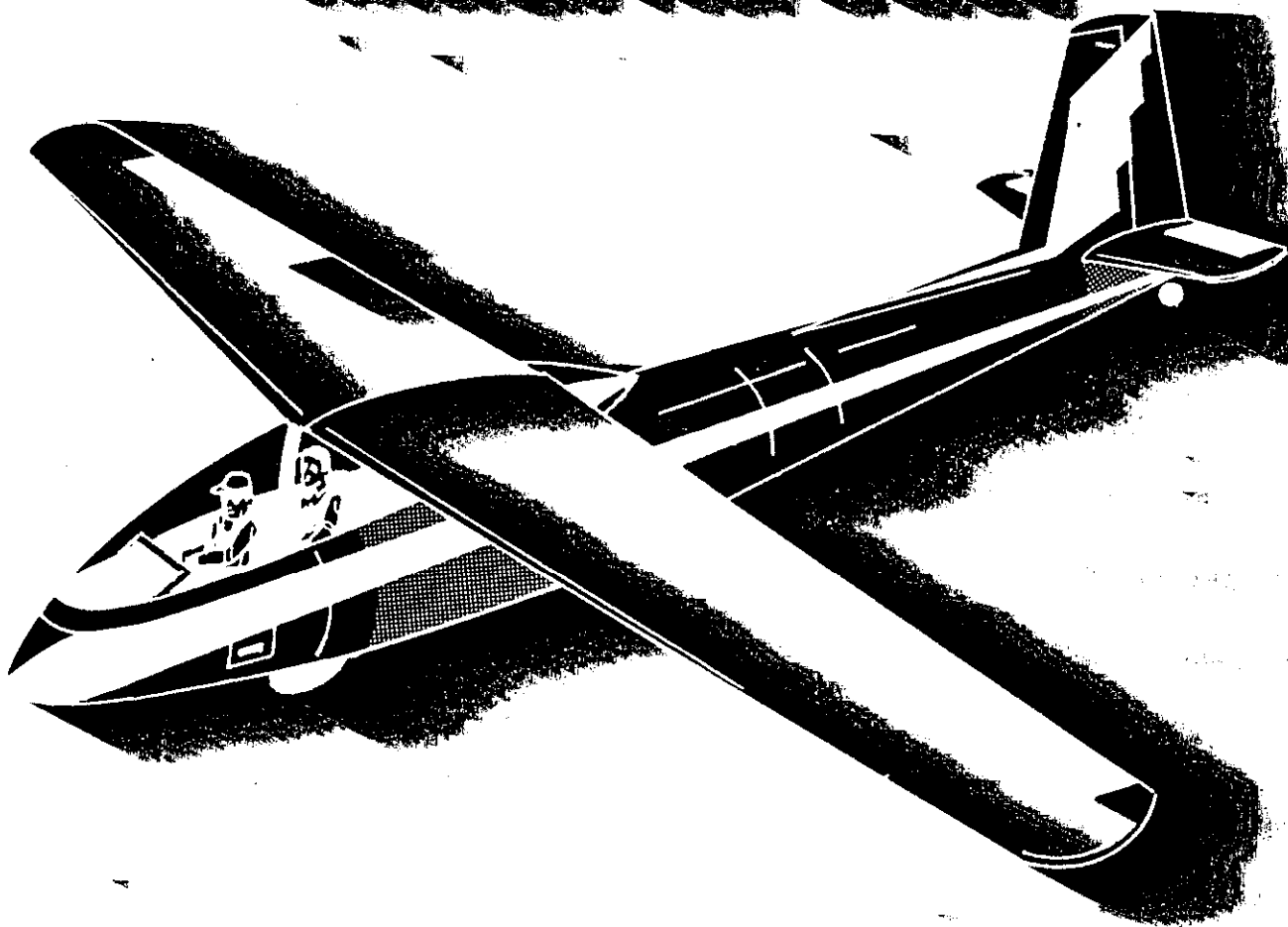


FLIGHT INSTRUCTOR - GLIDER

Written Test Guide



DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

**FLIGHT INSTRUCTOR GLIDER
WRITTEN TEST GUIDE**



1974

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE**

Preface

This edition of the Flight Instructor—Glider Written Test Guide has been developed by the Flight Standards Service of the Federal Aviation Administration to assist applicants who are preparing for the Flight Instructor—Glider Written Test. This guide is issued as Advisory Circular 61-75, and should be used by those persons pursuing the Flight Instructor Certificate with a Glider Rating under the provisions of Federal Aviation Regulations, Part 61 (Revised). AC 61-41A, *Glider Flight Instructor—Written Test Guide*, dated January 12, 1972, outlines the previous requirements and remains in effect until January 1, 1977.

This guide contains a comprehensive study outline, lists recommended study materials, and explains how to obtain these publications. It also includes sample study questions and illustrations pertinent to the subject of glider flight instruction, and it was prepared by the same FAA Specialists who developed the Flight Instructor—Glider Written Tests currently in use.

Comments regarding this publication should be directed to the U.S. Department of Transportation, Federal Aviation Administration, Flight Standards Technical Division, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

Contents

	<i>Page</i>
Preface	i
Introduction	1
Certification Requirements	1
Written Tests	1
Taking the Tests	2
Recommended Study Materials	2
How to Obtain GPO Publications	4
Charts	5
Study Outline—Fundamentals of Instructing	7
Study Outline—Flight Instructor—Glider (Knowledge Areas)	11
Sample Test Items with Answers and Explanations	17
Additional Questions for Study	19

Appendices

Appendix A—Sample Test Illustrations	21
Appendix B—Order Blank	45

List of Illustrations

<i>Figure</i>		
1. Weather Information		21
2. Letter Designators for Reports and Forecasts		21
3. Excerpts from SLC Area Forecast		22
4. Selected Terminal Forecasts		22
5. Winds Aloft Forecasts (FD)		23
6. Selected Aviation Weather Reports		23
7. Pilot Reports		24
8. In-Flight Advisories		24
9. Surface Weather Map Excerpt		25
10. Key to Aviation Weather Reports		26
11. Segmented Circle		26
12. Magnetic Variation Chart—Time Conversion Table		27
13. Progressive Stages of a Thermal Bubble		28
14. Thermals and Prevailing Wind		28
15. Lenticular Cloud		28
16. Schematic Cross Section of Mountain Waves		29
17. Altimeter Indications		30
18. Lateral—Longitudinal—Vertical—Axis		30
19. Equal Forces—Vertical Lift		31
20. Normal Turn—Centrifugal Force Equals Horizontal Lift		31
21. Flight Manual Excerpts		32
22. Omnibearing—Course Deviation Indicators		33
23. Variometer		33
24. Effects of Acceleration Error		34
25. Magnetic Compass Indications		34
26. Wake Turbulence		35
27. Airport/Facility Directory		36
28. Airport/Facility Directory		37

	<i>Page</i>
29. Airport/Facility Directory -----	38
30. Airport/Facility Directory -----	39
31. Airport/Facility Directory -----	40
32. Airport/Facility Directory -----	41
33. Airport Directory -----	42
34. Airman's Information Manual—Part 3A (Excerpt) -----	43
35. NTSB, Procedural Regulation, Part 430—in part (AIM Excerpt) -----	44

FLIGHT INSTRUCTOR—GLIDER WRITTEN TEST GUIDE

Introduction

The intent of this guide is to define the scope and narrow the field of study, insofar as possible, to the knowledge requisite to the glider flight instructor. Thus, the applicant is better able to intelligently direct his study plan. This guide is not offered as a quick and easy way to obtain the necessary knowledge for passing the written tests.

What is required to become a skilled and effective flight instructor? Although some possess in a greater degree than others those traits desirable in an instructor, no one is born a natural instructor. Good flight instructors become so through study, experience, and hard work. Probably more than any other single factor, the flight instructor's own attitude toward flight instruction determines what kind of job he will do.

After the prospective flight instructor has acquired his rating, it is imperative that he make a continuous effort to stay abreast of the latest trends in aviation, regulations, and practices. This is extremely important for the flight instructor because aviation is not static, it is dynamic and changing, and what holds true today may not necessarily apply tomorrow. The flight instructor must keep himself informed about new techniques, new equipment, new procedures, and regulatory changes.

Knowledge and understanding are seldom gained quickly or easily. This is particularly true in the diversified field of glider and sailplane flight instruction. There can be no substitute for diligent study to attain basic knowledge, unremitting effort to develop competence, and continuous review to remain current in the many areas where technological change is the rule rather than the exception.

Certification Requirements

To be eligible for a Flight Instructor Certificate with a Glider rating, the certification process requires that the applicant pass a Flight Instructor-Glider Written Test and a Fundamentals of Instructing Written Test. However, if the applicant already holds a valid FAA Flight or Ground Instructor Certificate, which he acquired after passing a written test on Fundamentals of Flight Instruction or Ground Instructor Fundamentals, he is not required to take the separate test on Fundamentals of In-

structing when applying for an additional instructor certificate or rating.

It is not necessary to take the Fundamentals of Instructing Written Test on the same day as the Flight Instructor-Glider Written Test. It is immaterial which test is taken first. The certification process also requires the applicant to pass a practical (oral and flight) test in which he must demonstrate his competency to instruct students in gliders.

For *specific* information pertaining to flight instructor certification, review the applicable sections of Federal Aviation Regulations, Part 61 (Revised).

Written Tests

The Flight Instructor-Glider Written Test and the Fundamentals of Instructing Written Test are very comprehensive because, to be effective, they must test an applicant's knowledge in many subject areas. These areas include all subjects in which ground instruction is required for private and commercial glider pilot certificates. In addition, the applicant must be knowledgeable in the areas of Fundamentals of Instructing such as the Learning Process, Elements of Effective Teaching, Student Evaluation, Quizzing and Testing, Course Development, Lesson Planning, and Classroom Instructing Techniques. These subject areas are incorporated in the appropriate written tests.

The Flight Instructor-Glider Written Test contains 60 test items and 3 hours are allowed for taking this test. The Fundamentals of Instructing Written Test contains 50 test items and 3 hours are allowed for taking that test.

All test items are the objective, multiple-choice type, and can be answered by the selection of a single response. This type of test conserves the applicant's time when taking the test, permits greater coverage of subject matter, lessens the time required for scoring, and eliminates subjective judgment in determining grades.

Each test item is independent of the other. That is, the correct response to one test item does not depend upon, or influence, the correct response to another test item.

After completing the test the applicant's answer sheet is forwarded to the FAA Aeronautical Center for scoring by ADP computers. Shortly there-

after, the applicant will receive an Airman Written Test Report which not only includes his score but lists, in code, the subject areas in which he experienced difficulty. Those subject areas can be determined by reference to the Subject Matter Outline which accompanies the report. This method provides an essential feedback to the applicant and can be effectively used to strengthen his knowledge in weak areas.

Taking the Tests

Communication between individuals, through the use of words, is a complicated process. Since tests involve the use of written language, communication between the test writers and the persons being tested becomes a problem if care is not exercised by the applicant in reading each test item. Considerable effort is expended to write each test item in a clear, concise manner. Therefore, applicants should carefully read the information and instructions given in the tests, as well as in each test item.

Always remember the following when taking the test:

1. There are no "trick" questions. Each statement means exactly what it says. Do not look for hidden meanings. The statement does not concern exceptions to the rule; it refers to the general rule.

2. Carefully read the entire test item, statement, or question first before looking at the answers below it. Skimming and hasty assumptions can lead to a completely erroneous approach to the problem because of failure to consider vital words. Look through the list of alternative answers or phrases and select the one that answers the question fully and correctly.

3. Only one of the alternative answers given is completely correct. The others may be the result of using incorrect procedures to solve problems, common misconceptions, or incomplete knowledge of the subject. If the subject matter is understood correctly answering the questions should not be difficult.

4. If considerable difficulty is experienced with a particular test item, do not spend too much time on it, but continue with other items which are considered less difficult. When easier items are completed, go back and complete the items which you found to be more difficult. This procedure will enable the applicant to use the total time available to maximum advantage in demonstrating knowledge and understanding of the subject.

Recommended Study Materials

Professionalism in flight instruction is as important as it is in any field classified as a profession.

To enhance professionalism in the field of flight instructing the prospective flight instructor should establish and maintain a current technical library. By obtaining study materials that are beneficial and appropriate to his preparation for certification, the prospective flight instructor will be starting an aeronautical library for use throughout his career. The following lists essential reference materials but does not include all the useful material that is available. Many excellent testbooks, audio-visual training aids, and instructional materials produced commercially may be obtained from various bookstores and fixed-base operators engaged in flight training.

1. *Flight Instructor's Handbook*, AC 61-16A. Revised 1969. (\$2.00 GPO. Catalog No. TD 408: In 7/3.) Gives guidance and information to pilots who are preparing for flight instructor certification and for use as a reference by certificated flight instructors.

2. *Aviation Instructor's Handbook*. [Available in the near future.] In the process of being developed to supplant *Flight Instructor's Handbook*, AC 61-16A. It is being designed to provide currently certificated flight and ground instructors and applicants for such certificates, with comprehensive, accurate, and easily understood information on learning and teaching, and to relate this information to the aviation instructor's task of conveying aeronautical knowledge and skill to his students.

3. *Flight Training Handbook*, AC 61-21. Reprinted 1969. (\$2.10 GPO. Catalog No. FAA 1.8:F 64/4.) Provides information and direction in the introduction and performance of training maneuvers for pilots who are requalifying or preparing for additional ratings and for flight instructors. It also contains information relating to aerodynamics and aeromedical aspects of flight. This publication is being redeveloped and expanded and will be available at the earliest possible date. Although written primarily for the airplane pilot, much of it is adaptable to the glider pilot.

4. *Pilot's Handbook of Aeronautical Knowledge*, AC 61-23A. (\$5.30 GPO. Catalog No. TD 4.408:P 64/5.) Contains essential, authoritative information used in training and guiding applicants for pilot certification, flight instructors, and flying school staffs. This is optional study material that was designed as a text of basic aeronautical knowledge for the airplane pilot. However, most of the chapters are applicable to private and commercial glider pilot applicants.

5. *Aviation Weather*, AC 00-6. Reprinted 1969. (\$4.00 GPO. Catalog No. FAA 5.8/2:W 37.) Contains information on weather phenomena for pilots and other flight operations personnel

GPO Bookstore
(Department of Commerce)
14th and Constitution Avenue, NW.
Washington, D.C. 20230

GPO Bookstore
(USIA)
1776 Pennsylvania Avenue NW.
Washington, D.C. 20547

GPO Bookstore
(Department of State)
21st and C Streets NW.
Washington, D.C. 20520

GPO Bookstore
(Pentagon)
Main Concourse, south end
Washington, D.C. 20310

GPO Bookstore
James Forrestal Building, Room 1-J-001
1000 Independence Avenue SW.
Washington, D.C. 20407

Mail orders may also be directed to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

GPO Bookstore
Federal Building
Room 158
400 West Bay Street
Jacksonville, FLA 32202

GPO Bookstore
Room 100, Federal Building
275 Peachtree Street, NE.
Atlanta, GA 30303

GPO Bookstore
Everett McKinley Dirksen Building
Room 1463, 14th Floor
219 South Dearborn Street
Chicago, IL 60604

GPO Bookstore
Room G25
John F. Kennedy Federal Building
Sudbury Street
Boston, MA 02203

GPO Bookstore
Federal Building, Room 144
601 East 12th Street
Kansas City, MO 64106

GPO Bookstore
Room 110
26 Federal Plaza
New York, NY 10007

GPO Bookstore
Federal Office Building
201 Cleveland Avenue SE.
Canton, OH 44702

GPO Bookstore
Federal Office Building, Room 171
1240 East Ninth Street
Cleveland, OH 44114

GPO Bookstore
Main Lobby, U.S. Post Office
and Courthouse
Ninth and Chestnut Streets
Philadelphia, PA 19107

GPO Bookstore
Room 1046, Federal Building
U.S. Courthouse
1100 Commerce Street
Dallas, TX 75202

Charts

A sectional aeronautical chart is furnished to each applicant taking a Glider Pilot (Private, Commercial, or Flight Instructor) written test.

The National Ocean Survey publishes and distributes Aeronautical Charts of the United States.

A "Catalog of Aeronautical Charts and Related Publications" which lists prices and information regarding distribution service may be obtained free, upon request, from:

Distribution Division (C44)
National Ocean Survey
Riverdale, Maryland 20840

Orders for specific charts or publications are made to the address given above and should be accompanied by a check or money order made payable to, "NOS, U.S. Department of Commerce."

whose interest in meteorology is primarily in its application to flying. It includes extensive material on present aviation weather services, a chapter on soaring weather, a glossary of meteorological terms, and over 175 illustrations, many in color.

6. *The American Soaring Handbook*. Published by the Soaring Society of America, this handbook represents the combined efforts of many of the veteran soaring pilots in this country. Each chapter is a separate booklet costing from \$0.75 to \$2.00 per chapter.

- a. Chapter 2—Training
- b. Chapter 3—Ground Launch
- c. Chapter 4—Airplane Tow
- d. Chapter 5—Meteorology
- e. Chapter 6—Cross-Country and Wave Soaring
- f. Chapter 7—Equipment I, Instruments and Oxygen
- g. Chapter 8—Equipment II. Radio, Rope, and Wire

7. *The Joy of Soaring* (\$5.75). A Training Manual, that is the latest in a series of publications by the Soaring Society of America, designed to promote not only enjoyment, but proficiency and safety in soaring activities. It supplements the American Soaring Handbook, and the monthly magazine "Soaring." It is the most comprehensive and authoritative description of training techniques available to the beginner or experienced glider pilot.

The American Soaring Handbook and *The Joy of Soaring* may be obtained from bookstores, sailplane operators, or ordered from:

The Soaring Society of America
P.O. Box 66071
Los Angeles, California 90066

8. *Wake Turbulence*, AC 90-23D. (Free.) Presents information on the subject of wake turbulence and suggests techniques that may help pilots avoid the hazards associated with wingtip vortex turbulence. Upon request, it is free of charge from the U.S. Department of Transportation, Publications Section, TAD-443.1, Washington, D.C. 20590.

9. *Federal Aviation Regulations*. Suggested Parts for study are:

Part 1—*Definitions and Abbreviations* (\$3.00 plus \$0.75 additional foreign mailing. GPO.)

Part 61—*Certification: Pilots and Flight Instructors* (\$5.05 plus \$1.30 additional foreign mailing. GPO.)

Part 71—*Designation of Federal Airways, Controlled Airspace and Reporting Points*, Volume XI (\$5.00 plus \$1.25 additional foreign mailing. GPO.)

Part 91—*General Operating and Flight Rules* (\$11.30 plus \$2.85 additional foreign mailing. GPO.)

NOTE: Individual parts of the Federal Aviation Regulations are now becoming available, rather than appearing only in volumes as in the past.

10. *National Transportation Safety Board. NTSB Part 430*. (Free.) This publication deals with notification and reporting procedures required relating to accidents and lost or overdue aircraft in the United States, its territories, and possessions. Upon request, it is free of charge from:

National Transportation Safety Board
Publications Unit, BCM-222
800 Independence Avenue, S.W.
Washington, D.C. 20591

11. *Airman's Information Manual (AIM)*. Presents, in four Parts, information necessary for planning and conducting flights within the National Airspace System. Besides providing frequently updated airport and NAVAID data, AIM includes instructional and procedural information, and is designed for use in the cockpit. Each part is available on a separate annual subscription basis to better serve the needs of the individual pilot.

Part 1. *Basic Flight Manual and ATC Procedures* (Annual Subscription \$7.00, foreign mailing—\$1.75 additional—GPO). Issued quarterly. Catalog No. TD 4.12:pt. 1/.

Part 2. *Airport Directory* (Annual Subscription \$7.00, foreign mailing—\$1.75 additional—GPO). Issued semi-annually. Catalog No. TD 4.12:pt. 2/.

Parts 3 and 3A. *Operational Data and Notices to Airmen* (Annual Subscription \$22.00, foreign mailing—\$5.50 additional GPO). Part 3 is issued every 56 days and Part 3A is issued every 14 days. Catalog No. TD 4.12:pt. 3/.

Part 4. *Graphic Notices—Supplemental Data* (Annual Subscription \$9.50, foreign mailing—\$2.50 additional GPO). Issued quarterly. Catalog No. TD 4.12:pt. 4/.

