AIR UNIVERSITY REVIEW

AIR TRAINING COMMAND: PROVIDING FOR THE FUTURE

SEPTEMBER-OCTOBER 1968

AIR UNIVERSITY
REVIEW

THE PROFESSIONAL JOURNAL OF THE UNITED STATES AIR FORCE

Address manuscripts to: Editor, *Air University Review*, Aerospace Studies Institute, Maxwell Air Force Base, Ala. 36112. Printed by Government Printing Office, Washington, D.C. Subscriptions are sold by Air University Book Department, Maxwell Air Force Base, Ala. 36112: yearly $4.50, back issues 75 cents. USAF RECURRING PUBLICATION 50-2.

the cover

One of the earlier associations an airman has with Air Training Command is the issuing of the uniform and the trying on of caps. Later exposure to the command is more enduring and certainly more significant in terms of long-range usefulness to the Air Force and the nation. In this issue of *Air University Review*, Lt. Gen. Sam Maddux, Jr., ATC Commander, and several members of his command discuss salient aspects of their mission: "Preparing the Man" for an Air Force career.

Vol. XIX No. 6 SEPTEMBER-OCTOBER 1968


REMOVE BEFORE

AIR TRAINING COMMAND LOOKS TO THE FUTURE

LIEUTENANT GENERAL SAM MADDUX, JR.

IT IS generally accepted that the United States Air Force is the most technologically and scientifically advanced military force in the world today. Our aerospace team is equipped with highly sophisticated weapon systems, the most effective that Air Force planners and the civilian aerospace industry can provide for the defense of this country and for the protection of the Free World.

To look back over the 23 years since the end of World War II, to consider our air power then, to follow it through the development stages of the postwar years, and then to realize what the force is comprised of today is a reassuring assessment. In less than a quarter of a century, a whole new spectrum of hardware and doctrine has been envisioned and brought into operational employment. This was not just a quarter of a century of advancement. It was also a period of military thrusts and political harassments by our adversaries bringing about many local situations on the world's geopolitical front which had to be dealt with as the aerospace force continued to take form.

Preparing the man for today's aerospace force is the task of Air Training Command (ATC). Various top-echelon air leaders have expounded repeatedly that a weapon system, however technical and effective it may be, is no better than the men who operate, maintain, and support it. ATC has the responsibility of selecting, processing, and training officers and airmen for these duties.

As one of the Air Force's largest commands, ATC averages about 131,000 military personnel assigned, including students, and

21,000 civilian employees. The training fleet has approximately 2000 aircraft of 13 different types.

In its 25 years of operation, ATC has conducted courses of instruction for more than 7 million personnel. Almost every member of the Air Force receives training at least once under ATC supervision. Many return several times to upgrade skills or to change to another field as the aerospace force introduces new systems.

Currently, ATC trains about 700,000 Air Force personnel yearly, conducts more than 3000 courses at 16 command bases, and has 146 field training detachments at other U.S. bases and throughout the world, including Southeast Asia. Other training squadrons are located on bases of other commands. In addition to Air Force requirements, several thousand Air National Guard, reservist, and foreign students are trained each year. ATC conducts training of foreign students under the Military Assistance Training Program, with personnel from as many as 60 nations attending the command's technical and flying schools at various times.

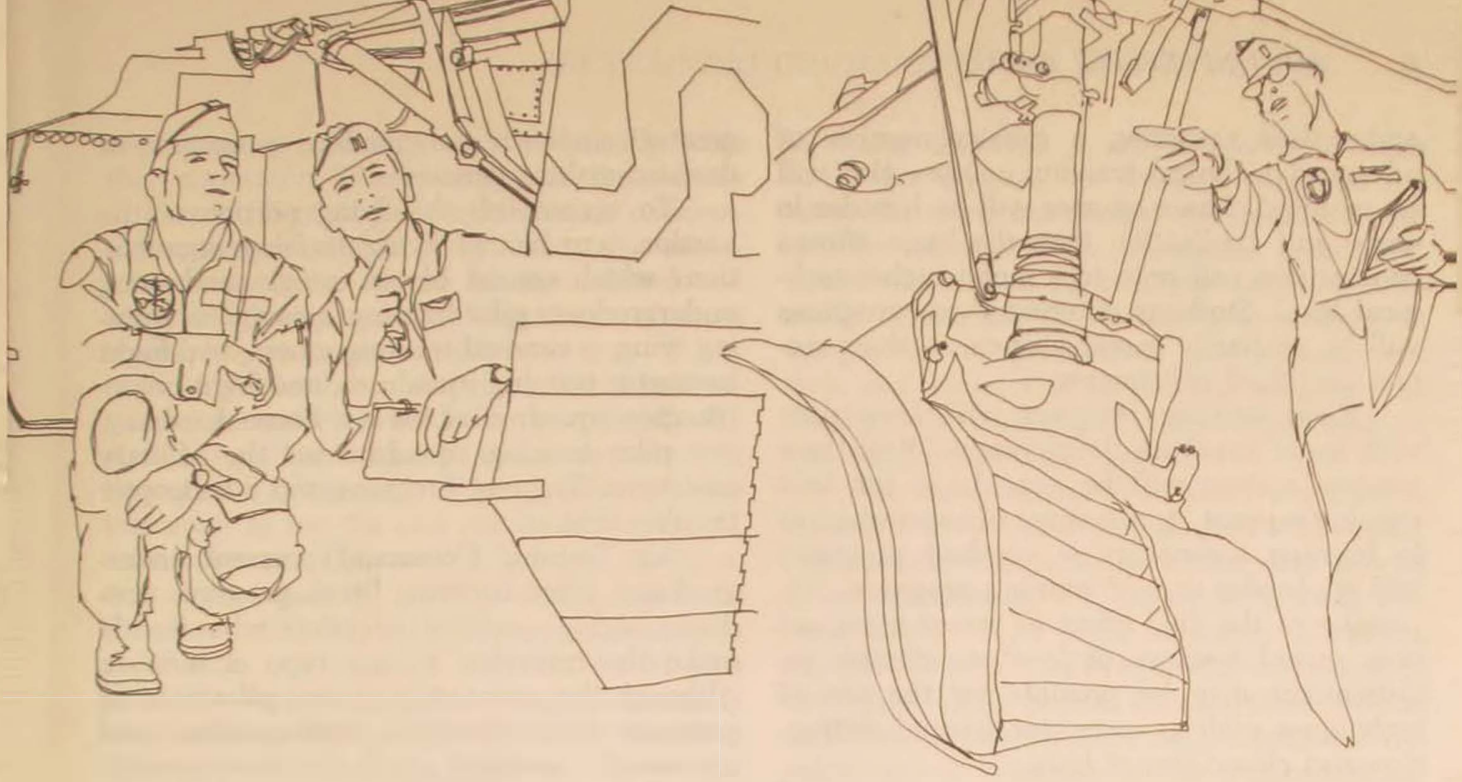
Basically, ATC has four broad missions—personnel recruiting, military training, technical training, and flying training, of which survival and special training are a part.

To provide the Air Force with people who have the necessary physical and mental qualifications is vital to its continued capability to perform assigned aerospace missions. As Air Force requirements change, there is an accompanying change in the number and types of recruitment programs. The recruiting effort, which enlists over 100,000 replacements each year, is further complicated by several factors which affect recruiting in varying degrees and over which neither the Air Force nor ATC has any control. These are selective service laws, nationwide employment trends, civilian wage scales, overseas military commitments, and the general worldwide political environment.

Basic to all recruitment activities is the face-to-face contact between the locally assigned recruiter-salesman and prospective recruits. Future changes and refinements in the recruiting system will be directed toward assisting the local recruiter to increase his effectiveness.

The introduction of data automation into selection and assignment actions for non-prior-service personnel has had a major impact on the recruiting operation. Implementation of the Selective, Qualitative Airman Recruiting System (SQARS) plays a most important role in this undertaking.

SQARS was developed in two phases. Phase



I, implemented in 1965, provided computer processing of airman personnel data in basic military training and Officer Training School, and also yielded management products for the personnel processing activities at Lackland Military Training Center. Phase II, implemented in January 1967, makes use of the computer for classification of basic trainees for most technical school courses and directed duty assignments. The system employs a mathematical technique to determine the best possible array of assignments for any given group of basic trainees.

Basic military training continues as a single-phase program to be completed by all non-prior-service personnel before assignment to formal technical training or to an Air Force unit for on-the-job training (OJT). There is a possibility that basic training will be extended to eight weeks, to provide initial training in the unique requirement of living and working in a combat environment.

Officer Training School (OTS) also continues to provide a short lead-time source for officer procurement. Liaison is maintained with agencies responsible for other DOD officer commissioning programs, to achieve greater standardization of training objectives in basic military skills and knowledge.

Indications are that there will be an increasing number of Air Force specialties based on the trend toward a vastly greater variety of equipment to be used in the Air Force. As re-enlistment rates are not expected to change greatly, there will be increasing emphasis on providing only essential technical training for effective first-term job application.

Implementation of a maintenance concept which emphasizes removal and replacement procedures as a first-line function will increase development of built-in test, automatic self-check, and "remove and replacement only" functions. Fewer highly skilled maintenance personnel will be required at this level. Deployment of automatic test equipment and maintenance of microminiaturized circuitry will require a higher ratio of skilled to semi-skilled personnel.

Fundamentals training and initial equipment-oriented phases of technical courses will tend to become shorter and more specifically keyed to actual narrow job specialty skill and knowledge requirements. This will dictate a greater number of such courses, with shorter training times and more-specialized graduates who have prepared to perform in their specific first-term assignment. To provide the higher skill and knowledge levels for the technicians who will be engaged in detailed maintenance diagnosis and repair, rather than in remove-

and-replace activities, a greater number of advanced technical training courses also will be required. These courses will be broader in scope and application than the basic airman courses and will train to a much higher technical level. Students entering these programs will be primarily career airmen on their second and third enlistments.

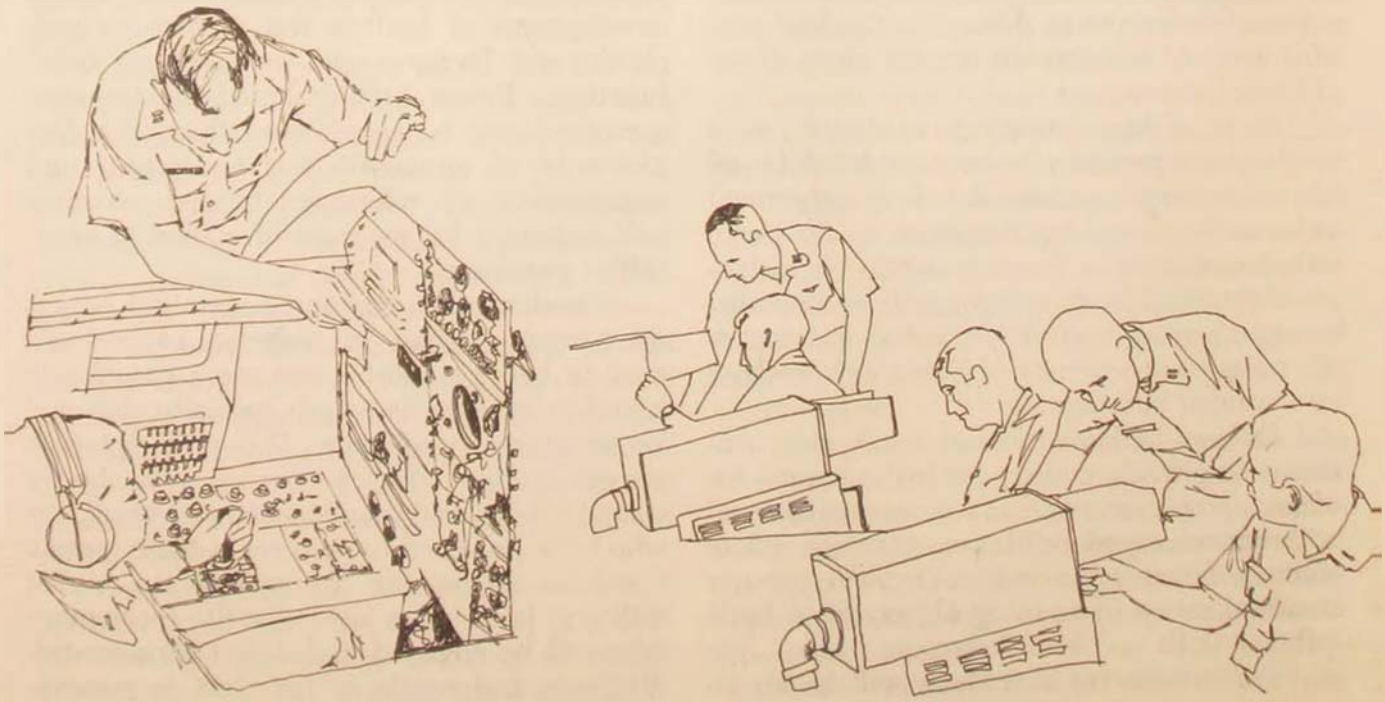
Field training programs will keep pace with force structure development. Each new weapon system will be considered for field training support. Applications of improvements in training technology in resident programs will apply also to field training programs. Expansion of the field effort to career areas not now served because of low quantitative requirements may be possible by the use of techniques such as computer-assisted instruction and closed-circuit links.

As with the airman programs, there will be an increasing number of officer specialties within the Air Force, and these will require additional courses to meet more specific skill and knowledge requirements. It is anticipated that officer training in general will include greater emphasis on modern management decision-making processes.

To accomplish the flying portion of the mission, ATC has 17 flying training organizations which consist of ten wings conducting undergraduate pilot training, a navigator training wing, a survival training school, two flight instructor training squadrons, one flight indoctrination squadron at the Air Force Academy, one pilot training squadron for the Military Assistance Training Program, and a helicopter training unit.

Air Training Command's current undergraduate pilot training (UPT) program produces highly qualified jet pilots who readily make the transition to any type of aircraft. Although the command's current pilot training program is producing a well-qualified and universally accepted product, it is possible that through experimentation and the application of advancements in training technology better pilots may be produced more economically and perhaps in less time.

The present UPT curriculum provides 240 hours in three different types of aircraft. Fu-

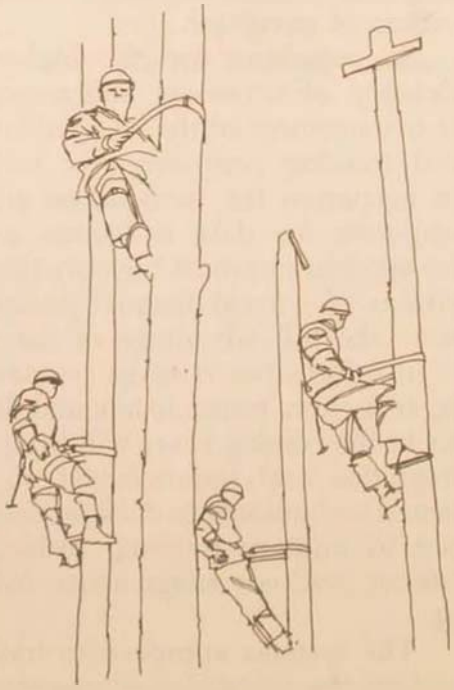


ture training concepts may drastically alter this curriculum. Two concepts are under study at present. First is the single aircraft concept. Advantages of such a program are that maintenance activities would be streamlined and simplified as spares and support equipment would be required for only one type of aircraft; more flexibility in assignment of maintenance personnel would be permitted; the student could remain with the same instructor through all phases of training, allowing the instructor to see the end results of his efforts, thus enhancing his motivation and, in turn, that of the student. Another benefit would be the elimination of academic courses relative to more than one aircraft, but this would also eliminate the training that students currently receive in problems related to the transition from one aircraft to another.

The second concept would use additional procedural trainers and flight simulators to improve the learning process and thereby increase the quality of the graduate. Current research projects in this area will provide further data on the optimum use of simulators in flying training. A major advance which could be adapted is training wherein the computer compares student performance with specific criteria in the automatic demonstration of maneuvers. An example would be automatic evaluation of student performance in comparison to preselected performance criteria and visual aids to provide realistic time displays for teaching of visual flight cues in the landing and traffic pattern.

The basic aeronautical skills required to operate various Air Force aircraft will remain substantially the same over the next several years, considering the family of aircraft systems which will be in the inventory. However, one system which will require development of new pilot skills is the vertical/short takeoff and landing (V/STOL) aircraft. Anticipated development of V/STOL fighter and transport aircraft with a limited-war and counterinsurgency operations capability indicates that substantial numbers of these aircraft will enter the inventory.

In helicopter pilot training, improvements will be made through the introduction of a



helicopter simulator and an aircraft designed specifically as a training vehicle. There will be a few changes in the basic flying skills employed in present helicopter operations.

ATC will continue to train navigators in a multitude of skills to meet the continued expansion of the scope of that rating. Requirements will exist for rated officers trained in pure navigation; however, introduction of highly sophisticated equipment will cause frequent revisions in the curriculum. The more specialized advanced training courses, designed to prepare navigators for duty as navigator-bombardiers and electronic warfare officers and to develop other essential skills, will undergo rapid changes in course materials and equipment.

ATC must increase its efforts to close the gap between training equipment available and the new navigation systems and electronic warfare systems in-being. Training applications to the new systems are impeded primarily by equipment limitations of the T-29 and associated ground trainers. Research and experimentation with multiple sensors, low light-level television, infrared detection devices, radar in the field of target acquisition, and the development of a hunter-killer weapon system —all will have an impact on the diversity of skills and specialties grouped under the rated position of navigator.

In searching for the highest levels of efficiency, effectiveness, and responsiveness in the management of the vast military and technical training programs, ATC will exploit to the maximum the tremendous advantages of computers for data collection and analysis. The applications must be more than mere conversions of current manual procedures. They must take full advantage of the state of the art in information storage, retrieval, processing, reduction, transmission, and display. Progress in the coming years will bring about total integration and improvement of the current manual and automatic data-processing systems used in military training, resident technical training, graduate assignments, and field training.

The systems approach to training, which employs the principles of programmed learning, has emerged as the primary methodology used in the development of ATC training programs. The systems concept involves all training personnel in the adoption of individual training systems. Instructors are being trained in the principles of programmed learning prior to the systemization of courses in which they are considered expert.

ATC will continue to explore and develop up-to-the-minute trainers and training devices to meet the demands of the rapidly expanding technology. New approaches in the use of simulators will be given high priority. Another method of presentation being used by ATC in an increasing number of training situations is the multimedia approach, which combines the advantages of the programmed text, 35-mm slide projector, 16-mm movie projector, and student response devices into an overall training presentation. Such a method permits maximum use of remote-site and on-the-job training instructions and provides high quality achievement and economy of instruction.

TV presentations will be combined with programmed instruction, and the effectiveness of the presentations will be validated by student learning outcomes. Performance testing by educational television (ETV) also will be exploited and will be used in remedial training areas, in basic military training, and even in complex flying training areas. TV kinescopes will be widely used, particularly in learner-centered instruction, and will be made for Extension Course Institute (ECI) and OJT courses for use by airmen worldwide, particularly those in remote assignments. The expanded use of mobile TV units in the field also is anticipated, and small video tape recorders will be fully exploited. Rear-screen projection equipment will eventually replace ETV monitors in the classroom.

In ATC, it is becoming increasingly commonplace to see students undergoing training programs based upon independent study. The instructor's role is being modified from the lecturer-authoritarian figure to one providing instruction when requested, clarifying misconceptions, and guiding students to achieve predetermined, clearly defined goals. Computer-assisted instruction systems will be de-

veloped for ATC use. Studies indicate that the major significance of such a system will be the challenge it presents in devising new methods of administration, instruction, and advisement. The system capitalizes on the established psychological principle that students vary in the rate at which they learn and that they learn better in a situation where they are self-paced.

Regardless of how advanced the educational system is, its most important element remains the instructor. The two most important attributes of the best instructor are enthusiasm for the job and technical competence in his specialty. To insure these qualities in the command instructor corps, ATC will continue to procure volunteers from field-experienced personnel.

Full exploitation of new training technology will require personnel with the vision and energy to seek new approaches to solving training problems and the professional and technical competence to apply them. Although the role of the individual instructor may change as new technologies are adopted and incorporated, ATC will continue to provide instructors a foundation of basic methods and techniques in instruction through a preservice instructor course and the opportunity for professional growth through an in-service training program.

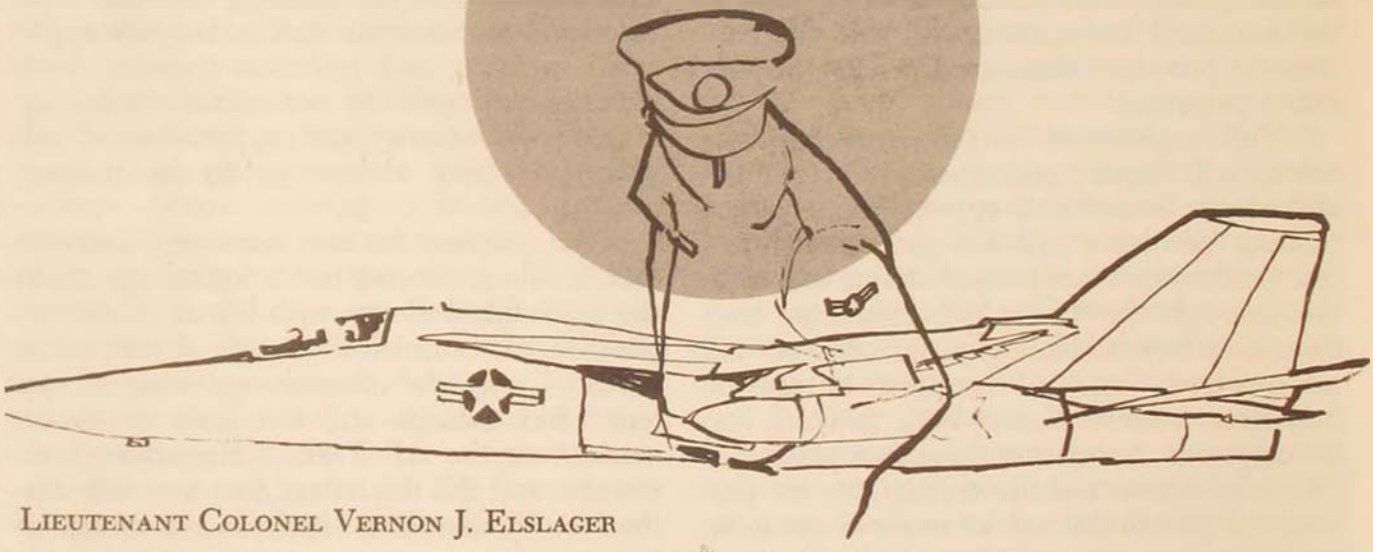
The contribution of these innovations must be measured through the design of the total system. Unless the training programs are developed in the system's total complexity, then any new innovation is merely a gadget which may or may not have a significant or permanent impact on the learning process.

The application of the systems approach requires, as a minimum, on-site facilities to analyze, develop, and, most important, test innovations in training methodologies and equipment. A study is under way now to establish an experimental facility at an undergraduate pilot training base and one at a technical training center. These facilities will have the capability to identify, test, and evaluate training concepts and techniques applicable to flying and technical training. Such facilities will provide centralized leadership in the development and application of advanced training technology to all training courses.

We continue to hear more and more in this rapidly advancing technological age about the mechanical means with which to accomplish our daily tasks. We speak of survival in terms of scientific progress and weapon systems. But man is still the most important element in the Air Force today—indeed tomorrow and the day after. And ATC will continue to "Prepare the Man" for our aerospace force.

Hq Air Training Command

TOWARD INDIVIDUALIZED INSTRUCTION



LIEUTENANT COLONEL VERNON J. ELSLAGER

RECENT advancements of educational and training research in the military environment have closely paralleled the direction and guidance our national leaders have provided on this subject.

President John F. Kennedy, in his "Message on Education" to the 88th Congress of the United States in January 1963, compared the growth of research in industry, health, and agriculture with the astonishingly meager and frequently ignored research in education. He deplored the fact that educational systems lag behind, sometimes as much as 20 or even 50 years, in utilizing the results of research and keeping abreast of knowledge in all fields, including education itself. President Kennedy recommended legislation to broaden the Cooperative Research Act to include support of centers for multipurpose educational research and for development and demonstration programs.

President Lyndon B. Johnson, in his "Message on Education" to the 89th Congress in January 1965, referred to the historic educational measures passed by the 88th Congress and its increased commitment

to education in America. He recommended the establishment under the Cooperative Research Act of regional educational laboratories, which would undertake research, train teachers, and implement tested research findings. Further recommendations under this act included broadening the types of research organizations now eligible for educational projects, training educational research personnel, and supporting construction of research facilities and purchase of research equipment. In the 10-month period January to October 1965 the 89th Congress legislated an educational revolution.

In June 1965 Secretary of Defense McNamara, in a memorandum to the service secretaries, expressed his concern over the relatively negligible funds being spent on educational innovations, including research and development and new methods and techniques. He called for an examination of the education and training programs of the respective departments, recommendations for improving these programs to reach him on or before 1 August 1965.

The forceful educational leadership of our national leaders had an immediate impact on military education and training, civilian educational institutions, and the software and hardware industries. Industry was alert to the advent of this educational revolution, and 1966 will perhaps be best remembered as the "year of the merger." Announcements in the financial pages told of a succession of corporate marriages that promised to exert a profound influence on the character and content of military, school, and college programs.

What, then, is the significance of these new ventures? The new companies are private, profit-making concerns; consequently, their approach to the problems of educational technology is to develop innovations based on instructional systems engineering. The processes involved in designing a training system are arbitrarily analyzed in three areas: (1) determining training requirements, (2) developing the training environment, (3) measuring the results of training.[1]

The success of the systems approach to education and training is based on the basic definition of learning: an individual's change in behavior as a result of experience. Therefore, it is important that, first, all training be geared to the place of the individual in the systems process. The behavioral analysis tasks have to be specifically structured in order to determine if learning has resulted. Education or training then becomes the process of arranging the environment of the individual in such a way as to make this behavioral change take place.

Dr. Robert Glaser, Director, Learning Research and Development Center, University of Pittsburgh, highlights the importance of individualized instruction in the systems approach with his definition of educational technology:

> Education involves behavioral change. The system in the environment we create in which the individual makes this behavioral change is what we call education. We have to use certain tools. The whole system, the tools we may use, whether they be computers, books, tests, or measurements—all of these comprise the technology which the educator uses to make this behavioral change take place.

The subject of individualized instruction is not a new one. Educators have been talking about the need to take account of individual differences for at least 40 years, but for 40 years they were doing little about it, in large part because they lacked the pedagogy and the technology. Now, however, the technology is becoming available, fortunately at a time when there is a growing insistence that instructing must take advantage of individual differences.

Today, this search for ways to individualize instruction is emerging as the most important single force for innovation and reform.

Learner-Centered Instruction

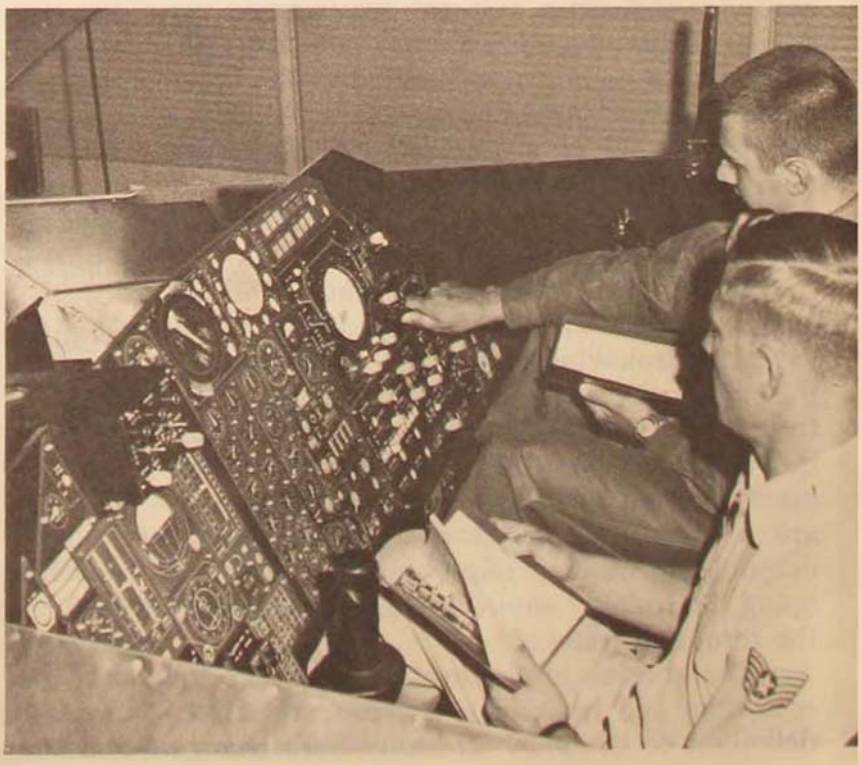
The Air Training Command, with about 3500 courses, has many major obstacles to overcome before total individualized instruction can become a reality. Fortunately, ATC pioneered the programmed instructional systems approach to training in the Air Force,

and in 1967 this learner-centered approach was declared operational. In the systems process, emphasis is placed on the instructor's role in assisting, guiding, and supervising individual student progress to achieve specific learning objectives after the appropriate mode of instruction has been determined. All new methods, devices, and procedures are identified and evaluated as to their purposefulness to training objectives. There are countless new devices, equipment, and techniques that have been developed by industry to assist in achieving specified training objectives. The ATC goal is to identify and analyze those innovations that are most suitable and applicable to its training programs.

Although ATC is involved in many research studies in instructional technology, the concept of learner-centered instruction has been identified as one which appears to present far-reaching effects in applying the principles of individual learning to a training environment. A learner-centered instruction project now being developed at Lowry AFB, Colorado, is an effort to demonstrate, evaluate, and significantly advance the existing technology of this approach. A course will be developed to relate to time schedules and data provisions of the F-111A weapon system. To better understand the rationale of this project, one must take a look at the basic definition, training problems, provisions for individual differences, and job motivation.

definition

The learner-centered instruction approach promises great rewards today for satisfying educational requirements in the design of individually oriented instructional systems. Although various forms of this technique have been studied in the past, there is a need to further explore "learner-based" environments in light of possible military applications. At the Aerospace Education Foundation Seminar held in Washington in September 1966, Major General Leo F. Dusard, Jr., Director of Personnel Training and Education, Hq USAF, pinpointed the urgent necessity to further study the individual and how he learns best:



Sessions in the cockpit of the F-111 Simulator give the student practice in performing operational checkout procedures, in detecting malfunction indications, and in troubleshooting equipment malfunctions. . . . An instructor sets malfunction indicators in the simulator. . . . A boresight trainer duplicates the complexity of boresighting the F-111.

> The teaching process continues to be refined, but what we need to know is how learning occurs so a more precise refinement of the teaching-learning process will take place. We know that a student learns more and remembers it longer if all his faculties and perceptive senses are made a part of the learning process.

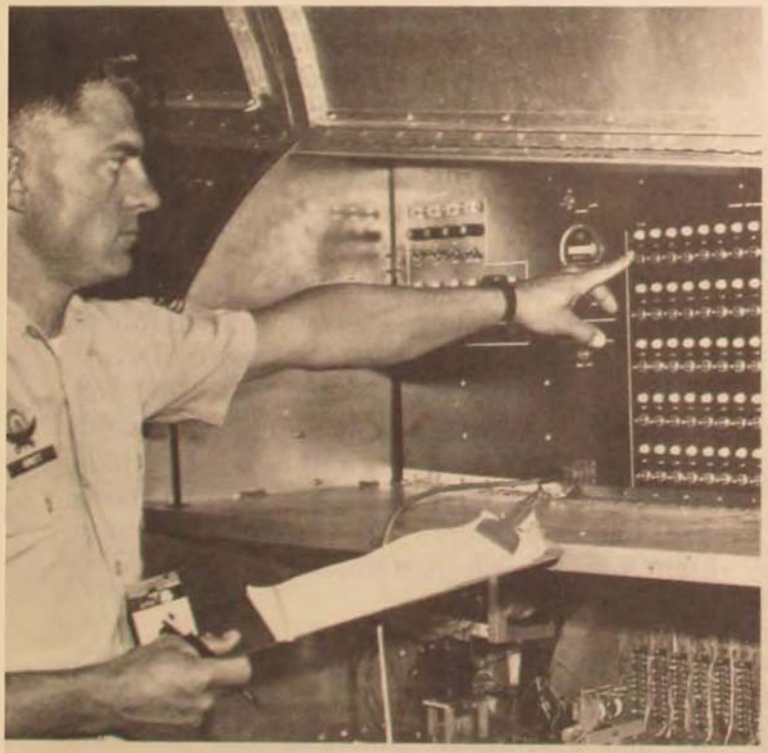
Learner-centered instruction is a systems approach that attempts to solve the problem referred to by General Dusard. For our purpose, we will define learner-centered instruction as an educational environment in which the student is provided with behavioral objectives and in which, with minimal instructor interaction, he proceeds at his own rate under self-selected learning conditions to specified terminal behaviors.

