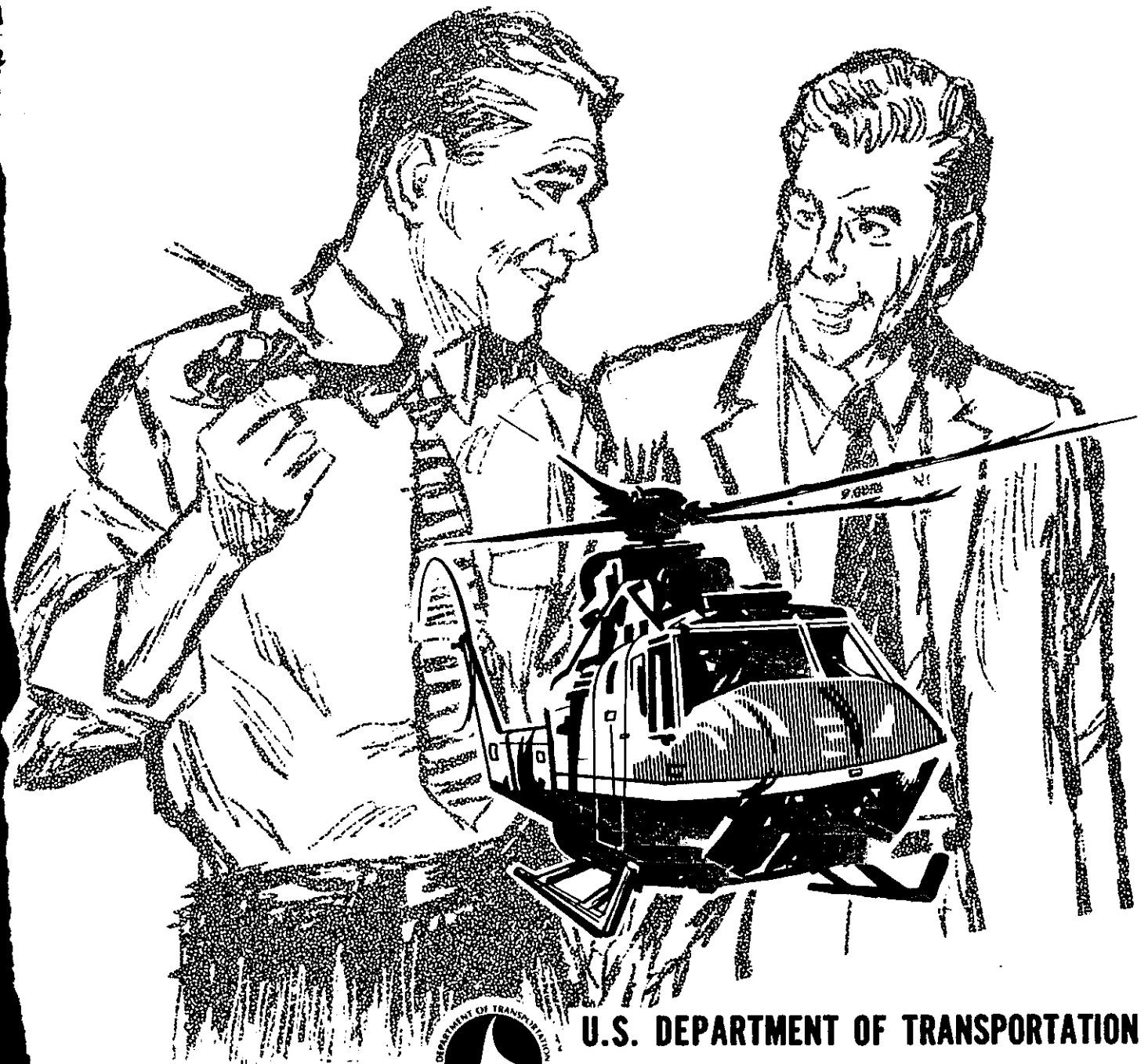


FLIGHT INSTRUCTOR Rotorcraft-Helicopter

Written Test Guide



Revised 1977



U.S. DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

**FLIGHT INSTRUCTOR
ROTORCRAFT-HELICOPTER
WRITTEN TEST GUIDE**



1977

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Flight Standards Service**

PREFACE

This written test guide was prepared by the Flight Standards Service of the Federal Aviation Administration to assist applicants in preparing for the Flight Instructor Certificate with a Rotorcraft-Helicopter Rating. It supersedes AC 61-74, Flight Instructor-Rotorcraft-Helicopter Written Test Guide, dated 1974.

This guide briefly explains the need for comprehensive instruction and describes the aeronautical knowledge requirements for certification as a helicopter flight instructor. Also included is information on the source material that can be used to acquire essential knowledge in the various subject areas. Further, it provides the instructions for taking the official FAA written test, as well as sample test items with explanations of the current answers, and illustrations representative of those used in composing the helicopter flight instructor written tests. The test items and choices of answers in this guide are based on regulations, principles, and practices that were valid at the time this publication was printed.

This guide is directed primarily toward the *aeronautical* knowledge requirements for the certification of flight instructors. Guidance relating to the fundamentals of instructing is provided in separate publications and, except for brief references, is not included in this guide.

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

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WRITTEN TEST GUIDE
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PILOT TRAINING

The Role of the Flight Instructor

All pilot training is directed toward developing competent, efficient, and safe pilots. The more complete a student's understanding of theory and principles, the easier it will be for that person to become a safe, competent pilot. It has long been recognized that ground instruction and flight training go hand in hand. Each complements the other, resulting in a training program which is more meaningful and comprehensive.

Generally, pilots learn by one of two methods. Some learn by rote (by memory alone without investigating fundamental principles), while others acquire knowledge and *understanding* of basic procedures and techniques and *apply* these concepts to the various piloting operations. The latter means of learning is by far the more effective method. Effective pilot training is based on the fact that knowledge and understanding of principles, along with skill, are essential to safety in flight.

The *keystone* of the present-day training concept is the flight instructor—a professional who assumes full responsibility for all phases of a student pilot's required ground and flight training.

How does one become a skilled and effective flight instructor? Although some people possess to a greater degree than others, those traits that are desirable in an instructor, no one is born a natural instructor. Flight instructors become competent through study, training, experience, and conscientious effort. Probably more than any other single factor, the flight instructor's own attitude toward flight instruction determines how well the job of teaching is done.

The flight instructor must, of course, be fully qualified as a pilot. Qualifications must go far beyond those required for certification as a pilot,

however, if success as a professional flight instructor is to be achieved. The instructor should have in addition to piloting skill, a thorough understanding of how learning occurs and how to employ teaching methods that best foster learning.

To provide good instruction, the flight instructor should thoroughly understand all aspects of aeronautical subjects and their relationship to various pilot operations. There can be no substitute for diligent study to attain knowledge, develop competence, and remain current as a flight instructor.

The flight instructor is the expert to whom students, and many experienced pilots, submit questions concerning regulations, technical matters, and current operating procedures and techniques. Obviously, to answer such questions responsibly, or resolve related problems, the flight instructor should have sound knowledge of the various aviation subjects.

After the flight instructor has gained the basic knowledge and skills, a continuous effort should be made to improve the quality of instruction and to remain abreast of the latest developments in aviation products, regulations, procedures, and practices. Study materials listed in this guide are beneficial and pertinent to the preparation for initial certification.

In addition to giving instruction during flight, the certificated flight instructor is authorized to conduct the required ground instruction for pilot and instructor applicants. In exercising this privilege, the instructor carries the *responsibility* for providing comprehensive training in the appropriate subjects and for ensuring that the trainees acquire sufficient knowledge and understanding of the subjects to qualify for pilot or instructor certification.

FLIGHT INSTRUCTOR CERTIFICATION

Requirements for Training and Testing

To be eligible for a helicopter flight instructor certificate, a person must hold a commercial or airline transport pilot certificate with a rotorcraft-helicopter rating.

Further, regulations require that an applicant for a flight instructor certificate satisfactorily complete a course of instruction in the fundamentals of instructing, including the subjects of how people learn, teaching and evaluating students, and the development of courses and lesson plans. The possession of a teacher's certificate authorizing employment as a teacher in a public school system, or status as an instructor in a college or university, may be accepted as evidence of having received training in the teaching and learning process.

The certification process requires that the applicant pass the FAA's Fundamentals of Instructing (FOI) Written Test to ensure that the person possesses adequate knowledge of teaching methods as they apply to pilot instruction. Although applicants holding a teacher's certificate or status as an instructor in a college or university are credited with having received training in teaching methods, they are *not exempt* from taking the FOI written test.

If the applicant already holds a valid FAA Flight or Ground Instructor Certificate and is applying for an instructor certificate other than that held, or for the addition of a rating to the certificate, that person *need not* take the FOI test again.

In addition to the requirement for the applicant to be trained and tested in teaching methods, the applicant for a Flight Instructor Rotorcraft-Helicopter Certificate is required to have received and logged ground instruction *from an authorized ground or flight instructor* in all of the subjects in which ground instruction is required for a private and commercial pilot certificate. To en-

sure that adequate knowledge of those subjects has been acquired, the instructor applicant must pass the FAA's Flight Instructor-Rotorcraft-Helicopter (FRH) Written Test. Those subjects are outlined in this study guide.

It is not necessary however, to take the Fundamentals of Instructing Test on the same day as the Flight Instructor-Rotorcraft-Helicopter Written Test, nor is it important which of these tests is taken first.

Finally, after the prescribed written tests have been passed, the certification process requires the applicant to pass a practical test in which competency to instruct students during flight must be demonstrated. This practical test must be satisfactorily completed within 24 months after the date the written tests were passed.

The written tests are administered by all FAA General Aviation District Offices (GADO), Flight Standards District Offices (FSDO), and some Air Carrier District Offices (ACDO) and Flight Service Stations (FSS). The practical test, unlike other flight tests, can be administered only by an FAA Inspector.

As a convenience to the prospective flight instructor, those portions of the present Federal Aviation Regulations pertinent to the general eligibility, flight proficiency, and aeronautical knowledge requirements for the instructor certificate have been included in this guide. *Applicants should be aware, however, that regulations are subject to change.* Any question regarding the currency of these regulation excerpts may be checked with the appropriate FAA office.

Subject Matter of Written Tests

The Fundamentals of Instructing Written Test and the Flight Instructor-Rotorcraft-Helicopter Written Test are very comprehensive because, to be effective, they must test an applicant's knowledge in many subject areas.

The test on Fundamentals of Instructing contains items involving subjects 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 extensively discussed in AC 60-14, Aviation Instructor's Handbook, which may be purchased from the Superintendent of Documents, U.S. Government Printing Office. The Fundamentals of Instructing Written Tests contain 60 test items and 4 hours are allowed for completion.

As stated earlier, the required aeronautical knowledge areas of the Flight Instructor-Rotorcraft-Helicopter Written Test include all subjects in which ground instruction is required for private and commercial rotorcraft-helicopter pilot ratings.

The test items deal with specific subjects such as basic navigation, radio navigation, radio communications, meteorology, aerodynamics, helicopter performance, Federal Aviation Regulations, and helicopter and powerplant operation. The written test evaluates the applicant for adequate knowledge and grasp of theory to assure that instruction in the specific subject matter will accomplish the goal of each lesson. Many questions require the ability to combine and interrelate knowledge in two or more of specific subject areas.

All test items are the objective, multiple-choice type, and can be answered by the selection of a single response. Each item is independent of other test items; that is, a correct response to one test item does not depend upon, or influence, the correct response to another. This type of test conserves the applicant's time, permits greater coverage of subject matter, minimizes the time required for scoring, and eliminates subjective judgment in determining the applicant's grade.

The sample test items in this study guide are similar to those used in the Flight Instructor Rotorcraft-Helicopter Written Test. It must be emphasized, however, that all pertinent subjects are not included and learning to answer these items solely by rote will not ensure sufficient knowledge of all subjects. They are merely a

sampling of one's knowledge. To acquire complete understanding of the pertinent subjects, the applicant is strongly urged to use the study outline provided herein and thoroughly study the material in referenced publications.

Flight Instructor-Rotorcraft-Helicopter Written Tests contain 60 items and 4 hours are allowed for completing a test.

Taking the Written Tests

Communication between individuals through the use of words is a complicated process. Since certification tests involve the use of written rather than spoken words, communication between the test writers and the persons being tested may become a difficult matter if care is not exercised by both parties. Consequently, considerable effort is expended to write each test item in a clear, precise manner. Applicants should carefully read the information and instructions given with the tests, as well as the statements 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—before selecting an answer. Skimming and hasty assumptions can lead to a completely erroneous approach to the problem because of failure to consider vital words. Examine and analyze the list of phrases or answers, then select the one that correctly completes the statement or answers the question.

3. Only one of the listed answers given is completely correct. The others may be the result of using incorrect procedures to solve problems, common misconceptions, or insufficient knowledge of the subject. Consequently, many of the incorrect answers may appear to be plausible to those persons whose knowledge is deficient. If the subject matter is adequately understood, the questions should not be difficult to answer correctly.

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 you consider to be less difficult. When all of the easier items are completed, go back and complete those items that were found to be more difficult. This procedure will enable you to use the available time to maximum advantage.

5. In solving problems which require computations or the use of a plotter and computer, select the answer which most nearly agrees with the calculated result. Due to slight differences in navigation computers and small errors that may exist in the measurement of distances, true courses, etc., it is possible that an exact agreement with available answers will not occur. Sufficient spread is provided between right and wrong answers, however, so that the selection of the answer which is more nearly that of the calculated result will be correct, *provided* correct technique and reasonable care were used in making computations.

Computers and plotters that contain information not directly related to their operation may be used only if that information is obscured by suitable masking material. The use of electronic or mechanical calculators is subject to the following limitations: (a) prior to, and on completion of the test, the applicant must actuate the "ON/OFF" switch to erase any data stored in memory circuits; (b) tape printout of data, if incorporated in the calculator, must be surrendered to the test monitor; and (c) the use of material containing instructions related to operation of the calculator is not permitted.

Applicants may find that certain test questions involving regulations, ATC procedures, etc., are outdated by very recent changes. In these instances, applicants are *given credit* for the test item during the period that it takes to distribute a revised question.

NOTE: To familiarize you with the procedures for taking the official Flight Instructor-Rotorcraft-Helicopter Written Test, samples of the actual General Instructions, Written Test Application, and answer sheet are provided in this guide.

After completing the test, your answer sheet is forwarded to the Federal Aviation Administration, Aeronautical Center in Oklahoma City, for scoring by electronic computers (ADP). Shortly thereafter, you will receive an Airman Written Test Report which not only includes the grade but also lists, in code, the subject areas in which test items were answered incorrectly. Those subject areas can be determined by reference to the *List of Subject Matter Codes* which accompanies the report. This method provides an essential feedback to you and can be effectively used for further study of the areas in which your knowledge was inadequate.

It must be emphasized here that the *total number* of subject codes shown on the test report is *not* necessarily an indication of the total number of test items answered incorrectly. When one or more questions are missed in a given subject area, the code for that subject appears only once on the grade report.

Retesting After Failure

An applicant who fails the written test may not apply for retesting until 30 days after the date the test was failed. In the case of the *first* failure, however, the person may apply for retesting before the 30 days have expired upon presenting a written statement from an authorized instructor certifying that appropriate ground instruction was given to the applicant and the instructor finds that person competent to pass the test. In addition, the written test report of the previously failed test must be presented at the time of retesting.

RECOMMENDED STUDY MATERIALS

The following list of source material outlines essential publications produced by the *U.S. Department of Transportation* but does not include all the useful and available material that is produced commercially. Other excellent textbooks, audio-visual training aids, and instructional materials may be obtained from various commercial bookstores and fixed-base operators engaged in flight training.

List of Publications

ADVISORY CIRCULARS

FAA Advisory Circulars inform the aviation public in a systematic way of nonregulatory material of interest. Each circular issued is listed numerically within its subject-number breakdown which corresponds to the subject area of the Federal Aviation Regulations. The identification number (i.e., AC 120-1), the change number of the latest change, if any, to the right of the identification number, the title, and the effective date for each circular are shown. A brief explanation of the contents is given for each listing in AC 00-2, Advisory Circular Checklist and Status of Federal Aviation Regulations.

The checklist AC 00-2, available free of charge, lists advisory circulars that are for sale as well as those distributed free of charge by the Federal Aviation Administration.

When a price is listed after the description of a circular in the checklist, that circular is for sale by the Superintendent of Documents. When (Sub.) is included with the price, the advisory circular is available on a subscription basis only. After your subscription has been entered by the Superintendent of Documents, supplements or changes to the basic document will be provided automatically at no additional charge until the subscription expires. When no price is given the circular is distributed free of charge by FAA.

Request free advisory circulars from:

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

Persons who want to be placed on FAA's mailing list for future circulars should write to:

U.S. Department of Transportation
Distribution Unit, TAD 482.3
Washington, D.C. 20590

It is recommended that the flight instructor applicant obtain Advisory Circulars in at least the following subjects:

Subject Number and Subject Matter

00	-----	General
20	-----	Aircraft
60	-----	Airmen
70	-----	Airspace
90	-----	Air Traffic Control and General Operations
140	-----	Schools and Other Certificated Agencies
170	-----	Air Navigational Facilities

AVIATION WEATHER. AC 00-6A. Contains information on weather phenomena for pilots and other flight operations personnel whose interest in meteorology is primarily in its application to flying.

AVIATION WEATHER SERVICES. AC 00-45. Supplements AC 00-6A, Aviation Weather. It explains the weather service in general, the use and interpretation of reports, forecasts, weather maps, and prognostic charts, and is an excellent source of study for pilot certification examinations.

HELICOPTER PILOT WRITTEN TEST GUIDE--PRIVATE--COMMERCIAL. AC 61-73. Gives guidance to applicants preparing for the aeronautical knowledge requirements for a private or commercial pilot certificate with a helicopter rating.

BASIC HELICOPTER HANDBOOK. AC 61-13A. Provides detailed information for the applicant who is preparing for the private, commercial, or flight instructor pilot certificate with a helicopter rating. It is also useful as an aid when training students.

FLIGHT INSTRUCTOR'S HANDBOOK. AC 61-16A. Gives guidance and information to pilots preparing for flight instructor certificates, and for use as a reference by flight instructors. (This publication will be superseded in 1977 by **AVIATION INSTRUCTOR'S HANDBOOK**, AC 60-14.)

PILOT'S HANDBOOK OF AERONAUTICAL KNOWLEDGE. AC 61-23A. Contains essential, authoritative information used in training and guiding applicants for private pilot certification. Flight instructors and flying school staffs will also find this publication useful.

PILOT'S WEIGHT AND BALANCE HANDBOOK. AC 91-23. Provides an easily understood text on aircraft weight and balance. It progresses from an explanation of basic fundamentals to the complete application of weight and balance principles in large aircraft operations, and also contains a section pertaining to helicopter weight and balance.

TERRAIN FLYING. AC 91-15. This pocket-size booklet is designed primarily for the private pilot with an airplane rating. However, the helicopter pilot should find this booklet beneficial since it contains observations, opinions, warnings, and advice from veteran pilots regarding flight over various types of terrain.

WAKE TURBULENCE. AC 90-23D. This circular alerts pilots to the hazards of aircraft trailing vortex wake turbulence and recommends related operational procedures.

MEDICAL HANDBOOK FOR PILOTS. AC 67-2. An aviation medicine handbook written in pilots' language that provides guidance on when, and when not, to fly. Emphasizes the fact that a good pilot must be physically fit, psychologically sound, and well trained.

INSTRUMENT FLYING HANDBOOK. AC 61-27B. This handbook is designed primarily for airplane pilots, and provides basic information needed to acquire an FAA instrument rating. The helicopter flight instructor however,

should find this handbook beneficial since it contains a wealth of information regarding basic flight instruments, radio navigation, air traffic control, etc.

NATIONAL TRANSPORTATION SAFETY BOARD PART 830. This publication deals with procedures required in the notification and reporting of accidents and lost or overdue aircraft within the United States, its territories, and possessions. It is available upon request from the National Transportation Safety Board, Publications Branch, Washington, D.C. 20594.

AIRMAN'S INFORMATION MANUAL (AIM). Contains information necessary for planning and conducting flights within the National Airspace System. Besides providing updated airport and NAVAID data, AIM includes instructional and procedural information.

To serve pilots better, AIM is available in five parts which may be purchased separately on an annual subscription basis.

Part 1. *Basic Flight Manual and ATC Procedures.* Issued semi-annually.

Part 2. *Airport Directory.* Issued semi-annually.

Part 3. *Operational Data and Notices to Airmen.* Issued every 56 days.

Part 3A. *Notices to Airmen.* Issued every 14 days.

Part 4. *Graphic Notices and Supplemental Data.* Issued quarterly.

FEDERAL AVIATION REGULATIONS (FARs). The FAA publishes the Federal Aviation Regulations to make readily available to the aviation community the regulatory requirements placed upon them. These regulations are sold as individual Parts by the Superintendent of Documents.

The more frequently amended Parts are sold on subscription service (that is, subscribers will receive changes automatically as issued), while the less active Parts are sold on a single-sale basis. Changes to single-sale Parts will be sold separately as issued. Information concerning these changes will be furnished by FAA through its "Status of the Federal Aviation Regulations, AC 00-44." Instructions for ordering this free status list are given in the front of each single-sale Part.

Check or money order made payable to the Superintendent of Documents should be included with each order. Submit orders for single-sales and subscription Parts on different order forms. No COD orders are accepted. All FAR Parts should be ordered from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The suggested Parts for Study are:

Part 1, *Definitions and Abbreviations.*

Part 61, *Certification: Pilots and Flight Instructors.*

Part 71, *Designation of Federal Airways, Area Low Routes, Controlled Airspace, and Reporting Points.*

Part 91, *General Operating and Flight Rules.*

Part 135, *Air Taxi Operators and Commercial Operators of Small Aircraft.*

Part 141, *Pilot Schools.*

Part 143, *Ground Instructors.*

VFR/IFR PILOT EXAM-O-GRAMS. Provide brief explanations of important aeronautical subjects. These include concepts and procedures critical to aviation safety, common misconceptions among pilot applicants, and areas which cause general difficulty in written tests. Exam-O-Grams are free and may be obtained by contacting U.S. Department of Transportation, Federal Aviation Administration, Flight Standards National Field Office, AFS-590, P.O. Box 25082, Oklahoma City, Oklahoma 73125. Lists of current Exam-O-Grams appear in Appendix J.

How to Obtain Publications for Sale by Sup't. Doc's.

1. Use an order form, not a letter unless absolutely necessary, when ordering Government publications. Order forms may be obtained *free* upon request from:

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

2. Send separate orders for subscription and nonsubscription items.

3. Give the exact name, Advisory Circular identification number, and Sup't. Doc's. stock number when ordering publications.

4. 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% to cover postage for foreign mailing.)

5. If a letter is used to request publications enclose a self-addressed mailing label.

6. Use special delivery when needed.

7. 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 important that the *correct* amount be enclosed with the order.

CHARTS

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."

PRACTICAL AIR NAVIGATION. Provides a comprehensive coverage of subjects and areas dealing with navigation whether it be pilotage, dead reckoning, or radio and celestial navigation. Students who understand the material in this textbook should have no trouble with the navigation problems. This textbook, originally developed by CAA (FAA), may be obtained from many book dealers or from the current publisher, Jeppesen & Co., 8025 East 40th Ave., Denver, Colorado 80209.

AIRPLANE FLIGHT MANUALS AND PILOTS' OPERATING HANDBOOKS. Aircraft manufacturers issue manuals for each aircraft model. They may be obtained from aircraft manufacturing companies or possibly from local airplane dealers and distributors.

STUDY OUTLINE

AERONAUTICAL KNOWLEDGE STUDY REFERENCES

This study outline is the framework of the basic aeronautical knowledge that the prospective flight instructor is required to know; questions in the FAA written test can be related to one or more of the topics in the outline. This subject matter is predicated on operationally realistic airman activity and meets the requirements specified in Federal Aviation Regulations.

I. FEDERAL AVIATION REGULATIONS

A. Parts 1 and 71: Definitions and Abbreviations; Controlled Airspace

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

B. Part 61: Certification: Pilot and 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. Duration of medical certificates

7. General limitations
8. Pilot logbooks
9. Operations during medical deficiency
10. Second-in-command qualifications
11. Recent experience: Pilot in command
12. Pilot-in-command proficiency check
13. Falsification, reproduction, alteration
14. Change of address
15. Private pilot privileges/limitations
16. Commercial pilot privileges/limitations

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

1. Responsibility of pilot in command
2. Pilot in command—more than one pilot
3. Preflight action
4. Flight crewmembers at stations
5. Interference with crewmembers
6. Careless or reckless operation
7. Liquor and drugs
8. Dropping objects
9. Fastening of safety belts
10. Portable electronic devices
11. ATC transponder equipment requirements
12. Civil aircraft: certificates required
13. Aircraft airworthiness
14. Aircraft operating limitations/markings
15. Instrument and equipment requirements
16. Limited/restricted aircraft limitations
17. Report: aircraft identification/activity

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

1. Waivers
2. Operating near other aircraft
3. Right-of-way rules
4. Aircraft lights
5. Complying — ATC clearances/instructions
6. ATC light signals

7. Minimum safe altitudes; general
8. Altimeter settings
9. Flight; information required
10. Flights between Mexico/Canada/U.S.A.
11. Operation—in vicinity of airport
12. Operation—airport with control tower
13. Operation—airport without control tower
14. Flight in terminal control areas
15. Temporary flight restrictions
16. Flight test areas
17. Restricted and prohibited areas
18. Positive control areas; route segments
19. Operations to/over Cuba
20. Basic VFR weather minimums
21. Special VFR weather minimums
22. VFR cruising altitude or flight level
23. ATC transponder test/inspection

E. Part 91: General Operating and Flight Rules—Subpart C—Maintenance, Preventive Maintenance, and Alterations

1. General maintenance and alterations
2. Maintenance required
3. Carrying persons after repair/alterations
4. Inspection/progressive inspections
5. Altimeter system tests/inspections
6. Maintenance records/transfer of records
7. Rebuilt engine maintenance records
8. ATC transponder test/inspection

F. Part 135: Air Taxi Operators and Commercial Operators of Small Aircraft

1. Subpart A—General
2. Subpart B—Rules—ATCO certificate holder
3. Subpart C—Operating rules
4. Subpart D—Crewmember qualifications
5. Subpart E—Aircraft and equipment

**II. NATIONAL TRANSPORTATION SAFETY BOARD
—PART 830**

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

D. Reporting of Aircraft Accidents, Incidents, and Overdue Aircraft

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 120—Air Carrier and Commercial Operators and Helicopters
- G. Series 140—Schools
- H. Series 150—Airports
- I. Series 170—Air Navigation Facilities

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. VOR (VHF omnidirectional range)
5. VOR receiver check
6. Distance measuring equipment
7. VHF direction finder
8. Radar
9. Visual approach slope indicator (VASI)
10. Rotating beacons
11. In-runway lightings
12. Runway markings
13. Controlled/uncontrolled airspace
14. Operating at non-tower airports
15. Special use airspace—prohibited, restricted, alert areas, military operations areas
16. Services available to pilots
17. Automatic terminal information service (ATIS)
18. ATC departure/en route/arrival procedures
19. Radar traffic information service
20. Transponder operation
21. Terminal control area
22. Terminal radar program for VFR aircraft
23. Aeronautical advisory stations (UNICOM)

- 24. Radiotelephone phraseology/technique
 - 25. Traffic/wind direction indicators
 - 26. Weather information/briefing
 - 27. En route flight advisory service
 - 28. Transcribed weather broadcasts
 - 29. Scheduled weather broadcasts
 - 30. In-flight weather advisories
 - 31. Clear air turbulence
 - 32. Thunderstorms
 - 33. Flight plans
 - 34. ADIZ and designated mountainous areas
 - 35. Pilot/controller roles/responsibilities
 - 36. Medical facts for pilots
 - 37. Fatigue
 - 38. Hypoxia
 - 39. Hyperventilation
 - 40. Alcohol
 - 41. Carbon monoxide
 - 42. Good operating practices
 - 43. Emergency procedures
- B. Part 2: Airport Directory**
- 1. Airport/heliport data
 - 2. FSS/weather service telephone numbers
- C. Part 3: Operational Data and Notices to Airmen**
- 1. Radio facility/FSS data
 - 2. Special notices/special operations
 - 3. Notices to Airmen (NOTAMS)
 - 4. VOR receiver checkpoints
 - 5. Restrictions to en route navigation aids
 - 6. Special notices
- D. Part 3A: Notices to Airmen**
- E. Part 4: Graphic Notices and Supplemental Data**
- 1. Parachute jumping areas
 - 2. Military aerial refueling tracks and olive branch routes
 - 3. Terminal radar service areas (TRSAs)
 - 4. Terminal area graphic notices
- V. AVIATION WEATHER. AC 00-6A**
- A. The Earth's Atmosphere**
- 1. Composition
 - 2. Vertical structure
 - 3. The standard atmosphere
 - 4. Density and hypoxia
- B. Temperature**
- 1. Temperature scales
 - 2. Heat and temperature
 - 3. Temperature variation
- C. Atmospheric Pressure and Altimetry**
- 1. Atmospheric pressure
 - 2. Altimetry
- D. Wind**
- 1. Convection
 - 2. Pressure gradient force
 - 3. Coriolis force
 - 4. The general circulation
 - 5. Friction
 - 6. The jet stream
 - 7. Local and small scale winds
 - 8. Wind shear
 - 9. Wind, pressure systems, and weather
- E. Moisture, Cloud Formation, and Precipitation**
- 1. Water vapor
 - 2. Change of state
 - 3. Cloud formations
 - 4. Precipitation
 - 5. Land and water effects
- F. Stable and Unstable Air**
- 1. Changes within upward/downward moving air
 - 2. Stability and instability
- G. Clouds**
- 1. Identification
 - 2. Signposts in the sky
- H. Air Masses and Fronts**
- 1. Air masses
 - 2. Fronts
 - 3. Fronts and flight planning
- I. Turbulence**
- 1. Convective currents
 - 3. Obstructions to wind flow
 - 3. Wind shear
 - 4. Wake turbulence
- J. Icing**
- 1. Structural icing
 - 2. Induction system icing
 - 3. Instrument icing
 - 4. Icing and cloud types

5. Other factors in icing
6. Ground icing
7. Frost

K. Thunderstorms

1. Where and when
2. They just don't happen
3. The inside story
4. Rough and rougher
5. Hazards
6. Thunderstorms and radar
7. Do's and don'ts of thunderstorm flying

L. Common IFR Producers

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

VI. AVIATION WEATHER SERVICE. AC 00-45

- A. The Aviation Weather Service Program
- B. Surface Aviation Weather Reports
- C. Pilot and Radar Reports
- D. Aviation Weather Reports
- E. Surface Analysis
- F. Weather Depiction Chart
- G. Radar Summary Chart
- H. Significant Weather Prognostics
- I. Winds and Temperatures Aloft
- J. Freezing Level Chart
- K. Stability Chart
- L. Severe Weather Outlook Chart
- M. Constant Pressure Charts
- N. Constant Pressure Prognostics
- O. Tables and Conversion Charts

VII. GENERAL AERODYNAMICS

- A. Laws of Motion
 1. Bernoulli
 2. Newton
- B. Airfoil
- C. Chord Line
- D. Relative Wind
- E. Pitch Angle
- F. Angle of Attack

- G. Lift
- H. Drag (airfoil)
- I. Stall
- J. Lift and Angle of Attack
- K. Lift and Velocity of Airflow
- L. Lift and Air Density
- M. Lift and Weight
- N. Thrust and Drag

