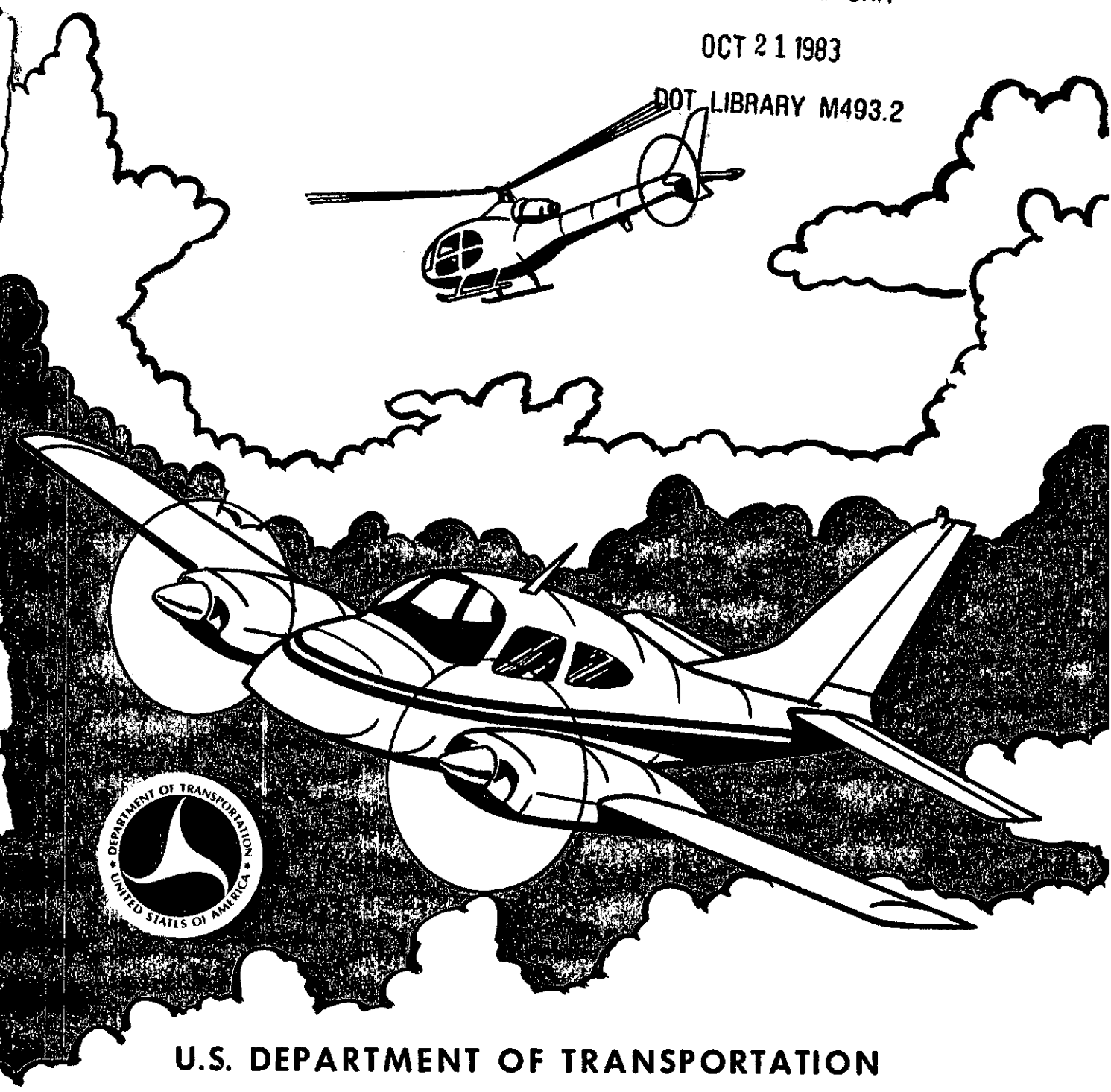
AC 61-8D

INSTRUMENT RATING

Written Test Guide



U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

INSTRUMENT RATING WRITTEN TEST GUIDE

Revised 1977

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

PREFACE

The *Instrument Rating Written Test Guide* has been prepared by the Federal Aviation Administration as an aid to pilots who are preparing for the Instrument Rating (Airplane, Helicopter, or Foreign Pilot) Written Tests. Its purpose is to define the scope of the written test and direct applicants to appropriate study material.

This guide supersedes AC 61-8C, *Instrument Rating (Airplane) Written Test Guide*, dated 1972, and AC 61-45, *Instrument Rating (Helicopter) Written Test Guide*, dated 1968, and is issued as AC 61-8D.

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

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Acting Director
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INSTRUMENT RATING WRITTEN TEST GUIDE

Introduction

The Federal Aviation Administration has adopted the question book concept for use in determining an applicant's knowledge in the Instrument Rating area. An applicant for the Instrument Rating (Airplane, Helicopter, or Foreign Pilot) Written Test is issued a question book containing several hundred questions, a Question Selection Sheet which indicates the specific questions in the question book to be answered, and an Airman Written Test Application which contains the answer sheet. The question book contains all the supplementary material required to answer the test questions. Supplementary material, such as a chart excerpt, precedes the questions with which it is associated, and chart legends and weather symbols are contained in the appendix of the question book for reference purposes.

This guide includes questions which are representative of those used in the official question book. The Subject Matter Outline (SMO) reference code for each question appears directly below each question number. This SMO code, and the Subject Matter Outline appear just before the test questions and will enable the applicant to readily identify the reference upon which each question is based. All questions on regulations and procedures are based on those in effect at the time of printing this guide.

Your study for the Instrument Rating will be more meaningful and profitable, if you visit a Flight Service Station and a National Weather Service office to discuss questions and problems you may have in preflight briefing and aviation weather. Similar visits to an Air Traffic Control Center and an Approach Control location will broaden your perspective of the air traffic control system and your understanding of air traffic control procedures. It is strongly recommended that you obtain some instrument flight time before taking the Instrument Rating Written Test and that you make one or more IFR cross-country flights in actual IFR weather conditions with an instrument instructor before taking the flight check.

When your instrument rating has been issued, your study and practice must not stop. Instrument flying skills must be used to be retained, and you should plan regular practice in a synthetic trainer or "under the hood" unless you fly frequently in actual IFR conditions. You are encouraged to file IFR flight plans for flights in good weather. This practice, in the more relaxed environment of VFR flight conditions, will help you develop and maintain proficiency in instrument procedures and techniques.

Eligibility requirements for rating

Federal Aviation Regulation (FAR) 61.35 (a) sets forth the prerequisites for taking a written test. For the Instrument Rating, the applicant must show satisfactory completion of the ground instruction or home study course required by 61.65 (b); present as personal identification an airman certificate, driver's license, or other official document; and must hold a current private or commercial pilot certificate.

Federal Aviation Regulations (FAR) 61.65 covers the Instrument Rating requirements. Pilot operations, procedures, and maneuvers appropriate to the required flight test are contained in AC 61–56A, *Instrument Pilot Airplane Flight Test Guide*, and AC 61–64A, *Instrument Pilot Helicopter Flight Test Guide.*

Aeronautical knowledge requirements are detailed in the study outline contained in this guide.

THE TEST

Nature of the test

The FAA uses the question book to determine the aeronautical knowledge of applicants for the Instrument Airplane, the Instrument Helicopter, and the Instrument Foreign Pilot Ratings. The test, taken by an applicant who does not hold either the Instrument Rating-Airplane or the Instrument Rating-Helicopter, consists of a group of questions from the question book listed on a Question Selection Sheet. The test includes questions pertaining to pilot responsibilities and certification; and also to preflight, departure, en route, and arrival operational situations. The average time required to complete the test is 4 hours.

If an applicant holds an Instrument Rating-Airplane and wishes to acquire an Instrument Rating-Helicopter, or vice versa, a written test consisting of 15 questions selected from the question book is administered. This 15-question test is a "differences" test and pertains specifically to an airplane or a helicopter, in the areas of recency of experience, performance, loading, weather minimums, etc.

A foreign pilot, whose license authorizes instrument privileges and who applies for a United States certificate with an instrument rating, is administered a written test consisting of questions selected from the question book. The test pertains to instrument flight rules and related procedures. The "foreign pilot" test is graded at the office where it is administered.

The answer sheets for the other written tests are sent to the FAA Aeronautical Center in Oklahoma City, where they are scored by a computer which is programmed to indicate by code, the knowledge areas in which the applicant was found to be deficient. A Written Test Subject Matter Outline, which lists the knowledge areas by code, is enclosed with the written test report. From this outline, the applicant is able to determine the knowledge areas which gave difficulty.

Taking the test

The test may be taken at FAA Flight Standards District Offices, certain Flight Service Stations and other designated places. Keep the following points in mind while taking the test:

1. Answer test items in accordance with the latest regulations and procedures.
2. Read every question thoroughly. Failure on the written test is frequently caused by not reading carefully, rather than lack of knowledge. Do not try to solve the problem before you understand the question.
3. Do not consider a complicated problem a "trick" question; each question has a specific objective. There is only one correct and complete answer. If any part of the answer is wrong, the answer is considered wrong. If you believe that none of the answers are completely correct, choose the one you think is the best answer.
4. Do not waste excessive time on questions that stump you. Go on to the questions you can answer readily, then return to those which gave you difficulty. Be sure to indicate on the Question Selection Sheet the questions to which you wish to return.
5. When solving a computer problem, select the answer nearest your solution. The problem has been checked with various types of computers and, if you have solved it correctly, your answer will be closer to the correct answer than to any of the other choices.
6. Enter personal data in appropriate spaces on the test answer sheet in a complete and legible manner to aid in scoring. The test number is the number printed on the Question Selection Sheet, *not the number* on the question book.

Retesting—FAR 61.49

Applicants who receive a failing grade, may apply for retesting by presenting their Airman Written Test Report, AC Form 8080-2

(1) after 30 days from the date the applicant failed the test; or,

(2) in case of the first failure, the applicant may apply for retesting before the 30 days have expired upon presenting a written statement from an authorized instructor certifying that the instructor has given ground instruction to the applicant and finds the applicant competent to pass the test.

RECOMMENDED STUDY MATERIALS

Persons studying for the Instrument Rating Written Test will find the publications listed in this section most helpful. The list identifies material which is helpful when preparing for the test, but does not include all material available in the subject areas. Textbooks and other references are available from many commercial publishers. It is the responsibility of applicants to obtain study materials appropriate to their needs.

AIRMAN'S INFORMATION MANUAL (AIM)—(Sup't. Doc's.)

This publication presents, in five parts, information necessary for the planning and conduct of flights primarily in the National Airspace System of the United States. Highlights of each part are described below.

Part 1—*Basic Flight Manual and ATC Procedures*

Issued: Semiannually (Jan. and July)

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 Glossary of Aeronautical Terms; Air Defense Identification Zones (ADIZ); Designated Mountainous Areas; and Emergency Procedures.

Part 2—*Airport Directory*

Issued: Semiannually (Mar. and Sept.)

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. 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 Stations and National Weather Service Telephone Numbers.

Part 3—*Operational Data*

Issued: Every 56 days.

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 En Route Navigation Aids; Special, General, and Area Notices; a tabulation of New and Permanently Closed Airports; Locations of VOR Receiver Check Points; a tabulation of North Atlantic Routes; Preferred Routes; Area Navigation Routes; and Sectional Chart Bulletin.

Part 3A—*Notices to Airmen*

Issued: Every 14 days.

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

Part 4—*Grapic Notices and Supplemental Data*

Issued: Quarterly (Jan., April, July, Oct.)

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

FEDERAL AVIATION REGULATIONS (FARs)—(Sup't. Doc's.)

Part 1, *Definitions and Abbreviations*

Part 61, *Certification: Pilots and Flight Instructors*

Part 91, *General Operating and Flight Rules*

HANDBOOKS

Instrument Flying Handbook, AC 61-27B—(Sup't. Doc's.) Provides the pilot with basic information needed to acquire an FAA Instrument Rating. It is designed for the reader who holds at least a Private Pilot Certificate and is knowledgeable in all areas covered in the "Pilot's Handbook of Aeronautical Knowledge," AC 61-23A.

Basic Helicopter Handbook, AC 61-13A—(Sup't. Doc's.) Provides detailed information to applicants regarding helicopter aerodynamics, performance, and flight maneuvers.

Aviation Weather, AC 00-6A—(Sup't. Doc's.) 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.

Aviation Weather Services, AC 00-45A—(Sup't. Doc's.) A supplement to Aviation Weather, AC 00-6A; it explains weather service in general and the details of interpreting and using reports, forecasts, weather maps, and prognostic charts. Many charts and tables apply directly to flight planning and inflight decisions.

Pilot's Weight and Balance Handbook, AC 91-23A—(Sup't. Doc's.) An excellent reference on loading and weight and balance for both the small and large aircraft.

Charts

The charts listed below are available through a network of sales agents located at or near principal civil airports. If not readily available, you may obtain a catalog of Aeronautical Charts and Related Publications from:

Distribution Division (C44)
Office of Aeronautical Charting
and Cartography
National Ocean Survey, NOAA
Riverdale, MD 20840.

Instrument Approach Procedure Charts. Individual charts give detailed information on procedures for specific airports. (AC 90-1A, Civil Use of U.S. Government Produced Instrument Approach Charts, clarifies the symbols and abbreviations used on these charts.)

En Route Charts: Low-Altitude and High-Altitude—These charts provide the necessary aeronautical information for en route instrument navigation.

Low-Altitude Area Charts—These charts supplement the En Route Charts by providing terminal data at a larger scale in congested areas.

Standard Instrument Departures (SIDs)—These charts are collated in two booklets, "East" and "West." They are designed for use with En Route High and Low Altitude and Area Charts. They furnish pilots departure routing clearance in graphic and textual form.

Standard Terminal Arrival Routes (STARs)—These charts are collated in one booklet and are designed for use with En Route High and Low Altitude Charts. They furnish pilots preplanned instrument flight rules (IFR) air traffic control arrival route procedures in graphic and textual form.

Advisory Circulars

The following Advisory Circulars may be obtained free of charge from:

Department of Transportation
Federal Aviation Administration
Publications Unit, TAD 433.1
Washington, D.C. 20590.

AC 00-2 (Latest revision)	Advisory Circular Checklist
AC 00-24	Thunderstorms
AC 00-50	Low Level Wind Shear
AC 20-32B	Carbon Monoxide (CO) Contamination in Aircraft. . . .
AC 60-4	Pilot's Spatial Disorientation
AC 60-6A	FAA Approved Airplane Flight Manuals. . . .
AC 61-84	Role of Preflight Preparation
AC 90-1A	Civil Use of U.S. Government Produced Instrument Approach Charts (This AC is also printed in the Instrument Flying Handbook, AC 61-27B, page 161.)
AC 90-12B	Severe Weather Avoidance
AC 90-14A	Altitude—Temperature Effect on Aircraft Performance
AC 90-23D	Wake Turbulence
AC 90-48	Pilot's Role in Collision Avoidance
AC 90-62	Flying DME Arcs
AC 91-8A	Use of Oxygen by General Aviation Pilots/Passengers
AC 91-17	The Use of View Limiting Devices on Aircraft
AC 91-43	Unreliable Airspeed Indications
AC 91.83-1A	Canceling or Closing Flight Plans

Exam-O-Grams

Exam-O-Grams are prepared on subjects which prove particularly troublesome to applicants in written tests. They provide information on items which are operationally important but commonly misunderstood.

Single copies of Exam-O-Grams may be obtained free of charge from:

FAA Aeronautical Center
Flight Standards National Field Office
Examinations Branch, AFS–590
P.O. Box 25082
Oklahoma City, Oklahoma 73125.