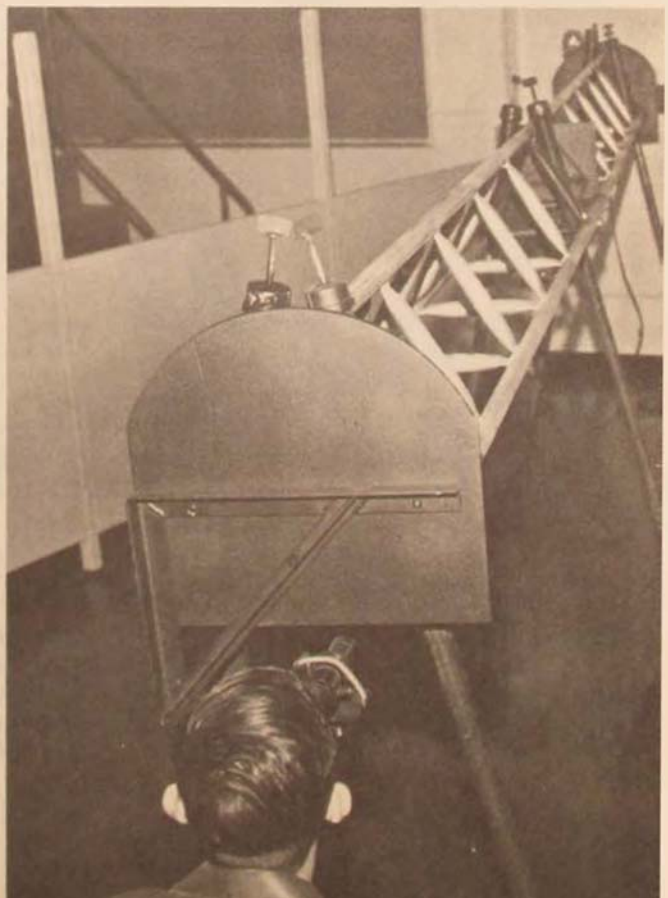
training problems

In recent years weapon systems have greatly increased in complexity because of modern technological advancements. Although greater equipment reliability, maintainability, and built-in test capabilities have been achieved, there is still a continuing need to train personnel to perform duties in an expanding number of weapon-system support activities. The high cost of training and low re-enlistment rates have served as a stimulus for exploring new training methods in the armed forces, especially in the electronics area. Research efforts have shown that electronics resident training under joblike conditions is possible.[2]

In the foreseeable future, computers, greater systems reliability and maintainability, and the use of procedural and troubleshooting aids will probably decrease the need for the maintenance technician to utilize theory on the job. Already these technological advancements are in exploratory stages of development. One such development, the Presentation of Information for Maintenance and Operation (PIMO), will be tested at Dover AFB, Delaware, and Charleston AFB, South Carolina, for possible use as a convenient retrieval system for cognitive maintenance and operation information.

The future use of microelectronic configurations of electronic systems will reduce sig-





An instructor guides students as they work troubleshooting logic problems using technical order data. Group or individual practice sessions normally follow programmed learning periods, which may cover system data flow, system functions, troubleshooting concepts, operating procedures, etc. Training is given in operating standard test equipment as well as specific F-111 test equipment.

nificantly the maintenance burden and thus reduce certain maintenance personnel and training requirements. The microelectronic configurations also suggest new techniques of organizing maintenance activities to further reduce training and personnel requirements.[3] Therefore, it seems justifiable to consider first-term airmen for an advanced development program designed to demonstrate the feasibility of training them to become proficient in the use of pertinent information-retrieval systems, tools and test equipment, and troubleshooting techniques. In view of the technological advancements in modern weapon systems and maintenance concepts, it may be unrealistic to provide extensive education in front-end principles, with the expectation that the trainee will apply the information later in the operational setting.

providing for individual differences

To gain entry into electronics maintenance training courses, airmen usually must achieve above-average scores (usually 80th percentile and above) on the electronics aptitude index of the Airman Qualifying Examination. Although airmen may score high on the index, there is no assurance that all of them will be able to cope equally with abstract training course content. A review of grades in courses taught in the traditional manner usually shows a wide range in student achievement. Of course, in a similar training environment, medium-aptitude trainees may achieve a similar distribution of scores and perhaps at a lower level of achievement, especially if the instruction remains constant for both high- and low-aptitude groups. However, by developing job-specific courses and providing for individual differences in learning, ATC should be able to train airmen with lower electronics aptitudes (60–75 percentile) as well as those with higher aptitudes (80–95 percentile) to a high level of job performance achievement.

job motivation

Motivation is often a problem in the training and operational situation. The problem

may become particularly acute if the airman does not intend to pursue a military career. Since this group represents the vast majority of first-term airmen, efforts should be directed toward making the training and operational jobs both challenging and rewarding.

Although many high-aptitude men enter the Air Force, there are also many jobs that require personnel with high ability, primarily because of the abstract nature of the content of a large number of training courses. For example, the traditional electronics technician program usually starts with an extensive study of electronics fundamentals, beginning with the electron and atom. In this program, students build their knowledge of theory through an abstract study of the nature of electricity, direct current, alternating current, electron tubes, and, later, design problems in radio transmitters, receivers, and other electronic equipment. The emphasis in this part of electronics training is on building and designing.[4]

In general, airmen who can successfully cope with the abstract verbal content of extensive training in front-end electronics principles plan technical careers after discharge from the Air Force. When these airmen are assigned to duties such as on-aircraft maintenance, they find little or no challenge in the "black box" scope of the job. On the other hand, medium-aptitude airmen may be able to perform such jobs to a high degree of proficiency and thus find satisfaction in their accomplishments. They should be tested on their ability to use test equipment and perform job tasks effectively rather than be required to verbalize the job by means of paper and pencil tests. It is possible to train airmen with a minimum of theory to perform flight-line maintenance tasks efficiently. However, their inability to speak the electronics language fluently may result in bias against them which could affect their job motivation.

In remarks by Dr. Eugene T. Ferraro, Deputy Under Secretary of the Air Force for Manpower, to the Air Force-wide Career Motivation Conference at Langley AFB, Virginia, on 2 May 1967, educational technology was identified as one of six priority areas required to develop an improved manpower and personnel system. His comments on this subject relate quite closely to the rationale for application of learner-centered instruction in a training situation. Dr. Ferraro stated:

> The recognition of Air Force manpower and personnel research has come most from its leadership in the development of education training technology. Many of the procedures and systems now being applied in the field of education had their origin or early application in the Air Force. Emphasis on educational technology is necessary to increase the Air Force's ability to meet its needs in the future.
>
> In view of this need, a thorough reappraisal of the Air Force education and training system may be in order—not so much in terms of the *adequacy* of training but of the *necessity* for much of it. What was the relation between the time spent in training the 84 percent of our first term airmen who have left the Air Force this year, with their period of productivity as Air Force members? Was it worth the time and effort? We need to consider alternatives. Possibly the best way to begin reducing training time and improving the productivity of our training system is to adopt different objectives for "first termers" and career airmen. Under this concept, all men would be trained at a certain level for their first tour, with in-depth training given only after reenlistment. We shall examine selected courses in several career fields to redesign them for the "first termer" and career training concept. This concept might also help retention by providing advanced educational opportunity as an inducement to reenlistment.

Systems Approach to Learner-Centered Instruction

The learner-centered instruction (LCI) systems approach to training has been developed as a result of many Department of Defense studies. The task analysis research in the early 1950s attempted to specify knowledge, skills, and abilities from data based on actual job requirements. Later refined task analyses have formed bases for well-defined learning objectives and terminal behavior statements. Many comparative training media studies have

advanced the methodology of training aids selection. Later research on troubleshooting, programmed instruction, performance aids, and job proficiency evolution has contributed to the refinement of training technology.

Since 1964, ATC has conducted experiments at Lowry AFB in learner-centered instruction. The LCI concept utilizes various education and training techniques, including programmed instruction and multimedia selection. In January 1966, the Behavioral Sciences Laboratory, Wright-Patterson AFB, Ohio, engaged in a joint effort with ATC to develop an LCI electronics fundamentals course based upon the systems approach to training. While exploratory research in the general technology of this approach to training has been accomplished, it still remains to be integrated and systematically validated for potential use in military technical training programs.

goals and purpose

The LCI research project has as its goal the development of a 12–14-week (conventional course 25 weeks), systems-oriented, learner-centered course in electronics maintenance for the Weapon Control Systems Mechanic (AFSC 322Xlr, F-111A). Although the course instruction will be conducted by Air Force personnel at Lowry AFB, the development of the total program will be through the standard multisource contract procurement with civilian companies. The Behavioral Sciences Laboratory will monitor all contracts.

The purpose of the Lowry LCI project is to demonstrate and evaluate the technology for developing job-specific electronics maintenance courses that will (1) be systems-oriented and compatible with time schedules and data provisions associated with the development of both the aircraft and the firepower control subsystem; (2) increase the efficiency of training through the use of multimedia, including automated instruction; (3) allow effective use of first-term airmen of lower aptitudes than those currently assigned to electronics maintenance training by providing for individual differences; and (4) develop course objectives from a detailed job behavioral analysis, with very little emphasis on theory. In addition, the effort will provide a demonstration to determine just what savings and performance increments will be possible.

experimental design

In the experimental demonstration to be conducted at Lowry AFB, the trainees will be divided into three groups of 40 students each. The trainees in the current electronics course (control course) will have high electronics aptitudes, ranging from 80 to 95, as will the trainees in one of two experimental courses. In the second experimental course the students will have lower aptitudes, ranging from 60 to 75. Airmen with scores below 80 will not take the current electronics course, since the training is oriented toward students in the 80–95 range. The experimental course will be designed to provide for individual differences throughout the aptitude range 60–95.

Development of Learner-Centered Instruction Course

The learner-centered systems approach to electronics training is programmed over a three-year schedule and will consist of three major phases: (1) job description and performance test; (2) development and conduct of course; and (3) course evaluation. Let us examine each of these developmental steps in relation to the programmed schedule.

Phase I: job description and performance test

The basic training philosophy underlying the Lowry LCI project is that the trainee should be taught on-the-job skills and knowledges in formal training. To develop a course based on this philosophy, it is necessary to analyze and describe the actual behaviors that are required on the specific job. A contract was awarded to obtain a behavioral analysis of job requirements, course objectives, and a job proficiency test of the Weapon Control Systems Mechanic for F-111A aircraft. The Phase I schedule:

Perform task analysis.....March 1967
Prepare job description.....June 1967
Prepare job performance test....June 1968
Deliver simulator .....June 1968.

The following work has been accomplished according to that schedule:

• Preparation of the job behavioral description

Data collection. The contractor was furnished all required quantitative and qualitative personnel requirements information (QQPRI) by the F-111A-SPO at Wright-Patterson AFB, Ohio. Prototype copies of all pertinent technical orders were provided by the F-111 manufacturer, General Dynamics, Fort Worth, Texas. Other pertinent documents and references were obtained by the contractor from various sources.

The first approximation to the job description (preliminary) contained all the elements expected to be included in the final job description, but in less detail and less authoritatively. The preliminary job description included names of the fire-control subsystems, definition of maintenance echelons used with this system, and the behaviors involved under the maintenance functions of checking, adjusting, replacing, repairing, servicing, and troubleshooting.

To facilitate field data collection, various materials were devised, including task analysis forms to permit systematic collection of data and simulated maintenance problems for use in structured interviews. Data collection visits were made to General Dynamics, Edwards AFB, California, and Cannon AFB, New Mexico.

Behavioral analysis. Two classes of behavior are associated with job performance: normal repertoire (NR) behavior, which requires no special skills or knowledges to perform; and special behaviors (SB), which only the proficient technician, using special skills and knowledges, can perform. Anyone who can read and follow directions can perform NR behaviors; therefore, these behaviors were of little concern in the behavioral analysis. However, the SB aspects received special consideration, since they include very narrow discriminations, especially in rapid responses, knowledge of unfamiliar terms, and test equipment operation. The behavioral analysis consisted of three steps: identifying tasks, determining task activities, and describing behavioral details.

• Development of job performance test

Preparation of test rationale and specifications. The LCI job performance test will serve as the criterion of the Weapon Control Systems Mechanic based upon task and equipment analysis of job requirements. In a performance test the trainee is observed while performing a task on real or simulated equipment and is scored on a quantitative or qualitative basis. The purpose of the LCI program is to demonstrate how well the airman can perform the job, not how well he can verbalize the job.

For each class of activity in the job behavioral description a statement giving the following information will be prepared: (1) critical aspects of the behavior to be measured in the proficiency tests; (2) type and nature of test items to be used in measuring this behavior; (3) kind of equipment needed, insofar as it can be specified before the items are prepared; (4) nature of the scoring of the item, if it can be specified before the item is prepared; and (5) an estimate of the time required for the item or class of items.

Preparation of list items. Items will be prepared in accordance with the stated specification and rationale. One requirement is that the test be diagnostic. In order to achieve this, subtests or test items will have part-task scores. For example, if the operation of a given item of equipment is to be tested, scores might be obtained on resetting the instrument, obtaining the proper display, and evaluating the display. If the trainee's performance is poor, the subtest with three subscores will reveal to some extent just where his difficulties lie.

• Development of simulated maintenance training environment (SMTE)

During the development of the job behavioral description, it became evident that the limited number of aircraft at the test sites would make it extremely difficult to obtain an

adequate performance test tryout. To overcome this problem, it was decided to build a fully transportable, full-size mockup of approximately a 14-foot section of the F-111A aircraft. The necessary physical, electrical, and electronic features for adequate simulation of the tasks of the Weapon Control Systems Mechanic will be incorporated into this mockup or into accessory equipment and materials. The simulation designed to support the job performance test would be the simplest possible device with only the fidelity necessary to provide testing ability and potential training facilities for the tasks performed by the mechanic. The characteristics of the SMTE will be determined from the job behavioral description and performance test requirements.

Phase II: development and conduct of course

Phase II, development of the LCI course schedule, deals with three major areas:

Prepare plan of instruction....March 1968
Develop training course.....July 1968
Monitor and conduct course...July-December 1968.

Let us consider a brief résumé of each step.

• Prepare plan of instruction

Preparation of primary statements of learning objectives (SOLOs). The primary learning objectives will be based upon the performance requirements of the job, taken directly from the behavioral job description but supplemented with performance times and error specifications. The statements will specify what the trainees will be expected to do at the end of the training program.

Determination of subordinate learning objectives. The subordinate learning objectives must be derived from the primary learning objectives through identification of their behavioral components. This process should produce a hierarchically organized set of subordinate learning objectives, so that for any higher-level task to be performed successfully the trainee must be able to perform all lower-level tasks.

Determination of teaching sequence. The development of an effective course sequence for practically any subject depends largely upon the judgment and insight of the person performing the sequence, although it is desirable to be as systematic as possible.

Selection of media and training equipment. A multimedia approach will be taken in the development of the LCI course, and the selection of the media and equipment will be determined by the objectives. Among other factors to be considered are the nature of the behavior change to be produced, number of students to be trained, proficiency level required at the end of training, and the manner in which the medium is to be used.

• Develop training course

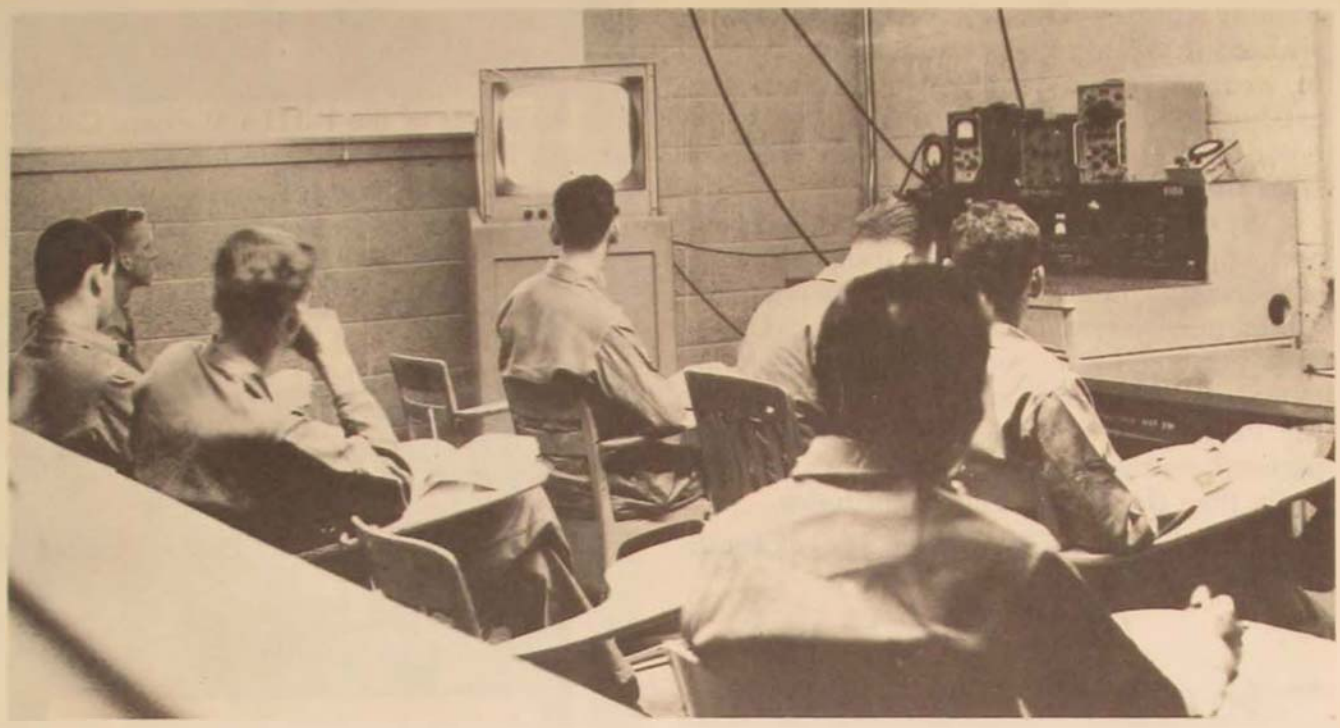
This phase will be devoted to the development and preparation of detailed lesson plans, actual training materials, and training media and equipment to be used in the conduct of the course. It will also include orientation of the Air Force instructors to be used in the experimental course. It is considered that the best orientation that can be given to the instructors would be to have them participate in the development of the LCI course. Two months prior to the course start, the instructors will be oriented to the approach and given experience with the course materials, procedures, and training media.

• Monitor and conduct course

Each instructor will teach the whole course to his class. To maintain the planned content and methods of instruction, contractor representatives will monitor much of the training. Television will be used for on-site monitoring of the classes and will eliminate the disruptive effect of an observer in the classroom. Video recordings will be made of some of the class samplings for later evaluation. In addition, the contractor representatives will confer with the Air Force instructors conducting the classes.

Phase III: course evaluation

The evaluation of this experiment will be made by means of the job proficiency test to be developed for the specific purpose. The



Closed-circuit television plays an important part in ATC training and has the collateral advantage of insuring that all the students receive the same amount and quality of instruction.

test will be designed to measure actual job performance in the field. It will be administered to graduates of both courses, and for follow-up the graduates will take the same test after they have been in the field about four months. The Air Force Specialty Knowledge Test (SKT) also will be administered when the trainees graduate and after they have been on the job four months. The job proficiency test will serve as the criterion for evaluating the experiment; however, the SKT results will be compared with the job proficiency test results.

The experimental course will be evaluated according to the following evaluation design:

	Upon Graduation		In the Field	
	Job Perf. Test	SKT	Job Perf. Test	SKT
Current Course				
Electronics Principles—10 weeks Equipment (sets)—14 weeks	x	x	x	x
Experimental Course				
LCI Electronics Maintenance Course—14 weeks	x	x	x	x

ALTHOUGH the general technology associated with the Lowry LCI project is largely available on a piecemeal basis, it has not been systematically evaluated for use in Air Force programs. The total program will focus and demonstrate the technology for developing job-specific, apprentice-like technical courses as an integral part of the weapon system development cycle. It is hoped that this systems-oriented approach for the development of job-related technical courses will provide the following potentials:

• In comparison with current practices, this program proposes to train personnel of equal or lower input aptitude in half the time and produce equal or better on-the-job proficiency in their first job.

• The technology associated with this program is keyed to the weapon system development cycle for several reasons. Personnel must be considered an integral part of operational Air Force systems. During the development of a weapon system, much information is generated that is of direct value in planning

training courses. Greatest economies can be realized if technical courses are initially keyed to weapon system requirements, rather than establishing a course that is not system oriented and redesigning it based on feedback from the field.

By making the technical course job-related and apprentice-like, we can train personnel of average aptitude to perform maintenance duties in a very satisfactory manner. Use of such personnel is important because they are more available, more likely to remain in the Air Force, and perhaps even more likely to perform routine maintenance duties satisfactorily than those with higher aptitudes.

• The course will make use of multi-media self-instruction and training to a job-sample performance criterion. This effort will include the development of formal performance measures of the F-111A Weapon Control Systems Mechanic. Accurate measurements of the effectiveness of the training program for teaching personnel to perform the electronics maintenance job will be developed.

The total program will be judged in terms of the applicability of the procedures used to efforts in other systems and the degree to which execution of this program increases confidence in the general technology being demonstrated and evaluated.

Hq Air Training Command

Notes

1. G. A. Eckstrand, "Current Status of the Technology of Training," Department of Commerce, AD608 216, September 1964.

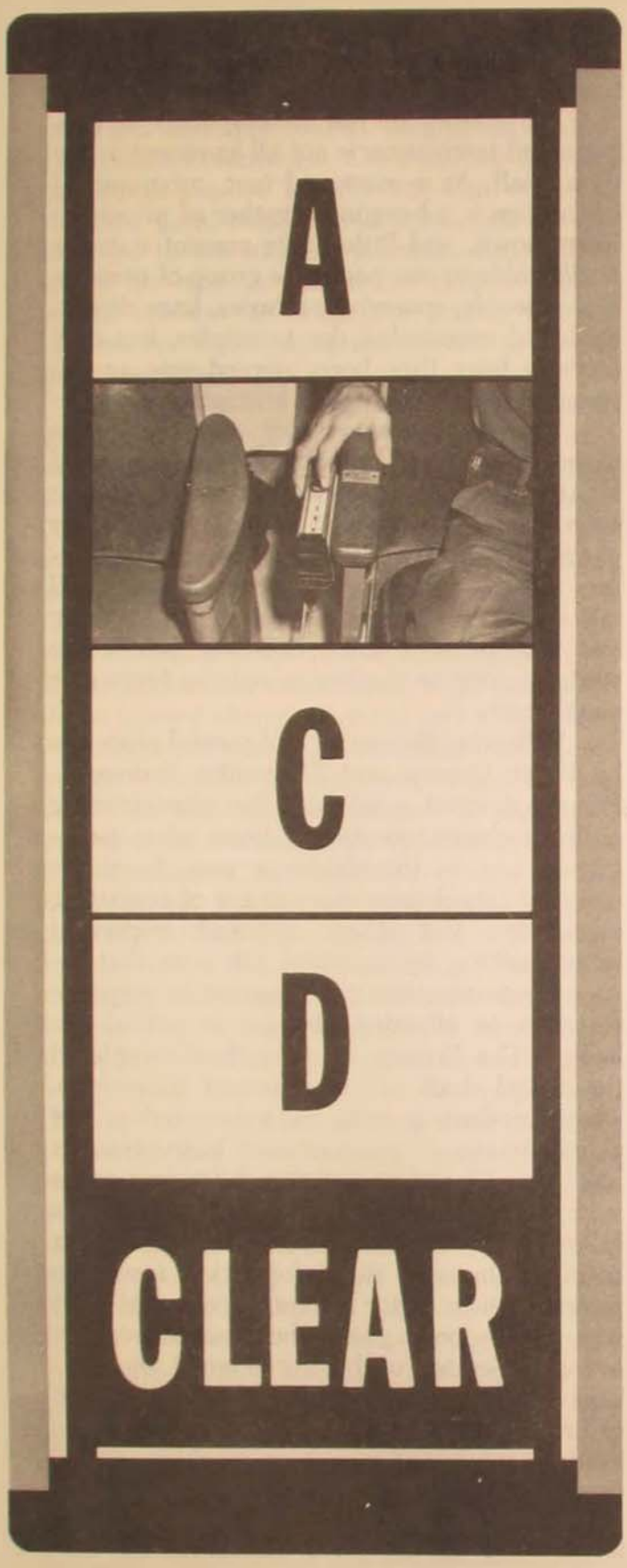
2. H. Valverde, "A Systems Approach to Electronics Maintenance Training, Part I," Wright-Patterson AFB, Ohio: Aeromedical Research Laboratories, August 1967.

3. D. H. Harris, "The Impact of Microelectronics on the Utilization and Training of Maintenance Personnel," San Diego, California: New Developments Research Branch, Bureau of Naval Personnel, June 1966.

4. J. P. Foley, Jr., "Performance Testing: Testing for What Is Real," Wright-Patterson AFB, Ohio: Aeromedical Research Laboratories, October 1961.

Acknowledgment

The author is grateful to Mr. Horace H. Valverde, F-111A Learner-Centered Instruction Project Contract Monitor, and others of the Behavioral Sciences Laboratory, Air Force Systems Command, for their assistance and technical advice in preparation of this article.



BEHAVIORALLY ORIENTED INSTRUCTION IN ATC

JOHN P. MURPHY

ALMOST any workday on many Air Force bases one can find a classroom whose unique environment is immediately noticed. Using a set of equipment descriptively called a multimedia teaching system, an instructor holds the attention of forty students, seldom uttering a word himself.

The equipment, now being used throughout the Air Force for training in traffic safety, consists of a tape deck, still and motion picture projectors, student responding devices, and response recorders. The system presents the audio portion of the lesson from conventional magnetic tape. A separate track of the tape controls the projectors, selecting still or motion projections to present the visual stimuli. Lessons presented by this equipment contain many questions which are voiced by the tape and presented visually by still projection. Each time a question is presented, the

student selects his answer by depressing one of four buttons on his responder. His relative performance is observable on digital counters at any time during the lesson, and the percentage of responses to all choices of each question is also visible.

The Air Force has in use about 150 complete sets of multimedia teaching equipment at stateside and overseas bases. When one sees this hardware in operation, he realizes immediately that it looks quite like programmed instruction. That observation is correct; the system is the result of some of the most advanced thinking and study in the application of the behaviorally oriented principles on which programmed instruction is based.

Two separate though related conditions are responsible for our having procured this multimedia teaching equipment (hardware) and programmed traffic safety lessons (software): first, the excessive involvement of Air Force members in traffic accidents; and second, the highly successful experience of Air Training Command with programmed instruction in the shaping of desired behaviors. The question arose: Can programmed instruction increase traffic safety consciousness in Air Force personnel enough to improve their driving behavior?

That question has not been answered yet because the multimedia teaching systems have not been in use long enough for their effectiveness to be conclusively evaluated. But Air Force experience thus far points up one irrefutable fact: *Careful selection and integration of media and the application of the behaviorally oriented principles of programmed instruction do in fact mold student behavior very efficiently, significantly, and desirably.*

Behaviorally oriented principles of programmed instruction guarantee that the student can perform the behaviors required by the job for which his training is designed. No item of subject matter is justified in the curriculum unless the end behavior requires it. Briefly, this behaviorally oriented instruction trains the student to do the task to the level required by the Specialty Training Standard (STS) and discards all irrelevant material, even that which is nice-to-know. Both economy and the basic principles of programmed instruction require that training be limited to teaching the tasks of a given job.

The history of the development of programmed instruction is not all as recent as the term itself. As a matter of fact, programmed instruction is a bringing together of principles long known, and little of its present status is attributable to one person or group of persons. Many people, spanning centuries, have discovered and expounded the principles, but only recently have they been merged into an impressive and still growing discipline.

The chain discovery of these principles dates back at least to Socrates, who questioned his students, then confirmed or corrected their responses immediately. Socrates used another of the characteristics that programmed instruction proponents have "discovered" and still use where possible: self-pacing. By teaching one student at a time, Socrates moved the student along in the lesson only as fast as he could learn.

Following the analyses of mental processes by Binet, Dewey, and Thorndike, Sydney L. Pressey devised a machine for administering multiple-choice questions.[1] Some alert pedagogues saw in this device a new dawn: its use could mechanize the process of imparting knowledge. But others, although impressed with teaching by machine, felt sure that response construction was superior to response selection in effecting changes in verbal behavior. The Pressey apostles then completed the initial draft of programmed instruction. Their product is with us today and is the classic image of programmed instruction. It has long series of verbal stimuli (or sometimes even two-dimensional graphic stimuli), always followed by an abundance of blanks to be filled in with the information from the prior sentence. After a soporific maze of such stimulus-response pairs, the student reaches a real objective of having learned *by rote.* This approach, known as constructed response or linear programming, is the most frequently used in paper-and-pencil or machine-administered programmed materials.

The pencil-and-paper medium has, however, been used effectively to train to the dis-

crimination level of knowledges. Contemporary with the appearance of machine-administered linear teaching programs, branching programs also appeared as "scrambled books." Designed by Norman A. Crowder, this method employed a more lengthy stimulus on each teaching page and exacted a multiple-choice response to the stimulus material. Each alternative directed the learner to another page—wrong answers to corrective pages, correct answers to confirmation, and thence to a new teaching page.[2]

Variations of the two basic principles have appeared, each with some merit. One such variation is mathetics. Devised by Thomas F. Gilbert, this one applies reinforcement theory to the analysis and engineering of behavior. It features extensive use of laboratory techniques found effective for training.[3]

The Air Training Command has experimented exhaustively with all these types. For presentations that are limited to or primarily aimed toward changing verbal and knowledge behaviors, ATC uses a presentation that draws heavily on all its predecessors; it can be described as "discrimination linear." Its segments are presented in consecutive order, as are those in conventional, constructed-response linear presentations. Yet, instead of exacting a constructed response from the student, it borrows from Pressey's teaching machine, Crowder's branching techniques, and Gilbert's mathetics, by exacting only discrimination responses. Multiple-choice, matching, and true-false are examples of the response modes employed. This type of programming lends itself not only to shorter and less boring paper-and-pencil lessons but also to multimedia instruction for group presentations. ATC requires that all courses, those employing multiple media as well as those using only programmed paper-and-pencil exercises, use all the following characteristics:

• *Behavioral analysis* is applied to course content to determine (1) what the trainee must know to perform the task he is assigned to do, and (2) the stimulus necessary to elicit each behavior. Explicit specifications of training objectives are then formulated. All behaviors not prescribed in the objectives are avoided like sin and rattlesnakes.

• *Controlled response* is required of all students of behaviorally oriented materials. By forcing the student to make specific responses, his behavior is shaped step by step until he achieves mastery of the subject or skill.

• *Immediate confirmation* after each response assures the student of the correctness of his response. This tends to prevent him from becoming habituated to wrong ideas or practices and strengthens the probability that he will respond correctly in a like situation later.

• *Optimum step size* is determined by experimentally applying the instructional materials to numbers of typical students. Care is taken to prevent moving in steps that are too large; they tend to lose the student. ATC experience has demonstrated that too-small steps are also damaging; they bore students. Hence, the optimum step is small enough to assure that the student can respond correctly, but not so small as to be boring.

• *Validation before implementation* is accomplished for all programmed lessons and multimedia teaching systems used by ATC. A system is tested and revised until it has successfully trained a large sample of the target population. The minimum acceptable performance level for a system is for at least 90 percent of the students to achieve the proficiency level specified for each learning objective.[4]

• *Self-pacing* allows the student to establish his own rate of progression through the material. When each student has his own separate material to attend, as in individually prepared programmed lessons, this practice can be fully employed. Yet when the systems designer has employed movies, still projection, television, or even the check of the functional system of an aircraft, self-pacing can be sacrificed if its loss can be offset by the advantages of group pacing.

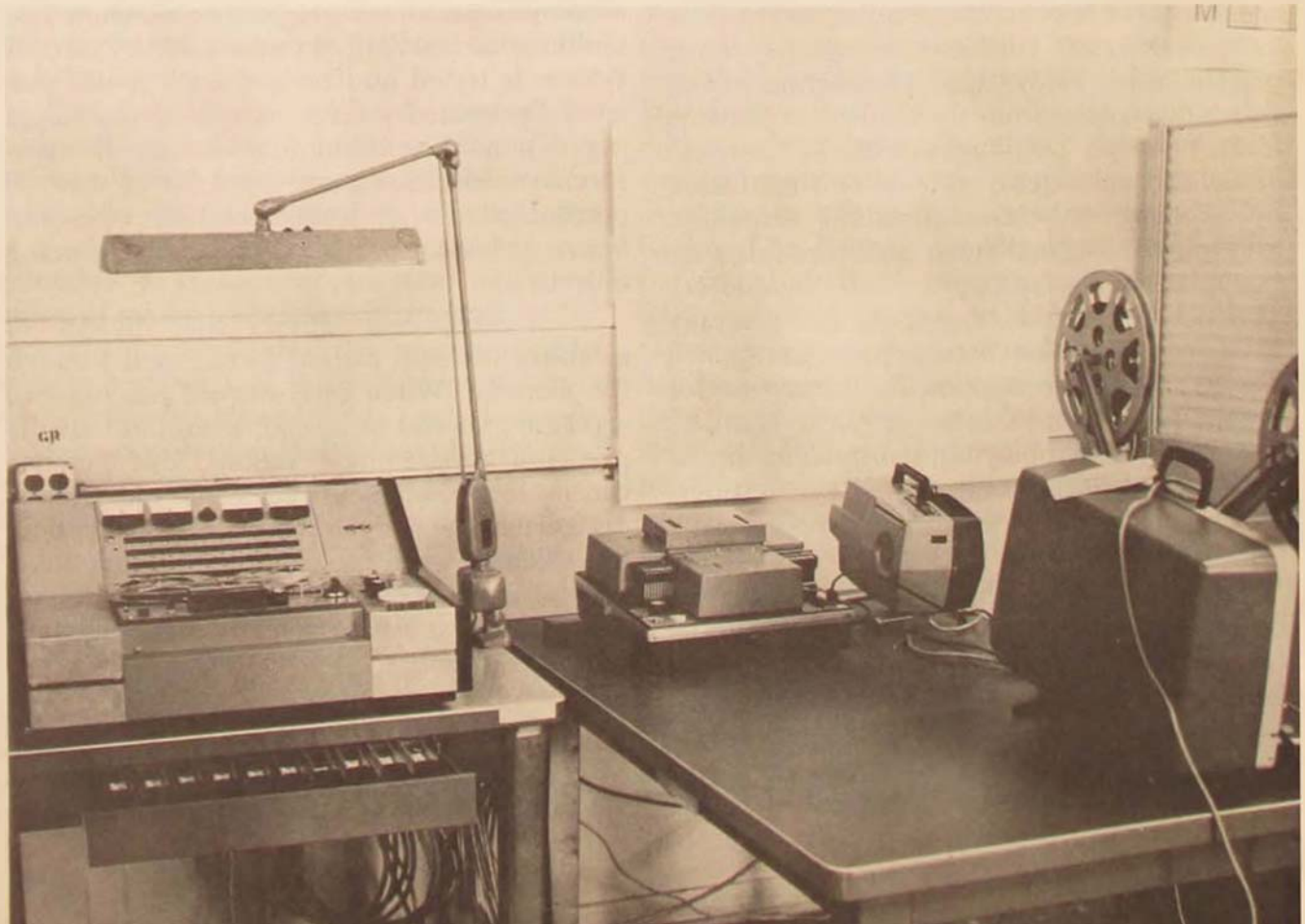
AIR TRAINING COMMAND entered the field of programmed instruction in 1962

by planning and executing an elaborate experiment in programming portions of many resident courses. Indoctrination of personnel was as complete as possible, with many trained in the techniques of programming; countless others were familiarized with its characteristics and potentials.