VIII. AERODYNAMICS OF FLIGHT

- A. Powered Flight
 1. Forces acting on the helicopter
 - (a) Hovering flight
 - (b) Vertical flight
 - (c) Forward flight
 - (d) Sideward flight
 - (e) Rearward flight
 2. Torque
 3. Auxiliary rotor
 4. Gyroscopic precession
 5. Dissymmetry of lift
 6. Blade flapping
 7. Coning
 8. Axis of rotation
 9. Coriolis effect
 10. Translating tendency or drift
 11. Ground effect
 12. Translational lift
 13. Transverse flow effect
 14. Pendular action
- B. Autorotation
 1. Rotor RPM during autorotation
 2. Flares during autorotation

IX. LOADS AND LOAD FACTORS

- A. Lift Components of a Turn
- B. Loads
- C. Load Factor

X. FUNCTIONS OF THE CONTROLS

- A. Collective Pitch Control
- B. Throttle Control
- C. Collective Pitch—Throttle Coordination
- D. Antitorque Pedals
- E. Heading Control
- F. Cyclic Pitch Control

XI. OTHER HELICOPTER COMPONENTS AND THEIR FUNCTIONS

- A. Transmission System
- B. Clutch
 - 1. Centrifugal clutch
 - 2. Friction or belt drive system clutch
- C. Freewheeling Unit
- D. Swash Plate Assembly
- E. Main Rotor System
 - 1. Fully articulated rotor systems
 - 2. Semirigid rotor systems
 - 3. Rigid rotor systems

XII. HELICOPTER OPERATIONS

- A. General
 - 1. Preflight/postflight safety practices
 - 2. Use of proper grade/type fuel
 - 3. Fuel system operation
 - 4. Fuel contamination—prevention/elimination
 - 5. Rotor and engine operating limitations
 - 6. Helicopter operating limitations
- B. Engine
 - 1. Reciprocating engine principles
 - 2. Engine oil system
 - 3. Ignition or electrical system/units
 - 4. Engine controls
 - 5. Carburetor/fuel injection principles
 - 6. Engine starting/shutdown
 - 7. Manifold pressure versus RPM
 - 8. Detonation cause/effect
 - 9. Carburetor ice—cause/detection/elimination
 - 10. Carburetor heat effect on fuel mixture
 - 11. Interpreting engine instruments
 - 12. Emergency—engine/systems/equipment/fire
- C. Weight and Balance
- D. Helicopter Performance
 - 1. Effect of high density altitude on helicopter performance
 - (a) Hovering flight
 - (b) Takeoff
 - (c) Rate of climb
 - (d) Landing

- 2. Effect of gross weight on helicopter performance
- 3. Effect of wind on helicopter performance
- 4. Practical methods for predicting helicopter performances
 - (a) Manifold pressure and payload
 - (b) Manifold pressure and hovering ceiling
 - (c) Payload and wind
 - (d) Hovering and skid height
 - (e) Hovering ceiling and gross weight
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- E. Some Hazards of Helicopter Flight
 - 1. Retreating blade stall
 - 2. Settling with power
 - 3. Ground resonance
 - 4. Abnormal vibrations
 - (a) Low-frequency vibrations
 - (b) Medium-frequency vibrations
 - (c) High-frequency vibrations
 - 5. Transition from powered flight to autorotation
 - 6. Height-velocity curve
 - 7. Antitorque system failure
 - (a) Antitorque system failure in forward cruising flight
 - (b) Antitorque system failure while hovering
 - 8. Wake turbulence
 - 9. Midair collisions
- F. Precautionary Measures and Critical Conditions
 - 1. General precautionary rule
 - 2. Rotor RPM operating limits
 - 3. Extreme attitudes and overcontrolling
 - 4. Flight technique in hot weather
 - 5. Effect of altitude on instrument readings
 - 6. High-altitude pilot technique
 - 7. Tall grass and water operations
 - 8. Carburetor icing
 - (a) Conditions favorable for carburetor icing
 - (b) Indications of carburetor icing
 - (c) Carburetor air temperature gauge
 - (d) Use of carburetor heat
 - (e) Fuel injection

- G. Flight Maneuvers
 1. Hovering flight
 2. Taxiing—air and surface
 3. Takeoffs/approaches/landings
 4. Slope takeoff/landing
 5. Autorotations
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 7. Confined area/pinnacle operation
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XIII. FLIGHT INSTRUMENTS AND SYSTEMS

- A. Attitude Indicator Operation/Errors
- B. Heading Indicator Operation/Errors
- C. Turn Indicator
- D. Vertical Velocity Indicator Operation/Errors
- E. Airspeed Indicator Operation/Errors
- F. Altimeter Operation/Errors
- G. Vacuum Systems/Instruments
- H. Pitot-Static Systems/Instruments
- I. Magnetic Compass Operation/Errors
- J. Altimeter Setting Procedures/Significance
- K. Pressure Altitude—Significance/Obtaining
- L. Gyroscopic Principles

XIV. RADIO COMMUNICATIONS

- A. V H F / U H F Radio Communications/Phraseology
- B. Position Reporting Procedure
- C. Tower/FSS/En Route Advisories/Instructions
- D. FSS Communications Procedures
- E. Obtaining Emergency Assistance
- F. Lost Procedure When Radio is Inoperative
- G. Use of Proper Communications Frequencies

XV. NAVIGATION

- A. General
 1. Chart projections used for air navigation
 2. Direction on a sphere
 3. Distance on a sphere
 4. Aeronautical charts
 - (a) Topographic information
 - (b) Cultural features
 - (c) Relief
 - (d) Aeronautical data

- (e) Navigation aids
- 5. Time zones and 24-hour system
- 6. Metric conversions
- B. Pilotage
 1. Plotting course
 2. Identifying landmarks
- C. Dead Reckoning
 1. Measuring courses
 2. Measuring distances
 3. Effect of wind on navigation
 4. Magnetic variation and deviation
 5. True airspeed and ground speed
 6. True course, magnetic course
 7. Wind direction
- D. Wind Triangles (Vectors)
 1. True course and groundspeed
 2. True heading and groundspeed
 3. Magnetic heading and groundspeed
 4. True course and true airspeed
 5. Wind direction and speed
- E. Navigation Computer
 1. Calculator side (slide rule)
 - (a) Time, speed, distance
 - (b) Fuel consumption
 - (c) Conversions — temperatures, speeds, distances, altitudes
 - (d) Off course corrections
 - (e) Climbs and descents
 - (f) Density altitude
 2. Wind face side (vectors)
 - (a) Courses and headings
 - (b) Groundspeed and true airspeed
 - (c) Off course corrections
 - (d) Wind direction and speed
- F. Radio Navigation
 1. Characteristics of VOR facilities
 2. Tuning VOR stations
 3. Identifying VOR stations
 4. VOR interpretation/orientation
 5. Intercepting VOR radials
 6. Tracking VOR radials
 7. Groundspeed checks using VOR radials
 8. VOR frequency interference
 9. VOR test signals/VOR receiver checks
 10. Characteristics of ADF facilities
 11. Tuning ADF receivers

12. Identifying stations used for ADF
13. ADF/RMI interpretation/orientation
14. Intercepting ADF/RMI bearings
15. Tracking ADF/RMI bearings or "homing"
16. Marker beacons/outer compass locators
17. Distance measuring equipment
18. Transponder use
19. Emergency locator beacons
20. Direction finding (DF)

EXCERPT FEDERAL AVIATION REGULATION

PART 61

PILOTS AND FLIGHT INSTRUCTORS

§ 61.171 General privileges and limitations.

An airline transport pilot has the privileges of a commercial pilot with an instrument rating. The holder of a commercial pilot certificate who qualifies for an airline transport pilot certificate retains the ratings on his commercial pilot certificate, but he may exercise only the privileges of a commercial pilot with respect to them.

Subpart G—Flight Instructors

§ 61.181 Applicability.

This subpart prescribes the requirements for the issuance of flight instructor certificates and ratings, the conditions under which those certificates and ratings are necessary, and the limitations upon these certificates and ratings.

§ 61.183 Eligibility requirements: general.

To be eligible for a flight instructor certificate a person must—

- (a) Be at least 18 years of age;
- (b) Read, write, and converse fluently in English;
- (c) Hold—
 - (1) A commercial or airline transport pilot certificate with an aircraft rating appropriate to the flight instructor rating sought, and
 - (2) An instrument rating, if the person is applying for an airplane or an instrument instructor rating;
- (d) Pass a written test on the subjects in which ground instruction is required by § 61.185; and
- (e) Pass an oral and flight test on those items in which instruction is required by § 61.187.

§ 61.185 Aeronautical knowledge.

(a) Present evidence showing that he has satisfactorily completed a course of instruction in at least the following subjects:

- (1) The learning process.
- (2) Elements of effective teaching.
- (3) Student evaluation, quizzing, and testing.

(4) Course development.

(5) Lesson planning.

(6) Classroom instructing techniques.

(b) Have logged ground instruction from an authorized ground or flight instructor in all of the subjects in which ground instruction is required for a private and commercial pilot certificate, and for an instrument rating, if an airplane or instrument instructor rating is sought.

§ 61.187 Flight proficiency.

(a) An applicant for a flight instructor certificate must have received flight instruction, appropriate to the instructor rating sought in the subjects listed in this paragraph by a person authorized in paragraph (b) of this section. In addition, his logbook must contain an endorsement by the person who has given him the instruction certifying that he has found the applicant competent to pass a practical test on the following subjects:

- (1) Preparation and conduct of lesson plans for students with varying backgrounds and levels of experience and ability.
- (2) The evaluation of student flight performance.
- (3) Effective preflight and postflight instruction.
- (4) Flight instructor responsibilities and certifying procedures.
- (5) Effective analysis and correction of common student pilot flight errors.
- (6) Performance and analysis of standard flight training procedures and maneuvers appropriate to the flight instructor rating sought.

(b) The flight instruction required by paragraph (a) of this section must be given by a person who has held a flight instructor certificate during the 24 months immediately preceding the date the instruction is given, who meets the general requirements for a flight instructor certificate prescribed in § 61.183, and who has given at least 200 hours of flight instruction, or 80 hours in the case of glider instruction, as a certificate flight instructor.

SAMPLE APPLICATION
AIRMAN WRITTEN TEST APPLICATION

PRIVACY ACT STATEMENT

The information on this form is required under the authority of the Federal Aviation Act (Section 602). Certification cannot be completed unless the data is complete.

Disclosure of your Social Security Account Number (SSAN) is optional. If you do not supply your SSAN, a substitute number or identifier will be assigned to give your record a unique 9-digit number for internal control of airman records.

If your SSAN has been previously given, it is already in the system. Requests for removal must be in writing. If you do not wish your SSAN on future records, please do not disclose SSAN on airman written test, airman certification, and/or medical certification applications.

Routine uses of records maintained in the system, including categories of users and the purposes of such uses: To determine that airmen are certified in accordance with the provision of the Federal Aviation Act of 1958. Repository of documents used by individual and potential employers to determine validity of airmen qualifications. To support investigative efforts of investigation and law enforcement agencies of Federal, State, and local Governments. Supportative information in court case concerning individual status and/or qualifications in law suits. To provide data for the Comprehensive Airman Information System (CAIS). To provide documents for microfilm and microfiche backup records.

INSTRUCTIONS TO APPLICANT:

- **ATTENTION: READ THE FOLLOWING PARAGRAPH CAREFULLY BEFORE COMPLETING THIS APPLICATION:**

WHOEVER, IN ANY MATTER WITHIN THE JURISDICTION OF ANY DEPARTMENT OR AGENCY OF THE UNITED STATES KNOWINGLY AND WILLFULLY FALSIFIES, CONCEALS OR COVERS UP BY ANY TRICK, SCHEME, OR DEVICE A MATERIAL FACT, OR MAKES ANY FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR REPRESENTATIONS, OR MAKES OR USES ANY FALSE WRITING OR DOCUMENT KNOWING THE SAME TO CONTAIN ANY FALSE, FICTITIOUS OR FRAUDULENT STATEMENT OR ENTRY, SHALL BE FINED NOT MORE THAN \$10,000 OR IMPRISONED NOT MORE THAN 5 YEARS, OR BOTH (U.S. CODE, TITLE 18, SEC. 1001.)

- ★ CERTAIN TEST QUESTIONS INVOLVING REGULATIONS, ATC PROCEDURES, ETC., ARE FREQUENTLY OUTDATED BY VERY RECENT CHANGES. IN THESE INSTANCES, APPLICANTS ARE GIVEN CREDIT FOR THE QUESTION DURING THE PERIOD THAT IT TAKES TO DISTRIBUTE A REVISED QUESTION.
- DO NOT TEAR SHEETS APART.
- TURN TO PAGE 4 AND COMPLETE THE PERSONAL DATA SECTION. BE SURE THAT YOUR SIGNATURE IS ON THE PROPER LINE. BEFORE COMMENCING TEST, READ INSTRUCTIONS FOR MARKING THE ANSWER SHEET.

INSTRUCTIONS TO FAA PERSONNEL:

- ★ REFER TO PAGE 3 OF THE APPLICATION FOR COMPLETION OF THE TIME WAIVER AND SECTION WAIVER BLOCK WHEN REQUIRED.

SAMPLE APPLICATION

DEPARTMENT OF TRANSPORTATION — FEDERAL AVIATION ADMINISTRATION										
AIRMAN WRITTEN TEST APPLICATION										
DATE OF TEST MONTH DAY YEAR			TITLE OF TEST				TEST NO.			
PLEASE PRINT ONE LETTER IN EACH SPACE—LEAVE A BLANK SPACE AFTER EACH NAME							DATE OF BIRTH MONTH DAY YEAR			
NAME (LAST, FIRST, MIDDLE)										
MAILING ADDRESS				NO. AND STREET, APT. #, P.O. BOX, OR RURAL ROUTE			DESCRIPTION			
CITY, TOWN OR POST OFFICE AND STATE				ZIP CODE			HEIGHT	WEIGHT	HAIR	EYES
BIRTHPLACE (City and State, or foreign country)			CITIZENSHIP		SOCIAL SECURITY NO.		IF A SOCIAL SECURITY NUMBER HAS NEVER BEEN ISSUED CHECK THIS BLOCK <input type="checkbox"/>			
Is this a retest? <input type="checkbox"/> No <input type="checkbox"/> Yes, date of last test			Have you taken or are you taking an FAA approved course for this test? <input type="checkbox"/> No <input type="checkbox"/> Yes (If "yes" give details below)							
Graduation date:		NAME OF SCHOOL				CITY AND STATE				
CERTIFICATION: I CERTIFY that all of the statements made in this application are true, complete, and correct to the best of my knowledge and belief and are made in good faith. Signature _____										
— DO NOT WRITE IN THIS BLOCK — FOR USE OF FAA OFFICE ONLY —										
CARD A					CARD B					Applicant's identity established by:
CATEGORY	TEST NUMBER	TAKE NO.	SECTIONS 1 2 3 4 5 6 7				EXPIRATION MONTH DAY YEAR	CERTIFICATED SCHOOL NUMBER	FIELD OFFICE DESIGNATION	SIGNATURE of FAA Representative
INSTRUCTIONS FOR MARKING THE ANSWER SHEET. Completely darken only one circle for each question. DO NOT USE (X) OR (✓). Use black lead pencil furnished by examiner. To make corrections, open answer sheet so erasure marks will not show on page 2. Then erase incorrect response on page 4. On page 2 (copy) mark the incorrect response with a slash (/). Questions are arranged in VERTICAL sequence as indicated by the arrows.										

↓	1 0 2 3 4	23 0 2 3 4	45 0 2 3 4	67 0 2 3 4	89 0 2 3 4	111 0 2 3 4	133 0 2 3 4
↓	2 0 2 3 4	24 0 2 3 4	46 0 2 3 4	68 0 2 3 4	90 0 2 3 4	112 0 2 3 4	134 0 2 3 4
↓	3 0 2 3 4	25 0 2 3 4	47 0 2 3 4	69 0 2 3 4	91 0 2 3 4	113 0 2 3 4	135 0 2 3 4
↓	4 0 2 3 4	26 0 2 3 4	48 0 2 3 4	70 0 2 3 4	92 0 2 3 4	114 0 2 3 4	136 0 2 3 4
↓	5 0 2 3 4	27 0 2 3 4	49 0 2 3 4	71 0 2 3 4	93 0 2 3 4	115 0 2 3 4	137 0 2 3 4
↓	6 0 2 3 4	28 0 2 3 4	50 0 2 3 4	72 0 2 3 4	94 0 2 3 4	116 0 2 3 4	138 0 2 3 4
↓	7 0 2 3 4	29 0 2 3 4	51 0 2 3 4	73 0 2 3 4	95 0 2 3 4	117 0 2 3 4	139 0 2 3 4
↓	8 0 2 3 4	30 0 2 3 4	52 0 2 3 4	74 0 2 3 4	96 0 2 3 4	118 0 2 3 4	140 0 2 3 4
↓	9 0 2 3 4	31 0 2 3 4	53 0 2 3 4	75 0 2 3 4	97 0 2 3 4	119 0 2 3 4	141 0 2 3 4
↓	10 0 2 3 4	32 0 2 3 4	54 0 2 3 4	76 0 2 3 4	98 0 2 3 4	120 0 2 3 4	142 0 2 3 4
↓	11 0 2 3 4	33 0 2 3 4	55 0 2 3 4	77 0 2 3 4	99 0 2 3 4	121 0 2 3 4	143 0 2 3 4
↓	12 0 2 3 4	34 0 2 3 4	56 0 2 3 4	78 0 2 3 4	100 0 2 3 4	122 0 2 3 4	144 0 2 3 4
↓	13 0 2 3 4	35 0 2 3 4	57 0 2 3 4	79 0 2 3 4	101 0 2 3 4	123 0 2 3 4	145 0 2 3 4
↓	14 0 2 3 4	36 0 2 3 4	58 0 2 3 4	80 0 2 3 4	102 0 2 3 4	124 0 2 3 4	146 0 2 3 4
↓	15 0 2 3 4	37 0 2 3 4	59 0 2 3 4	81 0 2 3 4	103 0 2 3 4	125 0 2 3 4	147 0 2 3 4
↓	16 0 2 3 4	38 0 2 3 4	60 0 2 3 4	82 0 2 3 4	104 0 2 3 4	126 0 2 3 4	148 0 2 3 4
↓	17 0 2 3 4	39 0 2 3 4	61 0 2 3 4	83 0 2 3 4	105 0 2 3 4	127 0 2 3 4	149 0 2 3 4
↓	18 0 2 3 4	40 0 2 3 4	62 0 2 3 4	84 0 2 3 4	106 0 2 3 4	128 0 2 3 4	150 0 2 3 4
↓	19 0 2 3 4	41 0 2 3 4	63 0 2 3 4	85 0 2 3 4	107 0 2 3 4	129 0 2 3 4	
↓	20 0 2 3 4	42 0 2 3 4	64 0 2 3 4	86 0 2 3 4	108 0 2 3 4	130 0 2 3 4	
↓	21 0 2 3 4	43 0 2 3 4	65 0 2 3 4	87 0 2 3 4	109 0 2 3 4	131 0 2 3 4	
↓	22 0 2 3 4	44 0 2 3 4	66 0 2 3 4	88 0 2 3 4	110 0 2 3 4	132 0 2 3 4	

SAMPLE TEST ITEMS

In some of the following test items, reference is made to certain illustrations which are located in the appendices of this guide and are representative of those used with the Flight Instructor-Rotorcraft-Helicopter Written Tests.

1. A Flight Instructor Certificate expires at the end of the
 - 1—6th month after the month it was last issued or renewed.
 - 2—12th month after the month it was issued or renewed.
 - 3—24th month after the month in which it was last issued or renewed.
 - 4—36th month after it was issued or renewed.

Response 3 is the correct answer.

A Flight Instructor Certificate—

- (1) Is effective only while the holder has a current pilot and a medical certificate appropriate to the pilot privileges being exercised; and
 - (2) Expires at the end of the 24th month after the month in which it was issued or renewed.
2. Using the appropriate information on page 45 and the charts on page 46, determine the center of gravity on the Hurleycraft 135 under the following conditions:

Pilot Weight	150 lbs.
Passenger weight	200 lbs.
Fuel	25 gals.

Under these conditions, the center of gravity would be located

- 1—well within the CG limit; the loading would be acceptable.
- 2—well aft of the aft CG limit; the loading would be unacceptable because the helicopter would be dangerously tail-heavy.
- 3—well forward of the forward CG limit; the loading would be unacceptable because the

helicopter would be dangerously nose-heavy.

- 4—within the CG envelope, but the loading would be unacceptable because the maximum allowable gross weight would be exceeded.

Response 1 is the correct answer.

Applying the given information to the loading graph the following conclusions are made:

		<i>Weight Moment/1000</i>
Helicopter basic weight		
(8 qts. oil included) --	935	94.3
Pilot and passenger ----	350	29.0
Fuel (6.0 lbs. per gal.) --	150	16.0
TOTALS -----	1,435	139.3

Drawing a parallel line from left to right (139.3/1000 lbs.-ins.) and a vertical line from bottom to top (1,435 lbs.) on the center of gravity moment envelope, the CG is located where the two lines intersect—at a point well within the center of gravity envelope.

3. When a warm air mass is being modified by cooling from below, that air mass tends to be characterized, in part, by
 - 1—unrestricted visibility.
 - 2—rough air.
 - 3—smooth air.
 - 4—showery-type precipitation.

Response 3 is the correct answer.

Cooling from below, which increases the stability of an air mass, may result from (1) the advection of a warm air mass over a colder surface, or (2) radiational cooling of the surface under the air mass. In addition, smooth air is typically associated with stable air.

4. GIVEN: Magnetic Heading ----- 135°
Relative Bearing ----- 055°

Based on the given information, the magnetic bearing to the station (radiobeacon) would be approximately

- 1—055°.
- 2—080°.
- 3—135°.
- 4—190°.

Response 4 is the correct answer.

By adding the magnetic heading (135°) to the relative bearing (055°), the magnetic bearing (190°), to the station is verified (MH+RB=MB).

5. While taxiing on the surface, the cyclic pitch stick should be used to control
- 1—helicopter heading.
 - 2—any drifting movement.
 - 3—rate of speed.
 - 4—starting and stopping.

Response 2 is the correct answer.

During crosswind taxi, the cyclic should be held into the wind a sufficient amount to eliminate any drifting movement.

6. A knowledge of load factors will emphasize the importance of aircraft gross weight during flight maneuvers. Load factor is the actual load the rotor blades must support at any given time
- 1—multiplied by the gross weight of the helicopter.
 - 2—subtracted from the gross weight of the helicopter.
 - 3—divided by the gross weight of the helicopter.
 - 4—added to the gross weight of the helicopter.

Response 3 is the correct answer.

The load factor is the actual load on the rotor blades at any time, divided by the normal load or gross weight (weight of the helicopter and its contents). Any time a helicopter flies in a curved flightpath, the load supported by the rotor blades is greater than the total weight of the helicopter. The steeper the bank, the greater the load supported by the rotor blades; therefore, the greater the load factor.

7. A static vent installation which provides the most accurate measurement of static pressure under various flight attitudes, is installed

- 1—in the cockpit where it is not influenced by variable angles of attack.
- 2—on one side of the helicopter and covered by a fine screen.
- 3—in the back of the instrument where the air is undisturbed.
- 4—on each side of the helicopter where the system will be unaffected by the attitude of the helicopter.

Response 4 is the correct answer.

Static pressure is taken from the static line attached to the pitot-static head or to a vent or vents mounted flush with the fuselage or nose section. On aircraft using the flush-type static source, there may be two vents, one on each side of the aircraft. These compensate for any possible variation in static pressure on the vents due to erratic changes in aircraft attitude.

8. Assume an altimeter indicates an altitude of 6,400 feet (MSL) with an altimeter setting of 30.13" Hg. What is the approximate pressure altitude?
- 1—6,200 feet.
 - 2—6,200 feet corrected for nonstandard temperature.
 - 3—6,600 feet.
 - 4—6,600 feet corrected for nonstandard temperature.

Response 1 is the correct answer.

Pressure altitude is the altitude read from the altimeter when 29.92 is set in the altimeter setting window. The indicated altitude is the altitude read directly from the altimeter (uncorrected) after it is set to the current altimeter setting.

$$\begin{array}{r} 30.12 \text{ (1 inch equals approximately 1,000} \\ -29.92 \text{ feet)} \\ \hline .20 \text{ difference} \end{array}$$

.20×1,000 feet=200 feet. In this case 30.12 is higher than 29.92; therefore the pressure altitude will be 200 feet low, i.e., 6,200 feet.

9. In the Northern Hemisphere the magnetic compass will normally indicate a turn toward the
- 1—south when the aircraft is accelerated on a north heading.
 - 2—west, if a right turn is entered from a north heading.

3—east, if a right turn is entered from a south heading.

4—east, if a right turn is entered from a north heading.

Response 2 is the correct answer.

The characteristics of the magnetic compass are:

- (1) If the aircraft is on a northerly heading and a turn is made toward east or west, the indication of the compass lags or indicates a turn in the opposite direction.
- (2) If the aircraft is on a southerly heading and a turn is made, the compass needle will indicate a greater amount of turn than is actually made.
- (3) If the aircraft is on an east or west heading, no error is apparent while entering a turn to north or south.
- (4) If the aircraft is on an east or west heading, an increase in airspeed causes the compass to indicate a turn toward north.
- (5) If the aircraft is on an east or west heading, a decrease in airspeed causes the compass to indicate a turn toward south.
- (5) If the aircraft is on a north or south heading, no error is apparent while climbing, diving, or changing airspeed.

10. The rotor blade pitch angle is the acute angle between the blade chord line and the

1—rotor plane of rotation.

2—direction of the relative wind.

3—horizon.

4—angle of attack.

Response 1 is the correct answer.

Pitch angle—the rotor blade pitch angle is the acute angle between the blade chord line and a reference plane determined by the main rotor hub. Since the rotor plane of rotation is parallel to the plane containing the main rotor hub, the rotor blade pitch angle could also be described as the acute angle between the blade chord line and the rotor plane of rotation. The pitch angle can be varied by the pilot through the use of cockpit controls (collective and cyclic pitch controls) provided for this purpose.

ADDITIONAL QUESTIONS FOR STUDY

Because the following questions are presented for the sole purpose of creating student interest,

answers and explanations are not included. Here again, the applicant should be aware that these questions do not cover all those subject areas found on the *Fundamental of Instructing or Flight Instructor-Rotorcraft-Helicopter Written Tests*.

1. Certain recency of experience requirements are mandatory prior to conducting night operations with passengers aboard. What are these requirements?
2. May a private pilot receive compensation when acting as pilot in command of an aircraft?
3. What is the difference between control zones and control areas?
4. What are the *basic* VFR weather minimums for helicopter operations within control zones?
5. May a helicopter be operated in a control zone under special VFR rules at night?
6. What is the difference between an Airport Traffic Area and an Airport Advisory Area?
7. Are "Airport Traffic Areas" depicted on aeronautical charts?
8. Will a lower than standard temperature have any effect on an altimeter?
9. What causes air to tend to flow parallel to isobars and contours?
10. Which is more dense—cold dry air or cold moist air?
11. What can a pilot do to better assist the weather briefer when requesting weather information by telephone?
12. What type weather is most likely to develop when the temperature/dewpoint spread is 4° and decreasing?
13. Scheduled weather broadcasts occur how often?
14. What type weather conditions should one expect to be associated with an advancing warm front that contains moist and stable air?
15. What is a "Squall Line"?
16. Severe turbulence is most likely to occur in what type clouds?
17. How can one tell when an individual thunderstorm has reached its mature stage of development?

18. What is the most serious type of in-flight structural icing?
19. What is the difference between pressure altitude and density altitude?
20. In what manner does high ambient temperature affect helicopter performance?
21. What is "settling with power," and how can a recovery from this situation be best accomplished?
22. What causes retreating blade stall?
23. What action should the pilot take if the anti-torque system fails while the helicopter is hovering or in flight?
24. What is ground resonance and what action should a pilot take if it is encountered?
25. How are wingtip vortices generated?
26. Do helicopters generate "wingtip vortices"?
27. Should a helicopter pilot ever need to be concerned about "hypoxia"?
28. What should the absence of a VOR station identifier signify to a pilot?
29. When transponder equipped, how can a pilot alert ATC that radio communications failure has occurred?
30. During confined area operations, what is the primary reason for making a low reconnaissance?
31. For navigation purposes, in both instances shown below, which fact must be determined first?
 1. True course or true heading.
 2. Groundspeed or true airspeed.
32. Where can you find information about any "Special Use Airspace" that may be located in the area or along the route where you plan to fly?
33. How does a magnetic compass function, and what are its errors?
34. What are aircraft performance charts and where can they be found for a particular helicopter?
35. What are the requirements for the notification and reporting of aircraft accidents?
36. Does fuel injection provide better fuel distribution? How?
37. What are detonation and preignition?
38. What is "Best Power" mixture?
39. At what fuel/air ratio do the highest cylinder temperatures occur?
40. What are the results of using an excessively rich mixture at high altitudes?

APPENDICES

The following material is presented to encourage further study in selected subject areas, and should be used for study purposes only. Because certain data may become obsolete, *under no circumstances* should any information herein be used for operational purposes.

APPENDIX A—General Aerodynamics

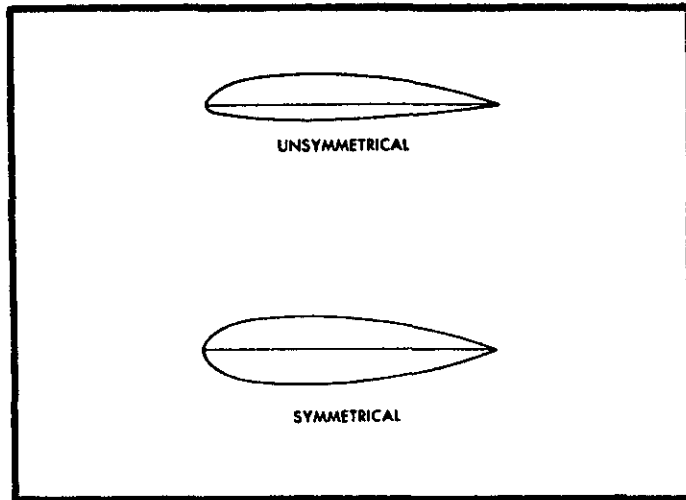


FIGURE 1. Airfoils.

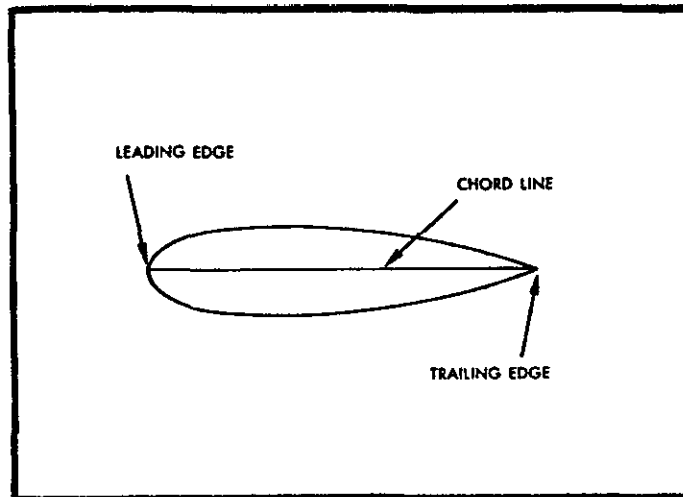


FIGURE 2. Chord line.

