AC NO. 61-73A

PRIVATE AND COMMERCIAL PILOT

ROTORCRAFT - HELICOPTER

WRITTEN TEST GUIDE

REVISED 1979

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

FLIGHT STANDARDS SERVICE

PRIVATE AND COMMERCIAL PILOT
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PREFACE

This test guide was developed to assist applicants in preparing for the Private or Commercial Pilot Certificate with a Rotorcraft-Helicopter Rating under the provisions of Federal Aviation Regulations, Part 61. This guide supersedes AC 61-73, Private and Commercial Pilot Rotorcraft-Helicopter Written Test Guide, dated 1974.

This guide outlines the aeronautical knowledge requirements for a private or commercial pilot certificate and informs the applicant of source material that can be used to acquire this knowledge. It includes study questions and illustrations representative of those used in the private and commercial helicopter written tests.

All test items pertaining to the Federal Aviation Regulations are based on regulations current at the time of printing.

Direct comments regarding this publication to the U.S. Department of Transportation, Federal Aviation Administration, Flight Standards National Field Office, Examinations Standards Branch, AFS-590, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

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PRIVATE AND COMMERCIAL PILOT ROTORCRAFT-HELICOPTER WRITTEN TEST GUIDE

Introduction

There is no quick and easy way to obtain the experience, knowledge, and skill that the private or commercial pilot must acquire. Only through conscientious study and practice are these essentials attained. Therefore, in a continuing effort to provide guidance and assistance to applicants who are preparing for the written tests, the Flight Standards Service of the Federal Aviation Administration has developed this test guide. By using this guide applicants are able to direct their study plan intelligently.

Certification

The certification process requires the applicant to pass a written test and a flight test appropriate to the certificate sought. Review the applicable sections of Federal Aviation Regulations, Part 61, for *specific* information pertaining to certification.

The Written Tests

The rotorcraft-helicopter tests are designed to integrate technical information of several subjects into test items which relate to a successfully planned and executed cross-country flight. The tests require an applicant to employ all pertinent flight information and knowledge of air traffic rules, weather, navigation, radio, operation of aircraft and engines, etc., in planning a safe, efficient flight.

Each written test contains 60 items. Four hours are allowed for taking a test. All test items are of the objective, multiple-choice type and each item can be answered by the selection of a single response as the correct choice. That is, the correct response of one test item does not depend upon, or influence, the correct response of another test item.

Taking the Test

The tests may be taken at General Aviation District Offices of the Federal Aviation Administration and at other designated places.

When reporting for the written test, be prepared to identify yourself and to present to the person administering the test proof of your eligibility to take it. You may not be permitted to begin the test unless there is sufficient time to complete it.

The equipment needed for taking the test includes a straight edge, a plotter or protractor, and a navigation computer or an electronic calculator. A pair of dividers may be useful.

Consider the following points while taking the tests:

1. Test items should be answered in accordance with the latest regulations and procedures.

2. Read the instructions and each test question carefully. Do not try to solve the problem before understanding the question. Be sure the objective of the test item is understood, then work the problem or analyze the choices and select the answer you believe to be the most correct.

3. Do not consider a complicated problem a "trick"question; each question has a specific objective. There are no trick questions. The questions and answers mean exactly what is stated, and refer to the general rule rather than to the exception to the rule.

4. There is only one correct and complete answer to each item. The alternate answers are derived from incorrect computations, or based upon common misconceptions, or lack of knowledge about the subject.

5. If you find that you have considerable difficulty with a particular test item do not spend too much time on it. Go on to the questions that you can answer readily, then return to the difficult items.

6. For a computer problem, select the answer closest to your own solution. If you have solved the problem correctly, your answer will be closer to the correct answer than to any of the other choices. The correct answer is an average of solutions obtained by using several different computers.

7. When marking the test answer sheet be sure that the number of the question matches the number on the answer sheet and that you mark only one answer block per question. An answer block for a test question that is left blank, a partially erased answer block, or more than one block marked is scored as wrong. Check your answer sheet carefully before you turn it in.

Recommended Study Materials

The prospective helicopter pilot will find the following list of publications useful when preparing for the written test. In addition, there are textbooks and reference materials produced commercially that may be obtained from the publishers, or various bookstores and fixed-base operators engaged in flight training.

Items 1 thru 4, 6, 7, and 10 of the following list are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Instructions for ordering these items are contained on page 3.

1. *AVIATION WEATHER, AC 00-6A.* Provides an up-to-date and expanded text for pilots and other flight operations personnel whose interest in meteorology is primarily in its application to flying. SN 050-007-00283-1.

2. *AVIATION WEATHER SERVICES, AC 00-45A.* Supplements AC 00-6A, Aviation Weather, in that it explains the weather service in general and the use and interpretation of reports, forecasts, weather maps, and prognostic charts in detail. SN 050-007-00392-7.

3. *BASIC HELICOPTER HANDBOOK, AC 61-13B.* Provides detailed information to applicants preparing for private, commercial, and flight instructor pilot certificates with a helicopter rating about helicopter aerodynamics, performance, and flight maneuvers. It may be useful to helicopter flight instructors as an aid in training students. SN 050-011-00074-7.

4. *PILOT'S HANDBOOK OF AERONAUTICAL KNOWLEDGE, AC 61-23A.* Contains essential, authoritative information used in training, and guides applicants for private pilot certification, flight instructors, and flying school staffs. SN 050-011-00051-8.

5. *WAKE TURBULENCE, AC 90-23D.* Alerts pilots to the hazards of aircraft trailing vortex wake turbulence and recommends related operational procedures. Free upon request from: U.S. Department of Transportation, Publications Section, M-443.1, Washington, D.C. 20590.

6. *AIRMAN'S INFORMATION MANUAL (AIM).* Has been designed primarily as a pilot's operational and information manual for use in the National Airspace System of the United States. It includes instructional and procedural information, and is designed for use in the cockpit.

Information formerly published in Parts 2 and 3 of the Airman's Information Manual (AIM) is now published as a combined directory in seven separate regional volumes, which are smaller and easier to use. All public airports will be listed, with information on runways, lighting, available fuel and service, frequencies, etc. Volumes will be updated every 56 days.

The Directory can be purchased by subscription to regional volumes from the National Ocean Survey, C-44, Department of Commerce, Riverdale, MD 20840. Volumes may be available for sale at certain chart outlets such as airports, fixed-base operators, flight schools, etc.

7. *FEDERAL AVIATION REGULATIONS.* 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.

8. *NATIONAL TRANSPORTATION SAFETY BOARD REGULATION, 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 free, upon request, from the National Transportation Safety Board, Publications Unit, Washington, D.C. 20591.

9. *VFR/IFR PILOT EXAM-O-GRAMS.* These brief summaries provide concise information about certain concepts and procedures that are critical to aviation safety.

The Exam-O-Grams are available free of charge (a single set only per request) from:

U.S. Department of Transportation
Federal Aviation Administration
Flight Standards National Field Office
Examinations Standards Branch, AFS-590
P.O. Box 25082
Oklahoma City, Oklahoma 73125

10. *PILOT'S WEIGHT AND BALANCE HANDBOOK, AC 91-23A.* Provides a text on aircraft weight and balance for safety of flight. Progresses from an explanation of fundamentals to the application of weight and balance principles for large aircraft. SN 050-007-00405-2.

11. *HELICOPTER FLIGHT MANUALS AND OWNERS' MANUALS.* These manuals may be ob-

tained from individual aircraft manufacturing companies or from local dealers and distributors.

How To Obtain GPO Publications

Requests for publications sold through the Superintendent of Documents should be submitted on an order form, if possible, to:

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

An order form may be obtained *free* upon request from the above address.

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

1. Send orders for subscription items and single sale items on separate requests.

2. Give the exact title of the publication, the agency identification number, and the stock number (SN).

3. Send a check or money order—NOT CASH—in the *correct* amount. (Include an additional 25% of the total order price to cover postage for foreign mailing.)

4. When ordering by letter enclose a self-addressed mailing label.

How To Obtain Aeronautical 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 (C-44)
National Ocean Survey
Riverdale, Maryland 20840

Orders for 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."

How To Obtain Advisory Circulars and Federal Aviation Regulations

The FAA issues an *Advisory Circular Checklist, AC 00-2,* and the *Status of Federal Aviation Regulations, AC 00-44.* These circulars describe those publications and explain how to obtain them. ACs 00-2 and 00-44 may be obtained free of charge by writing to:

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

STUDY OUTLINE

Private or Commercial Pilot Rotorcraft-Helicopter Knowledge Areas

The study outline which follows lists the basic aeronautical knowledge areas for the prospective private or commercial helicopter pilot. Each question on FAA written tests can be directly related to one or more of the topics contained in this outline. This subject matter is based on operationally realistic pilot activity and encompasses the requirements specified in FAR 61.105 for a private pilot certificate and in FAR 61.125 for a commercial pilot certificate.

I. FEDERAL AVIATION REGULATIONS

A. FAR Part 1.

Have a knowledge of:

1. General definitions
2. Abbreviations and symbols

B. FAR Part 61.

Have a knowledge of:

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. FAR Part 71.

Have a knowledge of:

1. Federal airways
2. Control areas
3. Continental control area
4. Control zones
5. Terminal control areas
6. Transition areas
7. Positive control areas

D. FAR Part 91—Subpart A.

Have a knowledge of:

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 operations
7. Liquor and drugs
8. Dropping objects
9. Fastening of safety belts
10. Parachutes and parachuting
11. Portable electronic devices
12. ATC transponder equipment requirements
13. Civil aircraft: certificates required
14. Aircraft airworthiness
15. Aircraft operating limitations/markings
16. Instrument and equipment requirements
17. Limited/restricted aircraft limitations

E. FAR Part 91—Subpart B.

Have a knowledge of:

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 plan; information required
10. Operation—in vicinity of airport
11. Operation—airport with control tower
12. Operation—airport without control tower
13. Flight in terminal control areas
14. Temporary flight restrictions
15. Flight test areas
16. Restricted and prohibited areas
17. Positive control areas; route segments
18. Basic VFR weather minimums
19. Special VFR weather minimums
20. VFR cruising altitude or flight level

F. FAR Part 91—Subpart C.

Have a knowledge of:

1. General maintenance and alterations
2. Maintenance required
3. Carrying persons after repair/alteration
4. Inspections/progressive inspections
5. Altimeter system tests/inspections
6. ATC transponder tests and inspections

G. FAR Part 135.

Have a knowledge of:

1. Applicability
2. Operating rules
3. Crewmembers qualification
4. Aircraft and equipment

II. NATIONAL TRANSPORTATION SAFETY BOARD REGULATION, PART 830

Have a knowledge of:

1. Applicability
2. Definitions
3. Immediate notification and information
4. Preservation of aircraft wreckage/mail/cargo/records
5. Reporting of aircraft accidents/incidents/overdue aircraft

III. FAA ADVISORY CIRCULARS

Have a knowledge of:

1. Series 00—General
2. Series 20—Aircraft
3. Series 60—Airmen
4. Series 70—Airspace
5. Series 90—Air Traffic Control and General Operations
6. Series 120—Air Carrier and Commercial Operators and Helicopter (commercial pilots only)
7. Series 150—Airports
8. Series 170—Air Navigation Facilities

IV. AIRMAN'S INFORMATION MANUAL, BASIC FLIGHT INFORMATION AND ATC PROCEDURES

Have a knowledge of:

1. Navigation Aids
   a. Air navigation radio aids
   b. Airport, air navigation lighting, and marking aids
2. Airspace
   a. Uncontrolled airspace
   b. Controlled airspace
   c. Special use airspace
   d. Other airspace areas
3. Air Traffic Control
   a. Services available to pilots
   b. Radio communications phraseology and technique
   c. Airport operations
   d. ATC clearances/separations
   e. Preflight
   f. Departures—IFR
   g. Enroute—IFR
   h. Arrival—IFR
   i. Pilot/controller roles and responsibilities
   j. Emergency procedures
   k. National security
4. Safety of Flight
   a. Weather
   b. Wake turbulence
   c. Medical facts for pilots
   d. Safety, accident and hazards reports
5. Good Operating Practices
6. Pilot/Controller Glossary

V. AVIATION WEATHER, AC 00-6A

Have a knowledge of:

A. The Earth's Atmosphere.

1. Composition
2. Vertical structure
3. The standard atmosphere
4. Density

B. Temperture.

1. Temperature measurement
2. Heat and temperature
3. Temperature variations

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 formation
4. Precipitation

F. Stable and Unstable Air.
1. Changes within upward and downward moving air
2. Stability and instability
3. What does it all mean

G. Clouds.
1. Identification
2. Signpost in the sky

H. Air Masses and Fronts.
1. Air masses
2. Fronts
3. Fronts and flight planning

I. Turbulence.
1. Convective currents
2. Obstruction to windflow
3. Wind shear
4. Wake turbulence

J. Icing.
1. Structural ice
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 don't just 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 visibility
5. Precipitation
6. Obscured or partially obscured sky

VI. AVIATION WEATHER SERVICES, AC 00-45A

Have a knowledge of:

A. The Aviation Weather Service Program.
1. Data flow
2. Observations
3. Meteorological centers and forecast offices
4. Service outlets
5. Users

B. Surface Aviation Weather Reports.
1. Station designator
2. Type and time of report
3. Sky condition and ceiling
4. Visibility
5. Weather and Obstruction to vision
6. Sea level pressure
7. Temperature and dewpoint
8. Wind
9. Altimeter setting
10. Remarks
11. Report identifiers
12. Reading the surface aviation weather report