The results obtained from the use of programmed texts during the experimental phase were not phenomenal, but they proved that programmed instruction had a place in the ATC picture.[5] Before its techniques could become fully accepted and used, some adjustments had to be made to fit programmed instruction into military training. Fortunately, these alterations led to many improvements in programming techniques and to the adaptation of programming principles to many other types of presentation. ATC does not claim to have invented the principles of programmed instruction, but her contributions in this field have been impressive.

From the outset, ATC was overripe for programming's most outspoken dogma—the necessity for behavioral objectives. Nice-to-know material was already gasping for breath because of the choking pressures of austerity. It followed naturally that the training contract should specify the skills and knowledges the trainee must have on termination of training and that all else should be excluded. Clearly and precisely stated objectives, specifying end behavior and the degree and conditions for it, soon became the norm for all ATC courses—even conventional courses—after the programming movement introduced them. All present ATC courses have felt the impact of behavioral objectives.

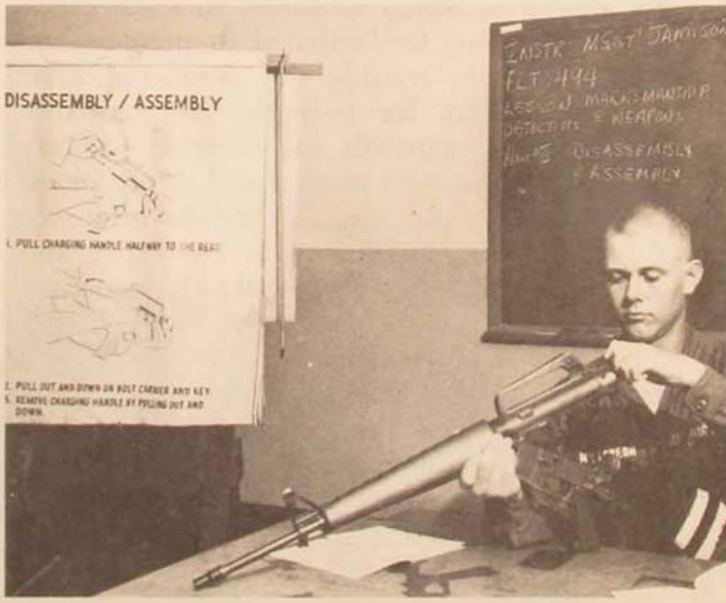
Another fallout benefit of the programmed instruction movement is its influence on the preparation and presentation of conventional instruction. In a conventional informal lecture, questions are sometimes used to measure the teaching effectiveness of each point presented;



active responding is thereby elicited from one student when he answers a particular question. The immediate knowledge of results occurs when the instructor acknowledges the student's response. But by the use of certain techniques—for example, a "response card"—the participation of all students at every step along the way is assured. A response card (and this is just one of a variety of similar devices) reveals a minimum of four colors, any one of which can be shown to the instructor in response to a question. For example, red may stand for answer "A," blue for "B," yellow for "C," and green for "D." With such a device, *all* students answer *all* questions asked during the presentation. Those who respond inappropriately are corrected on the spot. At the same time, the instructor measures the effectiveness of his instruction so he can make changes in later presentation of the same material based on student response. Of all the characteristics of programmed instruction, only self-pacing is absent from a lecture so prepared.

Another effective technique is the lecture-discussion-recitation (L-D-R). In such a learning situation, the class is first divided into groups of 3 or 4 students. As suggested by the name, the material is presented to the class in lecture form by the instructor. After a point is presented, members of each group briefly engage in a timed discussion of the material among themselves, normally in response to a question. A representative of each group reports on the responses of his group; then the instructor evaluates and comments on these responses. Though this technique lacks the strict control of student response which is characteristic of most programming, it effectively employs many of the features of programmed instruction.[6]

Air Training Command is now concentrating on the second generation of programming. This vigorous prodigy is called the "systems approach."[7]



Multimedia teaching equipment in ATC includes tape recorders; projectors for slides, film strips, and motion pictures; and responders for as many as forty trainees. . . . Students in cryptography use self-teaching devices at their own speed through theory and practical lessons. . . . A trainee follows a programmed text with an M-16 rifle to learn how to disassemble and assemble the weapon. Programmed methods are also used for lockstep instruction in firing-line procedures.

If the parents of instructional systems are programmed training and conventional training, the offspring retains and magnifies the best features of both. This apparent hybrid, systemization, has more potential for instructional success than either parent.

But wherein lies the difference between programmed instruction and systemized instruction? Lo, in the media each employs. Almost exclusively, programmed instruction was accomplished by a type of device called a programmed instructional package. Prepared as individual books (or machine-administered individual lessons), these packages typically shunned such desirable experiences as projections (motion or still), lectures (recorded or live), and other group media. On the other hand, the newer concept of systemization adapts any and all media to the principles previously employed by the individual packages.

Air Training Command has five Instructional Systems Development Teams. A single team is assigned at each of ATC's technical writing centers. Its primary duty is to prepare instructional systems to support the mission of the center to which assigned. In some cases, however, teams are assigned to prepare materials for use outside the command. The Lackland team, for example, has prepared programmed materials for General Military Training. It has also revised and administered commercially prepared materials used for driver training throughout the Air Force, and it is now preparing new materials for driver training.

In addition to the development teams, ATC maintains courses in instructional technology. All these courses are behaviorally oriented, stressing the principles of programmed and systemized instruction which have endured. The parent course, which has existed since August 1963 and is entitled "Instructional Programmer," has been attended by people from all branches within domestic and allied military establishments as well as numerous nondefense activities.

Another activity within ATC is the USAF Programmed Learning Advisory Service. Situated at Randolph AFB, this organization functions as a ready bank of information or aid for every activity within the defense establishment and for other government and even nongovernment agencies. Having the capacity to provide guidance in the most advanced aspects of programmed instruction or instructional systems, this organization has fostered the command's reputation as the prime authority on the instructional systems approach within the armed forces.

WHERE to now? What is the prospect for growth of behaviorally oriented instruction? Will systemized instruction continue to influence the evolution of pedagogy? We in Air Training Command are convinced that it is gaining impetus. As with all movements, it has met some opposition, and some of the original conflicts still give pause to the most optimistic seers. Yet with the development of new hardware more adaptable to behavioral philosophy and with the increased need for austerity in training, this command's efforts in "behavioralizing" its courses are moving forward at full throttle. The growing public acquaintance with the potential for the art in its highly developed and still advancing state is inducing other commands and branches to swell the procession.

Lackland AFB, Texas

Notes

1. A. A. Lumsdaine and Robert Glaser, *Teaching Machines and Programmed Learning* (Washington, D.C.: National Education Association of the United States, 1960), p. 32.
2. *Ibid.*, p. 21.
3. Air Force Manual 50-1, *Programmed Learning*, Hq USAF, 13 January 1967, p. 27.
4. Air Training Command Manual 52-10, *Instructional Systems Engineering*, Hq ATC, 1 March 1967, p. 29.
5. *Ibid.*, p. 1.
6. AFM 50-1, pp. 28, 29.
7. ATCM 52-10, p. 2.

MILITARY ASSISTANCE TRAINING PROGRAM

LIEUTENANT COLONEL FRANK H. ROBERTSON

THE Military Assistance Program (MAP) is an integral part of the overall United States foreign aid program and is designed to raise the effectiveness of the military forces of recipient nations to a level that will give reasonable assurance of internal security. MAP provides the means whereby selected countries are either furnished or sold equipment to achieve a specified force structure. It follows that if we provide military equipment, we also have a responsibility to insure its proper use. Qualified technicians of the recipient country must be available to operate the equipment and perform necessary maintenance. Supervisory and planning personnel must be trained in the tactics and techniques necessary for proper use of equipment and people. Training is

thus an extremely important part of the program. The United States cooperates in this area through the Military Assistance Training Program (MATP).

There are several methods by which Military Assistance training can be funded, just as in the materiel portion of the program. The most common of these are Grant Aid and Foreign Military Sales. Under Grant Aid, the United States pays for the training. Funds for this purpose are included in the Military Assistance portion of the Foreign Aid Bill each year. The funds are paid to the U.S. military department or agency that provides the training services to the foreign country. By the Foreign Military Sales method, these services are purchased by the foreign countries from or through the United States military organizations. There are also various cost-sharing and barter arrangements to provide assistance. However, the method of paying for training assistance is not of particular significance in this article except to illustrate a growing trend toward Military Sales (discussed later).

There are three main locales in which training under the Military Assistance Program takes place:

ConUS training. The training conducted in the continental United States is accomplished by formalized courses of instruction as well as by on-the-job training (OJT) and observer programs conducted by U.S. training, operational, and support organizations.

Overseas training. The training conducted by U.S. units located in overseas areas is normally by OJT programs. A noteworthy exception is the Inter-American Air Forces Academy at Albrook Air Force Base in the Panama Canal Zone, where courses are taught in both Spanish and Portuguese.[1]

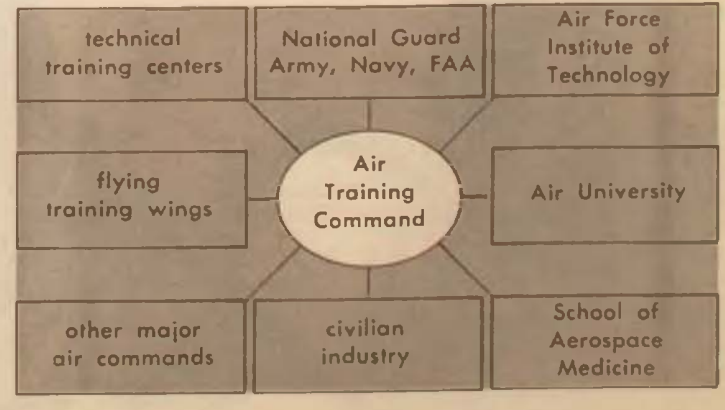
In-country training. The most typical example of training conducted within a foreign country by personnel sent for that specific purpose is the Mobile Training Team. The team is composed of highly qualified officer and NCO specialists, who provide training assistance in a specific area. The team is limited to a maximum of six months in-country. Mobile Training Teams are normally provided from ConUS resources; however, overseas commands frequently provide them.

In the United States Air Force, the Air Training Command is the prime agency responsible for implementing the ConUS portion of the Military Assistance Training Program. The overseas major air commands handle MAP-sponsored training on bases and in units within their areas of operation. Headquarters United States Air Force and the overseas major air commands share the responsibility for providing Mobile Training Teams.

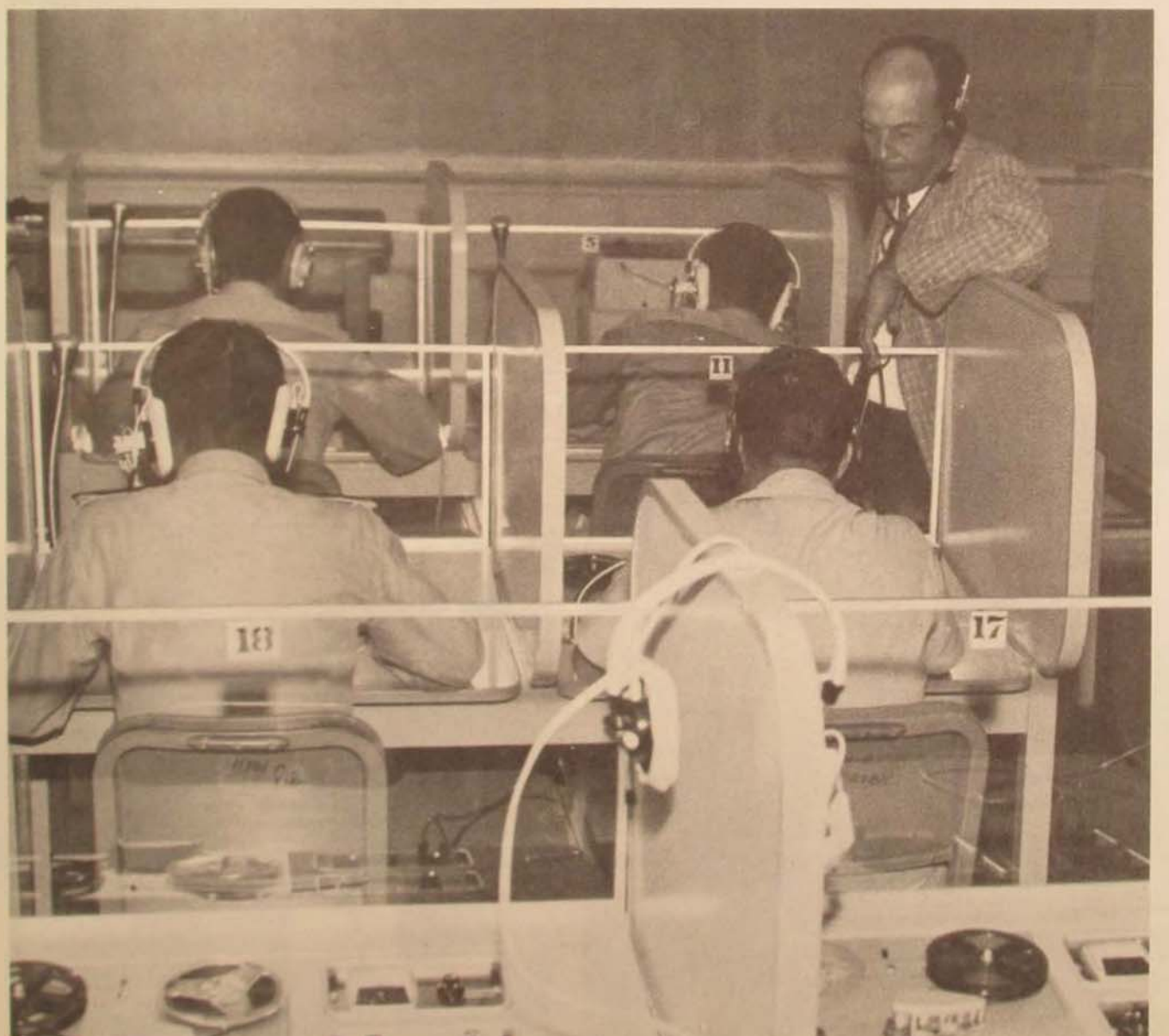
Air Training Command's role in the Military Assistance Training Program is varied and widespread. In fulfilling its obligation, the command does more than provide training within its training centers and wings. It also renders a management service by arranging for training of foreign air force personnel in other USAF commands, by other services and government agencies, and through contract with civilian industries and universities. (Figure 1)

Generally speaking, Air Training Command's responsibility is to schedule and monitor or conduct training that has been programmed by the Military Assistance Advisory Groups (MAAG) and approved for implementation by the Department of Defense. ATC publishes training schedules, authorizes the MAAG's to send students at the appropriate time, handles administrative problems involved, moves trainees from one course to the next, and sends students home when they have finished all

Figure 1. Sources of Military Assistance Program training—formal, OJT, observer



The Defense Language Institute English Language School, Lackland AFB, Texas

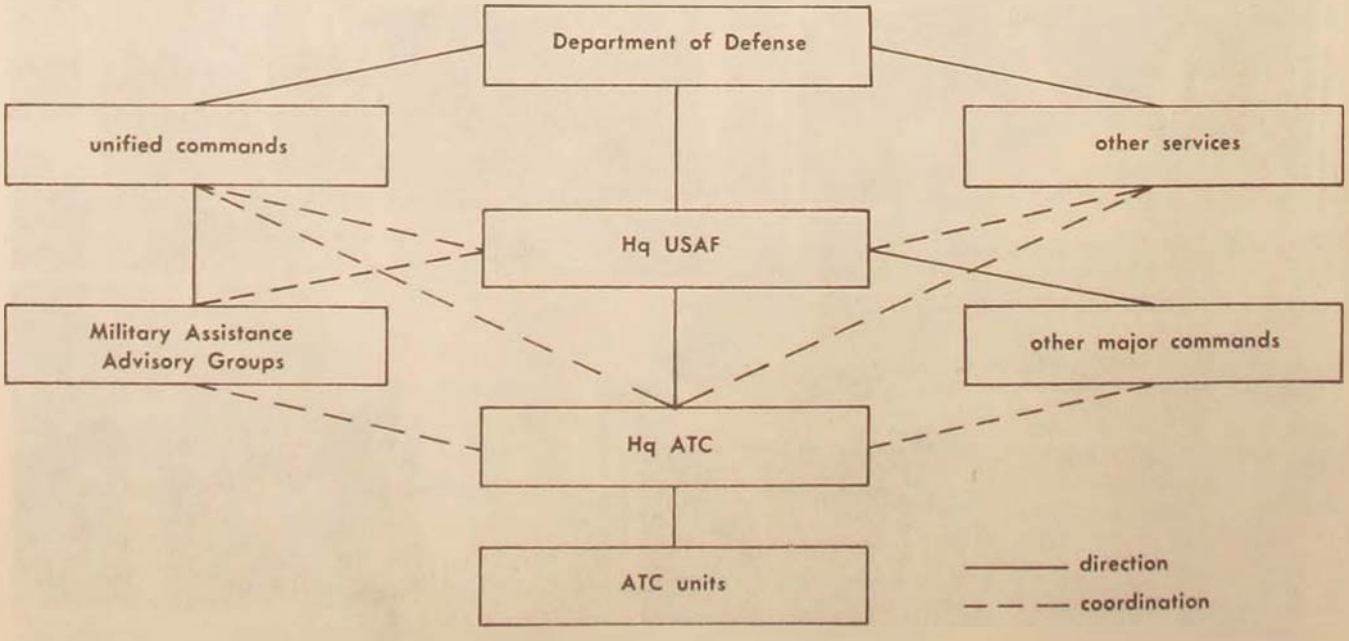


scheduled training. It also assists the MAAG's in programming their requirements by recommending appropriate training to solve specific problems. Air Training Command receives and accounts for MAP monies to pay USAF and other agencies for training provided. Figure 2 depicts the MAP training channels of communication in accomplishing these tasks.

During any given year 55–60 foreign countries participate in the Military Assistance Training Program, and 2200–2500 students are trained. This represents over 7000 training spaces each year, as trainees normally attend more than one course of instruction. The scheduling of these personnel results in 1600–1800 students from 40–50 countries in ConUS training at any one time. Of these, approximately 1200–1400 will be on Air Training Command bases, the remainder being dispersed throughout the other commands and training agencies in the ConUS. These students come from all over the world. A survey of the trainees at one of the larger ATC training centers would reveal students from widely diverse nations, varying from industrial countries like the Federal Republic of Germany to emerging African nations such as Mali, from the desert nations of Morocco and Saudi Arabia to the tropical republics of Latin America. Of course, a large percentage would be from the Far East—Republic of Vietnam, Thailand, Republic of Korea.

Training provided under the Military Assistance Program varies almost as much as the origin of the students. It ranges from familiarization with USAF procedures and techniques to maintenance or operation of the world's most modern weapon systems. Limited numbers of personnel even receive university-level education under MAP sponsorship. Many foreign trainees attend Air Training Command's undergraduate pilot training schools and then proceed to other commands, primarily Tactical Air Command, for combat crew training. Technical school graduates go on to OJT programs at various USAF units for vital practice of their newly learned skills in an actual operational environment. Various professional courses, such as those available at the USAF School of Aerospace Medicine, or observer programs at USAF hospitals provide training for foreign medical personnel. The Squadron Officer School and Air Command and Staff College conducted by Air University at Maxwell Air

Figure 2. Military Assistance Program training channels in the United States



Technical Training and T-28 Flying Training, Keesler AFB, Mississippi

Force Base provide necessary managerial training for key personnel and future leaders of many foreign countries. In addition to actual instruction, the Air Training Command sends special teams to survey in-country training programs and make recommendations for improvement. Further assistance is provided by Technical Training Centers in developing and providing training equipment.

Normally, Military Assistance training is limited to key personnel and instructors. However, a notable exception is in the flying training area, specifically in undergraduate pilot training. This type of training is, of course, very expensive to establish, prohibitively so for many small countries. For this reason it is much more economical to purchase or obtain through Grant Aid the limited training spaces needed. Training can then be accomplished in either the regular jet undergraduate pilot training course or in a special course in propeller-driven aircraft. The regular USAF jet undergraduate pilot training program is conducted at nine different Air Training Command bases scattered throughout the southern and southwestern parts of the United States. Foreign trainees attend this course with American students at all these bases.

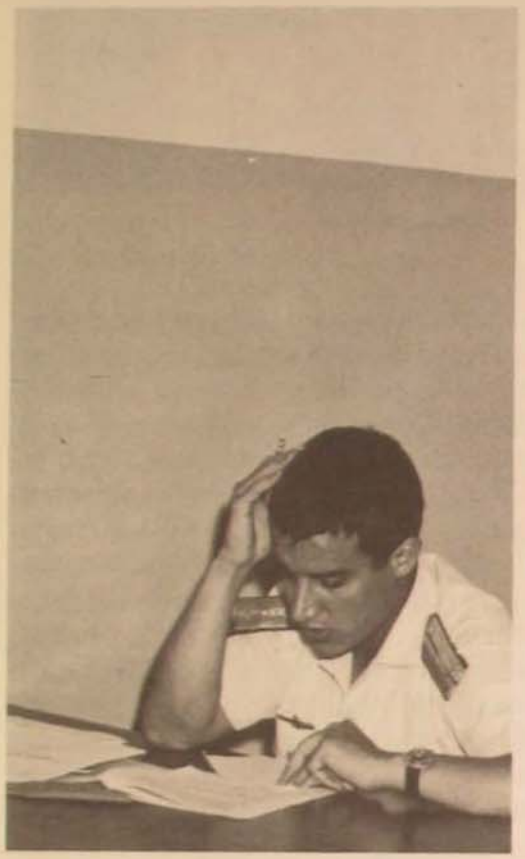
For those countries that do not need training in jet aircraft the Air Training Command conducts a course in conventional aircraft at Keesler Air Force Base, Mississippi. The training consists of 200 hours of flight instruction in the T-28 propeller-driven aircraft, an excellent, well-proven trainer. This course was designed specifically for foreign students, and the tempo of instruction has been adapted to fit their needs. Upon graduation, trainees are awarded USAF pilot wings, and they usually proceed to C-47 aircraft at Keesler or receive transition and combat crew training in some other type of aircraft with a unit of the Tactical Air Command.

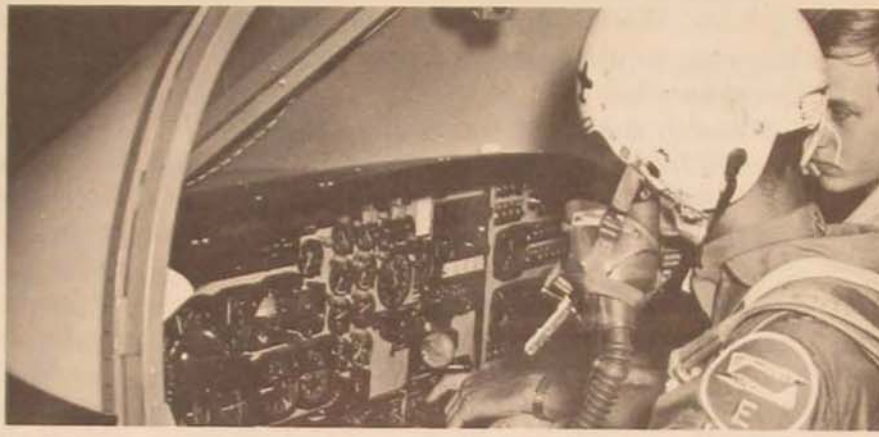
For the past few years, the majority of students in the T-28 course have been from the Republic of Vietnam Air Force (RVNAF), though many from other Asian, Latin American, and African countries have participated. Most of the RVNAF trainees have either checked out as C-47 pilots or have gone to Hurlburt Field, Florida, to become combat-ready A-1 pilots. Recently the Tactical Air Command has begun training RVNAF pilots in the A-37 aircraft at England AFB, Louisiana. This combined training effort by the Air Training Command and the Tactical Air Command has been the backbone of the RVNAF flying training program and has made a significant contribution to the struggle between the free world and Communism.

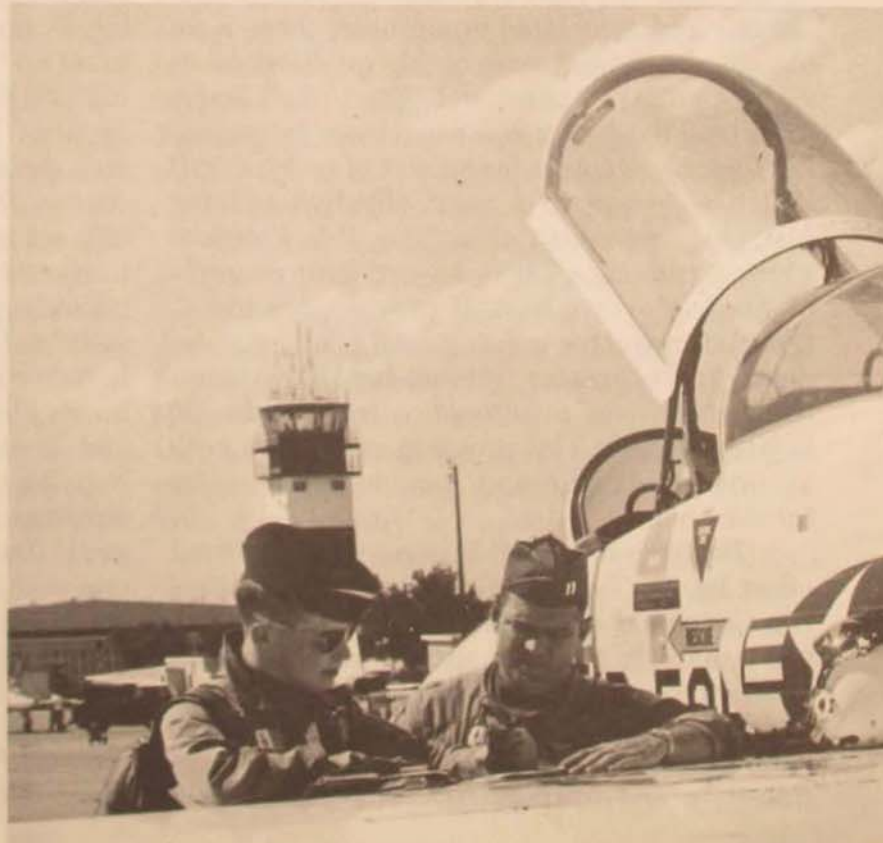
Larger countries also encounter problems in providing for their own pilot training. In the Federal Republic of Germany (FRG), for instance, a combination of limited airspace and bad flying weather makes training of jet pilots an extremely difficult and hazardous task. The FRG Air Force, therefore, requested assistance from the USAF in meeting its jet pilot training requirements. Since they needed more jet training spaces than the USAF could sell them in its regular undergraduate jet course, a joint agreement was reached and FRG Air Force pilots are now being trained in a special course at Sheppard AFB, Texas. The normal jet undergraduate pilot program consists of a preliminary light-plane phase utilizing T-41 aircraft, followed by T-37 and T-38 phases. However, the FRG Air Force gives its trainees light-plane training before they come to the United States. They then receive T-37 and T-38 instruction at Sheppard, and upon completion they go on to advanced training either in the United States or in the Federal Republic of Germany. Those who remain here go on to the F-104 at Tactical Air Command's F-104 combat crew training course at Luke AFB, Arizona. A unique feature of this program is that the FRG Air Force provides instructors and staff officers to assist USAF personnel in conducting the undergraduate program at Sheppard. The actual flying and related academic portions are conducted by USAF instructors, but the FRG Air Force conducts its own officer military training as an integral part of the course. FRG Air Force staff personnel are also available to assist in the F-104 training at Luke. All trainees are required to meet USAF course standards before they graduate.

Most people think of the Military Assistance Training Program as being paid for by the United States, which was generally true

Undergraduate Pilot Training, Webb AFB, Texas







Programmed ConUS Training
(in millions of dollars)

	FY 63	FY 64	FY 65	FY 66	FY 67	FY 68
Grant Aid	33	20	14	16	22	18
Foreign Military Sales	11	15	16	26	47	46

until a few years ago. However, there has been a drastic swing from Grant Aid (GA) to Foreign Military Sales (FMS) as shown in accompanying table. Were it not for the war in Vietnam, the swing would have been even more drastic. The causes behind this trend are many, but it is primarily a case of those who can afford to pay and those who cannot. As the Congress of the United States has reduced foreign aid appropriations, the Department of Defense has limited the countries eligible to receive Grant Aid assistance.

There also has been a gradual trend toward more sophisticated training. As the various countries throughout the world seek to modernize their air forces by higher-performance aircraft and associated equipment, there is an increased need for more highly qualified pilots and maintenance personnel. The United States Air Force has had much experience in preparing foreign air forces for receipt of new aircraft and has developed a most effective training plan to accomplish this. The F-5 Freedom Fighter training plan is an excellent example of the "cadre" concept. It provides for transition and instructor training for 6 pilots, maintenance and instructor training for 15 instructor technicians, and maintenance training for 36 key technicians. This program establishes both an instructor cadre and a maintenance cadre for the country.

The training of F-5 personnel is a joint effort by Air Training Command and Tactical Air Command at Williams AFB, Arizona. The pilots undergo a 2-week aircrew familiarization course in the Field Training Detachment of Air Training Command. They then proceed to the 4441st Combat Crew Training Wing (TAC) for transition and instructor pilot training for 13 additional weeks. The maintenance and maintenance instructor cadre personnel receive from 3 to 11 weeks of specialized training with the Field Training Detachment and then 2 to 8 weeks of OJT in the base maintenance shops at Williams. The maintenance personnel selected to be instructors also receive specialized training in instructional techniques; they prepare the lesson plans they will use when they return to their homeland. The maintenance instructor cadre is scheduled to complete training and return home 60 to 90 days before the aircraft are to be delivered.

At this time a Mobile Training Set, consisting of various training aids, mockups, cutaways, etc., is also delivered, and a USAF Mobile Training Team from Air Training Command arrives to set up the equipment. This team begins training additional maintenance personnel for the country. The instructor cadre assists this team and determines how to conduct the various courses. The cadre then takes over the training of a second group of technicians, and the USAF instructors observe and assist as necessary. This training period normally covers about three months. When this second group of technicians is trained, the Mobile Training Team returns home. Shortly before the team leaves, airframe and engine technical representatives ("Tech Reps") arrive to assist the country technical instructors in conducting OJT and follow-on upgrade training. These personnel depart after one year, and the country Air Force is then on its own.

A similar joint training effort takes place with the pilot cadre and a Mobile Training Team of two instructor pilots furnished by Tactical Air Command. This cadre plan insures that sufficient numbers of aircrew and mainte-

nance personnel are trained and ready when the aircraft are delivered. The plan, or modifications of it, has worked well in nine countries that are now flying the F-5 Freedom Fighter: Iran, Greece, Turkey, Morocco, Ethiopia, Republic of China, Republic of Korea, Thailand, and Republic of Vietnam. The cadre concept of training is readily adapted to other types of aircraft and is the basic plan used in the Military Assistance Training Program.

Training for foreign students in the United States is conducted in English. Separate classes for foreign trainees are not normally scheduled unless the course is simply one in which USAF personnel would usually not participate, such as T-28 Undergraduate Pilot Training. Even these special classes are taught in English by USAF personnel. Therefore, the foreign trainee must be fluent enough in the English language to enable him to assimilate the instruction and perform any tasks required of him. Most countries participating in the Military Assistance Training Program provide English language instruction to their students before they come to the United States. All students must achieve passing scores on English Comprehension Level tests administered by MAAG personnel or else receive English language training when they come to the United States.

English language training under the Military Assistance Program is provided by the Defense Language Institute English Language School located at Lackland AFB. The English Language School provides instruction for all foreign trainees participating in the Military Assistance Training Program, regardless of whether their follow-on training is with the Army, Navy, or Air Force.

Unless there are security limitations, foreign trainees are treated in the same manner as their counterparts in the United States Air Force. They are also expected to assume the same responsibilities as U.S. personnel. In the Air Training Command, this is especially significant since all students, U.S. or foreign, are expected to meet course standards before they are allowed to graduate. For foreign students, this is extremely important: they are usually key personnel who must incorporate the acquired knowledge into their own organizations when they return home. Therefore, extra effort is made to insure that the foreign trainee gets everything possible out of his training. Special training methods, individual attention, additional training time, and oral or practice tests assist the student to complete the course successfully. Practically any method is encouraged so long as it does not lower the standard of proficiency required for graduation. Whenever possible, foreign students are housed, fed, and intermingled with American students during the courses of instruction. This association not only enhances their language proficiency and subject understanding but also aids in developing close and lasting friendships.

