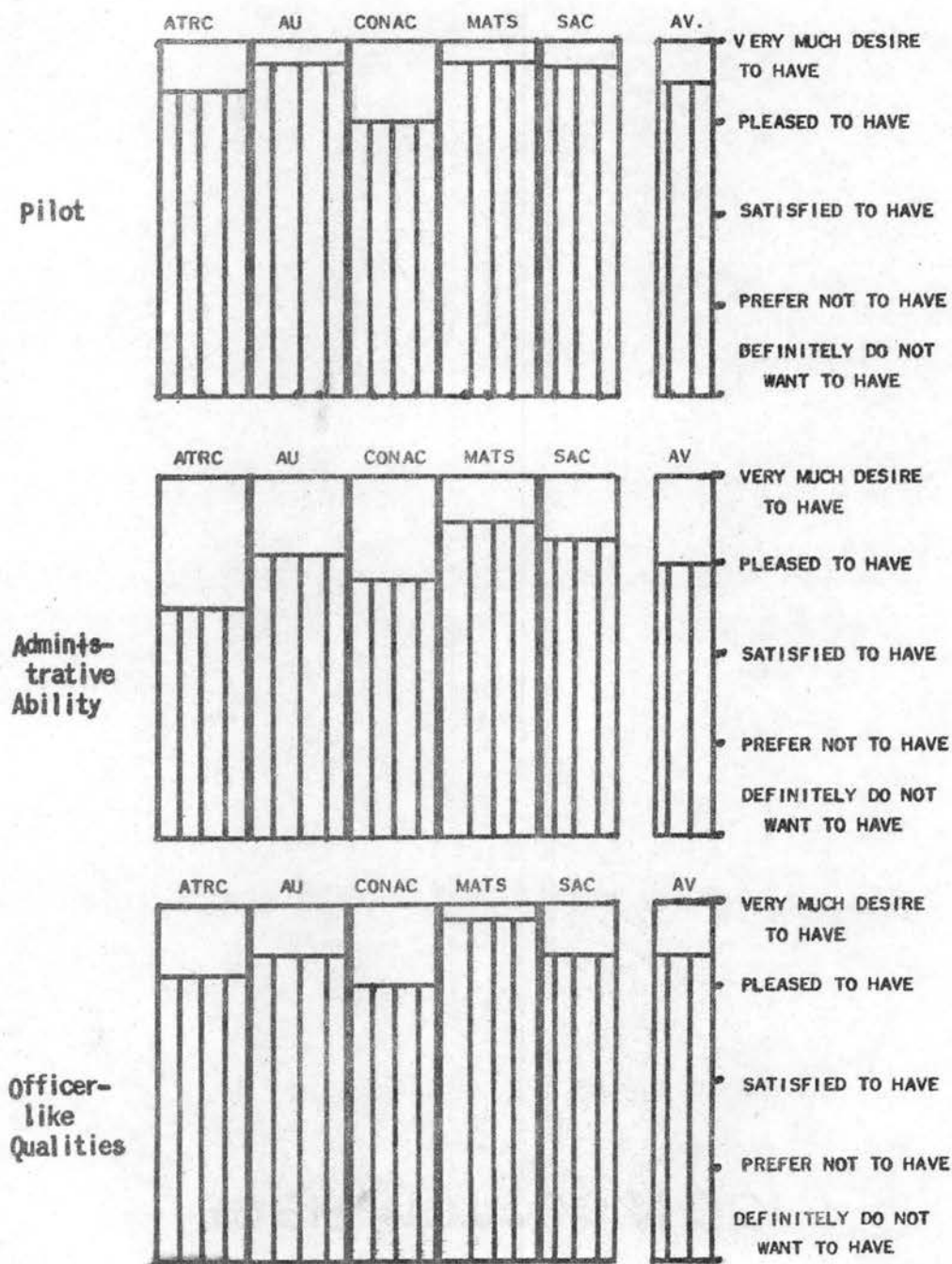


FIGURE 5

AVERAGE RATINGS OF 167 SUPERVISORS BY COMMANDS
AS TO SUPERVISOR PREFERENCE OF
FORMER STUDENTS

junior officers, indicate your preference for this officer with reference to the following." The sub-headings of Pilot and Officer-Like Qualities were rated very high, "Pleased to have" or above, by all the commands. Administrative Abilities, while rated relatively high, was lower than the above mentioned two ratings. Such a lower rating appeared to be consistent with the ratings and the possible reasons thereof as presented in the previous sections.