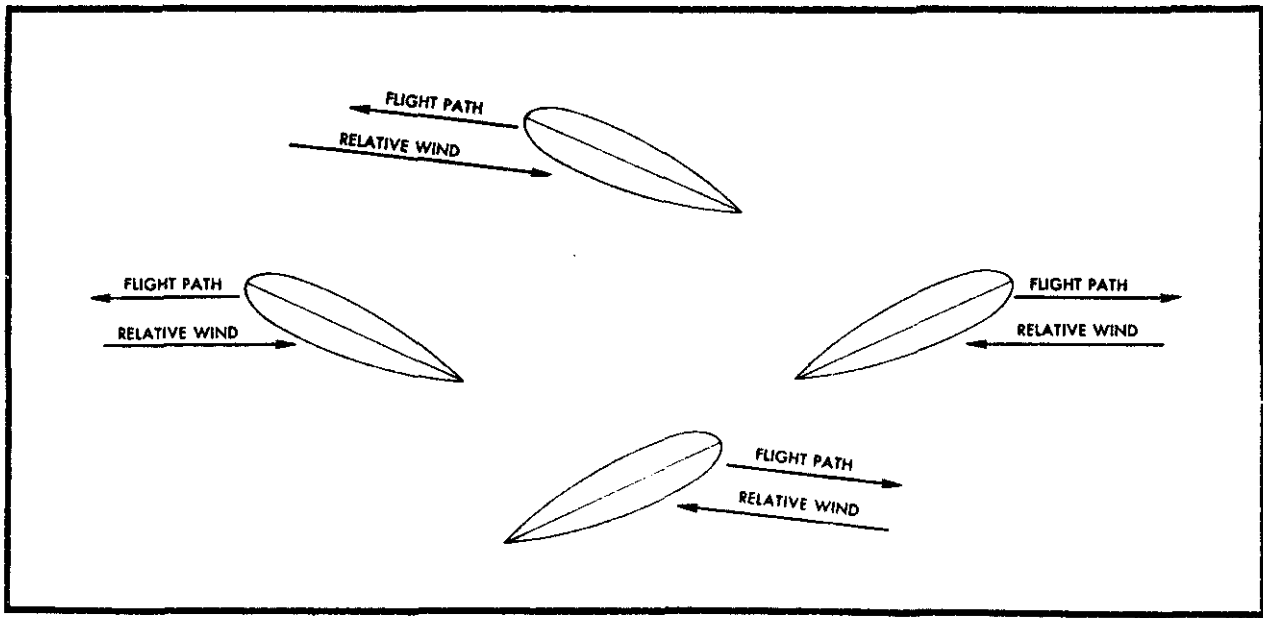


FIGURE 3. Relative wind.

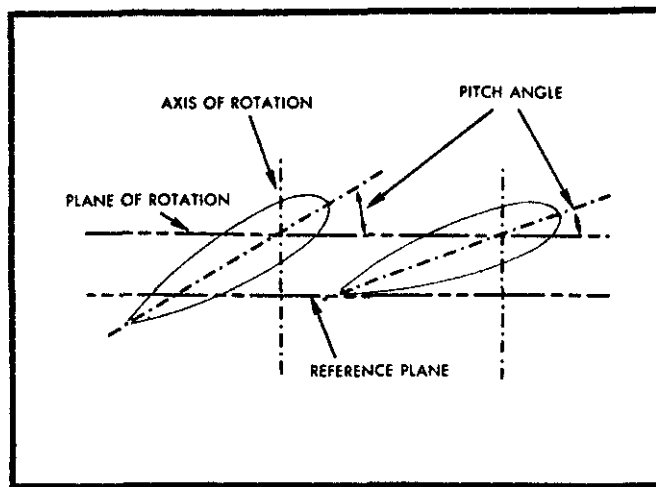


FIGURE 4. Rotor blade pitch angle.

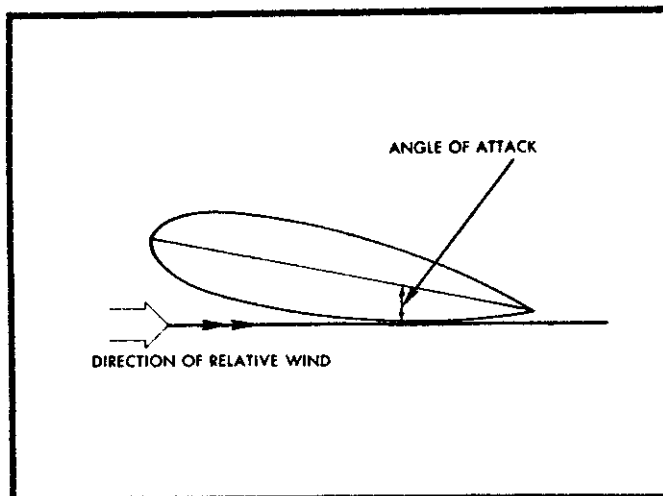


FIGURE 5. Angle of attack.

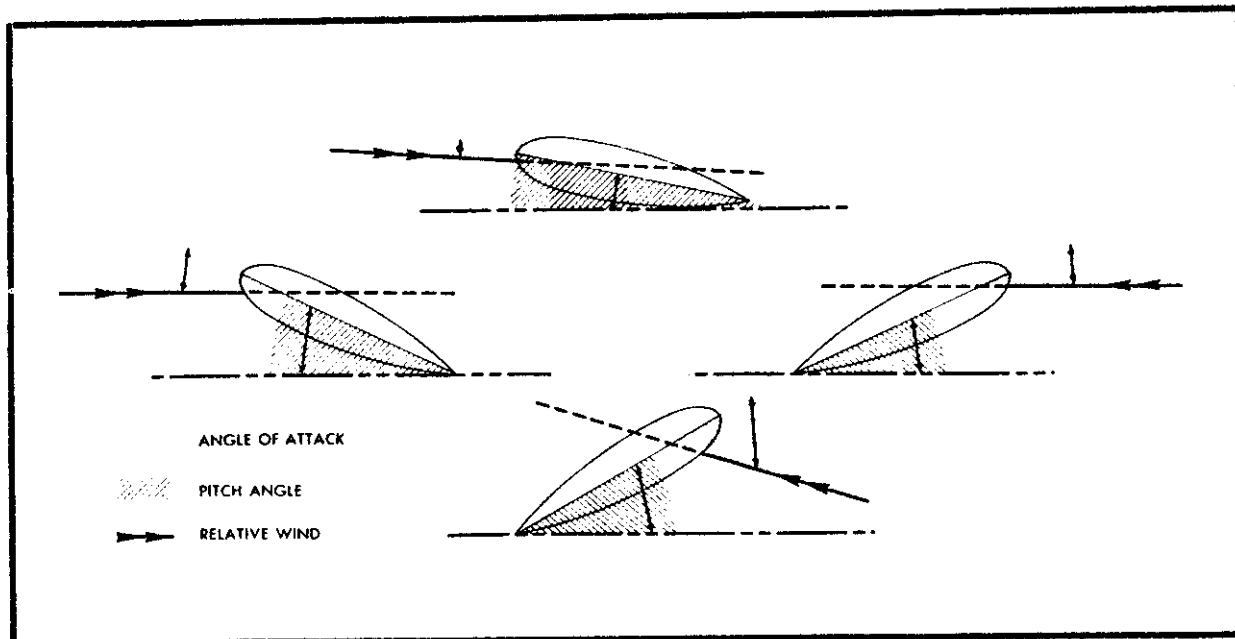


FIGURE 6. Angle of attack and rotor blade pitch angle relationship.

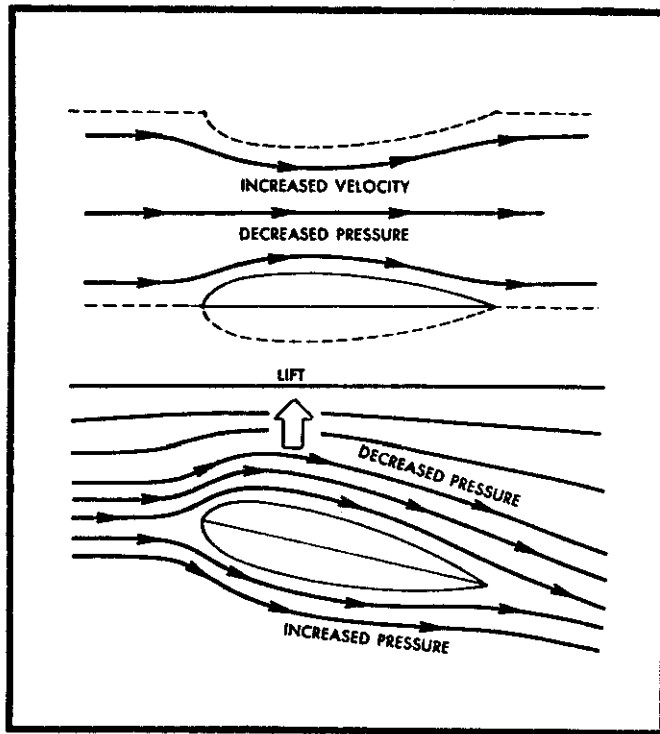


FIGURE 7. Bernoulli's principle.

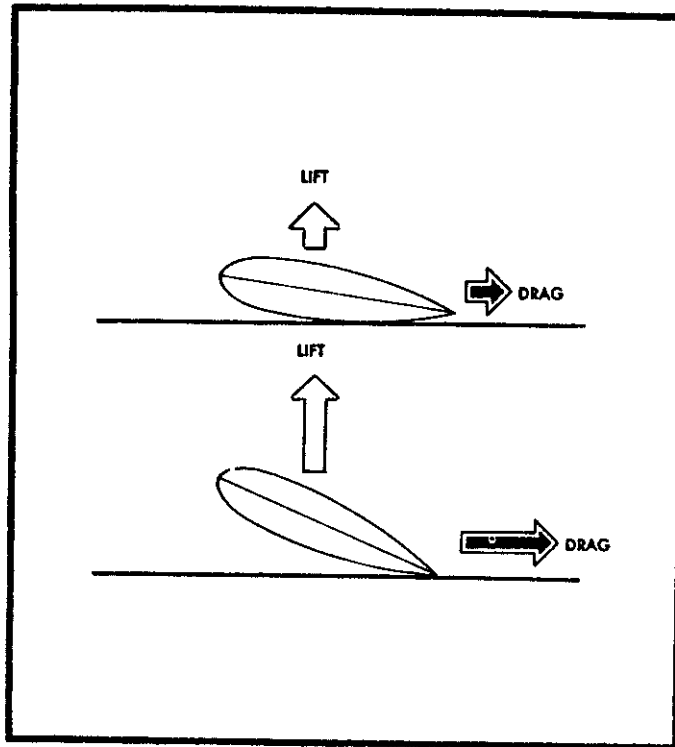


FIGURE 8. Angle of attack and lift and drag forces relationship.

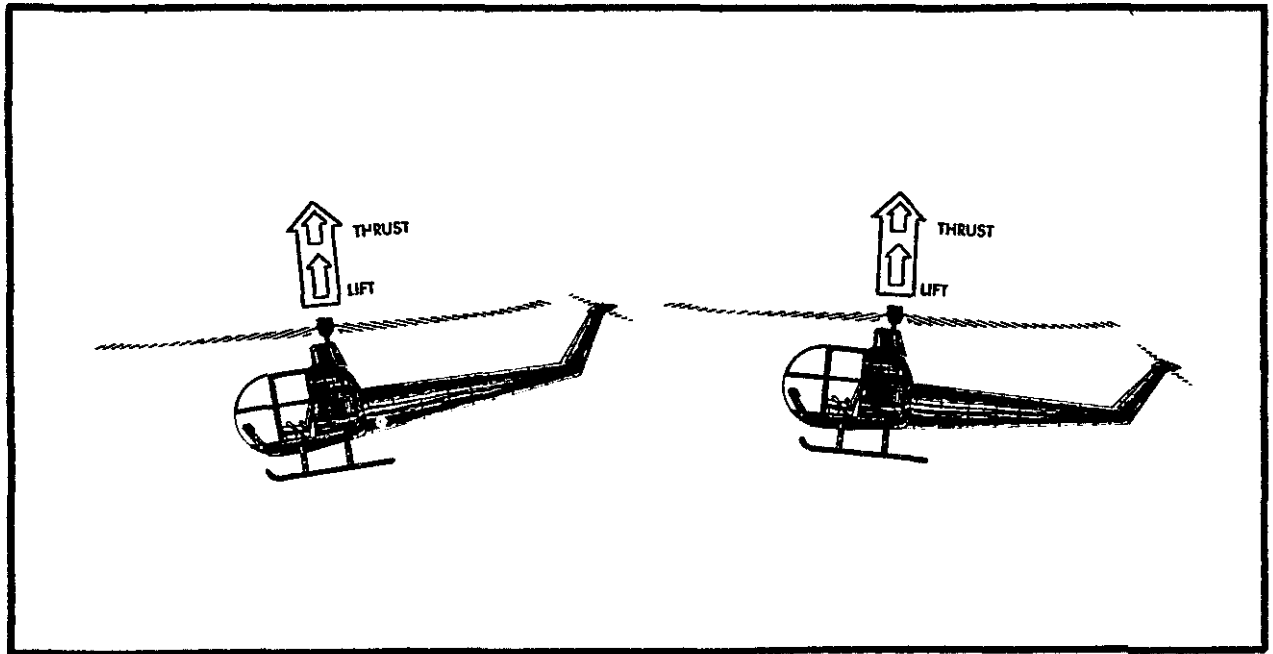


FIGURE 9. Total lift-thrust force and rotor disc relationship.

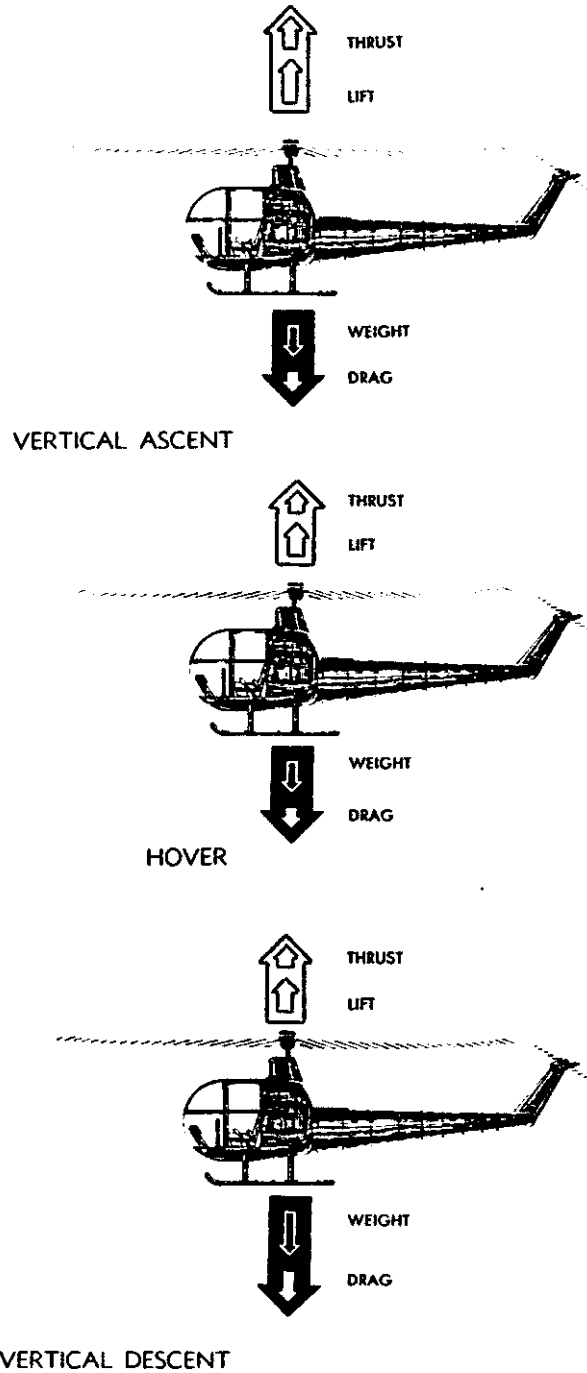


FIGURE 10 Hovering and vertical flight aerodynamic forces.

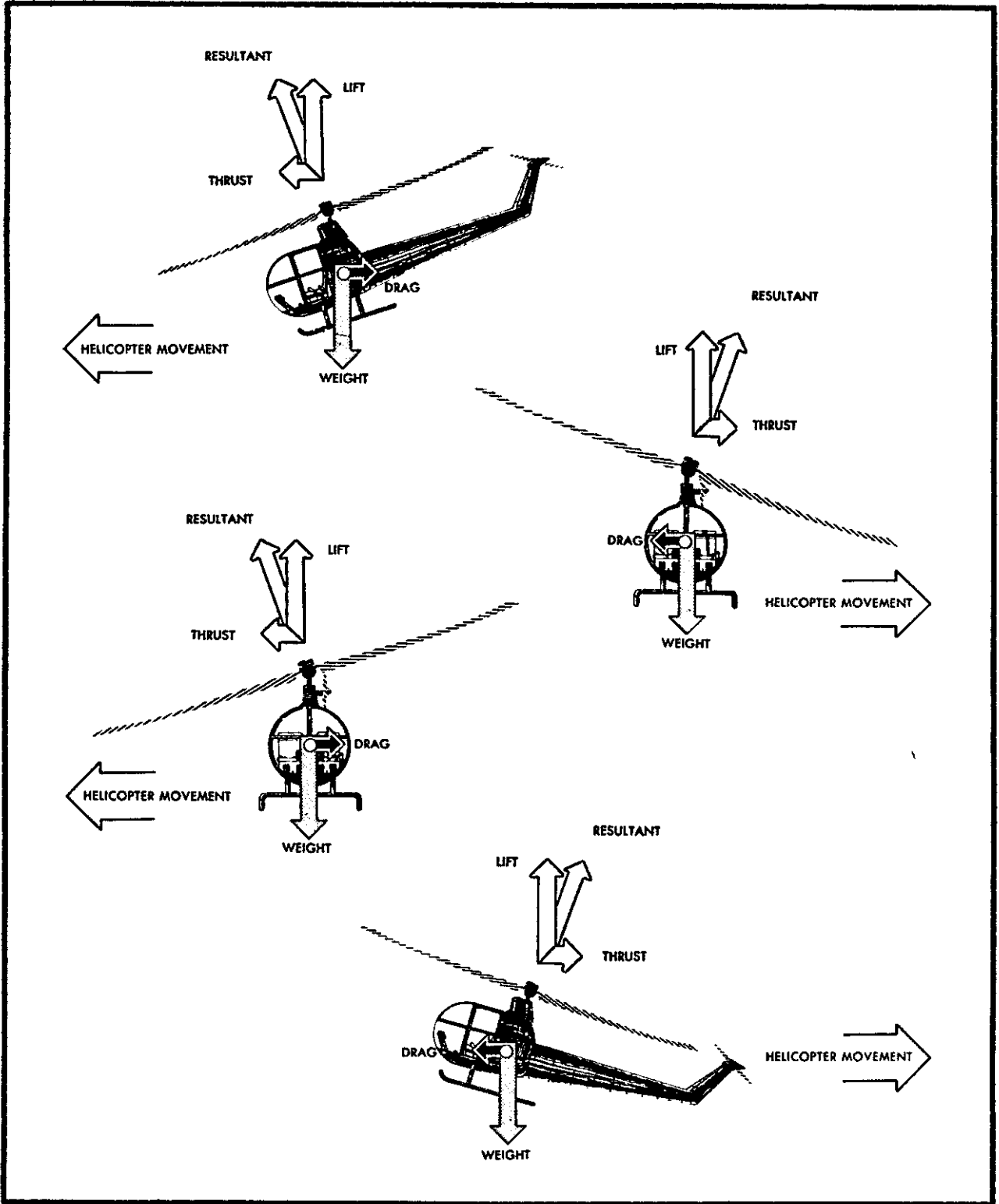


FIGURE 11. Forward, sideward, and rearward flight aerodynamic forces.

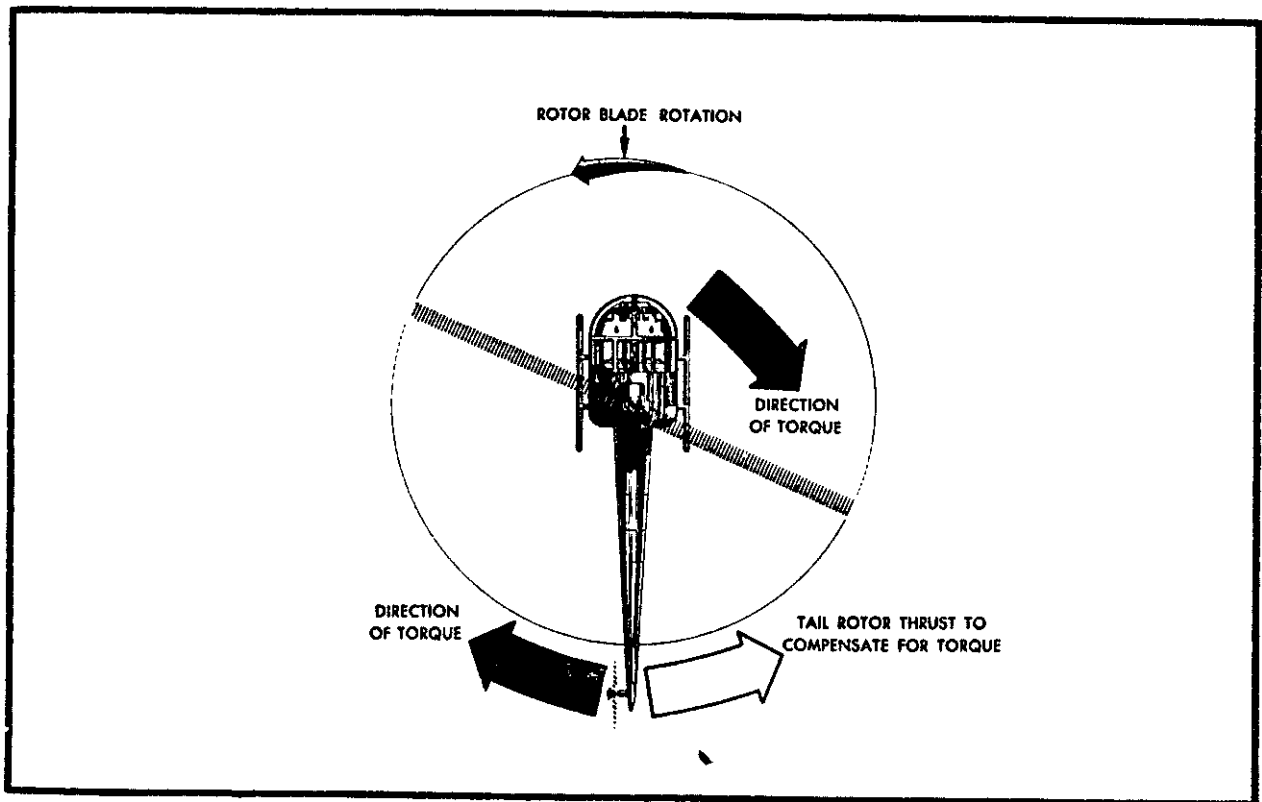


FIGURE 12. Effects of tail rotor thrust.

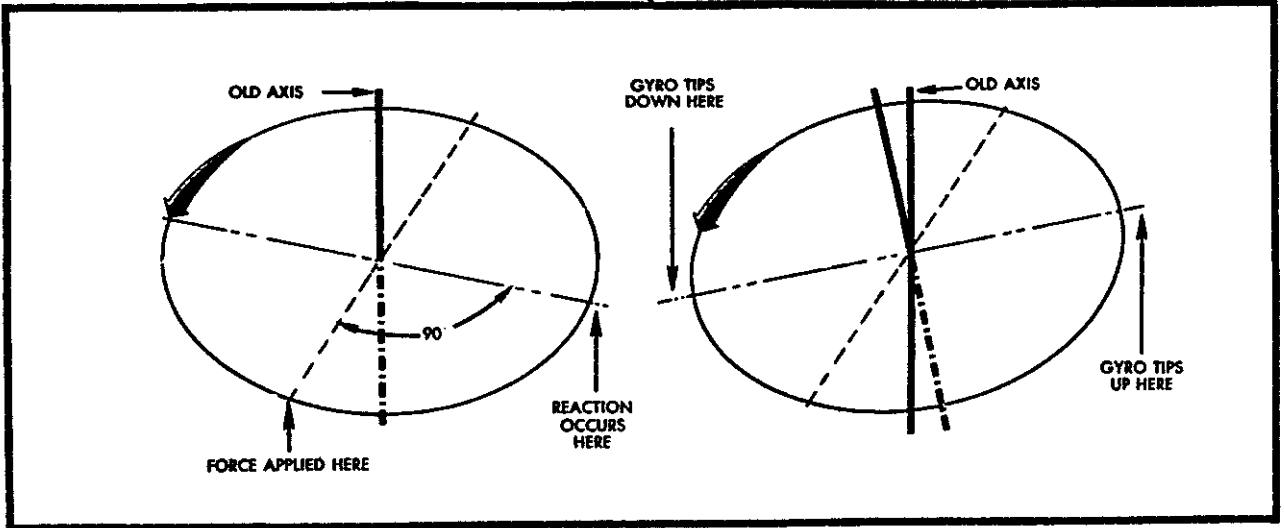


FIGURE 13. Gyroscopic precession principle.

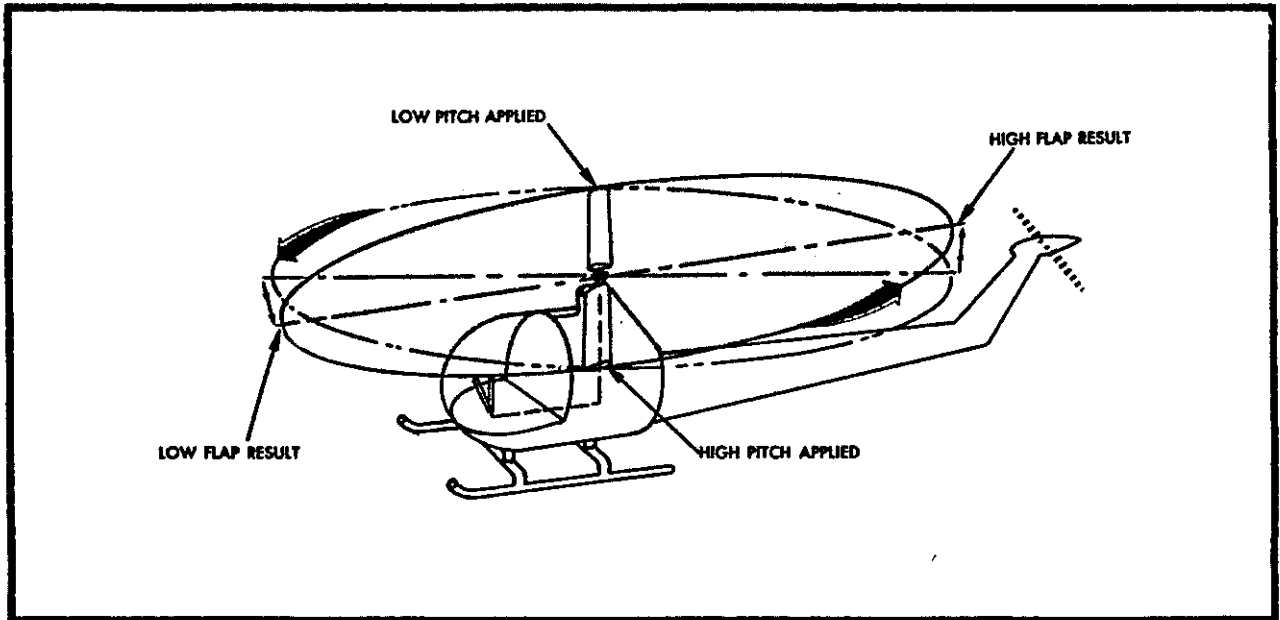


FIGURE 14. Rotor disc acts like a gyro.

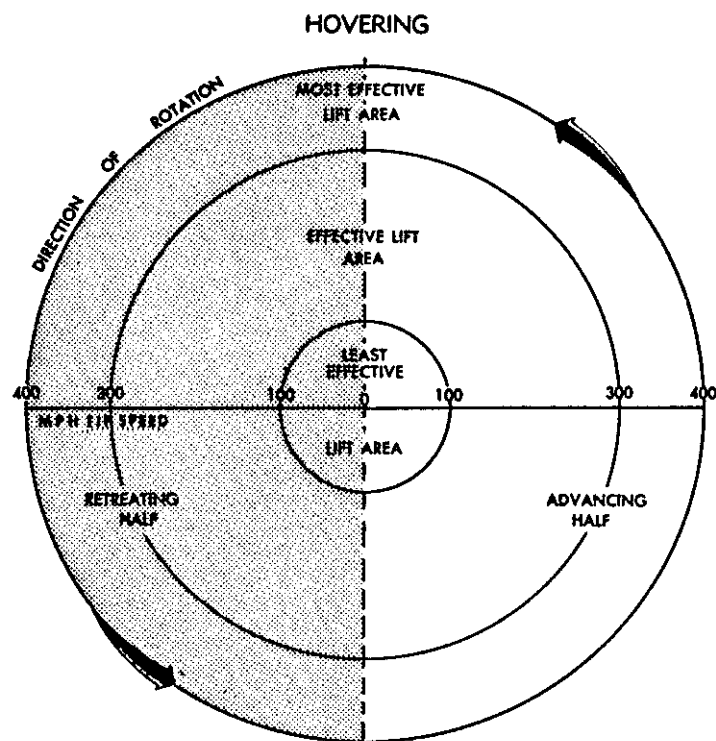
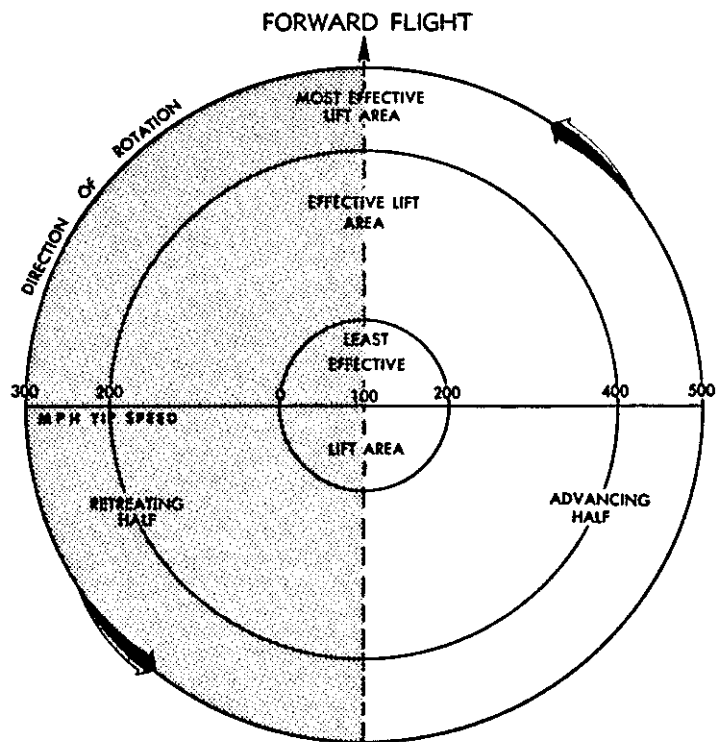


FIGURE 15. Rotor blade speeds.

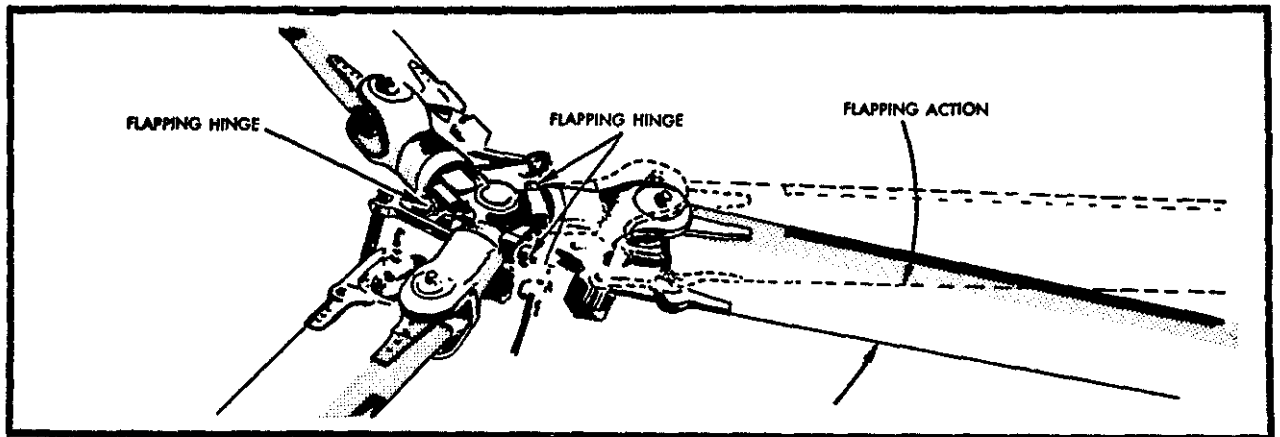


FIGURE 16. Flapping action.