How To Obtain Study Materials

The study materials listed (Sup't. Doc's.) may be obtained by remitting check or money order to:

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

To expedite your order when ordering publications from the Superintendent of Documents, be sure to include with the title the Stock Number given in the price line (e.g., SN 050–007–00064–2). This is found in the Advisory Circular Checklist, AC 00–2LL (or latest revision). A copy of this publication may be obtained free of charge by sending your request to:

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

WRITTEN TEST SUBJECT MATTER OUTLINE 33E

This study outline indicates the areas of aeronautical knowledge which pertain to the written test. It expands the general aeronautical knowledge requirements set forth in Federal Aviation Regulations, and is based on airman activity for flight under Instrument Flight Rules.

Reference code:

AC —Advisory Circular
AW —Aviation Weather (AC 00-6A)
AWS —Aviation Weather Services (AC 00-45A)
AIM —Airman's Information Manual
EOG —IFR Exam-O-Gram
IFH —Instrument Flying Handbook (AC 61-27B)
BHH —Basic Helicopter Handbook (AC 61-13A)
IAPC —Instrument Approach Procedure Charts
PHB —Pilot's Handbook of Aeronautical Knowledge (AC 61-23B)

(FAR references will be indicated by Part number only; i.e., 91.5 means FAR 91.5.)

FLIGHT PLANNING

A10 Certificates and Ratings

- A11 Requirements for certificates and ratings (61.3)
- A12 Eligibility for instrument rating (61.65)
- A13 Where instrument rating required (61.3(e), 91.97)
- A14 Recency of experience (61.57)

A20 Preflight Action for Flight

- A21 Familiarization with all available information (91.5; EOG-31; AIM-3)
- A22 Fuel requirements (91.23)

A30 Preflight Action for Aircraft (EOG-31)

- A31 Responsibility for airworthiness (91.29)
- A32 Equipment required
  Instruments and equipment (91.33)
  Transponder (91.24, 91.90)
  ELT (91.52)
- A33 Tests and inspections
  VOR (91.25; EOG-22; AIM 1-2)
  Altimeter system (91.170)
  Transponder (91.177)
- A34 Portable electronic devices (91.19)

A40 Flight Plan (AM-1)

- A41 When required (91.97, 91.115)
- A42 Information required (91.83)
- A43 Alternate airport requirements (91.83; EOG-29)

B10 Route Planning

- B11 Preferred route (AIM-3); SIDs and STARs (AIM-1, see Index)
- B12 Airport/Facility Directory (AIM-3)
- B13 NOTAM (AIM-3A)
- B14 FDC NOTAMs (AIM-3A)
- B15 Special Notices (AIM-3)
- B16 Area Navigation Routes (AIM-3)
- B17 Direct Routes (AIM-1, Airspace; FAR 91.119, and 91.121(b))
- B18 Restrictions to En Route Nav. Aids (AIM-3)
- B19 Substitute Route Structure (EOG-39)

B20 Flight Planning Computer Operations (Ch. XII—IFH)

- B21 Wind correction angle-heading
- B22 GS
- B23 ETE/ETA
- B24 Fuel estimates

B30 Aircraft Performance (Aircraft Owner's Handbook; VFR EOG-33; EOG-32; AC 90-14A)

- B31 Takeoff distance
- B32 Climb performance
- B33 Cruise performance (VFR EOG-38)
- B34 Fuel flow
- B35 Landing performance
- B36 Airspeed: IAS, CAS, EAS, TAS (Ch. XII-IFH)
- B37 Placards and instrument markings
- B38 Hovering

B40 Aircraft Operating Limitations (documents in aircraft, AC 60-6A)

- B41 Weight and balance (EOG-21; AC 91-23A)
- B42 Instrument limit markings and placards (FAR 91.31)
- B43 Maximum safe crosswind (VFR EOG-27)
- B44 Turbulence air penetration

B50 Aircraft Systems (Ch. IV—IFH)

- B51 Pitot-static system (EOG-10; IFH, page 55)
- B52 Vacuum/gyroscopic (EOG-24)
- B53 Electric/gyroscopic
- B54 Compass

C10 **Fundamentals of Weather**

- C11 Composition of the atmosphere (Ch. 1—AW)
- C12 Temperature (Ch. 2—AW)
- C13 Pressure (Ch. 3—AW)
- C14 Circulation (Ch. 4—AW)
- C15 Moisture (Ch. 5—AW)
- C16 Stability and wind (Ch. 6—AW)
- C17 Clouds (Ch. 7—AW)
- C18 Air masses and fronts (Ch. 8—AW)
- C19 Turbulence (Ch. 9—AW)

C20 **IFR Weather Hazards**

- C21 Icing (Ch. 10—AW)
- C22 Thunderstorms (Ch. 11—AW; AIM-1)
- C23 Fog and obstructions to vision (Ch. 12—AW)

C30 **Aviation Weather Observations and Reports**

- C31 Aviation weather reports (SA) (AWS-2)
- C32 Pilot weather reports (PIREPs, UA) (AWS-3)
- C33 Radar weather reports (RAREPs) (AWS-3) Radar summary chart (AWS-7)
- C34 Surface analysis (AWS-5)
- C35 Weather depiction chart (AWS-6)
- C36 Upper wind chart (AWS-9)
- C37 Freezing level chart (AWS-10)
- C38 Stability chart (AWS-11)
- C39 Constant pressure charts (AWS-13)

C40 **Aviation Weather Forecasts**

- C41 Terminal (FT) (AWS-4; EOG-5)
- C42 Area (FA) (AWS-4; EOG-5)
- C43 Winds and temperatures aloft (FD) (AWS-4) and chart (AWS-9)
- C44 Severe weather (AWS-4), Hurricane advisories (WH); convective outlook (AC); Weather Watch (WW); severe weather outlook chart (AWS-12)
- C45 TWEB route forecast and synopsis (AWS-4)
- C46 Inflight advisories (WS, WA, WAC) (AWS-4)
- C47 Prognostic charts: Surface (AWS-8); Significant Weather (AWS-8); Constant Pressure (AWS-14); Tropopause and Wind Shear (AWS-15)

C50 **Weather Tables and Conversion Graphs (AWS-16)**

- C51 Icing intensities
- C52 Turbulence intensities
- C53 Locations of probable turbulence
- C54 Standard temperature, speed, and pressure conversions
- C55 Density altitude

C60 **Weather Facilities**

- C61 FSS weather service (AIM-2, 3; EOG-19), Telephone numbers (AIM-2), Remote weather radar display (AIM-3), Scheduled weather broadcast (AIM-3)
- C62 ATIS (AIM-1, 3)
- C63 Weather Service Forecast Offices (AIM-1) TWEB, PATWAS (AIM-3)

DEPARTURE

D10 **Authority and Limitations of Pilot**

- D11 Pilot in command (91.3, 91.4, 91.67, 91.75, 91.87 (h))
- D12 Emergency action (91.3(b)), Deviation from rules
- D13 Required reports, Emergency deviation (91.3(c), 91.75(c)), Malfunction of equipment (91.33(c), 91.129)

D20 **Flight Plan**

- D21 Where to file (AIM-3—Airport/Facility Directory)
- D22 When to file (AIM-1—Flight Plan)

D30 **Departure Clearance (AIM-1, Departures; EOG-35)**

- D31 "Cleared as filed"
- D32 Amended clearance
- D33 Pre-taxi clearance procedure
- D34 Clearance delivery (AIM-3—Airport/Facility Directory)

D40 **Taxi and Takeoff Procedures (AIM-1—Departure and Airport Operation)**

- D41 Taxi limits (AIM-1; EOG-26, 28)
- D42 ATC control sequence (AIM-1)
- D43 Airport advisory service (AIM-1 and AIM-3—Airport/Facility Directory)
- D44 ATIS (AIM-1; AIM-3—Airport/Facility Directory)

D50 **Departure Procedure (AIM-1)**

- D51 Obstruction clearance minimums (approach chart book)
- D52 Departure control procedures (non-radar)
- D53 Departure control procedures (radar)
- D54 SIDs
- D55 Speed adjustments
- D56 Terminal area limitations

E10 **VOR Accuracy Check (AIM-1; EOG-22; FAR 91.25)**

- E11 VOT (AIM-3, L-chart legend)
- E12 VOR ground checkpoints (AIM-3)
- E13 VOR airborne checkpoints (AIM-3)
- E14 VOR dual receiver check

E20 **Pretakeoff Instrument Check (IFH, pages 68 and 249)**

- E21 Pre-start instrument indications
- E22 Taxi test

E30 **Transponder (EOG-25; AIM-1)**

- E31 Operation
- E32 Switching code
- E33 Emergency use

F10 **Airport Facilities (AIM-3, 3A, Charts)**

- F11 Service (AIM-3, 3A)
- F12 Runways (EOG-26, 28; AIM-1)
- F13 Airport lighting (AIM-1; EOG-33)
- F14 Communications (AIM-3)

F20 **FSS Facility (AIM–1; EOG–39; chart legend)**

- F21 Flight plan service
- F22 Traffic advisories (AIM–3)
- F23 Communications (AIM–3)
- F24 Weather advisories (AIM–3; AWS–1)

F30 **Departure Control Facility**

- F31 Communications (AIM–3; IAPC)
- F32 Geographical area

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G10 **En Route Limitations (AIM–1)**

- G11 Altitude limitations (91.119; EOG–8): MEA, MOCA, MCA, MRA, MAA
- G12 Cruising altitudes (91.121, 91.109)
- G13 Courses to be flown (91.123, 91.67)
- G14 Altimeter settings (91.81)
- G15 Positive Control Airspace (91.97)
- G16 Special Use Airspace (91.95; AIM–1; En Route Chart)

G20 **En Route Procedures (AIM–1; Ch. XI—IFH)**

- G21 Radar environment—vectors, reporting, handoffs
- G22 Nonradar environment—reporting, handoffs
- G23 Altitude: cruise, maintain, climb, descend, VFR on top
- G24 Delays: clearance limits, holding
- G25 Securing weather info (AWS–1)

G30 **ATC Clearances**

- G31 Phraseology (Ch. VIII—IFH; AIM–1; EOG–11, 34, 35)
- G32 Responses and readbacks (AIM–1; 91.125)

G40 **Oxygen Requirements (91.32)**

- G41 Pilot and crew requirements
- G42 Passenger requirements

G50 **Emergencies (AIM–1; EOG–2)**

- G51 Difficulty with communications
- G52 Malfunction of equipment
- G53 Lost
- G54 Lost communications (91.127; EOGs 36, 37, 38)
- G55 Malfunction reports (91.129, 91.33(e))
- G56 Deviation from clearance (91.75(c))

H10 **Radio Orientation (Ch. VII—IFH)**

- H11 VOR (EOG–7 & 14)
- H12 NDB (EOG–23)
- H13 LOC (EOG–7 & 14)
- H14 RNAV (EOG–30)

H20 **Establishing Radio Fixes and Waypoints (Ch. VII—IFH)**

- H21 VOR radials
- H22 VOR—DME (Ch. VI—IFH; AC 90–62; AC 170–3B)
- H23 ADF (EOG–23)
- H24 ADF–VOR/LOC
- H25 RNAV (EOG–30)

H30 **En Route Computer Operations (Ch. XII—IFH)**

- H31 GS
- H32 ETE/ETA
- H33 Altitude or speed conversions
- H34 Fuel

H40 **Attitude Instrument Flying (Ch. V—IFH)**

- H41 Interpretation of flight instruments
- H42 Aircraft control: pitch, bank, power
- H43 Basic maneuvers: straight and level, climbs and descents, turns (EOG–18)
- H44 Unusual attitudes
- H45 Flight patterns

H50 **Unusual Flight Conditions (AC 90–12B)**

- H51 Thunderstorms (AC 00–24; page 111—AW)
- H52 Structural icing (Ch. 10—AW)
- H53 Induction icing (Ch. 10—AW; PHB, page 91)
- H54 Use of anti/deicing equipment
- H55 Frost
- H56 Clear air turbulence

J10 **Radio Navigation Facilities (Ch. VII—IFH; AIM–1)**

- J11 VOR/VORTAC
- J12 NDB
- J13 LOC
- J14 DF
- J15 RADAR

J20 **Airway Route System (En Route Chart Legend; AIM–1; EOG–8)**

- J21 Victor/jet airway limits
- J22 Route identification: military, substitute, unusable
- J23 Altitude limits: MOCA, MEA, MRA, MCA, MAA
- J24 Reporting points: compulsory, non-compulsory
- J25 Fixes, waypoints
- J26 Geographical limit: VOR changeover points, altimeter setting boundary, time zone boundary
- J27 Airspace designation

J30 **Special Use Airspace (AIM–1, chart legends)**

- J31 Prohibited area
- J32 Restricted area
- J33 Military operations area
- J34 Warning area
- J35 Alert area—intensive student jet training area

J40 **ARTCC Facility (Ch. X—IFH; AIM–1)**

- J41 ARTCC remote frequencies (En Route Chart)
- J42 Geographical area of control (En Route Chart)
- J43 Advisories, services, assistance

J50 **En Route Weather Services (AIM–3)**

- J51 EFAS (AWS–1)
- J52 TWEB (AWS–1)
- J53 ARTCC significant weather advisories

J60 **Fixed-Wing Aerodynamic Factors (Ch. III—IFH; AC 61-23A)**

- J61 Aerodynamic forces
- J62 Straight and level
- J63 Turns
- J64 Climbs
- J65 Descents
- J66 Stalls

J70 **Rotary-Wing Aerodynamic Factors (BHH)**

- J71 Vibrations (Ch. 2)
- J72 Dissymmetry of lift (Ch. 2)
- J73 Translation (Ch. 2)
- J74 Rotor disc-loading, coning, and flapping (Ch. 9)
- J75 Settling with power (Ch. 9)
- J76 Ground resonance (Ch. 9)
- J77 Speed limitations (Ch. 9)
- J78 Autorotation particulars (Ch. 11)
- J79 Factors affecting performance (Ch. 11)

J80 **Physiological Factors (Ch. II—IFH; AIM-1)**

- J81 Physiologic altitude effects: hypoxia, aerotitis, aerosinusitis (AC 91-8A)
- J82 Hypoxic effects: alcohol, hyperventilation, drugs, carbon monoxide (AC 20-32B)
- J83 Sensations of instrument flying (AC 60-4)
- J84 Spatial disorientation (AC 60-4)

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K10 **Approach Control (AIM-1; Ch. XI—IFH)**

- K11 Radar control: STARs, vectors, approach clearances
- K12 Non-radar control
- K13 Aircraft speed (91.70)
- K14 Procedure turns/holding patterns
- K15 Visual and contact approaches

K20 **Holding Procedures**

- K21 Holding pattern entry
- K22 Shuttle
- K23 Changing altitude
- K24 Timing
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K30 **Precision Approaches (AC 90-1A; IFH, page 161; AIM-1)**

- K31 Initial approach/procedure turn (91.116(h))
- K32 Vectors to final approach (91.116(f))
- K33 Intermediate approach
- K34 Final approach
- K35 Glide slope
- K36 Decision height (91.117(b))
- K37 Inoperative components (91.117(c))
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L20 **Radio Orientation on Approach (Ch. VII—IFH)**

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- L23 LOC and glide slope (EOG-7; Ch. VI—IFH)
- L24 Marker beacons (Ch. VI—IFH)
- L25 Compass locators (EOG-23)
- L26 NDB (EOG-23)
- L27 VOR/VORTAC (EOG-7)
- L28 LOC type; LDA, SDF (AIM-1)

L30 **Wake turbulence (AIM-1; AC 90-23D)**

- L31 Landing hazards
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M10 **Terminal Area (IAPC; AIM-3)**

- M11 Approach control facility: frequencies, area
- M12 FSS (AIM-1): airport advisories, flight plan service, weather service

M20 **Instrument Approach Procedure Chart—Planview (AC 90-1A; IAPC legend)**

- M21 Facility frequencies and services
- M22 Procedural tracks
- M23 Fixes and markers
- M24 Obstructions
- M25 Special use airspace
- M26 Radio aids
- M27 Minimum altitudes

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M30 **Instrument Approach Procedure Chart—Profile (AC 90–1A; IAPC legend)**

- M31 Altitude limits
- M32 Descent pattern/glide slope
- M33 Facilities/fixes

M40 **Instrument Approach Procedure Chart Aerodrome Sketch (AC 90–1A; IAPC legend)**

- M41 Runway configuration and specifications
- M42 Approach light systems
- M43 Elevations: Obstacles, TDZE, and aerodrome
- M44 Airport taxi chart

M50 **Instrument Approach Procedure Chart—Minimums Section (AC 90–1A; IAPC legend)**

- M51 Aircraft category
- M52 DH/MDA
- M53 HAT
- M54 HAA
- M55 Minimum visibility: miles/RVR
- M56 IFR takeoff minimums and departure procedures
- M57 IFR alternate minimums
- M58 Civil RADAR instrument approach minimums

M60 **Approach Facilities (AIM–1; IFH)**

- M61 ILS
- M62 LDA
- M63 SDF
- M64 VOR/VORTAC
- M65 NDB
- M66 Marker beacons, compass locators
- M67 VASI (91.87(d)(8))

1. A13 The pilot in command of a civil aircraft must have an Instrument Rating only when operating

1- under instrument flight rules, in weather conditions less than the minimum prescribed for VFR flight, and in a positive control area or route segment.
2- in controlled airspace in weather conditions less than the minimum prescribed for VFR flight.
3- in controlled airspace when operating under instrument flight rules.
4- in weather conditions less than the minimum prescribed for VFR flight.