In general, the ratings were very favorable to the product of the Pilot Training Program at Vance AFB. The observation was made that the averages in the Personal Qualities Section were much higher than those in the Pilot Abilities and Officer Qualities Sections. One possible explanation may be that such items as Social Behavior, Personal Appearance, Personal Conduct, and Personal Responsibilities are traits formed by long standing usage in every individual. In contrast, items as Use of Military Authority, Judgment (as an officer), Navigational Ability, Weather Knowledge, and the like are newly trained and the new officer exhibits less ability and confidence in such fields with the resultant lowering of rating.

SAC averages appeared to rate as high as the other command averages in most of the various areas or even higher. One possible explanation is the fact that the airplane crews in SAC quickly develop into a compact, closely knit unit of operation. Each crew member is trained in responsibilities to the rest of the crew. Standards of performance are definite and objective in scope. The supervisors in SAC

then, perhaps, had a better opportunity to observe closely the new officer in all of his activities. This closeness of operation definitely tends toward improvement of training for the new officer and normally results in a higher opinion and rating. In Pilot Abilities, SAC and AU consistently rated higher than the other commands. One possible explanation was that the students actually performed best in these abilities. Another possible explanation could be that in these abilities the supervisors at SAC and AU actually tended to give higher ratings than did other supervisors.

In contrast to the SAC averages, the averages from CONAC appeared to be as low as the other command averages or lower. The nature of pilot duties is not as compact and closely knit as compared to SAC. The resultant ratings would then tend to reflect this situation. In Administrative Abilities CONAC should be able to rate consistently and accurately. The reason for the relatively lower ratings could probably stem from standards of work and production set by CONAC itself, since administrative work in CONAC would consist of a major portion of a new officer's duties.

Of special value to present students has been the "Advice to Present Students" section compiled from the questionnaire results. The information contained in this section has given the present students a pertinent insight to comments made by the supervisors of the former students. These comments reflect the "beneficial" and "detrimental" actions of the new officers as noted by the supervisors.

Summary. This chapter has presented the data of follow-up number two and analysis thereof in light of the missions of the using agencies. The next chapter will present the evaluation of the Pilot Training Program, in relation to the objective of the program, as based upon the data from follow-up number one and two. The strengths and weaknesses of the program as based upon the data compiled will be pointed out.

CHAPTER VII

EVALUATION OF THE PILOT TRAINING PROGRAM AT VANCE AFB

Purposes, Assumptions, and Procedures of the Evaluation Proc-

ess. Since the nature of this study is one of evaluation, a brief summary of the evaluation process and its relation to this study would seem to be in order at this point. Evaluation in an educational or training program may serve many purposes. According to Ralph W. Tyler,¹ the purposes of the evaluation procedure are as follows:

1. Check periodically on the effectiveness of the training program to indicate points in the program which need improvement.

2. Validate hypotheses upon which the training program operates. Most training curricula are organized upon the basis of a plan which seems to the training personnel to be the most efficient and satisfactory one available. Since the curricula are based upon the best judgments of the staff, in some cases the training program may continue for some time utilizing poorly organized curricula because no careful evaluation has been made to check the hypotheses upon which the curricula were organized.

3. Provide certain psychological security and satisfaction to training personnel. Sometimes the training personnel of a program may become concerned as to whether or not the program is actually

¹Ralph W. Tyler, "General Statement on Evaluation," Journal of Educational Research, XXXV (March, 1952), 492-501.

accomplishing the major objectives of the program.

4. Provide information basic to effective guidance and counseling to the students in the training program.

5. Provide sound basis for public relations. Evaluation provides a basis for the establishment of an understanding by the community as to the effectiveness of the training institution.

6. Aid training personnel and students to clarify their purposes and the direction in which the program is moving. Appraisal demands a clear conception of the desired results.

The above purposes of an evaluation program serve to summarize the main points that should be included in any training program evaluation process. The evaluation process as outlined in this study in support of the training program at Vance AFB appears to include all six of these purposes. Some are more pertinent than are others. For example, purpose number three, as stated by Tyler, pertaining to the accomplishment of course objectives is actually the main objective of this study. Tyler's purpose number four, pertaining to the gathering of information for the guidance and counseling of students, is of lesser importance in the Pilot Training Program; nevertheless it is a factor in the complete training program.

Tyler,² in addition to the foregoing statement of purposes, lists six basic assumptions underlying the development of an evaluation

²Ibid., pp. 492-501.

program. These are as follows:

1. Education is a process which seeks to change the behavior pattern of students.
2. The educational objectives of a training program are the types of behavior changes a program seeks to establish in the students.
3. A training program is evaluated by ascertaining the extent of realization of the program objectives.
4. The manner whereby the students organize their behavior patterns is an important aspect of appraisal.
5. Any accumulation of valid evidence regarding the extent to which the students achieve the training program objectives are acceptable methods of evaluation.
6. In order to obtain the maximum values from an evaluation program, all training personnel, and the community must participate.