Foreign trainees quite naturally experience many problems in adjusting to their new environment, and unique situations arise. To minimize their effects, a Foreign Training Office is established at each base where there are foreign trainees. The manning of these offices varies considerably, depending on the foreign student enrollment. At many locations the job of the Foreign Training Officer is an additional duty, whereas at others it may be a primary duty with several staff members to assist. In any case, the Foreign Training Office serves as the single point of contact on the base for matters pertaining to training and administration of foreign students. The Foreign Training Officer has a most difficult and perplexing job at times, but his efforts are rewarded by increased understanding and goodwill.

Selected countries also have liaison officers assigned to Air Training Command to assist in the administration of their students. At present there are liaison officers from Ethiopia, Federal Republic of Germany, Iran, Republic of Korea, Morocco, Norway, Turkey, and Republic of Vietnam. These officers provide invaluable assistance to the training units wherever students from their country are located.

While the primary objective of the Military Assistance Training Program is to develop professional and technical skills in foreign air forces, the program has a second objective: to provide a better understanding of the United States by introducing foreign trainees to the significant aspects of American life. Called the Informational Program for Foreign Military

Trainees and Visitors to the United States (Informational Program for short), it is designed to expose foreign trainees to American society, institutions, and ideals through lectures, discussions, films, visits, and tours. The activities are carefully planned by the Foreign Training Officers to meet the objectives of the program and to utilize judiciously the limited funds available for this purpose. The scope of the program includes agriculture, labor, education, U.S. government, the judicial system, press, etc. The Informational Program is built around the idea of showing America rather than selling America. America will sell itself if foreign students have the opportunity to see for themselves. Community support is perhaps the most important factor contributing to a successful program. Experience has shown that the civilian community responds enthusiastically, when made aware of the program. Likewise the foreign trainees enjoy the opportunity to leave the military environment and get acquainted with Americans and learn more about the host country. These international friendships literally span the globe! The Informational Program is a very important part of our foreign aid, and the resulting goodwill, friendship, and mutual understanding may well pay greater dividends in the long run than the actual training received by the foreign students.

The Military Assistance Training Program, then, is many different things to our several allies. But to all of them, rich or poor, it is the vehicle that gives them the chance to have the best-trained air force in the free world. It also allows us the opportunity to work firsthand with our friends and neighbors. These correlative opportunities have the residual effect of helping to insure smooth international relations in years to come.

It has been demonstrated again and again that the people we train through the Military Assistance Training Program rise to high positions in their countries. While underscoring this fact, a former Secretary of Defense said, "In all probability, the greatest return on a portion of our military assistance investment—dollar for dollar—comes from the training of selected officers and key specialists in United States schools and installations. These students are handpicked—they are the coming leaders of their nations. It is beyond price to the United States to make friends of these men."

AIR TRAINING COMMAND has been training foreign students for many years. Over 45,000 have been trained since 1950 in the United States alone. Many thousands more have been trained by USAF units overseas. This program has but one purpose: to help establish in friendly foreign air forces the capability to operate, maintain, and properly utilize their equipment and personnel. This purpose can only be achieved by effective education and training. The Military Assistance Training Program is an essential part of the United States foreign policy. To have strong allies, we must have well-trained allies. Air Training Command is proud to be doing its part.

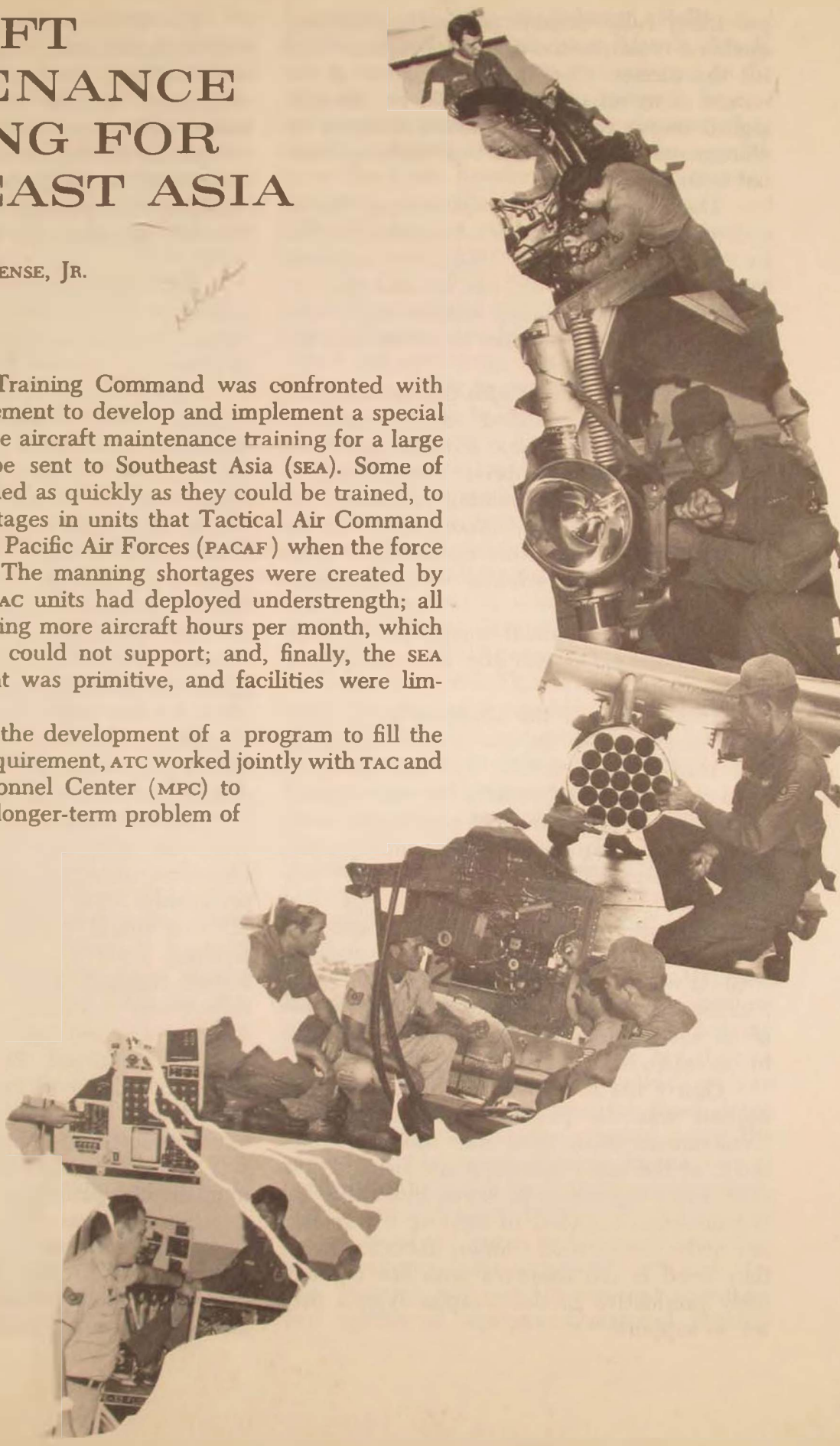
Hq Air Training Command

Note

1. Dr. A. Glenn Morton, "The Inter-American Air Forces Academy," *Air University Review*, November-December 1966, pp. 11–20.

AIRCRAFT MAINTENANCE TRAINING FOR SOUTHEAST ASIA

MAJOR FRANK F. E. HENSE, JR.



IN late 1965, Air Training Command was confronted with the urgent requirement to develop and implement a special program to provide aircraft maintenance training for a large number of airmen to be sent to Southeast Asia (SEA). Some of these airmen were needed as quickly as they could be trained, to make up manning shortages in units that Tactical Air Command (TAC) had transferred to Pacific Air Forces (PACAF) when the force buildup in SEA began. The manning shortages were created by several factors: some TAC units had deployed understrength; all deployed units were flying more aircraft hours per month, which ConUS manning levels could not support; and, finally, the SEA operational environment was primitive, and facilities were limited.

Concurrently with the development of a program to fill the urgent augmentation requirement, ATC worked jointly with TAC and the USAF Military Personnel Center (MPC) to resolve the greater but longer-term problem of

providing fully trained and weapon-system-qualified maintenance personnel replacements for the airmen then in SEA. Because of the nature of its mission, TAC would be the most logical source to provide mission-oriented replacements to sustain and replenish SEA combat units.

That command had tried to meet the requirement from within its own resources, but by the end of September 1965 it was apparent that these efforts would not be enough. Virtually all of its remaining mission units were being tapped for personnel to be fed into the replacement cycle.

TAC was also faced with the growing program to provide qualified combat-ready replacement aircrews. These aircrews had to be put through the appropriate weapon-system operational readiness training. To meet the aircrew training needs, almost all of its remaining fighter units were converted to combat crew training schools or replacement training units (RTU).

TAC's actual trained manpower requirement grew apace with the increased flying mission.

This, then, was the situation in late 1965 when ATC entered the SEA support arena. It was readily evident that TAC was going to need assistance, and rapidly. It was also apparent that large numbers of augmentees were going to be required in SEA, and quickly. Qualified replacements would have to be supplied soon.

The exact nature and extent of ATC support was not readily discernible in September 1965. It was evident, however, that ATC's field training capability—probably the most flexible of its several training mediums—would have to be expanded.

One of the solutions considered at PACAF's request was the placing of Field Training Detachments (FTD), with their training equipment, at the main operating SEA bases. However, ATC's experience in Korea indicated that organizations engaged in fighting a war cannot make use of such training facilities; what they need is replacements who are immediately productive in the weapon system they are to support.

The delivery of a fully qualified weapon system technician is a complex task—there just isn't any way to provide instant work-area experience and job knowledge to a maintenance technician, particularly in light of the complexity of the modern jet fighter. Nor was there time or the resources in TAC to allow qualification routinely by lengthy (6 to 12 months) exposure to the flight-line environment.

Hq USAF, recognizing these factors, directed ATC to develop and implement jointly with TAC a special program to provide the fully qualified replacements needed.

ATC, normally the provider of individual training, which this requirement surely was, could not accomplish such a task alone. This was an added mission, requiring facilities and equipment not available in ATC within the needed time frame. TAC, the center of tactical warfare and by far the major supplier of units, equipment, and personnel for the SEA build-up, did possess the facilities, equipment, and essential qualification environment. So in November 1965 the ATC/TAC/SEA training program was born. Operating under the charter given by Hq USAF, ATC and TAC joined in a coordinated training effort that has since produced the best-qualified replacements ever provided operational units.

The essentials of the training program were the following: (1) ATC would conduct classroom training at TAC RTU sites with FTD's, preferably with mobile training equipment. (2) TAC would provide practical, on-the-job training (OJT) in conjunction with the FTD formal training. The goal was to provide a fully oriented individual, and our formal FTD training was redesigned and tailored to this end. TAC absorbed the SEA replacements directly into the work center and let them get their hands dirty in the real-world situation while undergoing enroute training.

Since TAC could no longer provide the numbers of replacement personnel needed, the question then was where to find the people to train. The solution was provided in a joint conference of ATC/TAC and MPC. The formula developed would utilize TAC's inherent potential for work-area qualifying of maintenance

personnel yet preserve TAC's reservoir of the trained and qualified maintenance personnel essential to sustain the aircrew replacement training program. The formula called for training en route 50 percent of PACAF's replacement requirements. These personnel would be withdrawn from other commands, such as ADC, MAC, and SAC. They would get full ATC/FTD and TAC/OJT training en route to their SEA assignment. Since only 5 or 7 levels were selected, they would already be skilled maintenance personnel, requiring only transition training to another weapon system. TAC would provide another 25 percent; these would also be 5- and 7-level personnel already qualified on the appropriate weapon system. The remaining 25 percent would be developed from 3-level graduates of ATC's airman resident maintenance courses, who would be assigned to TAC as an intentional overmanning in order to gain work-area experience before being sent to SEA. The 3-level replacement would undergo the FTD/OJT cycle in a PCS status and be programmed to remain on base six months.

The scope and nature of the program was slowly developing, and by late November the immensity of the requirement began to take shape. Some measure of the scope could be obtained from the size and composition of the force that needed support: 10 F-4C, 5 F-100, and 5 F-105 squadrons, plus an unspecified number of RF-4C, RB-66, RF-101, and C-130 aircraft. PACAF had estimated that at least 6000 augmentation personnel might be required. The replacement trained personnel requirements (TPR) were estimated to be even greater—the estimates for the three fighter systems alone for 1966 totaled 7000, the preponderance of whom would need training.

Because of the size and urgency of the augmentation requirement, the decision was made by ATC/TAC and MPC to provide only FTD training, with limited practical experience, in as expeditious a manner as possible. The augmentees trained from 31 January through 18 May 1966 numbered 1813.

ATC designated FTD's, supplemented in some instances by travel teams, at 16 bases: for F-4 training, MacDill, Davis-Monthan, George, and Eglin were selected; F-105 training sites were Seymour Johnson, Nellis, and McConnell; F-100 sites were Myrtle Beach, Luke, and Cannon. Shaw was selected as the site for all reconnaissance training. Several technical training centers were designated to provide training that was beyond the capability of the FTD's: Keesler for electronic countermeasures, Amarillo for structural repair, and Chanute for jet engine and nondestructive testing.

By July 1966, the machinery designed jointly by ATC and TAC to sustain the units in SEA with system-qualified personnel was established and operating. The program had begun 6 months earlier to provide some 1800 additional personnel to reconcile the differences between ZI operation and overseas combat operation. This task had been completed in May 1966. Originally we had planned to train 3600 replacements for PACAF between July and December 1966, based on the formula devised to train en route 50 percent of the total PACAF requirement, which was 7000. However, in April 1966 PACAF furnished a more definitive TPR calling for 4813 personnel to be trained en route by May 1967. This TPR included replacements for some of the augmentees just trained. Adjusting the plan was eased by the fact that the program was in-being and that TPR's could be projected with some assurance.

Although it appeared that the rough spots were being ironed out in the replacement training program, there were certain inherent factors that had to be considered because they complicated the effort that was being expended. It was recognized that the already emplaced FTD's at the TAC bases were the most logical means for providing the replacement training; however, these units were initially there to support TAC basic needs, not the SEA requirement. The concurrent buildup of TAC units could not be overlooked by those doing the programming for SEA support, since the need for replacement aircrews in SEA was as critical as the need for maintenance replacements. Limited troop housing at Shaw, TAC's Reconnaissance Center, and at other bases had to be reckoned with, along with FTD and Mobile Training Set (MTS) movement schedules and additional equipment/materiel require-

ments. Moreover, the enlarged program generated a need for additional instructors and FY 1967 travel funds, initially estimated at $1.4 million for students and $105,000 for instructors. Amarillo and Chanute alone needed 37 more instructors and a budget increase of over $136,000 for travel and equipment movement.

By late 1966 evidence began to appear that a situation was developing which would render the training program less effective and would depress the skill level of the people being sent to SEA. The basis of the situation stemmed from the formula established for providing the personnel, specifically that part which levied on TAC one-half of the total SEA replacement requirements, of which 50 percent were to be 5 or 7 skill level. TAC no longer was capable of providing this caliber of personnel, and initial implications were that ATC would be required to train larger numbers of 5 and 7 personnel in the enroute training program. The situation was eased, though, when PACAF agreed to accept 34 percent of the total replacement requirements as 3-level weapon-system qualified. This eased the strain on TAC's resources by reducing its requirement for qualified 5- and 7-level personnel from 25 percent to 16 percent of the total SEA requirement.

Despite PACAF's revising the requirements downward, the cold fact remained that ConUS resources had been depleted severely. The situation was so critical that one base had to resort to the temporary hiring of civilian contract maintenance personnel to support local maintenance requirements. Further, the input of 3-level technical school graduates into the ConUS maintenance complexes was steadily increasing, with no end in sight. ATC would need at least 68 more instructors for the FTD's supporting TAC to handle training loads just through the remainder of FY 1967.

Stability of the ATC instructor force was also a concern, for ATC FTD instructors formed a pool of weapon-system-qualified maintenance personnel to be drawn upon to satisfy the needs of SEA. The computers in the Military Personnel Center readily recognized this and were withdrawing ATC instructors apace with the levies issued to the other commands. Something would have to be done and quickly, or ATC would be in a position similar to that of TAC: faced with a growing mission and depleted resources. Accordingly, in a conference in October 1966, MPC and ATC representatives developed procedures to insure stability and preservation of the ATC FTD instructor force needed to support SEA and TAC. Essentially, the agreement was that MPC would not levy upon ATC for an FTD instructor until his replacement was on board and qualified. This did not provide a permanent sanctuary from SEA assignments for ATC instructors, but it did insure that the FTD's maintained essential 100 percent capability at all times.

As always, ATC was not satisfied merely to deliver gross numbers of personnel to meet requirements; the quality of the individual was a concern also. Evaluations of the training made afterward by the students themselves indicated that a satisfying level of success was being attained, but this assurance was not sufficient to satisfy ATC's concern completely. Accordingly, a plan was instituted to evaluate the student after he began serving at his overseas assignment. The means for accomplishing this were to be a mailed questionnaire/critique form, on-the-spot evaluations by ATC traveling team instructors, spot checks by the ATC Liaison Officer to Seventh Air Force in Saigon, and field visits by Sheppard personnel, to compare course content with the job requirements.

The end-of-course critiques by the students almost universally showed satisfaction with course content, although a fairly common complaint was that some courses were longer than necessary. Fairly common, too, were complaints about lack of trainers, training and test equipment, and training materials. A shortage of technical data drew some criticism but subsided as soon as additional technical orders became available. Student facilities also received a fair share of criticism, mainly of housing, transportation, and overcrowded classrooms. But in spite of these conditions, overall ratings of "good" and "very good" predominated. This, then, indicated the measure of success being achieved in what could be classified as a rapid response to an add-on, unprogrammed requirement.

The success of the program must be attributed in part to the instructors' thorough understanding of their role in the training task and to their achievement in motivating the students.

In summation, ATC's support of the buildup in SEA tactical units was at first the providing of individual training to personnel required to augment those units. This was accomplished from January through May 1966. Replacement training began immediately thereafter and continues to date. The total trained so far in this unique TAC/ATC program exceeds 12,000. For the future, ATC foresees expansion of the training concept and scope to encompass all aircraft support personnel in SEA. Aircraft such as the helicopters, nonjet fighters, and assault airlift are being considered now. ATC believes that the growing need for qualified replacements who are ready to be productively employed on arrival can only be provided by this type of training program. The complexity of today's aircraft demands the cohesiveness of formal training in conjunction with practical work-area exposure.

Hq Air Training Command

SURVIVAL TRAINING

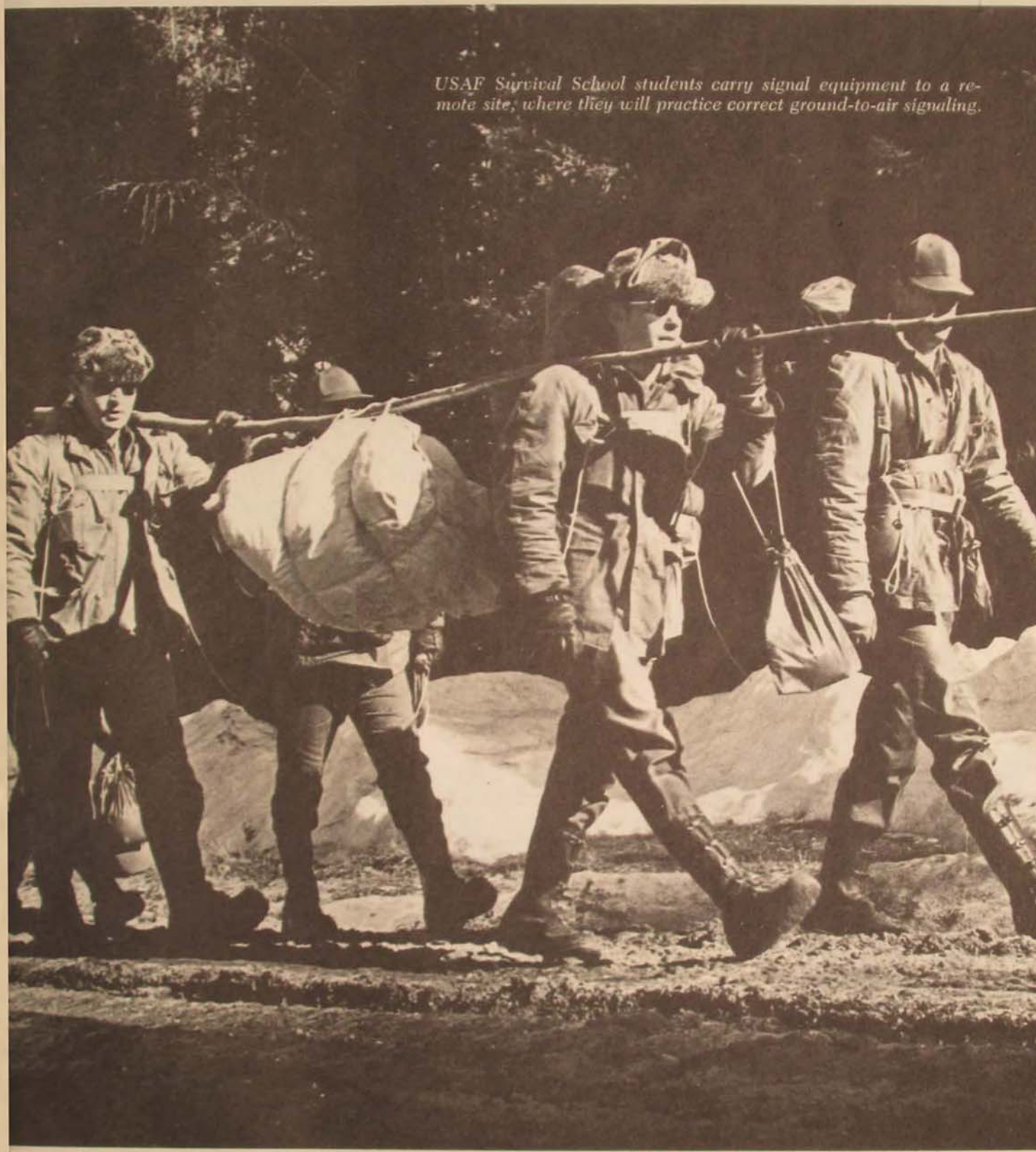
Second Lieutenant Robert M. Zickes

AIR TRAINING COMMAND prepares its aircrew members to be the best in the world. One of the fundamental and absolutely essential segments of ATC's air training program is the survival course conducted by the USAF Survival School at Fairchild AFB, Washington. This training provides the principles, procedures, and techniques that may directly save an aircrew member's life and enable him to return to his unit without giving aid or comfort to the enemy. It is often the final and, to the individual, most important step in preparing the man.

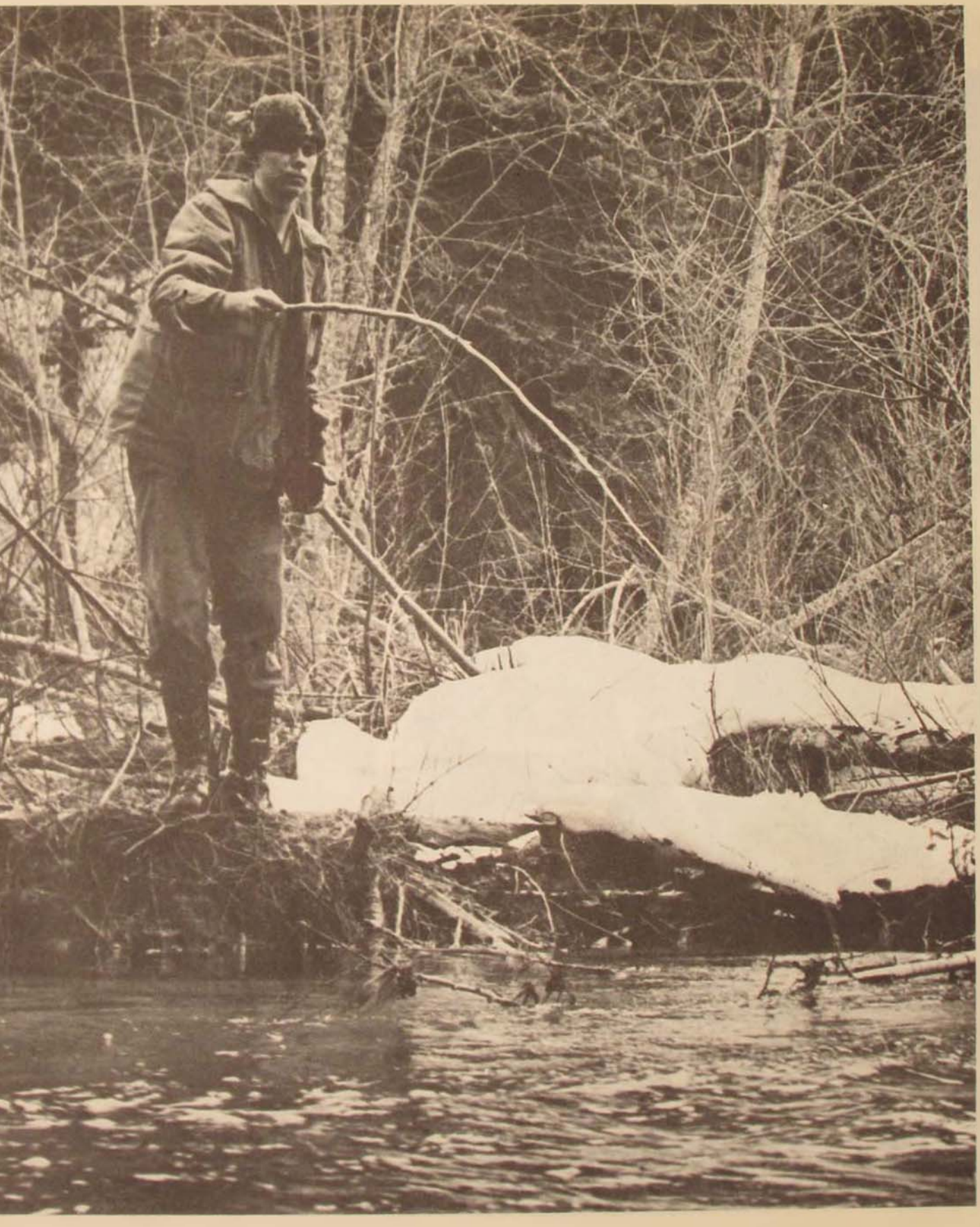
Survival schools for training military personnel have been in existence since the early part of World War II, but they were scattered, and no attempt was made to centralize control or standardize curricula.

In December 1949, under the stimulus of General Curtis E. LeMay, then Commander of the Strategic Air Command, a school for survival was established at Camp Carson, Colorado. Training began on 1 April 1950. Initially, the school was operated by the 3904th Training Squadron of Strategic Air Command. The faculty and staff were a cadre of survival specialists gathered from Air Force, Army, and reserve sources. The school was designed to satisfy the needs of SAC and its mission of that day.

In 1952 the school moved from Camp Carson to Stead AFB, Nevada. The Air Training Command assumed responsibility for providing Air Force survival training on 1 September 1954. The school operated under a wing, group, and squadron setup. The wing was a crew training wing originally, finally becoming



USAF Survival School students carry signal equipment to a remote site, where they will practice correct ground-to-air signaling.



During the field phase of training at the Survival School, the student applies what he has learned: how to procure food from the wild, as here by improvised rod, line, and fishhook . . . how to build a survival shelter . . . how to start a fire without matches.

a flying training wing. The squadron as such went through a series of name changes and finally was known as the 3637th Combat Crew Training Squadron, operated by the 3636th Flying Training Wing. After Stead was deactivated, elements from the old wing, group, and squadron moved to Fairchild AFB, Washington. There are two entities at Fairchild—the USAF Survival School and the 3636th Combat Crew Training Group, which operates the school.

Since Camp Carson days, the Survival School has trained almost 100,000 students in the art of combat survival. (From 1 April 1950 to 21 December 1967, 93,000 students were trained.) During fiscal year 1968, the school trained 9317 students in its several courses, 7965 of them in the regular survival course.

Knowledge gained during the Korean and Vietnam conflicts and the continuing cold war has necessitated changes in the curriculum to satisfy the requirements of the larger number of students now attending the courses. These include not only U.S. Air Force, Army, Navy, and Marine personnel but military personnel from many allied countries. "The School's mission is to train selected personnel in the employment of principles, procedures, equipment, and techniques which permit a person to survive regardless of climatic conditions or unfriendly environments, and return to his organization." The goal that challenges all students is to return with honor. In addition, the student will understand the basic concepts of guerrilla activity, causative factors of insurgency, and the organization concept of Special Forces. Under Air Force Regulation 53-28, 26 July 1966, the school's functions are, among other activities, to conduct academic and operational training in basic survival (the preservation of one's life against immediate perils such as starvation, drowning, dehydration, heat, cold, injuries, bacteria, and radioactivity); in combat survival (those measures to be taken by service personnel when involuntarily separated from friendly forces in combat, including procedures relating to individual survival, evasion, escape, and conduct after capture); in evasion and escape (the procedures and operations whereby military personnel and other selected individuals are enabled to emerge from an enemy-held or hostile area to areas under friendly control); in counterinsurgency operations; and in special training as directed. To carry out these functions, the USAF Survival School conducts the regular survival course (S-V80-A), which develops as follows:

a. On-base training (exclusive of Resistance Training Laboratory)
b. Resistance Training Laboratory
c. Field training (operational training):
   (1) Static camp (transition training)
   (2) Mobile training (advanced transition and operational training).

In reality the course is not "phased." For example, training in the on-base portion lays the foundation for the Resistance Training Laboratory and field training which follow; training in fieldcraft and travel techniques must be accomplished on a continuing basis throughout all the field training that is accom-

plished under direct instructor influence, both in static camp and during mobile training.

The classroom portion of survival training prepares the aircrew member by giving him basic and advanced survival theory. In order to give a student the background and tools which he will need to complete this rugged course successfully, he is given a wide variety of classroom and practical instruction. During the nine days (formerly 12) devoted to classroom and laboratory training, the student is instructed in parachute control and landing; water survival; survival medicine and hygiene; special problems posed by life as a prisoner of war, resistance to all aspects of exploitation, and escape; the procurement of food from available plants, fish, and game; and other survival principles. He is informed of the representative types of terrain and climate the world over and the hazards associated with each. He also learns the principles of land navigation, camouflage, and evasion movement.

Some of the more interesting segments of this on-base training are lab phases in parachute training and water survival.

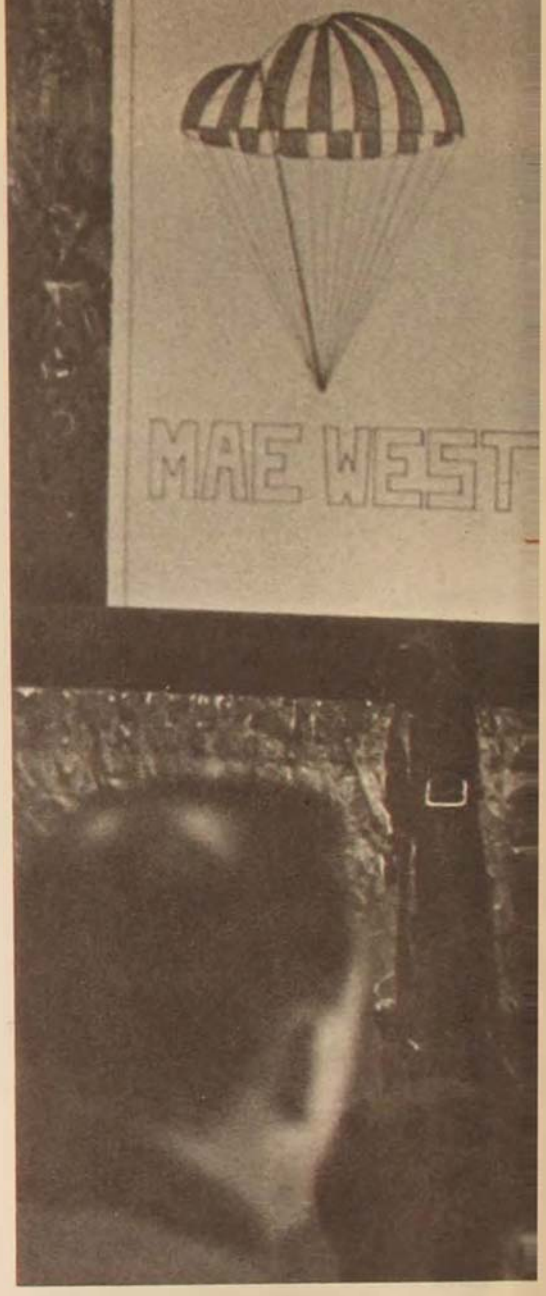
Five academic training hours of Course S-V80-A are devoted to parachute instruction and helicopter recovery. One hour is spent explaining the principles and procedures for control of the parachute in the air, landing falls, and recovery. Four hours are spent in actual practice.

The class is divided into five separate groups, which interchange after each segment of demonstration and practice is completed. Group 1 practices control of the parachute in the air, recovery from a faulty opening, and body position for landing in open field, water, high-tension wires, and trees. The instruction includes how to make a mid-air modification that will give a more steerable parachute (e.g., the four line cut).

Group 2 meanwhile is being taught how to make a parachute landing fall (PLF) from four basic positions—front, right side, left side, and rear—starting from a standing position on the ground and advancing to a four-foot platform. The correct falling procedures for a successful injury-free parachute landing are demonstrated. Then each student participates and is critiqued on his ability to effect a good landing, regardless of the direction of the fall.

Group 3 is being taught how to make a successful recovery or rescue by helicopter. The student learns how to use the new tree-escape letdown device which enables him to reach the ground if he becomes hung up in a tree after a parachute jump. He gets three rides in a simulated helicopter hoist (stationary tower), which is approximately 25 feet high; one ride is with the conventional sling, and two are with the newly designed forest penetrator.