2. A13 Which operation requires an instrument rated pilot in command?

1- DVFR.
2- Night VFR in TCAs.
3- VFR over the top.
4- "VFR conditions on top."

3. A13 A pilot holds a Private Pilot Certificate with a rotorcraft category and helicopter class rating; airplane category, single-engine land class rating; and an airplane instrument rating. May this pilot act as pilot in command of a helicopter under IFR conditions?

1- No; any pilot who acts as pilot in command of a helicopter under IFR must hold at least a helicopter instrument rating.
2- No; however, the pilot may do so if the FAA written test for the Airline Transport Pilot-Helicopter Certificate has been satisfactorily completed.
3- Yes, if a pilot with an Instrument Rating-Helicopter Certificate is aboard the aircraft.
4- Yes, if all recency of experience provisions of regulations are met.

4. A13 Under which condition must the pilot in command of a civil aircraft have an instrument rating?

1- For any flight above an altitude of 1,200 feet AGL, when the visibility is less than 3 miles.
2- When flying on an airway under simulated instrument conditions.
3- For a flight in VFR conditions on an IFR flight plan.
4- Anytime when flying above a solid overcast.

5. A11 You hold a Private Pilot Certificate, a single-engine land class rating, and an airplane instrument rating. You also hold a rotorcraft category rating and a helicopter class rating. According to regulations, may you act as pilot in command of a helicopter in IFR conditions?

1- No; however, regulations permit you to do so if you hold an Airline Transport Pilot-Airplane Certificate.
2- No; you must hold at least a helicopter instrument rating.
3- Yes, providing you meet the recency of experience requirements in a helicopter.
4- Yes, if a certificated helicopter instrument instructor is on board.

6. A13 You hold a Commercial Pilot Certificate with an airplane category, multi-engine land and sea class ratings, and an instrument rating. You also hold a rotorcraft category and a helicopter class rating. According to regulations, may you act as pilot in command of a helicopter under IFR conditions?

1- No; however, regulations permit you to do so if the pilot in the other control position holds a helicopter instrument rating.
2- Yes; if the second in command is either a certificated airplane or helicopter instrument flight instructor.
3- Yes; however, a certificated helicopter flight instructor must also be on board.
4- No; to act as pilot in command, you must hold a helicopter instrument rating.

7. A13 Which flight operation, below 18,000 feet, requires the pilot in command to be instrument rated?

1- A flight operation in a control zone when passengers are carried in weather conditions less than basic VFR.
2- Any flight operation where the pilot in command controls the airplane solely by reference to flight instruments.
3- A flight operation in weather conditions less than the minimums prescribed for VFR flight or under instrument flight rules.
4- Any flight operation in controlled airspace where controlled by ATC.

8. A11 You hold a Commercial Pilot Certificate, a multi-engine land class rating, and an airplane instrument rating. You also hold a rotorcraft category and a helicopter class rating. Do regulations permit you to act as pilot in command of a helicopter in IFR conditions?

1- No; however, regulations specify that you may do so if you hold an Airline Transport Pilot Certificate-Helicopter, limited to VFR.
2- No; you must hold either a helicopter instrument rating, or an Airline Transport Pilot Certificate-Helicopter, not limited to VFR.
3- Yes; however, you must comply with the recent instrument experience requirements of regulations as they apply to helicopters.
4- Yes, if the second in command is a certificated airplane or helicopter instrument flight instructor.

9. A13 You plan to practice instrument maneuvers in a helicopter in simulated instrument conditions. You may utilize an individual as safety pilot in the other control position if that person holds

1- a rotorcraft category and a helicopter class rating.
2- an instrument rating in either helicopters or airplanes.
3- a student pilot certificate and is receiving helicopter instrument training.
4- a Flight Instructor Certificate with airplane and instrument ratings.

10. A13 You hold a Commercial Pilot Certificate, a multi-engine land class rating, and an airplane instrument rating. You also hold a rotorcraft category and a helicopter class rating. Do regulations permit you to act as pilot in command of a helicopter in IFR conditions?

1- No, you must hold either a helicopter instrument rating or an Airline Transport Pilot Certificate-Helicopter, not limited to VFR.
2- No; however, regulations specify that you can do so if you hold an Airline Transport Pilot Certificate-Helicopter, limited to VFR.
3- Yes; however, you must comply with the recent instrument experience requirements of regulations as they apply to helicopters.
4- Yes, if the second in command is a certificated airplane or helicopter instrument flight instructor.

11. A13 A private pilot holds the following: rotorcraft category and helicopter class rating; airplane category, multi-engine land class rating, and an airplane instrument rating. Do regulations permit this pilot to act as pilot in command of a helicopter under IFR conditions?

1- No; however, regulations do permit this if the pilot holds an Airline Transport Pilot-Airplane Certificate.
2- Yes, if the second in command is either a certificated airplane or helicopter instrument flight instructor.
3- No, the pilot in command must hold either an unrestricted Airline Transport Pilot Certificate-Helicopter, or a helicopter instrument rating.
4- Yes, if the second-in-command holds a helicopter instrument rating.

12. A13 A private pilot holds the following: rotorcraft category and helicopter class rating; airplane category, single-engine land class rating; and an airplane instrument rating. May this pilot act as pilot in command of a helicopter under IFR conditions?

1- Yes, if all recency of experience provisions of regulations are met.
2- Yes, if either an Airline Transport Pilot-Helicopter, or a pilot with an Instrument Rating-Helicopter is aboard the aircraft.
3- No; any pilot who acts as pilot in command of a helicopter under IFR must hold at least a helicopter instrument rating.
4- No; however, the pilot may do so after having satisfactorily completed the FAA written test for the Airline Transport Pilot Certificate-Helicopter.

13. A14 You have accomplished six instrument approaches during 1 hour of simulator time, within the past 6 months. Which additional instrument experience, within the past 6 months, qualifies you to act as pilot in command of a helicopter under IFR conditions?

1- Three hours of actual instrument flight time in a helicopter.
2- Five hours of simulated instrument flight time in a helicopter.
3- Four hours of actual or simulated instrument flight time in either a helicopter or an airplane.
4- Two hours of actual instrument flight time in a helicopter, and 3 hours of simulated instrument flight time in an airplane.

14. A13 You hold a Private Pilot Certificate, a single-engine land class rating, and an airplane instrument rating. You also hold a rotorcraft category rating and a helicopter class rating. Do regulations permit you to act as pilot in command of a helicopter in IFR conditions?

1- No; you must hold at least a helicopter instrument rating.
2- No; however, regulations permit you to do so if you hold an Airline Transport Pilot-Airplane Certificate.
3- Yes, if a certificated helicopter instrument instructor occupies the other control position.
4- Yes, providing you meet the recency of experience requirements in a helicopter.

15. A14 You meet the recent instrument experience requirements of regulations to act as pilot in command of a helicopter under IFR if, during the past 6 months, you have accomplished 4 hours of instrument time in a simulator, performed four instrument approaches in an airplane, and have also accomplished

1- two instrument approaches and 2 hours of actual instrument flight time in an airplane.
2- six instrument approaches in a helicopter and 2 hours of simulated instrument time in either a helicopter or an airplane.
3- three instrument approaches and 2 hours of simulated instrument time in a helicopter.
4- two instrument approaches and 3 hours of simulated instrument flight time in a helicopter.

16. A14 Within the past 6 months, you have accomplished six instrument approaches in an airplane. Which additional instrument experience within the past 6 months qualifies you to act as pilot in command of a helicopter under IFR conditions?

1- Six hours of actual instrument flight time in a helicopter.
2- Three hours of simulated instrument flight time and three instrument approaches in a helicopter.
3- Four hours of actual or simulated instrument flight time in either an airplane or a helicopter, and three instrument approaches in a helicopter.
4- Two hours of actual instrument flight time in a helicopter and 4 hours of simulated instrument flight time in an airplane.

17. A14 In addition to the instrument approaches, which instrument experience within the past 6 months qualifies you to act as pilot in command of a helicopter under IFR conditions?

1- Two hours of actual instrument flight time in a helicopter, and 4 hours of simulated instrument flight time in an airplane.
2- Four hours of actual or simulated instrument flight time in either an airplane or a helicopter.
3- Three hours of actual instrument flight time in a helicopter.
4- Six hours of simulated instrument flight time in a helicopter.

18. A14 How much time after your instrument recent experience lapses do you have before you must pass an instrument competency check to act as pilot in command under IFR?

1- 90 days
2- 6 months
3- 12 months
4- 24 months

19. A14 A pilot fails to meet the "recency of experience" instrument requirements on August 5 of this year. What is the latest date the pilot can meet those requirements and not have to take an instrument competency check to act as pilot in command under IFR?

1- August 4, next year.
2- February 4, next year.
3- November 4, this year.
4- September 4, this year.

20. A14 To meet the minimum required instrument experience to remain current for IFR operations, you must accomplish during the past 6 months at least

1- six instrument approaches and 6 hours of instrument time in any aircraft.
2- six instrument approaches and 6 hours of instrument time; 3 hours of the instrument time must be in the category of aircraft to be flown.
3- six instrument approaches, three of which must be in the same category and class of aircraft to be flown, and 6 hours of instrument time in any aircraft.
4- six instrument approaches, three of which must be in the same category of aircraft to be flown; and 6 hours of instrument time, 3 hours of which must be in the same category of aircraft to be flown.

21. A14 What minimum conditions are necessary for the six approaches required for instrument currency?

1- The approaches may be made in either an aircraft or an approved instrument ground trainer.
2- At least three of the six approaches must be made in an aircraft.
3- At least three of the six approaches must be made in the same category of aircraft to be flown.
4- At least three of the six approaches must be made in the same category and class of aircraft to be flown.

22. A14 You meet the instrument recency of experience requirement to act as pilot in command of a helicopter under IFR conditions if, during the past 6 months, you have flown 3 hours of simulated instrument flight time, performed three instrument approaches in an airplane, and have also accomplished

1- two instrument approaches and 6 hours of actual instrument flight time in a helicopter.
2- three instrument approaches and 3 hours of simulated instrument flight time in a helicopter.
3- three instrument approaches in a helicopter and 2 hours of actual instrument flight time in an airplane.
4- six instrument approaches in a helicopter and 3 hours of simulated instrument flight time in either a helicopter or an airplane.

23. A14 How long does a pilot remain current for IFR flight after successfully completing an instrument competency check if no further IFR flights are made?

1- 12 months
2- 60 days
3- 90 days
4- 6 months

24. A14 What minimum instrument time is required within the last 6 months in order to be current for IFR?

1- Six hours; at least 3 of the 6 in the category of aircraft to be flown.
2- Six hours; at least 3 of the 6 in actual instrument conditions.
3- Six hours in the same category aircraft.
4- Six hours in the same category aircraft, and at least 3 of the 6 in actual conditions.

25. A14 What minimum <u>flight hours</u> in the past 6 months are required to maintain instrument currency in an airplane?

1- Three hours of actual or simulated instrument time in the same class airplane.
2- Three hours of actual or simulated instrument time in an airplane.
3- Three hours of actual instrument time.
4- Three hours of instrument time in IFR conditions in the same category aircraft.

26. A14 Which instrument experience, accomplished within the past 6 months, qualifies a person to act as pilot in command of a helicopter under IFR conditions?

1- Two hours of actual instrument flight time in a helicopter, 4 hours of simulated instrument flight time in an airplane, two instrument approaches in a simulator, and four instrument approaches in a helicopter.
2- Three hours of simulated instrument flight time in a helicopter, 3 hours of actual instrument flight time in an airplane, four instrument approaches in a simulator, and two instrument approaches in a helicopter.
3- Three instrument approaches in an airplane, 3 hours of actual instrument flight time in a helicopter, and three instrument approaches in a helicopter.
4- Four hours of actual or simulated instrument flight time in either a helicopter or an airplane, and six instrument approaches in a helicopter.

27. A14 What are the minimum recency of experience requirements for instrument flight? (Do not consider the instrument competency check.)

	Instrument flight time in same category--last 6 months	Other instrument time--last 6 months	Instrument Approaches
1-	6 hours	0	6--last 90 days
2-	3 hours	3 hours	3--last 90 days
3-	6 hours	0	6--last 6 months
4-	3 hours	3 hours	6--last 6 months

28. A14 Which instrument experience, within the past 6 months, qualifies you to act as pilot in command of a helicopter under IFR conditions?

1- Four instrument approaches in a helicopter, two instrument approaches in a simulator, 2 hours of actual instrument flight time in a helicopter, and 4 hours of simulated instrument flight time in an airplane.
2- Two instrument approaches in a helicopter, four instrument approaches in a simulator, 3 hours of simulated instrument flight time in a helicopter, and 3 hours of actual instrument flight time in an airplane.
3- Three instrument approaches in a helicopter, three instrument approaches in an airplane, and 3 hours of actual instrument flight time in a helicopter.
4- Six instrument approaches in a helicopter and 4 hours of actual or simulated instrument flight time in either a helicopter or an airplane.

29. A14 What minimum conditions are necessary for the instrument approaches required for IFR currency?

1- A minimum of six in an aircraft within the past 6 months.
2- A minimum of six in any approved instrument ground trainer or aircraft within the past 6 months.
3- A minimum of six, at least three of which must be in an aircraft within the past 6 months.
4- A minimum of six in an aircraft, at least three of which must be in the same category within the past 6 months.

30. A14 The instrument recency of experience requirements to act as pilot in command of a helicopter under IFR are met by a pilot who, during the past 6 months, has accomplished six instrument approaches and 4 hours of instrument time in a simulator, and has also accomplished

1- three instrument approaches and 6 hours of simulated instrument flight time in either a helicopter or an airplane.
2- 3 hours of actual instrument flight time in either an airplane or a helicopter.
3- 3 hours of simulated instrument flight time in a helicopter.
4- three instrument approaches and 2 hours of actual instrument flight time in a helicopter.

31. A14 A private pilot passed the flight check and received an instrument rating on July 15, 1977. Based on this flight only, which is the last day the pilot will be current to exercise each privilege of the Private Pilot Certificate and Instrument Rating? (Do not consider the medical certificate.)