These assumptions are essential to the evaluation process of any training program and consequently are pertinent to this study.

Following the presentation of the above purposes and assumptions as basic to the evaluation process of any training program, Tyler³ concluded by describing eight steps in any evaluation procedure. These are as follows:

1. Each school should formulate a statement of its training objectives.

³Loc. cit.

2. Each of these objectives should be defined in terms of behavior.
3. Situations should be identified in which the students may display these types of behavior.
4. Methods for use in obtaining evidence regarding each type of objective should be selected and tried.
5. Instruments should be constructed which can make a comprehensive appraisal of the evidence accumulated.
6. A selection should be made on the basis of a preliminary trial as to the most effective evaluation methods for further development and improvement.
7. The results from the instruments of evaluation must be interpreted for the use of all training personnel, students, and others concerned.
8. The evaluation process is an integral part of any training program and consequently must be continuous.

All of the above steps are appropriate to the evaluation of the Pilot Training Program at Vance AFB. With respect to steps one and two no published statement exists, other than the course syllabus, regarding the specific skills and knowledges or training objectives a graduate of the Pilot Training Program at Vance AFB should have. Specific course training standards and objectives are presently in the process of compilation by the personnel at Reese AFB. The level of attainment for successful completion in the skills and knowledges of the program is nebulous in nature and is not definitely specified other

than by a passing grade in the course.

Step number three as presented by Tyler, pertaining to identification of the behavior situations of the students, is an integral part in the process of formulating follow-up number two. Tyler's steps number four, five, and six, referring to the method of gathering data, construction of the instrument for data gathering, and testing the instrument are of primary concern and importance in both follow-up surveys used in this study. Step number seven, pertaining to the interpretation of data, is actually one of the functions of this evaluation of the Pilot Training Program. Step number eight as presented by Tyler, pertaining to the continuous nature of an evaluation process, is recognized as not being a characteristic of the Pilot Training Program at Vance AFB in the past.

In order to use the data from this study in an evaluation of the Pilot Training Program at Vance AFB, recapitulation is made here of the objective of the program. As previously stated, specific course objectives are presently being prepared. The main objective is to train the students in the general skills and knowledges required of a USAF multi-engine pilot and officer. Growing out of this main objective can be listed several more specific objectives commonly accepted by the training personnel of the Pilot Training Program at Vance AFB. They are as follows:

1. Pilot Skills: To train the student in the various skills of pilotage such as Instrument, Formation, Navigation, and Transition flying.

2. Knowledges: To train the student in the knowledges of various subject fields necessary for pilots and officers such as Cruise Control, Weather, Navigation, Engineering, Oral Expression, AF Administration, and the like.

3. Traits: To train the student in various traits associated with an officer and a pilot such as Discipline, Judgment, Calmness in Emergencies, and the like.

This selected list of skills, knowledges, and traits is by no means all inclusive, nor are they listed in order of importance. This list does, however, present representative examples of what the Pilot Training Program at Vance AFB desires to accomplish as program objectives in supplying satisfactory graduates to the using agencies.

Since follow-up number one obtained the former students' opinions of the adequacy of the program, and follow-up number two obtained the ratings from the present supervisors of other former students reflecting actual work and usage, the treatment of the data with respect to the program objectives will be made in two separate parts for follow-up number one and follow-up number two respectively. General statements will follow which will indicate the overall course strengths and weaknesses as reflected from both data. Furthermore, each questionnaire instrument did not cover the same identical areas in several instances because in follow-up number one student opinion was requested in relation to the subjects taught and in follow-up number two supervisor reaction was obtained in relation to student performance on

the job.

In order that this evaluation will be meaningful and clear to the reader of this study, a systematic analysis for each follow-up will be made covering the three listed objectives. This order will be as follows under each objective and for each follow-up:

- I. Statement of the objective
 - A. Subjects in the Pilot Training Program contributing directly to this objective
 1. Brief listing of the subject content. (Repetition will be omitted from part two.)
 2. Analysis of data from each follow-up, indicating any apparent strengths and weaknesses in the subject area.

This evaluation is in addition to the general data analysis already made in Chapters V and VI, which included statements of specific strengths and weaknesses with the probable reasons thereof.

Follow-up Number One in Relation to the Program Objectives.

I. Objective number one. Pilotage skills

A. Instrument flying

1. Radio range flying, Radio direction findings, Ground controlled approach, Radio range familiarization
2. The data in follow-up number one, Table I, indicated that this subject was apparently rated relatively high as to utilization and need. The individual aids to instrument flying, ADF, VAR, and the like, varied as to use in the commands and cannot logically be included as strengths and weaknesses in this analysis.