Group 4 is learning how to avoid being dragged by a full canopy if caught in a high wind. This is an important phase of jump training, for a full canopy in a 20-knot wind can be a great danger to a person who has otherwise made a good landing. Here the student is taught to lie on his back, head and legs raised, spring open the quick releases, and spill air from his parachute. A method for a quick roll from stomach to back is also taught and practiced.



An instructor in the Parachute Training Branch of the Survival School explains the dangers of parachute malfunctions during the lab phase. . . . The students learn how to operate and protect the various types of radios that are part of Air Force survival equipment for expediting emergency rescue operations.

Group 5, starting in January 1968, began using the newest parachute training aid, the swing landing trainer, which more realistically simulates a parachute landing fall. The student is in a harness while being lowered and swung as he falls approximately 12 feet. The instructor can control the speed of the fall, but the student cannot predict where or in what position he will land. This is advanced PLF training and is an important new segment of parachute instruction.

The parachute training received at the USAF Survival School is not designed to jump-qualify the student. Its purpose is to give him confidence in his parachute equipment and in his own ability to take care of himself in survival situations. The student generally enjoys and appreciates this training, knowing that one day it may help him make a safe parachute descent and landing.

Water survival is another important segment of survival training. The student gets two hours of instruction in emergency parachuting principles over water and the use of water survival equipment until rescue and recovery. He becomes familiar with his emergency water gear through a preliminary lecture before moving to the pool area for actual water instruction. The student is dropped from a high tower, simulating a water parachute landing. He learns how to prepare for the water landing, correctly enter the water, and release his parachute. Thus he enters into instruction in using life preservers and one-man and multiman rafts. A recent addition to the course teaches the student how to cope with a parachute canopy that collapses on him once he has hit the water.

Survival Course S-V80-A also includes resistance training. After being given intensive classroom preparation, the student enters the Obstacle Penetration Lab. After sunset, he covers the mile-long obstacle course. He is hindered by barbed wire, flares to betray his position, obstacles like those found on many territorial borders, and school instructors acting as guards.

Upon completing the obstacle course, the student is captured by school instructors masquerading as the enemy. This signals the beginning of the Resistance Training Laboratory, one of the most significant sections of training, particularly in what the student learns about himself. He is faced with simulated enemy interrogations and periods of isolation and cramped quarters. Later he is confronted with compound life in a prisoner-of-war camp, where the students as a group are faced with more and different problems relating to honorable survival while in captivity.

After each segment of this training, the student is critiqued by school instructors so that problem areas can be identified. These critiques are designed to make the student aware of his mistakes and give him the information necessary to correct them.

With his on-base classroom training and Resistance Training Lab completed, the student moves into the next portion of training, the static camp portion of field training. Instruction in the field is extremely important, for it is in the field that the survival principles, procedures, and techniques taught in the classroom take on new meaning as they are applied in actual situations.

Students are taken to one of the three training areas in the Kaniksu and Colville National Forests, approximately 65 miles north of Spokane, for their field training, which is divided into static camp and mobile training. For the training period of 5½ days, each student is issued survival and fresh rations totaling approximately 2500 calories. This supply of food, augmented by what the enterprising student can procure off the land, will be his sustenance during this period.

Transition survival training, conducted in the static camp for three days, gives the students an opportunity to practice field techniques while living in a semipermanent camp. They are grouped in small training elements, each with its own instructor. The instructor explains, discusses, and demonstrates survival principles, techniques, and procedures, and the stu-

By practicing landing falls, the student learns how to make an actual parachute landing and walk away unharmed. . . . His familiarity with rescue hoists may one day assist in his own helicopter rescue. . . . On the Survival School's swing lander the student learns correct ways to land a parachute. . . . He also learns to lower himself if his parachute should land in a tree.

dent practices under the instructor's supervision. Static camp serves as a transition between the academic phase and the mobile phase of training, as it gives the student an opportunity to review knowledge and skills introduced during on-base training and permits him to integrate this introductory material with field application.

The student learns the principles and techniques of personal protection (shelter and clothing); shelter location and selection; shelter construction; firecraft; care and use of equipment; improvised clothing and equipment; procurement, preparation, and preservation of food and water; field medicine and personal hygiene; survival under radioactive fallout conditions; preparation of communications; position determination; and day and night navigation on the ground (orientation).

At the end of each day in static camp, the instructor evaluates the performance of his element and each individual member. Constructive criticism and extra instruction when needed ensure that every student learns the essential survival principles and can put them into practice.

Following static camp, students move into perhaps the most demanding portion of survival training, the mobile training.

Mobile field training gives the student the opportunity to apply basic fieldcraft and travel techniques under changing conditions. Gradually the enemy opposition buildup (in the form of aggressor forces) and combat survival situations put a greater demand on the student's capabilities. While under this stress, he must put into practice what he has learned in the on-base and static camp training. The mobile training is the real test of the principles and techniques he has been learning. The last portion of the mobile training is called "confidence training," and rightly so. Successful completion of the mobile phase significantly increases the student's confidence that he can apply what he has learned and return safely from any emergency.

In the mobile training, which lasts two and one-half days, the students are again grouped in small training elements, each with its own instructor. However, direct instructor supervision and assistance are gradually withdrawn. The first two days, the students travel as an element force with their instructor nearby; after that, they pair off without an instructor.

The students travel by day and night, are harassed by a simulated aggressor enemy force, and attempt to evade capture by the enemy. A major problem encountered is ground navigation, but other important segments of training are presented: enemy harassment, evasion problems, cooperation with friendly forces, plus all the basic fieldcraft learned in static camp and the early part of mobile training (shelters, food, water, equipment, etc.). Upon completing the mobile training, each man can look back with a smile that reflects his feelings: "I survived."

THE USAF Survival School has a staff and faculty of highly skilled specialists with a wide range of the knowledge required by global combat survival training. The philosophy of the school is to teach the skills which will enable the student to survive in

In practice landings, the student learns the importance of quickly disengaging the parachute so as not to be dragged by it. . . . A wind machine introduces him to one of the serious problems of parachuting and graphically shows the need for immediate release of the chute.

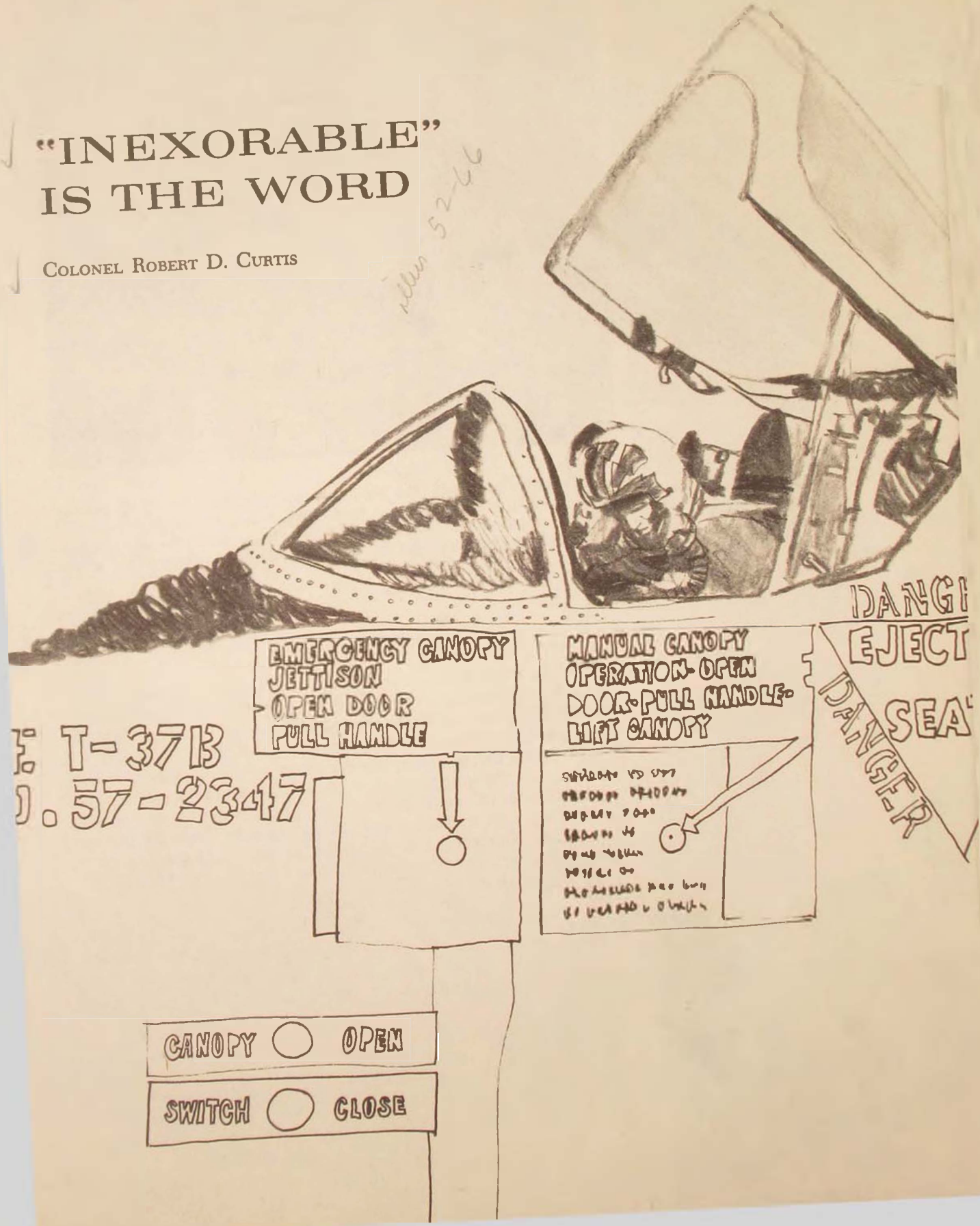
the event of a future emergency. The school must keep up to date on changing world conditions, keep abreast of military and technological developments, and continually adapt itself to the requirements of various commands of the Air Force.

In the last analysis, the main concern of the school is with the man, the individual. The goal of the school is his safe and honorable return from any emergency, whether it involves dealing with an enemy or not. That he may "Survive To Fight Again," the school is dedicated to providing the individual with the tools and training which will enable him to cope with any emergency anywhere on the globe.

Hq Air Training Command

"INEXORABLE" IS THE WORD

COLONEL ROBERT D. CURTIS



TODAY more than 3000 flying sorties will be launched from Air Training Command pilot training bases. There were 3000 launched yesterday, there will be 3000 more tomorrow, and there will be at least that many launched during virtually any working day one might select in the future, for the pace is increasing. During FY 1967, Air Training Command logged more than 795,000 flying hours in T-37 and T-38 aircraft. The number will be 900,000 in FY 1968 and will exceed one million in FY 1969. These are large figures. Yes, and other large figures are the $22.2 to $28.3 million FY 1967 operating costs for each of the nine Air Force bases devoted principally or solely to the pilot training mission, resulting in a figure of $243.3 million as the one-year price of pilot training. These flying hours and dollars yielded 2996 new military pilots in FY 1967 (of which 2702 were USAF). Production goals for FY 1968, 1969, and 1970 are 3293, 3473, and 3850 pilots respectively. This is big business by any standard and is indicative of the magnitude of the USAF pilot training task. This article will describe the nature of the task—what it is, how it is done and why, the sort of people involved, and the means by which the new pilot is tailored to meet future responsibilities.

background

The first substantial increase in pilot training rate in recent years was initiated with Class 67A on 29 July 1965. During the early 1960s, production had ranged from 1700 to 2200 new pilots each year, a relatively leisurely pace by present-day standards. The target for FY 1967 was 2982, with higher goals for subsequent years. Rather than accept the delay which would be required to activate or convert additional bases and obtain additional training aircraft, an adjustment in course content was made. The course requirement of 262 all-jet flying hours in the early 1960s was reduced to 252 in mid-FY 1965, then sharply curtailed to 210 in FY 1966. In view of the severe impact on proficiency that would inevitably result from this drastic reduction, a light-plane phase was added. The course became a three-phase one consisting of 30, 90, and 120 flying hours, flown in the T-41, T-37, and T-38 respectively. With minor modification, it is the course of today and for the immediately foreseeable future.

Addition of a light-plane "screening" phase was not a new idea in pilot training. The Air Force had used the Beech T-34 in like manner in the early 1950s. Reintroduction was expected to serve much the same purpose as before: to identify early the obviously unfit so that expensive, limited jet hours could be reserved for pilot students with above-average potential. The T-41 has served this purpose well. Since introduction of the T-41, fourteen classes have been graduated. From these classes, 45.2% of the students eliminated for flying deficiency were identified during T-41 flying. Furthermore, as an unexpected bonus, the T-41 has been found to provide useful orientation and training value. The student is conditioned to flying within a highly disciplined and procedural environment and is able to assimilate T-37 instruction faster than could his predecessor in pre-T-41 times.

So much for background. Let's go on to an investigation of the nature of the task.

the student

The USAF pilot training student of today is a commissioned officer and a college graduate. As such, he is intelligent and mature and has mastered habits of self-discipline and application to study. These traits are tested severely during the initial months of training.

The largest single source of student pilots is the Air Force ROTC program, supervised by Air University; 44.7% of the students who entered training during FY 67 were from this source. Incidentally, 84% of these ROTC graduates had received flight instruction in light aircraft while still in college. Under this Flight Instruction Program, the student flew 36 hours in light aircraft at an FAA-accredited civilian flying school. Although justified principally as a motivational device, the Flight Instruction Program (FIP) has had a substantial impact on elimination rates as well. The elimination rate for FIP-trained students has been approximate-

ly one-half that for students from universities where FIP training is unavailable.

A somewhat comparable program for Air Force Academy upperclassmen began in January 1968. The Pilot Indoctrination Program (PIP) provides 36 hours in the T-41 aircraft. This is an Air Training Command mission; Air Force pilots are the instructors, and the school is tightly supervised by a squadron commander and appropriate staff officers. The curriculum is patterned after that of the T-41 phase and serves the three purposes of screening, motivation, and preparation.

Other sources of student pilots, in descending numerical order, are: Officer Training School—31.8%; USAF officers already on active duty—8.6%; navigators—7.6%; and service academies—7.3% (principally from the Air Force Academy, though graduates of the United States Military Academy and United States Naval Academy are eligible, and a few—76 in the last 5 years—have selected an Air Force career by this route). Regardless of source, most student pilots are highly motivated toward mastery of the pilot skills, either because of the challenge of flight itself or as acknowledgment of the likelihood that the pilot rating will improve Air Force career potential.

the overall mission

In a general sense, the pilot training course is designed to provide mastery of the basic flying skills, which in due course will permit assignment to any Air Force aircraft or mission. At graduation, however, the new pilot is able to operate only those aircraft in which he was trained; he is qualified for no specific Air Force mission. Consequently, further training, ranging from a few weeks to several months, is necessary before the pilot can contribute usefully to national defense efforts. Most such postgraduate schools are the responsibility of major commands other than ATC.

Phase one. The initial phase of training is approximately five weeks in duration, depending upon seasonal variation in weather suitable for flying. Following one week of administrative processing and initial classroom "ground school" instruction, the student begins an arduous schedule—three hours in the classroom and six to eight hours on the flight line, five days a week, with extra hours in quarters for study, and occasional weekend flying. It is a demanding schedule and leaves little time for family or recreation.

Students from ROTC and Air Force Academy sources who have completed FIP or PIP light-plane training fly 18 hours in T-41 aircraft; all others fly 30 hours. It may appear that the 18 hours flown by FIP and PIP graduates is an expensive duplication of training already completed, but most students completed their light-plane training several weeks or months before entry into Air Force pilot training. Experience has proven that, were the 18 hours withdrawn, these students would be unable to assimilate T-37 training at a rate comparable to those who fly the full 30 hours in Phase I.

T-41 flight training is provided by civilian flight instructors at a civil airport in the near vicinity of each base. The T-41 aircraft are "loaned" to a civilian contractor, who furnishes instruction and maintenance in accord with the terms of a contract negotiated yearly. Quality control of both instruction and maintenance is assured through close monitorship by Air Force personnel. Three Air Force pilots oversee ground and air operations and fly at least 10% of the final check flights; two NCO's oversee maintenance procedures and practices.

The T-41 was purchased by the Air Force "off the shelf." With two minor exceptions, it is identical to the Cessna 172. It has a cruising speed of 120 mph and a maximum speed of 174 mph. Cost to the Air Force was a bit over $7000 each.

Phase two. The second-phase trainer is the Cessna T-37. Affectionately known as the "tweety bird" or "double-barreled dog whistle" because of the frequency and amplitude of the scream produced by its two jet engines, it is a first-rate training vehicle. Selected in 1955, it is the first Air Force training aircraft to be designed with side-by-side seating. Air Training Command received the initial production in 1956 and now operates 680 of these fine training aircraft. At takeoff, it weighs 6575

The AFROTC Flight Instruction Program (FIP) serves as effective orientation for many who after commissioning proceed to pilot training in ATC. . . . Since January 1968 upperclassmen at Air Force Academy have been offered a similar Pilot Indoctrination Program (PIP).

pounds. Two J-69 engines, rated at 1025 pounds' thrust each, push it to a cruising speed of 250 knots and a top speed of 372 knots. The price is approximately $147,000 each.

It is during the 23 weeks of phase two that the student pilot really learns to fly in accord with military standards, procedures, and techniques. The 90 flying hours are divided into increments of 55 hours' contact flying, 21 hours' instrument training, 9 hours' navigation practice, and 5 hours' formation introduction. At phase completion, the student pilot has experienced most aspects of modern military flying and is well along toward mastery of basic flying skills. Associated with the contact and instrument flying lessons are 22.5 additional hours in the T-4 ground trainer. This trainer is not a simulator in the technical sense; it does not move, but its cockpit duplicates that of the T-37 and its instrument indications simulate those of the aircraft. It is used initially to provide familiarity with cockpit layout and for practice of normal and emergency procedures. Later, each instrument instruction flight is flown first in the T-4 trainer, then soon thereafter in the aircraft. This practice assures understanding of the nature and content of each instrument flight before investment of expensive flying hours.

With the reduction in jet flying hours from 262 to 210 at the start of FY 1966, the principal cut was made in the T-37 phase, from 132 to 90 hours. Experience now indicates this cut may have been too severe. An increase of the T-37 phase to approximately 120 hours would provide long-term proficiency gains well worth the additional expense. The typical learning curve is still steep at 90 hours and does not appear to flatten until 110 to 130 hours.

Phase three. During the third and final phase of approximately 25 weeks' duration, the student further masters and polishes those skills introduced in the T-37 and adapts them to a modern high-performance aircraft. Again, Air Training Command is blessed with a near-optimum training aircraft. The Northrop T-38, driven by two J-85 engines of 2900 pounds' thrust each, cruises at a bit over 500 knots and can exceed mach 1.2 in level flight. It is a rela-

(Continued on page 58)

An ATC military supervisor discusses some of the fine points of flying the T-41A. . . . Flying training also includes three hours in the classroom, five days per week, as here at Williams AFB, Arizona. . . . Pilot trainees at Reese AFB, Texas, get the feel of T-41A controls.

To meet the stringent demands that flying makes on mind and body, student pilots must also take physical training. . . . The light prop-driven T-41 proves ideal and economical for pilot training leading to the jet T-37.

tively small aircraft with a takeoff weight of only 11,800 pounds, but its performance and flight characteristics duplicate closely those of modern tactical aircraft such as the F-4C. Air Training Command now operates 822 of these fine training aircraft, whose procurement price is approximately $880,000 each.

The 120 hours of T-38 flying is divided into increments of 36 hours' contact flying, 30 hours' instrument training, 16 hours' navigation practice, 36 hours' formation training, and 2 or 3 hours' optional time to be used where most needed. Initial contact flying and instrument training are augmented by 24 hours of training in a T-7/T-26 ground trainer, which duplicates the cockpit and performance characteristics of the T-38 as the T-4 does in the T-37 phase.

academic training

There are 289 hours of formal classroom instruction on subjects appropriate to qualify the student for pilot duties both during and subsequent to pilot training. Most of this material requires extensive extra-classroom preparation.

For many years Air Training Command has used a "prime base" concept. That is, each pilot training base is assigned prime or principal responsibility for a particular academic subject or subjects. Civilian experts in training material and evaluation, assisted by Air Force classroom instructors, prepare texts, instructor guides, student study guides, testing materials, and appropriate demonstration devices and visual aids. As such materials are developed, they are submitted for final review, editing, approval, and production to an element of the Hq ATC staff. Annually, each base hosts an "academic workshop" where representatives of all bases meet to review and further refine training materials for a particular subject.

Training materials now include 13 Programmed Instructional Packages, using up-to-date techniques of programmed instruction and a multitude of modern and sophisticated audio-visual training aids. Development of training techniques does not end here. Besides accomplishing the everyday teaching job, instructors and supervisors at all pilot training bases are engaged in in-house research, study, and evaluation. Various phases and units of instruction are compared for effectiveness, and equipment such as closed-circuit TV and other electronic picture and sound recording devices is evaluated for use. By these methods academic training is kept current, modern, pertinent, and keyed to job requirements. These are, of course, internal Air Training Command initiatives.

Of greater and broader consequence are the means by which the student is tailored to meet his postgraduate responsibilities in the other major commands. This aspect leads us to a document and a program.

Course Training Standard

The Course Training Standard (CTS) is a document published by Air Training Command. It consists of four parts:

Part I explains briefly the purpose of the CTS; it "sets forth the skills, knowledges, and degree of proficiency required of graduates . . . establishes the overall course objectives, and will be used as the basis for developing more detailed course control documents and training evaluation instruments."

Part II enumerates the general duties and responsibilities of the graduate.

Part III defines four levels of proficiency, ranging from

> 1. Knowledge of the general nature of the operation, task, equipment, or considerations, and able to relate the information or knowledge to the performance of his assigned duties.

to

> 4. Able to perform the operation or task correctly, quickly, and efficiently without assistance and able to apply the principles, techniques, and procedures involved to new or related operations, tasks, equipment, or situations.

In Part IV, job elements are listed, and levels of proficiency (from the four defined) are assigned. For the pilot training course, 62 job elements are listed.

Were a new course to be established, preparation of the CTS would be the first step. However, since the pilot training course has been established for many years and is relatively stable, the CTS serves another very important purpose: it permits efficient communication between ATC and the other major commands. That is, the CTS provides the vocabulary by which requests for change are expressed and negotiated. It is also an essential aspect of the Field Evaluation Program.

Field Evaluation Program

The Field Evaluation Program is formally established by ATC regulation for the purpose of providing currently valid information on the quality of recent graduates: Are they competent to meet postgraduate responsibilities? The question is answered in two ways—by personal interview and through questionnaires. Approximately three months after graduation, each new pilot who enters an advanced flying school in another command is interviewed by a representative from an ATC pilot training base, and his immediate supervisor is interviewed also. Those new pilots who are assigned directly to tactical units (and their supervisors) are mailed questionnaires. These interviews and questionnaires use the CTS as vocabulary and ask two kinds of questions: How often is each job element used? Is training for each job element adequate? Responses are correlated at base level and again at Hq ATC on a quarterly basis. As examples of the effort devoted to the Field Evaluation Program during FY 67: More than 1300 questionnaires were completed by recent graduates, 879 by their supervisors. Twenty-eight bases were visited, and 96 formal reports were prepared on these visits. It is estimated that 95% of all graduates will be queried at least once by questionnaire or interview within two years of graduation.

The Field Evaluation Program provides a means of validating course objectives and training quality on a near-continuous basis. Additionally, CTS review conferences are convened as required or as requested by other major commands, and, within the limits of flying hour availability, the course is adjusted appropriately. Thus continuous evaluation and positive action assure that the pilot graduate matches the requirements of his job. When the job changes, the training is modified promptly to meet new requirements.

course quality

Those readers who are familiar with and perhaps products of the pilot training program of past years will have learned little new so far. The course length has changed only a few weeks since post-World War II days; flying hour content is roughly comparable. But is course quality much the same? The answer to this question is an emphatic NO!

Through the years, the increasing demands of tactical aircraft and the flying environment have challenged the ingenuity of pilot training course managers. This challenge has been met. The pilot graduate of today is better than ever before and in most respects is fully competent to meet his new responsibilities. Nevertheless, the fact that it is possible to train a pilot to the proficiency level demanded by modern military flying with only a few more weeks and flying hours than it took in pre-World War II days should be considered an almost miraculous achievement. How has it been done?

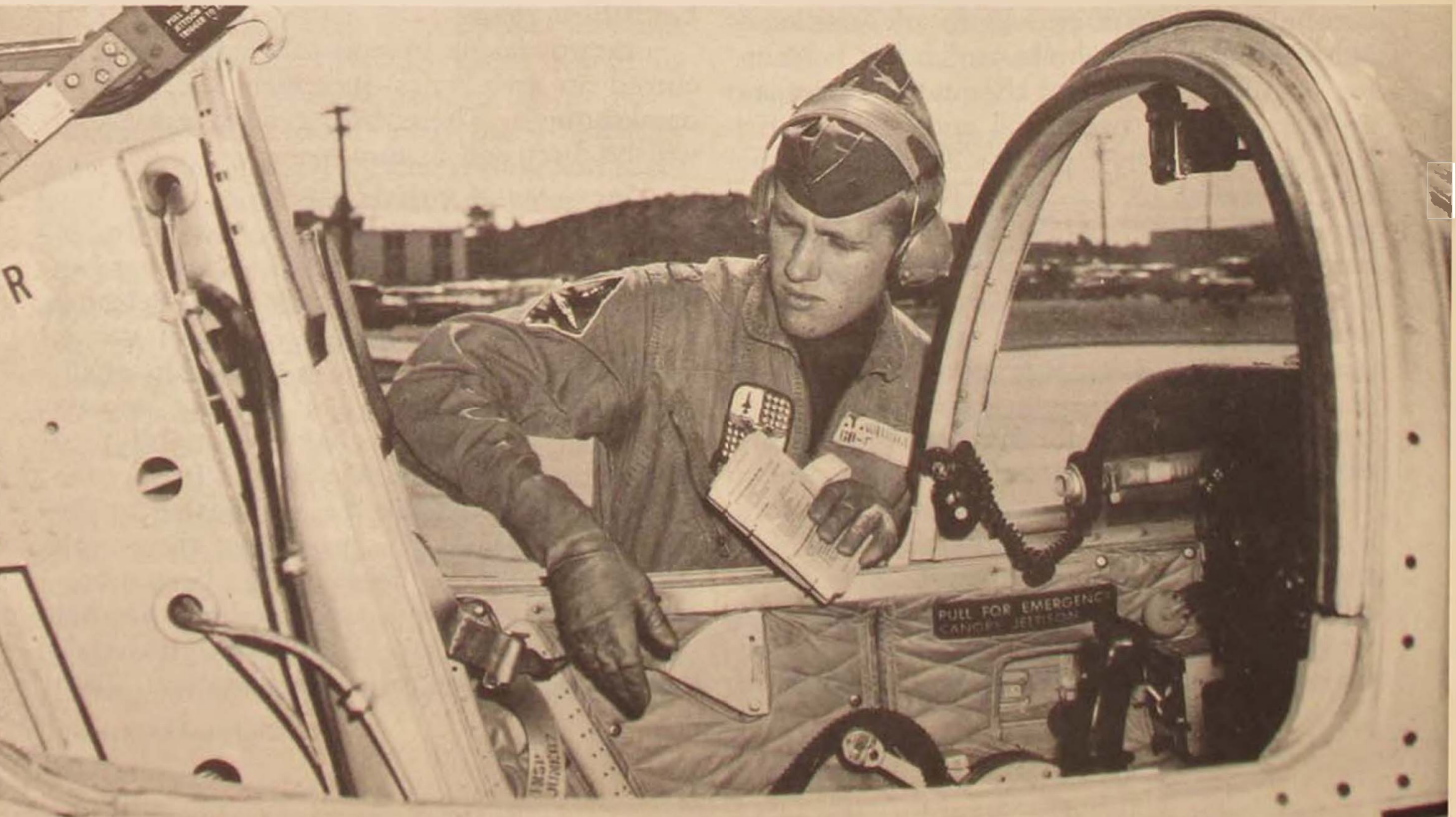
Improvement in course quality has occurred in two ways—incrementally and by breakthrough. These two general categories will be discussed in turn.

Incremental improvements.

(1) Control centralization. Today, control of the course curriculum is tightly centralized in an element of the Hq ATC staff. Here, selected from the entire personnel resources of ATC, is assembled a group of the most highly qualified and experienced pilot training experts in the Air Force. It is their responsibility to obtain maximum training value from each training day and flying hour allocated to the pilot training task. The product of their work and that of their predecessors has been a curriculum of ever improving quality, together with the training techniques and materials which assure its effective presentation. What

(Continued on page 62)

The student familiarizes himself with the T-37 by experience in the T-4 ground trainer Once promoted to the real thing, he gives his "tweety bird" the proper preflight check, including ejection seat and oxygen system. Progress through solo, acrobatic, and formation flying is made easier by T-37 side-by-side seating, which enables the instructor to get full reaction of his student to high-speed jet flying and make corrections when needed.




EXPLOSIV
SEE T.O.

is taught, when it is taught, and how it is taught are all the subject of detailed directives and course materials.

(2) Standardization/Evaluation (Stan/Eval) function. It is essential, of course, to ensure that the program is run precisely in accord with course directives and that every instructor and supervisor is doing his job correctly and professionally. This is the responsibility of the ATC Stan/Eval Board, also an element of the Hq ATC staff. The Stan/Eval Board consists of 14 highly experienced ex-instructor pilots. Their functions are spelled out in an ATC manual. In brief, they act as the eyes of the Commander, ATC; they visit each pilot training base at least twice yearly, where they fly with students, instructors, and supervisors, monitor briefings and classroom instruction, screen administrative records and local directives, and review all operational procedures. The Stan/Eval function is duplicated again at each base, where nine highly qualified instructor pilots perform the same service for the deputy commander for operations. The Stan/Eval function at Headquarters and base levels ensures that all the hundreds of people in the pilot training program understand what they are supposed to be doing, that they comply with directives, and that they use sound, safe operational procedures.

(3) Instructor pilot qualification. Certainly the qualification of the instructor is a key factor in course quality. This is particularly true in pilot training. Preparation of the instructor pilot for his influential role has received strong emphasis. Specialized instructor pilot training courses are operated for T-37, T-38, and academic classroom instructors. The T-37 and T-38 instructor courses are approximately ten weeks in duration, and they include 60 and 65 flying hours respectively. Already qualified in the aircraft at time of entry, the student instructor is taught the many procedures and maneuvers used in pilot training and the techniques by which he may best develop flying skills in his students. Prior to graduation, the student instructor must meet high instructing standards and demonstrate during check flights precise mastery of all maneuvers. As an indication of the emphasis placed on the instruction role, special procedures apply to pilots selected for instructor duty in these schools. Selection criteria include minimum OER average for the last five years of 7.5, two years' experience (minimum) as instructor pilot at a pilot training base, and at least 750 hours in the aircraft (T-37 or T-38). That ATC can afford so high an experience level in the instructor schools may be a surprise. Nevertheless, ATC now enjoys a very impressive experience level at the pilot training bases. The computer provides this profile of the typical ATC instructor pilot: he is 30.8 years of age, has a bachelor's degree, and has 26.6 months' experience as an instructor pilot; 57% of them have flying experience in other commands, and 26.5% have combat experience in Southeast Asia.

These instructor pilots are competent, disciplined, hard-working young men, highly qualified for their important job. During 1967 the "buck" instructor pilot, in whose hands ultimately rests the success of the program, worked a 50- to 55-hour week and averaged more than 45 hours of flying a month.

Innovations. Now let's look at improvements which may qualify for the term "breakthrough." I shall discuss three, though there are others. Probably a narrative exposition will make their nature and significance most easily understood.

(1) Flight scheduling. Traditionally, training aircraft were launched in flying periods. The flying day was divided into four or five periods, depending upon the season of the year. At the beginning of each period, many aircraft were launched together, flew the assigned missions, and returned together. This was known as the "pulse launch" system. It had several limitations, the most important of which is the fact that all aircraft were competing for takeoff space, airspace, navigation aids, and landing space. From a maintenance viewpoint, the working day consisted of a series of sharp peaks and valleys. That is, a large number of aircraft required starting at the same time. Then, at completion of the flying period, all aircraft required refueling and restart for the next period.