12. *Flight Test Guide—Private and Commercial Pilot Glider*. AC 61-61. (\$0.50 GPO.) Catalog No. TD 4.408:G 49. A publication designed to assist the glider pilot applicant in preparing for the Private or Commercial flight test. The glider flight instructor should find this guide helpful in preparing students for either the Private or Commercial Glider flight test.

13. *Practical Test Guide—Flight Instructor*, AC 61-58, (\$0.40 GPO.) Catalog No. TD 4.408:In

7/5. A publication which will assist the instructor and applicants in preparing for the practical (oral and flight) test for a Flight Instructor Certificate bearing the ratings specified in Part 61 of Federal Aviation Regulations. It contains information on the scope, standards, and administration of the instructor practical test.

14. *VFR and IFR Exam-O-Grams*. Brief, timely, and graphic articles developed and published on a continuing basis. They are nondirective in nature and are issued as an information service particularly to individuals interested in FAA Airman Written Tests. They relate to concepts, practices, and procedures critical to aviation safety, and assist in giving safety oriented information to airman applicants and practicing airmen. Exam-O-Grams are available free of charge but are limited to a single copy per request. Requests for placement on the mailing list should be addressed to:

FAA Aeronautical Center
Flight Standards Technical Division
Operations Branch, AAC-240
P.O. Box 25082
Oklahoma City, Oklahoma 73125

15. *Glider/Sailplane Flight Manuals and Owner's Manuals*. Aircraft manufacturers issue manuals for each aircraft model. They may be obtained from individual aircraft manufacturing companies or from local dealers and distributors.

16. *Advisory Circulars*. The FAA issues Advisory Circulars to inform the aviation public in a systematic way of non-regulatory material of interest. Advisory Circulars in the following subjects are recommended for the Flight Instructor and can be obtained free of charge from:

U.S. Department of Transportation
Publications Section, TAD-443.1
Washington, D.C. 20590

Subject Number and Subject Matter

00 -----General
20 -----Aircraft
60 -----Airmen
70 Airspace-----Airspace
90 -----Air Traffic Control and
 General Operations

How to Obtain GPO Publications

Request for publications sold through the Superintendent of Documents should be submitted on an order form, if possible. A sample order form is included in the back of this guide, which may be

duplicated by the user, or may be obtained *free* upon request from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

In order to aid the processing of your order, the following suggestions are offered:

1. Send separate orders for subscription and nonsubscription items.

2. Give the exact name, Advisory Circular identification number, and GPO catalog number when ordering publications.

3. Send a check or money order for the *exact* amount made out to the Superintendent of Documents, **DO NOT SEND CASH**. (Include an additional 25% of the total order price to cover postage for foreign mailing.)

4. Enclose a self-addressed mailing label if a letter is used to request publications.

5. Use special delivery when needed.

6. All prices are subject to change. The latest *Advisory Circular Checklist and Status of Regulations*, AC 00-2 should be consulted for current pricing of publications. It is very important that the *correct* amount be enclosed with the order.

7. Several GPO bookstores have been established throughout the country for the sale of Government publications. The public is encouraged to avail themselves of the mail-order service offered by these facilities. GPO bookstores are located at the following addresses:

GPO Bookstore
Room 102A, 2121 Building
2121 Eighth Avenue North
Birmingham, AL 35203

GPO Bookstore
Federal Building, Room 1015
300 North Los Angeles Street
Los Angeles, CA 90012

GPO Bookstore
Federal Building, Room 1023
450 Golden Gate Avenue
San Francisco, CA 94102

GPO Bookstore
Federal Building
U.S. Courthouse, Room 1421
1961 Stout Street
Denver, CO 80202

GPO Bookstore
710 North Capitol Street NW.
Washington, D.C. 20402

STUDY OUTLINE

Fundamentals of Instructing

I. THE LEARNING PROCESS

- A. Definition of Learning.
- B. Characteristics of Learning.
 - 1. Learning is purposeful.
 - 2. Learning comes through experience.
 - 3. Learning is multifaced.
 - 4. Learning is an active process.
- C. Laws of Learning.
 - 1. Law of readiness.
 - 2. Law of exercise.
 - 3. Law of effect.
 - 4. Law of primacy.
 - 5. Law of intensity.
 - 6. Law of recency.
- D. How People Learn.
 - 1. Perceptions.
 - 2. Factors which affect perception.
 - 3. Insights.
 - 4. Motivation.
- E. Levels of Learning.
- F. Learning Skills.
 - 1. Physical skills involve more than muscle.
 - 2. Desire to learn.
 - 3. Patterns to follow.
 - 4. Perform the skill.
 - 5. Knowledge of results.
 - 6. Progress follows a pattern.
 - 7. Duration and organization of lesson.
 - 8. Evaluation versus critique.
 - 9. Application of skill.
- G. Forgetting and Retention.
 - 1. Theories of forgetting.
 - 2. Retention of learning.
- H. Transfer of Learning.
- I. Habit Formation.
- J. Obstacles to Learning During Flight Instruction.
- K. The Instructor's Role in Flight Training.

II. HUMAN BEHAVIOIR

- A. Control of Human Behaviour.

B. Human Needs.

- 1. Physical needs.
- 2. Social needs.
- 3. Egoistic needs.
- 4. Self-fulfillment needs.

C. Defense Mechanisms.

- 1. Rationalization.
- 2. Flight.
- 3. Aggression.
- 4. Resignation.

D. The Instructor's Role in Human Relations.

- 1. Keep students motivated.
- 2. Keep students informed.
- 3. Approach students as individuals.
- 4. Give credit when due.
- 5. Criticize constructively.
- 6. Be consistent.
- 7. Admit errors.

III. EFFECTIVE COMMUNICATION

A. Basic Elements of Communication Process.

- 1. Source.
- 2. Symbols.
- 3. Receiver.

B. Barriers to Effective Communications.

- 1. Lack of common core of experience.
- 2. Confusion between the symbol and the thing symbolized.
- 3. Overuse of abstractions.

IV. THE TEACHING PROCESS

- A. Preparation.
- B. Presentation.
- C. Application.
- D. Review and Evaluation.

V. TEACHING METHODS

- A. Organizing Material.
 - 1. Introduction.
 - 2. Development.
 - 3. Conclusion.

B. Lecture Method.

1. Types of lectures.
2. Teaching lecture.
3. Preparing the teaching lecture.
4. Suitable language.
5. Types of delivery.
6. Use of notes.
7. Formal versus informal lectures.
8. Advantages and disadvantages of the lecture.

C. Guided Discussion Method.

1. Use of questions in a guided discussion.
2. Planning a guided discussion.
3. Student preparation for a guided discussion.
4. Guiding a discussion—instructor technique.

D. Demonstration—Performance Method.

1. Explanation phase.
2. Demonstration phase.
3. Student performance and instructor supervision phases.
4. Evaluation phase.

E. The "Telling and Doing" Technique in Flight Instruction.

1. Instructor tells—instructor does.
2. Student tells—student does.
3. Student does—instructor evaluates.

F. Programed Instruction.

1. One method of programing.

VI. THE INSTRUCTOR AS A CRITIC

A. Purpose of a Critique.

B. Characteristics of an Effective Critique.

1. A critique should be objective.
2. A critique should be flexible.
3. A critique should be acceptable.
4. A critique should be comprehensive.
5. A critique should be constructive.
6. A critique should be well organized.
7. A critique should be thoughtful.
8. A critique should be specific.

C. Methods of Conducting Critiques.

1. Instructor—student critique.
2. Student—led critique.
3. Small—group critiques.
4. Individual student critique.
5. Written critique.
6. Self—critique.

D. Ground Rules For Conducting a Critique.

VII. EVALUATION.

A. Oral Quizzing.

1. Characteristics of effective questions.

2. Types of questions to avoid.

3. Answering students' questions.

B. Written Tests.

1. Characteristics of a good test.
2. Written test items.
3. Effective item writing.
4. Principles to follow.

C. Performance Tests.

1. Uses of performance testing.
2. Demonstrations of piloting ability.

VIII. INSTRUCTIONAL AIDS

A. Theory Behind Use of Instructional Aids.

B. Reasons for Using Instructional Aids.

C. Guidelines for Use of Instructional Aids.

D. Types of Instruction Aids.

1. Chalkboard.
2. Models.
3. Charts.
4. Projected material.

E. Future Developments.

IX. FLIGHT INSTRUCTOR RESPONSIBILITIES

A. Professionalism

1. Sincerity.
2. Acceptance of the student.
3. Personal appearance and habits.
4. Demeanor.
5. Safety practices and accident prevention.
6. Proper language.
7. Self—improvement.

B. Helping Student Pilots Learn

1. Providing adequate instruction.
2. Demanding an adequate standard of performance.
3. Emphasizing the "positive".

C. The Flight Instructor as a Practical Psychologist.

1. Anxiety.
2. Normal reactions to stress.
3. Abnormal reaction to stress.
4. Instructor's actions regarding seriously abnormal students.

D. Student Pilot Supervision and Surveillance.

E. Flight Instructor Endorsements.

F. Flight Test Recommendations.

G. Airplane Checkouts.

H. Refresher Training.

X. THE INTEGRATED METHOD OF FLIGHT INSTRUCTION

- A. Definition.
- B. Objectives.
 - 1. Development of habit patterns.
 - 2. Accuracy of flight control.
 - 3. Operating efficiency.
 - 4. Emergency capability.
- C. Procedures.
- D. Precautions.
- E. Flight Instructor Qualifications.

XI. PLANNING INSTRUCTIONAL ACTIVITY

- A. Course of Instruction.
 - 1. Determination of standards and objectives.
 - 2. Identification of blocks of learning.
- B. Syllabus.
 - 1. Sample ground training syllabus.
 - 2. Sample flight training syllabus.
- C. Lesson Plan.
 - 1. Characteristics of a well-planned lesson.
 - 2. How to use a lesson plan properly.
 - 3. Lesson plan items.

STUDY OUTLINE

Flight Instructor—Glider Knowledge Areas

I. FEDERAL AVIATION REGULATIONS

A. Parts 1; 71: Definitions/Controlled Airspace.

1. Air commerce.
2. Airport traffic area.
3. Ceiling.
4. Commercial operator.
5. Flight level.
6. Flight visibility.
7. Major alteration.
8. Major repair.
9. Pilot in command.
10. Second in command.
11. Federal airway.
12. Control area.
13. Continental control area.
14. Control zone.
15. Terminal control area.
16. Positive control area.

B. Part 61: Certification: Pilots/Flight Instructors.

1. Required certificates/ratings.
2. Certificates and ratings issued.
3. Expired pilot certificates/reissuance.
4. Carriage of narcotic drugs/marihuana.
5. Duration of pilot certificates.
6. Medical certificates.
7. General limitations.
8. Pilot logbooks.
9. Second in command qualifications.
10. Recent experience: Pilot in command.
11. Pilot in command proficiency check.
12. Glider towing: experience/instruction.
13. Private pilot privileges/limitations.
14. Commercial pilot privileges/limitations.
15. Flight Instructor: records/authorizations/limitations.

C. Part 91: General Operating Rules—Subpart A.

1. Responsibility of pilot in command.
2. Pilot in command—more than one pilot.
3. Preflight action.
4. Flight crewmembers at stations.
5. Careless or reckless operation.
6. Liquor and drugs.
7. Dropping objects.
8. Fastening of safety belts.

9. Parachutes and parachuting.

10. Towing gliders: safety/links/waivers.
11. Civil aircraft: certificates required.
12. Aircraft airworthiness.
13. Aircraft operating limitations/markings.
14. Supplemental oxygen.
15. Limited/restricted aircraft limitations.
16. Emergency locator transmitters.

D. Part 91: General Flight Rules—Subpart B.

1. Waivers.
2. Operating near other aircraft.
3. Right-of-way rules.
4. Acrobatic flights.
5. Aircraft lights.
6. ATC light signals.
7. Minimum safe altitudes; general.
8. Altimeter settings.
9. Flight plan; information required.
10. Operation—in vicinity of airport.
11. Operation—airport with control tower.
12. Operation—airport without control tower.
13. Flight in terminal control areas.
14. Temporary flight restrictions.
15. Restricted and prohibited areas.
16. Positive control areas.
17. Basic VFR weather minimums.
18. Special VFR weather minimums.
19. VFR cruising altitude or flight level.

E. Part 91: Maintenance, Preventative Maintenance, and Alterations—Subpart C.

1. General maintenance and alterations.
2. Maintenance required.
3. Carrying persons after repair/alteration.
4. Inspections/progressive inspections.
5. Maintenance records/transfer of records.

II. NATIONAL TRANSPORTATION SAFETY BOARD PROCEDURAL REGULATION—PART 430

A. General.

1. Applicability.
2. Definitions.

B. Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft.

1. Immediate notification.
2. Information to be given in notification.

- C. Preservation of Aircraft Wreckage, Mail, Cargo, and Records.
 - 1. Preservation.
- D. Reporting of Aircraft Accidents, Incidents, and Overdue Aircraft.
 - 1. Reports and statements to be filed.

III. FAA ADVISORY CIRCULARS

- A. Series 00-General.
- B. Series 20-Aircraft.
- C. Series 60-Airmen.
- D. Series 70-Airspace.
- E. Series 90-Air Traffic Control and General Operations.
- F. Series 150-Airports.

IV. AIRMAN'S INFORMATION MANUAL

- A. Part 1: Basic Flight Manual and ATC Procedures.
 - 1. Glossary of aeronautical terms.
 - 2. Airport lighting/markings/aids.
 - 3. Air navigation radio aids.
 - 4. Controlled/uncontrolled airspace.
 - 5. Operating at non-tower airports.
 - 6. Special use airspace-prohibited, restricted, ISJTA, alert areas.
 - 7. Automatic terminal information service (ATIS).
 - 8. Aeronautical advisory stations (UNICOM).
 - 9. Radiotelephone phraseology/technique.
 - 10. Traffic/wind direction indicators.
 - 11. Obtaining weather information/briefing.
 - 12. Flight plans.
 - 13. Wake turbulence.
 - 14. ADIZ and designated mountainous areas.
 - 15. Medical facts for pilots.
 - 16. Good operating practices.
- B. Part 2: Airport Directory.
 - 1. Obtaining airport data.
 - 2. FSS/weather service telephone numbers.
- C. Part 3: Operational Data and Notices to Airmen.
 - 1. Obtaining radio facility/FSS data.
 - 2. Special notices/special operations.
 - 3. Notices to airmen (NOTAMS).
- D. Part 4: Graphic Notices and Supplemental Data.
 - 1. Terminal area graphic notices.
 - 2. Restrictions to enroute navigation aids.
 - 3. VOR receiver checkpoints.
 - 4. Parachuting jumping areas.
 - 5. Heavy wagon and olive branch routes.

V. WEATHER

- A. The Earth's Atmosphere.
 - 1. Composition.
 - 2. Vertical structure.
 - 3. The standard atmosphere.
 - 4. Density.
- B. Temperature.
 - 1. Temperature measurement.
 - 2. Heat and temperature.
 - 3. Temperature aloft.
 - 4. Temperature variation.
- C. Atmospheric Pressure and Altimetry.
 - 1. Atmospheric pressure measurements.
 - 2. Sea level pressure.
 - 3. Station pressure.
 - 4. Pressure variations.
 - 5. Pressure systems.
 - 6. Altimeters.
- D. Wind.
 - 1. Basic theory of general circulation.
 - 2. Convection.
 - 3. Pressure gradient force.
 - 4. Coriolis force.
 - 5. Friction.
 - 6. The jet stream.
 - 7. Local and small scale winds.
 - 8. Large wind system.
 - 9. Wind, pressure systems, and weather.
 - 10. Wind shear.
- E. Moisture.
 - 1. Measurements.
 - a. Relative humidity.
 - b. Dewpoint.
 - 2. Change of state.
 - 3. Condensation and sublimation products.
- F. Stability or Instability.
 - 1. Adiabatic process.
 - 2. Lapse rates.
 - 3. Stability determinations.
 - 4. Effects of stability or instability.
- G. Clouds.
 - 1. Composition.
 - 2. Formation and structure.
 - 3. Types.
 - 4. Recognition.
- H. Air Masses.
 - 1. Source regions.
 - 2. Classification of air masses.
 - 3. Air mass modification.
 - 4. Summer and winter air mass weather.

I. Fronts.

1. Structure of fronts.
2. Types of fronts.
3. Frontal waves and occlusions.
4. Frontolysis and frontogenesis.
5. Associated weather.

J. Turbulence.

1. Convective currents.
2. Obstructions to wind flow.
3. Wind shear.
4. Clear air turbulence.
5. Categories of turbulence intensities.
6. Wake turbulence.

K. Icing.

1. Structural ice formation.
2. Ice producing cloud types.
3. Accretion rate of in-flight structural icing.
4. Types and intensities of in-flight structural icing.
5. Effects of in-flight structural icing.
6. Structural aircraft icing and frost on the ground.

L. Thunderstorms.

1. Conditions necessary for thunderstorm formation.
2. Thunderstorm structure.
3. Classification of thunderstorms.
4. Thunderstorm hazards.
5. Thunderstorm information from radar.
6. Tornadoes.

M. Obstruction to Vision.

1. Fog.
2. Low stratus clouds.
3. Haze and smoke.
4. Blowing obstructions to vision.
5. Precipitation.
6. Obscured or partially obscured sky.

N. The Nations Aviation Weather System.

O. Weather Observations.

1. Surface weather observations.
2. Pilot weather reports (PIREPS).
3. Weather radar observations.
4. Upper air observations.

P. Weather Charts.

1. Weather depiction charts.
2. Surface weather charts.
3. Constant pressure charts.
4. Winds aloft charts.
5. Radar summary charts.
6. Prognostic surface and prognostic constant pressure charts.
7. Prognostic significant weather charts.

Q. Aviation Weather Forecasts.

1. Terminal forecasts.
2. Area forecasts.
3. Route forecasts.
4. Winds aloft forecasts.
5. In-flight weather advisories.
6. Severe weather outlooks.
7. Severe weather forecasts.
8. Surface analyses and prognoses.

R. Services to Pilot.

1. FSS briefing.
2. Enroute flight advisory service.
3. Transcribed weather broadcasts (TWEB).
4. Pilots automatic telephone weather answering service (PATWAS).

S. Determining Cloud-Height From Reports.

T. Information in a Weather Briefing.

U. Mountain Effects.

1. Turbulence.
2. Weather.

V. Soaring Weather.

1. Thermals.
2. Ridge lift.
3. Mountain waves.

VI. NAVIGATION

A. General.

1. Sectional chart interpretation.
2. Relating chart symbols to FAR.
3. Pilotage/recognition of landmarks.
4. Determining courses/distances on charts.
5. Planning traffic pattern.
6. Navigation computer principles.
7. Computing headings/courses.
8. Computing time, distance, speed.
9. Computing rates-of-climb/descent.

B. Radio Navigation.

1. Characteristics of VOR facilities.
2. Tuning VOR receivers.
3. Identifying VOR stations.
4. VOR interpretation/orientation.
5. Intercepting VOR radials.
6. Groundspeed checks using VOR radials.
7. VOR frequency interference.
8. VOR test signals/VOR receiver checks.

C. Radio Communications.

1. VHF radio communications/phraseology.
2. Position reporting procedures.
3. Tower/FSS/enroute-advisories/instructions.
4. FSS communications procedures.
5. Obtaining emergency assistance.
6. Use of proper communications frequencies.

VII. AERODYNAMICS AND PRINCIPLES OF FLIGHT

- A. Laws of motion.
- B. Functions of the Flight Controls.
- C. Principles of Airfoils.
- D. Wing planform.
 - 1. Area/span/chord.
 - 2. Aspect ratio/taper/sweepback.
 - 3. Effect of planform on stall patterns.
- E. Forces Acting on the Aircraft.
- F. Flight Controls/Axes of the Aircraft.
- G. Lift/Drag During Turns.
- H. Lift Versus Angle of Attack.
- I. Lift Versus Air Density.
- J. Types of Flaps, Spoilers, Divebrakes.
- K. Effect of Flaps, Spoilers, Divebrakes.
- L. Effect of Ice/Snow/Frost on Airfoils.
- M. Aileron Drag.
- N. Slipping/Skidding Turns.
- O. Types and Effect of Drag/Induced/Parasite/Profile.
- P. Ground Effect.
- Q. Loads/Load Factors.
- R. Stability/Static and Dynamic/Longitudinal/Lateral Directional.
- S. Stalls/Spins.
- T. Relative Wind/Angle of Attack.
- U. Effect of Wind During Turns.