C. Pilot and Radar Reports.
1. Pilot weather reports (PIREPS)
2. Radar weather reports (RAREPS)

D. Aviation Weather Forecasts.
1. Terminal forecasts
2. Area forecast (FA)
3. TWEB route forecasts and synopses
4. Inflight advisories (WS, WA, WAC)
5. Winds and temperatures aloft forecast (FD)
6. Special flight forecast
7. Hurricane advisory (WH)
8. Convective outlook (AC)
9. Severe weather watch bulletin (WW)

E. Surface Analysis.
1. Valid time
2. Isobars
3. Pressure systems
4. Fronts
5. Other information
6. Using the chart

F. Weather Depiction Chart.
1. Plotted data
2. Analysis
3. Using the chart

G. Radar Summary Chart.
1. Echo pattern and coverage
2. Weather associated with echoes
3. Intensity and trend of precipitation
4. Heights of echo bases and tops
5. Movement of echoes
6. Additional information
7. Using the chart

H. Significant Weather Prognostics.
   1. Domestic flights
   2. International flights
   3. Using significant weather progs

I. Winds and Temperatures Aloft.
   1. Forecast winds and temperatures aloft (FD)
   2. Observed winds aloft
   3. Using the charts

J. Freezing Level Chart.
   1. Plotted data
   2. Analysis
   3. Using the chart

K. Stability Chart.
   1. Lifted index
   2. K index
   3. Stability analysis
   4. Using the chart

L. Severe Weather Outlook Chart.
   1. General thunderstorms
   2. Severe thunderstorms
   3. Tornadoes
   4. Using the chart

M. Constant Pressure Charts.
   1. Plotted data
   2. Analysis
   3. Three dimensional aspects
   4. Using the charts

N. Constant Pressure Prognostics.
   1. Height contours/streamlines
   2. Temperature
   3. Windspeed
   4. Formats
   5. Using the charts

O. Tropopause, Max Wind, and Wind Shear Charts
   1. Observed tropopause chart
   2. Domestic tropopause wind and wind shear progs
   3. International tropopause and wind shear progs

P. Tables and Conversion Graphs.
   1. Icing intensities
   2. Turbulence intensities
   3. Locations of probable turbulence by intensities versus weather and terrain features
   4. Standard conversions
   5. Density altitude computation
   6. Selected contractions
   7. Acronyms

VII. GENERAL AERODYNAMICS, AC 61-13B

Have a knowledge of:

A. Airfoil.
B. Chord Line.
C. Relative Wind.
D. Pitch Angle.
E. Angle of Attack.
F. Lift.
G. Drag (airfoil).
H. Stall.
I. Lift and Angle of Attack.
J. Lift and Velocity of Airflow.
K. Lift and Air Density.
L. Lift and Weight.
M. Thrust and Drag.

VIII. AERODYNAMICS OF FLIGHT, AC 61-13B

Have a knowledge of:

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

Have a knowledge of:

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

X. FUNCTIONS OF THE CONTROLS.

Have a knowledge of:

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

Have a knowledge of:

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

Have a knowledge of:

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 starting/shutdown
3. Detonation cause/effect
4. Carburetor/fuel injection principles
5. Carburetor ice—cause/detection/elimination
6. Manifold pressure versus RPM
7. Interpreting engine instruments
8. 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 performance
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
f. Service ceiling and gross weight
E. 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. In forward cruising flight
b. 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

6. Rapid deceleration/quick stop
7. Confined area/pinnacle operations
8. Ground reconnaissance

XIII. FLIGHT INSTRUMENTS AND SYSTEMS

Have a knowledge of:

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 Procedure/Significance.
K. Pressure Altitude-Significance/Obtaining.
L. Gyroscopic Principles.

XIV. RADIO COMMUNICATIONS

Have a knowledge of:

A. VHF/UHF Radio Communications/Phraseology.
B. Position Reporting Procedure.
C. Tower/FSS/Enroute-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, AC 61-23A

Have a knowledge of:

A. General.
1. Sectional chart interpretation
2. Relating chart symbols to regulations
3. Pilotage/recognition of landmarks
4. Determining courses/distances on charts
5. Planning traffic pattern
6. Navigation computer principles
7. Computing heading/courses
8. Computing time, distance, speed, fuel
9. Computing rates of climb/descent
10. Computing wind direction/speed in flight
11. Computing off-course corrections
12. Selecting VHF cruising altitudes.

B. Radio.
1. Characteristics of VOR facilities
2. Tuning VOR receivers
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. Computing off-course corrections
12. Identifying stations used for ADF
13. ADF/RMI interpretation/orientation
14. Intercepting, tracking ADF/RMI bearings
15. Use of compass locators

SAMPLE TEST ITEMS

The following are included to acquaint you with the format of FAA written test items and as a sampling of your aeronautical knowledge. They *do not* direct attention to all of the topics on which you will be tested. For this reason you should concentrate on the "Study Outline." A knowledge of the topics presented in the outline—not just the ability to answer these sample test items—should be your goal as you prepare for the written tests in either of the two certification areas.

Some test items refer to certain illustrations located in the appendices of this guide. The illustrations are representative of those used in the Private and Commercial Rotorcraft-Helicopter Written Tests.

ITEMS, ANSWERS, AND EXPLANATIONS

1. What are the basic weather minimums for helicopter operations within control zones?
   1- 1 mile visibility; clear of clouds.
   2- 1 mile visibility; 1,000-foot ceiling.
   3- 3 miles visibility; clear of clouds.
   4- 3 miles visibility; 1,000-foot ceiling.

Answer. Response 4. FAR 91.105 *Basic VFR Weather Minimums* states: Except as provided in FAR 91.107 (Special VFR Weather Minimums), no person may operate an aircraft under VFR within controlled airspace when the visibility is less than 3 statute miles. Because the question asks for "basic weather minimums" within controlled airspace, 3 statute miles apply here. This minimum is in effect at all altitudes below 10,000 feet MSL. Also, FAR 91.105(c) states: No person may operate an aircraft under VFR within a control zone beneath the ceiling when the ceiling is less than 1,000 feet.

2. Assume that you hold a Second-Class Medical Certificate dated June 3 of this year, and a Commercial Pilot Certificate issued July 1 of this year. Under these circumstances, you could continue to exercise the privileges of
   1 - either a private or commercial pilot until August 1 of next year.
   2 - neither a private nor a commercial pilot after June 3 of next year.
   3 - a commercial pilot until June 3 of next year and those of a private pilot until June 3, two years hence.
   4 - a commercial pilot until July 1 of next year and those of a private pilot until July 1, two years hence.

Answer. Response 4. A Commericial Pilot Certificate has no specific expiration date and the issuance date is irrelevant to this situation. However, for the certificate to be valid, the pilot must possess a current, appropriate medical certificate. For operations requiring a Commercial Pilot Certificate, the Second-Class Medical Certificate expires at the *end of the last day* of the 12th month *after the month in which it is issued.* Thus, commercial pilot privileges may be exercised until July 1 of the next year. For operations requiring only a Private Pilot Certificate, a Second-Class Medical Certificate expires at the *end* of the day of the 24th month *after the month in which it is issued. In this case, private pilot privileges may be exercised until July 1, two years hence.*

3. In planning a cross-country flight you determine that the total distance is 105 statute miles and the average groundspeed will be 70 MPH. The Helicopter Flight MANUAL shows the total fuel capacity is 29.8 gallons. If you start with full fuel tanks and consume 10.5 gallons per hour, how much fuel will remain at the completion of the flight?
   1- 8.7 gallons.
   2- 11.7 gallons.
   3- 14.0 gallons.
   4- 16.1 gallons.

Answer. Response 3. This may be solved arithmetically or by use of a navigation computer. At a groundspeed of 70 MPH it will take 1 hour 30 minutes to travel 105 miles. In 1-½ hours at the rate of consumption of 10.5 GPH, the amount of fuel used will be 15.8 gallons. The remaining fuel at the end of the flight will be 14.0 gallons.

4. Certain maintenance inspections are required by regulations to be performed periodically. Completion of an "annual" inspection and the authoriza-

tion for the return of the aircraft to service should always be indicated by the

1- issuance date of the Airworthiness Certificate.
2- completion date of the 100-hour inspection form.
3- notation in the aircraft and engine records.
4- completion of appropriate portions of a Repair and Alteration Form.

Answer. Response 3. An Airworthiness Certificate is issued when the aircraft is deemed airworthy at the time of manufacture or after substantial alteration or repair. Only when this certificate has been issued within the preceding 12 months will it indicate compliance with annual inspection requirements. Therefore, response *number 1* is incorrect. *Number 2* is incorrect because although an annual inspection each 12 months will satisfy the requirements of a 100-hour inspection, a 100-hour inspecton will not suffice for an annual inspection. *Number 3* is correct because FAR stipulates that appropriate entries be made in maintenance records (logbooks) each time inspection or maintenance is done on the aircraft or engine. *Number 4* is incorrect since the Repair and Alteration Form is used for the description and approval of work done on a repaired or altered aircraft unit.

EXCERPTS FROM THE HELICOPTER FLIGHT MANUAL

Maximum gross weight–1,600 pounds

Items	*Weight (Pounds)*	*Moment 1000/Inch Pounds*
Basic Helicopter Weight	935	94.3
Fuel, Main (Full Tank-25 gal.)	150	?
Fuel, Aux. (Full Tank-19 gal.)	114	?
Pilot	?	?
Passenger	?	?
Totals	?	?

* * * * * * * * * * *

5. You plan to make a flight in the helicopter described. Your weight is 180 lbs. and the weight of your passenger is 170 lbs. Using the appropriate loading chart on page 18 and the appropriate center of gravity chart on page 19, how much fuel can be carried under these conditions?

1- A maximum of 8.5 gallons.
2- A maximum of 19 gallons.
3- A maximum of 25 gallons.
4- 44 gallons.

Answer. Response 4. This problem can be computed as follows:

Items	*Weight (Pounds)*	*Moment 1000/Inch Pounds*
1. Basic helicopter	935	94.3
2. Pilot	180	15.0
3. Passenger	170	14.2
SUB TOTALS	1,285	123.5
4. Fuel Main (full tank-25 gals.)	150	16.0
SUB TOTALS	1,435	139.5
5. Fuel Aux. (full tank-19 gals.)	114	12.0
TOTALS	1,549	151.5
Maximum gross weight	1,600 -1,549	

51 lbs. (Aircraft is below maximum weight by this amount.)

When plotting the total weight of 1,549 lbs. and the total moment of 151.5 on the appropriate center of gravity chart on page 19, you find that the aircraft is within weight and moment limits with fuel tanks filled to capacity.

6. Based on the Hovering Ceiling Chart (see page 22), and the following conditions, what hovering performance could you expect while operating in ground effect?

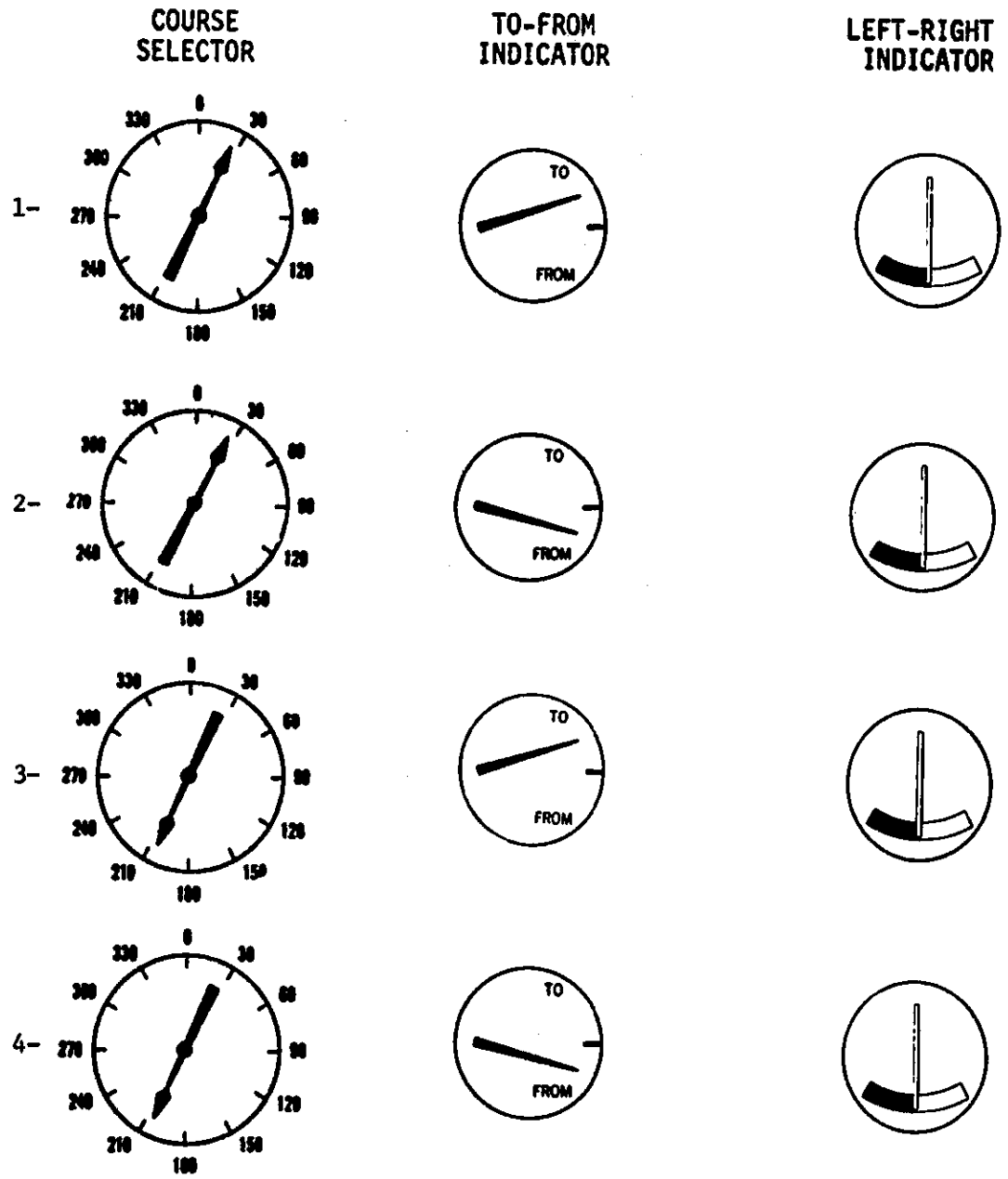
Gross weight ..... 1,600 lbs.
Pressure altitude ..... 2,000 feet
Temperature ..... 100° F.
Wind ..... Calm

1 - Hovering should be possible when operating in either dry or 80% relative humidity.
2 - Hovering should be possible only when operating in dry air.
3 - Hovering should not be possible when operating in either dry air or 80% relative humidity.
4 - Hovering should be possible when operating in either dry air or 80% relative humidity, but a running landing would be recommended.