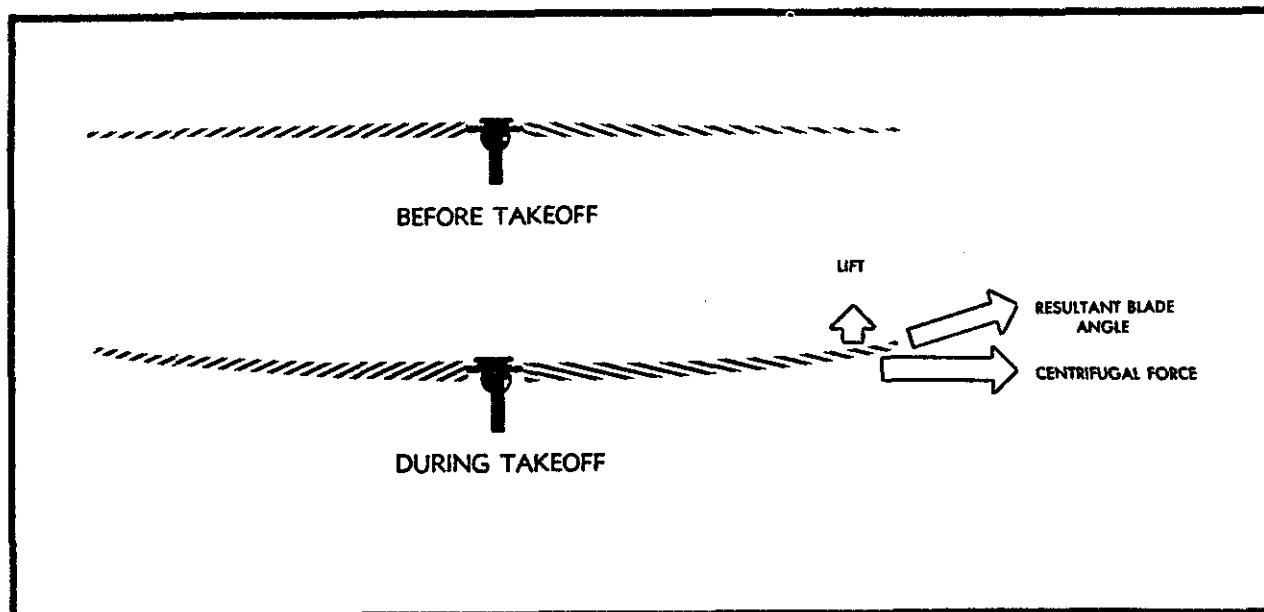


FIGURE 17. Blade coning.

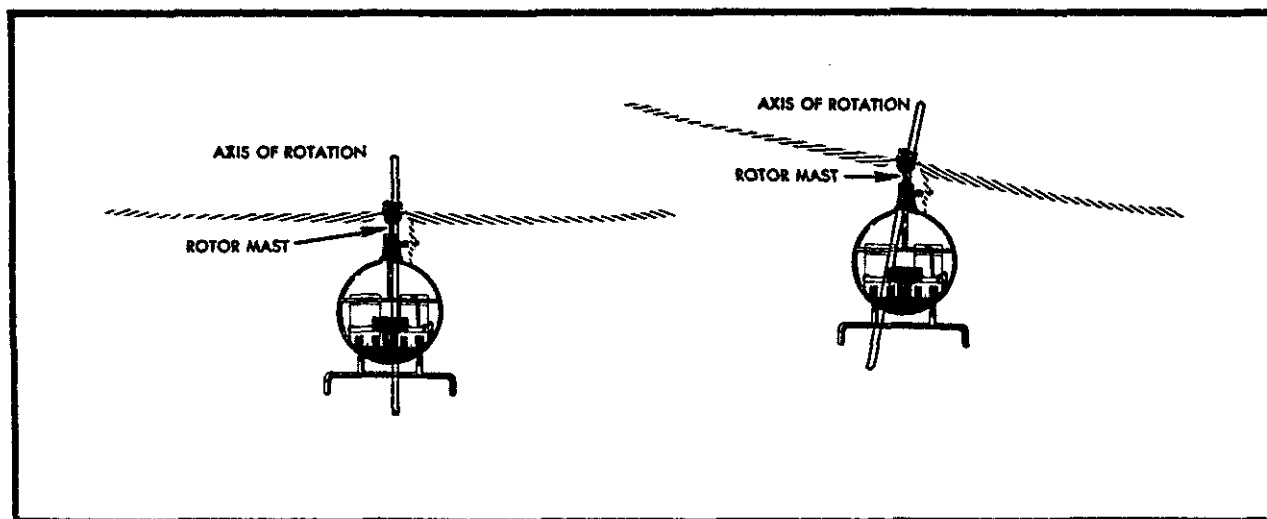


FIGURE 18. Axis of rotation.

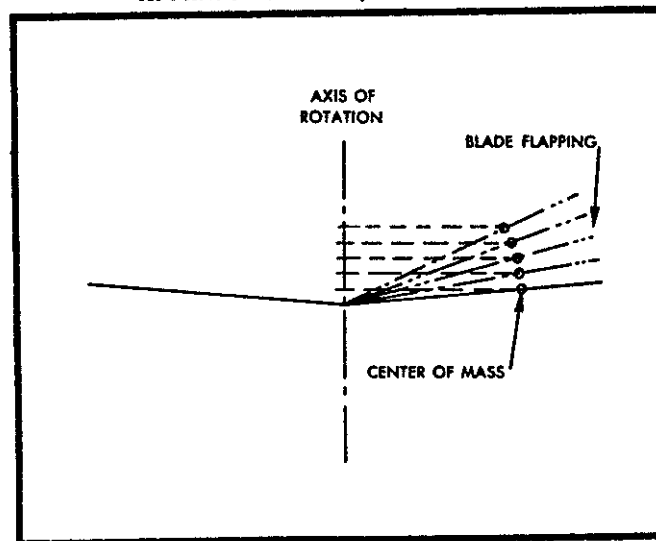


FIGURE 19. Coriolis effect.

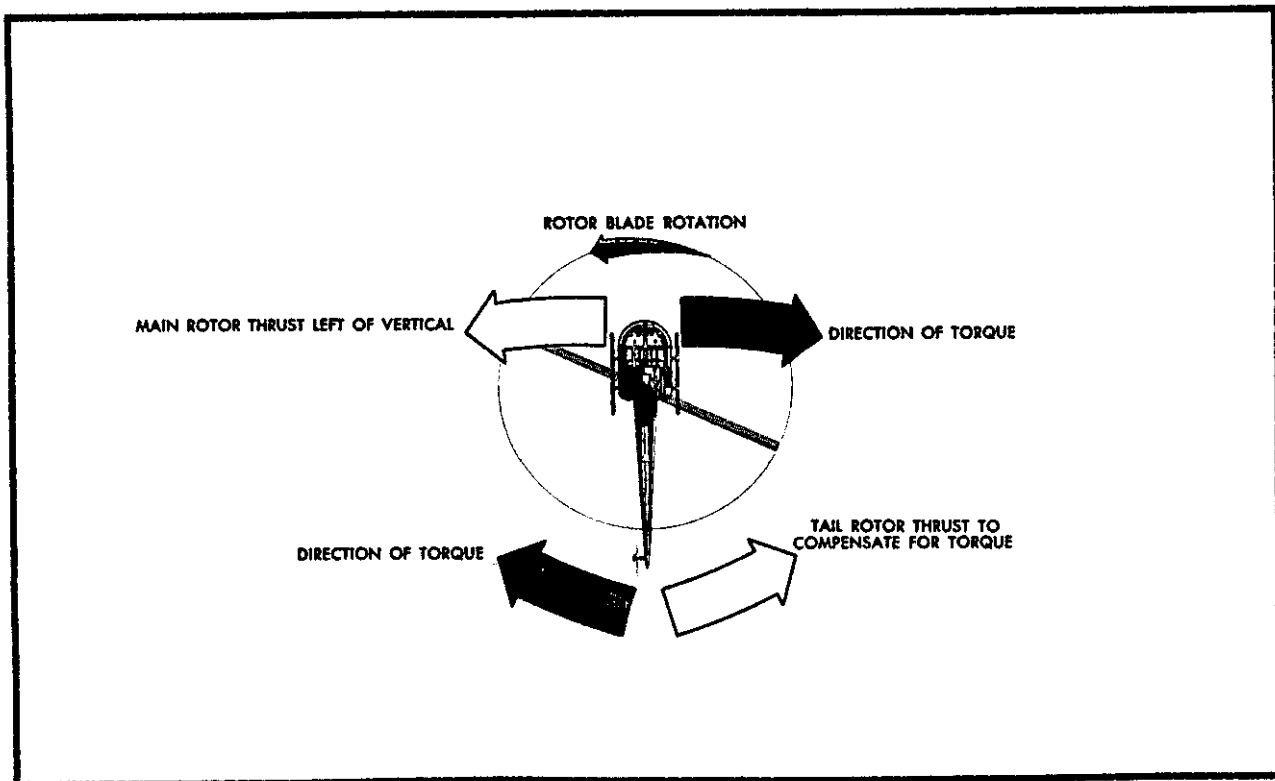


FIGURE 20. Translating tendency (drift).

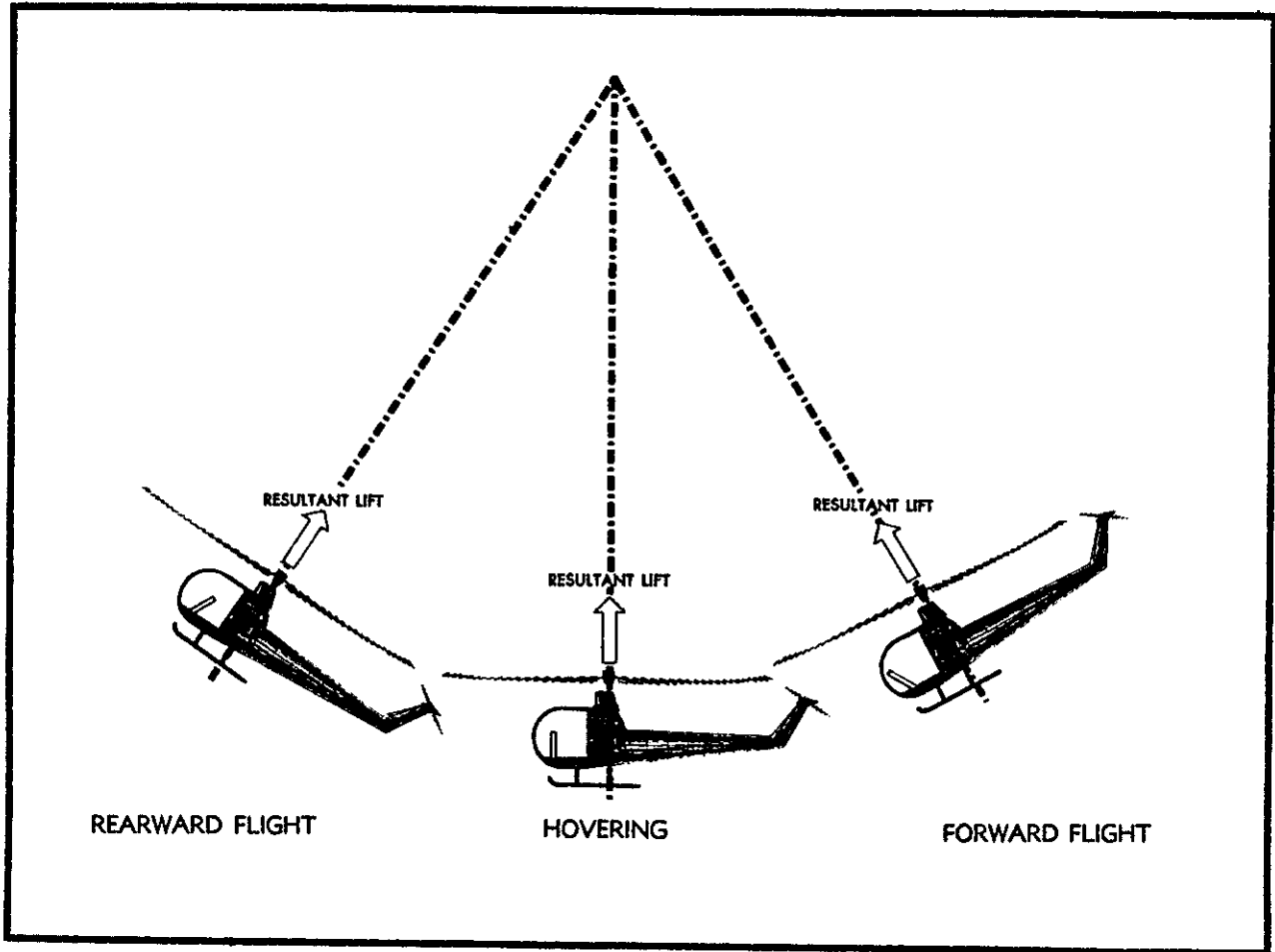


FIGURE 21. Pendular action.

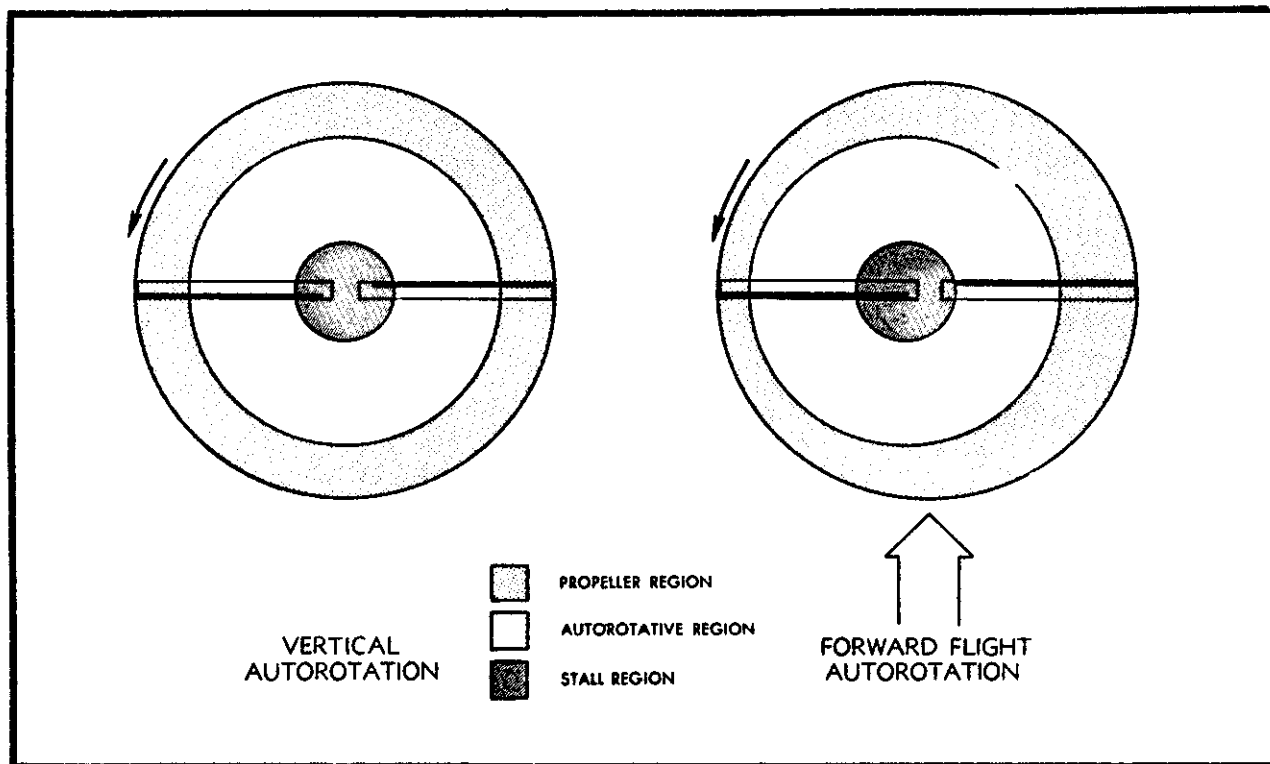


FIGURE 22. Rotor disc during autorotation.

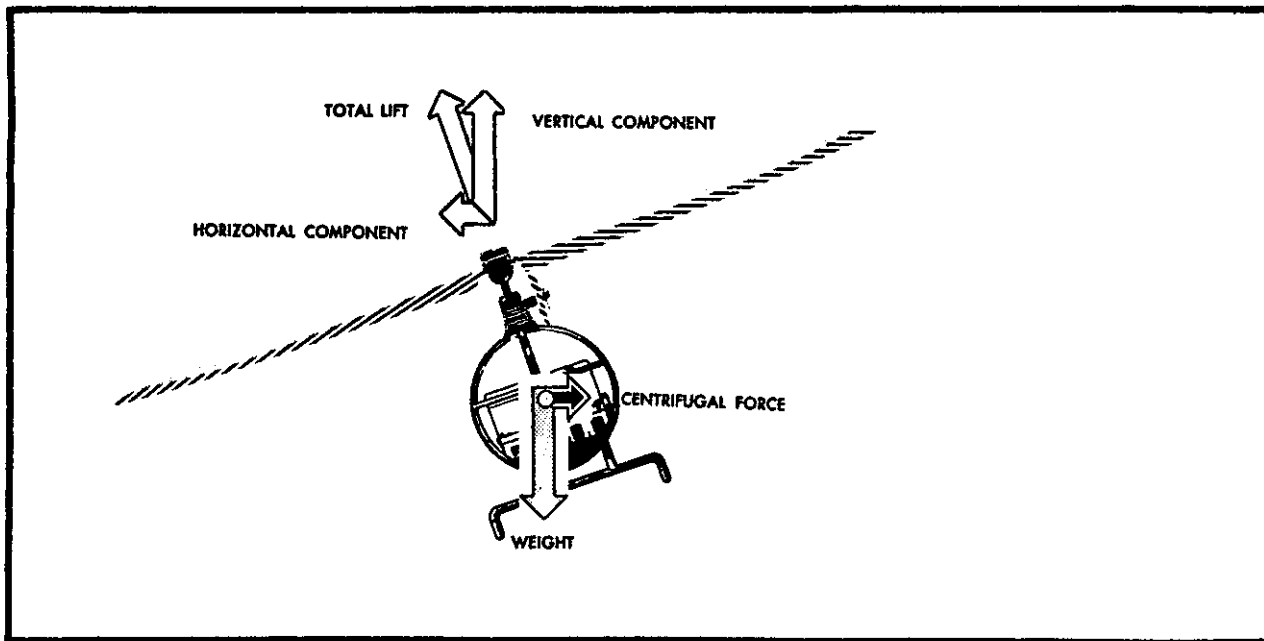


FIGURE 23. Forces acting on a helicopter during a turn.

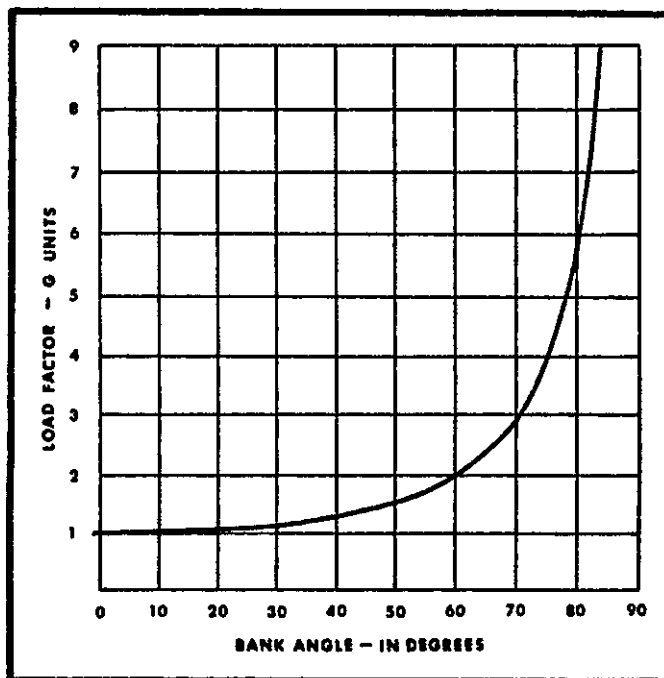


FIGURE 24. Load factor chart.

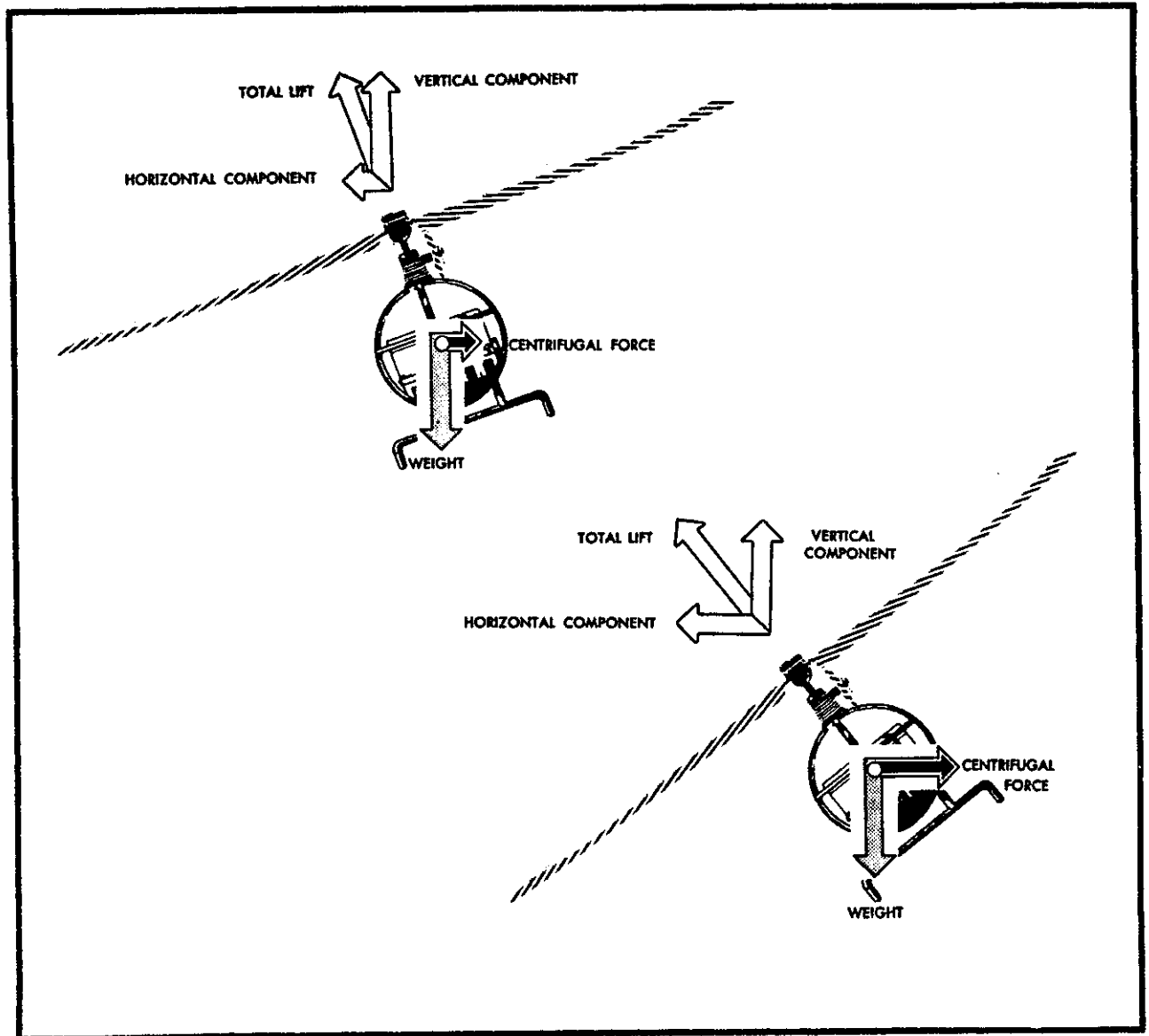
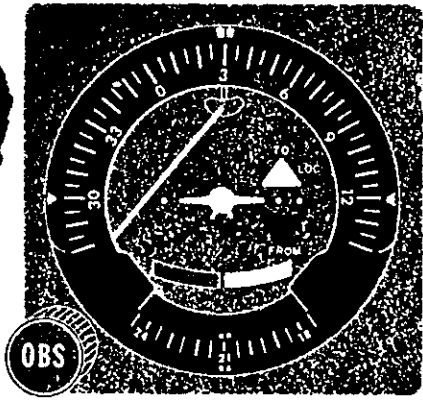
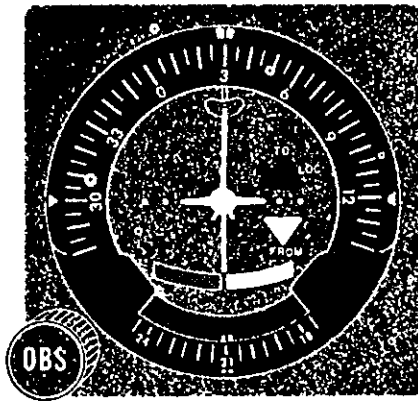


FIGURE 25. Total lift force and angle of bank relationship.

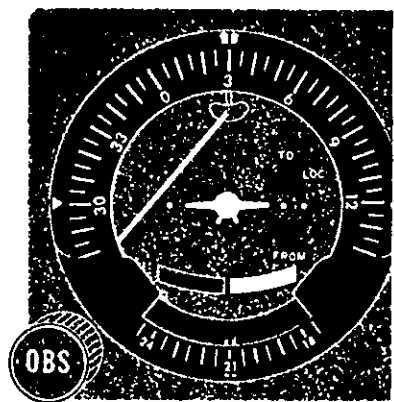
APPENDIX D—Radio Navigation



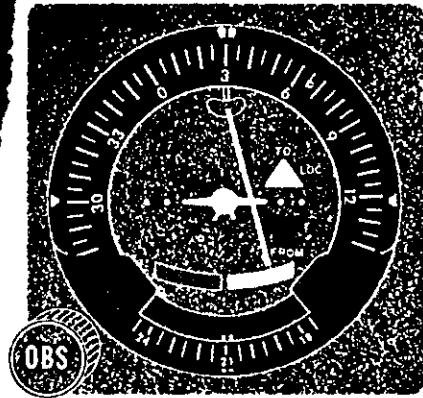
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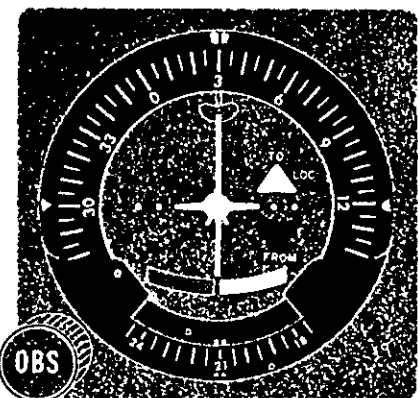
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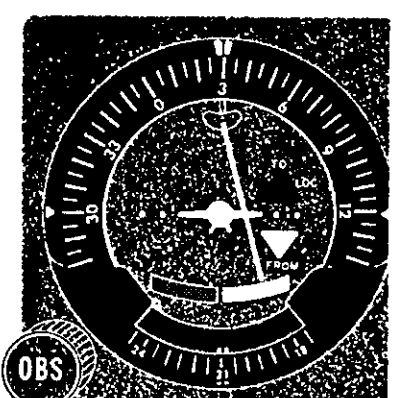
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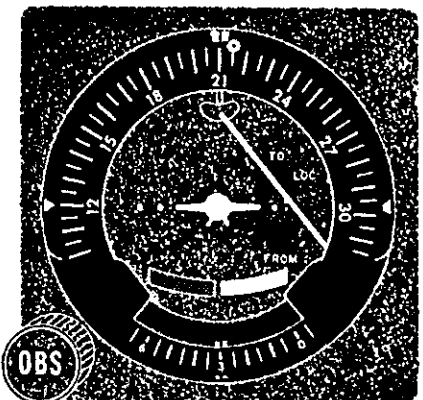
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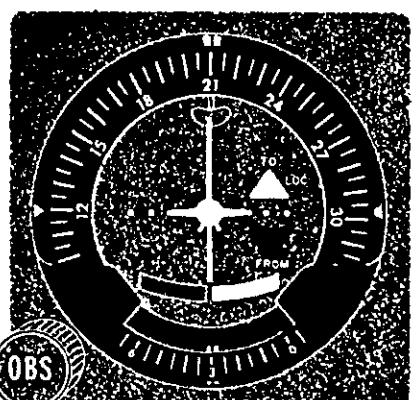
E



F



G

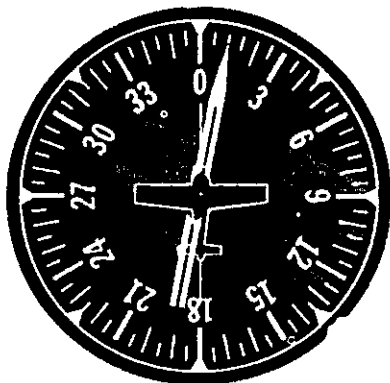


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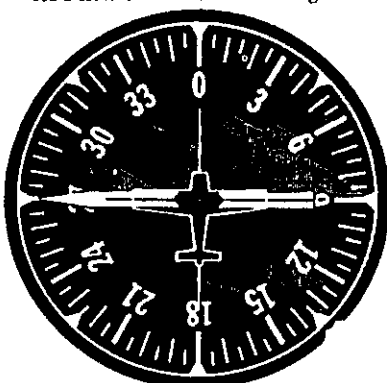


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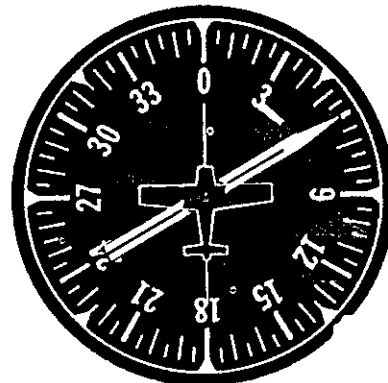
FIGURE 26. VOR orientation.