B. Formation flying

1. Assembly, Flying either wing position, Leading the

formation, Changing positions, Peel offs, Visual signals

2. Follow-up number one data from Table I, showed that this subject appeared satisfactory with the exception that consideration should be given to more time in the program and should include therein more high altitude and larger formation flying. Because of the fact that most of the former students, with exception of ATRC, had not flown any night formation since their graduation, consideration should be given to the possibility of lowering the number of hours in this area to the extent of allowing only for a trial flight rather than for proficiency.

C. Navigation flying

1. Dead reckoning pilotage, Radio aids to navigation,
Flight planning, Cruise control, Instrument cross-country flying procedures

2. In the data from follow-up number one shown in Table I, all commands indicated that the proper amount of time apparently had been given to this subject. In most cases the former students believed that, as a result of this subject, they were well qualified for flight duties in this subject. Apparently sufficient self-activity had been granted the student by the instructor in navigation since the former students' ratings varied from 70.4 to 100 per cent in this area. All commands indicated a desire for more emphasis, 86.4 to 100 per cent, on navigation and were consistent when they further indicated

that the practical application of navigation could be increased.

D. Transition flying

1. Ground operation, Climbs, Glides, Power-on and power-off stalls, Slow flying, Single-engine procedures, Go-around procedures, Night take-offs and landings, Recovery from unusual attitudes, Air discipline
2. With respect to the data as found in Table I, from the first follow-up, all commands indicated reasonably high satisfaction with this subject. ATRC and SAC desired more self-activity by the student in the transition phase, but the adequacy of training appeared to be quite satisfactory to all commands.

II. Objective number two. Pilot and officer subjects knowledge

A. Engineering knowledge

1. Fuel, hydraulic, and electrical systems, Normal and emergency operation of these systems, Weight and balance procedure, Operational problems, Emergency procedures
2. With the exception of ATRC and AU in Weight and Balance as previously noted in Chapter V, all commands in Table III rated the engineering training as necessary in their present assignments. The amount of information presented was apparently adequate, and the practical utilization was fairly high.

B. Weather knowledge

1. Surface weather map analysis, Use of weather reports,

Map problems, Upper air analysis, Atmospheric cross-sections, Flight problems

2. Follow-up number one, Table IV, indicated a strength in this subject, especially as to Surface weather map analysis, Use of weather reports and forecasts, Map problems, and Flight problems. A relatively lower rating of strength was noted in Upper air analysis and Atmospheric cross-sections. These lower ratings appear to be logical when considered in light of the slight usage by the average pilot.

C. Navigation knowledge

1. E-6B computer, Radio aids to navigation, Use of radio compass, High and low level navigational procedures, Night navigational procedures, Chart problems

2. The data from follow-up number one, Table V, indicated that this subject was a rather strong area. All commands asserted that this information appeared to be quite necessary for the adequate performance of their present assignments. With the exceptions as previously mentioned in Chapter V, all commands indicated that the amount of this subject matter was apparently sufficient, in some cases requesting even more (MATS and CONAC in Radio aids to navigation). All commands also rated rather high the practical utilization of this subject matter, indicating the value of such training.

D. Cruise control knowledge

1. Fundamentals; Factors affecting airplane, engine, and

propeller efficiency; Use of flight operating charts;
Solution of cruise control problems

2. The data from follow-up number one, Table VIII, indicated relatively high need of this information with exception of ATRC in Cruise control problems, as previously noted in Chapter V. The general consensus, however, appeared to indicate more time was needed in this subject. To a large extent this deficiency has been alleviated through the use of Flight planning, as explained subsequently in this Chapter.

E. Flight planning knowledge

1. Rules and regulations, Flight service facilities, Base operations and weather office facilities, Use of facility charts, Pilot procedures in use of ground controlled approach

2. The data from follow-up number one, Table VI, with only the exception previously mentioned in Chapter V, indicated that all Commands apparently utilized this subject in their present assignments and found the information very practical and necessary. In fact, general consensus was that more of this subject matter could be used.

F. Radio communication knowledge

1. Operation of VHF command set and homing adapter, Operation of IFF set, Operation of interphone and dinghy radio set, Operation of liaison set, Operation of GCA and ILS, Familiarization with VAR and VOR VHF

radio ranges, Operation of radio compasses, Standard interphone and radio telephone procedures, Security measures

2. The data from follow-up number one, Table VII, indicated that the radio communication knowledge necessary for practical utilization varied directly with the missions of the using agencies. Analysis, then, of the strengths and weaknesses, with possible reasons thereof, would repeat the information already presented in Chapter V. Certain knowledges, such as the Operation of the radio compass and Interphone and radio telephone procedures were basic to most missions and the data reflected a rather high need and practical utilization of these knowledges. Other data, such as Security measures, which varied according to command need did not reflect weaknesses nor strengths in the program but merely variations in usage and need.