Answer. Response 2. Based on the data provided, the chart indicates that hovering should be possible in ground effect up to a pressure altitude of 3,000 feet in dry air and up to 1,300 feet with a relative humidity of 80% or greater. Therefore, hovering should be possible at a pressure altitude of 2,000 feet only in dry air. Responses 1, 3, and 4 are incorrect or partially incorrect statements.

7. If you are tuned to a VOR and have the course selector set properly to follow the 025 radial outbound from the station, which of the following represents the proper indications of the OMNI components, assuming you are on course?

Answer. Response 2. The proper procedure when flying directly away (following a radial outbound) from a VOR/VORTAC station is to set the course selector to the radial desired, in this case to 025. Therefore, responses 3 and 4 would be incorrect. Since the test item states that you are on course (outbound) your TO-FROM indicator would read FROM. Therefore, reponse 1 is incorrect.



OMNI Components

8. Based on the Height Velocity (Airspeed vs. Altitude) Chart on page 22, which of the following airspeed-altitude combinations should be avoided?

	Airspeed	*Altitude*
A	15 MPH	450 ft.
B	40 MPH	20 ft.
C	45 MPH	50 ft.
D	50 MPH	300 ft.

The combination to be avoided is:

1-A.
2-B.
3-C.
4-D.

Answer. Reponse 3. Height vs. velocity or airspeed vs. altitude performance information is required by regulations for each certificated model of helicopter. This information is generally presented by charts, and portrays airspeed-altitude combinations considered unsafe for an autorotative landing. The airspeed-altitude combination listed under C is within the shaded areas of the chart and should be avoided. The airspeed-altitude combinations listed under A, B, and D, are within the unshaded areas and considered safe for autorotative landings.

9. Based on the Aviation Weather Report below, at what approximate indicated altitude (MSL) would you expect to find the base of the ceiling at Phoenix Sky Harbor International Airport (PHX)?

1- 1,500 feet MSL.
2 - 2,628 feet MSL.
3 - 3,000 feet MSL.
4 - 4,128 feet MSL.

PHX 2 SCT M15 BKN 30 OVC TRW-100/75/68/0608/998

NOTE: The field elevation at PHX is 1,128 feet.

Answer. Response 2. Ceiling is defined in Federal Aviation Regulations, Part 1, as the height above the earth's surface of the lowest layer of clouds or obscuring phenomena that is reported as "broken," "overcast," or "obscuration," and not classified as "thin" or "partial." In an Aviation Weather Report, a letter preceding height of cloud layer identifies the ceiling layer and indicates how ceiling height was obtained. Sky cover contractions are given in ascending order and the figures preceding the contractions are heights of cloud layers in hundreds of feet above the surface. Therefore, in this example, 2 SCT M15 BKN 30 OVC means that the cloud layers are at 200 feet, 1,500 feet, and 3,000 feet. The M15 BKN identifies the ceiling as a measured 1,500-foot broken ceiling. To determine the height of this ceiling above mean sea level (MSL), you must add 1,500 to the field elevation of the reporting station PHX (Phoenix Sky Harbor International Airport). 1,500 feet + 1,128 feet = 2,628 feet MSL, the correct answer.

10. Use the temperature, altimeter setting, and field elevation as given in item 9. What is the approximate density altitude for PHX?

1- Sea level.
2- 1,072 feet.
3- 2,400 feet.
4- 3,900 feet.

Answer. Response 3. To work this problem, pressure altitude must be determined before you can determine the density altitude. You are given the altimeter setting (29.98) and the temperature (75° F.) in the PHX Aviation Weather Report. Field elevation is normally found on the navigation chart (given in the "NOTE" for item 9). With this information you go to the Pressure Altitude and Density Chart on page 24, to determine the pressure altitude and density altitude. 29.98 falls between 29.92 and 30.0 and by interpolation you find that 56 feet must be subtracted from 1,128 feet for a pressure altitude of 1,072 feet. By plotting 1,072 feet on the 75° temperature line, you find that the density altitude is approximately 2,400 feet.

ADDITIONAL QUESTIONS FOR STUDY

The following questions are offered for the purpose of encouraging study. Answers and explanations are not included. Applicants should understand that these questions do not cover all subject areas found on the written tests.

1. What are special VFR weather minimums for operating a helicopter?
2. What current documents must be in your personal possession any time you are acting as pilot in command?
3. How soon after consuming alcoholic beverages may you act as a crewmember of a civil aircraft?
4. How can you determine the pressure altitude at an airport prior to takeoff?
5. Under what circumstances may a private pilot receive compensation when acting as pilot in command of an aircraft?
6. What is the difference between control zones and control areas?
7. Which is considered to be more susceptible to icing, an engine equipped with a conventional float-type carburetor or one equipped with a fuel injector unit?
8. Before takeoff you set the altimeter to the current altimeter setting for that airport. What should the altimeter read?
9. When should lighted position lights be displayed?
10. What altitude should be maintained when operating a helicopter under VFR in level cruising flight at an altitude of more than 3,000 feet above the surface and below 18,000 feet MSL while on a magnetic course of 0° through 179°?
11. What are the rules contained in Part 830 of the National Transportation Safety Board regulation?
12. What action is required if a control tower directs a flashing red light at you while you are on final approach to land?
13. Are "Airport Traffic Areas" depicted on aeronautical charts?
14. Who has the responsibility of determining that the helicopter you plan to fly is in condition for safe flight?
15. Are transponders required when operating a helicopter within Terminal Control Areas (TCAs)?
16. What can a pilot do to assist the weather briefer when requesting weather information by telephone?
17. What type weather is most likely to develop when the temperature/dewpoint spread is 4° and decreasing?
18. Scheduled aviation weather broadcasts occur how often?
19. What weather conditions are normally associated with an advancing warm front that contains moist and stable air?
20. What is a "Squall Line"?
21. What type cloud formation is most likely to produce severe turbulence?
22. What is "settling with power"? How can a recovery from this situation be best accomplished?
23. What causes retreating blade stall?
24. What action should the pilot take if the antitorque system fails while the helicopter is hovering or in flight?
25. What is ground resonance? What action should a pilot take if ground resonance is encountered?
26. 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.
27. Where can you find information about "Special Use Airspace" located in the area or along the route where you plan to fly?
28. Which publication should you use to determine type fuel, available servicing, and other information for an airport you wish to use?
29. What are the characteristics inherent in a magnetic compass?
30. How do you file, open, and close VFR and IFR flight plans?

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ILLUSTRATIONS

The following illustrations are 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.

