ATRC MANUAL 51-1

primary *flying*

AIR
TRAINING
COMMAND

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Number 51-1

Headquarters, Air Training Command
Scott Air Force Base, Illinois
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FOREWORD

1. Purpose. This Manual describes the techniques, procedures, and maneuvers which a student pilot must know and be able to perform to become proficient in the fundamentals of visual flying. Although this Manual is designed primarily to give the student pilot a sound foundation for primary and basic pilot training, the techniques covered are ones the pilot will use throughout his Air Force career.

2. Scope and Contents. The theory in this manual will be supplemented by academic training. This repetition of theory, in the Manual and in academic studies, is considered necessary to insure a positive transfer of the theory to practical application. To provide for continuity of instruction and to give the student pilot the necessary background for beginning each successive phase of his flight training, subjects are covered in this Manual in the same manner in which they will be presented to the student pilot by his instructors.

BY COMMAND OF LIEUTENANT GENERAL HARPER:

HEADQUARTERS OFFICIAL AIR TRAINING COMMAND

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table of contents

introduction to primary pilot training

chapter 1

Primary training is your opportunity to learn precision and maximum-performance flying. Pilots who treat flying as a hobby can get by without knowing the fine points. But military pilots, like all professional pilots, must develop the highest degree of proficiency possible. This manual is designed to help you master the fundamentals.

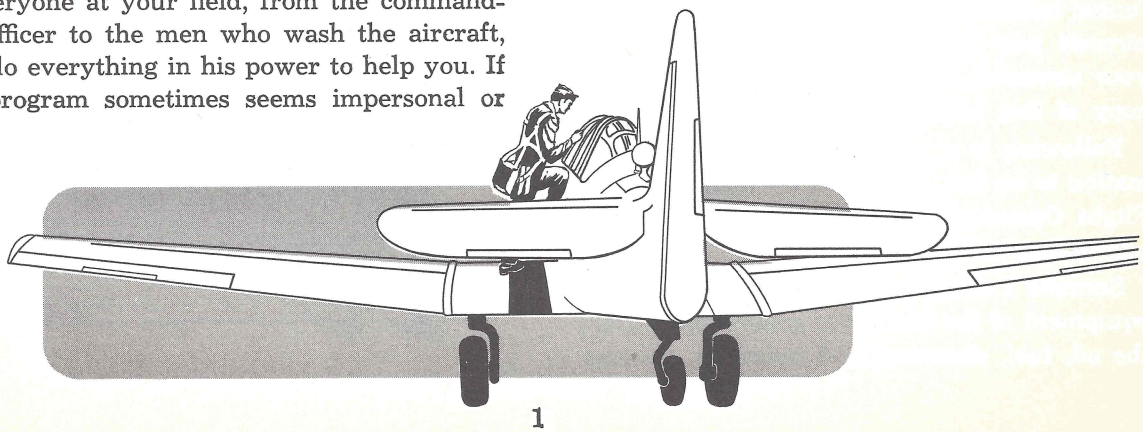
Flying Air Force aircraft requires initiative, good judgment, and trained reflexes, as well as skillful flying technique. To become an Air Force pilot, you must acquire all of these qualities. This will take considerable study, practice, and determination on your part. Becoming an officer and pilot in the U. S. Air Force should be incentive enough for you to make every effort to complete your training successfully. Hard work and determination offer you this reward.

Everyone at your field, from the commanding officer to the men who wash the aircraft, will do everything in his power to help you. If the program sometimes seems impersonal or rigid, remember that everyone is carrying a heavy load of responsibilities.

PRIMARY PILOT TRAINING

Primary pilot training involves close coordination between classroom and flight-line training. The better you master the classroom theory, the easier it will be for you to perform the operational maneuvers in the aircraft. Each part of pilot training — classroom and flight-line — will clarify and enliven the other.

The objective of the flying training presented in this manual is to develop you into a skilled pilot in the basic principles of visual flying. Your muscular responses will be developed to the point where they become reflex actions. As you gain flying proficiency, the acuteness of your senses — hearing, seeing, and feeling — will develop along with your muscular responses.