VIII. GLIDER/SAILPLANE OPERATION

- A. General.
 - 1. Preflight/postflight safety practices.
 - 2. Wake turbulence—causes/precautions.
 - 3. Crosswind takeoff/landing.
 - 4. Proper loading of the aircraft.
 - 5. Use of oxygen and oxygen equipment.
 - 6. Mid-air collision avoidance precautions.
 - 7. Procedures of assembly and disassembly.
 - 8. Towrope/cables/hooks/releases.
 - 9. Standard visual signals.
 - 10. Aero towing procedures.
 - 11. Ground towing procedures (auto).
 - 12. Ground towing procedures (winch).
 - 13. Traffic pattern/landing.
 - 14. Use of speed limiting devices.
 - 15. Strange field (cross-country) landings.
 - 16. Sharing thermals.
 - 17. Sharing ridge lift.
 - 18. Cross-country procedures.
 - 19. Emergencies—rope break, towplane power failure, etc.

- 20. Downwind landing.
- 21. Rate of descent in still-air chart.
- 22. Slack in towline.
- 23. Accidental stall recoveries.
- 24. Inspection of launch equipment.
- 25. Aircraft documents and records.

B. Performance.

- 1. Performance charts.
- 2. Flying through or around the wake.
- 3. Calculating speeds-to-fly.
- 4. Tow speeds.
- 5. Computing density/pressure altitudes.
- 6. Effect of density altitude on performance.
- 7. Effect of weight/balance on performance.
- 8. Critical performance speeds.
- 9. Effect of wind on aircraft performance.
- 10. Bank/speed versus rate/radius of turn.
- 11. Stall speed versus altitude or attitude.
- 12. Stall speed versus indicated/true airspeed.
- 13. Computation of gross weight/useful load/ballast.
- 14. Minimum sink speed.
- 15. Glide ratio—L/D.
- 16. Speed-to-fly.
- 17. Best-glide-speed.
- 18. Glider performance curves.
- 19. Airspeed for searching for lift.
- 20. Flight at critically slow airspeeds.
- 21. Ridge and mountain soaring/thermaling.

IX. INSTRUMENTS AND SYSTEMS

- A. Altimeter Operation/Errors.
- B. Altimeter Setting Procedures/Significance.
- C. Obtaining Pressure Altitude.
- D. Pitot-Static Systems/Instruments.
- E. Magnetic Compass Operation/Errors.
- F. Airspeed Indicator Operation/Errors.
- G. Variometer and Audio Device, Function and Adjustment.
- H. Oxygen Supply and Pressure Gauge.
- I. Turn Indicator/Coordinator.
- J. Radio Equipment (Communications/Navigation).

X. PHYSIOLOGICAL FACTORS RELATED TO FLIGHT

- A. Adjustment to the Flight Environment.
 - 1. Ground habits vs. flight habits.
 - 2. Individual differences in pilots.
- B. Reaction of the Body to Changes in Atmospheric Pressure.
 - 1. Changes in altitude.
 - 2. Aerosinusitis.

C. Reaction of the Body to Changes in Oxygen Partial Pressure.

1. Hypoxia.
2. Hyperventilation.

D. Self Imposed Stress.

1. Fatigue and its effect on the body during flight.
2. Alcohol and its effect on the body during flight.
3. Drugs and their effects on the body during flight.
4. Scuba diving and its effect on the body during flight.
5. Panic causes and prevention.

E. Sensations of Flight.

1. Body sensory systems involved in equilibrium.
 - a. Eyes.
 - b. Inner ear.
 - c. Skeletal muscles.
2. Sensory illusions in flight—vertigo—special disorientation.

F. Oxygen Equipment.

1. Requirements.
2. Types of oxygen.
3. Storage of oxygen.
4. Regulators and masks.
5. Use of oxygen equipment.

SAMPLE TEST ITEMS WITH ANSWERS AND EXPLANATIONS

The following test items are included to familiarize applicants with the *type* of questions that they may expect to find in the tests required for a Flight Instructor Certificate with a Glider Rating. Keep in mind that these sample items contain only a few of the topics found in the FAA written tests. It is for this reason that concentration of study on the subjects in the study outline "Fundamentals of Instructing" and study outline "Flight Instructor-Glider" should be emphasized. A knowledge of all the topics mentioned in these outlines—not just the mastery of these sample test items—should be used as the criterion for determining that you are properly prepared to take the FAA written tests.

There are two tests involved in the certification process. One test examines basic knowledge in "Fundamentals of Instructing" and the other examines basic knowledge in "Flight Instructor-Glider" subject matter. If the applicant for this certificate and rating already possesses a Flight Instructor Certificate he will not be required to take the "Fundamentals of Instructing" written test.

Fundamentals of Instructing Written Test

1. Motivation is a key factor in learning. In properly motivating students, a flight instructor should remember that
 - 1—students are innately able to evaluate their proficiency and rate of progress and will instinctively tend to arrive at correct self-concepts if properly motivated.
 - 2—it is best to emphasize long-range goals more than short-range goals.
 - 3—positive motivations are characteristically more effective than negative motivations.
 - 4—all of the above statements are considered true.

Correct answer 3. The most effective motivations are those based on positive or rewarding objectives. Positive motivations are provided by the promise or achievement of awards. Negative motivations are those which may engender fears, and be accepted by the student as threats. Negative motivations are not characteristically as effective in promoting efficient learning as are positive motivations.

2. On which of the following is the teaching success of a flight instructor considered to be most dependent?

- 1—Personality of the instructor.
- 2—Presentation by the instructor.
- 3—Flying ability and flight experience.
- 4—Proper planning of lessons.

Correct answer 4. Teaching success depends more upon lesson planning than it does on presentation, personality, flying ability, or experience.

3. Which of the following is most often the cause of poor student performance in learning to fly a glider?

- 1—Negative transfer.
- 2—Ignorance of correct procedures.
- 3—Fear, anxiety, and phobia.
- 4—Faulty habit patterns.

Correct answer 4. Reversals sometimes occur, during which a student's performance becomes worse with continued practice. Generally such reversals are due to a faulty habit pattern involving one of the basic elements of the maneuver or operation involved.

4. When a student cannot accept the real reason for his behavior, he may attempt to alleviate his feeling of guilt by relying on the defense mechanism called

- 1—flight.
- 2—rationalization.
- 3—aggression.
- 4—resignation.

Correct answer 2. If a student cannot accept the real reason for his behavior, he may rationalize.

5. Which statement is true regarding effective communication?

- 1—To be most effective as a communicator, an instructor should use abstract words as much as possible.
- 2—The most effective communicator relies on a single, proven channel to transmit his ideas.
- 3—Unless a common core of experience exists between the communicator and the receptor, effective communication will be difficult to achieve.

- 4—Effective communication has taken place when the receiver acknowledges receipt of the information.

Correct answer 3. Probably the greatest single barrier to effective communication is the lack of a common core of experience between communicator and receptor. Communication can be effective only to the extent that the experiences—physical, mental, or emotional—of the people concerned are similar.

Flight Instructor—Glider

Written Test

1. A significant thunderstorm hazard is the rapid change in wind direction and speed which occurs near and at the surface

- 1—while the storm is passing.
- 2—immediately after the storm has passed.
- 3—immediately before the passage of the storm.
- 4—as a result of the horizontal spreading out of the storm's updrafts.

Correct answer 3. This initial wind surge is called the "first gust" or "plow wind." It is particularly hazardous when aircraft attempt to land or takeoff in the face of a thunderstorm. The first gust usually is the strongest wind observed at the surface during the thunderstorm's passage.

2. In using the magnetic compass to establish and maintain your heading, you should know that the normal characteristics of a compass in the Northern Hemisphere will usually cause it to indicate a turn toward the

- 1—west as you enter a medium banked left turn from a south heading.
- 2—east as you enter a medium banked left turn from a north heading.
- 3—south when you accelerate on an east heading.
- 4—north when you decelerate on a west heading.

Correct answer 2. The lines of force in the earth's magnetic field are parallel to the earth's surface at the magnetic equator, but point increasingly downward when moving closer to the magnetic poles. In addition to aligning itself with the magnetic field and magnetic poles, the compass card has a tendency to dip downward because of the downward pull of the magnetic field. In straight-and-level flight the compass card is balanced to compensate for this tendency to dip downward. While in a banked attitude, however, the vertical component of the earth's magnetic field causes the north-seeking end of the compass card to dip to the low side of the bank and thus to rotate. In a bank

from a north heading, this rotation, from the pilot's viewpoint, is opposite to the direction of the bank, and from a south heading is in the same direction as the bank. In a left bank from a south heading, the card will rotate toward east, hence response number 1 is incorrect. A left bank from a north heading will rotate the card toward east as correctly stated in response number 2.

3. Consider the following Aviation Weather Report Prescott, Arizona, where the airport elevation is 5,042 feet:

PRC 130045 067/68/31/2728/991

While flying over this airport you would expect to encounter the base of the clouds at approximately

- 1—18,042 ft. msl.
- 2—13,000 ft. msl.
- 3—4,500 ft. msl.
- 4—7,958 ft. msl.

Correct answer 1. Reported scattered clouds or ceilings are measured from the surface at the point of observation to the base of the phenomena. Since the elevation of the surface at Prescott is 5,042 ft. msl and the reported scattered clouds are at 13,000 ft. above the surface, the base of the clouds would be encountered at 18,042 ft. msl (5,042 + 13,000 = 18,042).

4. The most likely error by the glider pilot during airplane tow, while maintaining the "high tow" position, is allowing the glider to get too

- 1—low.
- 2—far left.
- 3—far right.
- 4—high.

Correct answer 4. The easiest error to make (when in high tow) is to get too high when the glider pilot climbs above the normal tow position. The fixed length of towline causes the glider to move forward as well as up, gaining speed as it goes. If this motion is continued the glider can reach a point almost above the tug.

5. Which of the following statements pertaining to angle of attack is correct?

- 1—If a constant airspeed can be maintained, the angle of attack will increase as the pitch is increased.
- 2—It is possible for the wing of a glider to pass through the air at a high angle of attack even though a constant altitude is maintained.
- 3—A glider in a descent will normally have a negative angle of attack.

- 4—Regardless of the angle of attack, stalls will occur only at low or comparatively low airspeeds.

Correct answer 2. It is possible for the wing to pass through the air at a high angle of attack when the glider descends in a level flight attitude. Conversely, the angle of attack may be near zero in a steep dive. If, through analysis we can accept the validity of this statement, then we can perceive that when flying at a slow speed, it will be necessary to use a high angle of attack in order to maintain a constant altitude.

Additional Questions For Study

Answers and explanations are not included with the following questions. These questions are intended to direct study to selected areas, but by no means cover all subject areas found in the Fundamentals of Instructing or Flight Instructor—Glider written tests.

1. What is the meaning of “perceptions”?
2. What are “insights” as applied to learning?
3. How should a glider flight instructor deal with the problem of student airsickness?
4. Can you always expect temporary random plateaus in the learning rate of each student?
5. Should the flight syllabus provide a step-by-step progression of learning with regular review and evaluation?
6. What are the four basic steps in the teaching process?
7. Should a student be kept constantly aware of his progress?
8. What are “blocks of learning”?
9. Does oral quizzing of students reveal the effectiveness of the instructor’s training procedures?
10. Will accepting lower standards to please a student effect a genuine improvement in the instructor–student relationship?
11. What are the forces acting on a glider in flight.
12. How does air density affect glider performance?
13. What effect does increasing weight or adding ballast have on glider performance?
14. What is meant by adverse yaw when entering a turn?
15. What is the proper way to recover from a high-speed spiral?
16. Is it considered proper technique to place the “stick fully forward” on stall recoveries?
17. What is the proper technique for removing slack in the towline during an aero tow?
18. What are the standard soaring signals?
19. What are the pilot in command recency of experience requirements?
20. Where can the operating limitations for an aircraft be found?
21. How do you determine whether required inspections have been performed on a glider?
22. When is the use of supplemental oxygen required?
23. What are the requirements for acting as pilot in command of an aircraft towing a glider?
24. What is the minimum distance from a cloud formation for VFR glider operations outside of controlled airspace.
25. Is a total energy variometer responsive only to a change in total energy of the sailplane?
26. What is the band of clear air which often appears between the mountains and the first lenticular cloud called?
27. When is the intensity of the vortices created by large aircraft the greatest?
28. What radial of a VOR station are you on if you select 240° with the omnibearing selector (OBS), and receive a “FROM” indication with the Course Deviation Indicator needle centered?
29. Should you use the UNICOM frequency 123.0 MHz when landing at airports that are not served by an ATC tower or FSS?
30. In which publication would you expect to find rules pertaining to aircraft accidents, incidents, and overdue aircraft?

NOTE: Applicants taking the Flight Instructor—Glider Written Test will be provided an Aeronautical Sectional Chart for use in the hypothetical cross-country included in the scenario portion of the test.

APPENDIX

The appendix contains selected illustrations to familiarize applicants with certain material pertaining to Glider flight instruction, and to encourage further study in these subject areas.

Sample Test Illustrations

WEATHER INFORMATION

STATION IDENTIFIERS	
ABQ	- Albuquerque, New Mexico
FMN	- Farmington, New Mexico
FLG	- Flagstaff, Arizona
GNT	- Grants, New Mexico
INW	- Winslow, Arizona
PHX	- Phoenix, Arizona
PRC	- Prescott, Arizona
SAF	- Santa Fe, New Mexico
TUS	- Tucson, Arizona
ZUN	- Zuni, New Mexico

FIGURE 1.

LETTER DESIGNATORS FOR REPORTS AND FORECASTS	
FT	- Terminal Forecasts
FA	- Area Forecasts
FD	- Winds Aloft Forecasts
WS	- SIGMET - Weather significant to safety of all aircraft
WA	- AIRMET - Weather phenomena of operational interest to all aircraft, but potentially hazardous to aircraft of limited capability.
UA	- Pilot Report
SA	- Hourly Sequence Report
WW	- Severe Weather Forecasts
AC	- Severe Weather Outlooks
SD	- Individual Single Station Radar Report

FIGURE 2.

WEATHER INFORMATION

EXCERPTS FROM SLC AREA FORECAST

SLC FA 111240
13Z FRI - 07Z SAT
OTLK 07Z SAT - 19Z SAT

UTAH NEV IDA MONT ARIZ CALIF ORE WASH CSTL WTRS

HGTS ASL UNLESS NOTED

SYNS. LO PRES OVR SRN NEV WL MOV TO SWRN UTAH BY 01Z.
WK DFUS STNRY FNT WL CONT EXTRM WRN ARIZ.

SIGCLD AND WX.

.....

ARIZ. CLR UNTIL SCTD CU DVLP OVR MTNS DURG AFTN. 120-
140 SCT WITH A FEW HIGH LVL SHWRS MTNS UNTIL 03Z. SFC WNDS
LCLY 2325G35 BY 18Z. OTLK. VFR.

.....

ICG. LGT ICGIC. FRZG LVL 135-145.

FIGURE 3.

SELECTED TERMINAL FORECASTS

FT 111040

INW 111111 O. 19Z 8001200 2525G35. 02Z 1000. 05Z VFR..
PRC 111111 O. 17Z 800C1200 2320G30. 02Z C1500. 05Z VFR..
FLG 111111 O. 17Z 800C1200 2020G30. 02Z C1200 2315G25.
05Z VFR..

FMN 111111 O. 19Z C800 2320 OCNLY C700 BRF RW- VCNTY.
03Z C1000. 05Z VFR..

ABQ 111111 O. 19Z 8001200 2020 OCNLY C800 2525G30. 02Z 1000.
05Z VFR..

FIGURE 4.

WINDS ALOFT FORECASTS (FD)
10Z - 22Z (0300MST - 1500MST)

FT	3000	6000	9000	12000	18000
ABQ		2020	2325+10	2730+03	2740-10
FMN	1915	1920+18	2030+10	2040+02	2140-10
PRC		2715+20	2830+12	2940+05	3040-10
BLD		2816+22	3032+14	3131+07	3242-12
BCE		3018+24	3234+16	3444+09	3444-14

FIGURE 5.

SELECTED AVIATION WEATHER REPORTS
0700 MST

SA 111400Z
 PRC 140-020+064/60/32/1810/985
 FLG 120-015+ 055/55/18/1812018/993
 INW 100060 045/55/26/1810/998
 ZUN 120020+ 070/55/30/2005/995
 GNT 120-035 065/55/31/0000/001
 PHX 900120-045 075/70/30/2704/HK ALQDS
 TUS E1500300050 060/75/35/1810/983

SELECTED AVIATION WEATHER REPORTS
0800 MST

SA 111500Z
 PRC 130045 067/68/31/2728/991
 FLG 120020+ 065/60/30/2015/993
 INW 100060+ 047/65/31/1815/989
 ZUN 100-025 065/60/33/2310/999
 GNT 1200300-035 060/65/32/1810G15/000
 PHX 1000120-035 082/75/33/2705/HK ALQDS
 TUS E1500300070 075/75/32/2315/985

FIGURE 6.

PILOT REPORTS

UA 111300Z

N MEX

GNT 40 W GNT MDT TURBC 105 BN35. FLG AREA LGT TURBC SFC
TO 104 PA23. ZUN-INW MDT TURBC 95 C310
ZUN V-62 SAF MDT TURBC 120 C182
ZUN-GNT MDT TURBC INCRG 95 C172

ARIZ

50 E PRC LGT-MDT TURBC 105 PA24
ZUN-INW MDT TURBC 95 C310
INW-PRC MDT OCNLY SVR TURBC 105 PA22

FIGURE 7.

IN-FLIGHT ADVISORIES

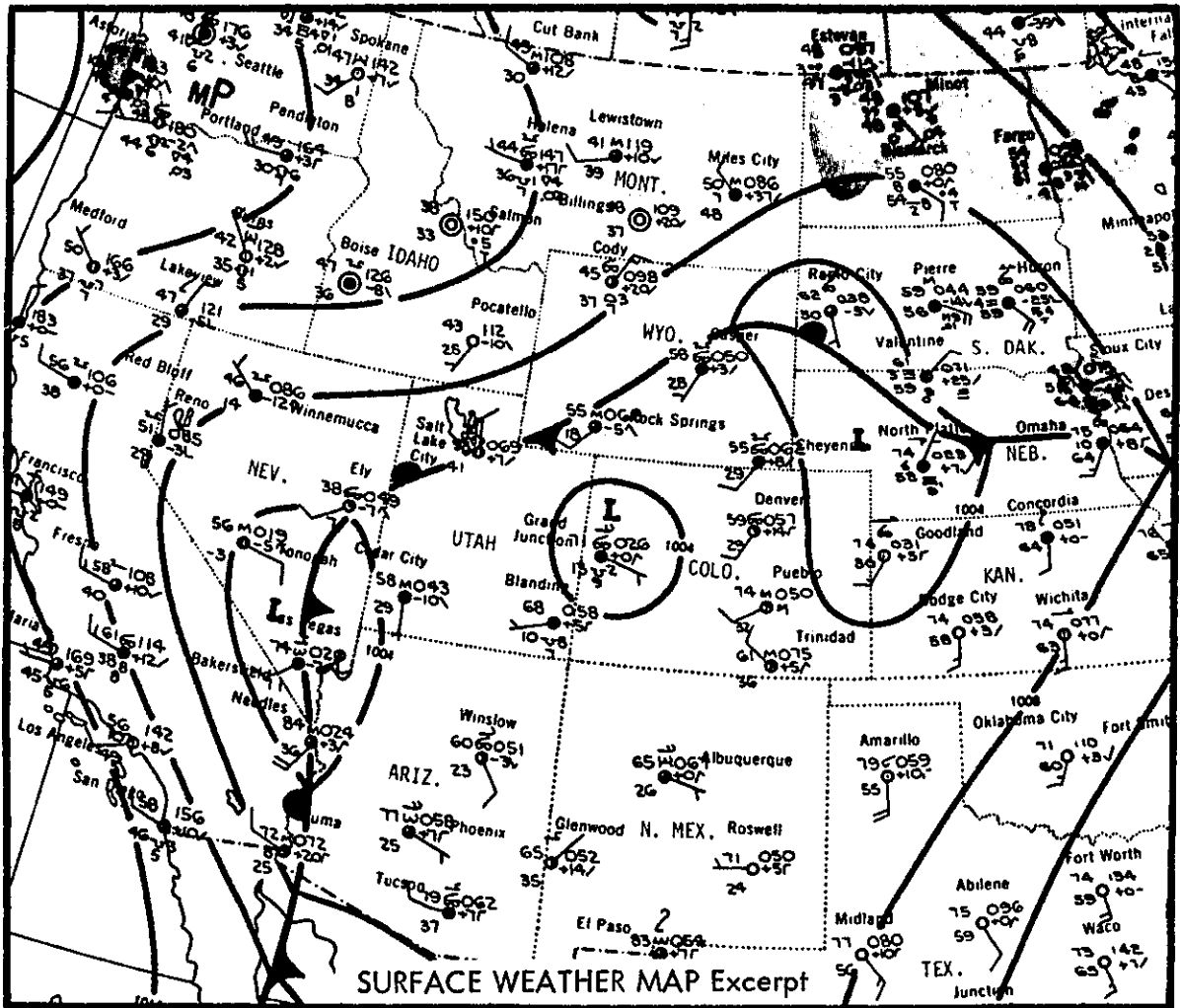
SLC WAC 111345
111345-UFN

AIRMET ALPHA 1. FLT PRCTN. NRN ARIZ AND W OF CONTEVD IN NRN N
MEX LGT TO MDT TURBC BLO 80 WITH STRONG DWDRFTS OVR LEE SLPS.
CONT AIRMET UNTIL CNCL NOTICE IS RCVD

SLC WA 112320
112320-120200

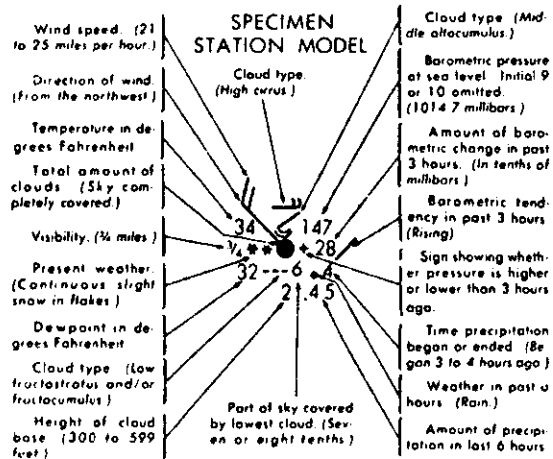
AIRMET ALPHA 2. CNCL AIRMET ALPHA 1. FLT PRCTN. NRN ARIZ NRN
N MEX MDT TURBC BLO 140 DCRG TO LGT BY 02Z

FIGURE 8.