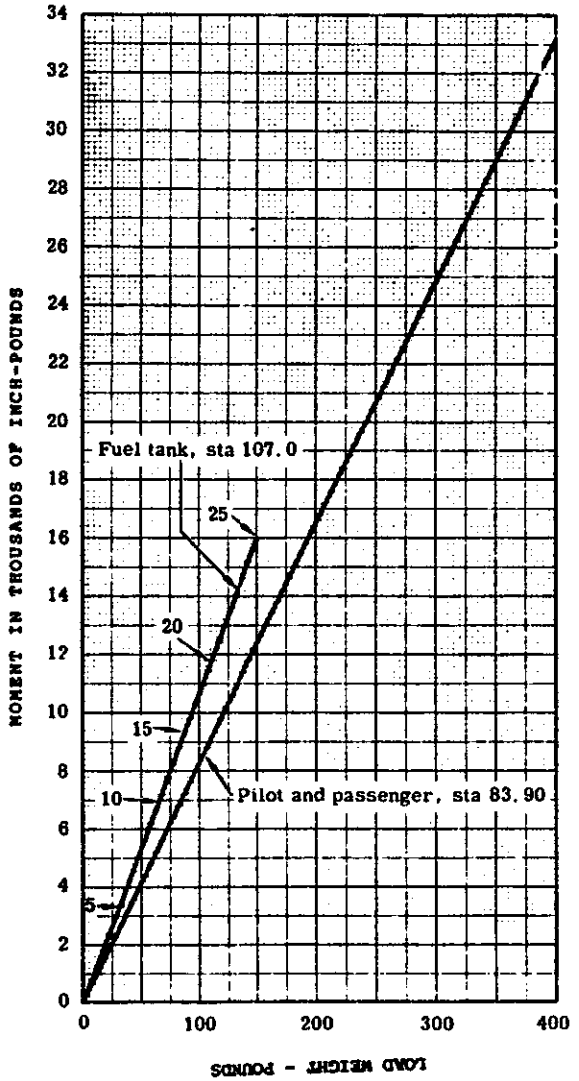


Figure 1.—Loading Chart

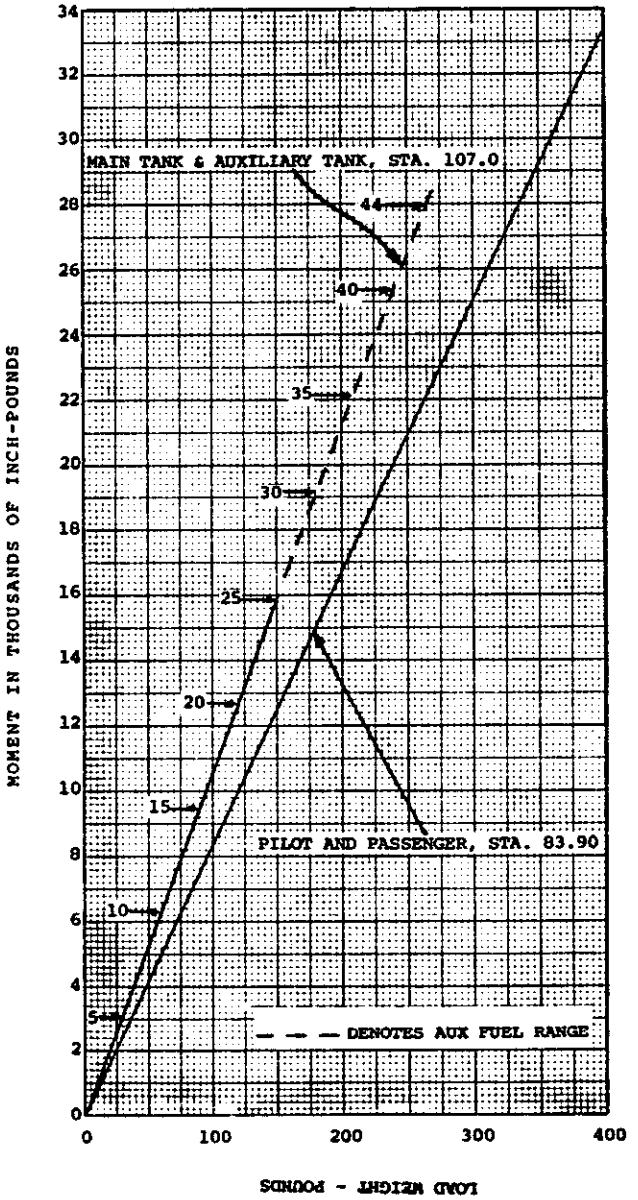


Figure 2.—Loading Chart

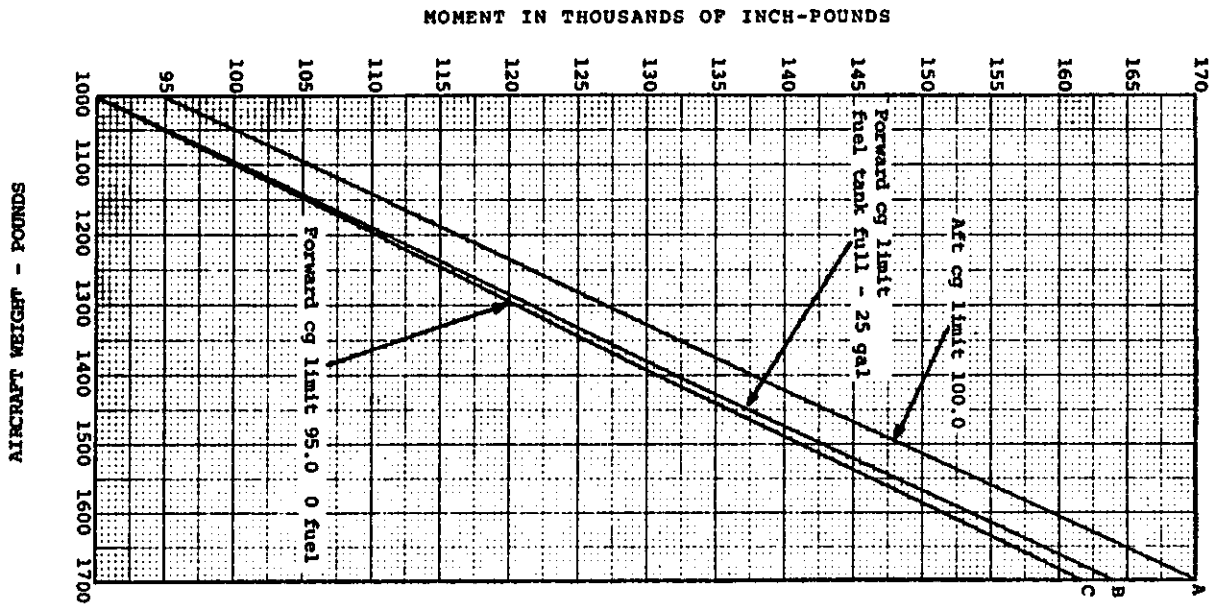


Figure 3.—Center of Gravity Chart

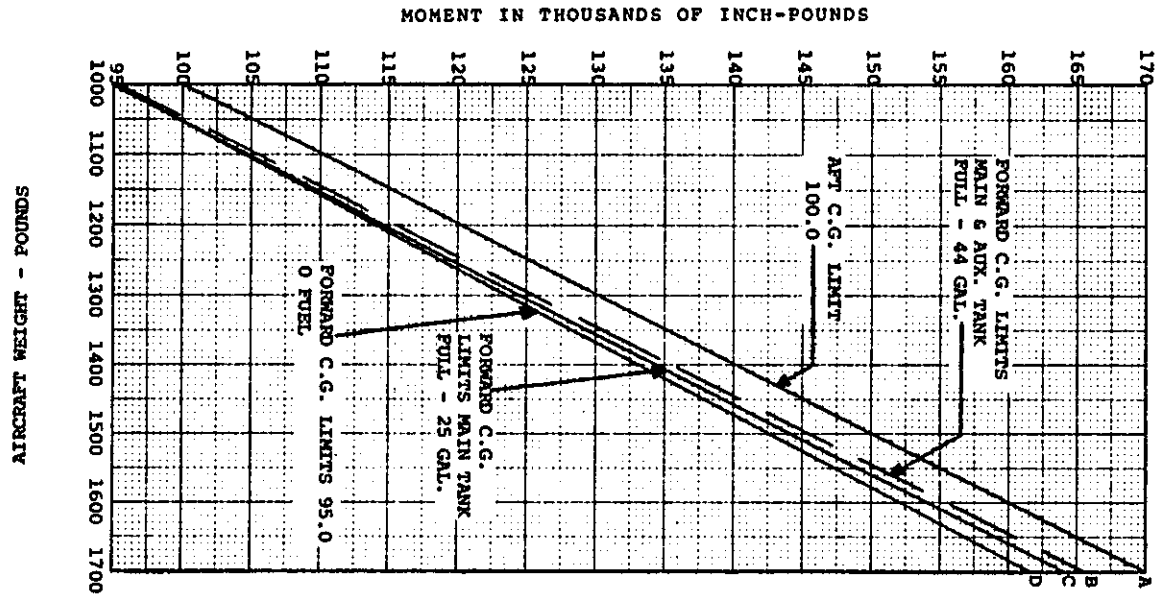
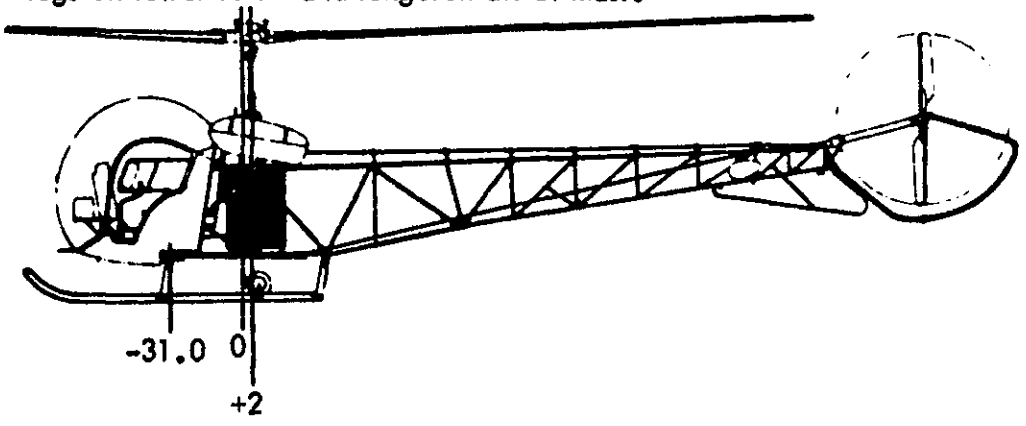


Figure 4.—Center of Gravity Chart

STATIONS DIAGRAM

*NOTE: STATION 0 - Centerline of weld cluster just foward of leveling lugs (approximately 2 inches forward of center line of mast). Leveling lugs on lower left-hand longeron aft of mast.



Balance Diagram

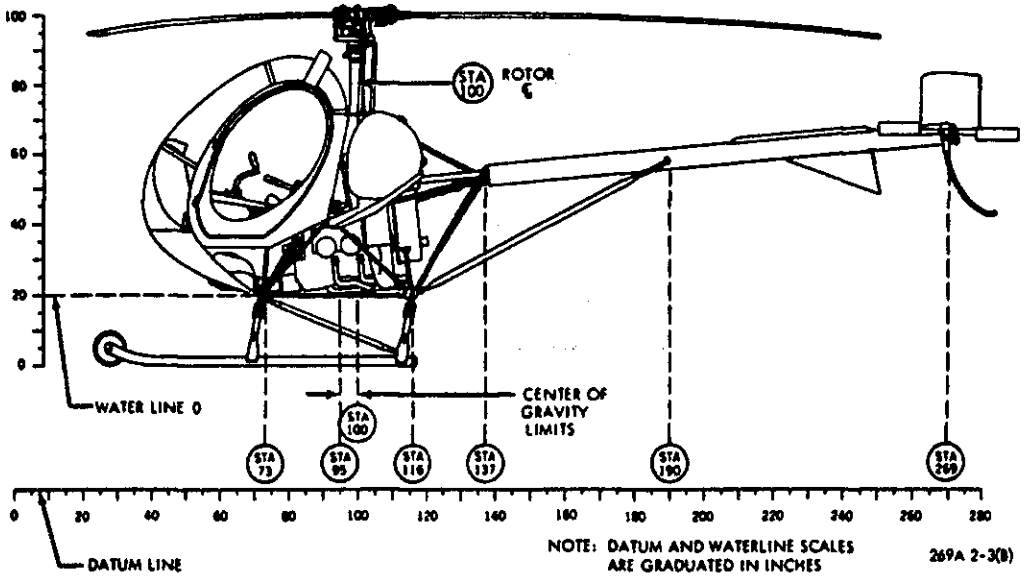


Figure 5.—Weight and Balance Diagrams

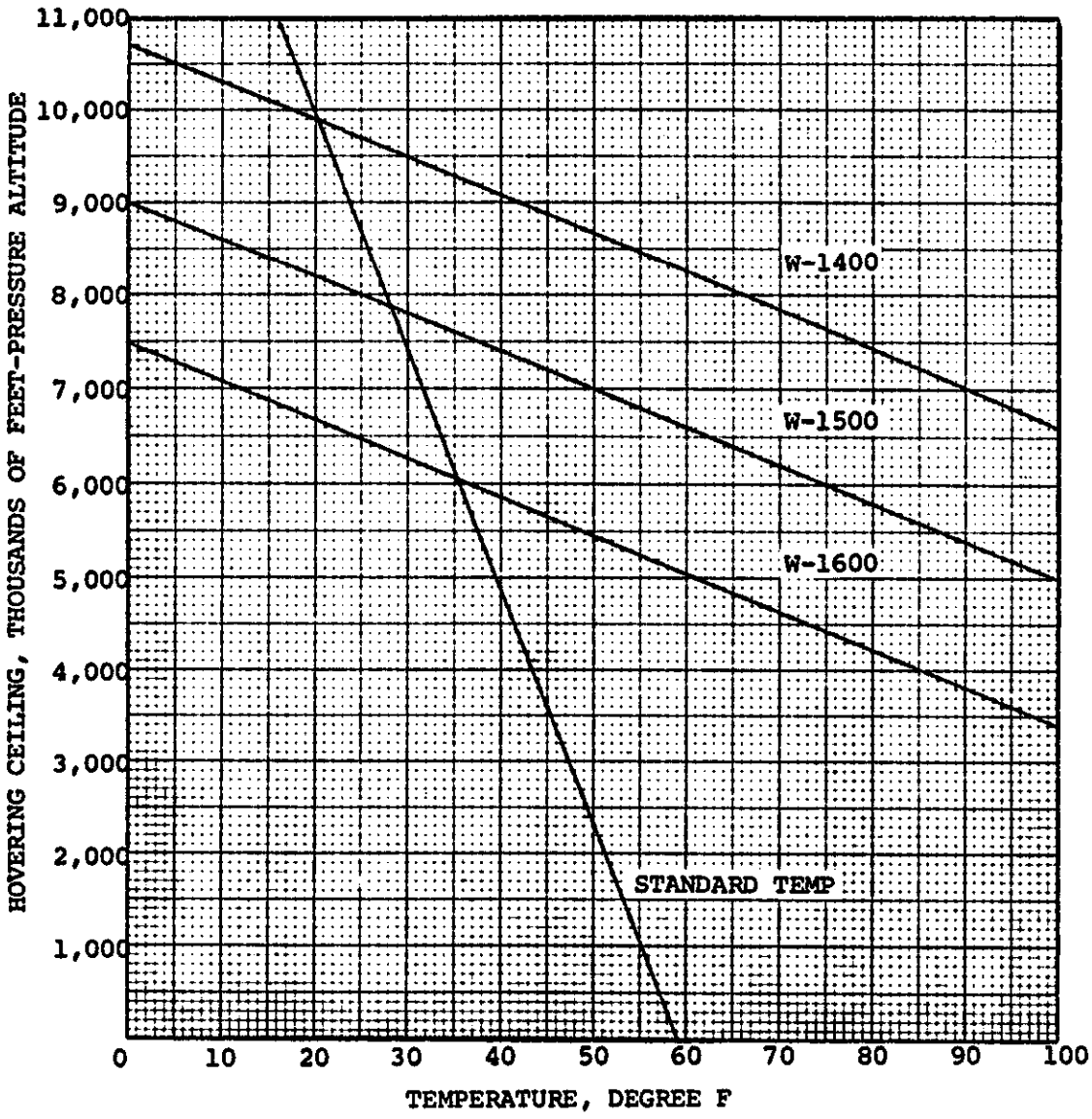


Figure 6.—Hover Ceiling vs. Temperature (Skid Height 3 Feet) Chart

Gross Weight Lbs.	Temperature		Hovering Ceiling Hp - Ft.	
			Dry Air	80% R. H.
1600	-20°F	-28.9°C	6700	6500
	20°F	-6.7°C	5500	5200
	60°F	15.6°C	4300	3900
	100°F	37.8°C	3000	1300
1500	-20°F	-28.9°C	8100	7900
	20°F	-6.7°C	7100	6800
	60°F	15.6°C	5900	5600
	100°F	37.8°C	4800	2900
1400	-20°F	-28.9°C	9900	9700
	20°F	-6.7°C	8700	8400
	60°F	15.6°C	7400	7100
	100°F	37.8°C	6300	4400
1300	-20°F	-28.9°C	11700	11400
	20°F	-6.7°C	10400	10100
	60°F	15.6°C	9400	9000
	100°F	37.8°C	8200	6100