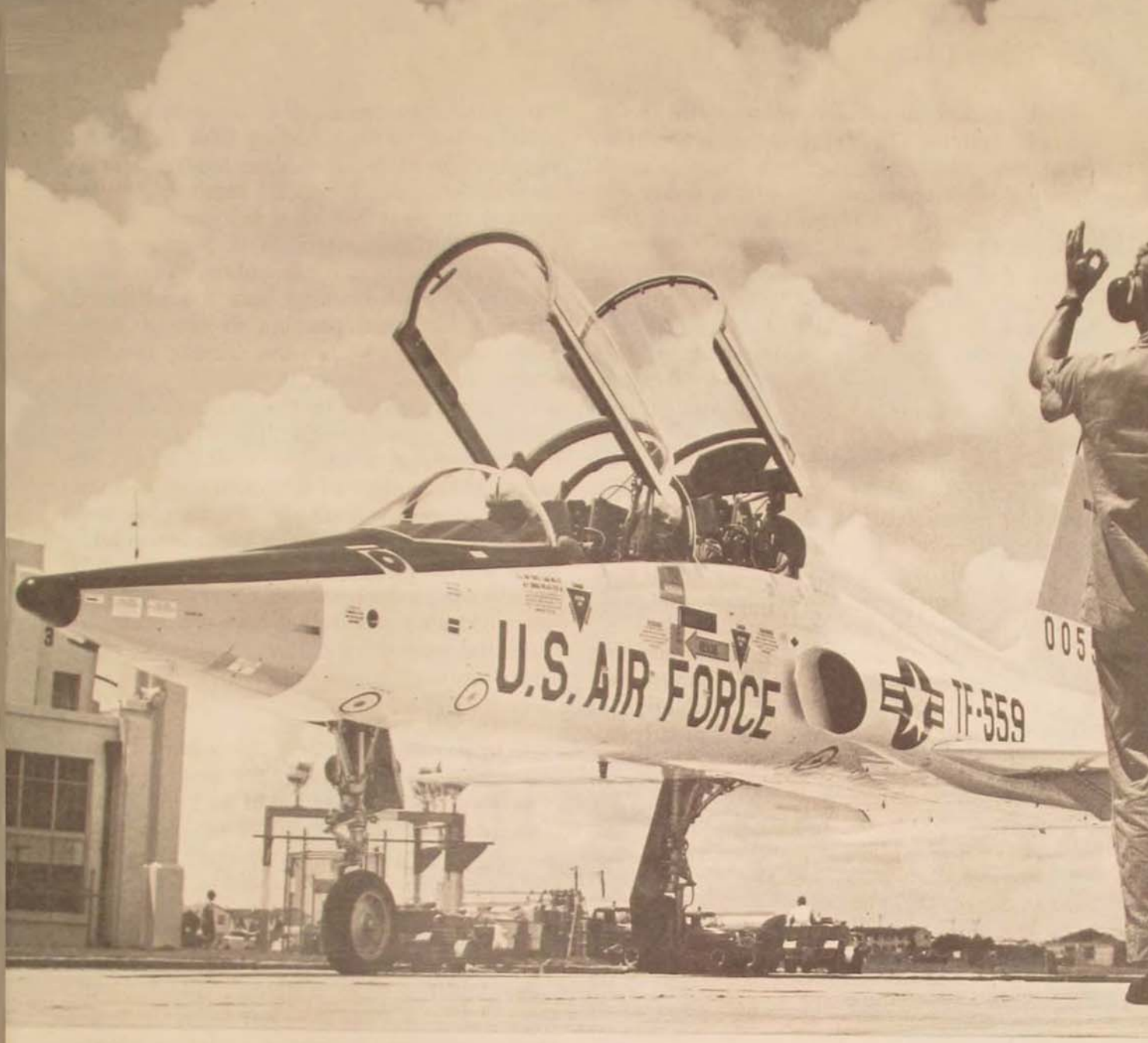
During the past two years, a new concept

(Continued on page 66)

In a ground trainer the student gets instruction in handling the T-38, including use of its tactical air navigation (TACAN) system. Student and instructor occupy tandem pilot seats in this most advanced trainer aircraft. When the student has mastered it, he is ready for easy transition to combat flying, for the T-38 is similar in design to the F-5 Freedom Fighter now being used in Vietnam.


AIR FORCE


91606


U.S. AIR FORCE
TF-559

called "smooth flow" has replaced the "pulse launch" system. The day is now divided into brief intervals of three or four minutes each. Every three or four minutes of the flying day a single aircraft (or formation) of each type is launched. Since each sortie is of approximately the same duration, aircraft return for servicing at approximately the same interval and rate. The maintenance workload is both reduced and leveled; only one aircraft need be launched or serviced at a time. More importantly, individual aircraft no longer need compete for runway time, airspace, or navigation aids. Improvement in training efficiency has been spectacular, since there is much less interference between individual sorties. Queueing for takeoff, approach, or landing is a problem of the past, and each student is able to receive many more opportunities for practice at the same flying hour cost.

(2) Air traffic control. Soon after receiving the first T-38 aircraft, it was apparent that ATC had a new problem. The combination of high speed and small silhouette greatly increased the probability of mid-air collision. In stark terms, if two T-38 aircraft get lined up on a head-on or near head-on collision course, both aircraft will be lost. Neither pilot will see the other aircraft in time to maneuver out of the way. The initial solution to this problem was to divide airspace into pieces and reserve a private piece for each aircraft. Because of maneuver requirements, a minimum size was defined, and the launch capacity of each base became limited by the number of airspace pieces available. Adoption of the "smooth flow" concept has greatly alleviated congestion and increased capacity. Additionally there has been aggressive action and considerable progress toward expansion of radar control. Hq ATC has established the ambitious goal of radar control of all training flights from initial takeoff to final landing. This goal is not as yet achieved; but, based on progress during the last two years, it appears attainable within perhaps the next two or three years.

(3) Use of computers. With improvements in aircraft control and scheduling, the training capacity of each training base has increased. Thus, it has been possible to accept larger production goals within the existing ATC base structure. This increase, in turn, has expanded and complicated greatly the problems of supervision and management. The computer has been the obvious answer. Today scheduling and a major portion of administrative accounting are done by machines. Further, as computers with greater capacity become available, more and more of the managerial task will be transferred to the machine, relieving supervisors of routine scheduling and administrative tasks and permitting closer attention to supervisory responsibilities.

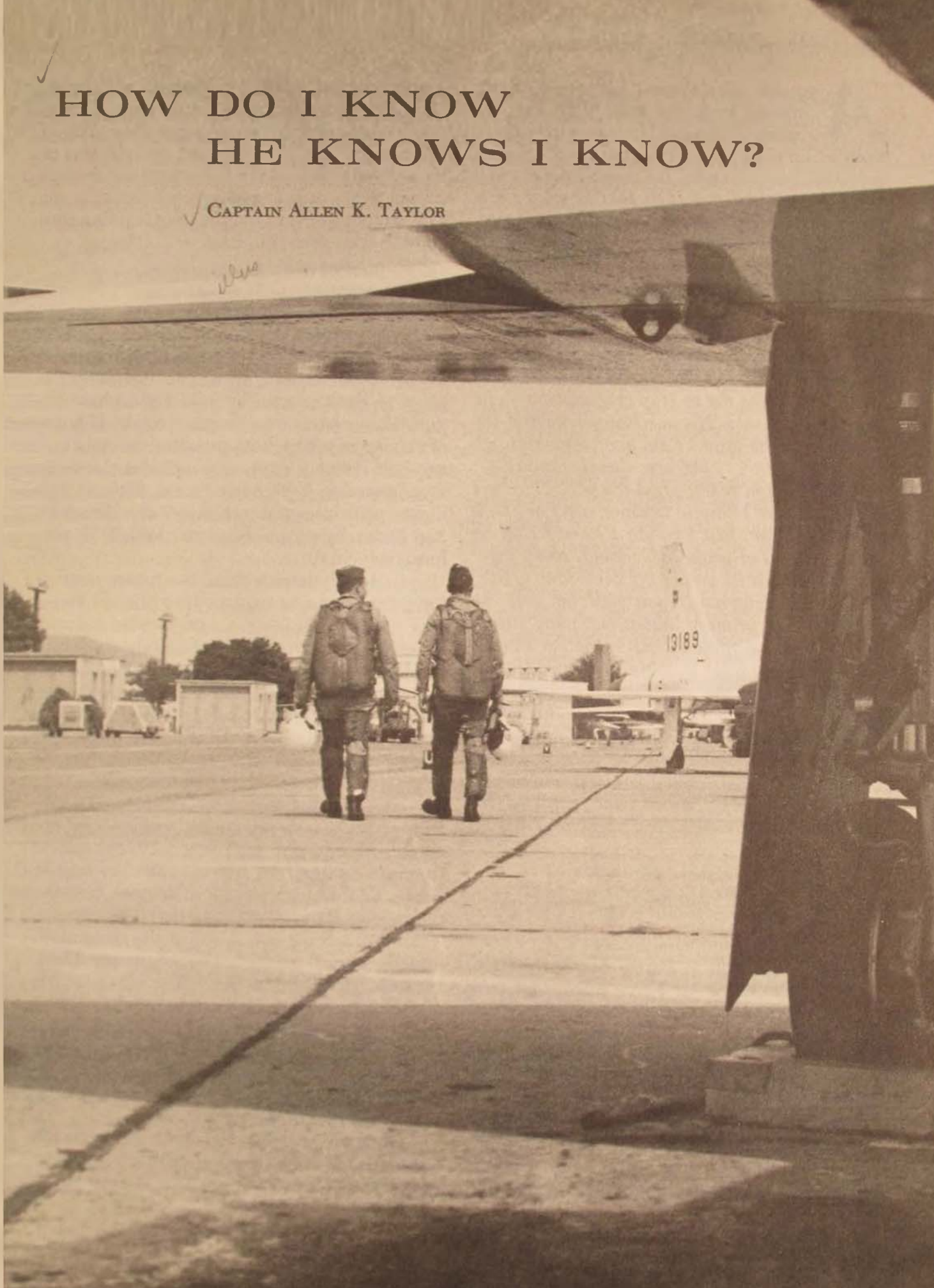
ALL IN ALL, the training operation of today bears little resemblance to the manual grease-pencil-wall-chart operation of a few years ago. The pilot training program is vital and adaptive and ever improving in quality, safety, and efficiency.

Webster provides a clue to the word "inexorable" in the title of this article: it "implies relentlessness of purpose." Such is the nature of the pilot training mission. Three thousand sorties are required today and again tomorrow; every six weeks a class graduates, and on its heels a new class enters; and every new pilot must be capable of carrying his share of the Air Force responsibility. This mission is a harsh taskmaster; it permits no letup in attention or effort.

Hq Air Training Command

HOW DO I KNOW HE KNOWS I KNOW?

CAPTAIN ALLEN K. TAYLOR



A young Air Force lieutenant looks around from the cockpit of his airplane. Through the windscreen in front of him, he sees a runway. He is on final approach for a landing. He doesn't have much flying experience, but then that is what he is here for: to learn how to fly in the Air Force. On this final approach everything looks right; he's sure it will be another good landing, his fourth in a row. Suddenly a voice from the seat next to him comes through on the intercom, "Make this one a full stop!"

The lieutenant thinks, "That's it; that's my instructor pilot, and he is ready to let me fly alone. He wants me to stop the airplane so he can send me solo. He has been watching me fly, and now he thinks I am good enough to go up without him . . . but how does he know? . . . I wonder if I'm really good enough. I guess I should be sure I can do it alone; after all, he is sure that I can. But how do I know? Can he really tell if I'm proficient enough to fly solo? How do I know he knows if I know how to fly?"

Relax, lieutenant, you can be sure he knows. That primary instructor pilot sitting next to you is a professional in the Air Force's undergraduate pilot training program. He has been trained in the school that grooms T-37 instructor pilots for the Air Force. In this school he has learned to evaluate your ability to fly. He has even learned how to help you with everything from strapping yourself into an airplane to counseling you on your problems. He is a graduate of T-37 Pilot Instructor Training (PIT).

T-37 PIT is conducted by the 3251st Flying Training Squadron at Perrin Air Force Base, Texas. PIT receives Air Force pilots that rank anywhere from colonel to second lieutenant and trains them to be T-37 instructor pilots. After graduation, these instructor pilots are fully qualified to teach flying for the Air Force in the pilot training program.

Nearly every future instructor comes to PIT on temporary duty from one of nine undergraduate pilot training (UPT) bases. These students are officers of varied backgrounds. Some of the younger men are second lieutenants with fewer than 300 hours of flying experience. Others rank as high as full colonel, have thousands of hours of flying experience, and are veterans of several wars. Still a very few others are foreign officers who are learning to teach flying in the T-37 so that they can aid the pilot training program in their own countries.

academic instruction

PIT classes at Perrin have approximately 12 students each. In a departure from the usual flying school format, academic instruction is given to them before the T-37 flight phase begins. This academic training consists of 47 hours of classroom instruction, presented in eight and one-half training days, and includes classes in aerodynamics, T-37 engineering, flight instruments, principles and techniques of instruction, Air Force flying publications, and T-37 performance charts.

In aerodynamics class, the future instructor pilot learns to explain in technical terms why an airplane flies, as well as why it sometimes doesn't. The theories of aerodynamics are discussed first. Then, in contrast to the traditional approach, the trainee goes one step further and learns how to apply these theories to obtain practical results. All issues are discussed from a pilot's viewpoint, to better enable the trainee to explain them to his students.

At T-37 Pilot Instructor Training, the subjects of flight instruments and engineering are combined into one instructional block called "aircraft systems." In systems class the trainee learns, first through a platform lecture, how the different parts or systems of the T-37 operate. Then through the use of one of the more modern educational methods, the programmed text, the trainee actually teaches himself the specifics of each system. The instruction is enhanced by the use of nine large training aids, including a full-sized mockup of the T-37 nose gear and cutaway engine. The class examines 25–30 actual T-37 components, including valves, instruments, fuel probes, and pumps.

Thus the trainee learns to answer such questions as: How does the T-37 landing gear extend and retract? How is the fuel quantity

measured in the T-37? How does the starting cycle progress in a jet engine? What components are available to a pilot of a T-37 if certain systems fail? The answers to these questions, and many others, are necessary knowledge to enable a pilot to fly the T-37 safely and to equip an instructor pilot to handle his student's questions effectively.

The classes in principles and techniques of instructing enable the would-be instructor pilot to fire the ammunition he receives in the rest of his training at PIT. Here he is taught the principles of Air Force instruction and is shown how students learn as well as how he can aid them in the learning process. Although this class does discuss some theory, it primarily presents a practical approach to instructing. Concepts are converted into realities by the use of many situations that have happened to instructors during pilot training. When a theoretical point is made, it is immediately clarified by relating it to one of these actual examples.

In principles of instruction the trainee also learns to grade, critique, and communicate. He even learns to counsel through a series of counseling situations where he plays the counselor role and attempts to get at the heart of certain problems. The problems used in the counseling situations are all based on actual student experiences.

The main contribution which the classes in principles of instruction make to future instructors is a positive attitude. Here the trainee is given the desire and motivation he needs to be an effective instructor. This positive attitude prepares him for the position of leadership he will assume with his students, and it especially prepares him to accept his responsibilities to the Air Force.

In the flight planning course, the PIT trainee reviews T-37 performance charts and Air Force flying publications. Through a variety of attention devices, the trainee is taught how to use the charts and graphs which allow him to precompute the exact performance of his T-37. He also reviews the rules and regulations that govern flying in the Air Force. As with all his academic training in PIT, this course is operation-oriented. The trainee is given only the information necessary to be an effective instructor pilot, not insignificant information.

After finishing the classes in aerodynamics, systems, principles of instruction, and flight planning, the trainee completes his academic instruction by passing a four-hour comprehensive examination. He is then ready for the second part of his training—learning to fly and instruct in the T-37.

flying instruction

Flying training for PIT trainees is in four phases: formation, contact (acrobatics, landing, etc.), instruments, and navigation. These correspond exactly to the phases which the trainee will eventually teach to pilot training students.

Formation. In the formation phase, the trainee learns to teach the basics of keeping one aircraft flying near another one. He learns to teach a student how to fly the different formation positions as well as how to rejoin with another aircraft. He also learns how he can prevent his students from flying into dangerous situations while in formation.

Contact. In the contact phase, the trainee learns how to teach pilot training students the fundamentals of flying: turns, stalls, acrobatics, climb and dive recoveries, landings, and spins. These are the very basics of flying and are representative of the task future T-37 instructors must perform—teaching the art of flying to students who know little or nothing about it.

Instruments. In the instrument phase, the trainee practices teaching the methods of controlling an airplane without any reference outside the cockpit. Pilot training students are required to fly the T-37 simulating weather conditions so bad that neither the ground nor the sky is visible. A visor or eyeshade is placed on the student to block out everything but the aircraft instrument panel. He is eventually required to be able to take off and fly a mission all the way to landing without ever looking outside. In the instrument phase of PIT, the trainee learns how to teach this unfamiliar procedure.

Navigation. In the navigational phase, the

instructor trainee learns how to teach students to use an airplane as a means of transportation. He practices teaching how to compute fuel consumption and the time it takes to fly to different check points. He learns how to teach map reading and to land at unfamiliar fields. In short, he learns how to teach pilot training students to apply their talents to mastering the tools and techniques of flying.

methodology

The formation, contact, and instrument phases are taught differently than the navigation phase. In the first three phases, PIT uses a gradual four-step educational approach.

Step 1. In each phase, the future instructors first fly several missions, in which they practice only piloting skills. A successful instructor pilot must be able to concentrate almost entirely on what he is saying, carefully choosing words that best convey instructional techniques. To do this, flying must become second nature and require little concentration; most of his attention then can be devoted to instructing. In this flying proficiency step, each trainee is assigned to a PIT instructor pilot. These are the most experienced men in the Air Force at flying and instructing in the T-37. They average over 2000 flying hours and four years' experience as T-37 instructor pilots.

Step 2. Once the trainee has gained the flying proficiency required to demonstrate "perfect" flying, he is ready to begin instructing while he flies. This is the second step of his flying training and is where he begins to gain the most from his own instructor's experience.

In step two, the trainee is taught the elements and instructional points of all the maneuvers he will eventually teach to pilot training students. He first reads a study guide that is a compilation of many proven instructional points and techniques. He then engages in seminars where trainees discuss, among themselves and with experienced PIT instructors, all the maneuvers to be taught. In these seminars an atmosphere of academic freedom prevails. Trainees exchange experiences and concepts among themselves as well as with

A student gives his T-37 a preflight check, to make sure that everything is in order for his solo flight. . . . An instructor briefs a pilot trainee on instrument procedures to be followed in flying the T-37. . . . Soloing the jet trainer represents a major milestone toward the goal.

their experienced instructors. They talk not only of the correct instructional techniques and different ways to present them but also of incorrect techniques and why they are not acceptable.

After the study guides and seminars have laid the groundwork, the trainee flies missions with his instructor. He learns mission planning, proper timing, and methods of organizing in-flight instruction. He practices maneuvers over and over again. He "teaches" his experienced instructor the proper techniques, and the PIT instructor corrects and guides him toward developing an effective presentation.

As the trainee learns how and what to teach while he flies, his PIT instructor gradually begins to say less and less in the airplane. He finally reaches a point where he tells the trainee little or nothing during a mission. Instead of acting as an instructor pilot, he begins to assume the role of an undergraduate pilot training student. This is the transition into the third step of flying instructor training, error analysis.

Step 3. During error analysis, experienced PIT instructors simulate problems, mistakes, and errors just as if they were novice pilot training students. The trainee first explains the various techniques involved in flying a certain maneuver; he then flies each maneuver as a demonstration for his "student" (the PIT instructor). The "student" then attempts to perform the maneuver himself, committing the same errors that pilot training students make and often going so far as to appear dangerous. The trainee develops his skills as an instructor by trying to analyze his "student's" errors and even by relieving him of control of the aircraft in "dangerous" situations. The trainee then attempts to analyze the errors that were committed and reinstruct his "student" on techniques that would cure his poor flying.

When the trainee is capable of precisely flying the T-37, accurately instructing in all maneuvers, and correcting common student errors, he is ready for the fourth step of his training, an evaluation flight.

Step 4. The evaluation flight is a complete test for an instructor pilot. Before the flight, the trainee is questioned by an experienced

evaluator for approximately one hour. He must explain about the T-37 and flying in general. After the questioning, the trainee flies with the same evaluator and instructs him just as he will instruct his pilot training students. During this mission the trainee must fly and instruct at the same proficiency level as a fully qualified instructor in undergraduate pilot training. When a trainee successfully completes this evaluation flight, he is qualified as an instructor in the phase tested: formation, contact, or instruments.

In the navigation phase, steps one and four (proficiency flying and the evaluation flight) are eliminated. Navigation is completed during a weekend cross-country flight, when the trainee and his "student" fly to several different bases. During this weekend the trainee learns to teach navigation at night, in weather conditions, and in simulated weather conditions. He learns to teach strange-field landing procedures, map reading, and everything that a pilot training student must know to fly an airplane from one place to another.

When the navigation phase is complete and the trainee has passed evaluation flights in the other three phases, he is graduated from Pilot Instructor Training. He has spent ten long weeks *learning*, and he is finally ready to begin *teaching*. He goes to a pilot training base as a fully qualified instructor pilot, ready to train Air Force pilots.

So, lieutenant, you see that your instructor can *evaluate your ability to fly. He has been trained in the best instructor pilot school in the Air Force, T-37 Pilot Instructor Training. He* knows *you know how to fly.*

Perrin AFB, Texas

Air Force Review

A 19th century recruiting pin

THE TECHNIQUES OF MODERN RECRUITING

BRIGADIER GENERAL J. T. SCEPANSKY

A DECADE AGO, recruiting for the Air Force was a matter of obtaining sufficient officers and airmen to fill manpower requirements. Technological progress and specialization, however, have increased the need for an Air Force manned by more highly qualified personnel with increasingly specialized skills. The Air Force today recruits in almost 40 different categories, including officers and airmen of both sexes. Moreover, within the next decade the recruiter may find himself recruiting for over 200 programs on practically a man/job match basis. He will interrogate a computer, which will tell him what the Air Force needs by skill, by number, by place, and by time. The state of the recruiting art, in fact, would permit such a system today if sufficient funds were available to provide the necessary communications and electronic equipment.

A project called ECONOMAN, which will be completed shortly, will computerize and define specific jobs throughout the Air Force. When that computer program is completed and interfaced with the Personnel Data System, which defines and categorizes the precise Air Force personnel inventory, it will be a simple matter to program computers to determine what is needed to fill existing vacancies on a man/job match basis.

At that point, it will be necessary only to determine the degree of decentralization the Air Force can afford in permitting the recruiting effort to interrogate the computers. It is almost certain that the system will have to permit input into the computers from the 74 Department of Defense Armed Forces Examining and Entrance Stations, as well as interrogation from the 46 Air Force recruiting detachment headquarters. Whether this automated data processing can be extended down to the 900-plus recruiting locations throughout the country is, again, largely a matter of available funds.

Virtually everyone recruited for the Air Force today is tested, screened, and categorized before enlistment. The Air Force is testing in approximately 9000 high schools and has recently embarked on a joint testing program with the recruiting commands of the other services. All high-school aptitude test scoring for this program is being accomplished at Air Force Recruiting Service headquarters. The results from these tests aid materially in the pre-enlistment screening process.

The recruiting organization inherently feels the pulse of the nation's youth. An economic boom or slowdown in a large industrial city has an immediate effect on Recruiting Service's success in that city and region. Strikes, seasonal economic cycles, the availability of jobs, optimism or pessimism in the local, state, or national economy—all are barometers by which the recruiting climate can be measured. When the climate is good and draft quotas are high, the recruiter is chiefly involved in sifting for quality. When the recruiting climate is less favorable and draft quotas are lowered or eliminated, as can be expected when the crisis in Southeast Asia has abated, the recruiter is faced with hard-to-meet quotas in numerous career fields and with a sizable selling job if he is to persuade the right man with the right skill to join the Air Force at the right time. Paramount within Recruiting Service planning is the overriding necessity to prepare for successful accomplishment of the recruiting mission in a post-Vietnam environment.

The techniques of recruiting have undergone rapid development to keep pace with the headlong scientific and technological advances in military methodology during this century. The same techniques which permit refined and expanded specific manpower requirements also permit rapid and vastly improved analysis of individual capabilities. However, recruiting today relies as much on modern methods of salesmanship and personnel quality control as military operations depend on the latest advances in weaponry and tactics. Recruiting can no longer depend on bands, parades, and missile displays to motivate the highly qualified young people needed in the Air Force; novelties and gimmicks will not impress a systems program analyst or an astronautical engineer. Thus, paradoxically, today's scientific sophistication and automation demand and make possible greater human sensitivity than ever before on the part of the individual recruiter. He must treat his prospects, not as numbers on a chart helping him fill his quotas, but as individuals with valuable skills to contribute to the nation's defense. Therefore, recruiting is and will continue to be a person-to-person process. The quality of the people recruited depends in the final analysis on the quality of the people who recruit them.

history

Recruiting has come a long way since the nineteenth century newspaper account of a typical recruiting effort:

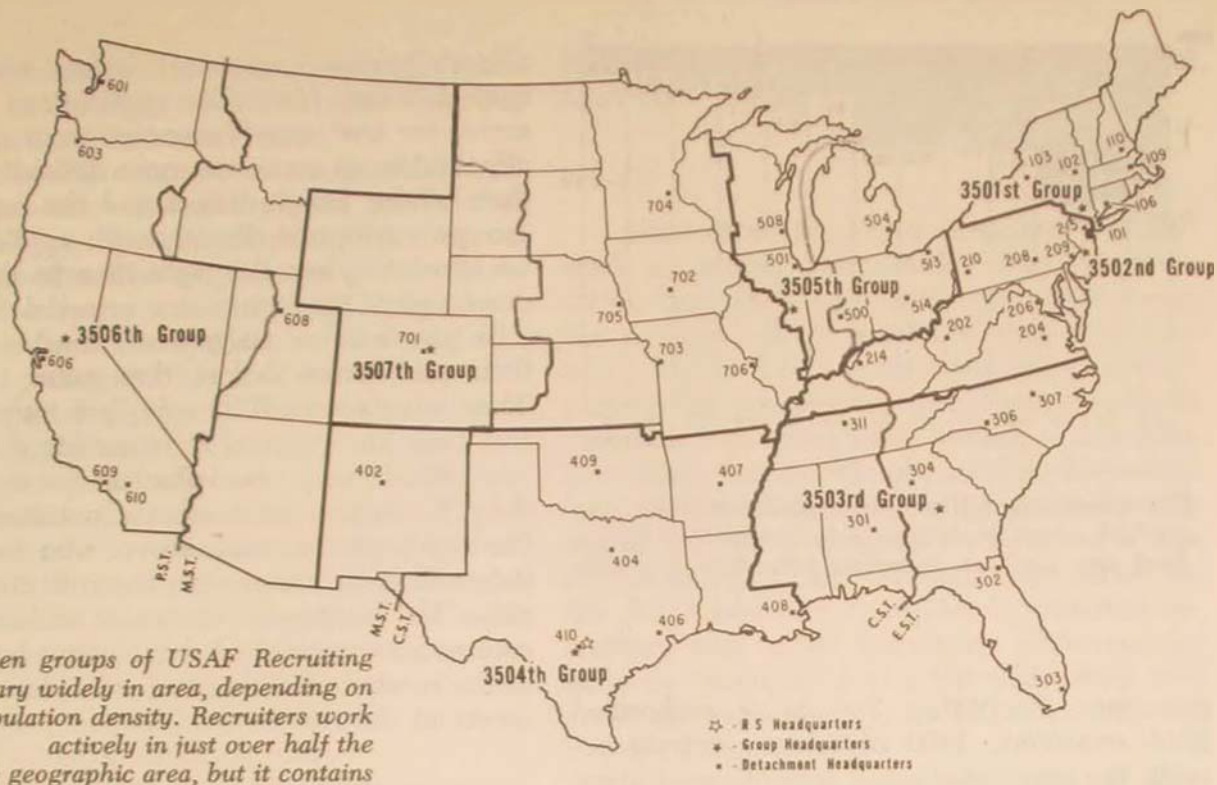
> We had a recruiting sergeant from Plattsburg parading our streets yesterday with a band of music, beating up for recruits. We hope he has been successful for we could spare a goodly number of loafers who, if they would serve their country as faithfully as they do the devil, would be a great acquisition to the Army.

Recruiting then was a catch-as-catch-can affair conducted by individual regiments. The United States Recruiting Service was established in 1822, but recruiting was streamlined and made more efficient only after World War I. During World War II, Selective Service handled procurement for all branches. After the war the Army recruited for the Army Air Forces, and when the Air Force became a separate service in 1947 the Secretary of Defense directed the two branches to continue a joint program through the Army's recruiting organization.

The joint recruiting service was completely decentralized and exercised little control over its recruiters. As a result, the Air Force could not shift its procurement efforts into more critical areas or regulate the number of recruiters to meet fluctuating requirements. Early in 1953 the Air Force petitioned to withdraw from the 1948 agreement and in March 1954 was directed to assume operational control of all Air Force manpower procurement programs.

The Air Force assumed responsibility for its recruiting on 1 July 1954 and assigned the mission to the 3500th USAF Recruiting Wing. During its first year as a separate recruiting force, it attained 96 percent of its overall production objective. The demonstrated ability of the Air Force to recruit successfully was the first step toward achieving an Air Force composed entirely of volunteers.

In 1956 the Air Force raised its minimum



The seven groups of USAF Recruiting Service vary widely in area, depending on population density. Recruiters work actively in just over half the nation's geographic area, but it contains more than 97 percent of the people.

qualifying score on the Armed Forces Qualification Test (AFQT). This resulted in a significant improvement in quality, as evidenced by the higher percentage of airmen enlistees who are high school graduates. Quality was emphasized further during fiscal years 1958 and 1959 with the introduction of the Airman Qualifying Examination (AQE), an aptitude test administered to all Air Force applicants. The test enables the Air Force to select only those applicants with the requisite aptitudes for technical training courses.

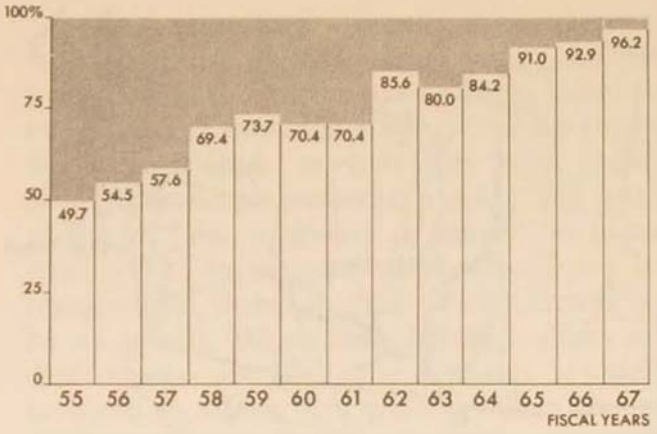
In July 1959 USAF Recruiting Service was established. It underwent a major reorganization in 1961–62 when Project Silver Spur increased the number of recruiting groups from 6 to 7, reduced the number of detachments from 48 to 46, and reduced the number of sectors from 190 to 181. These changes reduced the area of coverage, placed recruiting in more strategic areas, equalized the quota (based on market potential) in each group, and reduced the span of control and operating costs. The example set by the Air Force in quota allocations, manning, and market analysis during Silver Spur has since been emulated by the other services.

In 1963 Recruiting Service began to emphasize the "across-the-board" concept of recruiting, a management incentive program which stresses meeting quotas within all procurement categories instead of overproducing in some programs and ignoring others. The concept paid dividends in fiscal year 1964, when for the first time in its history Recruiting Service achieved 100 percent production in all procurement categories.

In January 1965 the headquarters moved from Wright-Patterson AFB, Ohio, to Randolph AFB, Texas, and on 15 June 1966 Recruiting Service was elevated to numbered air force level. For the last two years Recruiting Service has enjoyed unprecedented success in meeting ever increasing demands for both quality and specialized recruiting.

selecting the recruiter

The reporting identifier AFSC 99120 is used to identify all personnel performing duty as



The percentage of non-prior-service enlistees who are high school graduates reached an all-time high in fiscal year 1967—an important indication of quality.

recruiters. Recruiting Service is authorized 2224 recruiters, 1469 of whom actively recruit, the remainder being supervisors, testers, or administrators. Recruiters are noncommissioned officers who volunteer for recruiting duty at specific geographic locations. The selection of recruiters is a careful process; only one out of five NCO's applying is selected. Today's recruiter is highly qualified in his own career field and is a dedicated and resourceful individual. He is "Mr. Air Force" in many communities and is often the only contact between the Air Force and the public.

Successful manning of Recruiting Service requires an immediately available resource of qualified volunteer applicants when vacancies occur. A recruiter selection committee at Recruiting Service headquarters reviews all applications, considering such factors as formal education, age and appearance, service and grade relationship, performance ratings, number and physical status of dependents, and personal conduct. Applicants approved by this committee are then interviewed by a Recruiting Service representative (except overseas applicants). The interviewer notes the applicant's personal appearance, voice and communication abilities, motivation, and overall knowledge of the Air Force.

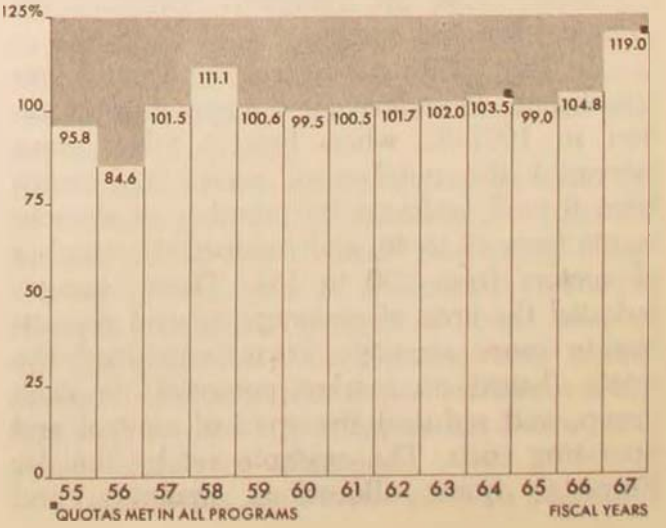
The selection committee again reviews the application, along with the interviewing officer's personal appraisal, before making a final decision. Normally, applications remain active for one year. Vacancies occur continually, and some areas are more difficult to man than others. Headquarters and the recruiting groups correspond directly with applicants in an effort to place the right man in the right community. Applicants are selected for specific geographical assignments consistent with their preferences before they enter training. They must successfully complete training before they are assigned to recruiting duty.

Officers may also volunteer for recruiting duty. Recruiting Service has a continuing need for highly professional officers who can motivate others to accomplish the recruiting mission. The major or lieutenant colonel who commands a recruiting detachment holds one of the most challenging and rewarding assignments in the Air Force.

recruiter training

Although all the noncommissioned officers selected for recruiting duty are outstanding, few have background or experience in the techniques of salesmanship and public relations. All would-be recruiters are introduced

The Recruiting Service has exceeded its overall procurement objectives in nine of the 13 years since its establishment. In 1964 and 1967, all its objectives were met.



to the techniques of recruiting and interviewing in an eight-week Recruiter Training Course at Lackland AFB, Texas.