YOUR INSTRUCTOR

Your instructor is a well-qualified pilot. He knows the primary trainer and he knows the maneuvers and how to teach them. His only objective is to graduate expert pilots, and to this end he will expect you to do your best. If he places great importance on exactness, it is because he is trying to train you as close to perfection as possible.

PILOT'S HANDBOOK OF FLIGHT OPERATING INSTRUCTIONS

Technical orders, known as T.O.'s, are published by the Air Force for every piece of equipment in use by Air Force activities. The "Pilot's Handbook of Flight Operating Instructions" pertaining to your training aircraft is the technical order which contains all the essential information you should know about the aircraft you are to fly. It is the "bible" for your aircraft's operation. You will be issued a copy of this handbook.

Following is a brief summary of the information to be found in the "Pilot's Handbook of Flight Operating Instructions." (Refer to this publication continually.)

SECTION I describes all the components and equipment of the aircraft in general and covers the oil, fuel, electrical, and hydraulic systems.

SECTION II discusses all the normal operating procedures. It gives the check-lists for all pre-flight and in-flight inspections. A check-list extracted from this T. O. is an essential item in every cockpit. It lists the steps performed in aircraft operation. These steps are the standard procedures which you and every other pilot must follow. Make use of this section frequently to familiarize yourself with all the standard operating procedures.

SECTION III covers all emergency operating procedures for fires, forced landings, and emergency procedures for the various systems, such as electrical installations, landing gear, and brakes.

SECTION IV explains operating procedures for all auxiliary equipment in the aircraft, such as radio, heating system, and lighting equipment.

SECTION V explains all limitations and restrictions.

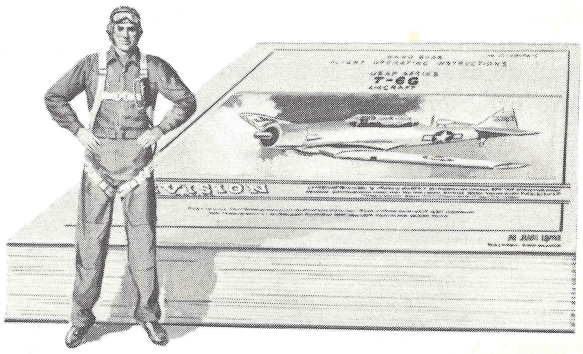
SECTION VI covers the flight characteristics of the aircraft.

SECTION VII discusses the operation and characteristics of the various aircraft systems.

SECTION VIII, on crew duties, has been deleted, since it does not apply to the T-6 aircraft.

SECTION IX covers operation under various weather conditions.

The APPENDIX contains all operating data charts necessary for efficient pre-flight and in-flight mission planning.



LOCAL FLYING REGULATIONS

As the *Primary Flying Manual* is designed to assist you in learning the basic elements in flying an aircraft, obviously it cannot include certain types of detailed information which will vary from school to school because of local conditions. This type of information is published by each school in "Local Flying Regulations."

"Local Flying Regulations" set forth rules to be followed while flying in a specific locality. They cover such subjects as flying areas, traffic rules, and traffic patterns. They are very important because they have been written to insure safe, efficient operation; these local flying regulations are in many cases based on regulations from higher levels of command.

Copies of pertinent flying regulations will be available in your flight room. You will be required to read these regulations and to abide by the rules they contain. Any violation of applicable flying regulations will seriously jeopardize your chance to complete your course successfully.

BE READY TO FLY

In order to utilize a flying period fully, you must be completely prepared for the lesson. Be sure that you read and understand all available material which will contribute to the work to be done. Be sure that your flying equipment is in good order and ready for use. You were chosen for your initiative, resourcefulness, and intelligence. Officers in the Air Force are expected to be alert and to think ahead. Be eager and enthusiastic, and you will find that your instructor will reflect your enthusiasm.

COCKPIT TIME

Sometimes, while you are awaiting your turn to fly, you may find yourself without a specific assignment. You can use this free time to become better acquainted with the cockpit of the aircraft, its controls, and instruments. This period spent in the cockpit of an aircraft on the ground is commonly known as "cockpit time." Your instructor will outline the procedures and policies for obtaining such training.