SURFACE WEATHER MAP Excerpt

FIGURE 9.



KEY TO AVIATION WEATHER REPORTS.....

LOCATION IDENTIFIER AND TYPE OF REPORT	SEY AND CEILING	VISIBILITY WEATHER AND OBSTRUCTION TO VISION	SEA LEVEL PRESSURE	TEMPERATURE AND DEW POINT	WIND	ALTIMETER SETTING	RUNWAY VISUAL RANGE	CODED PREFIX		
MKC 150M250	1R-K	1R-K	132	/58/56	/1807	/993/	R04LVR20V40	/055		
<p>KEY Sky cover symbols are in ascending order. Figure preceding symbols are heights in hundreds of feet above station. Sky cover symbols are: ○ Clear: Less than 0.1 sky cover ⊖ Scattered: 0.1 to less than 0.6 sky cover ⊕ Broken: 0.6 to 0.9 sky cover ⊙ Overcast: More than 0.9 cover - Thin (When prefixed to the above symbols) - Partly obscured: 0.1 to less than 1.0 sky hidden by precipitation or obstruction to vision (bases at surface) + Obscured: 1.0 sky hidden by precipitation or obstruction to vision (bases at surface)</p>		<p>WEATHER AND OBSTRUCTION TO VISION SYMBOLS A Mist IC Ice Crystals BW Rain Showers BD Blowing Dust IF Ice Fog S Snow BN Blowing Sand IP Ice Pellets SP Snow Grains BS Blowing Snow IPW Ice Pellets SW Snow Showers D Dust Showers T Thunderstorm F Fog S Smoke T+ Severe Thunderstorm GF Ground fog L Drizzle ZL Freezing Drizzle H Mist B Rain ZR Freezing Rain</p> <p>Precipitation intensities are indicated thus: - Very light - light (no sign) Moderate + Heavy</p>			<p>WIND Direction in tens of degrees from true north, speed in knots. 9999 indicates calm. G indicates gully. Peak speed follows G or Q when gusts or squalls are reported. The contraction W/SWIFT followed by local time groups in roman numerals indicates windshift and its time of occurrence (Knots ± 1.5 statute miles). EXAMPLES: 3627 260 Degrees 27 Knots 3627G40 260 Degrees 27 Knots. Peak speed in gusts 40 knots</p>		<p>RUNWAY VISUAL RANGE (RVR) RVR is reported from some stations. Extreme values for 10 minutes prior to observation are given in hundreds of feet. Runway identification precedes RVR report.</p> <p>CODED PREFIX Prefix reports of clouds not visible from ground are coded with MSL height data preceding and/or following sky cover symbol to indicate cloud bases and/or tops, respectively.</p> <p>RECORDED REPORT RANGL C-17. Record observation: 1500 feet scattered measured ceiling 2500 feet overcast visibility 1 mile light rain smoke sea level pressure 1013.2 millibars temperature 58°F dewpoint 54°F wind 180° 7 knots altimeter setting 29.93 inches runway 04 left visual range 2000 ft variable to 6000 ft top reports top of overcast 3500 feet (MSL)</p> <p>TYPE OF REPORT The omission of type of report data identifies a scheduled record observation for the hour specified in the sequence heading. The time of an out of sequence special observation is given as S followed by a time group (24 hour clock GMT) e.g. P17 S 0715 24010. A special indicates a significant change in one or more elements. Local reports are identified by ICL and a time group 1000s are transmitted on local frequency circuits only.</p>			
<p>CEILING Letter preceding height of layer identifies ceiling layer and indicates how ceiling height was obtained. Thus: A Aircraft B Radar R Bottom (ceiling or pilot or raob) W Indefinite E Estimated V Immediately following numerical value indicates a variable ceiling height M Measured</p>										

<p>TERMINAL FORECASTS contain information for specific airports on ceiling, cloud heights, cloud amount, visibility, weather condition and surface wind. They are written in a form similar to the AVIATION WEATHER REPORT.</p> <p>CEILING Identified by the letter 'C'. CLOUD HEIGHTS in hundreds of feet above the station (ground). CLOUD LAYERS Stated in ascending order of height. VISIBILITY in statute miles, but omitted if over 8 miles. SURFACE WIND in tens of degrees and knots, omitted when less than 10.</p> <p>EXAMPLE OF TERMINAL FORECASTS</p> <p>C150 Ceiling 1500', broken clouds O11/20F Clear, visibility one and one-half miles, ground fog</p> <p>C311/45+ Sky obscured, vertical visibility 500 ft, visibility one-fourth mile, heavy snow 7000Z0604 2320 Scattered clouds at 7000' ceiling 7000' overcast visibility 8 miles smoke surface wind 330 degrees 30 knots gusty</p> <p>AREA FORECASTS are 18-hour forecasts plus 12-hour OUTLOOKS of cloud, weather and frontal conditions for an area the size of several states. Heights of cloud tops, and icing are ABOVE SEA LEVEL (ASL), ceiling heights, ABOVE GROUND LEVEL (AGL), base of cloud layers are ASL unless indicated.</p>	<p>SIGMET or AIRMET warnings given in flight of potentially hazardous weather such as squall lines, thunderstorms, fog, icing and turbulence. AIRMET concerns less severe conditions which may be hazardous to some aircraft or to relatively inexperienced pilots. Both are broadcast by FAA on NAVVAD voice channels.</p> <p>WINDS AND TEMPERATURES ALOFT (FD) FORECASTS are computer prepared forecasts of wind direction (nearest 10° true) and speed (knots) for selected flight levels. Temperatures are forecast for all levels shown except that no forecasts are issued for the 3000 ft level or other levels within 2500 feet of a station's elevation.</p> <p>EXAMPLES OF WINDS AND TEMPERATURES ALOFT (FD) FORECASTS</p> <p>FD WSC 131743 BASED ON 131200Z DATA VALID 140800Z FOR US 1600-2300Z TEMPS NEG ABV 24000</p> <p>FT 3000 6000 9000 12000 15000 24000 30000 34000 39000</p> <p>WS 2137 3433-07 3470-11 3421-16 3516-27 3512-38 3116-49 2934-51 2834-51</p> <p>TP 3876 3337-08 3326-12 3322-16 3128-27 2922-39 2642-60 2851-58 2857-60</p> <p>An 6000 foot AGL over IPE wind from 330° at 27 knots and temperature minus 8° C</p>
<p>PILOTS... report in-flight weather to nearest FSS</p>	

FIGURE 10.

SEGMENTED CIRCLE

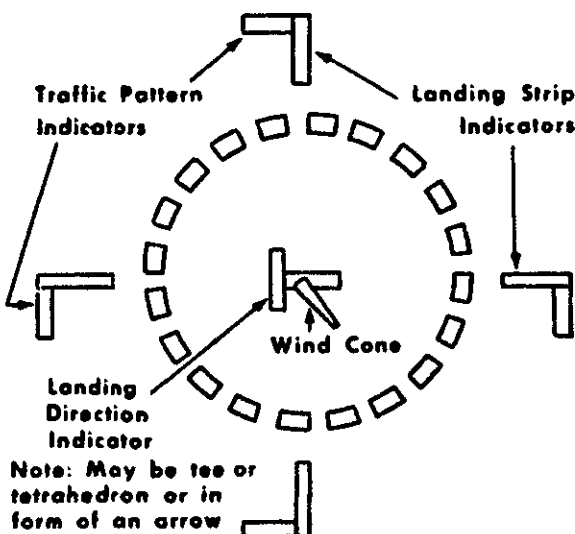


FIGURE 11.

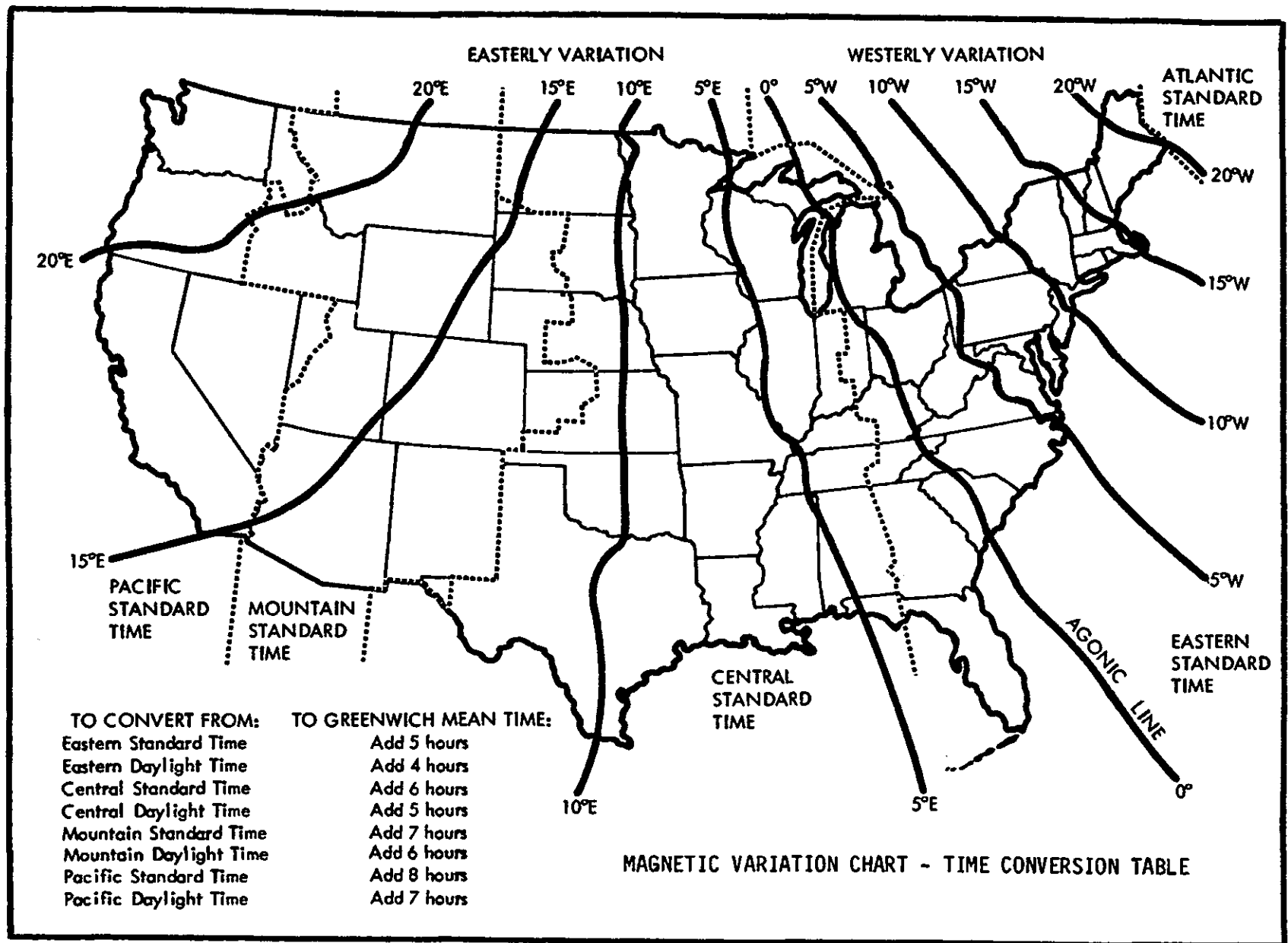
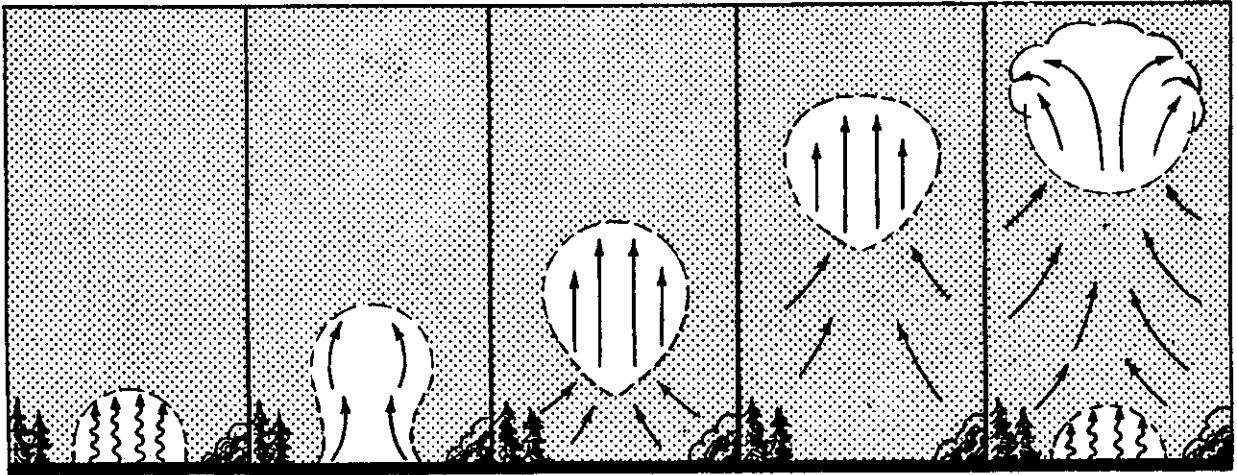


FIGURE 12.



PROGRESSIVE STAGES OF A THERMAL BUBBLE

FIGURE 13.

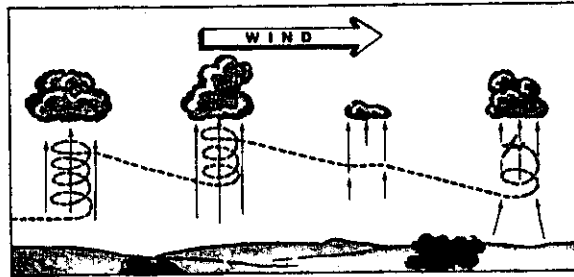
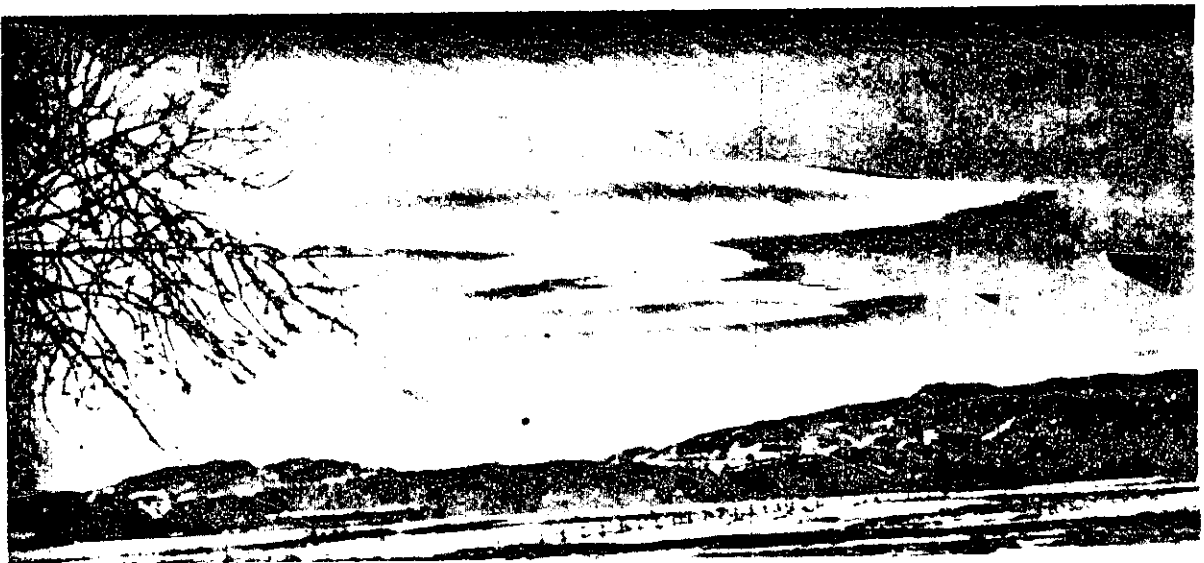
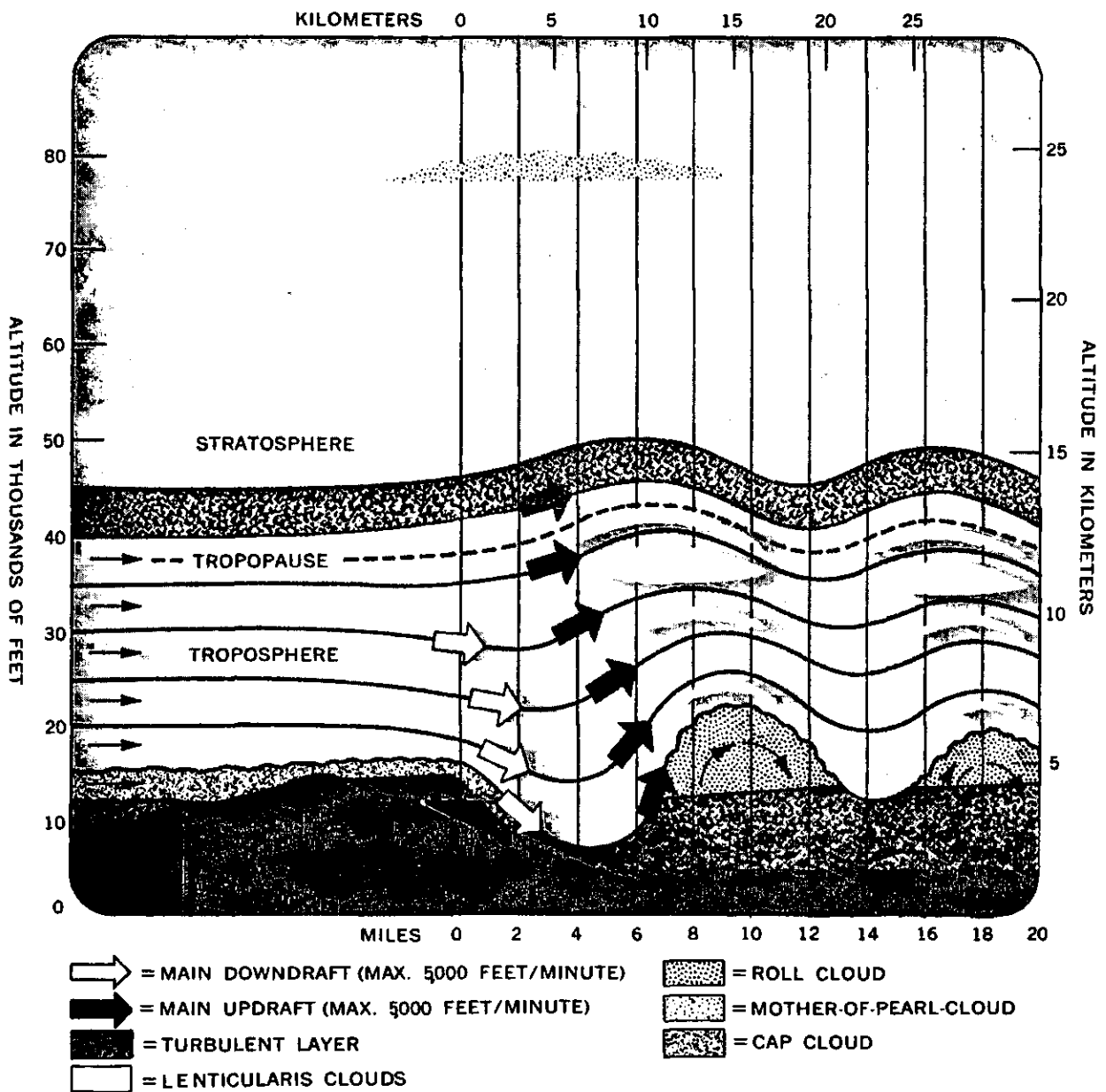


FIGURE 14. Method of utilizing thermals and prevailing wind in distance flight.