	Pilot in Command	Carry Passengers	Instrument Flight
1-	7/31/79	10/31/77	1/31/78
2-	7/14/79	10/13/77	1/31/78
3-	7/31/79	10/13/77	1/14/78
4-	7/14/79	10/13/77	1/14/78

32. A14 To satisfy the IFR recency of experience requirement regarding instrument approaches, the pilot must have made at least

1- three instrument approaches within the past 90 days in the same category and class aircraft to be flown.
2- three instrument approaches within the past 90 days in an airplane, helicopter, approved instrument ground trainer, or simulator.
3- six instrument approaches within the past 6 months, three of which must have been in the category of aircraft to be flown.
4- six instrument approaches within the past 6 months in any airplane, helicopter, approved instrument ground trainer, or simulator.

33. A14 Which instrument experience, within the past 6 months, qualifies you to act as pilot in command of a helicopter under IFR conditions?

1- Two instrument approaches in a helicopter, four instrument approaches in an airplane, and 3 hours of actual instrument flight time in a helicopter.
2- Four instrument approaches in a helicopter, two instrument approaches in a simulator, 2 hours of simulated instrument flight time in a helicopter, and 4 hours of actual instrument flight time in an airplane.
3- Four instrument approaches in a helicopter, two instrument approaches in a simulator, 3 hours of simulated instrument flight time in a helicopter, and 3 hours of simulated instrument flight time in an airplane.
4- Six instrument approaches in a helicopter and 6 hours of actual or simulated instrument flight time in either a helicopter or an airplane.

34. A14 Which instrument recency of experience qualifies a pilot to act as pilot in command of a helicopter under IFR conditions?

1- Six instrument approaches in a helicopter, and 6 hours of actual or simulated instrument flight time in either a helicopter or an airplane within the past 6 months.
2- One instrument approach in a helicopter, five instrument approaches in a simulator, 4 hours of simulated instrument flight time in a helicopter, and 2 hours of actual instrument flight time in an airplane within the past 6 months.
3- Three instrument approaches in a helicopter, three instrument approaches in either an airplane or a simulator, and 5 hours of simulated instrument time in a helicopter within the past 6 months.
4- Four instrument approaches in a helicopter and two in a simulator; 2 hours of simulated instrument flight time in a helicopter, and 4 hours of actual instrument flight time in an airplane within the past 6 months.

35. A14 What takeoff and landing requirements must have been met within the preceding 90 days to carry passengers on a night IFR flight?

1- At least three night takeoffs and landings to a full stop in the category and class of aircraft to be used.
2- At least five night takeoffs and landings, three of which must have been in the category and class of aircraft to be used.
3- At least two night takeoffs and landings to a full stop in the category and class of aircraft to be used.
4- At least five night takeoffs and landings to a full stop.

36. A14 To meet the 6 hours of instrument time within the past 6 months, required for currency in an airplane, at least 3 of the 6 hours must be obtained in

1- an aircraft under actual or simulated IFR conditions.
2- an aircraft in actual IFR conditions.
3- an airplane under actual or simulated IFR conditions.
4- the same class airplane as the one to be flown.

37. A14 Which experience, within the past 6 months, qualifies you to act as pilot in command of a helicopter in IFR conditions?

1- Four instrument approaches in each, a simulator and a helicopter, and 4 hours of actual instrument time in an airplane.
2- Six instrument approaches in a helicopter and 6 hours of actual or simulated instrument time in either a helicopter or an airplane.
3- Six instrument approaches in a simulator, 4 hours of simulated instrument time in a helicopter, and 2 hours of actual instrument time in an airplane.
4- Three instrument approaches in each, a helicopter and an airplane, and 5 hours of simulated instrument time in a helicopter.

38. A14 In the past 6 months, you have accomplished 4 hours of instrument time in a simulator and four instrument approaches in an airplane. Which additional experience will enable you to meet the recency of experience requirements to act as pilot in command of a helicopter under IFR?

1- Six instrument approaches in a helicopter and 2 hours of simulated instrument time in either a helicopter or an airplane.
2- Two instrument approaches and 2 hours of actual instrument flight time in an airplane.
3- Two instrument approaches and 3 hours of simulated instrument flight time in a helicopter.
4- Three instrument approaches and 2 hours of simulated instrument time in a helicopter.

39. A22 When an alternate airport is required, you must have sufficient fuel to complete the flight to the

1- first airport of intended landing and fly to an alternate airport within 45 minutes at normal cruising speed.
2- first airport of intended landing, then to the alternate, then fly for 45 minutes at normal cruising speed.
3- alternate and fly thereafter for 45 minutes at normal cruising speed.
4- first airport of intended landing, then to the alternate, then fly for 45 minutes at holding speed.

40. A14 You meet the instrument recency of experience requirements to act as pilot in command of a helicopter under IFR conditions if, during the past 6 months, you have flown 3 hours of simulated instrument flight time, performed four instrument approaches in an airplane, and have also accomplished

1- two instrument approaches and 2 hours of simulated flight time in a helicopter.
2- two instrument approaches and 3 hours of actual instrument flight time in a helicopter.
3- one instrument approach and 6 hours of actual instrument flight time in a helicopter.
4- six instrument approaches in a helicopter and 3 additional hours of simulated instrument flight time in either a helicopter or an airplane.

41. A21 Before beginning <u>any</u> flight under IFR, the pilot in command must become familiar with all available information concerning that flight. This information must include weather reports and forecasts, fuel requirements, known traffic delays, and landing distance information. In addition, the pilot must

1- check all the aircraft maintenance records to determine if the aircraft is airworthy.
2- list an alternate airport on the flight plan and determine if a STAR is available at the destination and alternate.
3- list an alternate airport on the flight plan and become familiar with the instrument approaches to that airport.
4- be familiar with the runway lengths at airports of intended use, and the alternatives available if the flight cannot be completed.

42. A31 Who is responsible for determining that an aircraft is safe for flight?

1- Owner
2- Mechanic
3- Operator
4- Pilot in command

43. A32 When is DME required for instrument flight?

1- Above 24,000 feet MSL when VOR navigational equipment is required.
2- In Terminal Control Areas.
3- Above 18,000 feet MSL.
4- In Positive Control Areas.

44. A22 What are the minimum fuel requirements for a flight in IFR conditions, if the first airport of intended landing is forecast to have a 1,500-foot ceiling and 3 miles visibility at flight planned ETA?

1- Enough fuel to fly to the first airport of intended landing, and then fly to an alternate within 45 minutes at normal cruising speed.
2- Enough fuel to fly to the first airport of intended landing, fly to the alternate, and then fly thereafter for 45 minutes at normal cruising speed.
3- Enough fuel to fly to the first airport of intended landing, then fly thereafter for 45 minutes at normal cruising speed.
4- Enough fuel to fly to the first airport of intended landing.

45. A32 In addition to a VOR receiver and two-way communication capability, which additional equipment is required for IFR operation in a Group I Terminal Control Area?

1- An operable coded transponder.
2- An operable DME and coded transponder.
3- At least one more VOR receiver and a DME.
4- Another VOR and communication receiver.

46. A32 What minimum navigational equipment is required for IFR flight?

1- VOR, ADF, and ILS receivers.
2- Navigation equipment appropriate to the ground facilities used.
3- VOR receiver, transponder, and DME.
4- VOR receiver and, if in ARTS III environment, a coded transponder equipped for altitude reporting.

47. A33 Which entry, in addition to date and signature, shall be recorded by the person performing a VOR operational check?

1- Place and bearing error.
2- Frequency, radial and facility used, and bearing error.
3- Flight hours and number of days since last check, and bearing error.
4- Tachometer reading, approval or disapproval of the VOR receiver, and the frequency used.

48. A32 Above what minimum altitude, excluding the airspace at and below 2,500 feet AGL, must airplanes and helicopters be equipped with operable transponders having Mode C capability when flying in controlled airspace of the 48 contiguous states?

1- 18,000 feet MSL
2- 14,000 feet MSL
3- 12,500 feet MSL
4- 10,000 feet MSL

49. A32 You check your flight instruments while taxiing to the "runup" area and find that the Vertical Speed Indicator (VSI) indicates a descent of 100 feet per minute. In this case, you

1- may takeoff and use 100 feet descent as the zero indication.
2- may not takeoff until the instrument is corrected by either the pilot or a mechanic.
3- may takeoff without any correction because this instrument is used very little during instrument flight.
4- must return to the parking area and have the instrument corrected by an authorized instrument repairman.

50. A32 A coded transponder equipped with altitude reporting equipment is required for Group I TCAs and all controlled airspace

1- except control zones.
2- below 14,500 feet MSL.
3- above 12,500 feet MSL.
4- above 2,500 feet above the surface.

51. A33 Within how many months preceding an IFR airplane flight in controlled airspace must the static pressure system and each altimeter instrument have been tested and inspected and found to meet FAA standards?

1- 12 months
2- 18 months
3- 24 months
4- 36 months

52. A33 What is an acceptable range of accuracy when checking a VOR receiver by use of a VOT?

1- 178° to 182° FROM
2- 176° to 184° TO
3- 354° to 006° FROM
4- 356° to 004° TO

53. A33 What is the maximum tolerance between the two omni-bearing indicators of a dual VOR system (units independent of each other--except the antenna) when making a VOR equipment check while airborne?

1- Plus or minus 4° between the indicated bearings to the station.
2- Plus or minus 6° between the indicated bearings to the station.
3- 4° between the indicated bearings to the station.
4- 6° between the indicated bearings to the station.

54. A33 In addition to the annual, what inspection, checks, or tests must be performed on an aircraft to operate under IFR if passengers are <u>not</u> carried for hire?

1- Altimeter system test within the last 24 calendar months, and VOR operational check within the last 10 days and 10 hours of operation.
2- 100-hour inspection, weight and balance check prior to each flight, and altimeter system test within the last 24 calendar months.
3- Weight and balance check prior to each IFR flight, altimeter system test within the last 24 calendar months, and transponder test each 12 calendar months.
4- Altimeter system test within the last 12 calendar months, VOR operational test within the preceding 10 days or 10 flight hours of operation, and transponder test within the last 24 calendar months.

55. A33 When an airplane is located on the designated checkpoint of an airport, a VOR receiver check should be made by tuning the receiver to the VOR frequency and setting the OBS to

1- 180° plus or minus 4° to center the CDI; the TO/FROM indication should be TO.
2- 360°; alter heading of the aircraft to within plus or minus 4° of 360°; the CDI should then be centered.
3- the designated radial, then center the CDI with the OBS, if necessary; the OBS must read within plus or minus 4° of the designated radial with the TO/FROM indicator on TO.
4- the designated radial, then center the CDI with the OBS, if necessary; the OBS must read within plus or minus 4° of the designated radial with the TO/FROM indicator on FROM.

56. What record shall be made by the pilot
A33 performing a VOR operational check?

1- The date, tach reading, frequency and bearing reading, and signature in the aircraft log.
2- The date, place, bearing error, and signature in the aircraft log or other permanent record.
3- The date, frequency of VOR or VOT, number of hours flown since last check, and signature in the aircraft log.
4- The date, approval or disapproval, tach reading, and signature in the aircraft log or other permanent record.

57. Which is the correct indication and
A33 acceptable tolerance when performing a ground check of the aircraft VOR equipment using a VOT frequency?

	TO/FROM	CDI (BEARING)	TOLERANCE
1-	TO	180°	±6°
2-	TO	000°	±4°
3-	FROM	000°	±4°
4-	FROM	180°	±6°

58. When must an operational check on the
A33 aircraft VOR equipment be accomplished to operate under IFR?

1- Every 10 days of operation and 10 hours of flight time.
2- Within the past 10 hours of flight and 10 days.
3- Each 10 days of operation or 10 hours of flight time, whichever occurs last.
4- Each 10 days of operation or 10 hours of flight time, whichever occurs first.

59. What inspections, checks, or tests are
A33 required for the aircraft to operate on an IFR flight not carrying persons for hire or instruction?

1- 100-hour, weight and balance test, and altimeter systems test.
2- 100-hour, altimeter systems test, and VOR accuracy check.
3- Annual, VOR accuracy check, and altimeter systems test.
4- Annual, altimeter systems test, VOR accuracy check, and transponder test.

60. What is the maximum tolerance allowed for
A33 an operational check of the aircraft VOR equipment when using a VOT?

1- Plus or minus 2°.
2- Plus or minus 4°.
3- Plus or minus 6° if one receiver is checked against the other.
4- Plus or minus 4° for a check while on the ground, and 6° while airborne.

61. When must an operational test of the VOR
A33 system have been performed to be current for instrument flight?

1- Within the preceding 10 hours of flight time and 10 days.
2- Within the preceding 10 hours of flight time or 10 days.
3- Every 10 hours of flight time and 10 days of operation.
4- Every 10 hours of flight time or 10 days of operation.

62. When must an aircraft altimeter system
A33 test and inspection for an IFR flight be accomplished?

1- Within the preceding 12 calendar months.
2- Within the preceding 24 calendar months.
3- At each annual aircraft inspection.
4- At each 100-hour aircraft inspection if the aircraft is used for hire.

63. Your airplane had the static pressure
A33 system and altimeter tested and inspected on January 10, 1976, and was found to comply with FAA standards. These systems must be reinspected and approved for use in controlled airspace under IFR by

1- January 31, 1977.
2- January 10, 1977.
3- January 31, 1978.
4- December 31, 1977.

64. Who is responsible to determine if a
A34 particular electronic device may be carried aboard an aircraft during an IFR flight?

1- Owner or operator
2- Pilot in command
3- FAA Inspector
4- Designated FAA Examiner

65. A41 How should the transition from VFR to IFR be accomplished when you have filed a composite flight plan the first segment of which is VFR?

1- Upon reaching the point for change to IFR, contact ARTCC and request your IFR clearance.
2- Upon reaching the point for change to IFR, contact the nearest FSS and cancel the VFR portion of your flight plan, then contact ARTCC and request your IFR clearance.
3- Upon reaching the point for change to IFR, contact ARTCC and give a position report and inform them that you are ready for your IFR clearance.
4- Before arriving at the proposed point for change to IFR, or before flying into IFR conditions, contact the nearest FSS and request your IFR clearance, then cancel the VFR portion.

66. A41 Which rules apply to the pilot in command when operating VFR conditions on top?

1- IFR only.
2- VFR only.
3- VFR and IFR.
4- VFR when "in the clear" and IFR when "in the clouds."

67. A41 Prior to which operation must an IFR flight plan be filed and an appropriate ATC clearance received?

1- Entering weather conditions below VFR minimums.
2- Takeoff when IFR weather conditions exist.
3- Entering controlled airspace when IFR weather conditions exist.
4- Flying by reference to instruments in controlled airspace.

68. A41 In which airspace are "VFR on Top" operations prohibited?

1- When flying through a TCA.
2- In uncontrolled airspace.
3- On that part of a flight through a Control Zone.
4- In Positive Control Airspace.

69. A41 To operate an aircraft under IFR, a flight plan must have been filed and an ATC clearance received prior to

1- entering controlled airspace.
2- entering clouds.
3- takeoff.
4- entering weather conditions below VFR minimums.

70. A41 When can a "VFR Conditions On Top" clearance be assigned by ATC?

1- Anytime suitable conditions exist and ATC wishes to expedite traffic flow.
2- When VFR conditions exist, but there is a layer of clouds below the MEA.
3- Anytime IFR conditions exist at the departure point, but not at the destination.
4- Upon request of the pilot when conditions are indicated to be suitable.

71. A41 Which airspace requires filing an IFR flight plan?

1- Any airspace when the visibility is less than 1 mile.
2- Controlled airspace with IFR weather conditions and Positive Control Area.
3- Continental Control Area, Terminal Control Area, and airspace with IFR conditions.
4- Any airspace above 700 feet, or 1,200 feet where designated, if the visibility is less than 1 mile.

72. A41 To operate under IFR below 18,000 feet, a pilot must file an IFR flight plan and receive an appropriate ATC clearance prior to

1- takeoff.
2- entering controlled airspace.
3- entering weather conditions below VFR minimums.
4- flying by reference to instruments in controlled airspace.