Figure 7.—Hover Ceiling (in ground effect) Chart

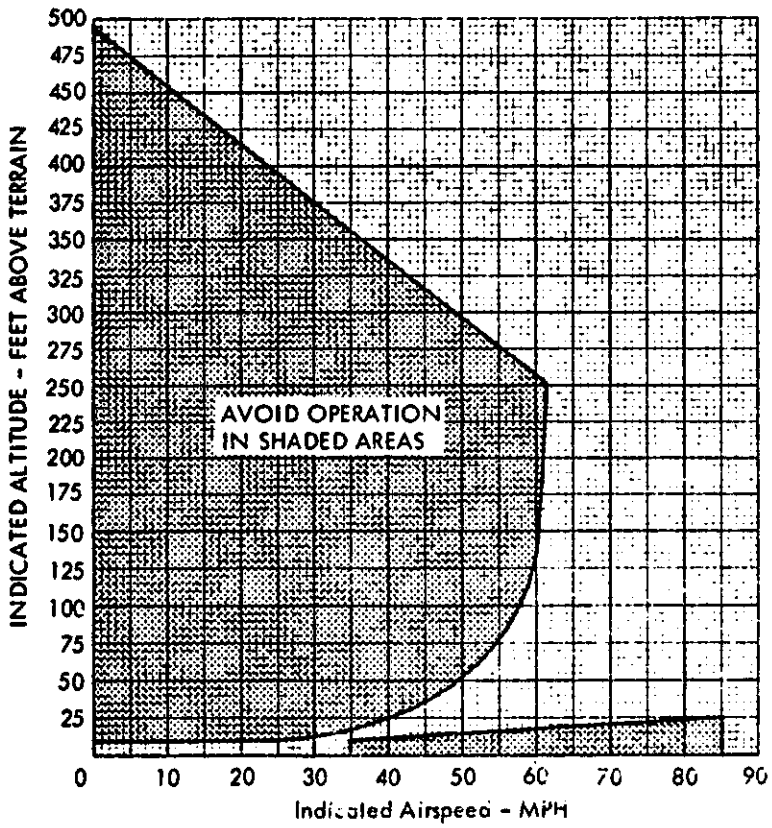


Figure 8.—Height Velocity Chart

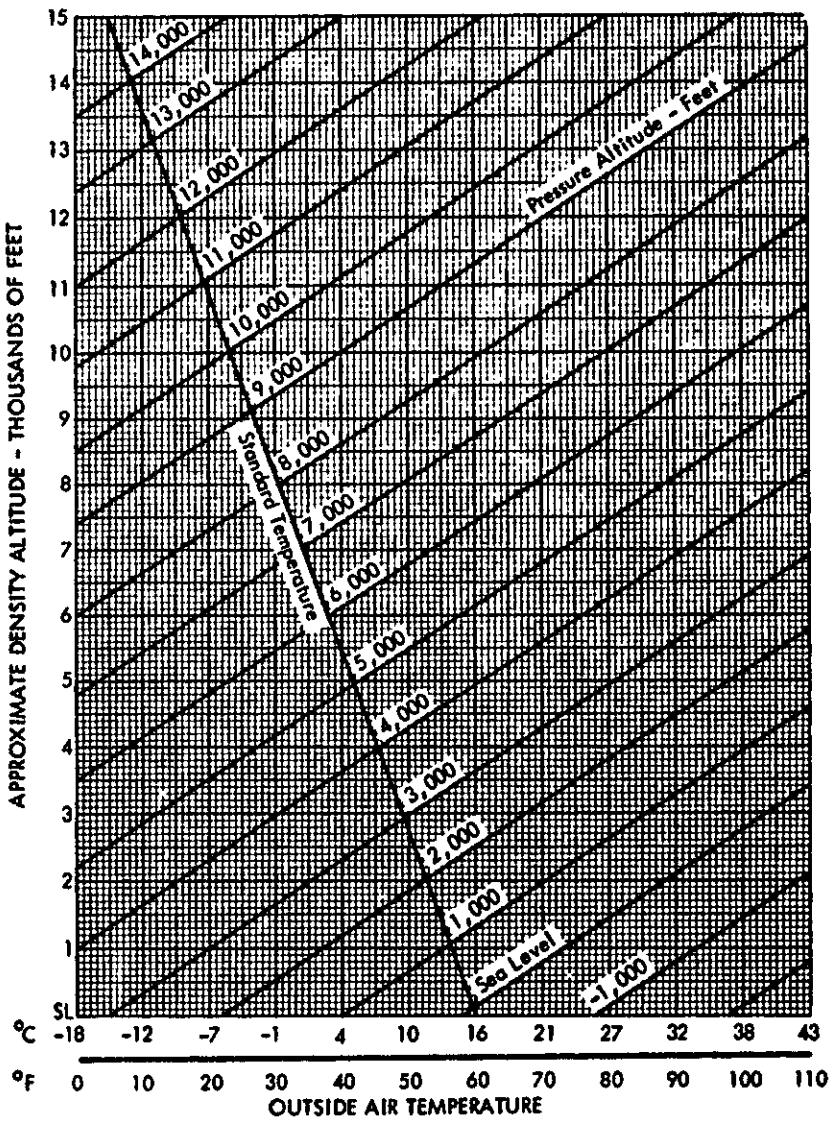
TAKE-OFF DISTANCE-FEET TO CLEAR 50 FOOT OBSTACLE AT 50 MPH 3200 RPM					
Gross Weight Pounds	Pressure Altitude Feet	At -13°F -25°C	At 23°F -5°C	At 59°F 15°C	At 95°F 35°C
2150	SL	373	401	430	458
	2000	400	434	461	491
	4000	428	462	494	527
	6000	461	510	585	677
	8000	567	674	779	896
2500	SL	531	569	613	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 9.—Takeoff Distance Chart to Clear a 50-Foot Obstacle

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 10.—Total Landing Distance Chart in Feet Over a 50-Foot Obstacle

DENSITY ALTITUDE CHART



Altimeter Setting (In. Hg.)	*Pressure Altitude Conversion Factor*
28.0	1,824
28.1	1,727
28.2	1,630
28.3	1,533
28.4	1,436
28.5	1,340
28.6	1,244
28.7	1,148
28.8	1,053
28.9	957
29.0	863
29.1	768
29.2	673
29.3	579
29.4	485
29.5	392
29.6	298
29.7	205
29.8	112
29.9	20
29.92	0
30.0	-73
30.1	-165
30.2	-257
30.3	-348
30.4	-440
30.5	-531
30.6	-622
30.7	-712
30.8	-803
30.9	-893
31.0	-983

Figure 11.—Density Altitude Chart

STATION IDENTIFIERS

ADM	Ardmore, Oklahoma
ALS	Alamosa, Colorado
AMA	Amarillo, Texas
BTR	Baton Rouge, Louisiana
CGI	Cape Girardeau, Missouri
CNU	Chanute, Kansas
COU	Columbia, Missouri
CSM	Clinton Sherman, Oklahoma
DDC	Dodge City, Kansas
DEN	Denver, Colorado
DFW	Dallas-Fort Worth, Texas
EMP	Emporia, Kansas
ESF	Alexandria, Louisiana
GAG	Gage, Oklahoma
GCK	Garden City, Kansas
GLD	Goodland, Kansas
HBO	Humbolt, Nebraska
HLC	Hill City, Kansas
HUT	Hutchinson, Kansas
ICT	Wichita, Kansas
IRK	Kirksville, Missouri
JAN	Jackson, Mississippi
JLN	Joplin, Missouri
LCH	Lake Charles, Louisiana
LFT	Lafayette, Louisiana
LIT	Little Rock, Arkansas
MAF	Midland, Texas
MCI	Kansas City Intl, Missouri
MKC	Kansas City, Missouri
MLC	McAlester, Oklahoma
MLU	Monroe, Louisiana
MSY	New Orleans Intl, Louisiana
NEW	New Orleans, Louisiana
OKC	Oklahoma City, Oklahoma
PNC	Ponca City, Oklahoma
RSL	Russell, Kansas
SGF	Springfield, Missouri
SHV	Shreveport, Louisiana
SLN	Salina, Kansas
STJ	St. Joseph, Missouri
STL	St. Louis, Missouri
TOP	Topeka, Kansas
TUL	Tulsa, Oklahoma

Figure 12.—Station Identifiers

SURFACE AVIATION WEATHER REPORTS

Summary of sky cover designators

Designator	Meaning	Spoken
CLR	CLEAR. (Less than 0.1 sky cover.)	CLEAR
SCT	SCATTERED LAYER ALOFT. (0.1 through 0.5 sky cover.)	SCATTERED
BKN*	BROKEN LAYER ALOFT. (0.6 through 0.9 sky cover.)	BROKEN
OVC*	OVERCAST LAYER ALOFT. (More than 0.9, or 1.0 sky cover.)	OVERCAST
−SCT	THIN SCATTERED. At least ½ of the sky cover aloft is transparent at and below the level of the layer aloft.	THIN SCATTERED
−BKN	THIN BROKEN.	THIN BROKEN
−OVC	THIN OVERCAST.	THIN OVERCAST
X*	SURFACE BASED OBSTRUCTION. (All of sky is hidden by surface based phenomena.)	SKY OBSCURED
−X	SURFACE BASED PARTIAL OBSCURATION. (0.1 or more, but not all, of sky is hidden by surface based phenomena.)	SKY PARTIALLY OBSCURED

* Sky condition represented by this designator may constitute a ceiling layer.

Ceiling designators

Coded	Meaning	Spoken
M	MEASURED. Heights determined by ceilometer, ceiling light, cloud detection radar, or by the unobscured portion of a landmark protruding into ceiling layer. (Figure 2-5 illustrates the principle of the ceilometer.)	MEASURED CEILING
E	ESTIMATED. Heights determined from pilot reports, balloons, or other measurements not meeting criteria for measured ceiling.	ESTIMATED CEILING
W	INDEFINITE. Vertical visibility into a surface based obstruction. Regardless of method of determination, vertical visibility is classified as an indefinite ceiling.	INDEFINITE CEILING

Weather symbols and meanings

Coded	Spoken
Tornado	TORNADO
Funnel Cloud	FUNNEL CLOUD
Waterspout	WATERSPOUT
T	THUNDERSTORM
T+	SEVERE THUNDERSTORM
R	RAIN
RW	RAIN SHOWER
L	DRIZZLE
ZR	FREEZING RAIN
ZL	FREEZING DRIZZLE
A	HAIL
IP	ICE PELLETS
IPW	ICE PELLET SHOWERS
S	SNOW
SW	SNOW SHOWERS
SP	SNOW PELLETS
SG	SNOW GRAINS
IC	ICE CRYSTALS

Obstructions to vision—symbols and meanings

Coded	Spoken
BD	BLOWING DUST
BN	BLOWING SAND
BS	BLOWING SNOW
BY	BLOWING SPRAY
D	DUST
F	FOG
GF	GROUND FOG
H	HAZE
IF	ICE FOG
K	SMOKE

When obscuring phenomena is surface based and partially obscures the sky, a remark reports tenths of sky hidden. For example,

K6

means 6/10 of the sky is hidden by smoke.

Figure 13.—

WEATHER CHART SYMBOLS

THE WEATHER DEPICTION CHART

TOTAL SKY COVER

- Clear
- Scattered
- Broken, or thin broken
- Overcast, with breaks
- Overcast
- Obscured

OTHER

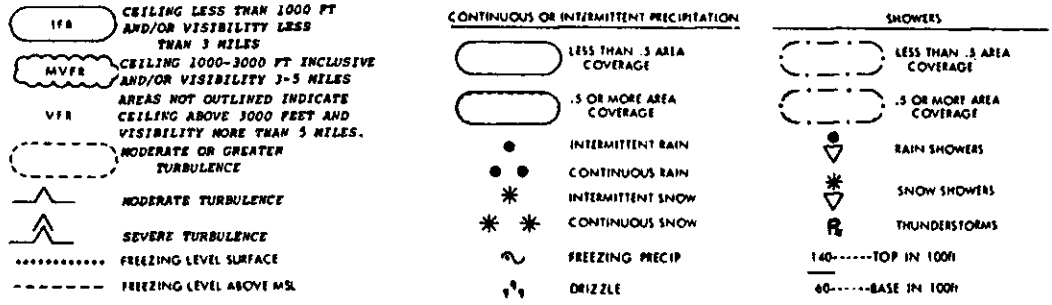
- Clouds Topping Ridges

WEATHER AND OBSTRUCTIONS TO VISION

- Hail
- Thunderstorm
- Rain
- Snow
- Drizzle
- Haze
- Fog
- Smoke
- Freezing Rain
- Freezing Drizzle
- Rain Shower
- Snow Shower
- Ice Pellets
- Blowing Dust
- Blowing Sand
- Blowing Snow

Figures below the circle are cloud heights in hundreds of feet--either the ceiling; or, if there is no ceiling, the height of the lowest scattered. Figures and symbols to left of circle are visibility and weather or obstructions to vision.

LOW LEVEL PROG CHART



RADAR CHART LEGEND

SYMBOLS COMMON TO ALL PLOTTED RADAR WEATHER REPORTS

WEATHER SYMBOLS

A	Hail	IP	Ice Pellets
R	Rain	L	Drizzle
RW	Rain Showers	ZL	Freezing Drizzle
S	Snow	ZR	Freezing Rain
SW	Snow Showers	T	Thunderstorm

ECHO INTENSITY

-	Weak	X	Intense
(No symbol)	Moderate	XX	Extreme
+	Strong	U	Unknown
++	Very Strong		
Solidus (/)	Separates intensity from intensity trend		

TREND

+	Increasing	NC	No Change
-	Decreasing	NEW	New

Examples of Precipitation Types, Intensity, and Trend

- TRW+/- Thunderstorm, heavy rainshower, decreasing in intensity.
- R-/NC Light rain, no change in intensity.
- TRW-/NEW Thunderstorm, light rain shower, newly developed.
- S Snow (No intensity or characteristic is shown for frozen precipitation.)

MOVEMENT OF ECHOES (Examples)

- 15 Northeast at 15 knots. (Individual Echo)
- 25 East at 25 knots. (Line or area movement)

HEIGHTS OF ECHO BASES AND TOPS

Heights in hundreds of feet MSL are entered above and/or below a line to denote echo tops and bases respectively. Examples are:

- 450 Average tops are 45,000 feet.
- 200/80 Tops 20,000 feet; bases 8,000 feet.
- 350 Top of individual cell, 35,000 feet.
- 620 Maximum tops, 62,000 feet.
- A250 Tops 25,000 feet, reported by aircraft. Absence of a figure below the line indicates that echo base was not reported. Radar detects tops more readily than bases, since precipitation usually reaches the ground. Also, curvature of the earth prohibits the detection of bases of distant precipitation. Information from ATC radar shows tops only when reported by aircraft.

"Boxes" enclosed by dash lines indicate severe weather watch in effect. Refer to latest "WW" for specifics.

SYMBOLS INDICATING NO ECHOES

NE	No echo (equipment operating but no echoes observed).
NA	Observation not available.
OM	Equipment out for maintenance.

SYMBOLS USED WITH WEATHER SURVEILLANCE RADAR

- A line of echoes
- An area of echoes
- Isolated cell
- Strong cell detected by two or more radars
- Over 9/10 coverage
- 6/10 thru 9/10 coverage
- 1/10 thru 5/10 coverage
- Less than 1/10 coverage

SYMBOLS USED WITH ARTCC ECHO REPORTS

- (Solid line) Echo boundary from ARTCC scopes.
- Line of echoes--possible squall line.