CAUTION

Do not touch switches or the landing gear handle while becoming familiar with the cockpit. Some basic schools mount trainers in level-flight attitude so that the landing gear may be raised and lowered. These trainers are called "Captivair" trainers. They are used as an aid to familiarize you with ground and flight cockpit procedures.

During your study of the cockpit, examine the check-list and study the prescribed procedures. As you go through the check-list, visualize the movement of the controls and the readings on the instruments. This practice will help you to develop the systematic approach you will need to perform the procedures in the check-list. Keep in mind that a thorough system is important in performing all procedures. The sooner you become familiar with the check-list, the cockpit arrangement, and the aircraft in general, the sooner they will become second nature to you. Your attention may then be devoted to flying the aircraft.

ASK QUESTIONS

Many things may occur that will seem strange to you and contrary to your former ideas about flying. Make certain that you seek a solution to each problem. Don't be afraid to

ask questions. You can never learn too much about flying. Pilots with years of experience and thousands of hours of flying are still asking questions and still learning.

Your instructor will brief you before each flight. In this pre-flight briefing, he will tell you *what you will do, why you will do it, and how you will do it.* Question any point that is not clear.

After each daily flight, your instructor will review the day's lesson. This is your chance to clear up any mistaken ideas and to learn the correct procedure. Your instructor's review will clarify these points, but be sure to ask questions if you have failed to grasp all the steps in any maneuver being discussed. Becoming an Air Force pilot demands that you grasp each lesson fully. Be sure to get a complete understanding of your mistakes and the action you take to correct them. The time to ask questions is immediately after the flight, when your problems are still fresh in your mind.

PHYSICAL CONDITION

Absorbing flying lessons quickly and completely requires physical stamina. Even if you are in top physical condition, learning all the information you will receive in the first few days will be fatiguing. Mental stress causes this. Your first flights will not be long; adjust your mental attitude so that your mind is free to consider the techniques of flying. Good physical conditioning helps to improve your mental condition.

OUTSIDE STUDY

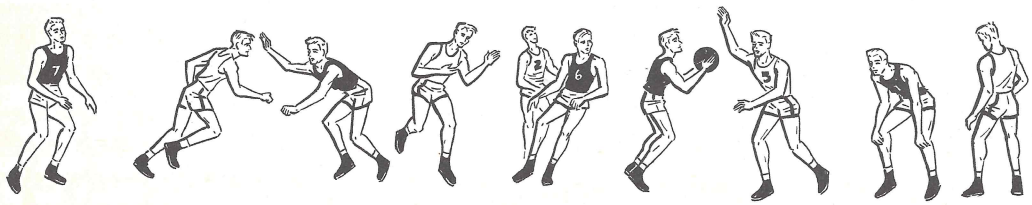
Learning to fly is learning to develop the proper reaction to an experience in an aircraft. You cannot understand each step unless you are prepared for it. Study each lesson and visualize how the pressures on controls will change the attitude of the aircraft. Review the lessons of each day, visualizing the "why" behind each operation. Use this manual, the "Pilot's Handbook of Flight Operating Instructions," and the check-list to prepare, review, and answer your questions about flying. In addition to these sources of information, you must become thoroughly acquainted with the local flight regulations, traffic patterns, and special technical orders on equipment made available to you.