73. A41 When may a pilot file a composite flight plan?

1- When requested or advised by ATC.
2- Anytime a portion of the flight will be VFR.
3- Anytime a landing is planned at an intermediate airport.
4- Only if the entire flight is in controlled airspace.

74. A41 Where are IFR flight operations required during VFR weather conditions?

1- Group I TCA.
2- Positive control area.
3- Group III TCA.
4- Continental Control Area and Positive Control Area.

75. A41 If you depart from an airport located outside controlled airspace during IFR conditions, you must file an IFR flight plan and receive a clearance before

1- takeoff.
2- entering controlled airspace.
3- operating the aircraft with reference to instruments.
4- entering an area where the visibility is less than 1 mile.

76. A42 Which ATC clearance should instrument-rated pilots request in order to climb through a layer of overcast or reduced visibility and then continue the flight VFR?

1- "Special VFR."
2- "VFR over the top."
3- IFR, to "VFR Conditions On Top."
4- "Special VFR" to "VFR Conditions On Top."

77. A42 When filing a composite flight plan where the first portion of the flight is IFR, which fix(es) should be indicated on the flight plan?

1- All compulsory reporting points along the entire route.
2- The fix where you plan to start the VFR portion of the flight.
3- All reporting points along the IFR route.
4- The VORs that determine the route of flight, and the fix where you plan to cancel your flight plan.

78. A43 What standard minimums are required to list an airport as an alternate on an IFR flight plan if the airport has a VOR approach only?

1- 600 feet and 2 miles
2- 800 feet and 2 miles
3- 800 feet and 1 mile
4- 1,000 feet and 3 miles

79. A43 What minimum weather conditions must be forecast for your ETA at an alternate airport that has no approved instrument approach procedure in order to list it on your IFR flight plan?

1- 600-foot ceiling and 2 statute miles visibility.
2- 800-foot ceiling and 2 statute miles visibility.
3- 1,000-foot ceiling and 1 statute mile visibility.
4- Adequate ceiling and visibility to allow descent from MEA, approach, and landing under basic VFR.

80. A43 What minimum weather conditions must be forecast for your ETA at an airport that has only a non-precision approach procedure, with standard alternate minimums, in order to list it as an alternate on your IFR flight plan?

1- 600-foot ceiling and 2 statute miles visibility.
2- 800-foot ceiling and 2 statute miles visibility.
3- 1,000-foot ceiling and 1 statute mile visibility.
4- Adequate ceiling and visibility to allow descent from MEA, approach, and landing under basic VFR.

81. A43 What minimum weather conditions must be forecast for your ETA at an airport that has a precision approach procedure, with standard alternate minimums, in order to list it as an alternate for your IFR flight plan?

1- 600-foot ceiling and 2 statute miles visibility.
2- 800-foot ceiling and 2 statute miles visibility.
3- 1,000-foot ceiling and 1 statute mile visibility.
4- Adequate ceiling and visibility to allow descent from MEA, approach, and landing under basic VFR.

82. A43 When may an airport which does <u>not</u> have a published instrument approach be used as an alternate?

1- When the existing ceiling and visibility is at least 2,000 feet and 3 miles.
2- When the ceiling and visibility forecast for your ETA is at least 1,500 feet and 5 miles.
3- When the forecast ceiling and visibility from 2 hours before to 2 hours after your ETA is at least 1,000 feet and 3 miles.
4- When the ceiling and visibility minimums permit descent from the MEA, approach, and landing under basic VFR.

83. B14 Where can you find the latest FDC NOTAMS?

1- Any ATC facility.
2- Part 3A of the Airman's Information Manual.
3- Any FAA Flight Service Station.
4- In the NOS Instrument Approach Procedure Chart folder for the particular region.

DEPARTMENT OF TRANSPORTATION— FEDERAL AVIATION ADMINISTRATION

FLIGHT PLAN

Form Approved
OMB No. 04-R0072

1. TYPE	2. AIRCRAFT IDENTIFICATION	3. AIRCRAFT TYPE/ SPECIAL EQUIPMENT	4. TRUE AIRSPEED	5. DEPARTURE POINT	6. DEPARTURE TIME		7. CRUISING ALTITUDE
VFR / IFR / DVFR			KTS		PROPOSED (Z)	ACTUAL (Z)	

8. ROUTE OF FLIGHT

9. DESTINATION (Name of airport and city)	10. EST. TIME ENROUTE HOURS	MINUTES	11. REMARKS

12. FUEL ON BOARD HOURS	MINUTES	13. ALTERNATE AIRPORT(S)	14. PILOT'S NAME, ADDRESS & TELEPHONE NUMBER & AIRCRAFT HOME BASE	15. NUMBER ABOARD

16. COLOR OF AIRCRAFT	CLOSE VFR FLIGHT PLAN WITH _____ FSS ON ARRIVAL

FAA Form 7233-1 (5-72) FAA AC 73-8330

FIG. 1

84. A42 What amount of fuel should be entered in block 12 on an IFR flight plan? (Fig. 1)

1- The amount to satisfy block 10 plus 30 minutes.
2- The total fuel to be carried on this flight.
3- Enough to fly to destination, then to an alternate, plus 45 minutes reserve.
4- The capacity of all of the fuel tanks.

85. A42 What information should be entered in block 7 of your flight plan, if your flight has 3 legs and you desire to fly each at a different altitude? (Fig. 1)

1- Altitude for first and second legs.
2- List all three altitudes.
3- List highest altitude.
4- Desired altitude for first leg.

86. A42 Which item(s) should be checked in block 1 (TYPE) of the flight plan if a composite flight plan is desired? (Fig. 1)

1- VFR and IFR
2- VFR
3- IFR
4- DVFR

87. A42 You file your flight plan at 1500Z. The time in block 6, proposed departure time, should be (Fig. 1)

1- 1600 or later.
2- 1545 or later.
3- 1530 or later.
4- 1515 or later.

88. A42 What information should be listed in block 8 (ROUTE OF FLIGHT) if an IFR flight plan is filed for a route off airways or by area navigation? (Fig. 1)

1- Only a minimum of facilities or waypoints within 200 miles apart and those that form a turnpoint.
2- Each facility or waypoint that will be used for navigation.
3- Only those facilities that are depicted as compulsory reporting points.
4- The departure and arrival fixes and only one facility or waypoint in each ARTCC area.

89. A42 What special equipment should be entered in block 3 of the flight plan? (Fig. 1)

1- Transponder, DME, TACAN, or approved area navigation.
2- Transponder, ELT, DME, or TACAN.
3- Any standby or dual equipment.
4- DME, ADF, and airborne radar.

90. What is the purpose of FDC NOTAMs?
B14

1- To provide all information considered essential to flight safety in one publication.
2- To issue notices for all airports and navigation facilities in the shortest possible time.
3- To advise of regulatory changes in instrument approach procedures prior to their normal publication cycle.
4- To provide the latest information on the status of navigation facilities to all FSS facilities for scheduled broadcasts.

91. Why should you review the latest FDC NOTAMs during preflight planning for an IFR flight?
B14

1- To find the restrictions to en route navigation aids.
2- To be aware of all of the latest flight safety information.
3- To obtain the latest information on the status of navigation facilities.
4- To see if there have been changes made that will affect an approach procedure that you might make.

92. What is a necessary condition for ATC to approve an IFR random RNAV route other than the aircraft being RNAV certificated and the pilot properly filing the IFR flight plan?
B16

1- The aircraft must be equipped with dual RNAV receivers.
2- The RNAV waypoints must be established fixes.
3- The route must be in radar environment.
4- The pilot must file the flight plan at least 1 hour prior to expected departure time.

93. What radio fixes may be used to define an off-airway direct route on an IFR flight plan?
B17

1- Only established Area Navigation Fixes not more than 80 NM apart.
2- Any type fix that the pilot can use to determine a position.
3- Only navigational aids established for use in a particular high or low altitude structure.
4- Any VHF or LF radio facility from which a fix can be established within 80 NM of the succeeding fix.

94. Why should a pilot specifically request FDC NOTAMS when filing an IFR flight plan?
B14

1- It is specifically required by regulation as an IFR preflight action.
2- FDC NOTAMS report conditions of facilities en route that may cause delays.
3- FDC NOTAMS define the IFR routes with the best service for weather and related flight conditions.
4- FDC NOTAMS contain the latest changes in instrument flight procedures that are not yet available on charts.

95. What is the purpose of FDC NOTAMs?
B14

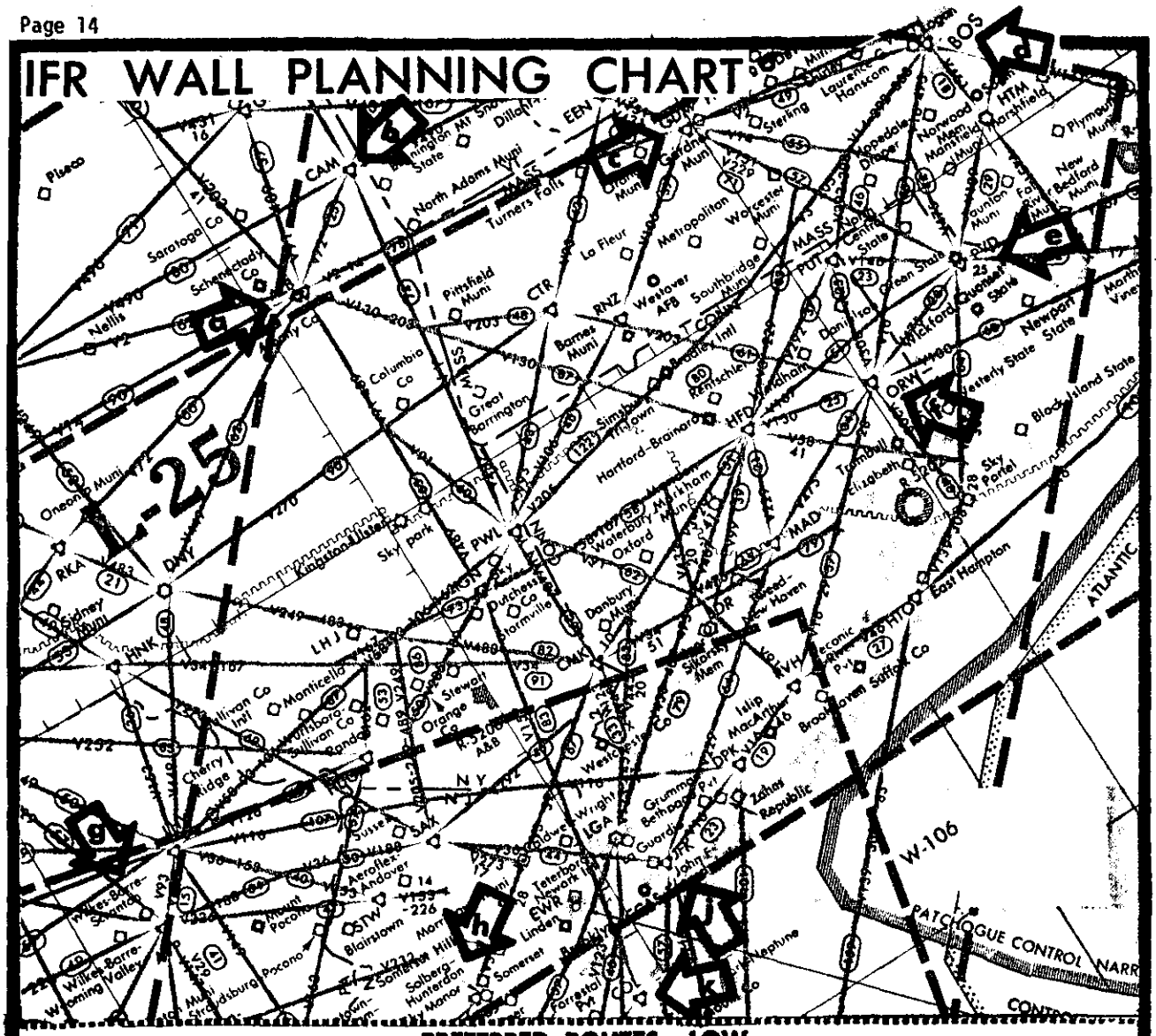
1- To issue notice of the operational status of all airports and navigation facilities in the shortest possible time.
2- To provide one publication with the latest flight safety information applying to airways, facilities, and airports.
3- To provide Flight Service Stations with the latest information on the status of navigation facilities for scheduled broadcasts.
4- To advise of changes in flight data, of a regulatory nature, that affect Standard Instrument Approach Procedures, Aeronautical Charts, and selected Flight Restrictions.

96. You plan to fly at 9,000 feet with a TAS of 175 knots. The upper wind forecast (FD) indicates the wind will be 230° @ 27 knots. The average magnetic course is 322° and the average variation is 15° east. What is the estimated groundspeed?
B22

1- 167 knots
2- 170 knots
3- 174 knots
4- 181 knots

97. During a climb on an instrument departure, helicopter performance is most adversely affected by
B32

1- higher than standard temperature and high relative humidity.
2- lower than standard temperature and low relative humidity.
3- higher than standard temperature and low relative humidity.
4- lower than standard temperature and high relative humidity.



PREFERRED ROUTES—LOW

Terminals	Route	Effective Times (GMT)
ALBANY		
Boston	(60–170 incl V2 GDM V431	1000–0300
Kennedy	(130–170 incl) V489 V157 Empire	1000–0300
	or	
	(90–120 incl) V91 V487 CMK	1000–0300
Guardia	(90–170 incl) V91 V487 CMK	1000–0300
Newark	(80–170 incl) ALB205 SAX034 Monroe	1000–0300
BOSTON METRO AREA		
Kennedy	(80–170 incl) V292 PUT V308 ORW V16 Bohemia	1000–0300
La Guardia	(60–170 incl) V3 CMK	1000–0300
Newark	(110–170 incl) V205 Monroe	1000–0300
Philadelphia	(100–170 incl) V308 HTO V139 Driftwood V312 Fantail	1000–0300
NEW YORK METRO AREA		
From **NEWARK** only		
Albany	(70–170 incl) Merritt V467 Seymour V91 PWL V487 Canaan V130	1100–0300
Baltimore	(80–170 incl) SBJ V3 V93 Jarrettsville	0000–2359
Boston	(70–170 incl) Merritt V475 ORW V16	1100–0300
From **KENNEDY** only		
Albany	(60–170 incl) Belle Terre BDR BDR027 V91 PWL V487 Canaan V130	1100–0300
Baltimore	(90–170 incl) CYN V16 ENO V379 Grasonville V93	1100–0300
Boston	(60–170 incl) Belle Terre V229 MAD V475 ORW V16	1100–0300

FIG. 2

98. B24 For planning purposes, approximately what minimum fuel is required for an IFR flight from Wilkes-Barre-Scranton Airport (g) to Boston (d)? An alternate is required. (Fig. 2)

TAS- - - - - - - - - - - - 165 knots
Wind - - - - - - - - - - - - Average 15 knots headwind
Route- - - - - - - - - - - - LHY V58 PWL V205 BOS
Alternate- - - - - - - - - V16 ORW (f) (Wind 15 knots tailwind.)
Fuel consumption - - - - - 13.5 GPH
Add a total of 5.5 gallons for taxi, takeoff, climbout to LHY, approach, and landing.