Figure 14.—

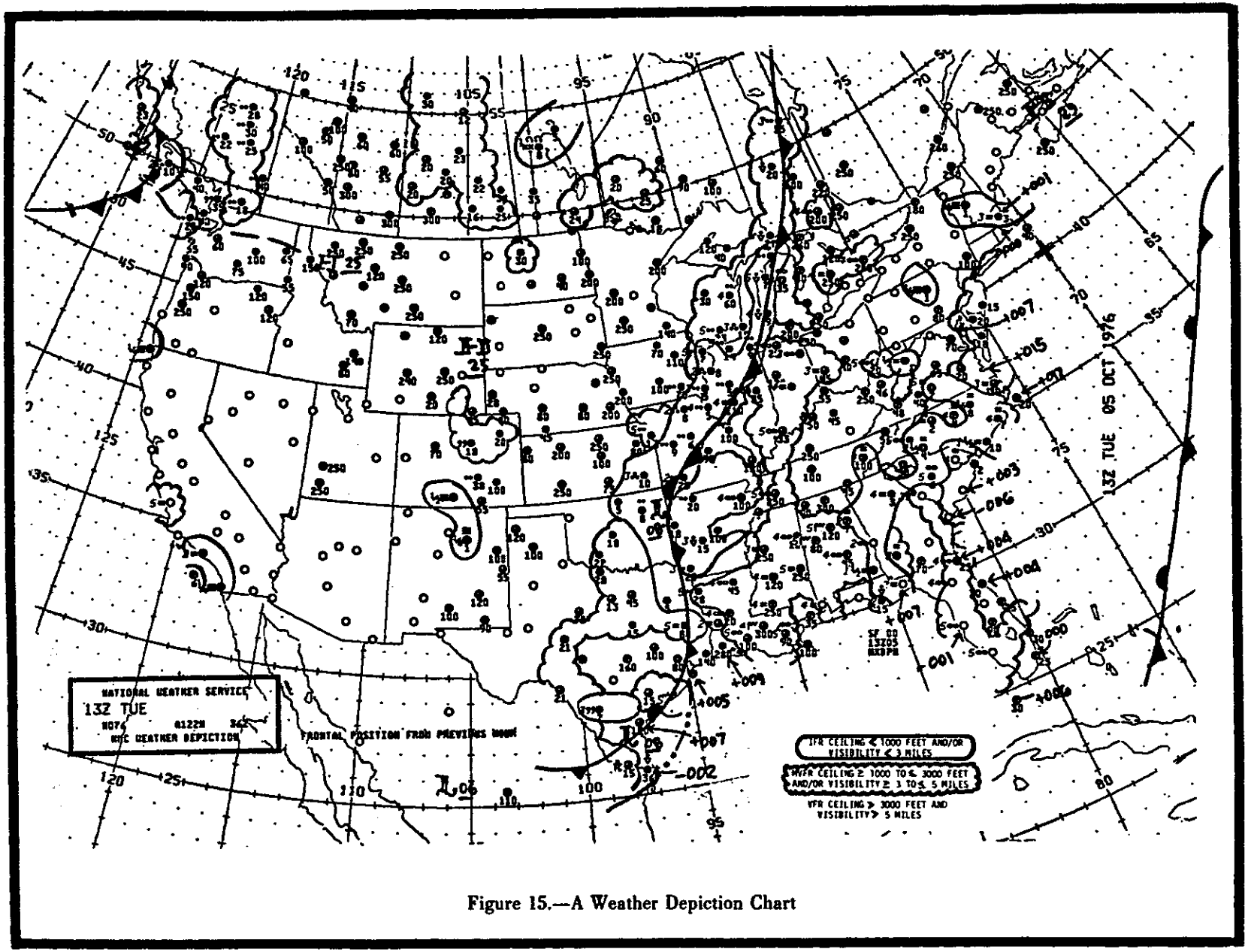


Figure 15.—A Weather Depiction Chart

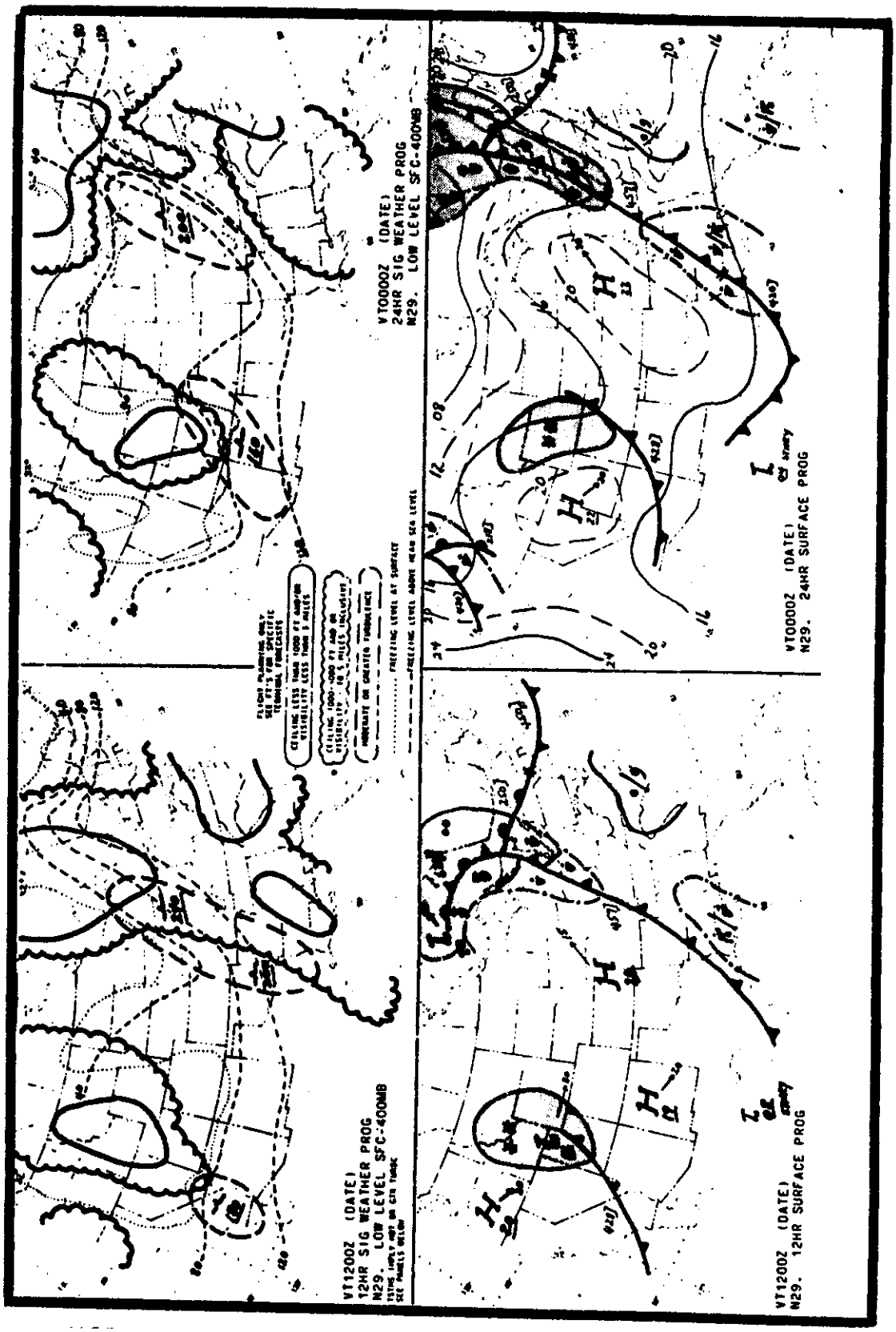


Figure 16.—U.S. Low Level Significant Weather Prog (Sfc-400 mb)