G. Physiological training knowledge

1. Physiological effects of altitude, acceleration, and speed; Night vision; Sensory illusions of flight; Emergency procedures; Oxygen equipment; Type I and II chamber flights; Leadership, discipline, and customs

2. With respect to the data in this subject from follow-up number one, Table X, all commands varied in their opinions. As above, with Radio communication knowledge, each command varied in its opinions as to the practical utilization and need for Physiological

training. For example, Night vision appeared to be necessary and utilized by all commands because this subject is fundamental to all pilot duties. In contrast, considerable variations existed between commands as to the need and use of Physiological effect of speed. The variations between commands and possible explanations were made in more detail in the data analysis as summarized in Chapter V.

H. Administration

1. Security, Pay allowances, Military publications, Organization of USAF, Staff functions, and Command missions
2. This subject was not included in the course syllabus at the time of follow-up number one.

I. Oral expression

1. Fundamentals of speech making and practice speaking
2. This subject was not included in the course syllabus at the time of follow-up number one.

III. Objective number three. Officer and pilot traits

Common consensus is assumed to be that such traits as calmness, judgment, enthusiasm, and the like are somewhat intangible as to the evaluation and training thereof. Certain courses in the Pilot Training Program, some of which have already been covered in this analysis, were believed to influence to some degree the above mentioned type traits. The specific subjects which influenced these traits or offered opportunity for training in them obviously cannot be

pinpointed, and mainly for that reason will not be listed as such in this part. Instead, some of the main officer and pilot traits will be listed and an analysis made of the related data. This list must not be considered as all-inclusive but only as representative.

A. Calmness in emergencies and judgment (headwork)

1. In follow-up number one, Table I, the data indicated that apparently enough emphasis was placed on emergency procedures, and a high percentage of the former students felt that they could handle any emergency that might arise when they were soloed in the airplane.

B. Interest in crew members

1. This subject was not covered as such in follow-up number one.

C. Use of military authority and discipline

1. The data in follow-up number one, Table II, indicated that a fairly high percentage of students did not have the opportunity to be a cadet officer and thus experienced little opportunity to make decisions. Discipline in relation to the class system and social privileges appeared to present no problems.

D. Initiative

1. As such this trait did not appear in follow-up number one.

E. Leadership

1. In follow-up number one, Table X, leadership was so

necessary and useful that all commands indicated very high ratings in this area.

Follow-up Number Two in Relation to the Program Objectives.

I. Objective number one. Pilotage skills

A. Instrument flying

1. In follow-up number two, Figure 2, Instrument knowledge and flying were rated relatively high by most commands and tended to be close to an Excellent rating.

B. Formation flying

1. Data from follow-up number two did not include Formation flying as such. Figure 2, however, included data on Technique in flying indicating general satisfaction of this broad subject which logically would reflect Formation flying ability.

C. Navigation flying

1. Navigational ability, as presented in follow-up number two on Figure 2, rated close to Excellent, indicating general satisfaction of this skill.

D. Transition flying

1. Specific data on this subject was not included in follow-up number two. However, Figure 2, indicated ratings on Safety Procedures, Flying Regulations, and Technique in Flying. Such areas could be considered as some reflection on Transition flying. Considered as such then, these three areas reflected favorable ratings on Transition flying with the former two ranging very close to Excellent.

II. Objective number two. Pilot and officer subjects knowledge

A. Engineering knowledge

1. In follow-up number two, Figure 2, the supervisors rated the former students relatively lower on engineering knowledge than on other pilot abilities. Since most of the former students were flying different type airplanes from those in which they had been trained, the newness of the type airplane might account for a relatively lower rating in this subject. General satisfaction, however, was indicated in the ratings by the supervisors on this subject.

B. Weather knowledge

1. Data in follow-up number two, Figure 2, indicated Weather knowledge as rating between Very satisfactory and Excellent. The ratings were slightly lower than in some of the other areas in Pilot Abilities but still could not be considered indicative as a weakness in former student knowledge.

C. Navigation knowledge

1. The data from follow-up number two, Figure 2, indicated the general ratings by supervisors of the former students in navigation ability was close to Excellent. When the subject of Flight Planning is considered in relation to navigation, this subject appears to be a strong area in the program. The data on Figure 2, under the heading of Flying Regulations, indicates that the former students were rated quite high in this subject.

D. Cruise control knowledge

1. This subject was not covered as such in follow-up number two, but again Technique in flying as noted in Figure 2, was rated generally satisfactory and could logically include a former student's ability in cruise control.

E. Flight planning knowledge

1. As such, Flight planning did not appear in follow-up number two. However, reference to the pilot abilities section as noted on Figure 2, appears to indicate very satisfactory ratings by the supervisors of the former students in this area.