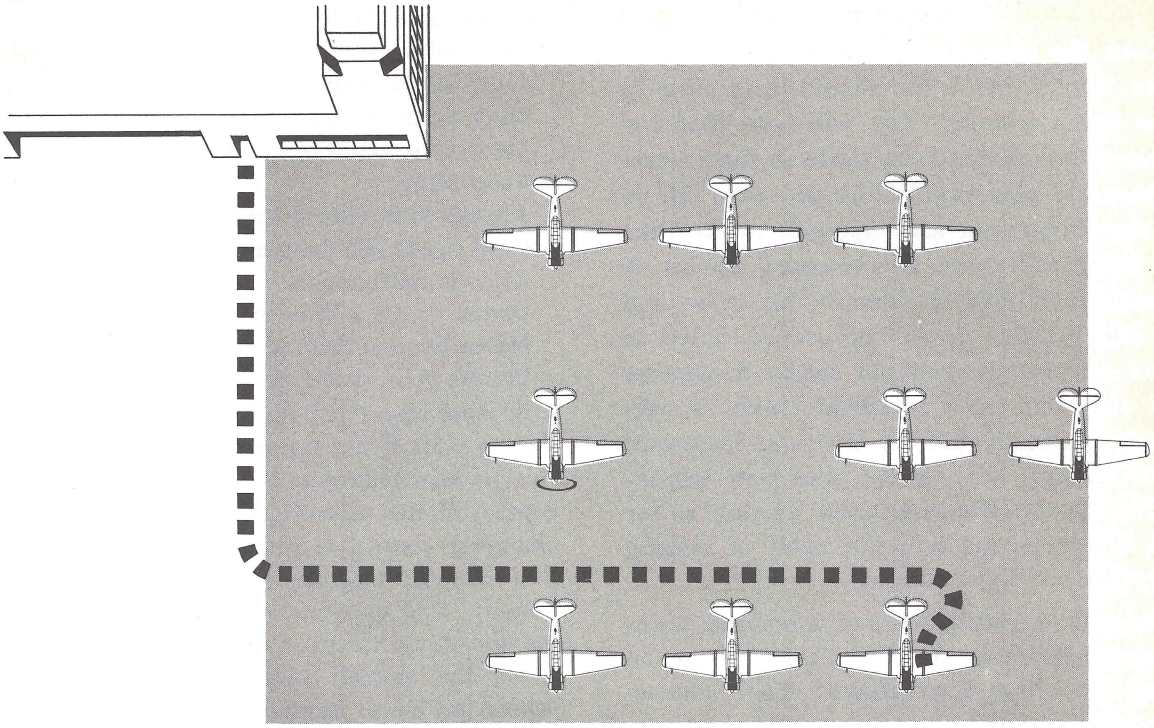
GROUND SAFETY

Municipal, state, and national officials must enforce rigid traffic regulations to insure the safety of pedestrians and automobile traffic in areas where they intermingle. The Air Force has similar problems and must enforce regulations in areas where ground personnel might interfere with aircraft operation. Your instructor will acquaint you with these regulations before he starts your flight training. Make a mental note to understand them thoroughly, and by all means abide by them to the letter.

Some of the problems of the ground safety officers will be discussed in this section so that you may better understand the importance of these regulations. Also included here are some practical common-sense rules or suggestions that you should consider before you get on a ramp or in the proximity of aircraft operating on the ground.

On most bases there is considerable activity on the ramp. Fuel trucks are driving up and down, mechanics are running up engines, aircraft are taxiing in and out, and you will at first feel there is no end of movement and noise. Because of this noise you must use your eyes continuously. Never trust your ears to warn you of an approaching truck or taxiing aircraft. It would be extremely ironic, to say





The Proper Way to Approach Your Aircraft

the least, if you were run down by a fuel truck on your way to fly.

As you go out on the ramp to your assigned aircraft, walk on the edge of the ramp and then along the inside ramp edge (the edge nearest the building area) to the line where your aircraft is parked. Then walk along the line of aircraft tails to the one you want to approach. As you reach the correct aircraft tail, approach the cockpit from the left *REAR*.

While approaching the aircraft, look all around for obstructions and articles such as fire extinguishers or cowling that you might run over when you begin to taxi the aircraft. After you have completed your pre-flight inspection and are ready to start the aircraft, *ALWAYS be sure that someone (normally one* of the ground crew) is standing by with a fire extinguisher.

When leaving your aircraft after flight, use the same precautions as when you first came out onto the ramp. You may be tired from the flight, but this is not the time or place to relax. The first time you taxi a T-6 aircraft, you will notice the blind spot in front of its nose. Remember this as you walk onto and along the ramp. The man taxiing the aircraft may not see you, but you certainly can see him and stay out of his way. When you leave your aircraft depart to the left rear and go directly to the inside edge of the ramp and then down that edge to your flight room.