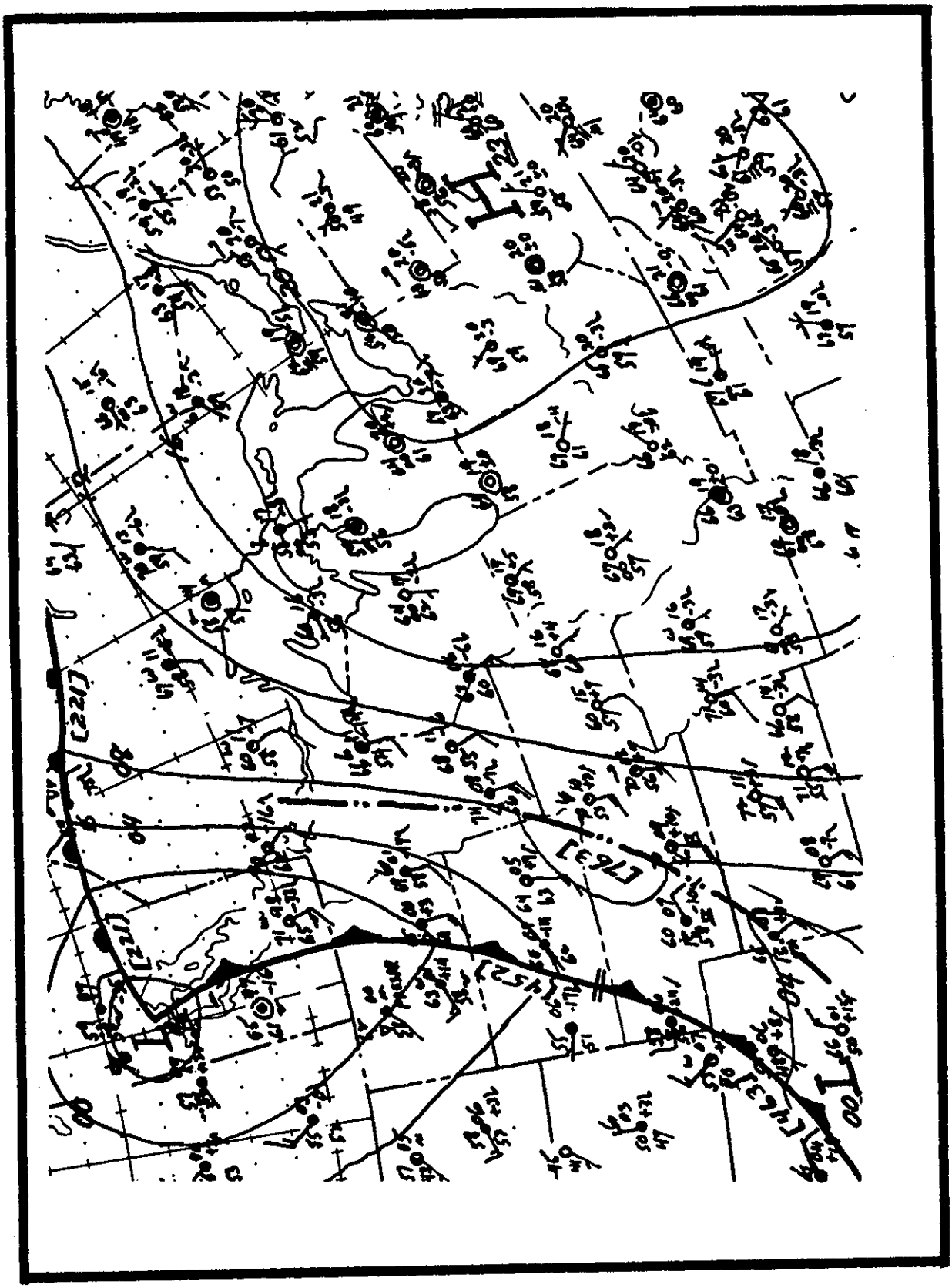


Figure 17.—Section of a Surface Weather Analysis

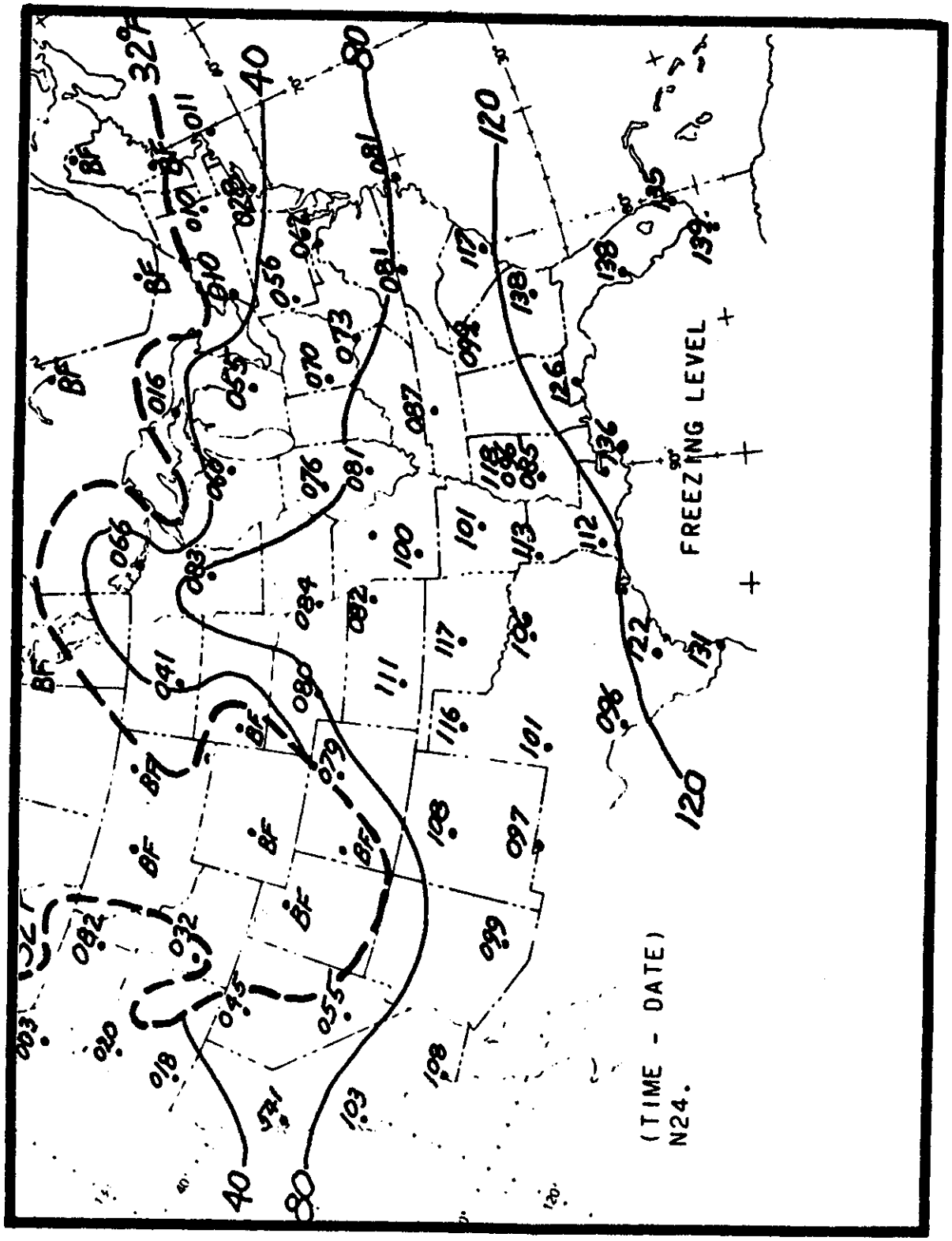


Figure 18.—A Freezing Level Chart

TERMINAL FORECASTS

```
KS 121452
CNU 121515 C2Ø BKN 2925G35 BKN V SCT. ØØZ CLR 3425G3Ø.
 Ø9Z VFR..
DDC 121515 C35 BKN 3335G5Ø CHC 4BD BKN V SCT. 2ØZ CLR
 3335G5Ø CHC 4BD. Ø9Z VFR..
GCK 121515 C35 BKN 333ØG45 CHC 4BD BKN V SCT. 2ØZ CLR
 3425G35 CHC 4BD. Ø9Z VFR..
GLD 121515 C35 BKN 6BD 3335G5Ø CHC SW-. 21Z CLR 3335G45.
 Ø9Z VFR..
ICT 121515 C2Ø BKN 3425G4Ø BKN V SCT. 17Z C35 BKN 3425G4Ø
 BKN V SCT. 22Z CLR 3325G35. Ø9Z VFR..
SLN 121515 C25 BKN 313ØG45 CHC SW- BKN V SCT. 21Z CLR
 333ØG4Ø. Ø9Z VFR..
TOP 121515 C25 BKN 293ØG5Ø CHC SW-. 19Z C3Ø BKN 3Ø3ØG5Ø
 CHC SW-. Ø1Z CLR 333ØG4Ø. Ø9Z VFR..

LA 121447
BTR 121515 5 SCT C12 OVC 3FK 151Ø SCT V BKN. 17Z C15 BKN 3Ø OVC
 1615 CHC TRW. Ø9Z IFR CIG TRW..
ESF 121515 C5 OVC 2R-F VRBL C1Ø OVC 5F 181Ø SLGT CHC TRW. 17Z C15 BKN
 3Ø OVC 1715 CHC TRW. Ø9Z IFR CIG TRW..
LCH 121515 5 SCT C15 OVC 5FH 161Ø OCNL C5 BKN 3R-F. 17Z C2Ø OVC 1715G
 CHC TRW. Ø9Z IFR CIG TRW..
LFT 121515 5 SCT C15 OVC 5FH 161Ø OCNL C5 BKN 3R-F. 17Z C2Ø OVC 1715G
 CHC TRW. Ø9Z IFR CIG TRW..
MLU 121515 C5 OVC 3R-F VRBL C1Ø OVC 181Ø SLGT CHC TRW. 17Z C15 BKN
 3Ø OVC 1815 CHC TRW. Ø9Z MVFR CIG..
MSY 121515 C5 BKN C12 OVC 5FH BKN V SCT CHC RW. 17Z C15 BKN 8Ø OVC
 1515 BKN V SCT CHC TRW AFT 18Z. Ø9Z IFR CIG TRW..
SHV 121515 C1Ø BKN 5Ø OVC 5R-F 181Ø CHC TRW. 18Z C2Ø BKN 8Ø OVC 2112
 CHC TRW. ØØZ C3Ø BKN 291Ø. Ø9Z MVFR CIG..


MO 121449
CGI 121515 C25 BKN 1818G3Ø BKN V SCT. 2ØZ CFP C2Ø OVC 2722G36.
 23Z C2Ø BKN 3222G41 BKN V OVC. Ø9Z MVFR CIG WIND BCMG IFR CIG WIND..
COU 121515 2Ø SCT 2Ø18G34 SCT V BKN. 19Z CFP C2Ø OVC 2722G4Ø.
 21Z C2Ø BKN 3328G42 BKN V OVC. Ø4Z C14 OVC 3624G35. Ø9Z MVFR CIG
 WIND..
JLN 121515 CLR 252Ø. 17Z C2Ø OVC 272ØG35. 19Z C2Ø BKN 3222G4Ø BKN V
 OVC. Ø3Z C18 OVC 3614G3Ø. Ø9Z MVFR CIG WIND..
MCI 121515 C18 OVC 3Ø3ØG45 OCNL RW-. 19Z C2Ø BKN 333ØG45 BKN
 V OVC CHC SW-. Ø1Z C14 OVC 3625G36. Ø9Z MVFR CIG WIND..
MKC 121515 C18 OVC 2926G4Ø OCNL RW-. 19Z C2Ø BKN 333ØG45 BKN V OVC
 CHC SW-. Ø1Z C14 OVC 3625G35. Ø9Z MVFR CIG WIND..
SGF 121515 CLR 242ØG4Ø. 18Z CFP C2Ø OVC 2721G38. 2ØZ C2Ø BKN 3222G42
 BKN V OVC. Ø4Z C1Ø OVC 3615G3Ø. Ø9Z IFR CIG WIND..
STJ 121515 C2Ø OVC 313ØG45 OCNL RW-. 18Z C2Ø BKN 333ØG45 BKN V OVC
 CHC SW-. Ø1Z C14 OVC 3625G38. Ø9Z MVFR CIG WIND. AMDTS NOT AVBL
 Ø5Z-14Z..
STL 121515 3Ø SCT 182ØG35 SCT V BKN. 18Z CFP C25 OVC 2727G4Ø.
 23Z C25 BKN 3328G45 BKN V OVC. Ø6Z C1Ø OVC 3624G37.
 Ø9Z MVFR CIG WIND..
```

Figure 19.—

TERMINAL FORECASTS (CONT'D)

```
OK 121445
ADM 121515 2Ø SCT 332ØG32. 23Z CLR 321Ø. Ø9Z VFR CLR..
GAG 121515 C2Ø OVC 342ØG35 CHC 3BD. 18Z 2Ø SCT 3418G32 SCT V BKN. ØØZ
 CLR 3212. Ø9Z VFR CLR..
HBR 121515 2Ø SCT 3318G32 SCT V BKN. 19Z CLR 3215G28. ØØZ CLR 341Ø.
 Ø9Z VFR CLR..
MLC 121515 2Ø SCT 3218G3Ø. ØØZ CLR 321Ø. Ø9Z VFR CLR..
OKC 121515 2Ø SCT 332ØG35 SCT V BKN. 19Z 2Ø SCT 3318G28. ØØZ CLR 331Ø.
 Ø9Z VFR CLR..
PNC 121515 C2Ø BKN 342ØG36. 18Z 2Ø SCT 3315G28 SCT V BKN. ØØZ CLR 3212.
 Ø9Z VFR CLR..
TUL 121515 C2Ø BKN 332ØG35. 18Z 2Ø SCT 3318G28 SCT V BKN. ØØZ CLR 3312.
 Ø9Z VFR CLR..
```

Figure 19.—(Cont'd)

SURFACE AVIATION WEATHER REPORT

```
KS
CNU SA 1Ø53 E25 BKN 15 157/35/28/312Ø/999/246 33
DDC SA 1Ø55 CLR 6BD 215/31/1Ø/3327G36/Ø14/PK WND 3235/2Ø
EMP RS 1Ø58 E2Ø BKN 1Ø 162/33/22/3125G35/999/PK WND 3235/2Ø
GCK SP 11ØØ -SCT 6BD 227/3Ø/17/332ØG28/Ø16/PK WND 3328/5Ø
GLD SP 11Ø2 SCT 5D 246/22/8/3432G42/Ø16/PK WND 3343/19
CNU COR 11Ø5 -X E5Ø BKN 8 223/25/19/3227G4Ø/Ø13/4BD PK WND 3244/51
HUT RS 111Ø 15 SCT 15 185/35/18/322ØG3Ø/ØØ6/25
ICT SA 1115 28 SCT 2Ø 185/34/16/3422G33/ØØ6/PK WND 3434/28
RSL SP 112Ø SCT 15 192/29/16/3323G4Ø/ØØ7/PK WND 3345/4Ø
SLN RS 1122 SCT 15 178/3Ø/2Ø/3225G32/ØØ3/PK WND 3239/48
TOP SA 113Ø E3Ø BKN 18Ø BKN 1Ø 15Ø/28/18/3Ø18G32/997/FEW CI SE4Ø
  PK WND 3Ø36/44/ LWR LYR BKN V OVC
```

Figure 20.—Surface Aviation Weather Report

RADAR WEATHER REPORTS (RAREPS)

```
LIT 1133 AREA 4TRW+/+ 22/1ØØ 88/17Ø 196/18Ø 22Ø/115 CELLS 2425
 MT 31Ø AT 162/11Ø
JAN 1935 SPL LN 1ØTRWX/NC 86/4Ø 164/6Ø 199/115 12W CELLS 243Ø
 MT 44Ø AT 159/65 D1Ø
MAF 113Ø AREA 2S 27/8Ø 9Ø/125 196/5Ø 268/1ØØ 241Ø MT 1ØØ UNIFORM
HBO 1132 AREA 2TRW++6R-/NC 67/13Ø 3Ø8/45 1Ø5W CELLS 224Ø
 MT 38Ø AT 66/54
OKC 1934 LN 8TRW++/+ 86/4Ø 164/6Ø  199/115 15W 2425
 MT 57Ø AT 159/65 2 INCH HAIL RPRTD THIS ECHO
```

Figure 21.—Radar Weather Reports (RAREPS)

WINDS AND TEMPERATURES ALOFT FORECAST

FD WBC 151745
BASED ON 151200Z DATA
VALID 1600Z FOR USE 1800-0300Z. TEMPS NEG ABV 24000

FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
ALS			2420	2635-08	2535-18	2444-30	245945	246755	246862
AMA		2714	2725+00	2625-04	2531-15	2542-27	265842	256352	256762
DEN			2321-04	2532-08	2434-19	2441-31	235347	236056	236262
HLC		1707-01	2113-03	2219-07	2330-17	2435-30	244145	244854	245561
MKC	0507	2006+03	2215-01	2322-06	2338-17	2348-29	236143	237252	238160
STL	2113	2325+07	2332+02	2339-04	2356-16	2373-27	239440	730649	731960

Figure 22.—

SELECTED PILOT REPORTS

UA/OV ICT ØØ8ØØ 1345 FLØ6Ø /TP BE58/SK Ø55
BKN/TA Ø3/WV 29ØØ2Ø/TB LGT-MDT

UA/OV SLN Ø71Ø18 141Ø FLØ8Ø/TP BE35/SK ØØ4
BKN Ø12/Ø22 BKN -OVC/TA Ø1/IC LGT-MDT RIME
Ø35-Ø6Ø/RM WIND COMP HEAD Ø2Ø MHØ71
TAS 15Ø

UA/OV OKC Ø55Ø45 15ØØ FL12Ø/TP C31Ø/SK Ø6Ø
OVC Ø9Ø/TA-Ø3/IC LGT-MDT MXD Ø6Ø-Ø9Ø

UA/OV PER 177Ø25 162Ø FL1ØØ/TP PA28/SK Ø5Ø
OVC Ø75/IC LGT RIME Ø5Ø-Ø75

Figure 23.—

GSW WS Ø91425
Ø91425 - Ø919ØØ

WEATHER ADVISORIES

SIGMET ALFA 4. FLT PRCTN. WRN OK WRN TX SCTD EMBDD TSTMS. ALG AND ABT ØSØ MI W OF ENID BROWNWOOD LN SCTD EMBDD. CB TOPS TO 2ØØ. TSTMS MOVG EWD 2Ø KT AND CONTG PAST 19Z.

GSW WA 121737
121737 - 1224ØØ

AIRMET CHARLIE 5. FLT PRCTN. GUSTY SFC WNDS MDT TURBC BLO 5 THSD FT ALG AND N OF CDFNT OVR OK AND TX. CDFNT ALG FSM FTW ABI HOB LN AT 17Z MOVG SWD ABT 25 KT. SOME BLWG DUST VSBYS LCLY ARND 3 MI MAINLY OVR NWRN TX AND WRN OK. COND CONTG PAST 24Z.