LENTICULAR CLOUD

FIGURE 15.



SCHMATIC CROSS SECTION OF MOUNTAIN WAVES

FIGURE 16.

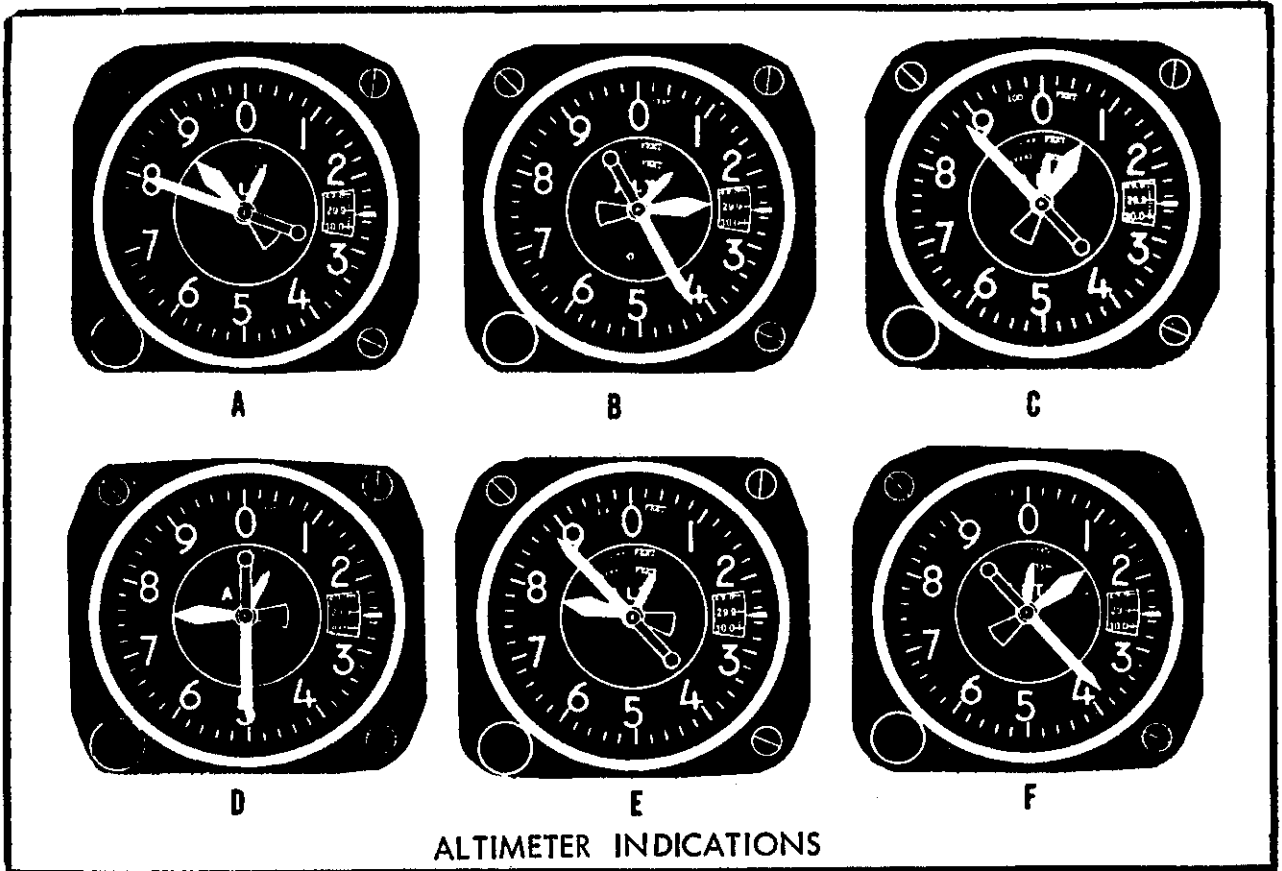


FIGURE 17.

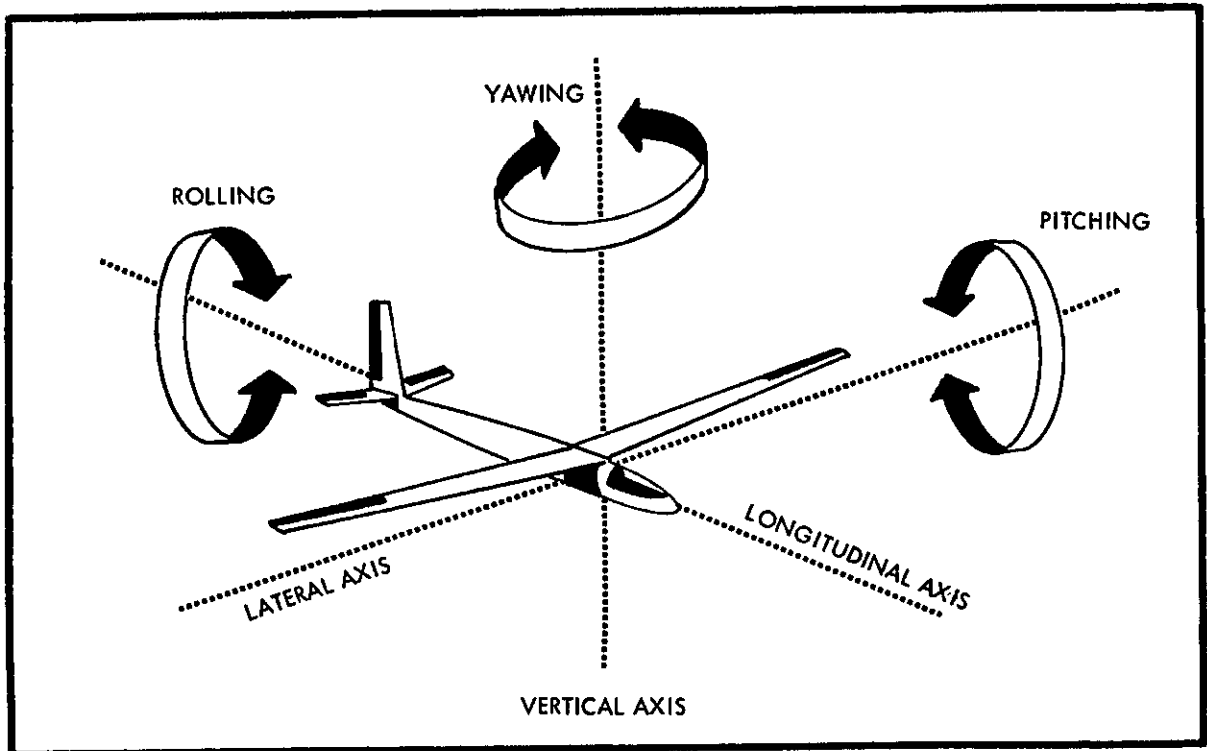
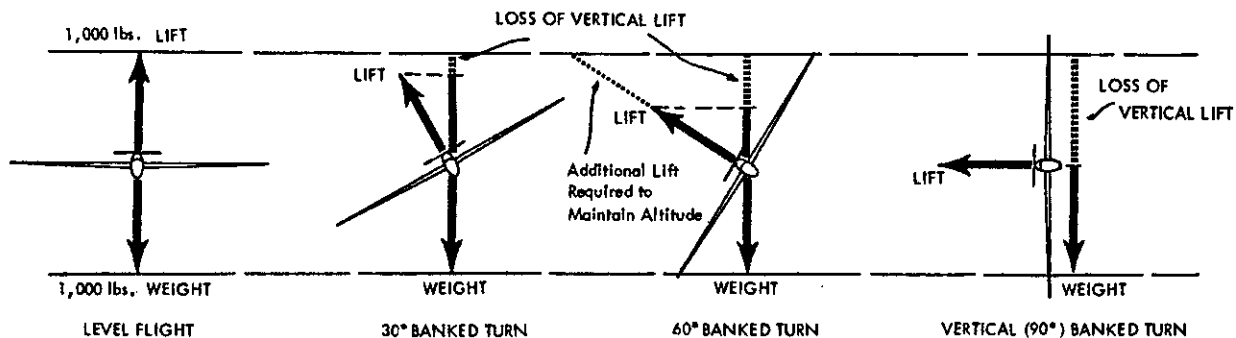


FIGURE 18.

NOTE: THE ARROWS  USED IN THESE ILLUSTRATIONS REPRESENT EQUAL FORCES.



IN A TURN —

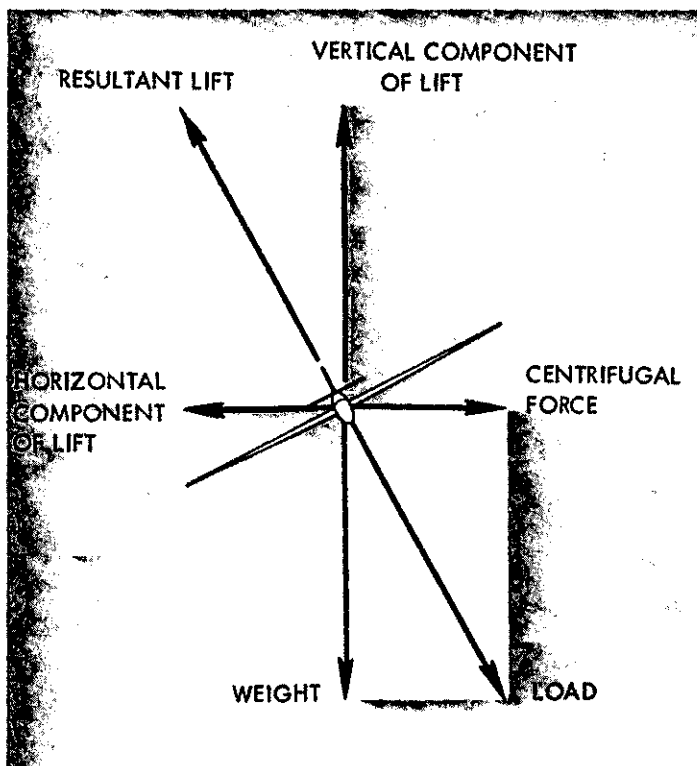
ALL LIFT DOES NOT ACT DIRECTLY OPPOSITE WEIGHT.

LIFT ACTS PERPENDICULAR TO THE WING SPAN — UPWARD AND INWARD IN THE DIRECTION OF THE BANK.

TO COMPENSATE FOR LOSS OF VERTICAL LIFT THE ANGLE OF ATTACK MUST BE INCREASED — TO MAINTAIN ALTITUDE.

IT IS IMPOSSIBLE TO MAINTAIN ALTITUDE IN CONTINUOUS VERTICAL (90°) BANKED TURNS.

FIGURE 19.



**NORMAL TURN —
CENTRIFUGAL FORCE EQUALS HORIZONTAL LIFT.**

FIGURE 20.

DESIGN DATA

Wing Span	51'	Empty Weight	600 lbs.
Length	25'9"	Gross Weight	1,040 lbs.
Height	9' 3-1/2"	Wing Area	219.5 sq. ft.
Aspect Ratio	11.85	Wing Loading	4.74 psf

PERFORMANCE

Max. Speed	98 mph	Stall (Dual)	35 mph
Airplane Tow	98 mph	L/D mph Solo	22.25 to 1 at 45
Auto Winch	69 mph	L/D mph Dual	22.25 to 1 at 52
Dive Brake			
Extend. Max.	98 mph	Sink Speed Solo	2.6 fps at 38
Stall (solo)	31 mph	Sink Speed Dual	3.1 fps at 42

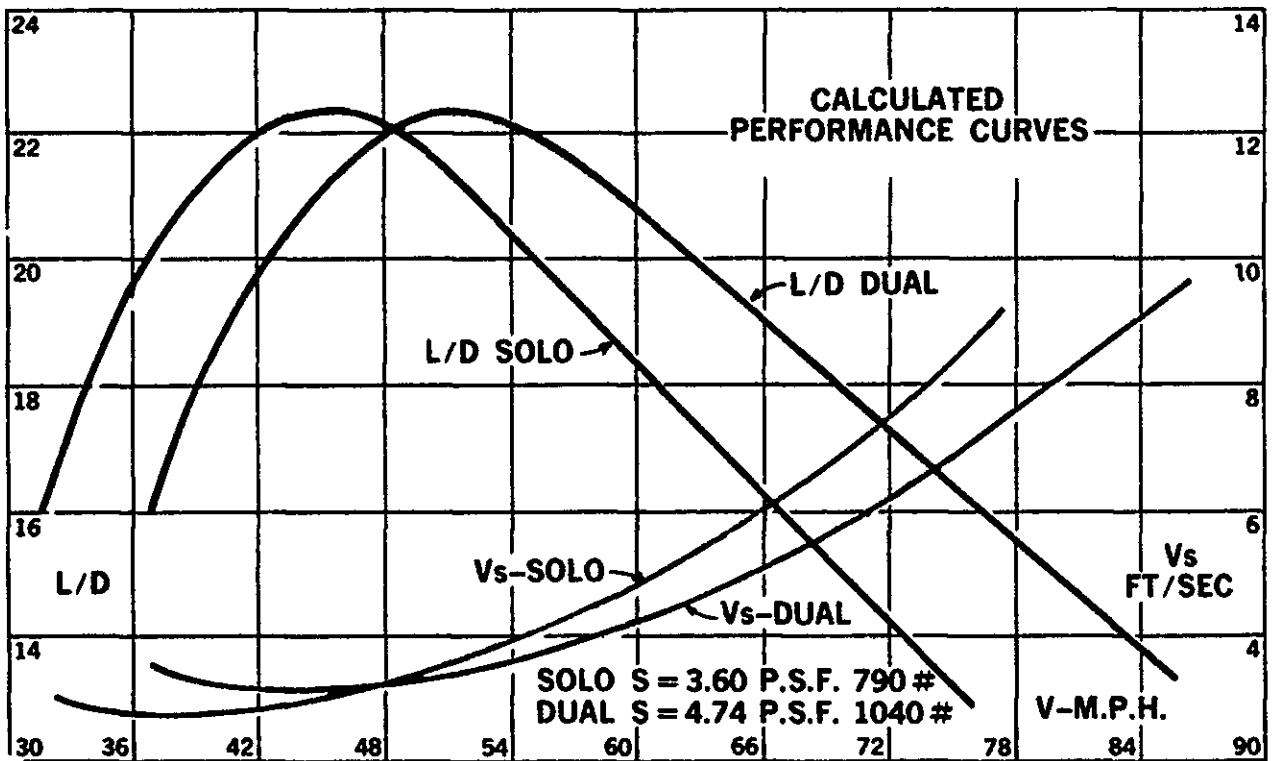
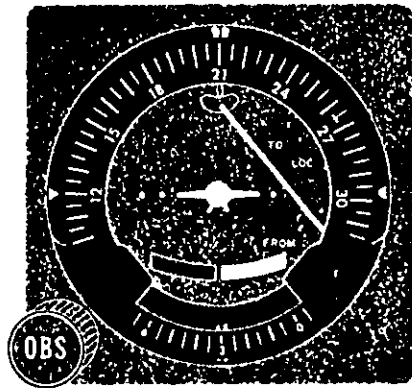
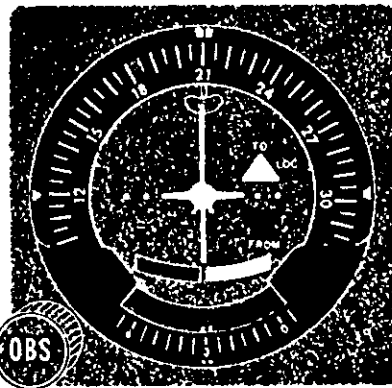


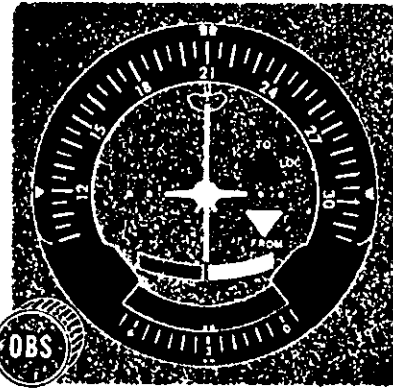
FIGURE 21.



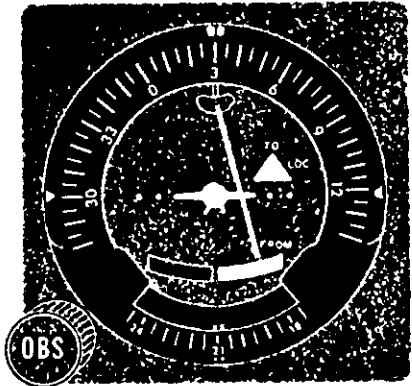
U



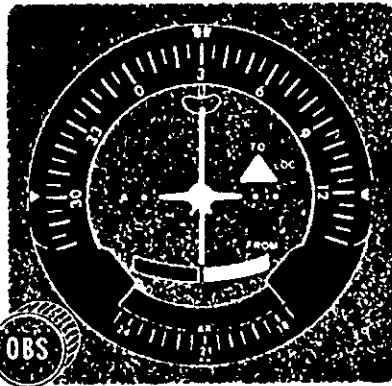
V



W



X



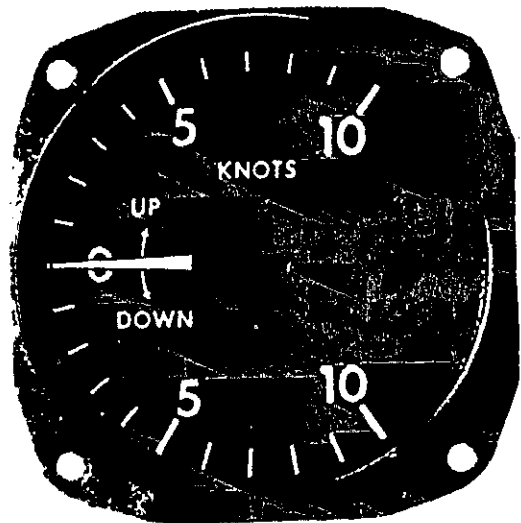
Y



Z

OMNIBEARING - COURSE DEVIATION INDICATORS

FIGURE 22.



VARIOMETER

FIGURE 23.