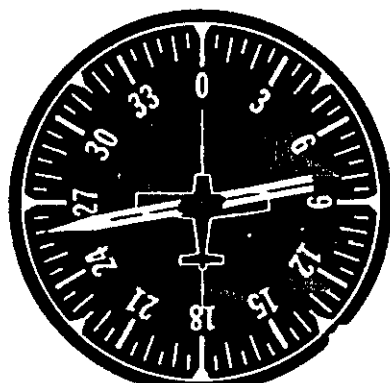
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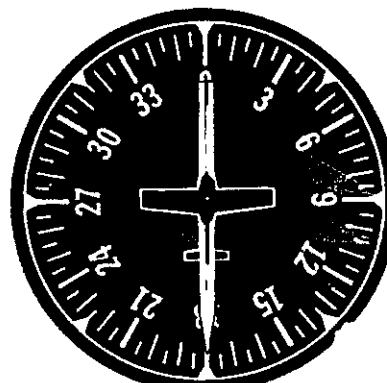
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T



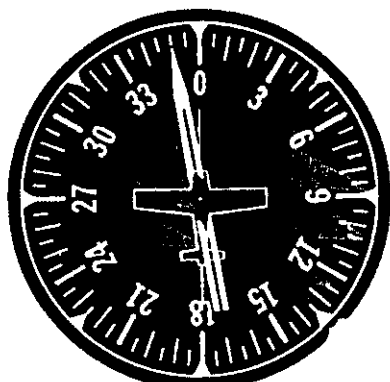
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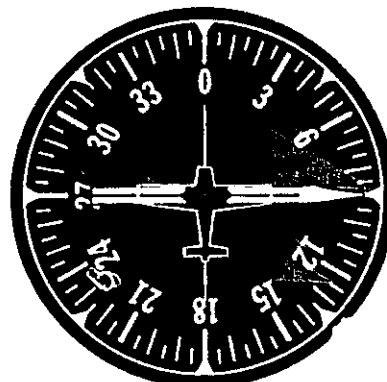
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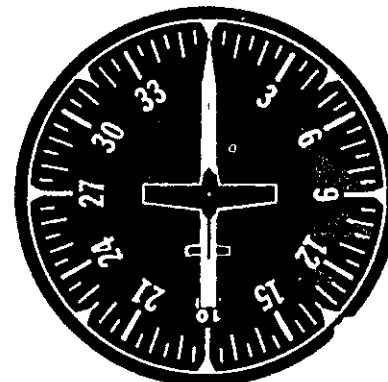
W



X



Y



Z

FIGURE 27. ADF orientation.

APPENDIX E—Husley Brothers Aircraft Corporation

DESIGNATION: Hurleycraft 135

BASIC WEIGHT: 935 lbs. (8 qts. oil included); basic weight moment, 94.3

GROSS WEIGHT: 1,600 lbs.

POWERPLANT: Malle 180 - air cooled, four cylinder, opposed

FUEL SYSTEM: Fuel injection

Fuel octane rating - 100/130 (minimum)

Fuel capacity - 25 gallons (all usable)

OIL CAPACITY: 8 quarts

IGNITION SYSTEM: Dual magneto

MAIN ROTOR SYSTEM: Fully articulating (3 blades)

LANDING GEAR: Fixed gear, skid-type

RADIO EQUIPMENT:

1 VHF transmitter and receiver	118.0 - 136.0 MHz
1 VOR receiver	108.0 - 117.9 MHz
1 ADF receiver	200 - 415 kHz

LIMITATIONS:

Forward CG limit station	95.0
Aft CG limit station	100.0
Maximum manifold pressure	27.5" below 500 AGL
Maximum engine RPM	3,000 RPM
Never exceed speed (V_{NE})	90 MPH IAS
Maximum rotor speed	550 RPM
Minimum rotor speed	410 RPM

FIGURE 28. Owner's manual excerpts.

Moment in Thousands of Inch-Pounds

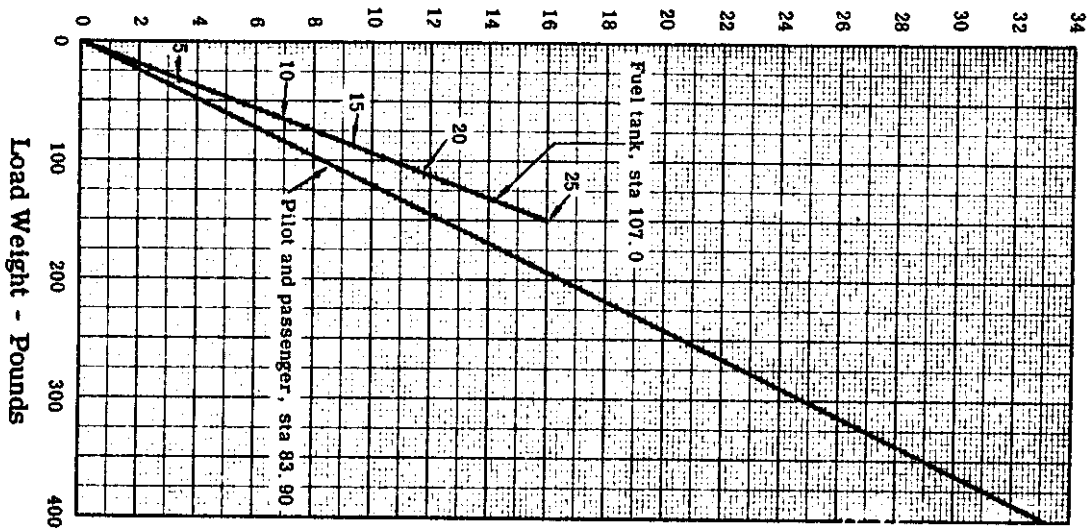


Figure 29. Loading chart.

Moment in Thousands of Inch-Pounds

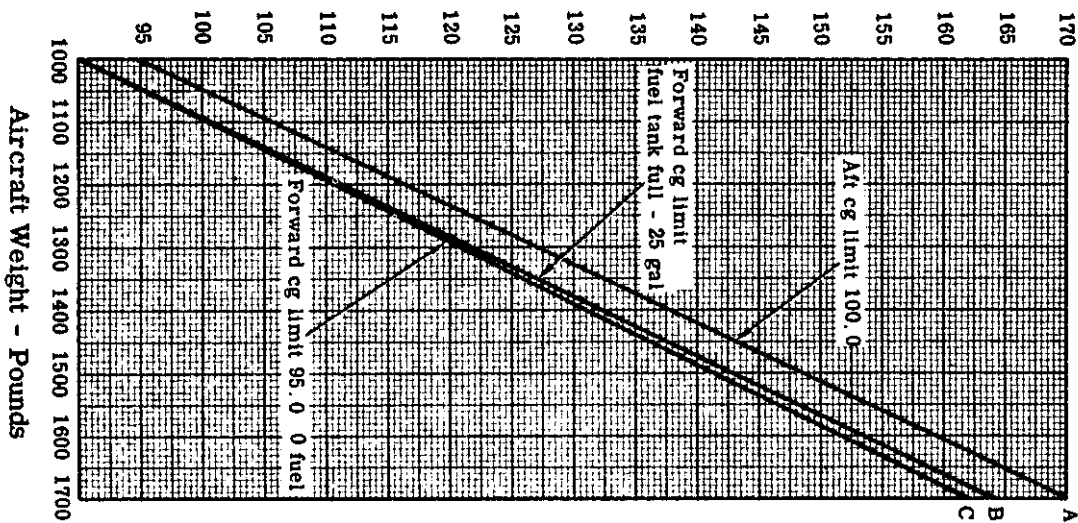


Figure 30. Center of gravity chart.

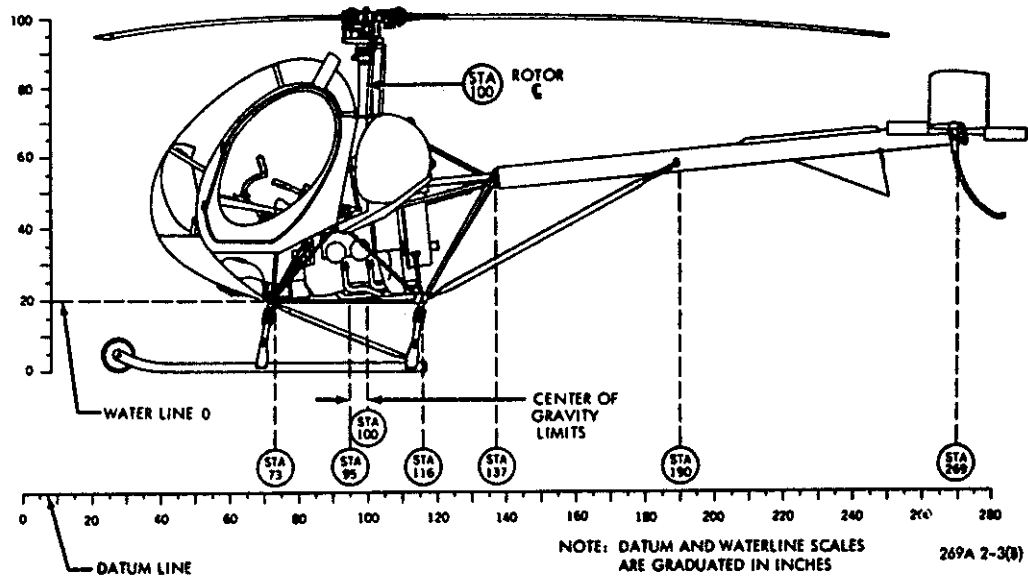


FIGURE 31. Balance diagram.

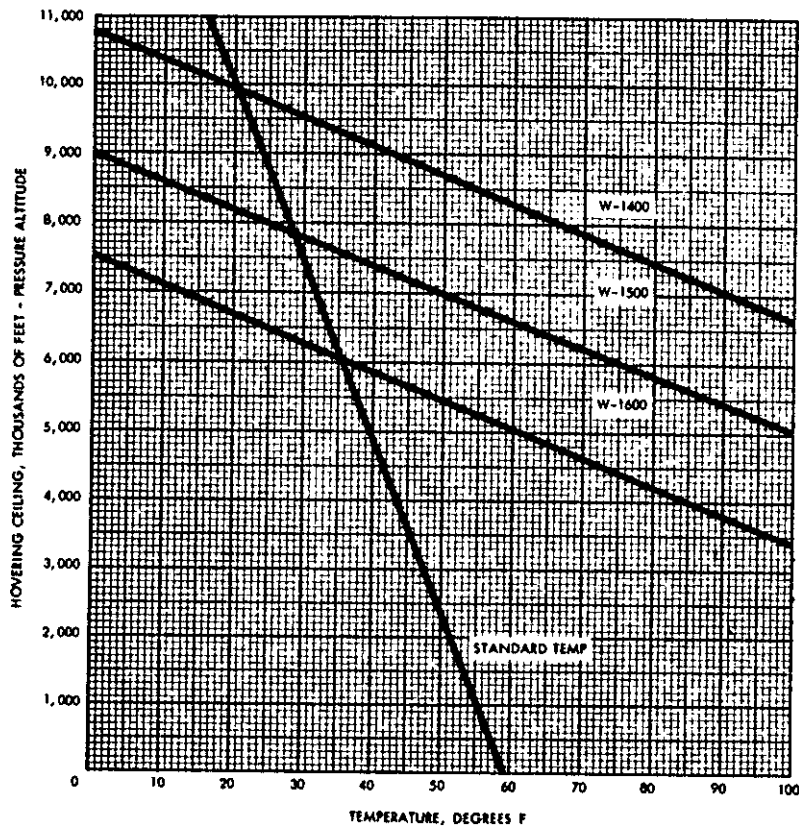


FIGURE 32. Hover ceiling chart vs. temperature (skid height 3 feet).

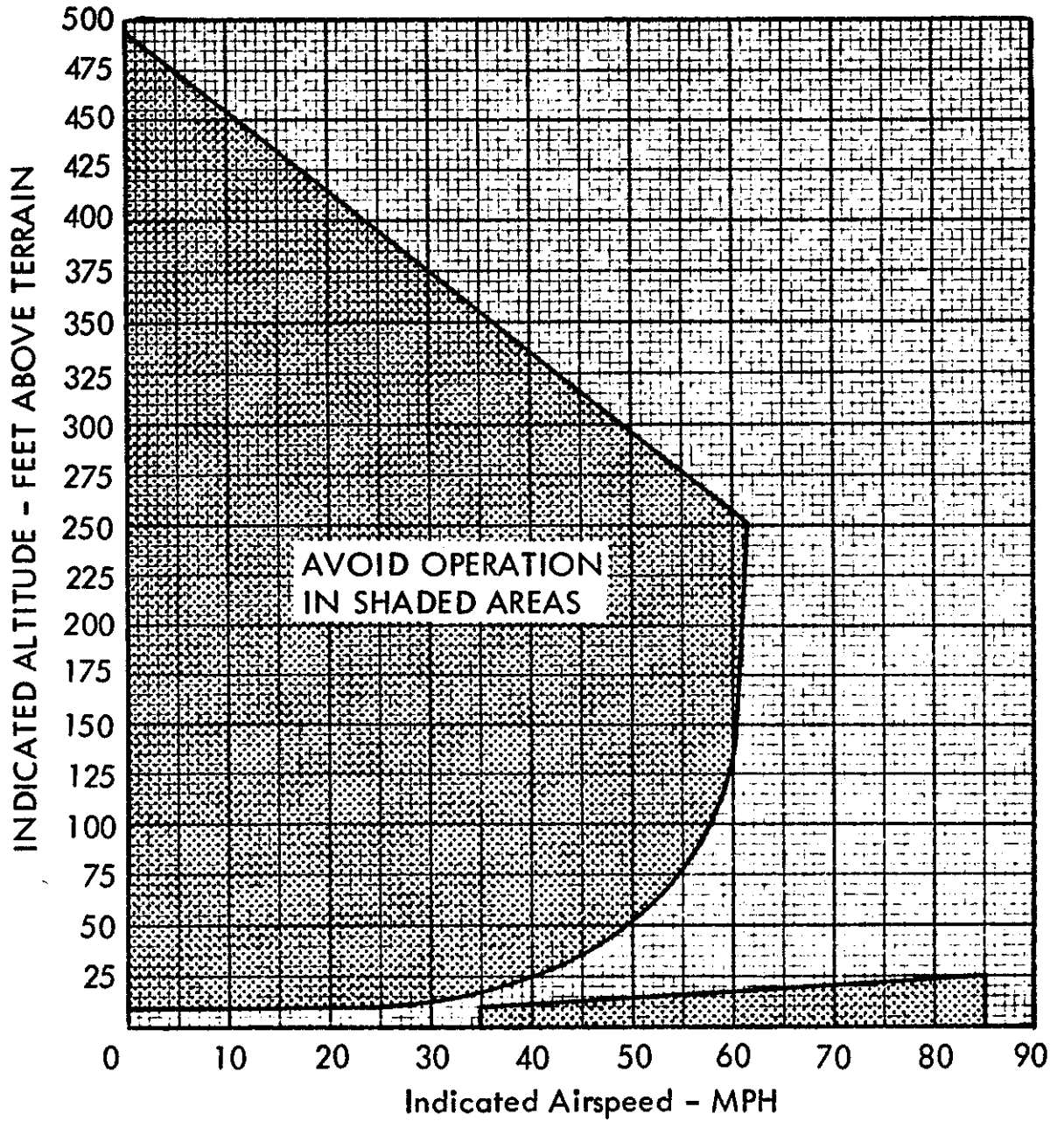


FIGURE 33. Height-velocity diagram.

MODEL: Bronco 27B

POWERPLANT: Siwel 540 - air cooled, six cylinder, opposed

FUEL SYSTEM: Float-type carburetor

Fuel octane rating - 100/130 (minimum)

Fuel capacity - 46.0 gallons (44.0 usable)

OIL CAPACITY: 8 quarts; moment arm (in.) + 1.0

IGNITION SYSTEM: Dual magneto

MAIN ROTOR SYSTEM: Semi-rigid

LANDING GEAR: Fixed, skid-type

RADIO EQUIPMENT:

1 VHF transmitter and receiver . . . 118.0 - 136.0 MHz

1 VOR receiver 108.0 - 117.9 MHz

1 ADF receiver 200 - 1750 kHz

1 Transponder 4096 codes

OPERATING LIMITATIONS:

Weight; maximum approved gross - 2,850 lbs.

Airspeed; V_{NE} 110 MPH - sea level to 10,000 feet
above 10,000 feet - decrease V_{NE} 5 MPH

Altitude; maximum - 20,000 feet

Rotor; flight - maximum 360 RPM, minimum 310 RPM

Powerplant; maximum continuous power - 26.8 in. Hg.

MAP SL to 20,000 feet

Idling RPM - 1200

Operating RPM - 3000 to 3200

Cylinder head temperature - 246° C

FIGURE 34. Owner's manual excerpts.

Loading Data; Basic weight - 1,700 lbs.

Basic weight moment arm (in.), + 6.0

Center of gravity limits --

2,850 lbs., - 3 inches to + 3.2 inches

2,300 lbs., - 3 inches to + 4.0 inches

Straight line variation between above points

CENTER OF GRAVITY vs. GROSS WEIGHT CHART.

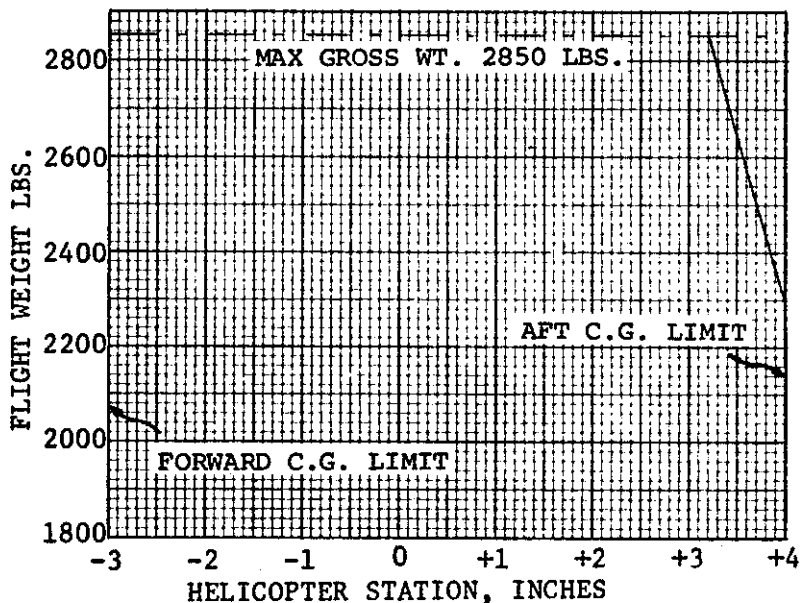


FIGURE 34. Owner's manual excerpts--cont'd.

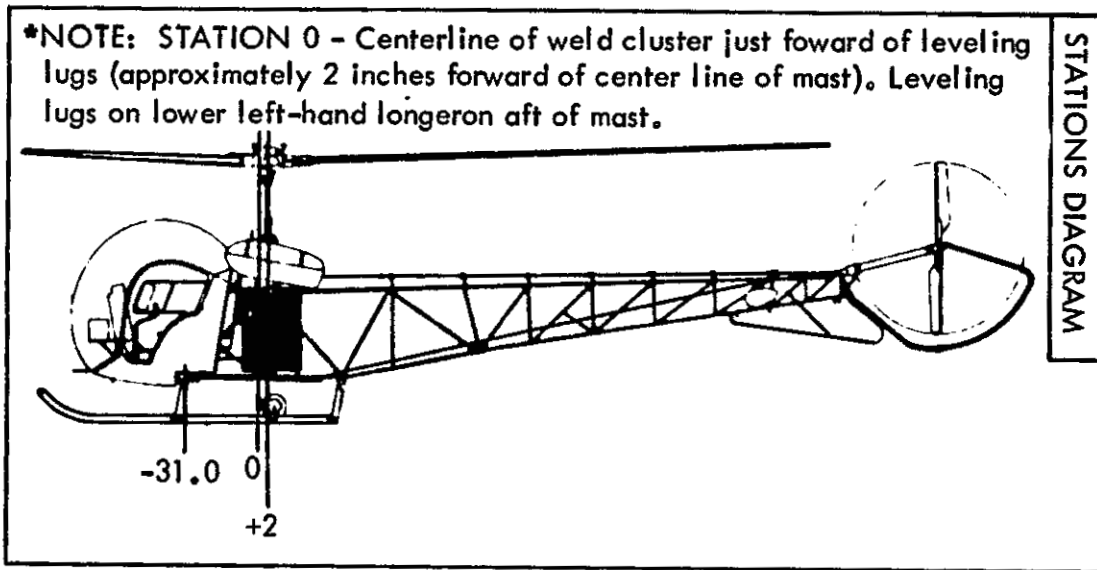


FIGURE 35. Stations diagram.

TAKE-OFF DISTANCE- FEET TO CLEAR 50 FOOT OBSTACLE					
AT 50 MPH			3200 RPM		
Gross Weight Pounds	Pressure Altitude Feet	At -13° F -25° C	At 23° F -5° C	At 59° F 15° C	At 95° F 35° C
2150	SL	373	401	430	458
	2000	400	434	461	491
	4000	428	462	494	527
	6000	461	510	585	677
	8000	567	674	779	896
2500	SL	531	569	613	652
	2000	568	614	660	701
	4000	611	660	709	759
	6000	654	727	848	986
	8000	811	975	1144	1355
2850	SL	743	806	864	929
	2000	770	876	929	1011
	4000	861	940	1017	1102
	6000	939	1064	1255	1538
	8000	1201	1527	-	-

FIGURE 36. Takeoff chart.

MAXIMUM RATE OF CLIMB FEET PER MINUTE AT 50 MPH-3200 RPM									
R/C MAX. Gross Weight Pounds	Pressure Altitude Feet	At -25°C -13°F		At -5°C 23°F		At 15°C 59°F		At 35°C 95°F	
		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
2150	SL	1095	1235	1065	1210	1040	1190	1015	1145
	2,000	1065	1220	1040	1155	1015	1065	985	-
	4,000	1040	1085	995	-	910	-	830	-
	6,000	925	-	835	-	750	-	675	-
	8,000	770	-	685	-	600	-	530	-
	10,000	615	-	535	-	455	-	380	-
2500	SL	805	945	780	915	750	885	730	850
	2,000	780	915	750	855	725	775	705	-
	4,000	755	800	710	-	630	-	560	-
	6,000	650	-	565	-	485	-	410	-
	8,000	505	-	420	-	340	-	265	-
	10,000	360	-	275	-	195	-	120	-
2850	SL	560	685	535	660	500	625	470	580
	2,000	535	660	505	600	470	515	435	-
	4,000	505	545	455	-	375	-	295	-
	6,000	400	-	315	-	235	-	155	-
	8,000	260	-	175	-	95	-	15	-
	10,000	115	-	35	-	-	-	-	-

NOTE:
 (1) Continuous Power
 (2) Two Minute Power Rating

FIGURE 37. Rate of climb chart.

TOTAL LANDING DISTANCE IN FEET OVER 50 FOOT OBSTACLE POWER-OFF AT 50 MPH					
Gross Weight Pounds	Pressure Altitude Feet	At -25°C -13°F	At -5°C 23°F	At 15°C 59°F	At 35°C 95°F
2150	SL	243	253	265	277
	2000	253	267	278	293
	4000	264	278	294	319
	6000	278	293	310	327
	8000	293	310	330	350
2500	SL	248	258	270	282
	2000	258	272	283	298
	4000	269	283	299	314
	6000	283	298	315	332
	8000	298	316	335	355
2850	SL	282	294	307	320
	2000	293	309	322	338
	4000	306	322	340	357
	6000	322	340	358	378
	8000	340	359	380	403

FIGURE 38. Landing chart.

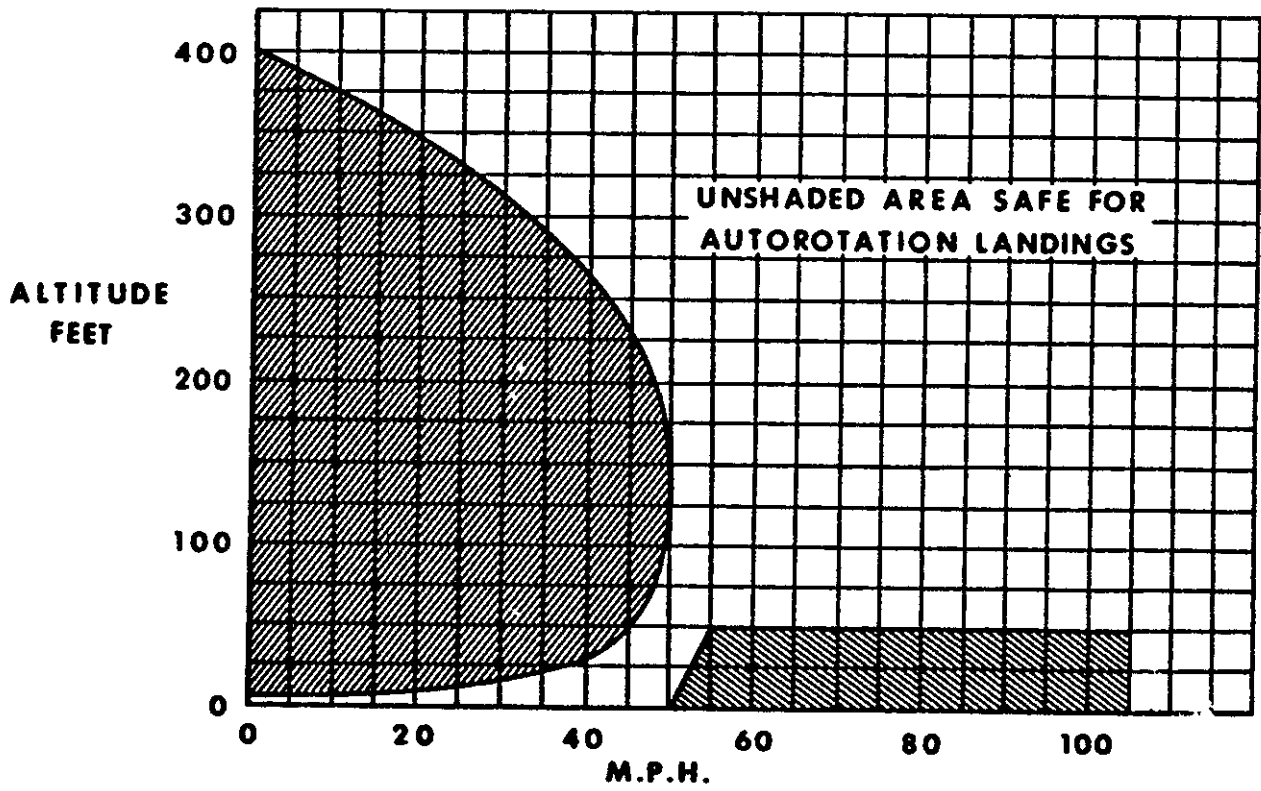


FIGURE 39. Height-velocity diagram.

APPENDIX G—Weather Data

SA21 042100
 MLC CLR 20 054/60/23/2313G20/970/ FEW CI SE S/ 514
 ADM CLR 20 63/20/2714G21/973/ 307
 DAL 250 -SCT 20 70/27/2510/979
 FTW 250 -SCT 10 69/24/3216/977 → FTW 1/2
 DFW SP 250 -SCT 15 078/67/30/3017G21/977/ WSHFT 54 FROPA / 517 1006
 CLL E8 OVC 6F 128/55/50/1605/991 SM BINOVC OVHD CIG RGD/ 720
 LFK E11 OVC 4HK 125/56/51/2207/990/ 610 → LFK 11/1 1/1
 TYR 250 -SCT 12 62/50/2117/982 → TYR 11/2
 OKC 13 SCT 250 SCT 20 097/42/26/3119G26/980 PK WND 3127/32
 334 1501 → OKC 1/2 1/3 1/6
 TUL M25 OVC 12 061/41/32/2917G24/971/ PK WND 2729/39 PRESRR/UA /OV TUL
 2052 FLUNK /TP LR24 /RM VARIOUS ACFT MDT TURBC 130 AND BELOW
 PNC E10 OVC 8 081/34/33/3018/975/ 336
 PGO AMOS 34/32/17M/976 000

FIGURE 40. Surface aviation weather reports.

→ NOSUM 042101
 → FTW 1/2 ZFW ARSR/SSR KELLER OTS
 → LFK 11/1 JAS ARPT CLSD
 → LFK 1/1 OCH NDB OTS
 → TYJ 11/2 AHX NDB OTS
 → MLC 1/1 DUA NDB OTS
 → OKC 1/2 OKC ENRT FLT ADZY SVC CMSN
 → OKC 1/3 OKC ENRT FLT ADZY SVC UNAVBL
 → OKC 1/6 SWO VOR UNMNTD

FIGURE 41. NOTAM summaries.

APPENDIX G—Weather Data

TX 120940
 ABI 121010 C4 OVC 1L-F VRBL 4 SCT C10 OVC 6H. 04Z LIFR CIG F..
 ACT 121010 C15 OVC. 15Z C12 OVC VRBL C5 OVC 1L-F. 04Z LIFR CIG LF..
 ALI 121010 C2 OVC 2L-F. 17Z C9 OVC 3L-F VRBL C3 OVC 1L-F. 04Z
 LIFR CIG L..
 AMA 121010 -X 1F VRBL C2 X 1/2F. 16Z 100 SCT 250 -BKN 2110.
 20Z 250 -BKN 2215. 04Z VFR CLR..
 AUS 121010 C15 OVC VRBL C8 OVC 3L-F. 14Z C10 OVC VRBL C5 OVC 2L-F.
 22Z C5 OVC 2R-F. 04Z LIFR CIG R..
 BPT 121010 C60 BKN 180 OVC 0910. 00Z C12 OVC 3R-F VRBL C5 OVC
 1R-F. 04Z LIFR CIG R..
 BRO 121010 C2 OVC 2L-F. 17Z C10 OVC 3L-F VRBL C5 OVC 2L-F. 04Z
 LIFR CIG L..
 CLL 121010 C25 OVC. 02Z C15 OVC. 04Z MVFR CIG OCNL IFR CIG LF..
 DAL 121010 C15 OVC. 18Z C12 OVC VRBL C5 OVC 1L-F. 04Z LIFR CIG LF..
 DFW 121010 C15 OVC. 18Z C12 OVC VRBL C5 OVC 1L-F. 04Z LIFR CIG LF..
 DRT 121010 C2 OVC 2L-F 1410. 17Z C8 OVC 3L-F. 00Z C6 OVC 2L-F.
 04Z LIFR CIG L..
 ELP 121010 C120 OVC. 13Z 60 SCT C100 BKN. 18Z 250 SCT.
 04Z VFR CLR..
 GGG 121010 C25 OVC. 04Z MVFR CIG OCNL IFR CIG LF..
 GLS 121010 NOT AVBL..
 HOU 121010 C30 OVC 0810. 21Z C10 OVC 3R-F VRBL C5 OVC 1R-F.
 04Z LIFR CIG R..
 IAH 121010 C30 OVC 0910. 21Z C10 OVC 3R-F VRBL C5 OVC 1R-F.
 04Z LIFR CIG R..
 INK 121010 C8 OVC 3F VRBL C4 OVC 1L-F. 17Z C15 BKN 1510 CHC C8 OVC
 5L-F. 20Z 20 SCT C100 BKN 1612. 94Z VFR CIG ABV TEN THSD..
 LBB 121010 C6 OVC OCNL C3 OVC 3F. 17Z C12 OVC 1310.
 20Z 20 SCT C100 BKN 1813. 04Z VFR CLR..
 LFK 121010 C25 OVC. 04Z MVFR CIG OCNL IFR CIG LF..
 MAF 121010 C8 OVC 3F 0910 VRBL C4 OVC 1L-F. 18Z C12 OVC 1210
 CHC C5 OVC 5L-F. 21Z C20 BKN 1612 BKN V SCT. 04Z VFR CIG ABV
 TEN THSD BCMG IFR CIG F ABT 09Z..
 MFE 121010 C2 OVC 2L-F. 17Z C10 OVC 3L-F VRBL C5 OVC 1L-F. 04Z
 LIFR CIG L..
 SAT 121010 C4 OVC 2L-F. 17Z C10 OVC 0910 VRBL C5 OVC 2L-F. 22Z
 C5 OVC 2R-F. 04Z LIFR CIG R..
 SJT 121010 C2 OVC 1/2-F 0910 VRBL C5 OVC 2R-F. 17Z C8 OVC 5F
 1110 VRBL C5 OVC 2R-F. 20Z C12 OVC 1410 CHC C5 OVC 5R-F.
 04Z MVFR CIG BCMG IFR CIG F ABT 07Z.
 SPS 121010 C18 BKN 300 OVC. 18Z C12 OVC VRBL C5 OVC 1L-F. 04Z LIFR
 CIG LF..
 TYR 121010 C22 OVC. 04Z MVFR CIG OCNL IFR CIG LF..
 VCT 121010 C15 OVC 0610 CHC C6 OVC 3L-F. 17Z C11 OVC 1310 VRBL
 C5 OVC 3L-F. 22Z C6 OVC 2L-F. 04Z LIFR CIG L..