F. Radio communication knowledge

1. In Figure 2, the data from follow-up number two indicates that both as to Communication equipment and Voice procedures, the supervisors rated the former students relatively high in these areas with both subjects resulting in near Excellent ratings.

G. Physiological training knowledge

1. This subject did not appear as such in follow-up number two. Safety procedures and Reaction to emergencies as shown in Figure 2, could easily stem from the training in Physiological subjects. Both of these areas were rated close to Excellent by the supervisors, indicating a fairly high regard for the former students' training. Leadership and discipline will be covered in the analysis of objective number three.

H. Administration

1. In follow-up number two, the supervisors were, on the

average, "Pleased to have" the former students as to their Administrative abilities as shown on Figure 4. This rating was not quite as high generally as Pilot abilities and Officer-like qualities, and the possible reason has been explained previously in Chapter VI. As to Squadron Administration and General Administration in Figure 4, these subjects rated relatively high, both resulting in ratings close to Excellent. The data indicated that more emphasis in administrative functions, supply duties, and the like would probably improve the program.

I. Oral expression

1. In the data from follow-up number two, Figure 1, Oral expression was rated quite high by the supervisors in all commands, resulting in close to Excellent ratings. The subject of Oral expression has subsequently been lengthened to include Written expression. In this part of the course the student is provided the opportunity to compose and rewrite directives, staff studies, general information, and the like in a manner easily read and understood. In Figure 2, Voice procedures as a pilot was rated quite high by all commands, indicating general satisfaction with this subject.

III. Objective number three. Officer and pilot traits

A. Calmness in emergencies and judgment (headwork)

1. In the data from follow-up number two, Figure 2, these traits indicated fairly high ratings from the supervisors. How much of these ratings may be due directly to training is controversial;

however, an assumption must be granted that a great part of a student's reaction in emergencies and the use of judgment stems from the effectiveness of his previous training and experiences. For example, as a part of the student's training in Transition flying, a single engine procedure is taught. Not infrequently, the instructor will involve the student in a single engine situation. When the student finds himself in such an emergency, training becomes a large factor in whether the student remains calm and extricates himself or whether he becomes panicky. On practically every flight, judgment of one form or another is involved. Such situations as changes in weather, changes in flight plans, responsibility for crew member safety, knowledge of the aircraft, and the like, all involve the use of some form of judgment which, in turn, is influenced greatly by the training received.

B. Interest in crew members

1. Data from follow-up number two, Figure 4, indicated high ratings by most of the supervisors of the former students. Included with this data of crew duties should be the traits of Ability to work with others and Ability to assume responsibility as noted in Figure 1. Both of these latter traits were rated as near Excellent by the supervisors indicating quite general satisfaction in this trait.

C. Use of military authority and discipline

1. Follow-up number two, Figure 1, indicated the supervisors rated quite high the former students' use of Military authority. In that same Figure, Military bearing was rated quite high with ratings

near Excellent. Figure 5 showed that the supervisors were more than "Pleased to have" the former students for their Officer-like qualities.

D. Initiative

1. In follow-up number two, Figure 1, the data indicated that the supervisors believed that the former students displayed considerable initiative, receiving ratings in this area of close to or above Excellent. Ability to assume responsibility, which may be thought of as a factor in initiative, also was rated close to or above Excellent by the supervisors.

E. Leadership

1. In follow-up number two, Figure 1, various qualities of leadership are listed as separate traits. All such traits received close to Excellent ratings, indicating fairly high satisfaction by the supervisors as to such areas. In fact, so necessary is this trait and the related fields of leadership to the training of officers that a separate section of the syllabus is now devoted to several courses covering this area.

Strengths and Weaknesses. The reader must bear in mind that the Training Analysis and Development Division served as only a consultant and advisor to the Pilot Training Group Commanding Officer. The Pilot Training Program at Vance AFB was founded upon an approved syllabus, and changes in the syllabus cannot be immediately initiated. The results of the data analyses were brought to the attention of the Commanding Officer as well as to curriculum

revision conferences, and changes, wherever possible and advantageous, have been effected.

As is true with each and every training program, weaknesses and strengths exist in the Pilot Training Program at Vance AFB. These extremes, however, proved to be relatively minor ones when the data of this study are analyzed and a comparison is made with the total training program. Improvement of the weaknesses is actually an ever-functioning necessity and a matter of grave concern to the supervisors and instructors in the Pilot Training Program at Vance AFB. Effort is constantly made to maintain and improve even more the strengths in the program and to strive always toward increasing improvements.

Cutting horizontally across the data from both follow-up surveys, certain statements appear to be justified in which the two follow-up surveys support each other.