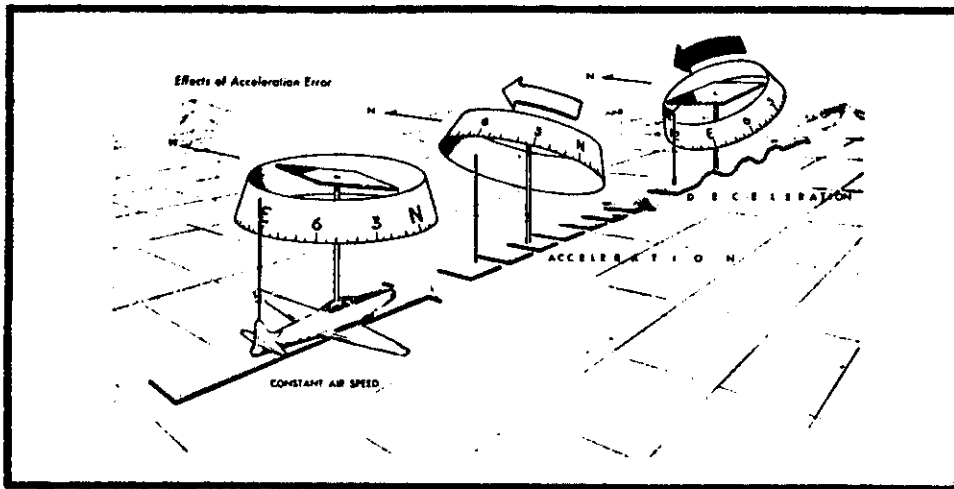


FIGURE 24.

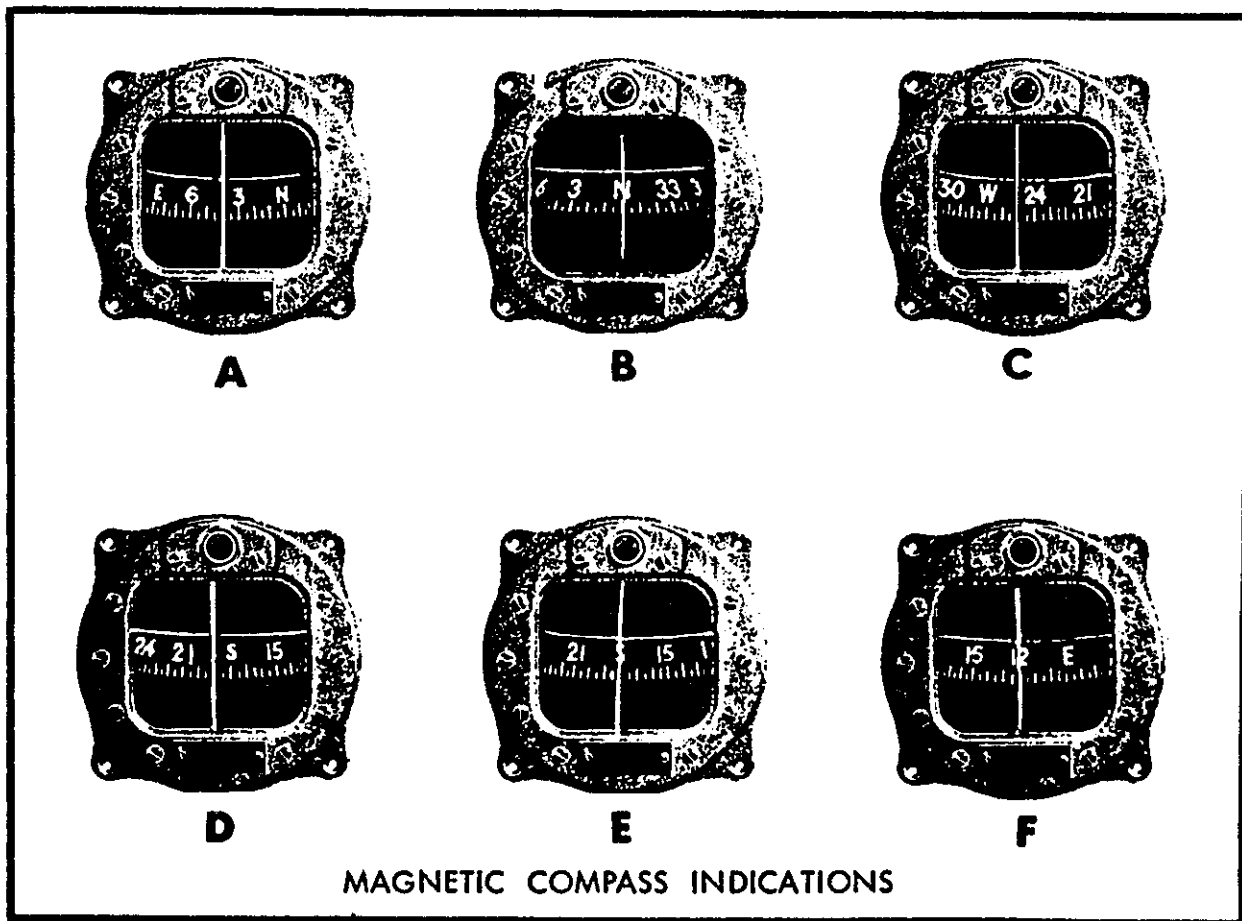


FIGURE 25.

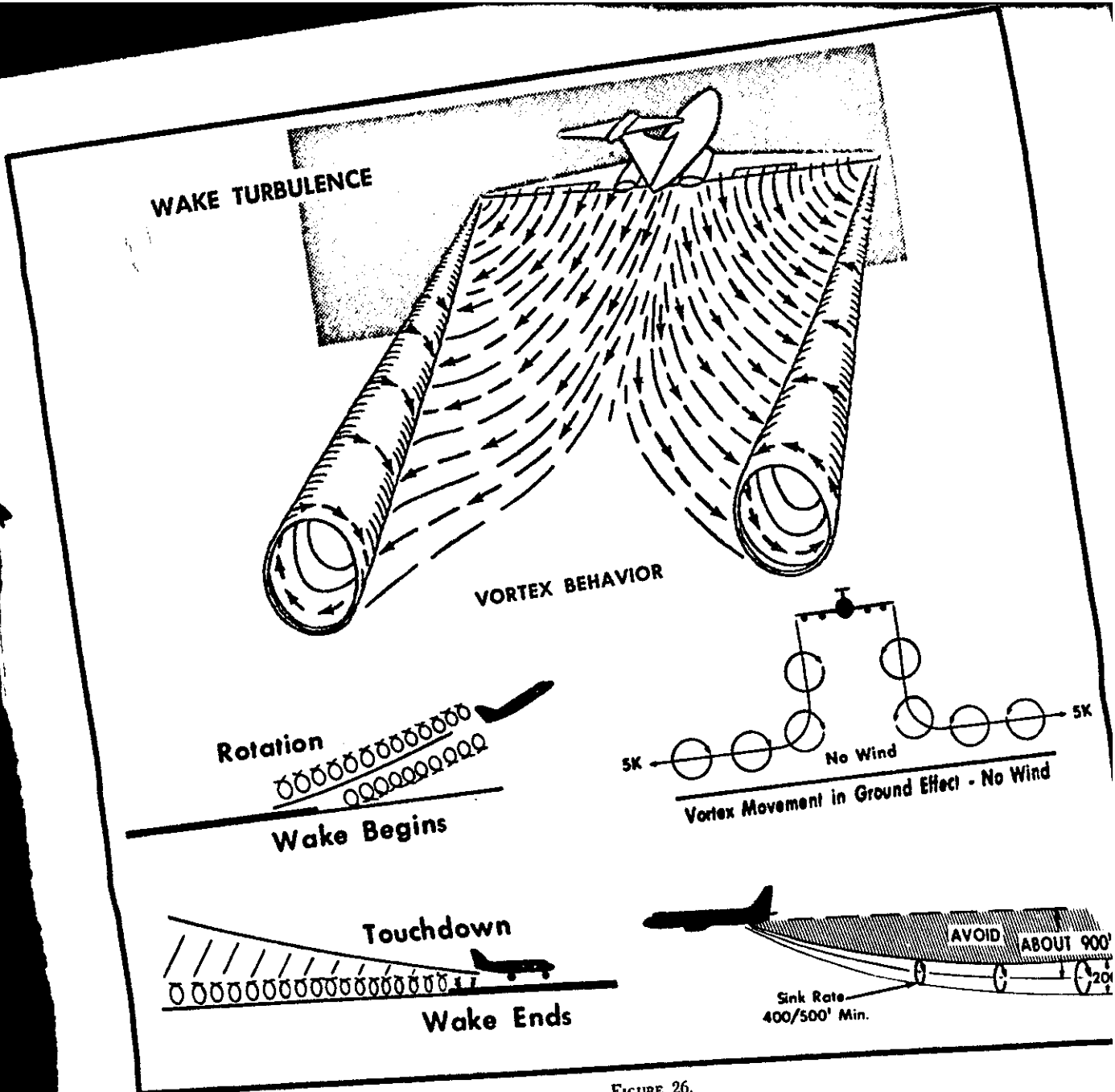


FIGURE 26.

AIRMAN'S INFORMATION MANUAL (AIM)

Excerpt

AIRPORT/FACILITY DIRECTORY

The Airport Directory in this publication is limited to airports with control towers and/or instrument landing systems. See Part 2 for a complete listing of all public use airports.

Note: All times are local time unless otherwise indicated.

LOCATION

The airport location is given in nautical miles (to the nearest mile) and direction from center of referenced city.

ELEVATION

Elevation is given in feet above mean sea level and is based on highest usable portion of the landing area. When elevation is sea level, elevation will be indicated as "00." When elevation is below sea level, a minus sign (-) will precede the figure.

RUNWAYS

The runway surface length, and weight bearing capacity are listed for the longest instrument runway or sealane, or the longest active landing portion of the runway or strip, given to the nearest hundred feet, using 70 feet as the division point, i.e., 1460 feet would be shown as "14"; 1470 feet would be shown as "15". Runway lengths prefixed by the letter "H" indicates that runways are hard surfaced (concrete; asphalt; bitumen, or macadam with a seal coat). If the runway length is not prefixed, the surface is sod, clay, etc. The total number of runways available is shown in parenthesis. (However, only hard surfaced runways are counted at airfields with both hard surfaced and sod runways.)

RUNWAY WEIGHT BEARING CAPACITY

Runway strength data shown in this publication is derived from available information and is a realistic estimate of capability at an average level of activity. It is not intended as a maximum allowable weight or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights of 25-50% in excess of the published figures. Permissible operating weights, insofar as runway strengths are concerned, are a matter of agreement between the owner and user. When desiring to operate into any airport at weights in excess of those published in this publication, users should contact the airport management for permission.

Add 000 to figure following S, D, DT and MAX for gross weight capacity, e.g., (S-000).

S—Runway weight bearing capacity for aircraft with single-wheel type landing gear. (DC-3), etc.

D—Runway weight bearing capacity for aircraft with dual-wheel type landing gear. (DC-6), etc.

DT—Runway weight bearing capacity for aircraft with dual-tandem type landing gear. (707), etc.

Quadricycle and dual-tandem are considered virtually equal for runway weight bearing considerations, as are single-tandem and dual-wheel.

Omission of weight bearing capacity indicates information unknown. Footnote remarks are used to indicate a runway with a weight bearing greater than the longest runway.

LIGHTING

B: Rotating Beacon. Green and white, split-beam and other types.

L: Field Lighting. An asterisk (*) may precede an element to indicate that it operates on prior request only (by phone call).

4—Low Intensity Runway

5—Medium Intensity Runway

6—High Intensity Runway

7—Instrument Approach (neon)

7A—Medium Intensity Approach Lights (MALS)

8—High Intensity Instrument Approach (ALS)

10—Visual Approach Slope Indicator (VASI)

11—Runway end identifier lights (threshold strobe) (REIL)

12—Short approach light systems (SALS)

13—Runway alignment lights (RAIL)

14—Runway centerline

15—Touchdown zone

Because the obstructions on virtually all lighted fields are lighted, obstruction lights have not been included in the codification.

SERVICING

52: Minor airframe repairs.

53: Minor airframe and minor powerplant repairs.

54: Major airframe and minor powerplant repairs.

55: Major airframe and major powerplant repairs.

FUEL

(Fuel data includes each grade available.)

Code	Grade
F12	80/87
F15	91/98
F18	100/130
F22	115/145
F30	Kerosene, freeze point -40°F
F34	Kerosene, freeze point -58°F
F40	Wide-cut gasoline, freeze point -60°F
F45	Wide-cut gasoline without icing inhibitor, freeze point -60°F

OXYGEN

Ox1 High Pressure

Ox2 Low Pressure

Ox3 High Pressure—Replacement Bottles

Ox4 Low Pressure—Replacement Bottles

FIGURE 27.

OTHER

- NOTAM** Service is provided. Applicable only to airports with established instrument approach procedures, or high volume VFR activity.
- AOE**—Airport of Entry—A customs Airport of Entry where permission from U.S. Customs is not required, however, at least one hour advance notice of arrival must be furnished.
- AVASI**—Abbreviated Visual Approach Slope Indicator—2 boxes.
- FSS**—The name of the associated FSS is shown in all instances. When the FSS is located on the named airport, "on fld" is shown following the FSS name. When the FSS can be called through the local telephone exchange, (Foreign Exchange) at the cost of a local call, it is indicated by "(LC)" (local call) with the phone number immediately following the name of the FSS, i.e., "FSS: WICHITA (LC481-5867)." When an Interphone line exists between the field and the FSS, it is indicated by "(DL)" (direct line) immediately following the name of the FSS, i.e., "FSS: OTTO (DL)."
- IFR**—Airport with approved FAA Standard Instrument Approach Procedure.
- LRA**—Landing Rights Airport—Application for permission to land must be submitted in advance to U.S. Customs. At least one hour advance notice of arrival must also be furnished.
- REIL**—Runway end identifier lights (threshold strobe).
- RVV**—Runway Visibility Values, applicable runway provided.
- RVR**—Runway Visual Range, applicable runway provided.
- TPA**—Traffic Pattern Altitude—This information is provided for only those airports without a 24-hour operating control tower or FSS.
- TRI-VAS**—Tri-Color Visual Approach Slope Aid.
- VASI**—Visual Approach Slope Indicator, applicable runway provided.
- TCH**—Threshold Crossing Height.
- RRP**—Runway Reference Point.

AIRPORT REMARKS

Aircraft Categories—Category I—Light-weight, single-engine, personal-type propeller driven aircraft. (Does not include higher performance single-engine aircraft such as the T-28.)

Category II—Light-weight, twin engine, propeller driven aircraft weighing 12,500 pounds or less such as the Aero Commander, Twin Beechcraft, DeHavilland Dove, Twin Cessna. (Does not include such aircraft as a Lodestar, Learstar, DC-3).

Category III—All other aircraft such as the higher performance single-engine, heavy twin-engine, four engine and turbojet aircraft.

"**FE**" indicates landing charges for private or non-revenue producing aircraft. In addition, fees may be charged for planes that remain over a couple of hours and buy no services, or at major airline terminals for all aircraft.

"**Rgt** **13-31**" indicates right turns should be made on landings and takeoffs on runways 13 and 31.

Remarks data are confined to operational items affecting the status and usability of the airport, traffic patterns and departure procedures.

Obstructions—Because of space limitations only the more dangerous obstructions are indicated. Natural obstructions, such as trees, clearly discernible for contact operations, are frequently omitted. On the other hand, all pole lines within at least 15:1 glide angle are indicated.

FLIGHT SERVICE STATIONS

Flight Service Station (FSSs) and Combined Station/Tower (CS/Ts) are listed alphabetically by state in the Airport/Facility Directory. At certain locations the preflight briefing and flight plan processing responsibilities of the CS/T have been reassigned to an adjacent FSS. At these locations the adjacent FSS will be listed as the 'Associated FSS,' otherwise, the CS/T will be listed. Limited Remote Communications Outlet (LRCO) and Remote Communications Outlet (RCO), where available at the facility, are shown following the three letter identifier. If located at other than a facility site they are listed alphabetically.

FSSs and CS/Ts provide information on airport conditions, radio aids and other facilities, and process flight plans. Airport Advisory Service is provided at the pilot's request on 123.6 by FSSs located at non-tower airports or when the tower is not in operation. (See Part 1, ADVISORIES AT NON TOWER AIRPORTS.)

Aviation weather briefing service is provided by FSSs and CS/Ts; however, CS/T personnel are not certified weather briefers and therefore provide only factual data from weather reports and forecasts. Flight and weather briefing services are also available by calling the telephone numbers listed in the chapter entitled 'FSS-CS/T Information and Weather Service Office Telephone Numbers,' located in Part 2."

Limited Remote Communications Outlet (LRCO)—Unmanned satellite air/ground communications facility, which may be associated with a VOR. These outlets effectively extend service range of the FSS and provide greater communication reliability.

Remote Communications Outlet (RCO)—An unmanned satellite air to ground communications stations remotely controlled and providing UHF and VHF communications capability to extend the service range of an FSS.

Civil communications frequencies used in the FSS air/ground system are now operated simplex on 122.0, 122.2, 122.3, 122.4, 122.6, 122.7, 123.6; emergency 121.5; plus receive-only on 122.05, 122.1, 122.15 and 123.6.

a. 122.0 is assigned to selected FSSs as a weather channel for both general aviation and air carrier.

b. 122.2 is assigned to all FSSs as a common en route simplex service.

c. 123.6 is assigned as the airport advisory channel at non-tower FSS locations, however, it is still in commission at some FSSs collocated with towers to provide part-time Airport Advisory Service.

d. 122.1 is the primary receive-only frequency at VORs. 122.05, 122.15 and 123.6 are assigned at selected VORs meeting certain criteria.

e. Some FSSs are assigned 50KHz channels for simplex operation in the 122-123 MHz band (e.g. 122.351).

Pilots using the FSS A/G system should refer to this directory or appropriate charts to determine frequencies available at the FSS or remote facility through which they wish to communicate.

Part time FSS hours of operation are shown in remarks under facility name.

COMMUNICATIONS

Clearance is required prior to taxiing on a runway, taking off, or landing at a tower controlled airport.

When operating at an airport where the control tower is operated by the U.S. Government, two-way radio communication is required unless otherwise authorized by the tower. (When the tower is operated by someone other than the U.S. Government, two-way radio com-

FIGURE 28.

munication is required if the aircraft has the necessary equipment.

Frequencies transmit and receive unless specified as: T—Transmit only, R—Receive only, X—On request. Primary frequencies are listed first in each frequency grouping, i.e., VHF, LF. Emergency frequency 121.5 is available at all TOWER, APPROACH CONTROL and RADAR facilities, unless indicated as not available in remarks.

COMMUNICATIONS REMARKS

Remarks data are confined to operational items affecting the status and usability of navigational aids, such as: ILS component restrictions, part time hours of operation, frequency sectorization, VOT frequencies.

VOICE CALL

The voice call for contact with the air traffic control tower is listed at each airport assigned such a facility.

SERVICES AVAILABLE

TOWER

- Pre-Taxi Clearance Procedure
- Clearance Delivery (CLRNC DEL).
- Approach Control (App Con) Radar and Non-Radar.
- Departure Control (Dep Con) Radar and Non-Radar.
- VFR Advisory Service (VFR Adv) Service provided by Non Radar Approach Control.
- Radar Advisory Service for VFR Acft (Stage I).
- Radar Advisory and Sequencing Service for VFR Acft (Stage II).
- Radar Sequencing and Separation Service for participating VFR Aircraft, (Stage III-Terminal Radar Service Area (TRSA)).
- Radar Sequencing and Separation Service for all aircraft in a Terminal Control Area (TCA).
- Ground Control (GND CON).
- VHF Direction Finding (VHF/DF).

RADIO NAVIGATION AIDS

Included in this section is a tabulation listed by facility name of all Air Navigation Radio Aids in the National Airspace System and those upon which the FAA has approved an instrument approach. Private or military Navigation Radio Aids not in the National Airspace System are not tabulated.

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS)

ATIS is continuous broadcast of recorded non-control information in selected areas of high activity. See Part 1.

FLIGHT SERVICE STATION (FSS)

- Airport Advisory Service (AAS).
- En Route Weather Advisory Service (Flight Watch).
- Island, Mountain and Lake Reporting Service.
- Remote Weather Radar Display (WR).
- VHF Direction Finding (DF).

UNICOM

A private aeronautical advisory communications facility operated for purposes other than air traffic control, transmits and receives on one of the following frequencies:

- U-1—122.8 MHz for Landing Areas (except heliports) without an ATC Tower or FSS;
- U-2—123.0 MHz for Landing Areas (except heliports with an ATC Tower or FSS;
- U-3—123.05 MHz for heliports with or without ATC Tower or FSS;
- U-4—122.85 MHz for landing areas not open to the public;

U-5—122.95 MHz for landing areas not open to the public.

NOTE.—UNICOM used for communications must be licensed by the Federal Communications Commission.