 AUS FT AMD 1 121310 1245Z C4 BKN 14 OVC 3L-F VRBL C1 OVC 1/2L-F.
 14Z C10 OVC VRBL C5 OVC 2L-F. 22Z C5 OVC 2R-F. 04Z LIFR CIG R..

 BRO FT AMD 1 121210 1200Z C12 OVC 3L-F CHC C3 OVC 1L-F. 17Z C10
 OVC 3L-F VRBL C5 OVC 2L-F. 04Z LIFR CIG L..

 ELP FT AMD 1 121210 1215Z C50 BKN 90 OVC 0310 CHC C30 OVC 31PW-SW-..
 17Z 100 SCT 250 -BKN 0410. 21Z 250 SCT. 04Z VFR CLR..

FIGURE 42. Terminal forecasts.

APPENDIX G—Weather Data

SLC FA 111240
 13Z TUE-07Z WED.
 OTLK 07Z-19Z WED.

MT ID NV UT AZ...

HGTS ASL UNLESS NOTED...

SYNS... PAC CDFNT MOVG INTO WRN PTNS WA AND OR BY SS DSIPTG SLOLY THRFTR AS IT MOVS FTHR INLD. MID LVL MSTR SPRDG ACRS NRN INTRMTRGN AHD OF WKNG CDFNT. SEC HI CNTRD OVR SRN ID DRFTG SEWD.

SIGCLD AND WX...

MT...

BKN VRBL OVC BTN 6 THSD AND 10 THSD LCLY LWR IN AREAS OF SNW WITH LCL VLY CIGS AND VSBYS AOB 15 HND FT AND 3 MIS IN PCPN WITH HIR TRRN FQTLY OBSCD XCP EXTRM SW PTN CLR BCMG GENLY BKN BTN 10 THSD AND 14 THSD BY SS. TOPS CLDS LYRD 140-180. OTLK MVFR CIG S.

ID...

LCL AREAS OF FOG AND LO ST WRN PTN AND WDSPRD FOG AND LO ST SERN ID RSTRG CIGS AND VSBYS AOB 1 THSD FT AND 3 MIS FQTLY OBSCG HIR TRRN. FOG DSIPTG BY 17Z-19Z W PTN AND BY 19Z-22Z SE PTN. INCRG MID CLDS DURG AFTN IN ADVN OF PAC CDFNT BCMG GENLY BKN VRBL OVC BTN 6 THSD AND 10 THSD BY SS WITH SNW DVLPG MNLY WRN PTN. HIR TRRN CONTD OBSCD. TOPS CLDS LYRD 140-180. OTLK...MVFR F S.

NV...

CLR OR VRBL THIN CI XCP EXTRM NRN PTN BKN VRBL OVC BTN 8 THSD AND 12 THSD DSIPTG BY NOON. MID CLDS INCRG NRN NV DURG AFTN BCMG SCT VFBL BKN BTN 12 THSD AND 16 THSD BY SS LCLY OVC AND LWR NWRN PTN AFT SS IN DVLPG SNW SHWRS. OTLK... VFR.

UT AZ...

SMK INVOF SLC IN NWRN UT RSTRG VSBYS BTN + AND 5 MIS OTRW CLR OR VRBL THIN CI. OTLK... VFR.

ICG... LGT LCLY MDT ICGIC. FRZLVL AT OR NR SFC MT ID UT NV AZ RSG 65-95 SRN NV AZ BY NOON.

FIGURE 43. Area forecasts.

APPENDIX G—Weather Data

FDUS3 KWBC 301945
DATA BASED ON 301200Z

VALID 011200Z FOR USE 0900-1500Z. TEMPS NEG ABV 24000

FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
ABI		2016+12	2019+09	2017+04	2016-11	2117-23	222038	232247	242656
ABQ			2014+12	2224+03	2236-12	2241-24	234340	234550	236258
ALS				2325+03	2244-12	2249-24	225340	225650	237359
AMA		2414	2422+11	2324+05	2126-11	2228-24	222839	222948	233957
ATL	3013	3018+11	3020+07	2920+01	2923-13	3027-25	313441	313750	304059
BHM	3009	2914+13	2814+08	2714+02	2814-12	3018-25	312540	312849	293059
ELD	1512	1816+03	2239+01	2248-04	2260-17	2273-29	238843	239752	730261
BNA	2710	2820+11	2826+06	2831+00	2835-14	2938-26	304441	304550	294259
BOI		1620+01	2127-05	2346-11	2165-25	2173-35	218147	219154	219359
BRO	1416	1517+11	1514+06	1510+01	9900-10	2305-22	251237	271946	293557
CRP	1519	1619+11	1615+06	1611+02	9900-10	2308-22	251538	272047	293357
DAL	1817	2218+12	2116+08	2114+02	1911-11	2211-23	241439	251648	241757
DEN			2420+11	2539+02	2344-13	2350-25	235841	236451	237959
DRT	1517	1519+11	1619+09	1716+04	1913-10	2215-22	241938	252347	273456
DSM	1225	1619+05	2116+03	2519-01	2839-13	2852-25	296741	297650	298560
ELP		1906	2010+10	2017+04	2121-10	2223-23	232439	242649	244457
GCK		2518+12	2523+11	2424+05	2326-11	2332-24	233640	243950	254857
GJT			2010+07	2234-01	2262-15	2270-26	227842	228551	720061
HLC		2518+10	2422+11	2424+04	2428-11	2434-24	244340	254850	265558
HOU	1615	1712+10	1710+06	1507+02	9900-11	2505-23	271238	271647	282157
ICT	2420	2427+12	2429+11	2427+04	2422-11	2526-24	253240	263649	264058
IND	0412	3012+04	2823+01	2833-04	2951-16	2960-27	307142	307650	307658
INK		1910+10	2015+11	2017+05	2020-10	2120-23	222038	232348	253956
JAN	2406	2206+13	2106+07	1905+02	9900-12	3007-24	321639	301948	272760
JAX	3409	3412+12	3511+07	3510+01	3311-12	3217-25	322540	313249	294459
JFK	3231	3244-10	3151-12	3059-15	3082-23	7902-33	791846	791651	790054
JDT	0828	0405+04	2914+00	2829-04	2851-16	2960-27	297342	308150	309059
LIT	2323	2424+13	2420+08	2417+03	2513-11	2816-24	302339	292649	282859
LOU	3207	2918+06	2826+02	2835-03	2948-15	2955-27	306342	306750	306558
LRD	1419	1521+11	1618+07	1614+02	1907-10	2210-22	241737	262246	293556
MEM	2517	2620+13	2620+08	2619+02	2720-12	2923-24	302940	303149	283259
MIA	0707	0912+10	0810+06	0609+02	3608-10	3116-22	303137	303946	294857
MKC	1918	2224+10	2426+08	2526+02	2730-11	2838-24	284840	285249	285659
MOB	9900	1305+12	1305+07	1306+02	9900-12	3207-24	311739	302248	273359
MSY	1208	1310+11	1210+06	1209+01	9900-12	3205-23	311538	292147	273158
OKC	2218	2425+13	2426+10	2324+04	2119-11	2219-24	242039	242248	242458
PRC			2231+04	2241-02	2249-14	2259-26	237142	237751	228061
SAT	1520	1621+12	1618+07	1714+02	1908-10	2211-22	241738	262147	282856
SAT	1520	1621+12	1618+07	1714+02	1908-10	2211-22	241738	262147	282856
SGF	2226	2430+12	2529+08	2526+03	2625-11	2830-24	293840	294149	294259
SHV	2115	2214+12	2111+07	1909+02	1806-11	2605-23	291239	281548	262059
SLC		1815	1919+02	2246-07	2271-19	2282-30	229344	720253	710961
STL	1412	2211+10	2520+06	2730+00	2845-13	2951-25	305941	306149	305959
TLH	0305	9900+12	9900+07	9900+02	9900-12	3211-24	312139	302848	294059
TUS		2008+15	2017+07	2125+01	2233-12	2238-24	234540	234850	225760

FIGURE 44. Winds aloft forecasts.

APPENDIX G—Weather Data

HOU UA /OV IAH 1401 FL UKN/TP UKN/SK OVC 025/RM CLR ABV
 MSY US /OV MSY 20NE 1414 FL130 /TP DH25 /SK OVC 50
 MKC UA /OV DURGC MKC SBND 1400 /TP AC6 /SK OVC 70 /IC NONE ON
 CLIMB /RM 45 S MKC SCT-BKN BASES 200
 MKC UA /OV BUM270020 1400 FL UNK /TP C340 /SK 25 OVC 59 GOOD VSBY
 /IC LGT-MDT RIME /RM O/RGD OVC 4) HI THN CI ABV
 LBB UA /OV LBB 225050 1355 /TP B727 /RM LGT RIME ICNG 170-200
 MDT RIME ICNG 240-270
 MEM UA /OV MEM090007 1414 FL UKN /TP UKN /SK OVC 70 HI CI ABV
 MSL UA /OV MSL060035-MSL 1410 FL 240 /TP B727 /TB CONT LGT

FIGURE 45. Pilot Weather Reports (PIREPS)

UB 051730
 OK 051725
 END UA /OV OKC 180018 1655 FL 090/TP T37/SK 130 OVC /RM BKN-OVC
 OKC ATA UA/OV OKC 1701 F310/TA MS38/WV 250130/TB SMTH/SK IN CIR
 TIK UA /OV TIK 1610 FL 310/TP T39 /SK 220 OVC UNK 26 BKN 35 /TB NONE
 /IC NONE /RM SCT CLDS DURGD
 TUL UA /OV TUL 1605FLUNK/TP PASW/SK OVC 40
 /IC LGT RIME 1CGIC

FIGURE 46. Pilot report summaries.

WMS CNCL
 ZCZC
 OKC
 OKC SYNS 051806 LGT TO MDT NLY LO LVL FLO OVR AREA.
 158 TWEB 051806 OKC-TUL-SGF CIGS GENLY NR 2 THSD FT ALG RTE WITH
 VSBYS BRFLY NR 3 MI IN FOG.
 159 TWEB 051806 OKC-ICT CIGS NR 2 THSD FT ALG RTE WITH VSBYS BRFLY
 NR 3 MI IN FOG N PTN.
 160 TWEB 051806 ICT-TUL-FSM CIGS NR 2 THSD FT ALG RTE WITH VSBYS
 OCNLY NR 3 MI IN FOG N PTN.
 163 TWEB 051806 TUL-MLC-DFW CIGS NR 2 THSD FT OK PTN WITH CIGS GENLY
 AOA 8 THSD FT TX PTN.
 164 TWEN 051806 ICT-AMA CIGS GENLY NR 2 THSD FT ALG RTE WITH CIGS
 OCNLY BLO 1 THSD FT AND VSBYS BLO 3 MI IN SNOW AND FOG W PTN.
 165 TWEB 051806 OKC-AMA CIGS GENLY NR 2 THSD FT ALG RTE WITH CIGS
 OCNLY BLO 1 THSD FT AND VSBYS BLO 3 MI IN SNOW AND FOG W PTN.

FIGURE 47. TWEB route forecasts.

APPENDIX G--Weather Data

MKC AC 031500
MKC AC 031500
VALID 031500-041200Z

SVR TSTMS...A FEW EXPCD THIS AFIN AND EVE S CNTRL AND ERN
OKLA WRN ARK CNTRL AND ERN TEX AND WRN LA.

GEN TSTMS...RT OF A LN 60E DRI BWD CDS GAG CNU CGI CBM PNS. ALSO
TO THE RT OF LN OMK LKV SFO.
OSTBY
RL 1516

FIGURE 48. Severe weather outlook.

GSW WA 031950
031950-040200

AIRMET ECHO 5. FLT PRCTN. CNTRL AND ERN OKLA AND NERN TEX
GENLY E OF END-LFK LN CIGS FQTLY BLO 1 THSD FT VSBYS FQTLY
BLO 3 MI. CONDS IPVG TEX PTN BY 00Z BUT CONTG OKLA PTN PAST
02Z.

FIGURE 49. AIRMET.

GSW WS 031425
031425-031900

SIGMET FOXTROT 1. FLT PRCTN. WRN OKLA WRN TEX SCTD EMBDD TSTMS.
ALG AND ABT 100 MI W OF ENID BROWNWOOD LN SCTD EMBDD TSTMS. CB
TOPS TO 300. TSTMS MOVG EWD 20 KT AND CONTG PAST 19Z

FIGURE 50. SIGMET.

APPENDIX G—Weather Data

MKC WW 032108
MKC 032108

BULLETIN

TORNADO WATCH NUMBER 560
ISSUED 3.08 PM CST FEB 3 1977

A....THE NATIONAL WEATHER SERVICE HAS ISSUED A TORNADO WATCH FOR...
PORTIONS OF EASTERN TEXAS

THE THREAT OF TORNADOES AND SEVERE THUNDERSTORMS WITH LARGE HAIL
AND DAMAGING WINDS WILL EXIST IN THESE AREAS FROM CURRENT UNTIL
7.00 PM CST THIS MONDAY AFTERNOON AND EVENING.

THE GREATEST THREAT OF TORNADOES AND SEVERE THUNDERSTORMS IS IN
AN AREA 70 MILES....60 NAUTICAL EAST AND WEST OF A LINE FROM 45
MILES....40 NAUTICAL....NORTH OF TYLER TEXAS TO 25 MILES...20
NAUTICAL...EAST OF COLLEGE STATION TEXAS.

PERSONS IN OR CLOSE TO THE TORNADO WATCH AREA ARE ADVISED TO BE
ON THE WATCH FOR LOCAL WEATHER DEVELOPMENTS AND FOR LATER
STATEMENTS AND WARNINGS.

C...TORNADOES AND A FEW SVR TSTMS WITH HAIL SFC AND ALF TO 2 IN.
EXTRM TURBC AND SFC WND GUSTS TO 70K. A FEW CBS WITH MAX TOPS TO 550.
MEAN WIND VECTOR 21045

FIGURE 51. Severe weather forecast.

SDUS KNKA 061232
SEP 1130 AREA 4R-ZR-ZL/NC 60/100 206/45 100W C2425 MT U140 PTLY R
00 001100 011210 0011110 11000 000

AMA 1135 AREA 7RIP-S/NC 3/130 89/140 173/145 242/140 301/120
2625 MT U150
1222 01222 01222 01110

ICT 1130 AREA 6S 352/106 67/130 100/130 145/145 300/70
ELEMENTS 2525 MT 170 AT 307/18
01 111 221 01110

FIGURE 52. Radar weather reports (RAREPS)

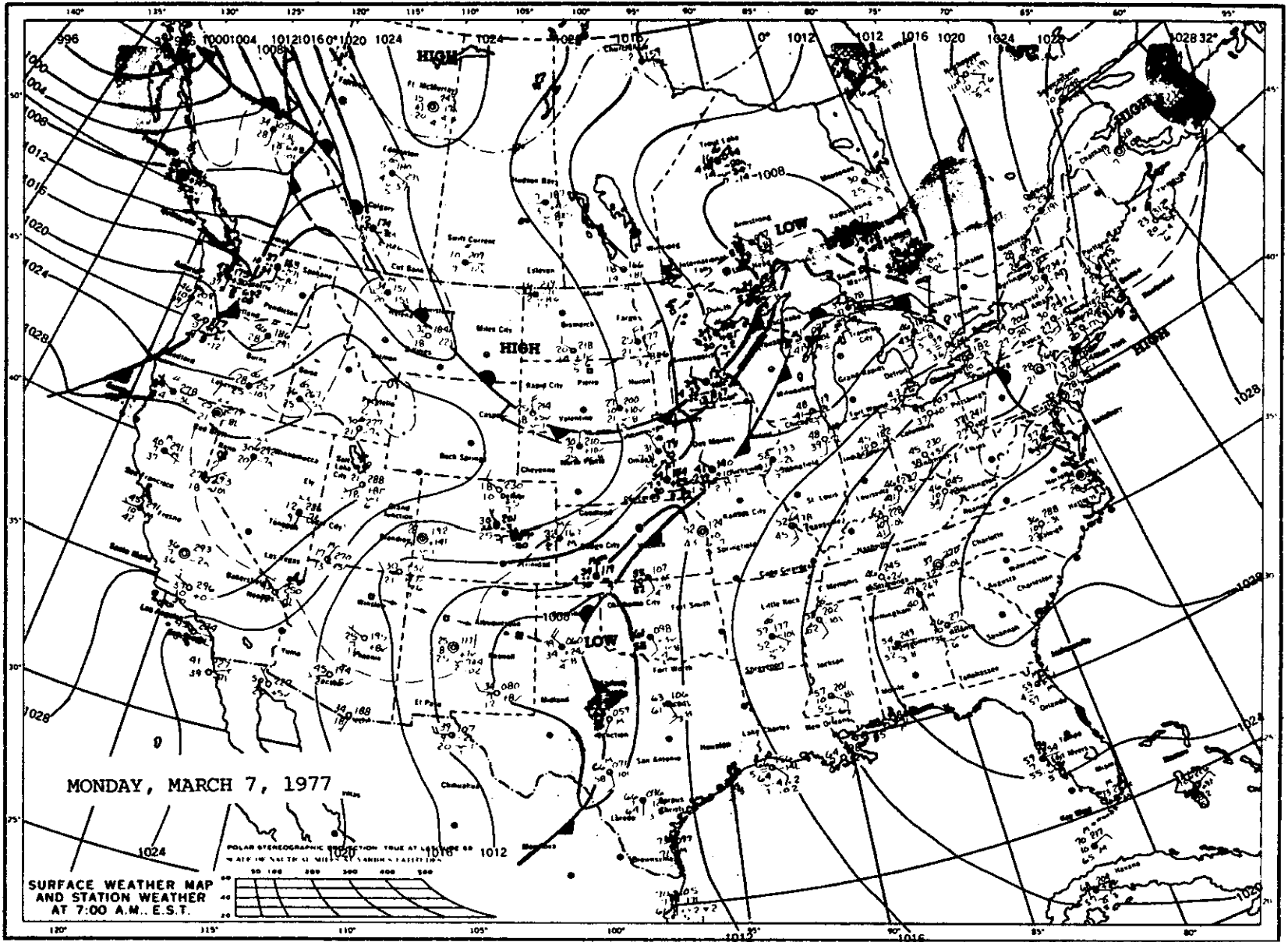


FIGURE 53. Surface weather map.

14

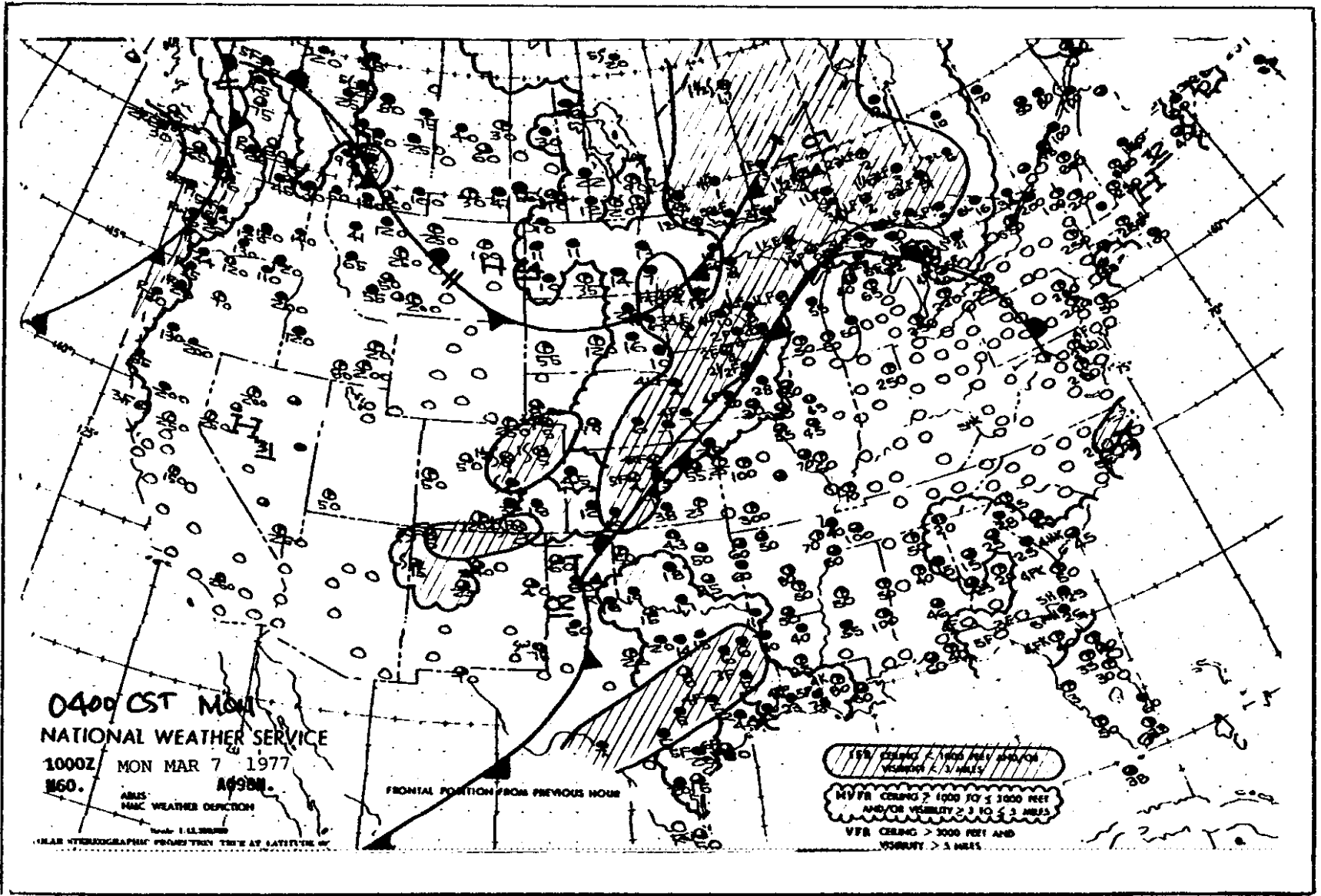


FIGURE 54. Weather depiction map.

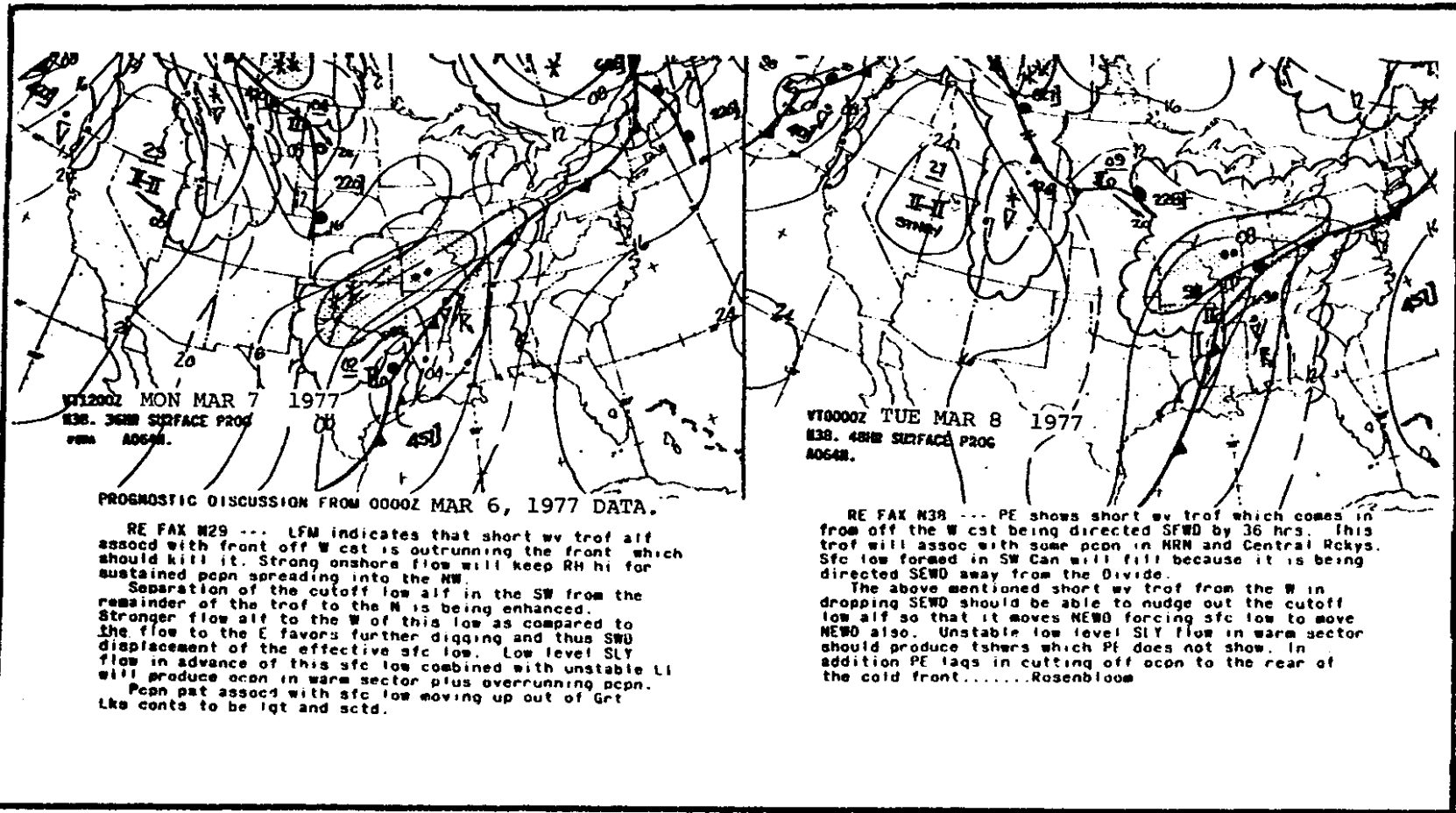


FIGURE 57. Thirty-six and 48 hour prognostic charts.

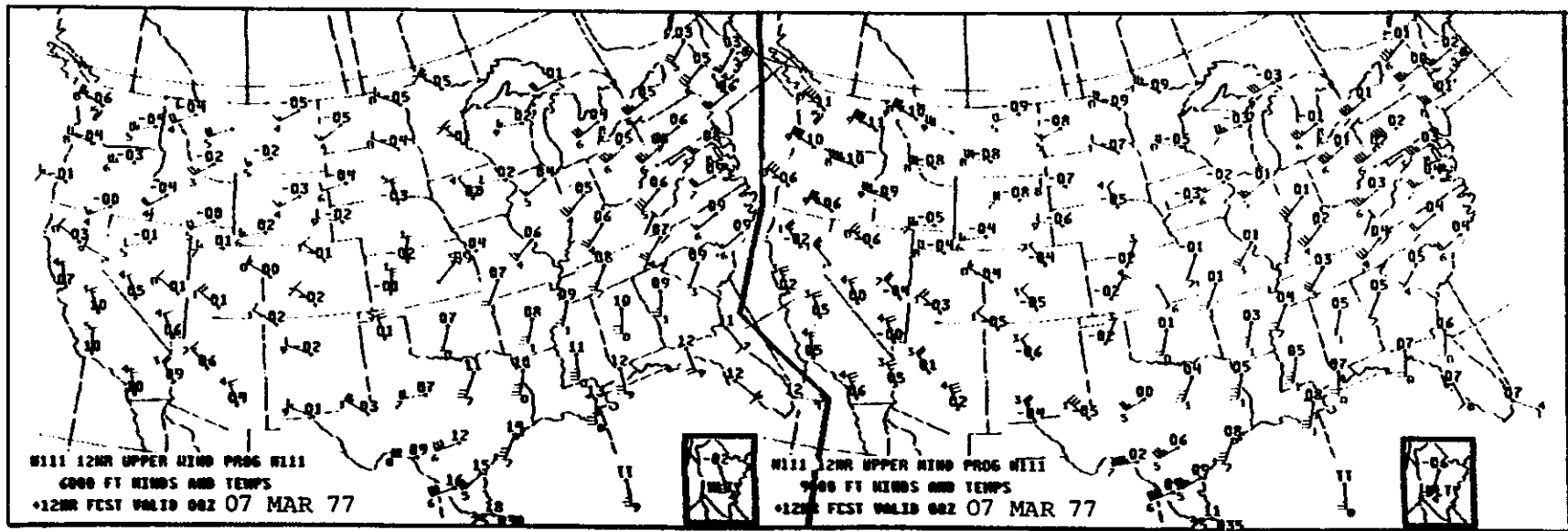


FIGURE 58. Upper wind prognoses chart.

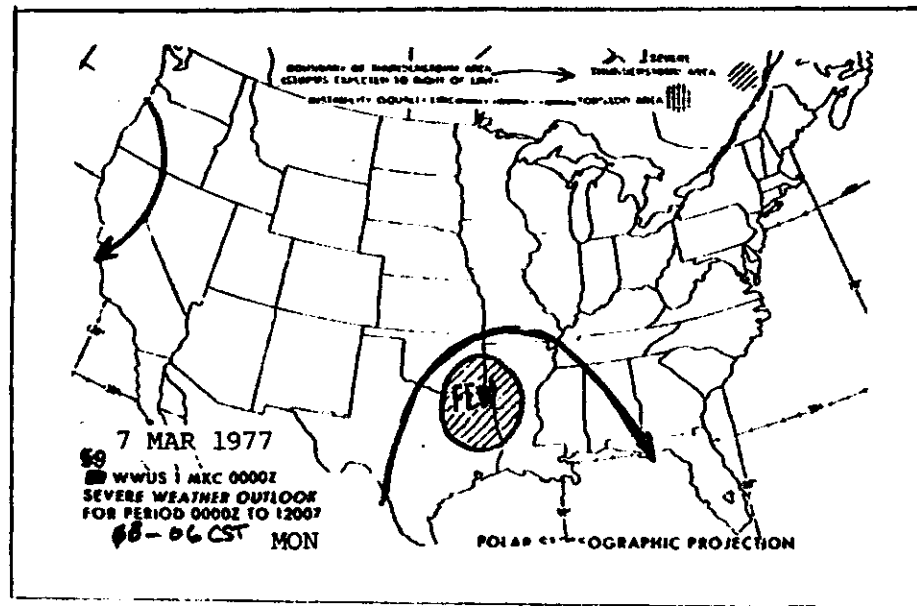
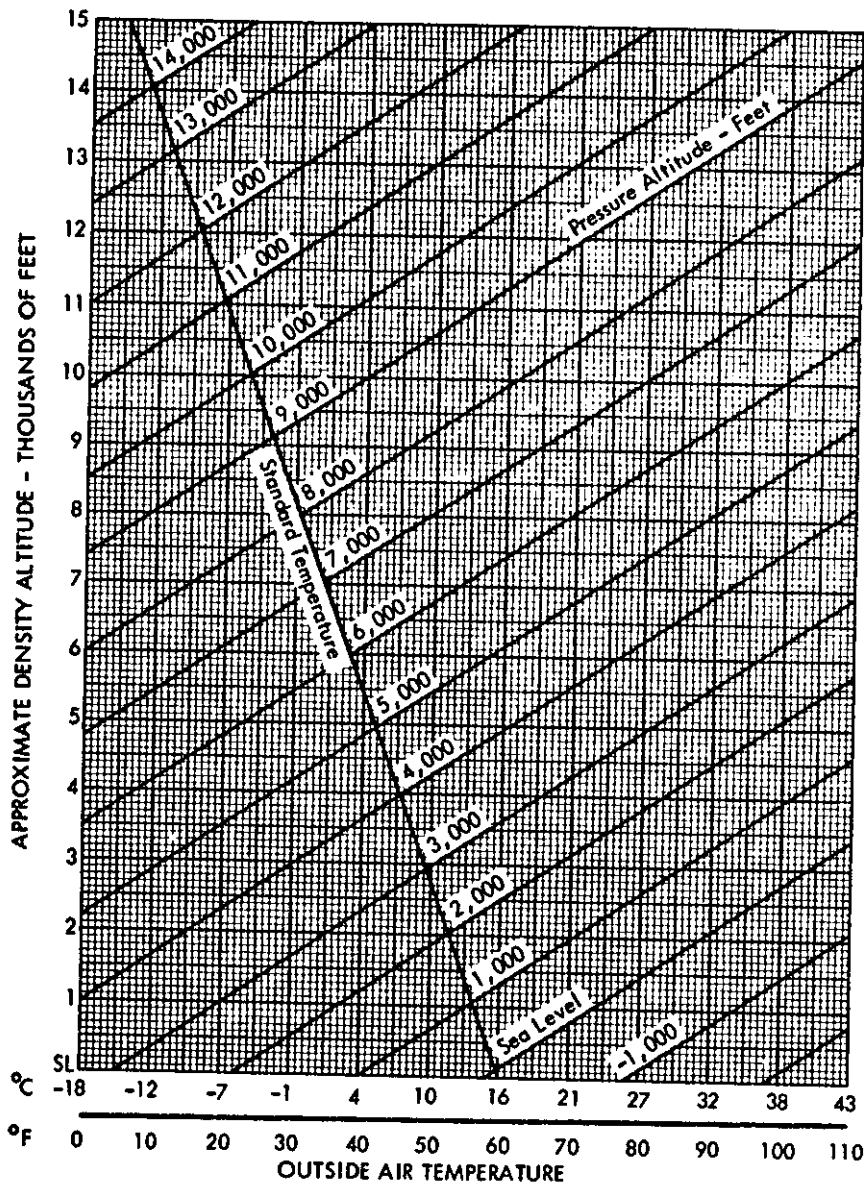


FIGURE 59. Severe weather outlook chart.