The course concentrates on five blocks of instruction—interview techniques, advertising and publicity, speech, selection criteria, and career benefits. The emphasis is not on memorizing techniques but on applying them in face-to-face confrontations. Students and teachers participate in mock interviews with every type of prospect. The students learn enough fundamental psychology so they can probe into a prospect's basic interests, desires, and ambitions. Once these are established, the recruiter learns to concentrate on those aspects of an Air Force career which would most appeal to the prospect—education, job satisfaction, security, etc. He discovers how to establish empathy with the prospect and overcome objections, and he acquires an intuitive sense of when to close the sale.

To make their recruiting presentations more graphic and convincing, recruiters are taught the proper use of sales aids—posters, pamphlets, etc. The school has also set up a model recruiting office to show students how to create attractive and businesslike surroundings. The model office helps standardize the physical setup, filing system, and functional responsibility of recruiting offices throughout the country.

A recent innovation is a closed-circuit television system consisting of two monitors, a camera, and a tape recorder. The system saves about 32 man-hours per class and has lowered the failure rate by 25 percent. It is especially helpful in speech courses, permitting students to see and hear their own presentations. They are made aware—painfully, in some cases—of faults like coughing, stammering, and distracting motions. Public speaking ability is an important asset to the recruiter, who is frequently called upon to speak at high schools and before civic groups.

The course is by no means the end of recruiter training. A vigorous on-the-job training program keeps recruiters skilled, flexible, and motivated. Training at detachment level is conducted in commander's management training, based on the philosophy that the knowledgeable recruiter is the successful recruiter.

benefits

Since most Air Force recruiters live and work in civilian communities where commissaries, base exchanges, and other USAF facilities are not readily available, they may face much higher living costs than their counterparts living on or near Air Force bases. In an attempt to offset these abnormal expenses, Recruiting Service has obtained authorization for 182 leased family-housing units for the use of recruiters assigned to 17 areas where cost of living is high. The units are leased by the Air Force and occupied by married recruiters, who forfeit their basic allowance for quarters. Occupancy of a leased housing unit saves the recruiter $30 to $60 a month, the average being $51.08.

Recruiters also receive the special subsistence allowance of $2.57 a day, paid when rations in kind are not available, and an initial uniform allowance to provide for purchase and maintenance of the extra military clothing required.

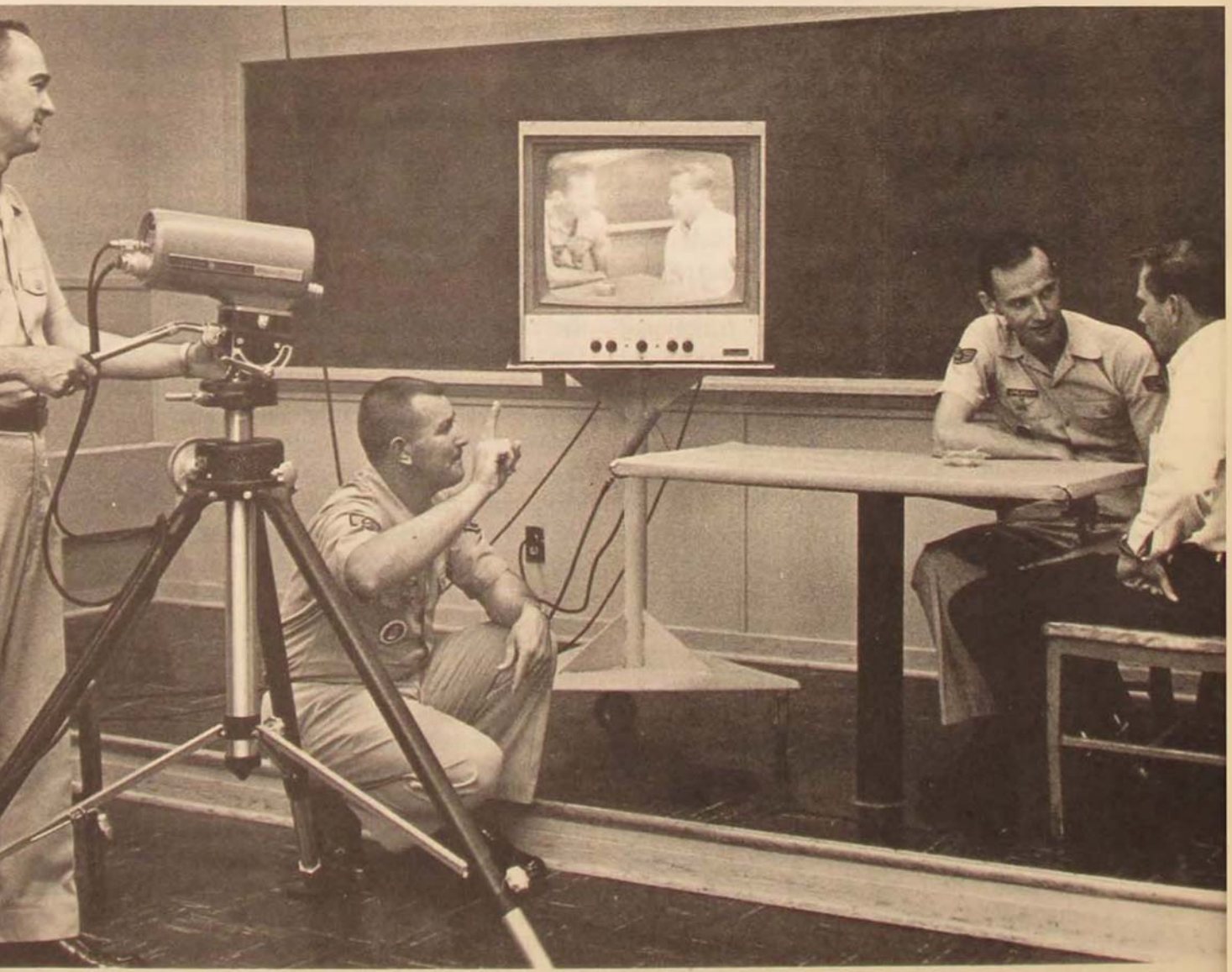
Recruiters also enjoy these benefits: they are assigned to their area of choice, usually to the specific city for which they volunteer; volunteers are sent to Recruiting School on temporary duty status and return to their home base before proceeding PCS to their recruiting assignment; when recruiters rotate after the normal minimum tour of four years, they know their new assignment three to four months in advance.

pre-enlistment testing

In October 1958, the Air Force began administering the Airman Qualifying Examination at recruiting offices instead of during basic training. This procedure enabled the recruiter to preclassify a non-prior-service (NPS) applicant into the broad career area for which he was eligible—mechanical, administrative, general, or electronic—so he could select his aptitude area before enlistment processing.

In 1961 the local testing program was

The Joint Centralized Test Scoring Branch at Air Force Recruiting Service headquarters uses a Digitek 100 Optical Reader in scoring the Armed Services Vocational Aptitude Battery. . . . Instructors at the Recruiting School record a model sales presentation on video tape, using a closed-circuit television system, one instructor playing the role of a prospective enlistee.



expanded to include high schools. By administering the AQE in the classroom, the Air Force was able to make first contact with graduating high school seniors, and the test results enabled recruiters to identify potentially qualified applicants. Test scores are also made available to high school guidance counselors. The results of the program can be seen in the steady climb in the enlistment rate of high school graduates.

The success of the Air Force's high school testing program prompted the Army and Navy to start similar programs, which resulted in all services competing for testing time in the high schools. To remedy this, in 1967 the services designed the Armed Services Vocational Aptitude Battery (ASVAB), a common test which enables each service to obtain its own particular aptitude scores. The test is administered in a joint high school testing program and scored at the Joint Centralized Test Scoring Branch at Air Force Recruiting Service headquarters. Test results are returned as a computer print-out record, which speeds processing and allows the results to be forwarded simultaneously to all services.

In addition to providing the standard mechanical, administrative, general, and electronic aptitude scores, the ASVAB has the capability of breaking these scores down into subtest areas. This opens the possibility at some future date for the ultimate in preenlistment classification—offering a prospective enlistee his choice of a specific career assignment at the recruiting office.

After qualifying on the ASVAB, approximately 96 percent of all regular Air Force nonprior-service enlistees are preprocessed at the Armed Forces Examining and Entrance Station (AFEES) to determine if they are mentally and physically qualified before enlistment. Preprocessing is necessary because:

- Recruiting Service must meet a daily, weekly, and monthly flow to the basic military training centers. The only way to insure this even flow is by sending qualified applicants to the AFEES for enlistment.
- Under Phase II of Project 100,000, 17 percent of all NPS enlistees must be from the group scoring in mental Category IV on the Armed Forces Qualification Test. These Cat-IV enlistees are divided into three subcategories, with specific quotas in each. Since the AFQT is administered only at the AFEES, it is only through preprocessing there that a person's mental category can be determined in advance of enlistment.

Project 100,000

In August 1966 the Secretary of Defense announced a program intended to enlist in the military services as many as 100,000 young men a year who would previously have been unable to meet the mental or physical standards for enlistment or induction.

During Phase I of Project 100,000, which ran from 1 October 1966 through 30 September 1967, the Air Force enlisted 10,166 airmen in mental Category IV (those scoring between 10 and 30 on the AFQT). This was based on the OSD requirement that 15 percent of all NPS enlistees be from Category IV. The minimum score for Category IV enlistees, which was 21 when the program began, was lowered to 16 on 1 January 1967 and to 10 in April 1967. Although both high school graduates and nongraduates were accepted, high school graduates were given priority.

The medical aspect of Project 100,000 was implemented on 1 February 1967, with the Medically Remedial Enlistment Program (MREP). This authorized the enlistment of applicants who are overweight, underweight, or suffering from readily remediable physical defects; MREP enlistments are limited to defects deemed correctable within six weeks.

With the beginning of Phase II of Project 100,000 (1 October 1967 to 30 September 1968), the mandatory percentage of Air Force NPS enlistees from Category IV was raised to 17 percent. Air Force's contribution to Phase II is 14,651 enlistments. In addition an objective of 1800 MREP enlistments was established for Phase II.

recruiting for women

The primary emphasis in Air Force re-

cruiting for women is on quality recruiting in the women's programs—Women in the Air Force Officer Training School, Women in the Air Force Non-Prior Service, nurses, and medical specialists—and the effort is geared to providing the Air Force with intelligent, personable young women. To assist in attracting these highly qualified recruits, Air Force women are presented to the public as attractive, feminine, and highly trained young people filling positions of responsibility. This image is fostered largely through personal contact between Air Force women and educators, administrators, students, and women's groups.

Officer Training School

Recruiting for Officer Training School (OTS) has been one of the most successful of all Air Force recruiting programs in recent years, as evidenced by consistent overproduction for practically all officer programs and by the positive acceptance of Air Force recruiters on most of the 1500 baccalaureate-degree college campuses where OTS recruiting originates.

Within the last two years, emphasis in the OTS program has been on pilots, navigators, and engineers. The only utilization field in which vacancies outnumbered OTS enlistments has been development engineering, AFSC 28XX. This field is composed of electronic, mechanical, astronautical, and aeronautical engineers. In late fiscal year 1967 the OTS program was directed to commission 300 development engineers. Requirements for specific utilization fields were imposed, and Recruiting Service submitted over 500 applications for these fields.

The requirement for engineers, as well as pilots and navigators, continued into FY 1968. That requirement for engineers imposed quotas on Recruiting Service for both applications and enlistments, resulting in increased production in both categories. Over 500 development engineers were commissioned in FY 1968, a record for the program. Overall, Recruiting Service submitted more than 20,000 applications to OTS during FY 1968, against a total goal of about 5600 officers in 42 career fields.

advertising

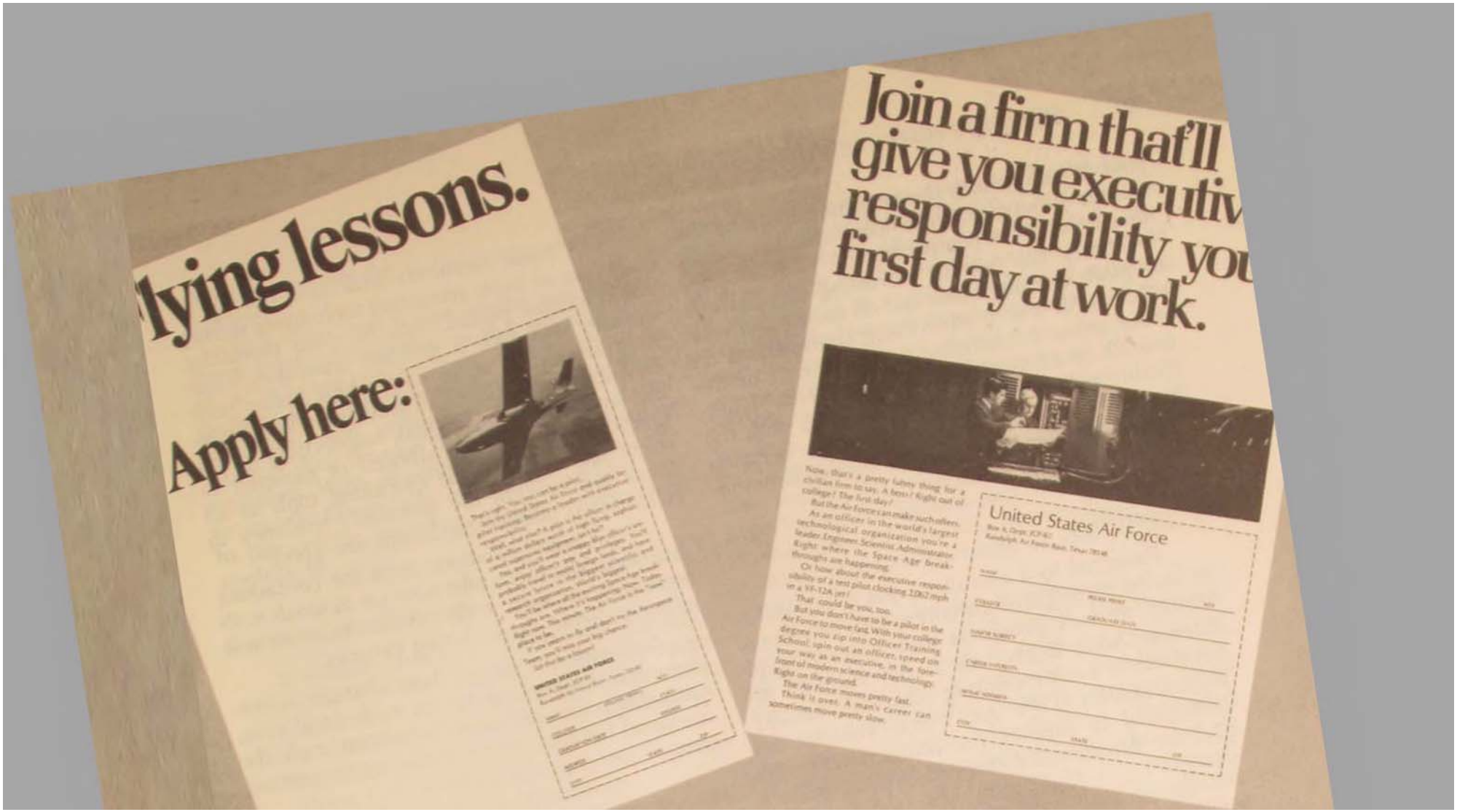
An essential tool for recruiting in all programs is advertising. Advertising builds an image and stimulates a prospect's interest in the Air Force. At the same time it helps create a favorable recruiting climate. National advertising efforts are geared to the procurement objectives for each recruiting category. The recruiter is also provided with advertising materials for local use.

All aspects of advertising are employed by Recruiting Service to get the Air Force message to the public: periodical advertising, radio, television, printed publications, window cards and displays. These media are used with varied emphasis, depending on the particular recruiting program.

For radio and television advertising, the Air Force must rely on public service time, depending on the good will of a station to present Air Force messages during unsold time. To make the most of this public service, Recruiting Service tries to provide attractive materials and encourage interest and effort by local recruiters. The Air Force distributes to subscribing stations three continuing radio shows—"Serenade in Blue" (stereo and monaural), "Music in the Air," and "Country Music Time." Transcribed spot announcements, often recorded by famous persons, are sent to recruiters for placement with local stations.

Television spot announcement clips in both 60-second and 10-second versions are also distributed by recruiters. "The Big Play," a programmed series of football highlights, is carried by more than 200 stations throughout the nation. A large share of the advertising budget is spent on reaching the public through the more than 700 television stations and over 5000 radio stations in the United States.

An equally important medium is periodical advertising. The marketing strategy of the contract advertising agency determines the appropriate magazines and proper advertising approach for each prospective group. Market analysis reveals such facts as the number of women who will graduate from college this year, the number of men who will earn baccalaureate or graduate degrees, and the number of nurses who make up the potential nurse


lying lessons.
Apply here:
Join a firm that'll
give you executiv
responsibility you
first day at work.
United States Air Force

Air Force advertisements in national magazines help to generate interest in the United States Air Force as a career. "Target" ads stimulate recruiting and attract quality enlistees in the pilot training program, the Officer Training School, and the Air Force Nurse Corps.

pool. It also reveals the magazines read by the various groups and the most efficient media for reaching the prospects.

Since the current recruiting emphasis is on pilots and engineers and on nurses and WAF officers, Air Force advertising concentrates on these areas. Advertising is a vital part of the overall recruiting effort at all levels. High-quality national advertising, coupled with the ingenuity of the local recruiter, has been an important contribution to the accomplishment of the recruiting mission.

transportation

Essential to a recruiter's job is his ability to travel throughout an entire area of responsibility to visit prospects and centers of influence. Accordingly, Air Force vehicles are assigned to each recruiting office and facility. Approximately 1700 Air Force vehicles are authorized to support the recruiting mission and are driven more than 23 million miles a year.

recruiting after Vietnam

Recruiting Service is devoting considerable thought and planning to the changes that will have to be made to recruit successfully in a post-Vietnam recruiting market with its anticipated low draft calls. Many considerations and adjustments will be required:

• Recruiters will have to devote more of their time to the male non-prior-service program, with less time available for the other programs in which quotas are levied—WAF, nurse, etc.

• A re-evaluation of manpower needs will be necessary if Project 100,000 and the fragmentation of programs—such as the engineer requirements in the OTS program—continue or expand.

• Headquarters and commanders in the field will have to anticipate changing market conditions, accurately judge their magnitude, and apply proper emphasis and recruiter effort so as to obtain the highest possible quality and quantity of applicants in all programs.

• Some recruiters who have relaxed in their use of basic recruiting techniques during the Vietnam period with its good recruiting climate will face a difficult transition when they are called upon to produce under poor recruiting conditions. To preclude a long training and transition period, supervisors at all levels are now being advised or directed to stress the use of basic recruiting tools at all times and to fight the recruiter's tendency to relax when market conditions are good.

• Communications costs for contacting prospects like those who now get in touch with recruiters on their own will increase, as will mileage driven in recruiting vehicles.

To help provide for these changes, a mission plan is prepared before each fiscal year, estimating the recruiting situation and the workload for each program during the coming year.

big-city recruiting

The key to successful recruiting after Vietnam—and the biggest problem facing recruiting today and in the future—is the ability to recruit in cities with populations of over two million. Big-city recruiting is complicated by factors not associated with smaller metropolitan or rural areas:

• The higher cost of living, which discourages many potential recruiters from volunteering for recruiting duty, compromises selectivity and the effectiveness of those assigned.

• Increased transportation costs from home to work and back.

• Congested and slow-moving traffic, which makes it difficult to visit applicants.

• Much greater difficulty in obtaining satisfactory newspaper publicity and public service radio and television time.

• Greater competition for available manpower from civilian industry.

Some steps which have been taken to ease living costs for recruiters have already been mentioned. Recruiting Service is also attempting to provide recruiters with addi-

tional allowances for out-of-pocket recruiting expenses.

One experiment now under way to improve big-city recruiting is the establishment of a full-time information center, the sole purpose of which is to answer questions from applicants and prospects. Recruiters spend much of their time on the telephone answering questions. With an assistant recruiter available to handle these calls, recruiters will be free to concentrate on securing new prospects or applicants.

automated recruiting system

Successful quality recruiting over the next several decades may depend on the long-range development of an electronic data-processing system designed to automate three basic recruiting tasks:

Phase I—Processing the enlistees into active duty (administrative processing)

Phase II—Selection of individuals for jobs (classification)

Phase III—Selection of individuals for entry into the Air Force (selective recruiting).

The administrative processing and classification phases have already been implemented at Lackland Military Training Center.

Phase III of the system, selective recruiting, which is still in the planning stage, has three main objectives:

(a) To procure manpower with the highest training and utilization potential from the total available resource, in order to improve the matching of individual skills and training potential to specific Air Force needs.

(b) To improve recruiting management capability by the use of advanced communications and computer processes.

(c) To reduce the time airmen spend in the recruiting and training pipeline.

The ultimate objective of Phase III is the pre-enlistment classification of recruits for specific training courses or a narrow range of job assignments. In the long-range time frame (1973 and beyond), this would provide for a specific contractual arrangement with the recruit which would guarantee training or a directed duty assignment in the job or career area for which he was classified. In the intermediate time period (1969–73) it will require the development of pre-enlistment job predictors which can be used to narrow the range of jobs offered to recruits. Instead of enlisting recruits into four pools corresponding to the four aptitude indexes of the AQE, the system envisions offering a small number of job possibilities to the applicant based on his qualifications determined prior to enlistment. At the beginning, no additional recruiting promises would be made to the applicant. As experience was gained and if it proved advantageous to mission accomplishment, a promise of a narrow range of jobs would be possible.

Recruiting Service recognizes that there are many problems in Phase III. Not the least of these is the need to consider expanding the recruiter force to include a capability for job counseling in line with the responsibility for pre-enlistment classification. Expanded mental testing capabilities will also be required to qualify applicants for some job assignments. From the recruiting standpoint, there is the problem of developing a method of selling enlistments in the "soft core" career fields. All assignments are now made at the Basic Military Training Centers, within the airman's selected aptitude area. The problems facing a career counselor when informing an airman in basic training that he is being assigned to a sophisticated or glamorous career field are quite different from the ones which face the recruiter who must inform a prospective Air Force enlistee that he may enlist only in the relatively menial career fields. These problems are under study, and acceptable solutions will be found before Phase III is accepted.

To SOME, the computers, long-distance communications network, and modern testing procedures threaten depersonalization. In fact, however, they are tools to help the recruiter procure the most highly qualified people available and match them to the jobs in which they will be of most value to themselves and to the Air Force. These tools, the techniques of sales-

manship taught at the Recruiting School and the modern advertising methods, are all secondary to the recruiter's concern for his prospect's interests and his sincere belief in the importance and advantages of an Air Force career.

Hq USAF Recruiting Service

Recruiting Programs

Recruiting Service is required to meet Air Force quotas in eight major programs, subdivided into more than 30 different categories. These quotas are allocated to the recruiting groups, then broken down and passed on to the detachments and individual recruiters in 774 recruiting offices throughout the nation. The major recruiting programs are:

- Non Prior Service (NPS)[1]
- Prior Service (PS)[2]
- Women in the Air Force (WAF)
- Officer Training School—Women (WOTS)
- Officer Training School—Men (MOTS)[3]
- Registered Nurses
- Medical Specialists[4]
- Judge Advocates General (JAG)

1. Included in this program is a requirement for specific numbers of enlistments in ten different qualifying score areas of four aptitude indexes (mechanical, administrative, general, and electronics). The NPS program also includes Project 100,000 requirements and bandsmen.
2. For directed duty or retraining.
3. Applicants are further categorized as pilot, navigator, scientist, engineer, or other.
4. Includes dietitians, physical therapists, and occupational therapists, both fully qualified and student.

PARAMILITARY FORCES NEED A NEW MISSION

MAJOR JOEL J. SNYDER

BASIC military understanding of the role of local militias and police forces in internal security and counterinsurgency activities is confused, and perhaps mistaken. National regular military troops putting down civil disorder in cities of the United States are a shocking reminder that there is a stage in civil disorder or incipient insurgencies when the capabilities of police or paramilitary forces are overreached. Current concepts of how local militias can and should be employed need to be re-examined, particularly where paramilitary elements closely resemble regular military forces or fight in more conventional military operations against subversive insurgents.

Paramilitary forces, loosely defined, are forces or groups distinct from the regular armed forces of a country. They may resemble the regular military establishment in equipment, organization, training, or mission. In practice they are usually integrated in various degrees with regular fighting units for specific operations or emergencies. These various con-

ditions have blurred the distinctness of paramilitary groups. There are no two identical units from one country to another. In a widespread insurgency such as the British emergency in Malaya or the current war in South Vietnam, paramilitary elements have changed considerably, appearing different than they were when the insurgencies first began. The general belief is that paramilitary forces are responsible for internal security, or "inner-perimeter defense," a phrase used in South Vietnam. Common paramilitary elements are local militia and civilian police institutions.

Nothing is less glamorous than the militia, or part-time soldiers, who protect their own village and maintain law and order. These troops seem to command little respect or admiration. Routine tasks of manning sentry outposts or patrolling have never been considered as jobs that require first-line training or equipment. So the self-defense platoons have been composed traditionally of rural inhabitants of the local area, partly trained and equipped, and inadequately paid, if at all. It is not surprising that the paramilitary forces have been the "ragtag" units in most internal defense concepts.

Despite their low prestige and lack of glamor, no one questions the necessity for them. Paramilitary units have proven essential for defending widely separated villages and small settlements. The successful Philippine and Malayan counterinsurgency experiences underlined the value of police and militias. In Malaya, the police force grew to twice the size of the regular Malayan armed forces during the final phase of the emergency;[1] and they continue today with a mission of internal security and counterguerrilla surveillance. The Philippine Constabulary, before 1950 and after 1955, has been the primary defense against a recurrent insurgency threat.[2] In South Vietnam, paramilitary troops, which include Regional Forces, Popular Forces, police, and civilian irregulars, constitute half of all Vietnamese men under arms.[3]

When adequately trained and equipped, paramilitary units possess inherent advantages in conducting counterinsurgency activities. They occupy a unique position in the broad category between conventional military operations and social or economic nation-building activities. Local militias usually conduct offensive patrols, provide combat support elements, or defend critical positions. Composed of small organic units, such as platoons and rifle companies, paramilitary forces should be well suited to the numerous smaller security requirements in rural or less-developed environments. The basic concept for their employment at the present time is generally understood to be as village platoons and hamlet squads which defend their own local areas against insurgents.[4]

Besides traditional internal security missions, paramilitary forces have an excellent opportunity to assist with community development. Many times military civic actions are carried out by paramilitary units in cooperation with central government economic or social teams. Pacification usually begins under the protection of paramilitary forces who also can support the development projects. As participants in the improvement of their own community, they naturally combine a capacity for security measures with military civic actions. Thus they possess substantial potential for nation-building activities in face of insurgent opposition.

Considering their potential advantages, paramilitary forces should be the most effective means of dealing with incipient insurgencies. Unfortunately their record includes a dismal string of failures. Paramilitary units by themselves have never been able to prevent the spread of concentrated, well-supported insurgencies. In the critical stages of the Philippine and Malayan experiences, the paramilitary forces proved ineffective. Eventual success came only after major efforts to reorganize, equip, train, and "regularize" the paramilitary troops.

The Philippine Constabulary, which was a poorly equipped police force under the Department of Interior before 1950, bore the brunt of the government's anti-Huk campaign from 1946 to 1950. Constabulary strength was about 12,000, roughly equal to the estimated strength of the armed guerrillas. In 1950 the Constabulary was merged with the Philippine

Army. Primary responsibility for internal law and order was transferred to the regular military forces, where it remained until the Huk threat was defeated.[5] This pattern of paramilitary unit ineffectiveness, until reinforced with regular military strength, was repeated in Malaya. There, approximately a 100,000-man Special Constabulary, composed of Kampong (village) Guards and Home Guards, was also ineffective up to 1951 because of lack of training and shortages of weapons in their units.[6]

Paramilitary troops have not been successful in their support of the pacification efforts in South Vietnam either. Hamlet development plans that failed because of inadequate local security forces are at least as old as the 1959–60 Agroville resettlement scheme, which never extended beyond a few villages in Vinh Long Province. The major pacification effort, Diem's strategic hamlet program, also lacked the security necessary to support the local hamlets. The strategy was to use regular Vietnamese Army (ARVN) units to fight Viet Cong main forces, while locally recruited militia were to defend rural hamlets against smaller units of local Viet Cong guerrillas.

On 12 August 1962 the *Christian Science Monitor* reported that ". . . thousands of civic action cadres in numbers and with arms sufficient to defend themselves are to go into unprotected villages." Approximately 150,000 paramilitary troops were partially armed and given several days of military training.[7] Nevertheless, the program was a "crushing failure."[8] In the first month following the coup in November 1963, the Viet Cong overran 15 strategic hamlets in Tay Ninh Province alone.[9] This happened despite emphasis on trying to reduce hamlet vulnerability to Viet Cong attack and efforts to enable villagers to defend themselves. By the end of 1966 it was obvious that the local paramilitary forces in Vietnam could not protect the hamlets in the pacification program. In November regular ARVN units were assigned the mission of internal security, reinforcing the paramilitary militia in local security activities with about 50 percent of the ARVN maneuver battalion troop strength. In May 1967, the reorganization of American pacification efforts under military control, instead of the Deputy Ambassador's direction, further emphasized the overall lack of security in the rural areas and the need for regular military forces to provide it.

The record in the Philippines, Malaya, and in Vietnam under Diem all contradict the earlier assumption that local militia could be trained and equipped to protect the rural population from the harassments and attacks of equally well-equipped and possibly better trained and motivated guerrillas. The reason is elementary: The insurgents' primary targets are those forces in the rural zones which represent the government and its ability to maintain law and order. Guerrillas attack the paramilitary forces because they are the weakest and most exposed element of government security. As long as paramilitary forces are part-time, partially trained, nonregular soldiers, they will never be a match for the concentrated insurgent attacks that mark the advancing stages of any insurgency. As small, isolated defensive units, village militias necessarily forfeit tremendous advantages to the enemy—initiative, surprise, and concentration of forces, to name a few.

One of the problems of paramilitary forces stems from their "distinctness." By definition they are "apart from" regular military units. In actual combat this distinctness often means that the small patrols or outposts are isolated from reinforcing regular army elements, are seldom included in military campaign planning, and almost never have access to information about enemy activities and capabilities in their immediate area. An essential requirement in that hamlet-district defense concept—namely, rapid communications and reinforcement of units under attack—is conspicuously absent from most of the Vietnamese provincial security plans. Only limited military support is usually available, and often there are no means of transportation to move needed forces out to the scene of attack. In this environment of isolation, poor training, and partial equipping, the paramilitary soldiers are easy victims for insurgents. Their casualty rates have always been high.[10]

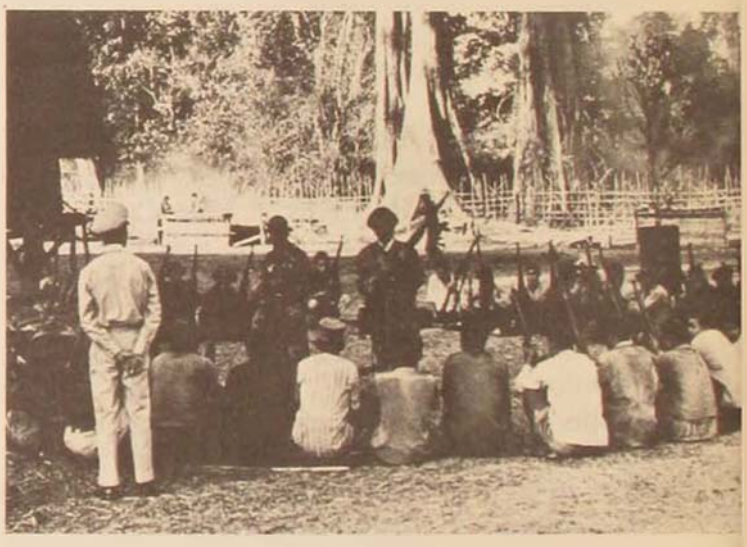
One significant exception to the failure of

paramilitary units in face of concentrated guerrilla attacks has been the offensive reconnaissance patrols of indigenous tribal groups. This tactic downgrades the importance of local defense and counterattack as the concept of employment and concentrates instead on offensive counterguerrilla operations. In these operations militia groups are trained and led by regular military forces especially equipped to aid such units. Moreover, the local militia receives fast-response air support from special air warfare squadrons, which provide visual reconnaissance, aerial resupply, and close air support on a priority basis. In short, these paramilitary units are on the offensive and are combined with supporting elements, both ground and air, from regular military forces.

Combining paramilitary with regular military forces is one solution to the paramilitary unit's chronic ineffectiveness. In South Vietnam the trend to "regularize" the militia is proceeding at a fast pace. Both Regional Forces (provincial) and Popular Forces (district) are now so much like the ARVN units in training, equipment, and (in the Regional Forces) in pay and benefits, that they are no longer referred to as paramilitary forces in official troop listings. This trend has also included integration of paramilitary affairs into coordinated national military plans for regional and local pacification. A remaining difference has been the more limited scope of operations best suited to the company and platoon-sized elements within Regional and Popular Forces. But even this distinction is not firm. Many of the smaller operations by Regional or Popular Forces are conducted under the operational control of regular military unit commanders, as more ARVN units undertake the internal security mission that once was the primary concern of the paramilitary.