RADIO CLASS DESIGNATIONS

Identification of VOR/VORTAC/TACAN Stations by Class (Operational Limitations):

Class	Normal Usable Altitudes and Radius Distances	
	Altitudes	Distance (miles)
T	12,000' and below	25
L	Below 18,000'	40
H	Below 18,000'	40
H	14,500' — 17,999'	100*
H	18,000' — FL 450	130
H	Above FL 450	100

*Applicable only within the contiguous 48 States.
(H)=High (L)=Low (T)=Terminal

NOTE: An H facility is capable of providing L and T service volume and an L facility additionally provides T service volume.

The term VOR is, operationally, a general term covering the VHF omnidirectional bearing type of facility without regard to the fact that the power, the frequency-protected service volume, the equipment configuration, and operational requirements may vary between facilities at different locations.

- AB ----- Automatic Weather Broadcast (also shown with \blacksquare following frequency).
- B ----- Scheduled Broadcast Station (broadcasts weather at 15 minutes after the hour.
- DME ----- UHF standard (TACAN compatible) distance measuring equipment.
- H ----- Non-directional radio beacon (homing), power 50 watts to less than 2,000 watts.
- HH ----- Non-directional radio beacon (homing), power 2,000 watts or more.
- H-SAB ----- Non-directional radio beacons providing automatic transcribed weather service.
- ILS ----- Instrument Landing System (voice, where available, on localizer channel).
- LDA ----- Localizer Directional Aid.
- LMM ----- Compass locator station when installed at middle marker site.
- LOM ----- Compass locator station when installed at outer marker site.
- MH ----- Non-directional radio beacon (homing) power less than 50 watts.
- S ----- Simultaneous range, homing signal and/or voice.
- SABH ----- Non-directional radio beacon not authorized for IFR or ATC. Provides automatic weather broadcasts.
- SDF ----- Simplified Direction Facility.
- TACAN ----- UHF navigational facility—omnidirectional course and distance information.
- VOR ----- VHF navigational facility—omnidirectional, course only.
- VOR/DME -- Collocated VOR navigational facility and UHF standard distance measuring equipment.
- VORTAC --- Collocated VOR and TACAN navigational facilities.
- W ----- Without voice on radio facility frequency.
- Z ----- VHF station location marker at a LF radio facility.

FIGURE 29.

AIRPORT/FACILITY DIRECTORY

SAMPLE

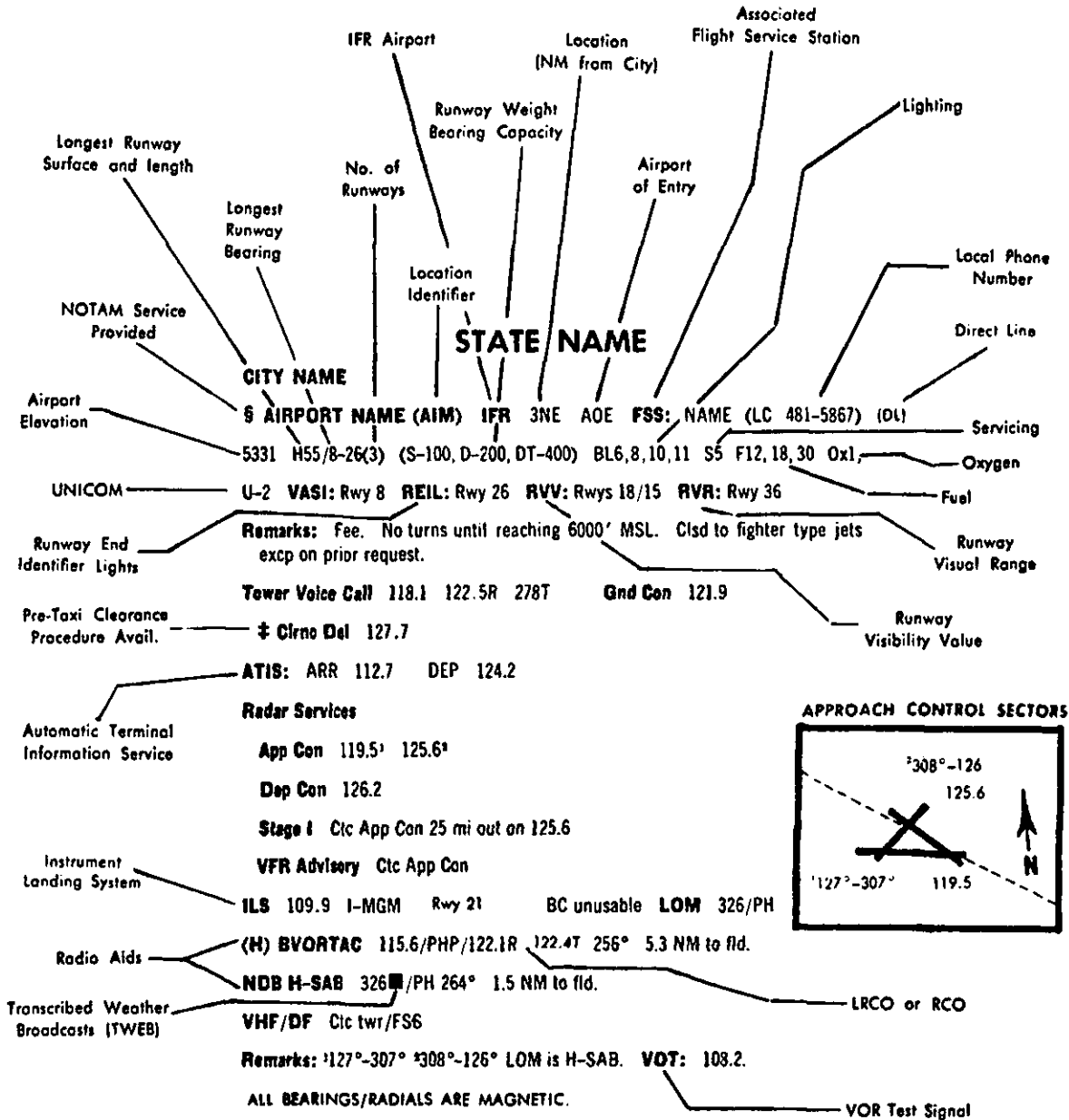


FIGURE 30.

AIRPORT/FACILITY DIRECTORY

ALABAMA—Continued

MUSCLE SHOALS FSS 121.5 122.1R 122.2 122.4T 123.6 **DF**
§ MUSCLE SHOALS IFR (MSL) 1E FSS: MUSCLE SHOALS on fld
 550 H60/11-29(2) (S-38, D-53, DT-75) BL5,6 S5 F12,18,34 O×2 U2
 Remarks: Rwy 18-36 (S-53, D-78, DT-135). Attended daylight
 hrs, nghts phone 766-2203, ngt service charge. During a calm
 wind condition the preferred rwy is 29.
Radar Services:
 Huntsville App Con 120.35 118.75
 Huntsville Dep Con 120.35 118.75
 ILH 109.7 I-MSL Rwy 29
 Muscle Shoals (L) **BVORTAC** 116.5/MSL 289° 5.7NM rwy 29
 VHF/DF Ctc FSS.
 Remarks: GS not cmsnd.

ROEBUCK NDB MHW 201/ROE FSS: BIRMINGHAM
SARATOGA NDB MHW 296/ARF FSS: ANNISTON
 Remarks: Non-federal facility.

TALLADEGA (L) BVORTAC 108.8/TDG/122.0SR FSS: ANNISTON
§ TROY MUNI (TO) IFR 5NW FSS: DOTHAN (DL)
 399 H50/7-25(3) (S-50, D-80, DT-140) BL5 S5 F12,18 U-1
 Remarks: Attended Mon-Fri 0600-1700 except holidays, other
 times ctc FBO. Extensive helicopter operations approach end
 rwy 32 0700-2100 lcl. Unmrkd dspld thr rwy 14R.
 Troy Tower 124.3 134.95
Radar Services:
 Cairns App Con 125.8 133.45
 ILS 108.9 I-TOI Rwy 7 BC unusable **LOM:** 365/TO
 NDB MHW 066° 4.6NM to rwy 7 (see Youngblood).
 Remarks: Twr ops 0600-1800 Mon-Fri except holidays. ILS
 unmonitored when twr not in opern, GS unusable below 588'
 MSL. Rwy 7 LOM is Youngblood NDB.

TUSCALOOSA FSS 123.6
§ TUSCALOOSA MUNI (TCL) IFR 3NW FSS: TUSCALOOSA on fld
 169 H65/4-22(2) (S-90, D-120, DT-190) BL5,6 S5 F12,18,34 O×2
 Remarks: Rwy 11' clsd for tkof 1800-1000. 500' stopway each
 end rwy 11-29.
 Tuscaloosa Tower 126.3 **Gnd Con** 121.8
Radar Services:
 Birmingham App Con 124.5
 ILS 109.1 I-TCL Rwy 4 **LOM:** 362/TC
 Tuscaloosa (L) **BVORTAC** 117.8/TCL 238° 4.0NM to rwy 4.
 Remarks: Twr operates 1000-1800, FSS provides AAS other hrs
 on 126.3.

TUSKEGEE (L) BVORTAC 117.3/TGE/122.1R FSS: MONTGOMERY
WHITESBURG NDB MHW 407/ITS FSS: MUSCLE SHOALS
WILMER NDB BH 248/MO FSS: MOBILE
YOUNGBLOOD NDB MHW 365/TO FSS: DOTHAN
 Remarks: NDB unmonitored 55-0700 weekdays and weekends.

ALASKA

A separate publication titled ALASKA SUPPLEMENT is issued every 28 days for Alaska.

ARIZONA

BUCKEYE (L) BVORTAC 110.6/BXK/122.1R FSS: PHOENIX
CASA GRANDE (H) BVORTAC 114.8/CZG/122.1R FSS: PHOENIX
COCHISE (H) BVORTAC 115.8/CIE/122.1R FSS: DOUGLAS
DOUGLAS FSS 121.5 122.1R 122.2 122.6 123.6
 Remarks: No wea bcst avbl 2200-0500 lcl time.
DOUGLAS (L) BVORTAC 108.8/DUG FSS: DOUGLAS
FLAGSTAFF (L) BVOR 108.2/FLG/126.65R FSS: PRESCOTT

ARIZONA—Continued

FORT HUACHUCA/SIERRA VISTA
§ LIBBY AAF/SIERRA VISTA MUNI (FHU) IFR 3N FSS: DOUGLAS
 4664 H53/11-29(2) BL5 F12,18
 Remarks: Attended daylight. Rgt tlc rwys 20, 29.
 Libby Tower 118.9 122.5R **Gnd Con** 121.7
 Fort Huachuca (T) **VOR** 111.6/FHU on fld
 Fort Huachuca **NDB H** 410/FHU on fld
 Remarks: Twr ops 0600-2200 Mon-Fri, 0700-1700 Sat, Sun and
 holidays.

GILA BEND (H) BVORTAC 116.6/GBN/121.5 122.1R 122.6
FSS: PHOENIX
GLOBE LRCO 122.3 **FSS: PHOENIX**
GOODYEAR
§ PHOENIX-LITCHFIELD MUNI (GYR) 1SW FSS: PHOENIX
 (LC 261-4295)
 968 H85/3-21(1) (S-60, D-80, DT-140) BL5 S5 F12,18,22,30 U2
 Remarks: Rwy 21 threshold displaced 2000'. Rgt tlc rwy 21
 for acft approaching from West at 2000' or below, otherwise
 left tlc pattern. TRI-VAS rwy 21.
 Litchfield Tower 120.1 **Gnd Con** 121.7
Radar Services:
 Phoenix App Con 120.7
 Remarks: Twr ops 0600-2300. Two-way rdo required. Freq
 121.5 not avbl.

§ GRAND CANYON NATIONAL PARK (GCN) IFR 7S FSS: PRESCOTT
 6605 H90/3-21(1) (S-40, D-50, DT-80) BL5 S3 F12,18,30 U1
 Remarks: TRI-VAS: Rwys 3, 21.
 Grand Canyon Tower 119.0 **Gnd Con** 121.9
 Grand Canyon (L) **BVOR** 109.0/GCN/122.1R 090° 0.3NM to fld
 Remarks: Twr ops 0800-1600. Twr clsd Oct-June.

IMPERIAL LRCO 122.6 **FSS: IMPERIAL**
KINGMAN (L) BVOR 108.8/IGM/122.1R FSS: PRESCOTT
NOGALES RCO 122.4 FSS: TUCSON
PAPAGO NDB H-SAB 326/PQO FSS: PHOENIX
PEACH SPRINGS (H) BVORTAC 112.0/PGS/122.15R FSS: PRESCOTT
PHOENIX FSS 121.5 122.1R 122.2 122.6 122.05 **DF**
 Remarks: No wea bcst avbl 2200-0600 lcl time.

PHOENIX
DEER VALLEY MUNICIPAL (PO9) 17N FSS: PHOENIX
 1475 H51/7-25(1) (S-30, D-45, DT-60) BL4 S5 F12,18 U-2
 Remarks: 5150 x 60 extension E end clsd, but avbl on prior
 request. Glider ops in vicinity of arpt Sat & Sun 1100-
 Sunset.
 Deer Valley Tower 118.4 **Gnd Con** 121.8
 Remarks: Twr ops 0700-1900 lcl Mon-Fri, dawn-dusk Sat and
 Sun. Non-federal facility.

PHOENIX
§ SKY HARBOR INTL (PHX) IFR 3E LRA FSS: PHOENIX on fld
 1128 H103/8R-26L(2) (S-100, D-200, DT-350) BL5,6,7A,11,13 S5
 F12,18,30,34 O×1,2,3,4 U2 REIL: Rwy 8L, 26R RVV: Rwy 8R
 Remarks: Rgt tlc rwys 8R, 26R. Rwy 26L threshold displaced
 706'. Unless advised by ATC all turbine acft and acft 12,500 lbs
 and over remain at or above 3,000' MSL until established on
 final. Fly base leg at least 5 mi from arpt.
 Phoenix Tower 118.7 (Rwy 8L-26R) 120.9 (Rwy 8R-26L)
Gnd Con 121.9
 § Cirnc Del 118.1
 ATIS: 125.6
Radar Services:
 Phoenix App Con 119.2 (010-109°), 124.1 (110-269°), 120.7
 (270-009°), 115.6T
 Phoenix Dep Con 119.2 (010-109°), 124.1 (110-269°), 120.7
 (270-009°), 115.6T

FIGURE 31.

ARIZONA—Continued

PHOENIX—(Continued)

Stage I Ctc App Con beyond 10 miles
 ILS 108.3 I-PHX Rwy 8R
 Phoenix (H) BVORTAC 115.6/PHX 256° 5.3 NM to fld.
 Remarks: No wea bst avbl 2200-0600. VOT: 109.0.

PRESCOTT FSS 121.5 122.15R 122.2 122.4 123.6 DF
 Remarks: No wea bst avbl 2200-0500 lcl time.

PRESCOTT (H) BVORTAC 114.1/PRC FSS: PRESCOTT

RYAN NDB H-SAB 338/RYN FSS: TUCSON

ST. JOHNS (H) BVORTAC 112.3/SJN/122.1R FSS: GALLUP

SAN SIMON (H) BVORTAC 115.4/SSO/122.1R FSS: DOUGLAS

TUBA CITY (H) BVORTAC 113.5/TBC/122.05R FSS: PRESCOTT

TUCSON LRCO 122.4 FSS: TUCSON

TUCSON FSS 121.5 122.1R 122.2 122.7 123.65 DF
 Remarks: No wea bst avbl 2200-0500.

8 TUCSON INTL (TUS) IFR 75 AOE FSS: TUCSON on fld
 2630 H120/11L-29R(3) (S-160, D-205, DT-305) BL5,10 S5
 F12,18,22,30,40 Ox1,2,3,4 U2 VASI: Rwy 29R

Remarks: Rwy 11L threshold displaced 1100'. 1000' asph
 overrun each end rwy 11L-29R. Lndg fee. J-bar rwy 11L-29R.
 VASI rwy 29R upper TCH 78', lower TCH 42'; upper RRP 1690',
 lower RRP 1090'.

Tucson Tower: 118.3 Gnd Con 121.9

Radar Services:

App Con 118.5 (121-299°) 125.1 (300-120°) 134.1 117.1T

Dep Con 118.5 (121-299°) 125.1 (300-120°)

Stage II Ctc App Con 25 NM out on 125.9 (300-120°) 30 NM

out on 124.0 (121-299°)

ILS 108.5 I-TUS Rwy 11L

VHF/DF Ctc FSS.

(H) BVORTAC 117.1/TUS 254° 6.1 NM to fld.

Remarks: VHF/DF unusable beyond 40 NM below 13,500' MSL

345-070° below 12,500' MSL 070-090°.

VERDE LRCO 122.7 FSS: PRESCOTT

WINSLOW (H) BVORTAC 112.6/INW/122.15R 122.6 FSS: PRESCOTT

YUMA FSS 121.5 122.1R 122.2 122.3
 Remarks: No sked wea bst 2200-0500 lcl time.

8 YUMA MCAS/INTL (YUM) IFR 45 AOE FSS: YUMA on fld
 213 H133/3L-21R(4) (S-103, D-200, DT-400) BL6 S5 F12,18,30
 Ox1, 2

Remarks: Attended daylight. Rwy 3R-21L GWT (S-162, D-200,
 DT-400). 1000 overrun each end rwy 3L-21R. A-gear rwys
 3L-21R and 3R-21L. 2300-0600 civil rwy will remain lgt and
 addnl lgtg avbl thru FSS in emerg. TPA-jets 1700' MSL,
 props 1200' MSL, helicopters 700' MSL. Rpt tlc rwy 3L, 3R,
 8, 26, 17.

Marine Yuma Tower 119.3 126.2 Gnd Con 121.9

8 Ctrc Del 121.9

App Con 120.0

ILS 108.3 I-YUM Rwy 21R

VHF/DF Ctc twr.

(H) BVORTAC 116.8/YUM 167° 6.0NM to fld.

Remarks: Twr opens 0600-2300 except avbl for emgcy, FSS pro-
 vides AAS other hrs on 119.3. Rwy 21R ILS unmonitored
 2300-0600.

ARKANSAS

ARKADELPHIA NDB MHW 275/ADF FSS: PINE BLUFF

Remarks: Non-federal facility.

BATESVILLE NDB MHW 317/BVX FSS: JONESBORO

Remarks: Non-federal facility.

BLYTHEVILLE (L) VOR 111.8/BYH FSS: DYERSBURG

NDB HW 311/BYH

ARKANSAS—Continued

BRUINS NDB MHW 215/BSA FSS: MEMPHIS

CAMDEN NDB MHW 335/COH FSS: EL DORADO

Remarks: Non-federal facility.

CHEROKEE VILLAGE NDB MHW 344/CVK FSS: JONESBORO

Remarks: Non-federal facility.

DeQUEEN NDB MHW 281/DEQ FSS: TEXARKANA

CROSSETT NDB MHW 396/CRT FSS: EL DORADO

Remarks: Non-federal facility.

DRAKE (T) BVOR 108.8/DAK FSS: FAYETTEVILLE

ELDORADO FSS 121.5 122.1R 122.2 123.6 DF

EL DORADO (L) BVORTAC 108.2/ELD FSS: EL DORADO

FAYETTEVILLE FSS 121.5 122.2 122.3 DF

8 DRAKE FLD (FYV) IFR 45 FSS: FAYETTEVILLE on fld

1251 H60/16-34(1) (S-40, D-60, DT-102) BL5 S5 F12,18,30 U-1

Remarks: Attended daltg hrs.

Drake Tower 118.5 Gnd Con 121.8

LOC 111.9 I-FYV Rwy 16

Fayetteville (H) BVORTAC 116.4/FYV/122.1R

Remarks: FSS provides AAS on 118.5 when twr clsd. Twr opens
 0800-2000.

FLIPPIN (L) BVOR 115.1/FLP/121.5 122.1R 122.6 122.2 FSS: HARRISON

FORREST CITY NDB MHW 332/FCY FSS: MEMPHIS

Remarks: Monitored 0700-2200 lcl Mon-Sat.

FORT SMITH CS/T 121.5 122.1R 122.6 122.2

8 FORT SMITH MUNI (FSM) IFR 45E FSS: FAYETTEVILLE

(LC 782-0343)

468 H80/7-25(2) (S-75, D-170, DT-300) BL5,6,8,10 S5 F12,18,22,30

U2 RVV: Rwy 25 VASI: Rwy 7

Remarks: Attended 0600-2200. Fuel avbl on req after 2200,
 and fee. A-gear rwy 7-25. Arresting Cable rwy 25 1000'
 from threshold.. VASI rwy 7 TCH 46' RRP 1000'.