APPENDIX H—Density Altitude Chart

Set Altimeter to 29.92 In. Hg.
When Reading Pressure Altitude



Altitude Setting in Hg.	Altitude Correction
28.0	1,825
28.1	1,725
28.2	1,630
28.3	1,535
28.4	1,435
28.5	1,340
28.6	1,245
28.7	1,150
28.8	1,050
28.9	955
29.0	865
29.1	770
29.2	675
29.3	580
29.4	485
29.5	390
29.6	300
29.7	205
29.8	110
29.9	20
29.92	0
30.0	-75
30.1	-165
30.2	-225
30.3	-350
30.4	-440
30.5	-530
30.6	-620
30.7	-710
30.8	-805
30.9	-895
31.0	-965

FIGURE 60. Density altitude.

AIRMAN'S INFORMATION MANUAL (AIM)

The Airman's Information Manual has been designed primarily as a pilot's operational and information manual for use in the National Airspace System of the United States (unless otherwise indicated). It is divided into five basic parts, each of which may be purchased separately. Frequency of issuance, area of coverage, annual subscription costs and highlights of the contents of each part follow.

• Part 1—Basic Flight Information and ATC Procedures

Issued: Semiannually (Jan. and July). *Coverage:* Entire U.S. unless otherwise indicated.

This part contains the basic fundamentals required to fly in the U.S. National Airspace System. Among other data it also contains adverse factors affecting Safety of Flight; Health and Medical Facts of interest to pilots; ATC information affecting rules, regulations and procedures; a Pilot/Controller Glossary; Air Defense Identification Zones (ADIZ); Designated Mountainous Areas; and Emergency Procedures.

Annual Subscription: \$5.00 for U.S., plus \$1.25 for other foreign mailing.

Part 2—Airport Directory

Issued: Semiannually (Mar. and Sept). *Coverage:* Conterminous U.S., Puerto Rico and Virgin Islands (Note: similar information for Alaska and Hawaii appears in Alaska Supplement and Pacific Chart Supplement, respectively—See Special Notice Section, Part 3 for availability.)

Part 2 contains a Directory of all airports, seaplane bases, and heliports available for civil use. It includes all their services, *except communications*, in codified form. (Those airports with communications are also listed in Part 3.) A list of new and permanently closed airports which updates Part 2 is contained in Part 3. Also included in Part 2 are U.S. Entry and Departure Procedures, including Airports of Entry and Landing Rights Airports; and a listing of Flight Service Station and National Weather Service Telephone Numbers.

Annual Subscription: \$7.00 for U.S., Canada and Mexico, plus \$1.75 for other foreign mailing.

Part 3—Operational Data and Special Notices

Issued: Part 3, every 56 days. *Coverage:* Conterminous U.S., Puerto Rico and Virgin Islands (Note: Similar information for Alaska and Hawaii appears in Alaska Supplement and Pacific Chart Supplement, respectively—(For sale by National Ocean Survey, Distribution Division, C44, Riverdale, Md. 20840).

Part 3 contains an Airport-Facility Directory of all major airports with control towers and/or instrument landing systems; a tabulation of Air Navigation Radio Aids including Restrictions to Enroute Navigation Aids; Special, General, and Area Notices; a tabulation of New and Permanently Closed Airports (which updates Part 2); Locations of VOR Receiver Check Points (both ground and airborne); a tabulation of North Atlantic Routes; Preferred Routes; Area Navigation Routes; and Sectional Chart Bulletin.

Annual Subscription: \$30.50 for U.S., plus \$7.65 for other foreign mailing.

Part 3A—Notices to Airmen

Issued: Every 14 days. *Coverage:* Same as Part 3.

Part 3A contains current Notices to Airmen considered essential to the safety of flight as well as supplemental data to all Parts of AIM.

Annual Subscription: \$20.55 for U.S., plus \$5.15 for other foreign mailing.

Part 4—Graphic Notices and Supplemental Data

Issued: Quarterly (Jan., April, July, Oct.). *Coverage:* Conterminous U.S., Puerto Rico and Virgin Islands (Note: similar information for Alaska and Hawaii appears in Alaska Supplement and Pacific Chart Supplement, respectively—(For sale by National Ocean Survey, Distribution Division, C44, Riverdale, Md. 20840).

Part 4 contains a tabulation of Parachute Jump Areas; Special Notice—Area Graphics; Terminal Area Graphics; Terminal Radar Service Area Graphics; Olive Branch Routes and other data not requiring frequent change.

Annual Subscription: \$14.40 for U.S., plus \$3.60 for other foreign mailing.

Where to Purchase AIM

The five basic parts described above are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Orders should be accompanied by check or money order made payable to the Superintendent of Documents.

Errors, Omissions, or Changes

Errors, omissions, or suggested changes should be forwarded to the Federal Aviation Administration, National Flight Data Center, AAT-480, Washington, D.C. 20591.

FSS—CS/T AND NATIONAL WEATHER SERVICE TELEPHONE NUMBERS

Flight Service Stations (FSS) and Combined Station/Tower (CS/T) provide information on airport conditions, radio aids and other facilities, and process flight plans. CS/T personnel are not certificated pilot weather briefers; however, they provide factual data from weather reports and forecasts. Airport Advisory Service is provided at the pilot's request on 123.6 by FSSs located at airports where there are not control towers in operation. (See Part I ADVISORIES AT NON TOWER AIRPORTS.)

The telephone area code number is shown in parentheses. Each number given is the preferred telephone number to obtain flight weather information. Automatic answering devices are sometimes used on listed lines to give general local weather information during peak workloads. To avoid getting the recorded general weather announcement, use the selected telephone number listed.

● FAST FILE FLIGHT PLAN SYSTEM

Some Flight Service Stations have inaugurated this system for pilots who desire to file IFR/VFR flight plans with or without a weather briefing. Pilots may call the discrete telephone numbers listed and file flight plans in accordance with prerecorded taped instructions. IFR flight plans will be extracted from the recorder and subsequently entered into the appropriate ARTCC computer. VFR flight plans will be transcribed; and both IFR/VFR flight plans will be filed in the FSS. This equipment is designed to automatically disconnect after 8 seconds of no transmission, so pilots are instructed to speak at a normal speech rate without lengthy pauses between flight plan

elements. Pilots are urged to file flight plans into this system at least 30 minutes in advance of proposed departure. The system may be used to close and cancel flight plan.

Preflight weather services remain available through regular telephone numbers.

★ Indicates Pilot's Automatic Telephone Weather Answering Service (PATWAS) or telephone connected to the Transcribed Weather Broadcast (TWEB) providing transcribed aviation weather information.

◆ Indicates a restricted number, use for aviation weather information.

■ Call FSS for "one call" FSS—WSO briefing service.

⚡ Automatic Aviation Weather Service (AAWS).

● §§ Indicates Fast File telephone number for pre-recorded and transcribed flight plan filing only.

Location and Identifier	Area Code	Telephone
ALABAMA		
Anniston ANB.....	FSS (205)	831-2303
Birmingham BHM.....	FSS (205)	595-6151■
	FSS (205)	595-2101★
Dothan DHN.....	FSS (205)	983-3551
Huntsville.....	WS (205)	772-3521◆
Mobile MOB (Bates).....	FSS (205)	344-3610■
Montgomery MGM (Dannelly).....	FSS (205)	832-7516■
Muscle Shoals MSL.....	FSS (205)	383-6541■
	FSS (205)	381-2500★
Tuscaloosa TCL.....	FSS (205)	758-3628
ARIZONA		
Douglas DUG (Bisbee-Douglas).....	FSS (602)	364-8458
Flagstaff.....	WS (602)	774-2851
	(602)	774-1424
	(602)	774-0475
Phoenix PHX (Sky Harbor).....	FSS (602)	261-4295■
	E bound (602)	267-7239★
	W bound (602)	267-1181★
Prescott PRC.....	FSS (602)	445-2160
Grand Canyon.....	(602)	638-2943
Kingman.....	(602)	753-5659

Location and Identifier	Area Code	Telephone
ARIZONA (Can't.)		
Tusocn.....	FSS (602)	792-6359■
		294-2635★
Tuscon-Hermosillo, Mexico Route.....	(602)	898-8549★
		(0500-2200)
	E Bound (602)	294-7441★
	W Bound (602)	294-8263★
Winslow.....	WS (602)	289-3592
Yuma YUM.....	FSS (602)	726-2601■
ARKANSAS		
El Dorado ELD (Goodwin).....	FSS (501)	863-5128
Fayetteville FYV (Drake).....	FSS (501)	HI 2-8277
Ft. Smith.....	WS (501)	646-7885◆
Harrison HRO.....	FSS (501)	EM 5-3433
Jonesboro JBR.....	FSS (501)	WE 5-3471
	(0600-2200 Other hrs. Memphis)	
Little Rock.....	FSS (501)	376-0721
	(501)	835-7626
Texarkana TXK.....	CS/T (501)	774-4151■
CALIFORNIA		
Arcata ACV.....	FSS (707)	839-1545

FIGURE 62. FSS and WS telephone numbers.

Part 2

APPENDIX I—Airman's Information Manual Excerpts

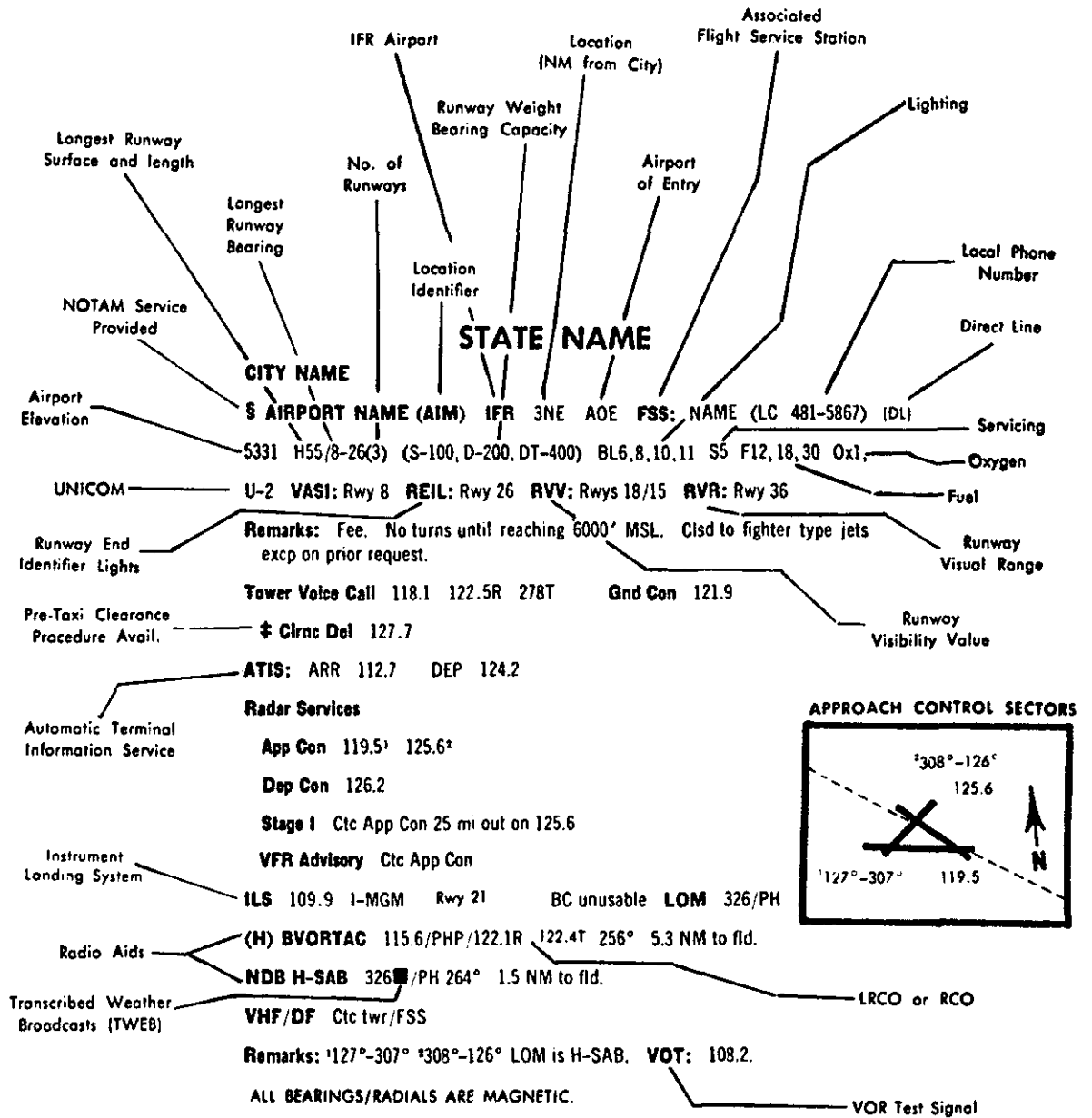


FIGURE 63. Airport/facility directory sample.
Part 3

NEW JERSEY

NEW JERSEY—Continued

ATLANTIC CITY

§ NAJEC/ATLANTIC CITY (ACY) IFR 10NM
 FSS: MILLVILLE (LC 399-8096)
 76 H100/13-31(3) (S-85, D-120, DT-350) BL5,6,8,14,15 S5 F18,30
 RVR: Rwy 13
 Remarks: Fee. Arresting gear 2000' from apch end rwy 13 and 1000' from apch end rwy 31 contact ATCT for operations Lighted frangible distance to go mrks every 1000' each side rwy 13-31. CSA & B747 type acct use rwy 13-31 & twy B only. Turns prohibited except at rwy ints & warm up blocks. All rwys have blast pads. Rwy 4-22 clsd to acct over 100,000 lbs GWT, except prior permission. Cert.-FAR 139, CFR Index A.
Atlantic City Tower 118.9 Gnd Con 121.9
Radar Services:
 Atlantic City App Con 124.6 118.35
 Atlantic City Dep Con 119.55 118.35
 Stage II Ctc apch cfl within 20NM
 ILS 109.1 I-PVO Rwy 13 LOM: 336/PV
 Atlantic City (I) VORTAC 108.6 ACY on fld
 VHF/DF Ctc App Con

BERGEN NDB MHW 241/BUG FSS: TETERBORO
CALDWELL
§ WRIGHT (CDW) IFR 2N FSS: TETERBORO (LC 226-2773)
 175 H47/4-22(2) (S-42) BL4 S5 F30 Ox3,4 U2
 Remarks: Attended 0700-dark. Pure jet takeoffs rwy 4-22 only. Rgt ifc rwy 27. Pole-lighted apch rwy 4. Trees apch rwys 9, 22, 27.
Caldwell Tower 126.5 Gnd Con 1219
Radar Services:
 Newark App Con 127.6
 Newark Dep Con 119.2
 Remarks: Twr opers 0900-1700 Sat and Sun.

CHATHAM NDB MHW 254/CAT FSS: TETERBORO
COLTS NECK (I) VORTAC 115.4/COL FSS: TETERBORO
COYLE (H) BVORTAC 113.4/CYN/122.1R FSS: MILLVILLE
LAKEHURST NDB HW 396/NEL FSS: PHILADELPHIA
 Remarks: Opers 0700-2300.

McGUIRE (I) VORTAC 110.6/GXU FSS: PHILADELPHIA

MILLVILLE FSS 121.5 122.1R 122.2 122.7 123.6

MILLVILLE (I) BVORTAC 115.2/MIV FSS: MILLVILLE

§ MORRISTOWN MUNI (MMU) IFR 3E FSS: TETERBORO (LC JEB-2196)
 187 H60/5-23(2) (S-30, D-80) BL5,6,7A,11,13 S5 F12,18,30 U2
 REIL: Rws 5, 23
 Remarks: Attended 0700-2300. Fee. For MALSR rwy 23 key 118.1 5 times in 5 seconds for hi intensity & 3 times in 3 seconds for med intensity. No kittype home made, fighter type, or experimental aircraft permitted. No turbajet landings rwy 12 or takeoff rwy 30 without permission arpt mgr. No touch and go lndgs any rwy hrs of darkness. Cert.-FAR 139, CFR Index A.
Morristown Tower 118.1 Gnd Con 121.7
Radar Services:
 Newark App Con 126.7 127.6
 Newark Dep Con 119.2

ILS 110.3 I-MMU Rwy 23 LOM: 212/MM
 Remarks: Twr opers 0630-2230. LOC unusable below 500' MSL and below 2500' beyond 17NM; BC unusable, and ILS unmonitored 2300-0700.

§ NEWARK INTL (EWR) IFR 3S LRA FSS: TETERBORO (DL)
 18 H98/4R-22L(3) (S-84, D-350, DT-650) BL6,7A,8,10,11,14,15 S5
 F12,18,34 REIL: Rws 22R, 29 VASI: Rws 22R, 29 RVR: Rws 4L, 4R, 22L

Remarks: Rwy 4R thr dsplcd 1200'. Rwy 22L thr dsplcd 1600'. Rwy 11 thr dsplcd 200'. Rwy 29 thr dsplcd 282'. Rwy 4L thr dsplcd 750'. Rwy 22R thr dsplcd 450'. Fee. Cert.-FAR 139, CFR Index E. South 9300' rwy 4R-22L grooved to width 140'.
Newark Tower 118.3 134.05 Gnd Con 121.8
 ‡ Clrc Del 118.85

ATIS: (Arr) 115.7T (Dep) 132.45 [(201) 624-6463]

Radar Services:
 Newark App Con 125.5 126.7 127.6
 Newark Dep Con 119.2 135.35
 TCA Group 1: See NOS TCA chart

ILS 108.7 I-EWR Rwy 4L BC unusable LOM: 241/EW
108.7 I-LSQ Rwy 22L LOM: 241/BUG
108.7 I-EZA Rwy 4R LOM: 204/EZ
 Newark NDB H-SAB 379^M/EWR 058° 1.0NM to fld.
 Remarks: LOM rwy 22L is Bergen NDB. VOT: 110.0. 128.35 used for clrc del at Linden Arpt.

PALISADES PARK NDB MHW 233/PAD FSS: TETERBORO

PATERSON NDB MHW 347/PNJ FSS: TETERBORO

RAINBOW NDB SBH 363/RNB FSS: MILLVILLE

ROBBINSVILLE (H) BVORTAC 113.8/RBV/122.1R FSS: N. PHILADELPHIA

SEA ISLE (H) BVORTAC 114.8/SIE/122.1R FSS: MILLVILLE

SOLBERG (I) BVORTAC 112.9/SBJ/122.1R FSS: TETERBORO

SPARTA (H) BVORTAC 115.7/SAX FSS: TETERBORO

STILLWATER (I) BVORTAC 109.6/STW/122.1R FSS: TETERBORO

TETERBORO FSS 121.5 122.0 122.2 122.7
 Remarks: Flight Watch opers 0600-2200.

§ TETERBORO (TEB) IFR 1SW LRA FSS: TETERBORO on fld
 9 H70/1-19(2) (S-50, D-80) BL6,10,11,13 S5 F18,30 Ox1 U2
 VASI: Rws 19, 24 REIL: Rws 19, 24

Remarks: Fee. P-line apch rwy 24. Rwy 1 thr dsplcd 770'. Jets follow published noise abatement procedures available on req. All acct avoid hospital 1.7 mi N of rwy 1-19. Touch and go lndgs prohibited Mon thru Fri 0900-2100, Sat 1200-1900, helicopters excluded. Clsd to motorless acct and unctld acct activity except by prior permission. Cert.-FAR 139, CFR Index A.
Teterboro Tower 119.5 128.05 Gnd Con 121.9

Radar Services:
 Newark App Con 126.7
 Newark Dep Con 119.2 127.6

ILS 108.9 I-TEB Rwy 6 BC unusable LOM: 219/TE
Teterboro (T) VOR 114.2/TEB

FIGURE 64. Airport/facility directory.

APPENDIX I—Airman's Information Manual Excerpts

NOTICES TO AIRMEN

INFORMATION CURRENT AS OF JANUARY 13, 1977

THIS SECTION CONTAINS NOTICES TO AIRMEN THAT ARE EXPECTED TO REMAIN IN EFFECT FOR AT LEAST SEVEN DAYS.

NOTE: NOTICES ARE ARRANGED IN ALPHABETICAL ORDER BY STATE (AND WITHIN STATE BY CITY OR LOCALITY). NEW OR REVISED DATA: NEW OR REVISED DATA ARE INDICATED BY UNDERLINING THE AIRPORT NAME.

NOTE: ALL TIMES ARE LOCAL UNLESS OTHERWISE INDICATED.

ALABAMA

ANDALUSIA OPP ARPT: ARPT closed. (7/75)
 BREWTON MUNI ARPT: Rotating beacon cmsnd. (10/76-2)
 BIRMINGHAM FSS: Enroute Flight Advisory 0600-2200 cmsnd. (12/76-3)
 DEMOPOLIS MUNI ARPT: UNICOM freq 122.8 cmsnd. (1/77-2)
 GADSDEN MUNI: Rwy 6-24 closed. (10/76)
 ST JOHNS MUNI ARPT: Rwy 13-31 now 5000 ft. (11/76-2)

ALASKA

For complete information on Alaska consult the Alaska Supplement.

ARIZONA

GRAND CANYON AND PETRIFIED FOREST NATIONAL PARKS: All pilots are requested to avoid flying below the canyon rim and to maintain a distance 1500 ft above and horizontally from all scenic overlooks, parks, and trails. (10/74)
 ASH FORK JAY HASBROOK ARPT: Left tfc rwy 3, rwy 7, rwy 21 and rwy 25. (10/76-2)
 FORT HUACHUCA/SIERRA VISTA LIBBY AAF/SIERRA VISTA MUNI ARPT: ATCT hours 0600-2400 Mon-Fri, 0800-1600 Sat-Sun and holidays. (1/77-3)
 GOODYEAR PHOENIX-LITCHFIELD MUNI ARPT: TPA 1000 ft. (12/76-2)
 HOLBROOK MUNI ARPT: UNICOM freq 122.8 cmsnd. (10/76-2)
 HUNT GREEN VALLEY ARPT: Arpt closed (11/76-3)
 ST JOHNS MUNI ARPT: UNICOM freq 122.8 cmsnd. (10/76-2)
 SELLS ARPT: Rwy 14-22 now 6000 ft asphalt. (10/76-2)
 TUBA CITY ARPT: Rotating beacon cmsnd. MIRL rwy 1-19 cmsnd. (11/76-2)
 WINDOW ROCK ARPT: UNICOM freq 122.8 cmsnd. (12/76-2)

ARKANSAS

BENTONVILLE MUNI ARPT: Rwy 17-35 wt brg capacity S -12500 lbs. (12/76-2)
CAMDEN, HARRELL FIELD: Rwy 18-36 wt brg capacity S -53000 lbs, D -67000 lbs, DT -105000 lbs. (1/77-3)
 CLINTON MUNI ARPT: Rwy 13-31 now 4500 ft. (1/77-2)
 DECATUR CRYSTAL LAKE ARPT: Rwy 13-31 now 3350 ft. Rwy 13 open full. Rwy 31 night threshold dsplcmt removed. (1/77-2)
 FAYETTEVILLE DRAKE FIELD: TWR 1139 ft AGL Strobe lighted 14.9 mi SE Drake Field. (9/76)
 FORT SMITH, TWIN CITY ARPT: Rwy 17 open full length. (1/77-2)
 HARRISON BOONE COUNTY ARPT: VASI rwy 18 cmsnd. (10/76-3)
 JONESBORO MUNI ARPT: Threshold rwy 14 dsplcd 130 ft. Threshold rwy 32 dsplcd 160 ft. Rwy 18-36 now 3943 ft. Threshold rwy 18 dsplcd 160 ft. Threshold rwy 36 dsplcd 347 ft. VASI rwy 23 cmsnd. (11/76-2)
LAWRENCE COUNTY: NDB "LWQ" 227 kHz cmsnd. (1/77-3)
 MENA MUNICIPAL ARPT: Rwy 17-35 now 5000 ft x 75 ft. (12/76-2)
 PIGGOTT MUNI ARPT: Rwy lights OTS. (7/76)

ROGERS MUNI ARPT: Rwy 1-19 wt brg capacity S -42000 lbs, D -50,000 lbs. VASI rwy 1 and rwy 19 cmsnd. (12/76-2)
 RUSSELLVILLE: NDB "RUE" OTS. (6/76)
 SPRINGDALE MUNI ARPT: MIRL rwy 18-36 cmsnd. VASI rwy 18 and rwy 36 cmsnd. (12/76-2)
 STUTTGART MUNI ARPT: Rwy 18-36 wt brg capacity S -25000 lbs. (12/76-2)
 TEXARKANA MUNI-WEBB FIELD: Demolition activity, shrapnel and shock waves to 2400 ft MSL 18 miles W of arpt 0700-1700 daily. (12/76-2)

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. (10/74)
 SPECIAL NOTICE: The MELONES RESERVOIR/DAM AREA, lctd about 5 to 12 miles SW of Columbia Arpt and about 8 miles S of Frog Town Arpt at Angels Camps; acft are cautioned to avoid the area, if necessary to fly over the area maintain a minimum alt of 4000 ft, due to possible damage from flying rock or turbulence caused by continuous blasting for dam construction until 1979.
 SPECIAL NOTICE: Avoid flying below 1000 ft over a 400 acre Wildlife Refuge along the south side of the mouth of the Salinas River and ocean shoreline eastward. (1/76)
 ANO NUEVO ISLAND: Avoid low flying in the vicinity and over island. Biological research of wild life in progress. (10/74)
 BLAIR MUNI ARPT: Rwy 1-19 now 2800 ft. (10/76-2)
 BLYTHE ARPT: S 915 ft rwy 17-35 closed. Rwy 3-21 closed permly. (12/76-2)
 BRIDGEPORT BRYANT FIELD: Right tfc rwy 16. (6/76-2)
 CARLSBAD PALOMAR ARPT: TPA 900 ft light acft, TPA 1200 ft heavy acft. (12/76-2)
 FAIR OAKS, PHOENIX FIELD: Intensive military tfc all quadrants. (1/77-2)
 FORT JONES SCOTT VALLEY ARPT: Rwy 16-34 wt brg capacity S -19000 lbs. MIRL rwy 16-34 cmsnd. (12/76-2)
 LODI KINGDON AIRPARK: Rwy lights operate dusk-2400. (12/76-2)
 LOS ANGELES WHITEMAN ARPT: TPA 1000 ft. Threshold rwy 12 dsplcd 654 ft. (1/77-2)
 MENDOTA ARPT: Rotating beacon cmsnd. (10/76-2)
 MONTEREY PENINSULA ARPT: Rwy 6-24 closed until Feb 15. (12/76)
 OCEANSIDE MUNI ARPT: Threshold rwy 24 dsplcd 208 ft. (11/76-2)
 POPE VALLEY ARPT: Rwy 9-27 now 10-28. Low intensity rwy lights dcmsnd. Right tfc rwy 28. (12/76-2)
 REDDING, BENTON FIELD: VASI rwy 15 and rwy 33 cmsnd. (5/76-2)
 RIALTO MUNI/MIRO FLD: Threshold rwy 34 dsplcd 230 ft. Rwy 16-34 wt brg capacity S -12500 lbs. VASI rwy 24 cmsnd. (12/76-2)
 RIALTO MUNI/MIRO FLD/HELIPORT: TPA 600 ft. (11/76-2)
RICHVALE ARPT: Rwy lights rwy 16-34 OTS until Mar 12. (1/77)
 SACRAMENTO METROPOLITAN ARPT: MALS rwy 34 cmsnd. ILS rwy 34 cmsnd. (1/77-3)
 SALTON CITY SALTON SEA ARPT: Rotating beacon cmsnd. (1/77-2) (6/76)
 SAN DIEGO MONTGOMERY FIELD HELIPORT: No touch and go landings on helipad. Tfc pattern arrive from E and depart to S. (7/76-2)
 SANTA ANA, ORANGE COUNTY ARPT: Pilots required to use noise abatement procedures all quadrants. ILS LOC/DME 19R cmsnd. (1/77-3)
 SANTA BARBARA MUNI ARPT: VASI rwy 25 cmsnd. (12/76-3)
 SHAFTER-KERN COUNTY ARPT: Trucks crossing apch end rwy 12 days. (9/76-2)
 SNELLING BONNAZA HILLS ARPT: Arpt closed until April 1, 1977. (7/76-2)
 THERMAL ARPT: For rwy lights after 2200 ctc Thermal FSS. (4/76-2)

FIGURE 65. Airman's Information Manual

Part 3A.

APPENDIX I—Airman's Information Manual Excerpts
HELIPORT DIRECTORY

ARIZONA

FREEWAY See TUCSON

PRESCOTT MUNI (PRC) 8W 34°39'05" 112°25'15" FSS: PRESCOTT ON FLD
 @ 5042 F12,18
 REMARKS: HELIPORT ATTENDED 0600-1900 ON CALL OTHER HRS.

TUCSON, FREEWAY (P12) 4NW 32°16'45" 111°00'35" FSS: TUCSON
 @ 2290 H40X40 B F18
 REMARKS: PRKD ACFT IN RWY H1 APCH. APCH & DEPART TO NORTH.

WHITERIVER (E24) 3SW 33°48'30" 109°58'45" FSS: PHOENIX
 5152 H200X150

WINDOW ROCK (P34) ADJ S 35°39'20" 109°03'45" FSS: GALLUP
 6755 H100X100
 REMARKS: HELIPORT ATTENDED 0800-1700.

CALIFORNIA

BAKERSFIELD AIRPARK (L56) 3S 35°19'43" 118°59'48" FSS: BAKERSFIELD
 @ 378 H80X80 U-1 (LC 399-1787)
 REMARKS: HELIPORT ATTENDED 0800-1700 CLSD XMAS & NEW YEARS.