1- 22.8 gallons
2- 28.3 gallons
3- 34.0 gallons
4- 39.5 gallons

99. B11 Plan an IFR route from Albany, New York (a), to Kennedy International (j), which will minimize delays and changes while en route. Depart 1400Z and cruise 11,000 feet. (Fig. 2)

1- V489 IGN V157 V36 JFK
2- V489 V157 Empire Vector to JFK
3- V91 V487 CMK Vector to JFK
4- Belle Terre BDR BDR027 V91 PWL V487 Canaan V130

100. B11 Plan an IFR route from Boston (d) to Kennedy International (j) which will minimize delays and changes while en route. Depart 1200Z and cruise 12,000 feet. (Fig. 2)

1- V292 PUT V308 ORW V16 Bohemia Vector to JFK
2- V16 ORW V475 MAD V229 Belle Terre Vector to JFK
3- V475 MAD V229 JFK
4- V16 JFK

101. B11 Plan an IFR route from Kennedy International (j) to Boston (d) which will minimize delays and changes while en route. Depart 1330Z and cruise 13,000 feet. (Fig. 2)

1- V229 HFD V292 BOS
2- V229 MAD V475 BOS
3- Belle Terre V229 MAD V475 ORW V16 BOS
4- V16 BOS

102. B24 For planning purposes, approximately what minimum fuel is required for an IFR flight from Green State Airport at Providence (e) to Solberg-Hunterdon (h)? An alternate is required. (Fig. 2)

TAS- - - - - - - - - - 172 knots
Wind - - - - - - - - - - Average 36 knots headwind
Route- - - - - - - - - - PVD V167 HFD V3 SBJ
Alternate- - - - - - - V3 CMK (Wind 36 knots tailwind)
Fuel consumption - - - 13 GPH
Add a total of 3.6 gallons for taxi, takeoff, climbout, approach, and landing.

1- 23.8 gallons
2- 30.2 gallons
3- 33.7 gallons
4- 20.2 gallons

103. B24 For planning purposes, approximately what minimum fuel is required for an IFR flight from Gardner Muni (c) to Wilkes-Barre-Scranton Airport (g)? An alternate is required. (Fig. 2)

TAS- - - - - - - - - - 177 knots
Wind - - - - - - - - - - Average 20 knots headwind
Route- - - - - - - - - - GDM V106 AVP
Alternate- - - - - - - V106 PWL (Wind 20 knots tailwind)
Fuel consumption - - - 13.6 GPH
Add 5.6 gallons for taxi, takeoff, climbout, and landing approach.

1- 29.2 gallons
2- 34.4 gallons
3- 38.8 gallons
4- 42.4 gallons

104. B24 For planning purposes, approximately what minimum fuel is required for an IFR flight from Colt's Neck (k) to Cambridge (b)? An alternate is required. (Fig. 2)

TAS- - - - - - - - - - - 155 knots
Wind - - - - - - - - - - - Average 10 knots tailwind
Route- - - - - - - - - - - COL V157 IGN V489 ALB V72 CAM
Alternate- - - - - - - - V72 ALB V489 IGN (Wind 10 knots headwind)
Fuel consumption - - - - 12.8 GPH
Add 3.3 gallons for taxi, takeoff, climbout, and landing approach.

1- 30.9 gallons
2- 40.8 gallons
3- 37.5 gallons
4- 34.2 gallons

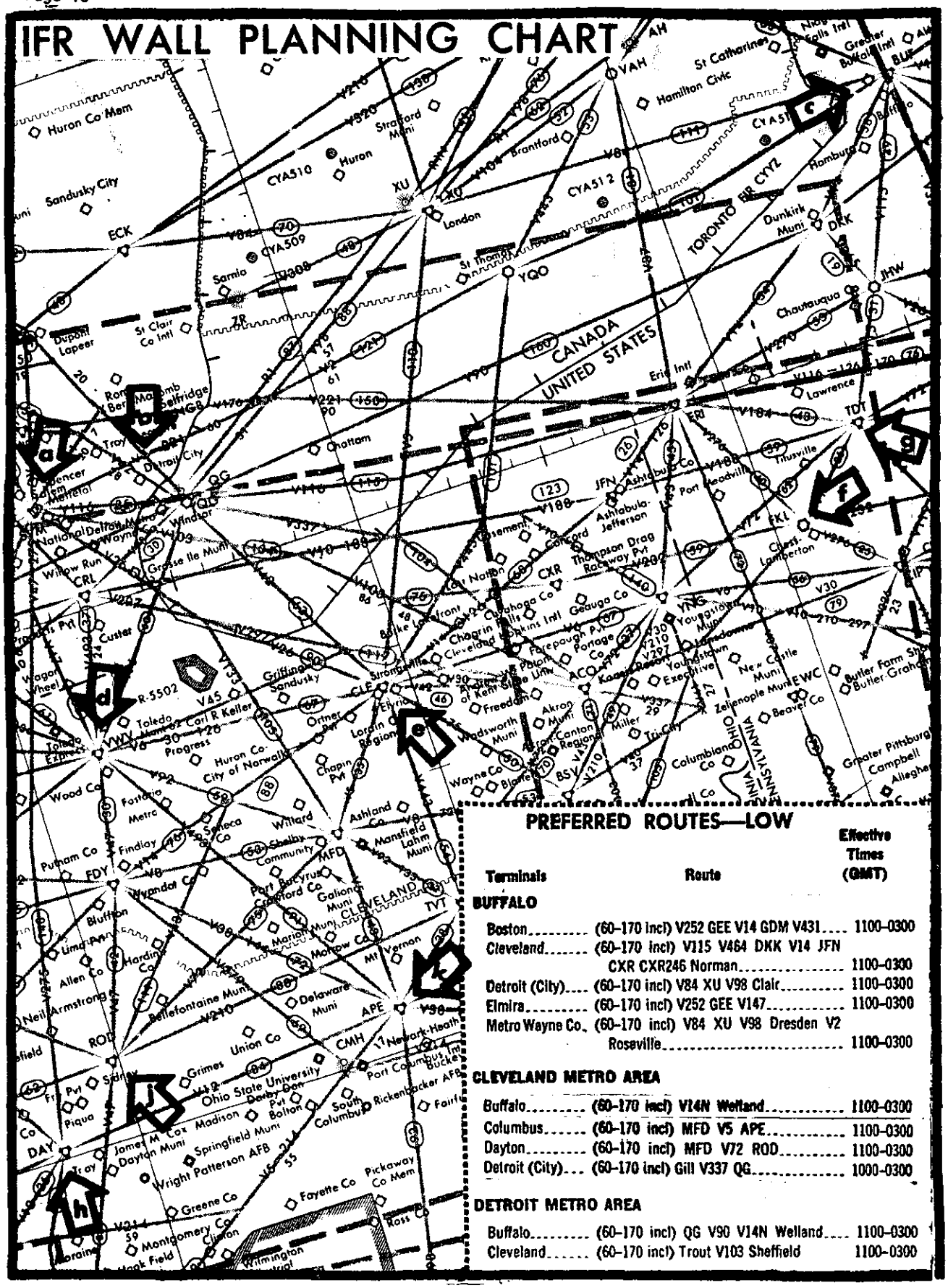

IFR WALL PLANNING CHART
CANADA
UNITED STATES
TORONTO
CLEVELAND
PENNSYLVANIA
OHIO
PREFERRED ROUTES—LOW
Terminals
Route
Effective Times (GMT)
BUFFALO
Boston..... (60–170 incl) V252 GEE V14 GDM V431.... 1100–0300
Cleveland..... (60–170 incl) V115 V464 DKK V14 JFN CXR CXR246 Norman..... 1100–0300
Detroit (City).... (60–170 incl) V84 XU V98 Clair..... 1100–0300
Elmira..... (60–170 incl) V252 GEE V147..... 1100–0300
Metro Wayne Co.. (60–170 incl) V84 XU V98 Dresden V2 Roseville..... 1100–0300
CLEVELAND METRO AREA
Buffalo..... (60–170 incl) V14N Welland..... 1100–0300
Columbus..... (60–170 incl) MFD V5 APE..... 1100–0300
Dayton..... (60–170 incl) MFD V72 ROD..... 1100–0300
Detroit (City)... (60–170 incl) Gill V337 QG..... 1000–0300
DETROIT METRO AREA
Buffalo..... (60–170 incl) QG V90 V14N Welland.... 1100–0300
Cleveland..... (60–170 incl) Trout V103 Sheffield 1100–0300

FIG. 3

105. B24 For planning purposes, approximately what minimum fuel is required for an IFR flight from Waterville, Ohio (d), to Tidioute, Pennsylvania (g)? An alternate is required. (Fig. 3)

TAS- - - - - - - - - - - - 155 knots
Wind - - - - - - - - - - - - Average 25-knot headwind
Route- - - - - - - - - - - - VWV V6 YNG V72 TDT
Alternate- - - - - - - - - V72 YNG
(Wind 25-knot tailwind.)
Fuel consumption - - - - - 19.3 GPH
Add 4 gallons for taxi, takeoff, climbout, approach, and landing.

1- 58.5 gallons
2- 46.5 gallons
3- 50.5 gallons
4- 54.5 gallons

106. B24 For planning purposes, approximately what minimum fuel is required for an IFR flight from Salem, Michigan (a), to Dayton, Ohio (h)? An alternate is required. (Fig. 3)

TAS- - - - - - - - - - - - 160 knots
Wind - - - - - - - - - - - - Average 15-knot tailwind
Route- - - - - - - - - - - - SVM V275 DAY
Alternate- - - - - - - - - V12 APE (k) 10-knot headwind
Fuel consumption - - - - - 13.8 GPH
Add 3.4 gallons for taxi, takeoff, climbout, approach, and landing.

1- 39 gallons
2- 36 gallons
3- 33 gallons
4- 29 gallons

107. B24 For planning purposes, approximately what minimum fuel is required for an IFR flight from Salem, Michigan (a), to Franklin, Pennsylvania (f)? An alternate is required. (Fig. 3)

TAS- - - - - - - - - 185 knots
Wind - - - - - - - - - Average 15-knot tailwind
Route- - - - - - - - - SVM V221 ERI V276 FKL
Alternate- - - - - - V276 ERI
(Wind 15 knots headwind.)
Fuel consumption - - 22.5 GPH
Add a total of 4 gallons for taxi, takeoff, climbout, approach, and landing.

1- 47.5 gallons
2- 44 gallons
3- 37 gallons
4- 40.5 gallons

108. B11 Plan an IFR route from Buffalo, New York (c), to Detroit City (b) which will minimize delays and changes while en route. Depart 1300Z and plan to cruise 12,000 feet. (Fig. 3)

1- V14 DKK V90 QG DET
2- V14 ERI V116 QG DET
3- V84 XU V98 Clair DET
4- V2 V98 QG DET

109. B11 Plan an IFR route from Buffalo, New York (c), to Cleveland, Ohio (e), which will minimize delays and changes while en route. Depart 1200Z and plan to cruise 10,000 feet. (Fig. 3)

1- V14N Welland CLE
2- V115 V464 DKK V14 JFN CXR CXR246 Norman CLE
3- V2 YQO V443 CLE
4- V14 CLE

110. B11 Plan an IFR route from Cleveland (e) to Dayton (h) which will minimize delays and changes while en route. Depart 1100Z and cruise 8,000 feet. (Fig. 3)

1- V14 V275 DAY
2- V14 V435 ROD Vector to DAY
3- Vector to MFD V72 ROD Vector to DAY
4- V14 FDY V47 ROD Vector to DAY

111. B24 For planning purposes, approximately what minimum fuel is required for an IFR flight from Rosewood, Ohio (j), to Buffalo, New York (c)? An alternate is required. (Fig. 3)

TAS- - - - - - - - - - - 140 knots
Wind - - - - - - - - - - Average 15-knot headwind
Route- - - - - - - - - - ROD V72 MFD V5 CLE V14 BUF
Alternate- - - - - - - - V14 ERI
(Wind 15-knot tailwind.)
Fuel consumption - - - - 18 GPH
Add a total of 6 gallons for taxi, takeoff, climbout, approach, and landing.

1- 76 gallons
2- 67 gallons
3- 73 gallons
4- 70 gallons

F.A.A. NATIONAL FLIGHT DATA CENTER

FDC NOTAMS

THE LISTING BELOW INCLUDES, IN PART, CHANGES IN FLIGHT DATA, PARTICULARLY OF A REGULATORY NATURE, THAT AFFECTS STANDARD INSTRUMENT APPROACH PROCEDURES, AERONAUTICAL CHARTS AND SELECTED FLIGHT RESTRICTIONS, PRIOR TO THEIR NORMAL PUBLICATION CYCLE. THEREFORE, THEY SHOULD BE REVIEWED DURING PRE-FLIGHT PLANNING. THIS LISTING INCLUDES ALL FDC NOTAMS CURRENT THRU FDC NOTAM NUMBER SHOWN BELOW. FDC NOTAMS ISSUED FOLLOWING THIS NUMBER ARE AVAILABLE AT ALL F.A.A. FLIGHT SERVICE STATIONS.

LEGEND

FDC ------- NATIONAL FLIGHT DATA CENTER
Q/103 ----- ACCOUNTABILITY NUMBER ASSIGNED TO THE MESSAGE ORIGINATOR BY FDC
FI/T ------ FLIGHT INFORMATION/TEMPORARY
FI/P ------ FLIGHT INFORMATION/PERMANENT
--------- NEW NOTAM

THE FOLLOWING LISTING CONTAINS ALL FDC NOTAMS
THRU FDC 6/313

SOUTHWEST

TEXAS

FDC 5/171 FI/T MILLER INTERNATIONAL MCALLEN TX. LOC/BC RWY 31 ORIG NA.

FDC 6/8 FI/T ROBERT MUELLER MUNI AUSTIN TX. VORTAC RWY 12R AMDT 3 SI ALL CAT MDA 1100FT HAT 470FT CRCG CAT C MDA 1160FT HAA 526FT. VORTAC RWY 16R AMDT 2 ILS RWY 30L AMDT 26 NDB RWY 30L AMDT 26 CRCG CAT C MDA 160FT HAA 526FT.

FDC 6/232 FI/T SAN ANTONIO INTERNATIONAL SAN ANTONIO TX. SI MINS NA FOR NDB RWY 30L /ILS RWY 30L/LOC RWY 30L/RNAV RWY 30L/NDB RWY 12R/ILS RWY 12R/LOC RWY 12R.

WEST CENTRAL

IOWA

FDC 5/885 FI/T BOONE MUNI BOONE IA. NDB RWY 14 AMDT 2 SI MDA 1900FT HAT 753FT ALL CAT. VSBY CAT B 1 1/4MI CAT C 1 1/2MI CAT D 13/8MI. CRCG MDA 1900FT HAA 753FT ALL CAT. VSBY CAT B 1 1/4MI.

FDC 6/158 FI/T LE MARS MUNI LE MARS IA. NDB RWY 18 AMDT 2 SI AND CRCG MDA 1960FT ALL CAT. VSBY SI CAT B C D AND CRCG CAT B INCR 1/4MI.

FDC 6/159 FI/T WEBSTER CITY MUNI WEBSTER CITY IA. NDB RWY 32 AMDT 2 SI MDA 1680FT ALL CAT. CRCG MDA 1680FT CAT A B C.

FIG. 4

RESTRICTIONS TO ENROUTE NAVIGATION AIDS

Radio Facility Restrictions are cited until cancelled by the Associated Station.

Restricted areas are defined in degrees from magnetic North.

ALABAMA

BROOKLEY VORTAC: VOR portion unusable beyond 30 mi below 2,000 MSL.

EUFAULA VORTAC: DME portion unusable 245-315° below 1300' MSL beyond 30 NM, below 1900' MSL beyond 35 NM, below 2400' MSL beyond 40 NM.

GADSDEN VORTAC: VOR portion unusable 340-047° below 5000' MSL; 237-245° and 309-339° all sectors and altitudes.

MOBILE VORTAC: VOR portion unusable 023-033°.

ARIZONA

BUCKEYE VORTAC: Unusable beyond 28 nmi below 4000' MSL 060-075°, beyond 35 nmi below 5000' MSL 230-260°, beyond 35 nmi below 7000' 280-320°, beyond 37 nmi below 6000' MSL 320-360°.

COCHISE VORTAC: Unusable beyond 35 NM below 10,000' MSL 005-015°, beyond 25 NM below 10,000' MSL 015-030°, beyond 35 NM below 10,000' MSL 030-040°, beyond 30 NM below 9,000' MSL 190-220°, beyond 25 NM below 9,200' MSL 220-240°.