Fort Smith Tower 118.3 Gnd Con 121.9

App Con 125.4 110.4T

ILS 109.5 I-FSM Rwy 25 LOM: 223/FS

Fort Smith (L) BVORTAC 110.4/FSM 226° 5.2NM to fld.

Fort Smith NDB HW 223/FS 254° 6.9NM to fld.

Remarks: Rwy 25 LOM is Fort Smith NDB.

HARRISON FSS 121.5 122.1R 122.2 123.6

HARRISON (L) BVOR 112.5/HRO FSS: HARRISON

HEBER SPRINGS NDB MHW 296/HBZ FSS: HARRISON

Remarks: Non-federal facility.

HICKS NDB MHW 299/HKA FSS: DYERSBURG

Remarks: Non-federal facility.

HOT SPRINGS

8 MEMORIAL FLD (HOT) IFR 35W FSS: PINE BLUFF (LC NA 4-4481)

535 H61/5-23(2) (S-35, D-49, DT-78) BL5,6,7A,13 S5 F12,18,30

Remarks: Attended 0700-2100. MALSR unmonitored when twr is
 clsd. P-line SW. Pole NE.

Hot Springs Tower¹ 120.3 122.5R Gnd Con 121.7

Hot Springs App Con¹ 118.85 122.5R 110.0T

VFR Advisory Ctc App Con on 118.85

ILS 111.5 I-HOT Rwy 5 LOM: 385/HO

Hot Springs (L) VOR 110.0/HOT on fld.

Hot Springs NDB MHW 385/HO 048° 5.1NM to fld.

Remarks: Twr opens 0700-2300, other hrs ctc Little Rock App
 Con 110.0T and 120.3R. Rwy 5 ILS unmonitored when twr
 not operg. Rwy 5 LOM is Hot Springs NDB.

JONESBORO FSS 121.5 122.1R 122.2 122.6 123.6

Remarks: Operg 0600-2200, other hrs ctc Memphis FSS.

JONESBORO (T) BVOR 108.6/JBR FSS: JONESBORO

Remarks: From 2200-0600 automatic course monitor only.

FIGURE 32.

ARIZONA

ARIZONA—CONTINUED

AJO MUNI (P01) 6N 32°27'00" 112°52'00" FSS: PHOENIX
 1450 H63/12-30 (1) BL4 F12
 REMARKS: ARPT UNATTENDED. HWY JET TFC VCNTY ARPT. FUEL AVBL EMERG. CALL
 SHERIFF 387-7621. LIGHTS ON CENTER 3950'.
ANGEL FLD See FORT GRANT
ANTELOPE RANCH See ROLL
BAGDAD 2NE 34°35'45" 113°10'10" FSS: PRESCOTT
 4136 H36/5-23 (1) (S-4) BL4
 REMARKS: ARPT UNATTENDED. UNUSUAL AIR CURRENTS VICINITY ARPT, ESPECIALLY
 EAST APCH. RWY LGTS ACTIVATED BY KEYING 122.8 3 TIMES OR BY PRIOR REQ OR
 CIRCLING TOWN.
BISBEE MUNI (P04) 6SE 31°21'50" 109°52'57" FSS: DOUGLAS
 4780 39/2-20 (3) L4 S5 F12
 REMARKS: RWY LGTS TURNED ON AUTOLY FOR 12 MIN BY VOICE RELAY ON 122.8
CLIFTON-MORENCI, GREENLEE COUNTY (CFT) 9SE FSS: DOUGLAS
 32°57'10" 109°12'35"
 3811 H49/7-25 (1) (S-21) *BL5
 REMARKS: ARPT UNATTENDED. FOR RWY LGTS & ROTG BCH PHONE 864-3080 OR
 864-4149.
COCHISE COUNTY See WILLCOX
COLORADO CITY MUNI 4SW 36°56'50" 113°00'50" FSS: CEDAR CITY
 4840 34/13-31 (2)
 REMARKS: ARPT UNATTENDED.
COOLIDGE MUNI 2SW 32°58'00" 111°32'45" FSS: PHOENIX
 1402 H21/8-26 (1) (S-4) F12 (LC 723-3392)
 REMARKS: ARPT ATTENDED IRREGULARLY. FUEL IN EMERG ONLY.
COOLIDGE FLORENCE MUNI (P08) 6SE 32°56'00" FSS: PHOENIX
 111°25'30"
 1587 H55/5-23 (4) (S-80, D-115, DT-210) S3 F12, 18 (LC 723-3392)
 REMARKS: RGT TFC RWY 5, 8, 11, 35. PARACHUTE JUMPING SAT & SUN. TPA 1000'
 AGL. ALL TRAFFIC PATTERNS VARY DURING AF TRAINING. INTENSIVE JET TRAINING
 RWY 5-23 DAYLGT HRS MON-FRI. CTC AF MOBILE ATCT ON 122.8 BEFORE ENTERING
 TRAFFIC PATTERN.
BOLAN SPRINGS, LAKE MOHAVE RANCHOS 1W 35°34'06" FSS: NEEDLES
 114°17'55"
 3200 37/1-19 (1)
 REMARKS: ARPT UNATTENDED. P-LINE IN RWY 1 APCH.
DOUGLAS MUNI (DGL) 2E 31°20'30" 109°30'15" FSS: DOUGLAS
 4181 53/18-36 (3) BL5 S5 F12, 18 OX2,4 (LC 364-8458)
 REMARKS: ANTENNA IN RWY 8 APCH. RGT TFC RWY 8, 36, 12. ADDNL 3000 X 90
 ASPH STRIP ON S SIDE RWY 8-26 CLSD. ONLY MID 2000' RWY 18-36 LGTD. OX 1 &
 OX-4 AVBL FM TOWN.
DOUGLAS @ BISBEE, BISBEE DOUGLAS INTERNATIONAL (DUG) FSS: DOUGLAS ON FLD
 9NW 31°28'02" 100°36'03" IFR AOE
 4158 H75/12-30 (4) (S-12) BL5 S5 F12, 18, 22, 34
 REMARKS: RWY 8-26 W/ BRG CPTY S-85, D-95, DT-155. ARPT ATTENDED 0600-2000
 MAX ALLOWABLE GROSS WGT RWYS 83-21 & 12-30 IS 12500 LBS. RWY LGTS &
 ROTG BCH ACTIVATED ON 121.7.
DOWNTOWN TUCSON See TUCSON
DVR See TACNA
EDS FIELD See PICACHO
ELDY MUNI 4NW 32°48'25" 111°35'10" FSS: PHOENIX
 1513 H39/2-20 (1) (S-12.5) BL5 F12, 18
ESTRELLA SAILPORT See MARICOPA
FALCON FLD See MESA
FARM AERO See PHOENIX
FLAGSTAFF, PULLIAM (FLG) 5S 35°08'16" 111°40'18" FSS: PRESCOTT
 IFR (LC 774-0475)
 7012 H70/3-21 (1) (S-65, D-85, DT-130) BL5 S5 F12, 18, 30
 U-1
 REMARKS: ARPT ATTENDED 0700-1900 ON CALL AFTER 1900.
FLY IN PICNIC GROUNDS See QUARTZSITE
FLYING E GUEST RANCH See WICKENBURG
FOREPAUGH See WICKENBURG
HOLBROOK MUNI (P14) 3NE 34°56'20" 110°08'20" FSS: PRESCOTT
 5245 H50/3-21 (1) (S-12) BL5 S3 F12, 18
MUNT, GREEN VALLEY 2S 34°35'08" 109°37'23" FSS: PRESCOTT
 5609 56/N-S (1)
 REMARKS: ARPT UNATTENDED.
PHOENIX SKY HARBOR INTL (PHX) 3E 33°26'07" FSS: PHOENIX ON FLD
 112°00'43" IFR LRA
 112C H103/8R-26L (2) (S-100, D-200, DT-350) BL5, 13, 7A, 11
 S5 F12, 18, 30, 34 OX1,2,3,4 U-2
 REIL: RWY 8L, 26R RVV: RWY 8R
 REMARKS: (1) RWY 26L THRESHOLD DISPLACED 706'. RGT TFC RWY 26R, 8R. FLY
 BASE LEG AT LEAST 5 MI FM ARPT. UNLESS ADDD BY ATC ALL TURBINE ACFT &
 ACFT 12,500 LBS & OVER REMAIN AT OR ABOVE 3000' MSL UNTR ESTABD ON
 FINAL.
POLACCA 4SW 35°48'00" 110°25'00" FSS: PRESCOTT
 5573 H38/4-22 (1)
 REMARKS: ARPT UNATTENDED. RGT TFC RWY 4, 22, 15, 33.
PRESCOTT MUNI (PRC) 0N 34°39'05" 112°25'15" IFR FSS: PRESCOTT ON FLD
 5042 H76/3-21 (2) (S-50, D-63, DT-100) BL5 S5 F12, 18
 U-2
 VHF/DF: CTC FSS
 REMARKS: ARPT ATTENDED 0600-1900 ON CALL OTHER HRS RWY 3 THRESHOLD
 DISPLACED 797'.
PULLIAM See FLAGSTAFF
TUCSON, DOWNTOWN TUCSON ADI SE 32°11'10" FSS: TUCSON
 110°56'55"
 2490 43/16-34 (2) F12, 18 (LC 792-6359)
 REMARKS: ARPT ATTENDED DAWN-DUSK. P-LINE IN RWY 1E APCH. P-LINE IN RWY 29
 APCH. P-LINE IN RWY 16 APCH.
TUCSON, FREEWAY (P12) 4NW 32°16'40" 111°00'30" FSS: TUCSON
 2290 H45/12-30 (1) (S-6) BL4 S5 F12, 18 U-1 (LC 792-6359)
 REMARKS: RWY 30 THRESHOLD DISPLACED 500'. P-LINE IN RWY 30 APCH. MAINTAIN
 50' OVER ROMERO RD ON FINAL TO RWY 30
TUCSON, RYAN FIELD 12SW 32°08'29" 111°10'00" FSS: TUCSON
 2413 H40/6R-24L (1) (S-9) BL4 S5 F12, 18 U-1 (LC 792-6359)
 REMARKS: ARPT ATTENDED 0800-1800. RGT TFC RWY 6R, 16. GLIDER OPERNS
 WITHIN 10 MILE RADIUS WEEKENDS 2525 X 25 ASPH STRIP SUPERIMPOSED ON
 DIRT STRIP 6L-24R BEGINNING 625' FM SW END. RWY 6L-24R RESTRICTED TO
 GLIDERS ONLY.
TUCSON INTL (TUS) 7S 32°07'05" 110°56'32" IFR FSS: TUCSON ON FLD
 AOE
 2630 H120/11L-29R (3) (S-160, D-205, DT-305) BL5, 10 S5
 F12, 18, 22, 30, 40 OX1,2,3,4 U-2
 VASI: RWY 29R
 VHF/DF: CTC FSS
 REMARKS: (1) RWY 11L THRESHOLD DISPLACED 1100'. ARRESTING DEVICE RWY 21,
 11L, 29R. VASI RWY 29R UPPER TCH 78', LOWER TCH 42' UPPER RRP 1690',
 LOWER RRP 1090'. 1000' ASPH OVRN EACH END RWY 11L-29R.
WINDOW ROCK (P34) 1S 35°39'20" 109°03'45" FSS: GALLUP
 6755 H70/2-20 (1) (S-30, D-45, DT-75) L5 F18
 REMARKS: ARPT ATTENDED 0800-1700
WINDSHLOW MUNI (HWM) 1W 35°01'20" 110°43'20" IFR FSS: PRESCOTT
 4938 H71/11-29 (2) (S-60, D-70, DT-110) BL5 S3 F12, 18 (DL)
 U-1
 REMARKS: ARPT ATTENDED 0700-1800 ON CALL AFTER HRS RWY 29 THRESHOLD
 DISPLACED 400'.
YUMA MCAS/YUMA INTERNATIONAL (YUM) 4S 32°39'24" FSS: YUMA ON FLD
 114°36'18" IFR AOE
 213 H133/3L-21R (4) (S-103, D-200, DT-400) BL6 S5 F12,
 18, 30 OX1,2
 VHF/DF: CTC TWR
 REMARKS: (1) RWY 3R 21L W/ BRG CPTY S-162, D-200, DT-400. ARPT ATTENDED
 DAYLIGHT. ARRESTING DEVICE RWY 3L, 21R, 3R, 21L. RGT TFC RWY 3L, 3R, 8, 26,
 17. 1000' OVERRUN EACH END RWY 03L-21R. FSS PROVIDES ARPT ADV SVC WHEN
 TWR CLSD. TPA JETS 1700' MSL/PROPS 1200' MSL/COPTERS 700' MSL
 2300 0600 APROP CIVIL RWY LGTD. OTHER RWYS LGTD ON REQ THRU FSS IN
 EMERG

FIGURE 33.

Excerpt

AIRMAN'S INFORMATION MANUAL—PART 3A

NOTICES TO AIRMEN

This part is issued every 14 days. It contains appropriate notices from the daily NOTAM Summary, and other items considered essential to flight safety.

This section contains Notices to Airmen that are expected to remain in effect for at least seven days. Temporary notices without published duration dates are normally carried twice unless resubmitted.

NOTE: Data preceded by a checkmark (✓) are considered permanent and will be published one time only in this section. Data should be noted on charts and records.

NOTE: Notices are arranged in alphabetical order by State (and within the State by City or locality).

NEW OR REVISED DATA: New or revised data are indicated by underlining the first line of the affected item. The new information is not necessarily limited to the underlined portion, which is used only to attract attention to the new insert.

ALABAMA

AUBURN, OPELIKA ARPT: Tmpy ATCT and FSS will oper on Nov 10. Freqs 123.1 lcl ctl, 121.8, 122.5R gnd ctl, 121.5 emgcy. Hours 1000-1800 lcl.

TALLADEGA MUNI ARPT: Rwy 3-21 clsd to acft 40,000 lbs GWT or over. (8-73)

TUSCALOOSA: FSS remains operational, telephone number—(205) 758-3028.

TUSKEGEE—MOTON FIELD ARPT: Const in progress. Arpt clsd til aprxly Dec 1973. (8-73)

ALASKA

SPECIAL NOTICE: Pilots flying aircraft equipped with SCR-718 altimeters will assure that the altimeter is turned off within 200 NM of Clear, Alaska and Thule, Greenland.

For complete information on Alaska consult the Alaska Supplement.

ARIZONA

BISBEE MUNI ARPT: Rwy lgts 2-20 inop. (8-73)

GRAND CANYON: Control zone hrs 0800-2000 lcl time.

GRAND CANYON NATIONAL PARK ARPT: ATCT deactivated until aprxly 1 June 74.

GRAND CANYON NATIONAL PARK: All pilots are requested to avoid flying below the canyon rim and to maintain a distance 1500' above and horizontally from all scenic overlooks, parks, trails and Grand Canyon Village.

PRESCOTT MUNI ARPT: Obstrn 30' AGL lctd ¼ NM SSW of TDZ rwy 3 unlgtd. First 1450' rwy 11 clsd.

ARKANSAS

EL DORADO, GOODWIN FLD: Threshold rwy 22 displaced 413'. (8-73)

FORDYCE MUNI ARPT: Rwy 04 thr dspld 100'. (8-73)

HELENA/WEST HELENA - THOMPSON - ROBBINS ARPT: Rwy 17-35 clsd UFN. (9-73)

CALIFORNIA

SPECIAL NOTICE: Do not mistake dirt strip on large island, Lake Berryessa, lctd lat 38-34 long 122-13 for airport. Strip is unauthorized and unsafe.

ANO NUEVO ISLAND: Avoid low flying in the vicinity and over island. Biological research of wild life in progress.

BISHOP RDO: VOR Ident "BIH" OTS. (11-73)

BLYTHE ARPT: Intensive airline jet acft training in progress 24 hrs daily. Inbound acft report 20 miles out on 123.6 and guard 123.6 for arpt advisory service, UFN. Use other freqs for other purposes. Unicom is not for arpt advisory use.

CHINO ARPT: Constr on arpt til aprxly Jan 1974.

LOS ANGELES INTL ARPT: ILS/OM "I-LAX" serving rwy 25L shutdown til aprxly Dec 20. (8-73)

PRIEST RDO: VOR/DME—DME portion will be demsnd eff 6 Dec 73. (11-73)

REDDING, SKY RANCH ARPT: 4' drop off SE end rwy 12-30 not marked or lgtd. (10-73)

SALINAS MUNI ARPT: Const on fld. Rwy 13-31 clsd til aprxly Feb 74. Check NOTAMS for current info. (9-73)

SAN CLEMENTE FLIGHT RESTRICTION: FAR Section 91.95 prohibits acft operns below 4000' MSL within a one mile radius of the San Mateo Point Loran Station/Oceanside VORTAC 300 radial 12.5 NM.

SAN FRANCISCO INTL ARPT: Rwy 10L-28R clsd Indg Mon-Sat 0600-1830 lcl til aprxly Jan 74. Blast fence 8 ft high lctd 770 ft east of dspld thr of rwy 28R til aprxly Apr 74. East 600' rwy 10L-28R clsd til aprxly April, 1974. (11-73)

SAN JOSE MUNI ARPT: In the interest of noise abatement, all turbojet acft are requested not to takeoff or land between 2400-0600 lcl unless justifiable. Cessna Citation or acft of equally low noise level excepted. The use of reverse thrust should be minimized at pilot's discretion at all times.

SAN JOSE MUNI ARPT: DME lctd glide slope bldg operg on test on channel 46 for 2-segment apch rwy 30L.

SANTA ROSA, SONOMA CO. ARPT: Twr 40' AGL W side TDZ rwy 32 unlgtd UFN.

FIGURE 34.

**RULES PERTAINING TO AIRCRAFT ACCIDENTS,
INCIDENTS, OVERDUE AIRCRAFT, AND
SAFETY INVESTIGATIONS**

(National Transportation Safety Board, Procedural
Regulation, Part 430 (in part)).

1. IMMEDIATE NOTIFICATION

The operator of an aircraft shall immediately, and by the most expeditious means available, notify the nearest National Transportation Safety Board, Bureau of Aviation Safety Field Office when:

(a) An aircraft accident or any of the following listed incidents occur:

(1) Flight control system malfunction or failure;
(2) Inability of any required flight crewmember to perform his normal flight duties as a result of injury or illness;

(3) Turbine engine rotor failures excluding compressor blades and turbine buckets;

(4) In-flight fire;

(5) Aircraft collide in flight.

(b) An aircraft is overdue and is believed to have been involved in an accident.

(c) The following information is required if available:

(1) Location;

(2) Date;

(3) Time;

(4) Aircraft make, model, and registration number and nationality.

(5) Names of operator and crew;

(6) Number of persons involved;

(7) Injuries of each person;

(8) Weather conditions.

2. MANNER OF NOTIFICATION

The most expeditious method of notification to the National Transportation Safety Board by the operator will be determined by the circumstances existing at that time. The National Transportation Safety Board has advised that any of the following would be considered examples of the type of notification that would be acceptable:

(a) Direct telephone notification.

(b) Telegraphic notification.

(c) Notification to the Federal Aviation Administration who would in turn notify the NTSB by direct communication; i.e., dispatch or telephone.

3. REPORTS

a. The operator shall file a report on NTSB Form 6120.1 or 6120.2, available from the National Transportation Safety Board Field Offices, or the National Transportation Safety Board, Washington, D.C.:

(1) Within ten (10) days after an occurrence for which notification is required in 1 (a) and (b) above;

(2) When, after seven (7) days, an overdue aircraft is still missing;

(3) Upon request of an authorized representative of the National Transportation Safety Board;

b. Each crew member, if physically able at the time the report is submitted, shall attach thereto a statement setting forth the facts, conditions and circumstances relating to the accident or occurrence as they appear to him to the best of his knowledge and belief. If the crew member is incapacitated, he shall submit the statement as soon as he is physically able.

4. WHERE TO FILE THE REPORTS

a. The operator of an aircraft shall file with the Field Office of the National Transportation Safety Board nearest the accident or incident any report required by this section.

b. The National Transportation Safety Board field offices are listed under U.S. Government in the telephone directories in the following cities: Anchorage, Alaska; Chicago, Ill.; Denver, Colo.; Fort Worth, Texas; Kansas City, Mo.; Los Angeles, Calif.; Miami, Fla.; New York, N.Y.; Oakland, Calif.; Seattle, Wash.; Washington, D.C.

FIGURE 35.