Under some light conditions it is difficult to see a rapidly revolving propeller. This may give the impression that it is not there. For this reason, or out of pure carelessness, the files of ground safety officers contain cases that read: "Victim walked into a rapidly turning propeller." Don't become the subject of one of these reports. You can never have too much respect for turning propellers. Stay away from them. Never for a second let your mind stray or you may walk into trouble. By the same token, never approach a propeller that is not turning unless you have *personally* checked the cockpit and *know* that the switches are off.

FLYING SAFETY

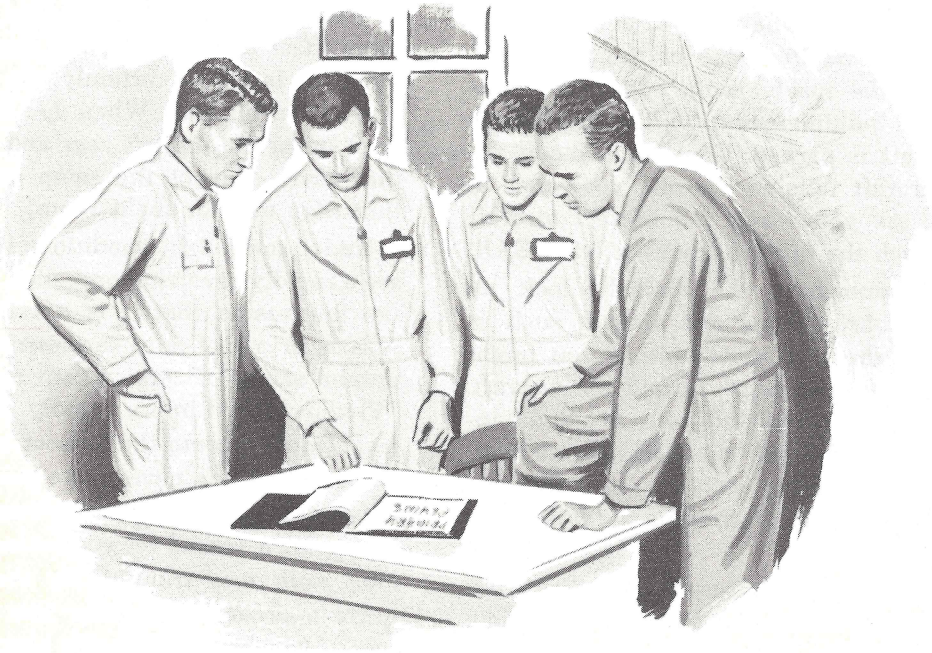
Take the proper steps to insure safety in flight. This is a rule you should learn early in your flying training. You will note that frequent reference has been made to flight preparation and planning. Before you take off, do all the things you are supposed to do. Plan the flight and make all necessary checks. A careless pilot may let himself, his crew, and his fellow pilots down because he failed to make a thorough pre-flight check. Remember that any item on a pre-flight check, if neglected, can easily become the most important factor in your life. Do not take your responsibility lightly. For your sake, as well as for that of others, get into the habit of making thorough pre-flight checks.

The safe operating limits of your basic trainer are outlined in the "Pilot's Handbook on Flight Operating Instructions." Your instructor will discuss them; you must abide by them.

Throughout your entire flying career. You will be concerned with safety. Observe this rule always: LOOK AROUND; It means flying with safety:

Look above you.
Over your left shoulder.
Over your right shoulder.
Keep alert.
Always look before turning.
Rigid necks are dangerous.
Once is not enough.
Under you is a blind spot.
Never assume that others see you.
Divide your attention.

A most important flying safety requirement during your flying training is a clear and positive understanding at all times as to who has control of the aircraft. The procedure for exchanging control is for the instructor to tell you over the interphone, "I have it" or "You have it," and for you to acknowledge by shaking the stick. Stay on the controls and keep flying the aircraft until you are told to do otherwise. Never be in doubt as to *who is doing the flying.* Always fly as if you were flying solo unless you *know* that the instructor has the controls.



Flight Line Briefing