Figure 24.—

PIREP

(U)UA►/OV► **FL**

MSG TYPE LOCATION OF PHENOMENA 3-LTR IDENT RADIAL DISTANCE TIME (Z) FLT LVL

/TP► **/SK►**

TYPE AIRCRAFT SKY COVER BASE AMOUNT TOP

/TA► **/WV►**

TEMPERATURE-CELSIUS WIND-DIRECTION SPEED

/TB► **/IC►**

TURBULENCE-INTENSITY TYPE* ALTITIDE** ICING-INTENSITY TYPE ALTITUDE**

/RM►

REMARKS (MOST HAZARDOUS ELEMENT REPORTED FIRST)

LEGEND: ►= SPACE SYMBOL *=ONLY FOR CAT **=ONLY IF DIFFERENT FROM FL

TURBULENCE REPORTING CRITERIA TABLE

Intensity	*Aircraft Reaction*	*Reaction Inside Aircraft*
LIGHT	Turbulence that momentarily causes slight, erratic changes in altitude and/or attitude (pitch, roll, yaw). Report as *Light Turbulence*;* or Turbulence that causes slight, rapid and somewhat rhythmic bumpiness without appreciable changes in altitude or attitude. Report as *Light Chop*.	Occupants may feel a slight strain against seat belts or shoulder straps. Unsecured objects may be displaced slightly. Food service may be conducted and little or no difficulty is encountered in walking.
MODERATE	Turbulence that is similar to Light Turbulence but of greater intensity. Changes in altitude and/or attitude occur but the aircraft remains in positive control at all times. It usually causes variations in indicated airspeed. Report as *Moderate Turbulence*;* or Turbulence that is similar to Light Chop but of greater intensity. It causes rapid bumps or jolts without appreciable changes in aircraft altitude or attitude. Report as *Moderate Chop*.	Occupants feel definite strains against seat belts or shoulder straps. Unsecured objects are dislodged. Food service and walking are difficult.
SEVERE	Turbulence that causes large, abrupt changes in altitude and/or attitude. It usualy causes large variations in indicated airspeed. Aircraft may be momentarily out of control. Report as *Severe Turbulence*.*	Occupants are forced violently against seat belts or shoulder straps. Unsecured objects are tossed about. Food service and walking are impossible.
EXTREME	Turbulence in which the aircraft is violently tossed about and is practically impossible to control. It may cause structural damage. Report as *Extreme Turbulence*.*	

* High level turbulence (normally above 15,000 feet ASL) not associated with cumuliform cloudiness, including thunderstorms, should be reported as CAT (clear air turbulence) preceded by the appropriate intensity, or light or moderate chop.

INTENSITY	ICE ACCUMULATION
Trace	Ice becomes perceptible. Rate of accumulation slightly greater than rate of sublimation. It is not hazardous even though deicing/anti-icing equipment is not utilized, unless encountered for an extended period of time (over 1 hour).
Light	The rate of accumulation may create a problem if flight is prolonged in this environment (over 1 hour). Occasional use of deicing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the deicing/anti-icing equipment is used.
Moderate	The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or diversion is necessary.
Severe	The rate of accumulation is such that deicing/anti-icing equipment fails to reduce or control the hazard. Immediate diversion is necessary.

Pilot Report: Aircraft Identification, Location, Time (GMT), Intensity of Type,* Altitude/FL, Aircraft Type, IAS.

FORECAST WINDS AND TEMPERATURES ALOFT (FD)

Plotted	*Interpretation*
12 6	12° C, wind 060° at 5 knots
03 6	3° C, wind 160° at 25 knots
-09 6	−9° C, wind 260° at 50 knots
6 -47	−47° C, wind 360° at 115 knots
-11 99	−11° C, wind calm (light variable)

Figure 25.—

CONVECTIVE SIGMET

```
ZCZC
MKC WST 221835
CONVECTIVE SIGMET 19
KS OK
FROM 30E GCK TO 20E GAG.
IN BKN TSTMS 25 WIDE MOVG FROM 2515 WITH AN INTS-LVL5 CELL.
TOPS TO 450...HAIL TO 1 IN...WIND GUSTS TO 55.

IN BKN TSTMS 25 WIDE DFW 340300 DFW 335250
MOVG 2515 TOPS 450
CELL LVL5 DIAM 10 DFW 330280 MOVG 2120 TOPS 450

CONVECTIVE SIGMET 20
ND SD
FROM 90W MOT TO PMB TO 40N MHE TO RAP.
AREA BKN TSTMS MOVG FROM 2530 WITH
A FEW INTS-LVL5 AND EXTRM-LVL6 CELLS.
TORNADO RPTD 1820Z VCNTY GFK.  MAX TOPS TO
450...HAIL TO 1 IN...WIND GUSTS TO 55.  CONDS
EXPCD TO INTSFY.

AREA BKN TSTMS FSD 310400 FSD 350270
FSD 310080 FSD 290240 MOVG 2530 TOPS 450
CELL LVL6 DIAM 20 FSD 300210 MOVG 2515 TOPS 420
CELL LVL5 DIAM 10 FSD 330200 MOVG 2515 TOPS 420
WILLIAMS
NNNN
```

Figure 26.—

SPECIAL CONVECTIVE SIGMET

```
ZCZC
MKCC WST 131910
CONVECTIVE SIGMET 21
ND
5NE JMS
ISLTD EXTRM-LVL6 TSTM DIAM 20 MOVG FROM 2530.
TORNADO RPRTD 1910Z 5NE JMS...TOPS 500...HAIL
TO 2 IN...WIND GUSTS TO 60.

CELL LVL6 DIAM 20 FSD 340200 MOVG 2530 TOPS 500.
BINGAMAN
NNNN
```

Figure 27.—

Both VFR and IFR Exam-O-Grams are included

U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

VFR PILOT EXAM-O-GRAMS

2/78

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 (a single set only 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
2	VFR Cruising Altitudes - 10/71
4	Preflight Planning for a VFR Cross-Country Flight (Series 1) - 1/74
5	Preflight Planning for a VFR Cross-Country Flight (Series 2) - 10/71
6	Preflight Planning for a VFR Cross-Country Flight (Series 3) - 3/71
7	Trapped on Top of an Overcast - 8/77
8	Airspeed Indicator Markings - 1/78
9	Altimetry - 11/77
10	Fuel Contamination - 1/78
12	The Magnetic Compass - 4/77
13	Weight and Balance - 1/77
15	How to Use VOR (Series 1) - 8/64
16	How to Use VOR (Series 2) - 8/64
17	Common Misconceptions (Series 1) - 1/77
18	Lost Procedures -- Pilotage - 9/64
19	Emergency or Lost Procedures (Radio) - 8/77
20	Ceiling and Visibility - 6/76
21	Flying into Unfavorable Weather - 7/69
22	Potential Midair Collisions - 8/77
23	Interpreting Sectional Charts (Series 1) - 11/77
26	Common Misconceptions (Series 2) - 8/77
27	The Effect of Wind on an Airplane - 1/74
28	Factors Affecting Stall Speed - 9/65
29	Potential Midair Collisions (Series 2) - 1/74
33	Use of Performance Charts - 1/77
34	How to Obtain Proper Weather Briefing - 8/77
35	UNICOM Frequencies and Uses - 4/77
36	Commonly Misunderstood Areas of Aeronautical Knowledge (Series 1) - 6/76
37	Commonly Misunderstood Areas of Aeronautical Knowledge (Series 2) - 1/72
38	Mixture Control — Fuel/Air Ratio - 11/66
39	Simple ADF for VFR Navigation - 8/67
40	Visual Approach Slope Indicator (VASI) - 8/77
41	Controlled Airspace (Series 1) - 10/71
42	Controlled Airspace (Series 2) - 10/71
43	ATIS (Automatic Terminal Information Service) - 4/77
44	How High the Clouds? - 8/77
45	Airspeeds and Airspeed Indicator Markings (Series 2) - 1/69
46	Aviation Weather Reports — Remarks - 6/76
47	Ground Effect - 1/74
48	Midair Collisions (Series 3) - 1/74
49	Use of Oxygen in General Aviation Aircraft - 1/71
50	Interpreting Sectional Charts (Series 2) - 1/77
51	Interpreting Sectional Charts (Series 3) - 8/77
52	Sky Cover and Ceiling - 6/76
53	Dangers of Wingtip Vortices - 1/77
54	Emergency Locator Transmitters (ELTs) - 4/77
55	Terminal Radar Service Areas (TRSAs) "Stage III" - 1/77
56	Sky Cover Symbols in Weather Reports and Forecasts - 6/76
57	Flight in the Region of Reversed Command in Relation to Takeoffs and Landings - 8/77
58	Pilot Induced Accidents - 1/77

In this set of Exam-O-Grams the following issues have been deleted: Nos. 1, 3, 11, 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 25082
Oklahoma City, Oklahoma 73125

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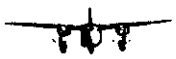
Figure 28.—

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

IFR PILOT EXAM-O-GRAMS



8/77

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.

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IFR EXAM-O-GRAMS

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

Exam-O-Grams Nos. 1, 3, 4, 9, 12, 13, and 20 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. 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
Publications Section, TAD-443.1
Washington, D.C. 20590

Figure 29.—

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.

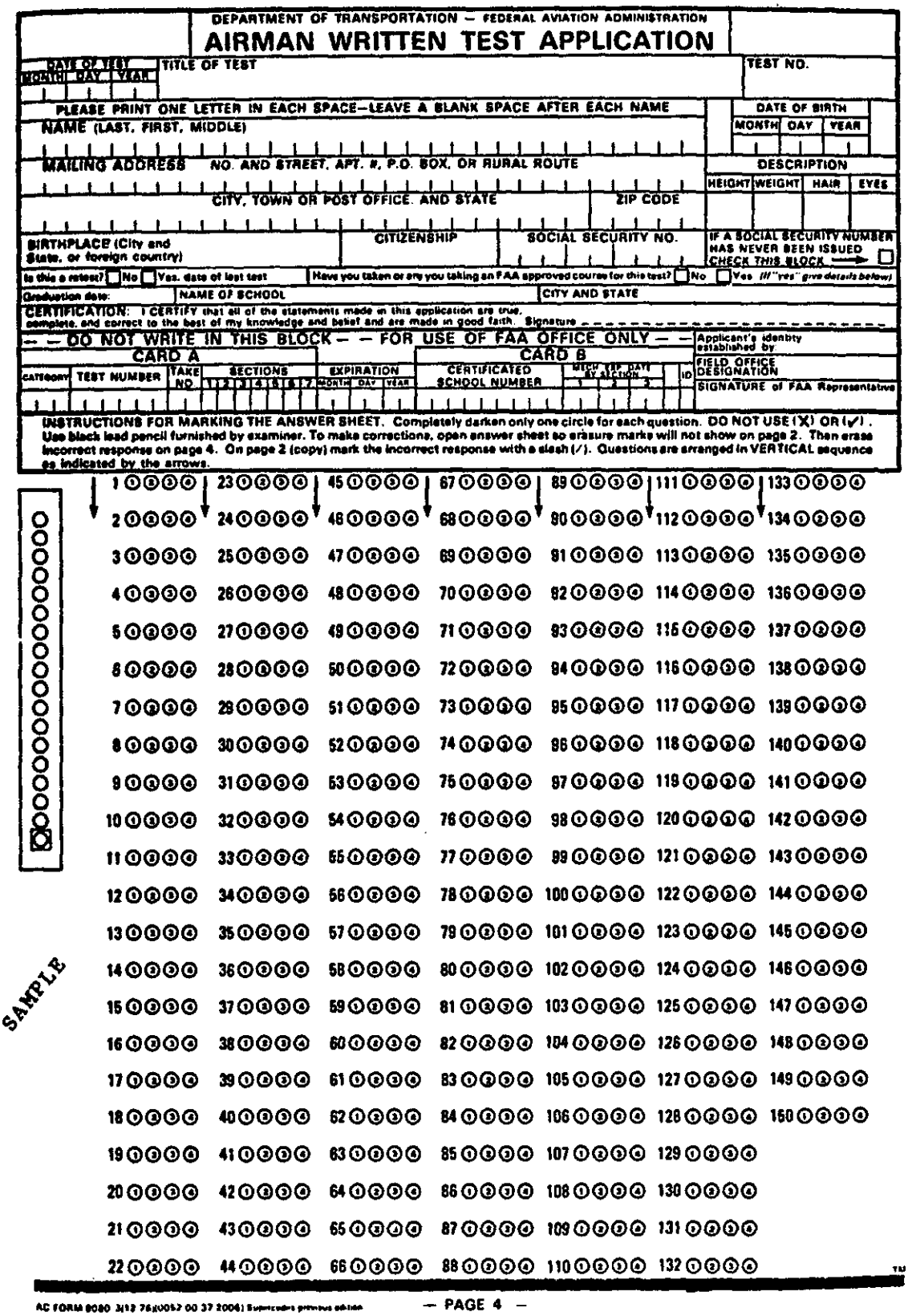
* DO NOT TEAR SHEETS APART.

* 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.

Figure 30.—Airman Written Test Application (Page 1)



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

NAME (LAST, FIRST, MIDDLE) | DATE OF BIRTH (MONTH, DAY, YEAR)

MAILING ADDRESS NO. AND STREET, APT. #, P.O. BOX, OR RURAL ROUTE | DESCRIPTION (HEIGHT, WEIGHT, HAIR, EYES)

CITY, TOWN OR POST OFFICE, AND STATE | ZIP CODE

BIRTHPLACE (City and State, or foreign country) | CITIZENSHIP | SOCIAL SECURITY NO. | IF A SOCIAL SECURITY NUMBER HAS NEVER BEEN ISSUED CHECK THIS BLOCK ⟶ ☐

Is this a retest? ☐ No ☐ Yes, date of last test | Have you taken or are you taking an FAA approved course for this test? ☐ No ☐ 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 — —

Applicant's identity established by:

CARD A: CATEGORY | TEST NUMBER | TAKE NO | SECTIONS 1 2 3 4 5 6 7 | EXPIRATION MONTH DAY YEAR

CARD B: CERTIFICATED SCHOOL NUMBER | MEDICAL CERT. DATE BY SECTION 1 2 3 | ID

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.

SAMPLE

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

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Figure 31.—Airman Written Test Application (Page 4)

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FEDERAL AVIATION ADMINISTRATION
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