DOUGLAS VORTAC: DME portion unusable beyond 26 NM below 10,000' MSL 045-065°; beyond 28 NM below 9500' MSL 065-095°; beyond 35 NM below 11,300' MSL 355-010°.

FLAGSTAFF VOR: Unusable beyond 30 nmi below 8300' MSL 030-110°, beyond 35 nmi below 10,200' MSL 110-155°, beyond 30 nmi below 9300' MSL 155-245°, beyond 30 nmi below 11,900' MSL 245-325°, beyond 15 nmi below 14,100' MSL 325-030°.

GRAND CANYON VOR: Unusable 340-030° beyond 30 NM below 10,800' MSL, 030-060° beyond 25 NM below 9500' MSL, 060-100° beyond 20 NM below 9000' MSL, 230-270° beyond 15 NM below 10,000 MSL.

KINGMAN VOR: Unusable beyond 25 NM below 9,000' MSL 085-130°, beyond 15 NM below 10,000' MSL 130-180°, beyond 30 NM below 7,000' MSL 180-255°, beyond 35 NM below 9,000' MSL 255-315°, beyond 20 NM below 8,000' MSL 315-085°.

9100' MSL 185-195° beyond 13 nmi below 9100' MSL 195-220° beyond 25 nmi below 9100' MSL 220-235° beyond 30 nmi below 8800' MSL 263-275°.

SAN SIMON VORTAC: Unusable beyond 30 nmi below 8000' MSL 350-360°, beyond 30 nmi below 8000' MSL 020-050°, beyond 28 nmi below 11,300' MSL 150-190°, beyond 30 nmi below 9000' MSL 190-220°, beyond 30 nmi below 9900' MSL 235-250°.

TUCSON VORTAC: Unusable beyond 23 NM below 10,200' MSL 040-095° and beyond 32 NM below 10,700' MSL 325-020°.

YUMA VORTAC: Unusable beyond 27 nmi below 3600' MSL 280-300°.

ARKANSAS

HOT SPRINGS VOR: Unusable 346-055° beyond 20 NM below 3500' MSL; 050°-140° beyond 20 NM below 6500' MSL; 141-227° beyond 20 NM below 3500' MSL; 141-227° beyond 26 NM below 5500' MSL; 228-311° beyond 20 NM below 3500' MSL; 312-345° beyond 15 NM below 5500' MSL; 312-345° beyond 32 NM below 9500' MSL.

PINE BLUFF VORTAC: VOR portion unusable 054-079° beyond 35 NM below 5000' MSL, 170-185° beyond 30 NM below 2000' MSL, 230-249° beyond 20 NM below 6000' MSL or beyond 26 NM below 8000' MSL.

CALIFORNIA

ARCATA VOR: Unusable 090-150° beyond 20 NM below 6000'.

AVENAL VORTAC: DME portion unusable beyond 40 nmi below 3000' MSL 320-065° below 4000' MSL, 065-095° below 4500' MSL, 095-125° below 8500' MSL, 125-170° below 7500' MSL, 170-198° below 7000' MSL, 195-230° below 8000' MSL, 230-305°.

BIG SUR VORTAC: VOR portion unusable 215-235° beyond 16 nmi below 10,000' MSL. DME portion unusable beyond 35 nmi below 9000' MSL 320-085°.

FIG. 5

112. What is the status of the LOC/BC RWY 31 approach at Miller International at McAllen, Texas? (Fig. 4)
B14

1- Both front and back course localizer is out of service.
2- The approach is an original approach being commissioned.
3- The approach is temporarily not authorized.
4- The approach is permanently not authorized.

113. What is the status of the straight-in approaches to RWYs 30L and 12R on San Antonio International at San Antonio, Texas? (Fig. 4)
B14

1- Straight-in minimums have not been approved.
2- Straight-in approaches are permanently not authorized.
3- Straight-in minimums are temporarily not authorized.
4- All of the approaches have been temporarily cancelled.

114. What is the new landing minimum for Category B aircraft on the NDB RWY 18 approach at Le Mars Municipal, Le Mars, Iowa? (Fig. 4)
B14

1- Ceiling 1,960 feet and visibility increased by 1/4 mile.
2- Visibility 1/4 mile.
3- Visibility increased by 1/4 mile.
4- Ceiling 1,960 feet and visibility 1/4 mile.

115. What is the new landing minimum for Category B aircraft on the NDB RWY 14 approach at Boone Municipal, Boone, Iowa? (Fig. 4)
B14

1- Ceiling 1,900 feet; visibility 1 1/4 mile.
2- Ceiling 753 feet.
3- Ceiling 1,100 feet; visibility 4 miles.
4- Visibility 1 1/4 mile.

116. For how long are the changes in effect for the NDB RWY 14 approach at Boone Municipal, Boone, Iowa? (Fig. 4)
B14

1- Until omitted in future lists.
2- 30 days.
3- 90 days.
4- Permanently.

117. Under what conditions, if any, could DME signals be used for navigation when approaching Eufaula VORTAC (Alabama) on the 300° radial from 35 NM? (Fig. 5)
B18

1- None, the DME is unusable on the 300° radial.
2- By setting 120° on the OBS and using the reverse sensing feature.
3- By maintaining an altitude at or above 1,300 feet MSL.
4- By using the TACAN frequency or the DME receiver.

118. What CAS should you use to obtain 178 knots TAS at 6,000 feet (pressure altitude) with an outside temperature of 3°C?
B36

1- 166 knots
2- 163 knots
3- 172 knots
4- 169 knots

119. What radials of the Big Sur VORTAC (California) are unusable for VOR navigation below 9,000 feet and beyond 35 NM? (Fig. 5)
B18

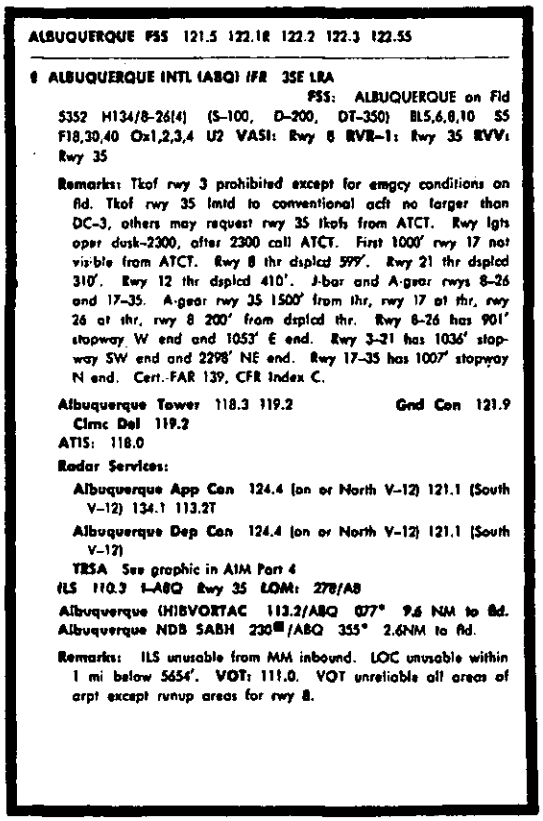
1- 215° and 235°
2- 215° - 235°
3- 320° - 085°
4- 215° - 235° and 320° - 085°

120. What action, if any, should permit an IFR flight to receive accurate navigation signals from the Buckeye VORTAC (Arizona) beyond 28 NM on a magnetic course of 070° from the facility? (Fig. 5)
B18

1- Maintain an altitude at or above 4,000 feet.
2- No action, the radial is unusable.
3- Use dual VORs and average the indications.
4- Set 252° on the OBS and use the reverse sensing feature.

121. Why should a pilot file "Preferred IFR Routes" when they are available?
B11

1- It is an ATC requirement in high density areas.
2- To assure the pilot of a radar environment.
3- To aid ATC controllers in aircraft separation and to assure the pilot of priority upon arrival at a terminal facility.
4- To minimize route changes and to aid in the systematic flow of air traffic.



ALBUQUERQUE FSS 121.5 122.1R 122.2 122.3 122.55

ALBUQUERQUE INTL (ABQ) IFR 3SE LRA
FSS: ALBUQUERQUE on Fld
5352 H134/8-26[4] (S-100, D-200, DT-350) BL5,6,8,10 S5 F18,30,40 Ox1,2,3,4 U2 VASI: Rwy 8 RVR-1: Rwy 35 RVV: Rwy 35

Remarks: Tkof rwy 3 prohibited except for emgcy conditions on fld. Tkof rwy 35 lmtd to conventional acft no larger than DC-3, others may request rwy 35 tkofs from ATCT. Rwy lgts oper dusk-2300, after 2300 call ATCT. First 1000' rwy 17 not visible from ATCT. Rwy 8 thr dsplcd 599'. Rwy 21 thr dsplcd 310'. Rwy 12 thr dsplcd 410'. J-bar and A-gear rwys 8-26 and 17-35. A-gear rwy 35 1500' from thr, rwy 17 at thr, rwy 26 at thr, rwy 8 200' from dsplcd thr. Rwy 8-26 has 901' stopway W end and 1053' E end. Rwy 3-21 has 1036' stopway SW end and 2298' NE end. Rwy 17-35 has 1007' stopway N end. Cert.-FAR 139, CFR Index C.

Albuquerque Tower 118.3 119.2 Gnd Con 121.9
Clnc Del 119.2
ATIS: 118.0
Radar Services:
Albuquerque App Con 124.4 (on or North V-12) 121.1 (South V-12) 134.1 113.2T
Albuquerque Dep Con 124.4 (on or North V-12) 121.1 (South V-12)
TRSA See graphic in AIM Part 4
ILS 110.3 I-ABQ Rwy 35 LOM: 278/A8
Albuquerque (H)VORTAC 113.2/ABQ 077° 9.6 NM to fld.
Albuquerque NDB SABH 230/ABQ 355° 2.6NM to fld.

Remarks: ILS unusable from MM inbound. LOC unusable within 1 mi below 5654'. VOT: 111.0. VOT unreliable all areas of arpt except runup areas for rwy 8.

FIG. 6

122. B51 You are flying at an indicated altitude of 5,000 feet with an altimeter setting of 29.96. ATC gives you the current altimeter setting of 29.92 and, after setting the altimeter, it indicates 4,960 feet. At what pressure altitude are you flying?

1- 4,920 feet
2- 4,960 feet
3- 5,000 feet
4- 5,040 feet

123. B42 What does the lower limit of the white arc on an airspeed indicator represent?

1- Minimum controllable airspeed; gear and flaps retracted.
2- Power off stall speed; gear and flaps retracted.
3- Minimum controllable airspeed; gear and flaps extended.
4- Power off stall speed; gear and flaps extended.

124. B42 The colored markings on the airspeed indicator are based on

1- IAS.
2- EAS.
3- CAS.
4- TAS.

125. B12 On what frequency is Transcribed Weather Broadcasts provided on Albuquerque International Airport? (Fig. 6)

1- 278 kHz
2- 118.0 MHz
3- 113.2 MHz
4- 230 kHz

126. B12 What maximum service is provided for a TRSA, such as Albuquerque? (Fig. 6)

1- Radar control of IFR traffic and radar advisory for VFR aircraft.
2- Radar vectoring, sequencing, radar advisories, and separation for all IFR and participating VFR aircraft.
3- Radar advisory and sequencing for participating VFR aircraft.
4- Radar control of all IFR and VFR aircraft.

127. B12 Where should you file an IFR flight plan at Albuquerque International? (Fig. 6)

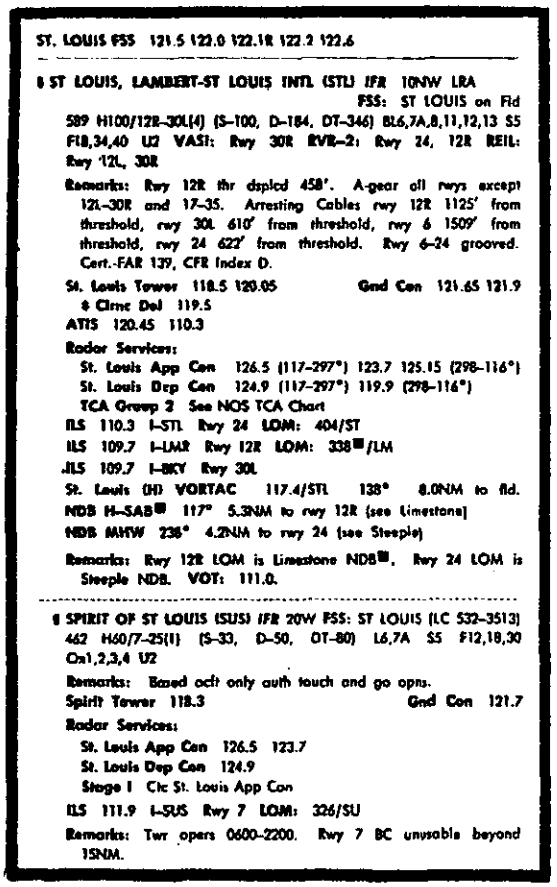
1- With Clearance Delivery on 119.2.
2- With Ground Control on 121.9.
3- With the FSS on 121.5.
4- With the FSS by phone or visit.

128. B51 A pilot parks an airplane on the airport parking ramp with the altimeter indicating the correct elevation. Which atmospheric change will cause the altimeter to indicate lower than the actual elevation?

1- An increase in temperature.
2- An increase in pressure altitude.
3- An increase in atmospheric pressure.
4- An increase in density altitude.

129. B42 During the en route phase of an instrument flight, a helicopter pilot should be certain to remain below the never-exceed speed (V_{NE}). This speed, in most helicopters,

1- decreases up to critical altitude and increases above critical altitude.
2- is lower at high altitude than at low altitude.
3- decreases as altitude decreases.
4- remains the same regardless of altitude.



ST. LOUIS FSS 121.5 122.0 122.1R 122.2 122.6

ST LOUIS, LAMBERT-ST LOUIS INTL (STL) IFR 10NW LRA
FSS: ST LOUIS on Fld
589 H100/12R-30L(4) (S-100, D-184, DT-346) BL6,7A,8,11,12,13 S5 FI8,34,40 U2 VASI: Rwy 30R RVR-2: Rwy 24, 12R REIL: Rwy 12L, 30R
Remarks: Rwy 12R thr dsplcd 458'. A-gear all rwys except 12L-30R and 17-35. Arresting Cables rwy 12R 1125' from threshold, rwy 30L 610' from threshold, rwy 6 1509' from threshold, rwy 24 622' from threshold. Rwy 6-24 grooved. Cert.-FAR 139, CFR Index D.
St. Louis Tower 118.5 120.05 Gnd Con 121.65 121.9
Clrnc Del 119.5
ATIS 120.45 110.3
Radar Services:
St. Louis App Con 126.5 (117-297°) 123.7 125.15 (298-116°)
St. Louis Dep Con 124.9 (117-297°) 119.9 (298-116°)
TCA Group 2 See NOS TCA Chart
ILS 110.3 I-STL Rwy 24 LOM: 404/ST
ILS 109.7 I-LMR Rwy 12R LOM: 338■/LM
ILS 109.7 I-BKY Rwy 30L
St. Louis (H) VORTAC 117.4/STL 138° 8.0NM to fld.
NDB H-SAB■ 117° 5.3NM to rwy 12R (see Limestone)
NDB MHW 238° 4.2NM to rwy 24 (see Steeple)
Remarks: Rwy 12R LOM is Limestone NDB■. Rwy 24 LOM is Steeple NDB. VOT: 111.0.

SPIRIT OF ST LOUIS (SUS) IFR 20W FSS: ST LOUIS (LC 532-3513)
462 H60/7-25(1) (S-33, D-50, DT-80) L6,7A S5 FI2,18,30 On1,2,3,4 U2
Remarks: Based acft only auth touch and go opns.
Spirit Tower 118.3 Gnd Con 121.7
Radar Services:
St. Louis App Con 126.5 123.7
St. Louis Dep Con 124.9
Stage I Clc St. Louis App Con
ILS 111.9 I-SUS Rwy 7 LOM: 326/SU
Remarks: Twr opers 0600-2200. Rwy 7 BC unusable beyond 15NM.