BISHOP (BIH) 2E 37°22'24" 118°21'54" FSS: TONOPAH
 4118 H100X100
 REMARKS: APCH & DEP SE.

BRIDGEPORT, MONO GENERAL HOSPITAL (Q18) 1S 38°15'12" 119°13'47" FSS: RENO
 @ 6450 H160X160
 REMARKS: HELIPORT UNATTENDED. YELLOW LGTS OUTLINE HELIPAD AND OPER HOURS OF DARKNESS.

BRIDGEPORT, U S FOREST SERVICE (Q28) 3NW 38°16'30" FSS: RENO
 119°17'15"
 @ 6550 H30X30
 REMARKS: HELIPORT UNATTENDED. RGT TFC RWY H1. FUEL AVBL IN CITY.

BROWN FIELD MUNI See SAN DIEGO

EMERYVILLE MUNI (Q48) ADJ W 37°50'24" 122°17'48" FSS: OAKLAND
 10 H146X110 (S-19)
 REMARKS: HELIPORT ATTENDED 0600-2300. SIGN IN RWY H1 APCH. CERT FAR 139 CFR INDEX A.

FRESNO AIR TERMINAL (FAT) 6NE 36°46'21" FSS: FRESNO ON FLD
 119°43'08"
 339 H90X90 (S-60,D-110)
 REMARKS: HELIPORT ATTENDED JUN-AUG 24 HRS SEP-MAY 0610-2200 ON CALL 2200 0610.

FRESNO, SIERRA SKY PARK (Q68) 7NW 36°50'25" FSS: FRESNO
 119°52'10"
 @ 320 200X200 F12,18
 REMARKS: HELIPORT ATTENDED DAWN-DUSK. RGT TFC RWY H1. FOR RWY LGTS CALL 209-439-2345.

FULLERTON MUNI (L75) 3W 33°52'20" 117°58'44" FSS: LOS ANGELES
 96 H100X50 S5 F12,18,40 0x1,2,3,4 (LC 542-3585)
 REMARKS: HELIPORT ATTENDED 0800-2000. FENCE IN RWY H2 APCH. LANDING FEE.

GAVIOTA (L76) ADJ E 34°28'21" 120°12'48" FSS: SANTA BARBARA
 @ 127 H50X50 F12
 REMARKS: HELIPORT UNATTENDED.

GILLESPIE FLD See SAN DIEGO -SANTEE-

NEMET RYAN (HMT) 3SW 33°44'06" 117°01'14" FSS: ONTARIO
 @ 1512 H100X100
 REMARKS: HELIPORT ATTENDED DAWN-DUSK.

LOS ANGELES INTL (LAX) 10SW 33°56'24" 118°24'09" FSS: LOS ANGELES ON FLD
 126 H200X150 (S-20,D-50)
 REMARKS: B747 ACTIVITY & OTHER HEAVY ACFT GND TFC E AND N OF USCG HELIPAD CONTACT TWR FOR TFC PATTERN.

LOS ANGELES-VAN NUYS-, VAN NUYS (L83) 3NW 34°12'35" FSS: LOS ANGELES
 118°29'20"
 800 H25X25 U-5
 REMARKS: CONTACT ATCT FOR APCH-DEP ROUTES.

MARIN COUNTY See SAUSALITO

METROPOLITAN OAKLAND INTL HELIPAD 1 See OAKLAND

MONO GENERAL HOSPITAL See BRIDGEPORT

MONTGOMERY FIELD See SAN DIEGO

OAKLAND, METROPOLITAN OAKLAND INTL HELIPAD 1 (Q87) FSS: OAKLAND ON FLD
 5S 37°42'52" 122°12'54"
 6 H100X75 (S-200,D-200,DT-400)

QUARTZ HILL (RZH) 5W 34°39'03" 118°12'18" FSS: LANCASTER
 2469 H50X50 (S-4)
 REMARKS: HELIPORT ATTENDED DAWN-DUSK. HELIPAD LCTD BTWN RWYS 5 & 9 FRNT OF APRN.

RAMONA (L39) 2W 33°02'15" 116°54'30" FSS: SAN DIEGO
 @ 1393 200X200 U-1

RIALTO MUNI /MIRO FLD/ (L67) 3NW 34°07'45" FSS: ONTARIO
 117°23'30"
 @ 1434 H100X100 L5

SAN DIEGO, BROWN FIELD MUNI (SDM) 15SE 32°34'20" FSS: SAN DIEGO
 116°58'47"
 524 H50X50
 REMARKS: HELIPORT ATTENDED 0700-2300.

SAN DIEGO, MONTGOMERY FIELD (MYF) 7N 32°48'57" FSS: SAN DIEGO
 117°08'23"
 423 H132X100
 REMARKS: HELIPORT UNATTENDED.

SAN DIEGO -SANTEE-, GILLESPIE FLD (SEE) 12NE 32°49'33" 116°58'19" FSS: SAN DIEGO
 @ 385 H30X30 L*4 F12,18 U-2
 REMARKS: TWO DESIGNATED ADJACENT LNDG PADS LCTD ON 200' X 100' ASPHALT AREA. BLINKING PAD PERIMETER LGTS INDICATE PAD/PADS OCCUPIED.

SANTA MONICA MUNI (SMD) 3E 34°00'58" 118°27'03" FSS: LOS ANGELES
 175 H50X50 B (LC 670-1000)
 REMARKS: ROTG BCN LCTD ON SANTA MONICA MUNI APT. LNDG & TROF AS DIRECTED BY ATCT.

SANTEE See SAN DIEGO -SANTEE-

SAUSALITO, MARIN COUNTY (JMC) 2NW 37°52'45" FSS: OAKLAND
 122°30'45"
 2 H100X100 (S-19) L5 F18
 REMARKS: HELIPORT ATTENDED SUN-FRI 0530-2230 SAT 0630-2200. CERT FAR 139 CFR INDEX A.

SIERRA SKY PARK See FRESNO

STOCKTON METROPOLITAN (SCM) 5SE 37°53'39" FSS: STOCKTON
 121°14'14"
 @ 295 H75X75 S3 F12

U S FOREST SERVICE See BRIDGEPORT

VAN NUYS See LOS ANGELES-VAN NUYS-

VISALIA MUNI (VIS) 5W 36°19'36" 119°23'54" FSS: FRESNO
 288 H100X100 U-1 (LC 734-1044)
 REMARKS: HELIPORT ATTENDED 0700-1900.

COLORADO

ASPEN VALLEY HOSPITAL (6V7) 1N 39°11'48" FSS: DENVER
 106°49'02"
 @ 7880 H150X80 L*4
 REMARKS: HELIPORT UNATTENDED. ROTG BCN LGT OPERS PHONE REQ. UNICOM 123.1.

DENVER TECHNOLOGICAL CENTER (8V3) 3SE 39°37'06" FSS: DENVER
 104°53'38"
 @ 5660 H100X100 U-3
 REMARKS: HELIPORT UNATTENDED. INGRESS/EGRESS ROUTES ARE ESTABLISHED EAST OF HIGHWAY 25.

FIGURE 66. Heliport directory.

PARACHUTE JUMPING AREAS

The following tabulation lists all reported parachute jumping sites in the United States. Unless otherwise indicated, all activities are conducted during daylight hours and under VFR conditions. The busiest periods of activity are normally on weekends and holidays, but jumps can be expected at anytime during the week at the locations listed. Activities conducted on military facilities are not included in this list.

All times are local and altitudes MSL unless otherwise specified.

Refer to Federal Aviation Regulations Volume 6, Part 105 for required procedures relating to parachute jumping.

Organizations desiring listing of their jumping activities in this publication should contact the nearest FAA facility (FSS, tower or ARTCC).

Note: (c) indicates Parachute Jump Area is charted.

LOCATION	DISTANCE AND RADIAL FROM NEAREST VOR/VORTAC	MAXIMUM ALTITUDE	REMARKS
ALABAMA			
(c) Bayou La Batre, Roy E. Ray Arpt -----	12 NM; 217° Brookley -----	12,500	Daily SR-SS
Bessemer, Old Bessemer Arpt -----	16 NM; 057° Brookwood -----	10,000	1030-SS weekends
(c) Elberta, Horak Arpt -----	11 NM; 268° Saufley -----	12,500	Continuous weekends and holidays, occa- sional weekdays
Ellis Drop Zone -----	15 NM; 220° Decatur -----	1,500	0.4 NM radius. Occa- sional use
Eutaw Muni Arpt -----	30 NM; 200° Tuscaloosa -----	13,000 AGL	Weekends and holi- days
Harvest, Epps Arpk -----	9 NM; 297° Huntsville -----	13,500	Daily SR-SS
Headland Muni Arpt -----	8 NM; 070° Dothan -----	15,000	Weekdays 1200-SS; Sat-Sun, and holi- days SR-SS
Jones Drop Zone -----	6 NM; 276° Huntsville -----	1,500	0.25 NM radius. Occa- sional use
Kaiser Drop Zone -----	48 NM; 268° Saufley -----	1,500	0.2 NM radius. Occa- sional use
Kilby Drop Zone -----	18 NM; 014° Montgomery -----	1,500	0.2 NM radius. Occa- sional use
Marion, Perry Co Arpt -----	30 NM; 315° Cahaba -----	12,500	Wednesday, week- ends, holidays
(c) Ozark/Ft. Rucker, Cairns AAF -----	Over Cairns -----	14,000	0600-1800 weekends and holidays.
Redstone Drop Zone -----	9 NM; 220° Huntsville -----	1,500	0.2 NM radius. Occa- sional use
Renda Drop Zone -----	8 NM; 234° Talledega -----	1,500	0.25 NM radius. Occa- sional use
(c) St. Elmo -----	10 NM; 236° Brookley -----	12,500	1500-SS daily.
Selma Drop Zone -----	10 NM; 242° Cahaba -----	1,500	0.1 NM radius. Occa- sional use

FIGURE 67. Parachute jumping areas.
Part 4

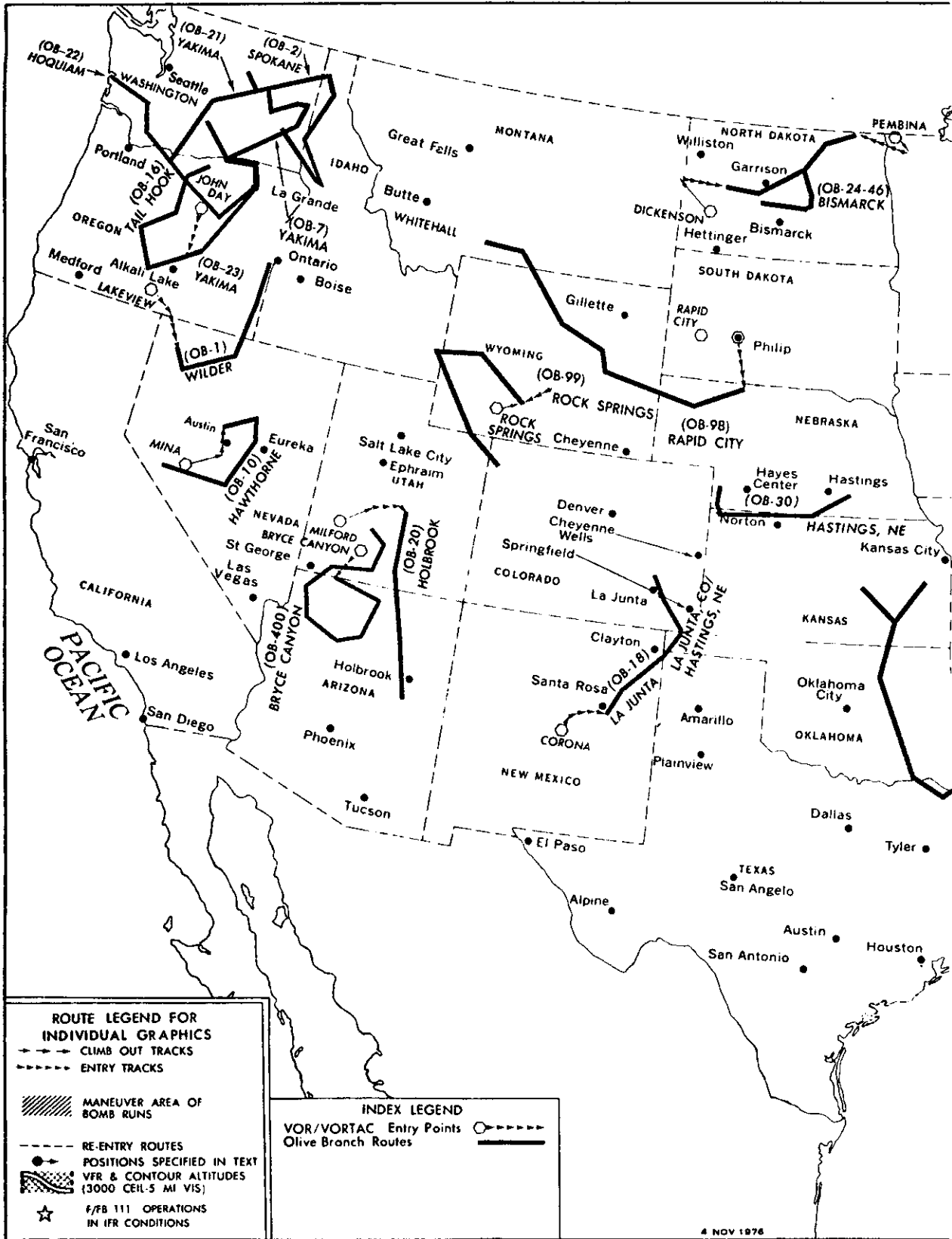
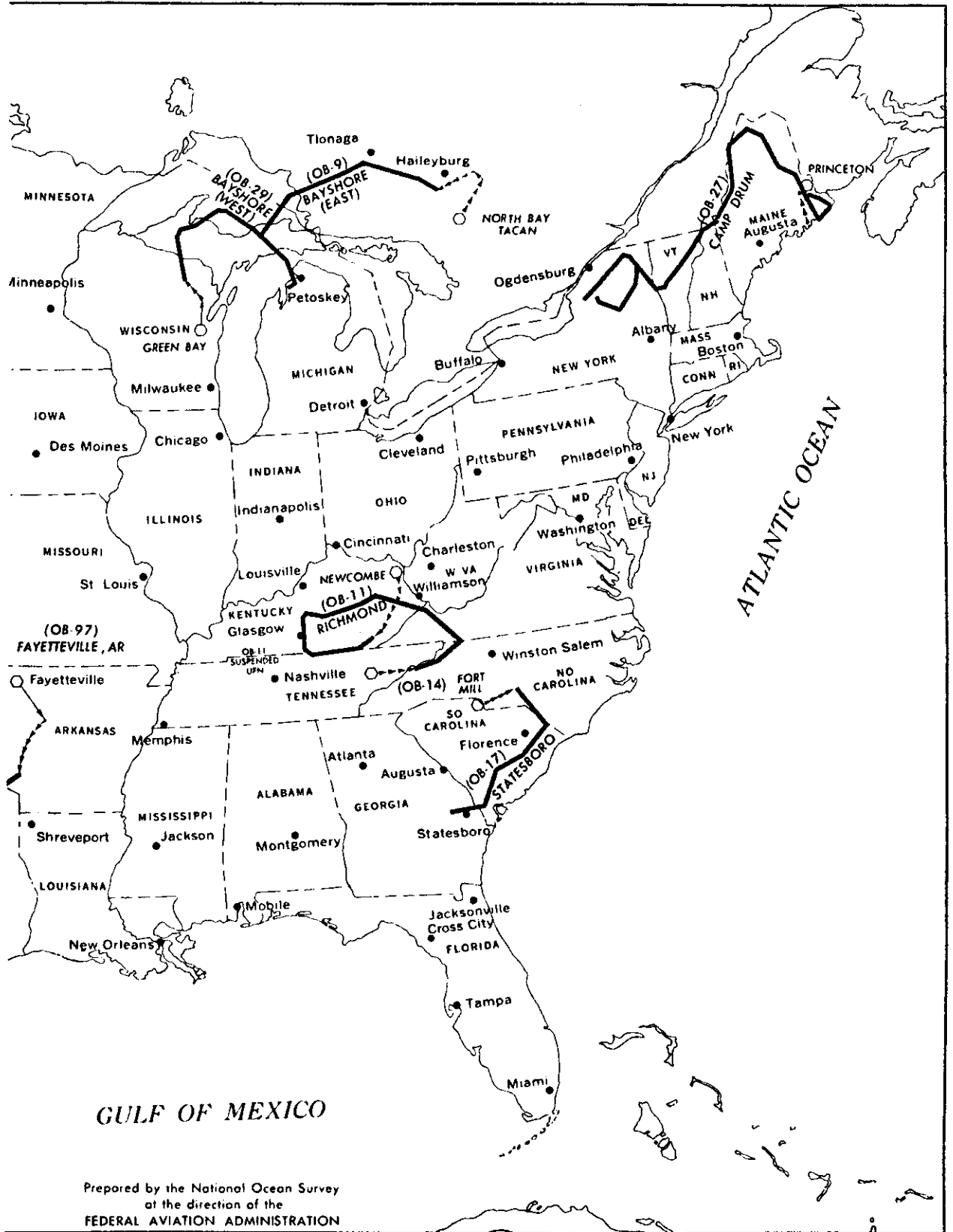


FIGURE 68. Index of olive branch routes.

Part 4



Prepared by the National Ocean Survey
at the direction of the
FEDERAL AVIATION ADMINISTRATION

FIGURE 68. Index of olive branch routes—cont'd.

Part 4

TAHOE VALLEY, CALIFORNIA

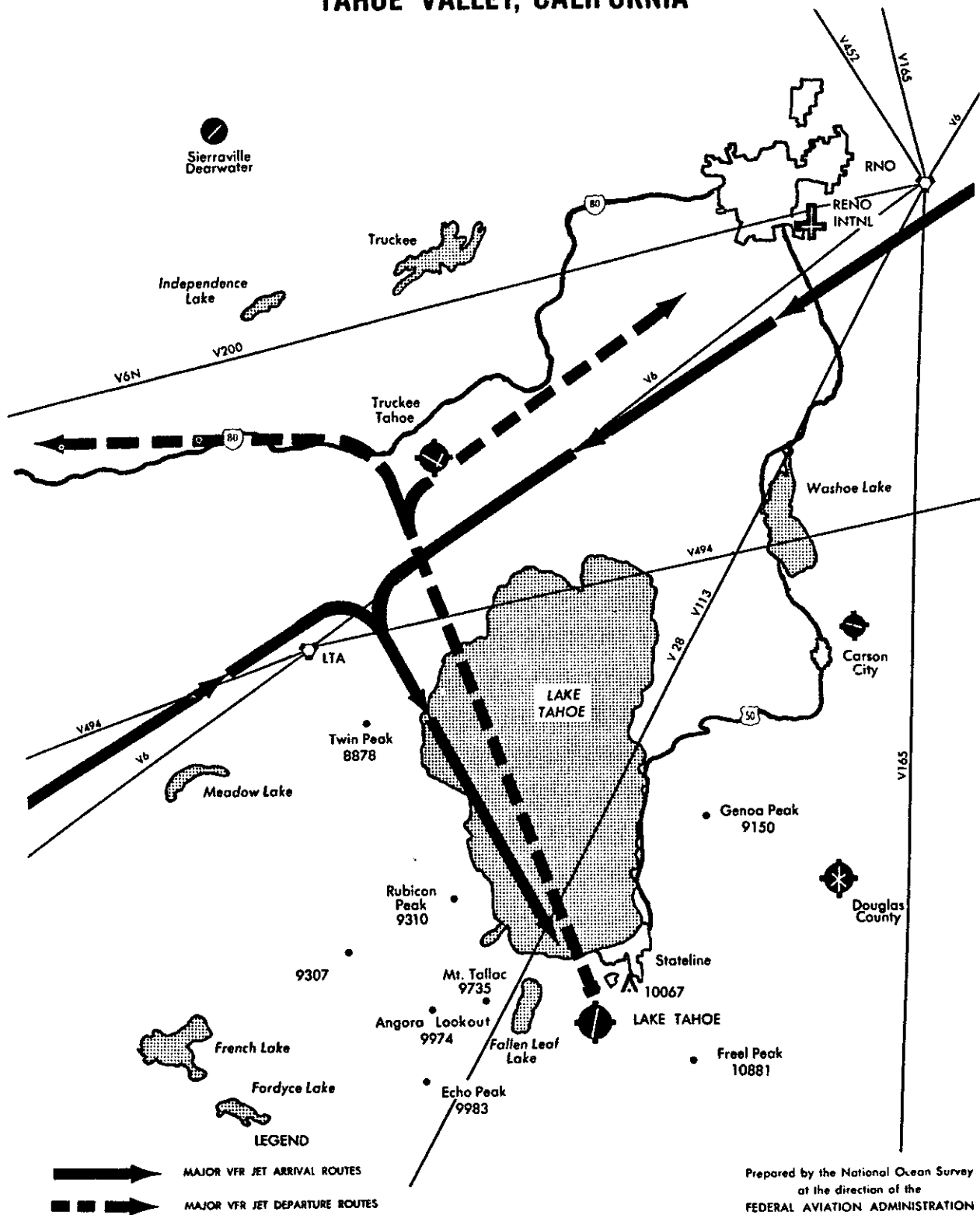


FIGURE 71. Terminal area graphic notice.

Part 4

**TOLEDO, OHIO, TOLEDO EXPRESS ARPT
FIELD ELEV. 684' MSL**

ATIS 133.55

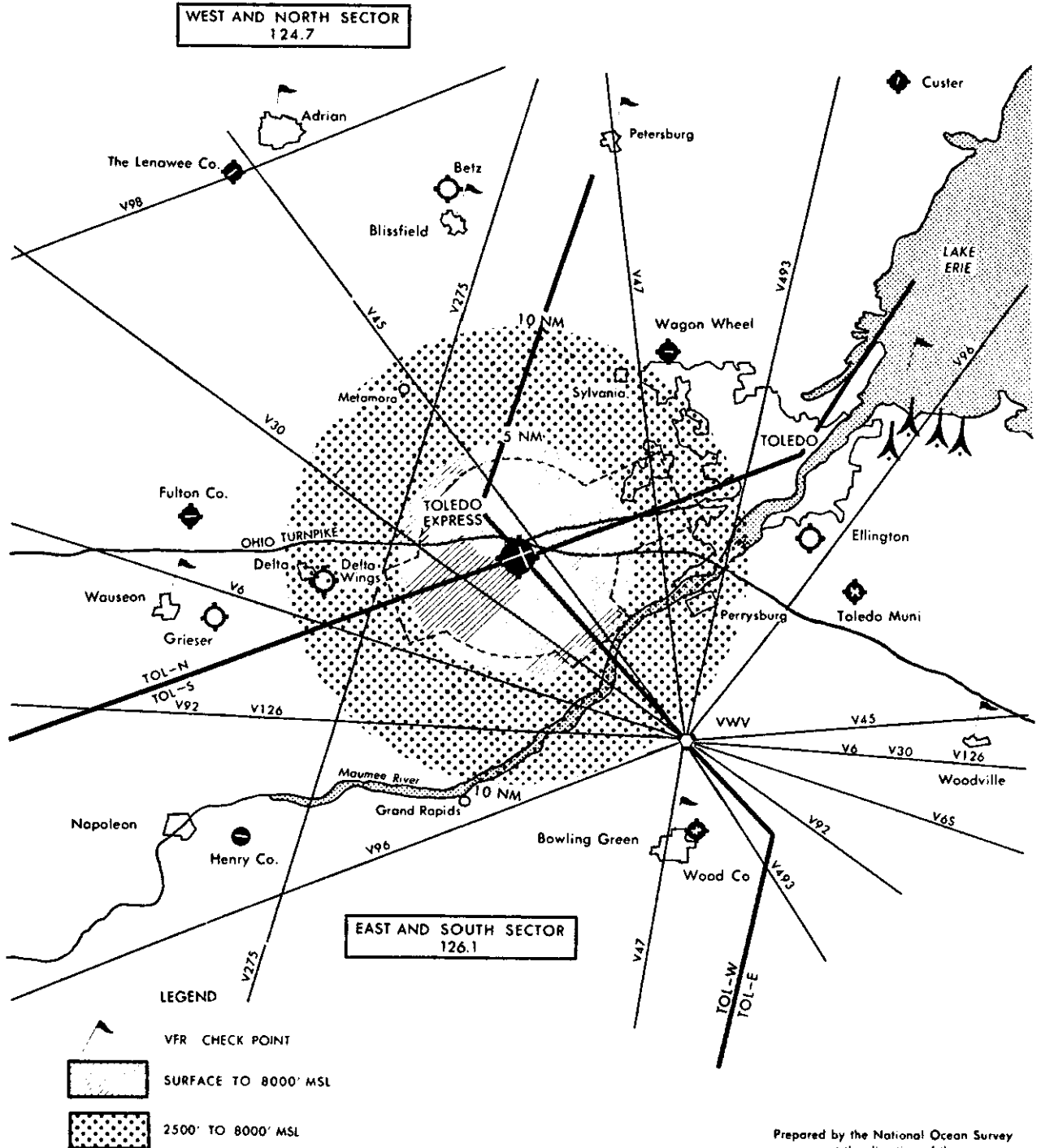


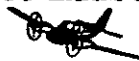
FIGURE 72. Terminal radar service area.

Part 4

APPENDIX J--Pilot Exam-O-Grams

U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

VFR PILOT EXAM-O-GRAMS



1/77

Exam-O-Grams are brief and timely explanations of important aeronautical knowledge items. These items include concepts and procedures that are critical to aviation safety, common misconceptions among airman applicants, and areas which cause general difficulty in written tests.

Exam-O-Grams are developed on a continuing basis, only as needs arise, and not on a regularly scheduled basis. They are distributed free (one copy per request) to airman applicants, pilots, ground and flight instructors, educational institutions, airman training centers, flying clubs, and other interested groups and individuals. Exam-O-Grams may be reproduced without further permission from FAA.

VFR EXAM-O-GRAMS

No.	Title and Revision Date	No.	Title and Revision Date
2	VFR Cruising Altitudes - 10/71	37	Commonly Misunderstood Areas of Aeronautical Knowledge (Series 2) - 1/72
4	Preflight Planning for a VFR Cross-Country Flight (Series 1) - 1/74	38	Mixture Control -- Fuel/Air Ratio - 11/66
5	Preflight Planning for a VFR Cross-Country Flight (Series 2) - 10/71	39	Simple ADF for VFR Navigation - 8/67
6	Preflight Planning for a VFR Cross-Country Flight (Series 3) - 3/71	40	Visual Approach Slope Indicator (VASI) - 1/74
9	Altimetry - 1/77	41	Controlled Airspace (Series 1) - 10/71
13	Weight and Balance - 1/77	42	Controlled Airspace (Series 2) - 10/71
15	How to Use VOR (Series 1) - 8/64	43	ATIS (Automatic Terminal Information Service) - 1/74
16	How to Use VOR (Series 2) - 8/64	44	How High the Clouds? - 1/77
17	Common Misconceptions (Series 1) - 1/77	45	Airspeeds and Airspeed Indicator Markings (Series 2) - 1/69
18	Lost Procedures -- Pilotage - 9/64	46	Aviation Weather Reports -- Remarks - 6/76
19	Emergency or Lost Procedures (Radio) - 1/74	47	Ground Effect - 1/74
20	Ceiling and Visibility - 6/76	48	Midair Collisions (Series 3) - 1/74
21	Flying into Unfavorable Weather - 7/69	49	Use of Oxygen in General Aviation Aircraft - 1/71
22	Potential Midair Collisions - 1/74	50	Interpreting Sectional Charts (Series 2) - 1/77
23	Interpreting Sectional Charts (Series 1) - 1/77	51	Interpreting Sectional Charts (Series 3) - 1/77
26	Common Misconceptions (Series 2) - 1/74	52	Sky Cover and Ceiling - 6/76
27	The Effect of Wind on an Airplane - 1/74	53	Dangers of Wingtip Vortices - 1/77
28	Factors Affecting Stall Speed - 9/65	54	Emergency Locator Transmitters (ELTs) - 5/74
29	Potential Midair Collisions (Series 2) - 1/74	55	Terminal Radar Service Areas (TRSAs) "Stage III" - 1/77
33	Use of Performance Charts - 1/77	56	Sky Cover Symbols in Weather Reports and Forecasts - 6/76
34	How to Obtain Proper Weather Briefing - 1/74	57	Flight in the Region of Reversed Command in Relation to Takeoffs and Landings - 7/75
35	UNICOM Frequencies and Uses - 1/77	58	Pilot Induced Accidents - 1/77
36	Commonly Misunderstood Areas of Aeronautical Knowledge (Series 1) - 6/76		

In this set of Exam-O-Grams the following issues have been deleted: Nos. 1, 3, 7, 8, 10, 11, 12, 14, 24, 25, 30, 31, and 32. They have been discontinued since the subject areas which they cover are now adequately treated in FAA Advisory Circulars.

The Advisory Circular Checklist, AC 00-2, may be obtained free of charge from:

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

Federal Aviation Administration
Flight Standards National Field Office
Examinations Branch
P.O. Box 25067
Oklahoma City, Oklahoma 73125

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material.

FIGURE 73. List of VFR exam-o-grams.

APPENDIX J--Pilot Exam-O-Grams

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
IFR PILOT EXAM-O-GRAMS



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Exam-O-Grams are brief and timely explanations of important aeronautical knowledge items. These items include concepts and procedures that are critical to aviation safety, common misconceptions among airman applicants, and areas which cause general difficulty in written tests.

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IFR EXAM-O-GRAMS

No.	Title and Revision Date	No.	Title and Revision Date
2	Use and Abuse of Radar - 2/71	25	The ATC Transponder - 1/77
6	VFR Operations on an Instrument Flight Plan - 9/69	26	Runway Marking - 10/71
7	CDI Interpretation - 9/69	27	Airport Surveillance Radar (ASR) Approaches - 1/77
8	Minimum IFR Altitudes - 11/75	28	Category II Taxiway Holding Lines - 7/69
10	Altimetry - 12/67	29	When an Alternate Airport is Not Required - 3/70
11	Communications Procedures for Pilots on Instrument Flight Plans - 2/71	30	VORTAC Area Navigation - 3/74
14	VOR Quiz - 8/65	31	Is Your Instrument Flight Really Legal? - 11/73
15	The Weather Depiction Chart is for You - 1/77	32	Aircraft Performance Charts - 3/71
16	The Low Level Prognostic Chart - 11/73	34	IFR Departure Clearances - 9/71
17	The Radar Summary Chart - 1/77	35	Clearance Delivery Procedures - 1/72
18	Rate of Turn - 1/67	36	Lost Communications Procedures - Altitude Requirements - 1/72
19	Telephone Weather Briefing - 6/71	37	Lost Communications Procedures - Route Requirements - 9/72
21	IFR Weight and Balance Computations - 9/67	38	Lost Communications Procedures - Approach Requirements - 3/73
22	VOR Receiver Accuracy Check - 2/74	39	Enroute Chart Information - 4/73
23	Fundamental ADF Procedures - 1/71	40	The ILS Category II Approach - What is It? - 10/76
24	The Attitude Indicator - 5/70		

Exam-O-Grams Nos. 1, 3, 4, 5, 9, 12, 13, 20, and 33 have been deleted since the subject areas are adequately treated in other FAA publications. The material in Exam-O-Gram No. 1 is covered in AC 90-1A. Exam-O-Gram No. 5 is covered in AC 00-45. Advisory Circular 90-1A and certain other free Advisory Circulars, including the Advisory Circular Checklist, may be obtained from:

Department of Transportation
Federal Aviation Administration
Distribution Unit, TAD-484.3
Washington, D.C. 20590

FIGURE 74. List of IFR exam-o-grams.