Generally speaking, the data from the two follow-up surveys indicated that the objective of pilotage skills was being accomplished to a relatively high degree by the Pilot Training Program at Vance AFB. The use of high altitude and large formation flying is emphasized, where applicable, in schools and commands subsequent to Vance AFB. Only the basic fundamentals and practice on formation flying are taught at Vance AFB, since some commands have little need for this type of flying. In spite of the above fact, attention of the training personnel should be drawn to this subject area for consideration of possible curriculum revision. Emphasis was placed upon student

self-activity in all phases of flying training. At various instructor meetings, discussions were held as to methods whereby instructors could increase the self-activity on the part of a student. On cross-country flights, especially, the student is now placed in complete charge of taking care of the airplane, checking weather, filling out clearance forms, navigation, and the countless details pertaining to such training missions, all supervised by the instructor. General comments pertaining to the knowledge of navigation training will be incorporated subsequently in relation to the factual knowledge of navigation.

Procedures have been taken at Vance AFB to relate the practical application of subject matter knowledges to officer and pilot duties. The Academic Training Section has developed an excellent Flight Planning Room complete with Weather Station, Airdrome Officer, and Base Operations. Each student is given three simulated cross-country flight problems whereby he must check weather, fill out clearance forms, and obtain the other data necessary for a flight. Through the actual use of interphones and monitors, the student makes position reports, receives weather information, receives advice from Flight Service, and the like and must adjust his flight to conform with information received, simulating an actual cross-country flight even though never leaving the Flight Planning Room. The Flight Planning Room and problems have contributed greatly to increasing student proficiency.

A few certain sub-sections of the general subject areas, for example in Weather and Physiological training, were indicated as being weak from a practical utilization viewpoint. Information such as Use of flight operating charts, Atmospheric cross sections, and Psychological effects of speed may not be used in the day-by-day working of the graduates of Vance AFB. However, such information was included in the syllabus because of the general knowledge background necessity, the similarity and carry-over to charts applicable to the airplane presently used, and the need for possible utilization, especially in emergencies. The data in such cases did not indicate nor imply a need for voiding such information from the program but indicated only a low utilization in present assignments. Attention of training personnel should be directed to such situations for possible curriculum revisions or for an awareness as to the retention of such items. Generally speaking, the data from both follow-ups indicated that satisfaction was evident with the general subject areas.

As one of the out-growths of these follow-up surveys, a practical on-the-job administrative training program for the cadets was established at Vance AFB. In brief, during the last six weeks of training each cadet is assigned to a working Base Section of his own choosing. During this six week period, the Base Section gives to these cadets, for solution, a number of practical work problems encountered as a part of the routine duties in that Section. The solution of these problems involves a study of local and higher regulations, Technical

Orders, personnel relations, supply functions, and administration.

The cadet has frequent conferences with the Officer-in-charge of the Base Section to which the cadet is assigned. Through such a procedure the cadet is given amplified training to supplement the previous classroom officer and administrative training.

Opportunity to make or to receive training in making decisions and serving as a cadet officer was increased when the Military Training Section recently underwent reorganization whereby more opportunity was given each cadet to become a cadet officer several times during his tour of duty at Vance AFB. Training in the proper use of military authority is stressed in the classroom subjects as well as in the on-the-job training program for cadets. Incorporated now as a part of the officer training section is the information relative to a "New Officer Etiquette" course. In this course the student is briefed in the customs of the service, various ceremonies and social functions, how to check in and out of a new base, proper action at the officers' club, and the like.

The data indicated that certain officer and pilot traits which could logically be considered as emitting from or related to the Pilot Training Program at Vance AFB were rated quite high by either the former students or the present supervisors of former students. The extent to which the outward signs of these traits are the resultant of training is somewhat a matter of opinion. Concession must be granted, however, that certain courses and training experiences in the Pilot Training

Program contribute largely to the development of such traits.

Based upon the analyses of the data in this study concerning the Pilot Training Program at Vance AFB, it appears evident that the program generally is successful in meeting the accepted course objectives. Both the former students and the immediate supervisors of other former students rated the Pilot Training Program and the product thereof relatively high in most of the subject areas. From the viewpoint of the using agencies, indications were given that there is general satisfaction with the Pilot Training Program at Vance AFB.

In recapitulation, the possible weaknesses of the Pilot Training Program at Vance AFB are listed. These weaknesses include:

1. High altitude, night, and large formation flying.
2. Practical application of the subjects to flight planning.
3. Student activity on flights.
4. Opportunity to serve as cadet officers and make decisions.
5. Practical application of the administrative subjects.
6. Such sections of Weather, Instrument Flying Aids, and Physiological training that indicate little utilization.

The strengths of the training program became evident from examining the results of the data. Among these strengths are:

1. Flight planning problems and practical training in procedures.
2. Weather knowledge.
3. Navigation procedures.
4. Instrument knowledge and flying.