In the northern First Corps Tactical Zone (ICTZ) some of the Vietnamese Popular Forces are organized into Combined Action Companies with U.S. Marine rifle squads and U.S. Navy corpsmen. The new companies are a "single operational entity" and are successful examples of a kind of paramilitary unit operating under regular military commanders. An-

Paramilitary forces in Vietnam help maintain order,



. . . study tactics and techniques for internal security,

. . . combine defense with community development.

other kind of "regularizing" has begun in the Third Corps Tactical Zone (IIICTZ) where the paramilitary effort is being enhanced through use of mobile advisory teams of U.S. and ARVN personnel.[11]

The local militias are also undergoing a detachment from traditional combat roles and moving slowly into military civic actions. This change may realize more of the paramilitary potential for nation-building actions and reduce their vulnerability in the internal security role. At least, the re-emphasis suggests a trend for the future. During 1966 at the same time the Regional and Popular Forces, as well as all Allied forces in Vietnam, were given civic action as an additional mission, a large number of civilian Revolutionary Development Teams began to deploy to rural areas. Elements of these teams, like the paramilitary, were trained in military subjects and had a primary mission to expose the hamlet-level Viet Cong infrastructure.[12] At the same time the teams also received training in social, political, and development subjects and were charged with responsibility for aiding basic economic and social programs in the villages. Since the Revolutionary Development Teams had both paramilitary and nation-building missions, their purposes paralleled those of traditional paramilitary units, plus the politically oriented mission of establishing a government presence in the village and motivating the people to support the government.

The Viet Cong recognized the challenge of these new pacification activities. As they had against the strategic hamlet program in 1962–63, they now concentrated on Revolutionary Development Teams whenever the situation allowed. Several hundred civilian workers were killed or wounded by the end of the year. Revolutionary Development leaders complained about the lack of local security and about their teams having to fight Viet Cong instead of carrying out constructive hamlet programs. Enemy action forced the new teams to emphasize internal security and passive defense.

On the military side were Regional and Popular Forces with the mission of hamlet security but with emphasis on civic actions, while on the civilian side were Revolutionary Development Teams with the job of nation-building but with the necessity of carrying out military operations to gain hamlet security. Thus it appeared that neither organization was devoted exclusively to internal security or nation-building, but rather the roles were loosely and unequally combined.

Overall area security remains the essential condition before any civic action or revolutionary development can proceed. But the gaining and maintaining of a reasonable degree of local security passed, by necessity, into the mission of regular military forces. The overall command of both civilian pacification and military security thus came into the hands of regular military commanders. A successful example of the new trend for paramilitary elements occurred in Binh Dinh Province of Vietnam in 1966. Military operations had cleared 43,000 people from Viet Cong control, too many for the Revolutionary Development Teams that were available. To augment and support the civilian development program, new military-civil teams were organized under the control of the ARVN 22d Division. The teams included a Regional-Popular Force platoon, civilian hamlet officials, ARVN psychological warfare specialists, police, and other provincial technicians, such as health workers. Each team received a 15-day training course before deployment and then was assigned to support three hamlets. These paramilitary–civic action elements could not carry out complete revolutionary development programs, but they could provide a measure of government assistance and development in preparation for the Revolutionary Development Team's arrival. They met the need for dealing with rural people who were uncovered by military operations, disrupted and caught in combat areas, and who needed government attention as early as possible.[13]

In the future, combined teams of paramilitary security troops and civic action personnel will become more prevalent as their advantages gain wider familiarity. This trend will also realize a better use of local militias, which have traditionally proven unequal to the military task of counterinsurgency.

EXISTING policy for counterinsurgency rightfully gives priority attention to internal security as a basic condition for the growth of economic and social development programs. But the old purely military role of "distinct" paramilitary forces no longer applies. This article has suggested that there is a definite limit to the degree to which paramilitary units can serve as a first line of defense against insurgency. Therefore, concepts for the employment of paramilitary forces must consider two important questions: First, at what stage in the developing insurgency will the paramilitary units' security capabilities be overreached and regular military forces required? Second, what is the best combination of paramilitary and nation-building activities to enable local militias to successfully represent the government's presence in local, regional, or broader terms? These considerations will help the paramilitary to achieve a more realistic contribution to the counterinsurgency mission in the future.

USAF Special Air Warfare School

Notes

1. Sir Robert Thompson, *Defeating Communist Insurgency* (New York: Frederick A. Praeger, 1956), pp. 103–5, 124.
2. Adrian H. Jones, *et al.*, *Internal Defense Against Insurgency: Six Cases*, Center for Research in Social Systems, American University, December 1966, p. 53.
3. Colonel H. W. Lange, USA, lecture, "Regional Forces/Popular Forces," MACV Advisor Orientation Course, JUSPAO, Saigon, Vietnam, 19–23 December 1966.
4. "Professional Knowledge Gained from Operational Experience in Vietnam," *NAVMC Bulletin* 2614, 1965–66, pp. 28–29.
5. Jones, *et al.*, pp. 52–53.
6. Harry Miller, *Menace in Malaya* (London: Harrap Co.), pp. 216–17.
7. *New York Times*, 25 August 1962.
8. John Meeklin, "The Struggle To Rescue the People," *Fortune*, LXXV, 4 (April 1967), 132.
9. *New York Herald Tribune*, 5 December 1963.
10. Colonel Frederick C. Spann, USA, "Role of Paramilitary Forces in Counterinsurgency," a research paper, U.S. Army War College, Carlisle Barracks, Pa., p. 46.
11. Letter, Hq CORDS, IIICTZ, Bien Hoa, Vietnam, "Mobile Advisory Teams (MAT)," 10 July 1967.
12. Memo, Ministry of Revolutionary Development, Republic of Vietnam, Saigon, Vietnam, "Reorganization and Training of RD Groups," 7 October 1966.
13. "Military Civil Teams," *OCO/MACV RD Support Newsletter*, No. 1, 22 March 1967, pp. 7–8.

In My Opinion

HUMANE WARFARE FOR INTERNATIONAL PEACEKEEPING

LIEUTENANT COLONEL ARNOLD J. CELICK

A CAPABILITY already exists for mankind to wage an unusual kind of warfare, one which can be accomplished with relatively little, if any, killing. The technique is not a new one; it has been quietly developing and improving for a number of years. If applied to international peacekeeping, such "humane" warfare might prove to be of inestimable value to the future of humanity. Rather than fantasy, the present state of the art indicates that a large military force completely equipped with nonlethal weapons is at least as plausible as nuclear weapons were twenty-five years ago.

As far back as 1959, Major General William M. Creasy, a former Chief of the Army Chemical Corps, suggested that the development of psychochemicals provided a means of waging war without death.[1] At about the same time the general was speaking, veterinarians were hailing the newly marketed tranquilizer dart gun for a wide range of applications, from taming obstreperous domestic bulls to capturing wild animals.

Recent concern about civil disturbances has accelerated the development of nonlethal techniques for mob control, in the interest of public safety. Use of tear gas is already common practice of police and National Guard units. The use of tear gas has also proven effective in clearing out Viet Cong tunnels in South Vietnam. Large-scale air delivery of riot-control agents is currently feasible and openly discussed in military professional journals.[2]

These examples, by no means complete, should be sufficient to establish the advanced status of a fair variety of nonlethal weapons. Modern science and technology, if sufficiently motivated, could undoubtedly produce far more effective agents and devices that could be adapted to the useful purpose of ending human violence. At any rate, it seems reasonably safe to conclude that the technique of humane warfare is probably far more nearly realizable than our willingness to employ it.

Chemical warfare has had a bad reputation ever since use of poison gas was initiated in World War I and called a German "atrocity." This and other epithets have a tendency to muddy even the most well-intentioned suggestions regarding its use. Unfortunately,

labels frequently seem to displace logic in human affairs. Recent debate about the use of riot-control agents in Vietnam serves to spotlight the perplexing position of some critics. The latter seem to insist that a painful mangling or even death is more acceptable than the use of other techniques which are *relatively* less harmful but equally effective in combat.

Admittedly, present nonlethal weapons are highly dependent on terrain and meteorological conditions. Their toxicity is difficult to control, particularly toward the very young or very old. It is not unreasonable to argue, however, that these characteristics can be improved. We have seen what scientific concentration can accomplish in less desirable fields of endeavor.

Another charge against the use of *any* form of weaponry is the pious one that the proper way to end war is to remove those basic causes of conflict such as poverty, traditional hatreds, and so on. Although laudable, such goals seem somewhat remote and unrealistic. Most people will agree, however, that before anyone can consider and work toward the solution of any problem, it is necessary that the situation at least be *under control*. It is hoped that any nonlethal technique as a control mechanism is preferable to massacre. In international conflicts, as in riots, it is difficult to achieve justice or preserve any of the dignities of man when either bullets or bottles are in the air.

If mankind is to continue to survive, society simply *must* do something about the problem of war. Sooner or later, the conception that war constitutes a form of illegitimate behavior on the part of a nation state, similar in nature to any other kind of lawbreaking, must be adopted by the international community. In order to stop conflict, the pressures of civilized society will have to be brought to bear against the disturber of the peace. Logic appears to dictate but a single solution: It seems inevitable that some sort of improved and powerful world federation will ultimately be required. Most nations, however, remain reluctant to accept such an answer. A truly strong and effective international authority implies a considerable loss of national sovereignty and raises the specter of a world "police force."

Piecemeal loss of national sovereignty is in fact becoming rather commonplace due to growing economic interdependence and the space-time contraction of the world resulting from modern technology. The idea of a truly effective international police force is far more alarming. There is the ever present fear that someone might seize the reins of such power and achieve world dictatorship. Still, even as the mature community needs a police force to maintain law and order, the world will continue to require an enforcement agency for international law. Let us speculate on what benefits might accrue to world order by equipping a hypothetical international police force to engage only in nonlethal warfare.

If the simple charge to a central world government were to put a stop to any kind of official or semiofficial killing between nations, use of humane warfare would make the decision for action far easier for the responsible world council. Generally speaking, international bodies constituted to preserve peace traditionally find it very difficult to wage war. Obtaining rapid and resolute action from a world peacekeeping council might be stimulated by combining so simple an objective with the relatively innocuous mechanism of an army which itself can engage only in nonkilling. There might be less vacillation in launching so friendly a force in so good a cause.

The present option allows only for the replacing of one kind of killing with yet another. Humane warfare is a far more defensible alternative. To protest the use of such a police force, properly constituted and operating under international law, a nation must adopt the awkward position of trying to justify killing over reason and peaceful control.

As a second useful benefit, a world police force equipped with humane weapons might make the difficult transition to effective and enforceable world government more acceptable to us and to other nations. There is something a trifle "antiseptic" in the idea of such an army designed to control a dangerous international situation without having to compound

the slaughter. The unarmed London bobby is accorded a similar kind of respect.

Finally, since practically all plans for effective world government are presumed to operate in an environment of realistic general disarmament, a world federal army empowered only to wage nonlethal warfare should do much to allay the fears of such a monopoly of strength. All nations would possess sufficient ordinary police forces necessary to maintain internal order. It is difficult to imagine the wanton use of an international force of the kind suggested, one composed of representative troops of many nations, to seize world dictatorial power. It would be virtually impossible to subjugate and enslave the entire world by use of only such a force, particularly against any large coalition of outraged "customers." As with present community police forces, the tolerance of the world community would be necessary for the effective utilization of such an army.

Once the basic morality of the objective is established—and few can argue that ending war is not a moral objective—it would appear that humane warfare for international peacekeeping might be a possible approach. The continued arms race, constant minor wars, and proliferation of nuclear weapons to such an internationally irresponsible nation as Communist China—all seem to dictate a need for a timely solution to the problem of war.

The proposal introduced here is simply a suggestion for additional consideration. If some perfect plan existed and were already acceptable, there would be no need for new ideas. Our generation must attempt to visualize and plan for a future world somewhat unlike the present one. Technological pressures are forcing us to seek new and workable solutions without the luxury of time for much further experimentation or evolution. Like the sorcerer's apprentice, man is seeking to harness his recently released nuclear genie and will require the help of all the earth's nations to accomplish this feat. Wishful thinking will not avail.

Fortunately, the same technology which has provided mankind with the potential for ultimate disaster can also furnish a means of enforcing world covenants, without killing. Science has quietly presented the instruments with which society can intervene to dispel the use of force and provide a climate in which the rule of law may flourish, an environment which at least permits the employment of reason.

Humanity still has several prudent courses of action from which to make its selection. Many of these have already been outlined by the great philosophers and statesmen of a more leisurely age. Our future depends on our present willingness and ability to grasp our remaining opportunities. The capacity for self-destruction is already at hand and presses our decision.

In the urgent search for the road to permanent world peace, perhaps "humane warfare" is a path that has been neglected.

Air War College

Notes

1. Major General William M. Creasy, "Can We Have War Without Death?" *The Reader's Digest*, September 1959, p. 74.

2. "Riot Control Agent Delivery System," *Infantry*, January-February 1967, pp. 49–51.

Books and Ideas

INTO THE AIR WITH ATC

General Frederic H. Smith, Jr., USAF (Ret)

IT IS RARE indeed to find a writer who can express in delightfully readable English the many facets of a complex and highly technical subject. In *The New Tigers*† Herbert Molloy Mason, Jr., has displayed a talent for making his subject live.

He has accomplished a work which describes the process evolved by the Air Force for producing fighter pilots in these days of pressing need. More than this, he describes it with a clarity which transports the reader into the cockpit, the classroom, and the vital society of airmen.

To one who went through the Air Force training system in an era long past, the book was fascinating. The author senses the eagerness, the determination, and the occasional discouragement of the young trainee, as well as the strain which is part and parcel of being in an intentionally demanding environment.

During the summer and winter of 1966, Mr. Mason spent long hours at various levels of command. He parasailed, flew T-41s, T-37s, and T-38s as part of his research on Air Training Command. Later he flew on gunnery missions in F-105s and F-4Cs with the Tactical Air Command at Nellis AFB, Nevada. The book is lavishly illustrated with excellent black-and-white photographs taken by Mr. Mason.

The few very minor criticisms I would have with the book—and these nitpicks are apparent only to one who has been closely associated with the program—only serve to point up the accuracy, authenticity, and general readability of the book as a whole.

For the young man who really wants to be a fighter pilot, the book should be an inspiration. For the one who is timid or lazy, it should provide adequate discouragement—he couldn't be a tiger anyhow.

Washington, D.C.

†Herbert Molloy Mason, Jr., *The New Tigers* (New York: David McKay Company, Inc., 1967, $6.95), xiii & 241 pp.

THE LABYRINTHIAN WORLD OF SOVIET MILITARY DOCTRINE

Dr. Kenneth R. Whiting

EVER since Engels began to fancy himself as a military theorist a century ago, Marxists have tried to convert the art of preparing for and fighting wars into a science with all the exactitude of physics or chemistry. If all the books and articles on military doctrine produced by Soviet theorists since Frunze's classic dispute with Trotsky in the early 1920s were enumerated, the list would run into the thousands. Over the years these doctrinal writings have come to resemble the worst products of medieval scholasticism. It would seem that Communists are just not happy unless they have a doctrinal crutch to lean on. In addition to this penchant for doctrine, the well-known Russian psychosis about revealing any concrete military data forces the writer on things military to stick to the vague and abstract, i.e., doctrine. Thus it is not strange that Americans, who on the whole are pragmatic and not inclined toward philosophical speculation, find Soviet military literature a bit hard to get with.

Professor Kintner and Mrs. Scott have now produced a work† which gives those who do not read Russian a chance to see how Soviet military theorists approach the problems of contemporary warfare. The book consists of 27 articles, most of which were published between late 1964 and early 1967. Some are from collections of articles published in book form in the Soviet Union, but most of them are from the military journals, especially the *Communist of the Armed Forces (Kommunist vooruzhennykh sil),* which (as is stated right above the table of contents in each issue) is the "military-political journal of the Main Political Administration of the Soviet Army and Navy" and thus, it would seem safe to say, is closely controlled by General of the Army A. A. Yepishev, top man in the Main Political Administration. The book is divided into five major sections, each comprised of a number of pertinent articles. The editor-translators explain the significance of each major segment and also preface each article with an explanatory introduction. The translations are well done, and Mrs. Scott is not to be blamed for the heavy, dull, pedantic style that is the hallmark of Soviet military theorists. There is also a Glossary at the end of the book, as well as an Appendix, in which the top Soviet military leaders are listed. All in all, it is a competent piece of work.

There are several main themes that run through most of the articles. The first is the constantly reiterated assertion that the Soviet Strategic Rocket Forces are now the elite element of the armed forces. This, of course, has to be so, since there is near unanimity among the Soviet writers that World War III, "if it is unleashed by the imperialists," will be a nuclear war. Nevertheless, each author, after describing the decisive role of the Strategic Rocket Forces, hastens to add that victory can only be achieved by the combined forces of all the services of the armed forces. The "why" of the necessity for all the services to get into the act in a nuclear exchange is never spelled out. Finally, all the writers agree upon the infallibility of Soviet military doctrine.

Before rushing out to buy the book, the potential reader should be warned that Soviet military writings, especially those dealing with doctrine and strategy, are ponderous, repetitious, and crammed with hoary clichés. Soviet military theorists, in Manichaean style, divide the world into absolute good and absolute evil:

---

†***The Nuclear Revolution in Soviet Military Affairs,*** **translated and edited, with Introduction and Commentary, by William R. Kintner and Harriet Fast Scott (Norman, Oklahoma: University of Oklahoma Press, 1968, $6.95), 420 pp.**

all virtue and wisdom belong to the socialist camp, especially to the Soviet Union, and evil and injustice are the monopoly of the "imperialists." Furthermore, through the use of Marxist-Leninist analysis, the Communist Party leadership can always assess the future accurately, which gives it a tremendous advantage over its imperialist enemies. At this point the Soviet writers have to explain, somewhat awkwardly, that the "cult of the personality," i.e., Joe Stalin, managed to thwart the Marxist-Leninist foresight of the Party leadership in 1941 and thereby caused the Soviet Armed Forces to get caught flatfooted by the Nazis on 22 June. The "cult of the personality" is also censured for the extermination of some of the best military cadres on the eve of World War II. (See Shtemenko's article, p. 51.) This is a euphemistic way of saying that Stalin butchered tens of thousands of the top officers of the Red Army in the 1937–40 period, which is naturally a sore point with the present Soviet officer corps. Khrushchev, "the erratic, harebrained" one, to quote from his official Soviet condemnation, was also guilty of obfuscating and perverting the collective wisdom of the Party leadership. But inasmuch as all Soviet policies, including military policy, were controlled by either Stalin or Khrushchev from at least 1929 through 1964, or for 35 out of the Soviet Union's 50-year lifespan, the advantages of the Marxist-Leninist analytical tool seem somewhat dubious to the uninitiated Western reader. If the reader, however, can suffer a certain amount of boredom and if his adrenalin does not tend to get out of control when his country is described as the incarnation of all evil, then this collection of Soviet articles is worth reading. After all, "to know your enemy" has been a widely accepted maxim for military men for at least a couple of millennia.

In the course of examining the Soviet military literature for the 1960–64 period, the reviewer was struck more by what the Soviet military theorists *did not* say than with what they did discuss.[1] Nothing seems to have changed in the last three years, judging from what Mrs. Scott's stable of authors manages not to say. They just skip the tough problems, or skirt them in a gingerly manner. The following are just a few of the evaded issues: Whether World War III will be a short, spasmodic nuclear exchange or a protracted conflict? Just what is the Soviet doctrine on limited war? How do "wars of national liberation" fit into their doctrine? What is their strategy, or lack of it, in the military use of outer space? Do they mean a pre-emptive attack when they refer to "the frustration of a surprise nuclear attack"? These are important contemporary problems and the Soviet military theorists must think about them, but there are no concrete discussions of them in the open literature.

A good example is the continuous refrain that the Soviet Armed Forces can and will "frustrate" a surprise nuclear attack. For instance, Colonel Strokov, on page 223, states that

> Soviet military doctrine considers the frustration of a surprise attack of the enemy and carrying to him a crushing blow as the main immediate task of the Armed Forces.

He then goes on to quote Marshal Malinovsky as follows:

> The main common mission for all of our Armed Forces, in the course of combat and operational training, is set by us as the studying and working out of ways for the sure repulse of a surprise nuclear attack of an aggressor and also of ways to frustrate his aggressive plans by way of a well-timed carrying out of a crushing blow on him.

Both Strokov and Malinovsky must mean either that the nuclear attack will be pre-empted or that the Soviets have an impenetrable antiballistic missile (ABM) defense. But at no time does any Soviet writer spell out in concrete terms what he means. Incidentally, as early as 1955 the Soviets were preaching about their ability to frustrate a surprise nuclear attack; it was already an article of faith, and they certainly did not have an ABM defense then.[2] This constant chant about the Soviet capability to thwart a nuclear surprise attack is probably a morale builder.

Closely associated with the "frustration of a nuclear attack" thesis is another article of faith, the assumption that the Soviet Union will be victorious in a nuclear war. In this case, however, a few Soviet heretics have from time

to time expressed the opinion that such an exchange might end civilization, and as early as 1954 Malenkov was roundly scolded for expressing such a thought. Here, again, one is inclined to see this "optimism" more as an attempt to keep up popular morale than as a genuine conviction. For example, Colonel Ribkin (on p. 113), after asserting that the Soviet Union will be victorious in a nuclear war, becomes somewhat more ambiguous when he says:

> However, to maintain that victory in nuclear war is in general impossible would be not only untrue theoretically *but dangerous from a political point of view.* (Italics mine.)

In their introductory comments to the various articles, Kintner and Scott assert repeatedly the thesis that the Soviets have opted for nuclear war and they are relentlessly driving toward a superiority in both offensive and defensive nuclear missile systems. It would be hard to dispute the fact that the Soviets have increased the tempo of their production of ICBM's. According to the figures given by former Secretary McNamara in February 1968, the Soviets had increased their arsenal of ICBM's to 720 by 1 October 1967, almost doubling their capability in that area in a year. The former secretary, however, seemed much less worried about the Soviet capabilities in the ABM field. At the present time, it would seem, the Soviets still have some distance to go before they get to parity, let alone superiority, in the number of nuclear warheads that can be delivered by each side. But even parity might well present problems for the United States in the not too distant future.

It would seem to this reviewer that any attempt to predict Soviet intentions from Soviet military literature is a dubious proposition. For example, during the 1945–54 decade, Soviet military theorists wrote only about Stalin's five "permanently operating factors for victory," which called for huge ground forces loaded with artillery and tanks, while at the same time denying the possibility that nuclear weapons plus a surprise attack could influence the course and outcome of a war. Yet it was precisely during that period that they were developing atomic and nuclear weapons, long-range bombers, and doing research on missiles. The doctrine espoused in the open literature had no connection with the weapons development going on at the time. Actually, the doctrine denied the efficacy of the very weapons that the Soviets were developing at such great cost to their economy.

Today, as the articles selected by Kintner and Scott illustrate, the military doctrine indicates that a nuclear war is the only type of war the Soviets have under consideration. But the present composition of their armed forces could indicate otherwise. The Soviet Navy is rapidly becoming a major element in the overall military capability of the nation. It now has a large surface fleet as well as a huge submarine force, and it is now busy playing a role in the Mediterranean. The Soviets are developing their own leathernecks, the naval infantry as they call them, and are equipping them with various types of landing craft. The Soviet merchant marine, which could be used to take care of logistical support if Soviet troops were to engage in operations in distant regions on the globe, is being built up at an ever increasing tempo. That other requirement for worldwide operational activities, special forces with their own airlift capability, is now being rapidly augmented. In the May Day display for 1968, there were more parachute troops with their raspberry-colored berets than had ever participated before.

If an analysis of Soviet intentions were to be made on the basis of the new developments in the direction of a flexible capability in military operations and on the basis of what seems to be Russian foreign policy objectives in the last few years, the conclusion might well be that the Soviets intend their nuclear missile buildup to act as an umbrella over their penetration of the Middle East and their intention to play an active military role on a global basis in support of "wars of national liberation." In short, when dealing with the theoretical writings of Soviet military men, as much consideration should be given to what they refuse to talk about as to those things they do discuss *ad nauseam*. What bothers this reviewer about the editorializing of Kintner and Scott is their as-

sumption that the present Soviet doctrine on nuclear war necessarily represents the real Soviet military intentions. They might well have taken the editing job done by Dinerstein, Gouré, and Wolfe in the RAND edition of Sokolovsky's *Military Strategy* as a model and pointed out the inconsistencies and lacunae in the writings of the Soviet military theorists. But for all of the carping of this critic, the book is a valuable addition to the sparse literature on Soviet military affairs that is available in English.

Aerospace Studies Institute

1. Kenneth R. Whiting, *Soviet Reactions to Changes in American Military Strategy* (Maxwell AFB: Air University, 1965).
2. *Ibid.*, p. 30.

The Contributors

LIEUTENANT GENERAL SAM MADDUX, JR., is Commander, Air Training Command, Randolph AFB, Texas. Graduated from University of Oklahoma in 1936 and flying training in 1937, he served in the Canal Zone until 1940, when he joined 19th Bombardment Group, March Field, California. He flew a B-17 to the Philippines, October 1941, was on Bataan and Mindanao until March 1942, in Australia and New Guinea until November 1942, when assigned to the War Department General Staff. He joined 20th Bomber Command, Guam, 1945, and was Chief of Personnel, FEAF, Japan, 1946-48. Other assignments have been at Hq USAF, 1949-52; as Commander, Mather AFB, California, 1953-57; Deputy Commander, Flying Training Air Force, Randolph AFB, 1957-58; Inspector General, ATC, 1958-59; Senior Member, United Nations Command, Military Armistice Commission, Korea, 1959-60; Deputy for Plans and Operations to CINCPAC, to 1963; Commander, Thirteenth Air Force, Philippines, to 1965; and Vice Commander in Chief, PACAF, 1965-66. General Maddux is a graduate of Air War College and National War College.

LIEUTENANT COLONEL VERNON J. ELSLAGER (M.S., Drake University) is an education and training staff officer, Hq Air Training Command. Commissioned in 1943, he served as a bombardier and navigation instructor at Childress, Texas. After the war he taught at the high school and junior college levels in Iowa until recalled to service in 1952 as a B-29 bombardier at Mountain Home AFB, Idaho. Other assignments have been as personnel services officer at Johnston Island AFB and Lincoln AFB, Nebraska, 1954-58; AFROTC instructor, Iowa State University; faculty member, Academic Instructor and Allied Officer School, Maxwell AFB, Alabama; and chief training adviser to the Vietnam Air Training Center, Nha Trang, Vietnam, 1965-66.

JOHN P. MURPHY (B.S., Abilene Christian College) is a training specialist with the Instructional Systems Branch, Lackland Military Training Center, Lackland AFB, Texas. An employee of Air Training Command for the past sixteen years, he was in the first group of instructional programmers trained on Air Force facilities. He designed an M-16 rifle instruction system, which is used in the Basic Military Training Program at Lackland, and has helped develop other behaviorally oriented instructional systems.

LIEUTENANT COLONEL FRANK H. ROBERTSON is Chief, Operations Division, Directorate of Military Assistance, DCS/Plans, Hq Air Training Command. Commissioned from Officer Candidate School in 1950, he has served in various training assignments at the USAF Basic Military Training School, Hq Technical Training Air Force, and Hq Air Training Command. His overseas tours have been as Training Officer, 58th Fighter Bomber Wing, Korea, 1953-54, and as Education and Training Advisor to the Argentine Air Force, 1961-64. He was a member of the Presidential Emergency Relief Mission to the Dominican Republic, 1965. Colonel Robertson's assignment since 1964 has included visits to 16 foreign countries and participation in conferences at USAF and Unified Command level concerning the Military Assistance Training Program.

MAJOR FRANK F. E. HENSE, JR., (B.G.E., University of Omaha) is training manager for Air Training Command technical training activities in support of the F/RF-4 weapon system, assigned at Randolph AFB, Texas, since 1966. After completing flying training in 1952, he served with the 449th Fighter Interceptor Squadron in Alaska. In ATC since 1954, he has worked in flight test, quality control, aircraft scheduling, and flightline maintenance; attended Aircraft Maintenance Officers course at Chanute AFB, Illinois; and commanded mobile or flying training detachments on the F-86, F/RF-101, and RF-4C.

COLONEL ROBERT D. CURTIS (B.S., University of Oregon) is Assistant DCS/Operations, Air Training Command. Commissioned and rated pilot in 1941, he served as instructor and supervisor of pilot training, then commanded 548th Night Fighter Squadron through 18 months of combat in the Saipan, Iwo Jima, Okinawa, and Japan offensives. Postwar assignments have been as operations officer and commander of night and all-weather operations; Director of Flying Training, Hq ATC; Operations and Training Officer, Military Assistance Advisory Group, Germany; in DCS/Plans and Programs, Hq USAF, and AF member, Chairman JCS Staff Group; and Commander, Craig AFB, Alabama, 1963–65. Colonel Curtis is a graduate of the Industrial College of the Armed Forces.

SECOND LIEUTENANT ROBERT M. ZICKES is Information Officer, USAF Survival School, Fairchild AFB, Washington. Before graduating from the University of Notre Dame in 1967, he worked for the school radio station as an announcer and public relations director. Commissioned through Officer Training School in September 1967, Lieutenant Zickes joined the 3636th Combat Crew Training Group (ATC) (Survival) and took the Survival Training Course before assuming his present duty.

CAPTAIN ALLEN K. TAYLOR (B.A., University of Omaha) is an academic instructor, T-37 Pilot Instructor Training (PIT), Perrin AFB, Texas. Upon his graduation from pilot training at Williams AFB, Arizona, in 1963, he was assigned as a T-37 instructor pilot, Laredo AFB, Texas. He was an instructor pilot, T-37 PIT, Randolph AFB, Texas, from January 1966 until his present assignment in June 1967. Captain Taylor is a graduate of the T-37 Pilot Instructor Training, ATC Academic Instructor School, and Squadron Officer School.

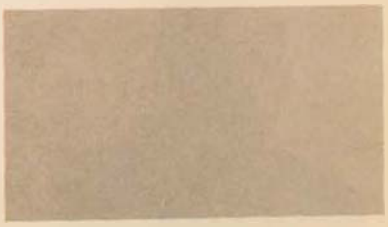
BRIGADIER GENERAL JOE T. SCEPANSKY (M.B.A., Stanford University) is Commander, U.S. Air Force Recruiting Service, Randolph AFB, Texas. Commissioned and rated pilot in 1941, he served throughout World War II in the flying training program as instructor, organizer, director, and commander. Other assignments have been as Plans Officer, Hq USAFE, Wiesbaden, 1949–52; Planning Officer, Secretary for JCS Matters, and Executive to Director of Plans, DCS/O, Hq USAF, 1952–56, Deputy for Operations, 35th Air Division (Defense), Dobbins AFB, Georgia; DACS/O, Hq PACAF, Hawaii, 1959–62; and Deputy Director of Personnel Planning, Hq USAF, 1963–66. General Scepansky is a graduate of Air War College and National War College.

MAJOR JOEL J. SNYDER (M.S., George Washington University) is Instructor, Counterinsurgency Course, Special Air Warfare School, Hurlburt Field, Florida. Other assignments have been as Intelligence Officer, Third Air Force, England, 1955–57; with a tactical reconnaissance wing, 1957–60; as student, Squadron Officer School, 1959, and Academic Instructor Course, 1960; Instructor, later Education Officer, Squadron Officer School, 1960–64; student, Air Command and Staff College, 1964–65; and Intelligence Staff Advisor to Hq Intelligence Branch, Vietnamese Air Force, Tan Son Nhut Air Base, Vietnam, 1966.

LIEUTENANT COLONEL ARNOLD J. CELICK (M.S., Ohio State University) is Deputy Chief, McClellan Central Laboratory, Headquarters Command USAF, McClellan AFB, California. Commissioned in 1944, he served as a weather officer and CAA controller in the U.S., Africa, and India. He was graduated from the University of Wisconsin (Pharmacy) in 1948. Recalled to active duty in 1951, he served in special weapons assignments at Sandia, Kirtland, Schilling, and Loring. Under the AFIT program, he studied nuclear chemistry at Ohio State, 1956–58, and has since served as a nuclear research officer. Colonel Celick has taught chemistry at Sacramento State College. He is a 1968 graduate of Air War College.

GENERAL FREDERIC H. SMITH, JR. (USMA), USAF (Retired), is Management Consultant, Ryan Aeronautical Company, Washington, D.C. During World War II he served as Commander, 8th Fighter Group, New Guinea; Chief of Staff, Advance Echelon, Fifth Air Force; Commander, First Air Task Force; Director, Operations, Allied Expeditionary Air Forces, United Kingdom; Deputy Chief of Staff, Army Air Forces; and Commander, Fifth Fighter Command, Philippines and Okinawa. Subsequently, he was Chief of Staff, Strategic Air Command; National Commander, Civil Air Patrol; Assistant for Programming, DCS/O, Hq USAF; Commander, Eastern Air Defense Force; Vice Commander, Air Defense Command; Commander, Fifth Air Force, Japan; Commander, Air Training Command; Commander in Chief, U.S. Air Forces, Europe; and Vice Chief of Staff, USAF, when he retired from active duty, 30 June 1962.

DR. KENNETH R. WHITING (Ph.D., Harvard University) is a member of Aerospace Studies Institute and of the faculty, Air University. He formerly taught Russian history at Tufts College. Dr. Whiting is the author of *The Soviet Union Today: A Concise Handbook* (1962) and of numerous studies and monographs on Russian subjects, including *Readings in Soviet Military Theory, Essays on Soviet Problems of Nationality and Industrial Management, Iron Ore Resources of the U.S.S.R.*, and *Materials on the Soviet Petroleum Industry*. He also contributed two chapters to Asher Lee's book, *The Soviet Air Force*, and an article to Eugene Emme's book, *The Impact of Air Power*.



AWARD

The Air University Review Awards Committee has selected "Vietnam: Our World War II Legacy" by Major John F. McMahon, Jr., USAF, as the outstanding article in the July-August 1968 issue of the *Air University Review*.

ATTENTION

Air University Review is published to stimulate professional thought concerning aerospace doctrines, strategy, tactics, and related techniques. Its contents reflect the opinions of its authors or the investigations and conclusions of its editors and are not to be construed as carrying any official sanction of the Department of the Air Force or of Air University. Informed contributions are welcomed.

UNITED STATES AIR FORCE
AIR UNIVERSITY REVIEW