5. Transition in day and night procedures.
6. Engineering knowledge.
7. Military bearing of the new graduates.
8. Personal qualities as related to or influenced by training.
9. Reliability of the new graduates in performance of their duties.
10. Ability of the new graduates to work and get along with others.

Summary. This chapter has presented the basic underlying principles of an evaluation process. In addition, the essential steps in the evaluation process are listed. It also pointed out the strengths and weaknesses in relation to the objectives of the Pilot Training Program as evidenced by the accumulated data. The next chapter presents a summary of the findings of this study and the conclusions and recommendations evolving from this study.

CHAPTER VIII

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter is to state the findings, conclusions, and recommendations evolving from this study.

Findings. Certain findings have emerged from this investigation of the Pilot Training Program at Vance AFB. These are as follows:

1. There is a dearth of published research in the evaluation of the Pilot Training Program, particularly the Advanced Multi-Engine Pilot Training Program. Informal or unpublished evaluations do exist but are not the type which provide data indicating the effectiveness of the Pilot Training Program in supplying graduates to fill the needs of the using agencies.

2. Specific statements of training standards and objectives of the Vance AFB Pilot Training Program are definitely lacking. The syllabus does not state specific objectives of the course in relation to the skills and knowledges a graduate should have.

3. Graduates of the Pilot Training Program at Vance AFB are assigned to many different commands of the USAF. Therefore, the Pilot Training Program must of necessity train the students in the general skills and knowledges required of multi-engine pilots and officers.

4. While a number of methods exist for the evaluation of any training program, each method has certain advantages and disadvantages. The personal visitation follow-up survey employing the use of

a questionnaire is a promising technique for the collection of data for the evaluation of the Pilot Training Program.

Conclusions. Based on this study, the following conclusions appear to be defensible:

1. Pilots graduating from the Pilot Training Program at Vance AFB are satisfactorily achieving the skills and knowledges needed to satisfy the using agencies.

2. The strengths of the Pilot Training Program at Vance AFB include the following:

- a. Flight planning problems and practical training in procedures.
- b. Instrument knowledge and flying.
- c. Military bearing of the new graduates.
- d. Ability of the new graduates to work and get along with others.

3. In light of this study certain specific areas of the Pilot Training Program at Vance AFB appear to need strengthening. Such areas include the following:

- a. High altitude, night, and formation flying.
- b. Opportunity to serve as cadet officers and make decisions.
- c. Practical application of the administrative subjects.
- d. Such sections of Weather, Instrument Flying Aids, and Physiological training that indicate little utilization.

4. The effectiveness of the Pilot Training Program at Vance AFB

is impaired by the failure to provide for continuous evaluation of the program in terms of achievement of objectives.

Recommendations. Based on this study of the Pilot Training Program at Vance AFB, the following recommendations are made:

1. Specific training objectives and standards of the Pilot Training Program should be determined and published. No training program can operate efficiently without the actual existence of such objectives and standards.

2. A plan for the continuous study and evaluation of the Pilot Training Program at Vance AFB in terms of clarified objectives should be established immediately. The supervisory and instructional personnel of this Pilot Training Program should be kept informed as to the effectiveness of the program in furnishing satisfactory graduates to the using agencies.

3. Future studies and evaluations should experiment with various research techniques in the attempt to find the most effective methods. Constant improvement in methodology, however, should be a primary concern in future evaluations. A combination of the techniques used in follow-up number one and two in this study should be investigated as a possible future methodology which may yield valuable data for an evaluation.

4. For ease of administration, future follow-up studies of this type should be conducted so as to request the establishment of a project officer at each base. The project officer would be requested to

schedule interview appointments with the appropriate base personnel to be surveyed.

5. Policies regarding instructor selection, retention, and training at a base training level should be considered. ATRC has established a policy partially fulfilling this recommendation, but further studies are warranted.

6. Consideration should be given to the possibility of having crews using sample airplanes from each using agency appear at Vance AFB periodically in order to inform at first hand the graduating students as to the missions and duties of such agencies.

7. A correlation method of Pilot Training Program at Vance AFB evaluation should be investigated for possible future use. Such a correlation method might compare the grades made as a student in the Pilot Training Program at Vance AFB to an officer effectiveness rating of the using agency. All grades in the Pilot Training Program at Vance AFB are now given on a T-Score basis.

8. The possibility should be investigated of issuing graduation assignments a number of weeks prior to the end of the course. The data from this study indicated that certain subjects areas included in the Pilot Training Program at Vance AFB were not utilized equally by each using agency. If an early assignment for each student could be effected, the possibility should then be considered of some specialization in training pertinent to the mission of the using agency to which assigned. Coordination with higher headquarters is an

absolute necessity in this recommendation.

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