FIG. 7

130. B12 On which frequency can you receive automatic weather broadcasts at Lambert-St. Louis? (Fig. 7)

1- 111.0 MHz
2- 338 kHz
3- 120.45 MHz
4- 117.4 MHz

131. B12 Which frequency should you use for communications if you plan a departure to the south from Lambert-St. Louis? (Fig. 7)

1- 125.6
2- 119.9
3- 123.7
4- 124.9

132. B12 Which frequency is assigned to the St. Louis FSS as a weather channel for all aircraft? (Fig. 7)

1- 122.6
2- 122.2
3- 122.1R
4- 122.0

133. B12 How is an instrument flight plan activated at Lambert-St. Louis? (Fig. 7)

1- The pilot should call clearance delivery on 119.5.
2- The pilot should request ground control to activate it when ready for takeoff.
3- Departure control will automatically activate it when the tower hands off the flight to them.
4- The tower will automatically activate it after the aircraft takes off.

134. B36 What CAS would be required to obtain 200 knots TAS at 7,000 feet PA and a temperature of 5°C?

1- 170 knots
2- 179 knots
3- 176 knots
4- 173 knots

135. B36 What TAS should you have at 8,000 feet PA with a temperature of 10°, if your IAS and CAS are 150 knots?

1- 179 knots
2- 176 knots
3- 173 knots
4- 170 knots

136. B42 How can a pilot readily determine the maximum structural cruising speed of the airplane?

1- By applying the gross weight of the airplane to a graph provided in the airplane flight manual.
2- By multiplying 2.5 X the power-off stall speed.
3- By reference to the upper limit of the green arc on the airspeed indicator.
4- By referring to a placard in the cockpit.

137. B11 Why should a pilot plan to use appropriate "Preferred IFR Routes"?

1- Pilots filing such routes are normally provided more efficient departure, en route, and arrival service from ARTCC.
2- Radar service is provided throughout flights on such routes.
3- Pilots using such routes are assured ARTCC priority service.
4- ARTCC requires operation on such routes if a flight is more than 500 miles.

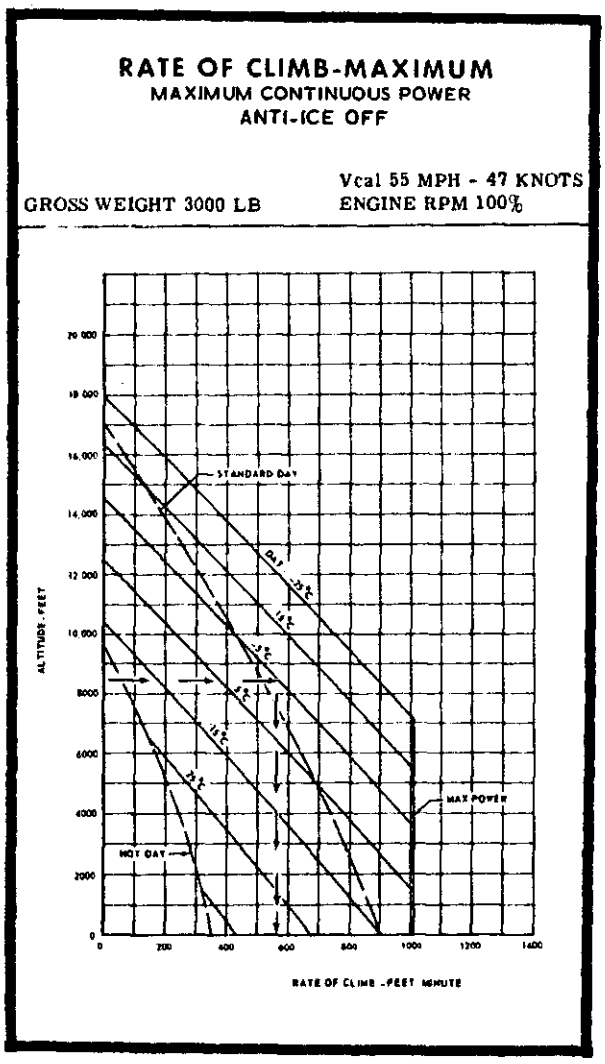


FIG. 8

138. B32 You are departing on an instrument flight from a high altitude heliport. Determine the altitude at which this helicopter's rate of climb will be reduced to 100 feet per minute. (Fig. 8)

Temperature- - - - - - Standard

1- 16,100 feet
2- 15,600 feet
3- 11,250 feet
4- 9,200 feet

139. B32 What is the maximum rate of climb you can expect in this helicopter during a departure on an instrument flight? (Fig. 8)

Altitude- - - - - - - - 4,500 feet
Temperature - - - - - - +18°C.

1- 350 feet/min.
2- 525 feet/min.
3- 400 feet/min.
4- 475 feet/min.

140. B32 You are departing from a high altitude heliport on a helicopter instrument flight. Determine the altitude at which this helicopter's rate of climb will be reduced to zero. (Fig. 8)

Temperature- - - - - - +10°C.

1- 11,400 feet
2- 12,300 feet
3- 8,200 feet
4- 9,500 feet

141. B32 You are departing on an instrument flight from a high altitude heliport. Determine the altitude at which this helicopter's rate of climb will be reduced to zero. (Fig. 8)

Temperature- - - - - - Standard

1- 17,000 feet
2- 16,400 feet
3- 14,500 feet
4- 10,200 feet

142. B32 What is the maximum rate of climb you can expect in this helicopter during a departure on an instrument flight? (Fig. 8)

Altitude- - - - - - 1,000 feet
Temperature - - - - +29°C.

1- 500 feet/min.
2- 450 feet/min.
3- 300 feet/min.
4- 250 feet/min.

143. B32 What is the maximum rate of climb you can expect in this helicopter during a departure on an instrument flight? (Fig. 8)

Altitude- - - - - - 5,500 feet
Temperature - - - - +16°C.

1- 425 feet/min.
2- 475 feet/min.
3- 250 feet/min.
4- 350 feet/min.

144. B32 What is the maximum rate of climb you can expect in this helicopter during a departure on an instrument flight? (Fig. 8)

Altitude- - - - - - 6,500 feet
Temperature - - - - -10°C.

1- 650 feet/min.
2- 825 feet/min.
3- 700 feet/min.
4- 975 feet/min.

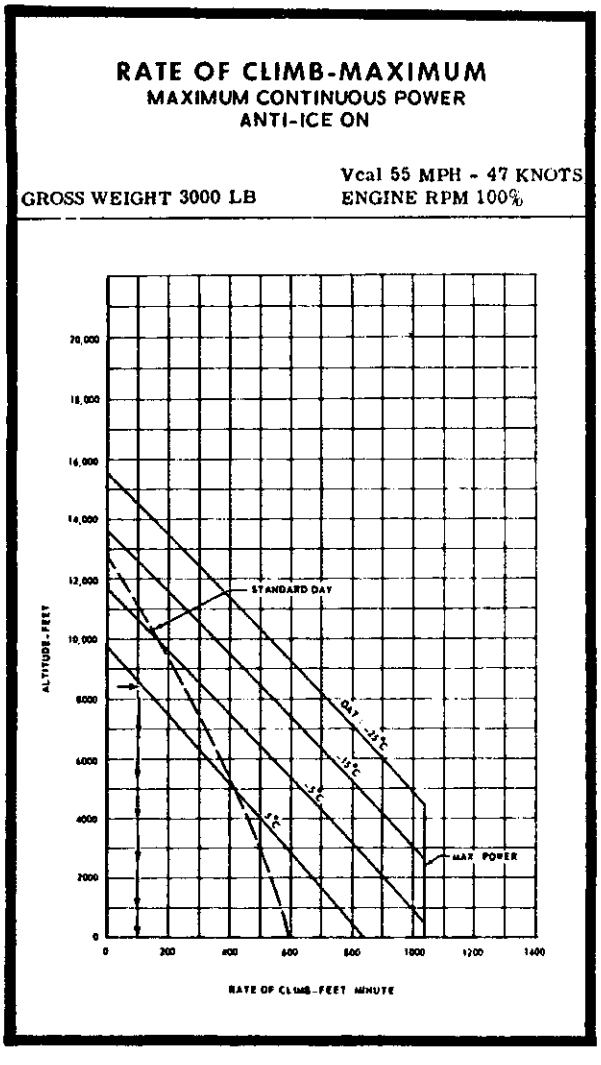


FIG. 9

145. B32 Prior to departure on an instrument flight, ATC issues you a clearance with this climb restriction: "CROSS ALPHA VORTAC AT THREE THOUSAND...CROSS BRAVO INTERSECTION AT SEVEN THOUSAND...." Determine the average rate of climb you can expect between 3,000 and 7,000 feet. (Fig. 9)

Temperature at 3,000 ft. - - - 0°C.
Temperature at 7,000 ft. - - - -3°C.

1- 700 feet/min.
2- 550 feet/min.
3- 400 feet/min.
4- 250 feet/min.

146. B32 Prior to departure on an instrument flight, ATC issues you a clearance with this climb restriction: "CROSS ALPHA VORTAC AT TWO THOUSAND...CROSS BRAVO INTERSECTION AT SIX THOUSAND...." Determine the average rate of climb you can expect between 2,000 feet and 6,000 feet. (Fig. 9)

Temperature at 2,000 ft. - - - +3°C.
Temperature at 6,000 ft. - - - -8°C.

1- 600 feet/min.
2- 650 feet/min.
3- 550 feet/min.
4- 700 feet/min.

147. B32 Prior to departure on an instrument flight, ATC issues you a clearance with this climb restriction: "...CROSS ALPHA VORTAC AT SEVEN THOUSAND...CROSS BRAVO INTERSECTION AT NINE THOUSAND...." Determine the average rate of climb you can expect between 7,000 and 9,000 feet. (Fig. 9)

Temperature- - - - - - Standard

1- 275 feet/min.
2- 425 feet/min.
3- 150 feet/min.
4- 350 feet/min.

148. B32 Prior to departure on an instrument flight, ATC issues you a clearance with this climb restriction: "...CROSS ALPHA VORTAC AT THREE THOUSAND...CROSS BRAVO INTERSECTION AT NINE THOUSAND...." Determine the average rate of climb you can expect in this helicopter between 3,000 and 9,000 feet. (Fig. 9)

Temperature at 3,000 ft. - - -10°C.
Temperature at 9,000 ft. - - -23°C.

1- 800 feet/min.
2- 500 feet/min.
3- 650 feet/min.
4- 750 feet/min.

149. B32 Prior to departure on an instrument flight, ATC issues you a clearance with this climb restriction: "CROSS ALPHA VORTAC AT ONE THOUSAND...CROSS BRAVO INTERSECTION AT EIGHT THOUSAND...." Determine the average rate of climb you can expect in this helicopter between 1,000 and 8,000 feet. (Fig. 9)

Temperature at 1,000 ft. - - +5°C.
Temperature at 8,000 ft. - - -5°C.

1- 650 feet/min.
2- 550 feet/min.
3- 350 feet/min.
4- 200 feet/min.

150. B32 Prior to departure on an instrument flight, ATC issues you a clearance with this climb restriction: "...CROSS ALPHA VORTAC AT TWO THOUSAND...CROSS BRAVO INTERSECTION AT EIGHT THOUSAND...." Determine the average rate of climb you can expect in this helicopter between 2,000 and 8,000 feet. (Fig. 9, page 23)

Temperature- - - - - Standard

1- 400 feet/min.
2- 250 feet/min.
3- 550 feet/min.
4- 650 feet/min.

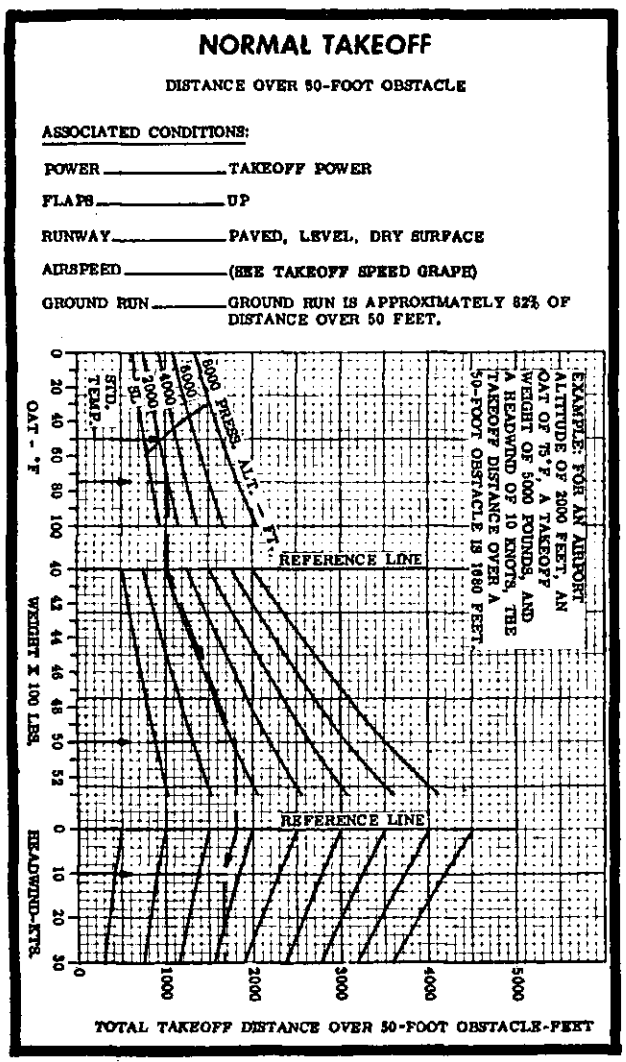


FIG. 10

151. B31 How much is the takeoff distance over a 50-foot obstacle affected by a 25° rise in temperature from standard conditions at sea level? (Aircraft weight--4,000 lbs.) (Fig. 10)

1- 100 feet
2- 10 feet
3- 900 feet
4- 200 feet

152. B31 Determine the ground run with a standard temperature at sea level, aircraft weight of 4,450 lbs., and a calm wind. (Fig. 10)

1- 1,150 feet
2- 1,000 feet
3- 820 feet
4- 710 feet

153. B31 Approximately how much should the takeoff distance over a 50-foot obstacle be affected by reducing the aircraft weight from 4,500 lbs. to 4,000 lbs. on a standard day at sea level? (Fig. 10)

1- 10 feet
2- 900 feet
3- 250 feet
4- 100 feet

154. B31 What is the total takeoff distance over a 50-foot obstacle if the temperature is standard at sea level, the aircraft weight is 4,000 pounds, and the wind is calm? (Fig. 10)

1- 1,000 feet
2- 1,200 feet
3- 1,400 feet
4- 800 feet

155. B31 What is the total takeoff distance over a 50-foot obstacle if the temperature at 3,000 pressure altitude is 40°F., aircraft weight is 4,900 lbs., and the headwind is 10 knots? (Fig. 10)

1- 1,500 feet
2- 1,100 feet
3- 1,300 feet
4- 900 feet

156. B31 Determine the total takeoff distance over a 50-foot obstacle with these conditions. (No wind) (Fig. 10)

Temperature- - - - - - - - - Standard
Pressure altitude- - - - - - 5,000 feet
Aircraft weight- - - - - - - 5,150 lbs.

1- 2,500 feet
2- 1,900 feet
3- 2,100 feet
4- 2,300 feet

157. B31 What is the total takeoff distance over a 50-foot obstacle with these conditions. (Fig. 10)

Temperature - - - - - 60°F.
Pressure altitude - - Sea level
Aircraft weight - - - 4,750 lbs.
Wind- - - - - - - - - 20-knot headwind

1- 1,200 feet
2- 1,100 feet
3- 1,000 feet
4- 900 feet

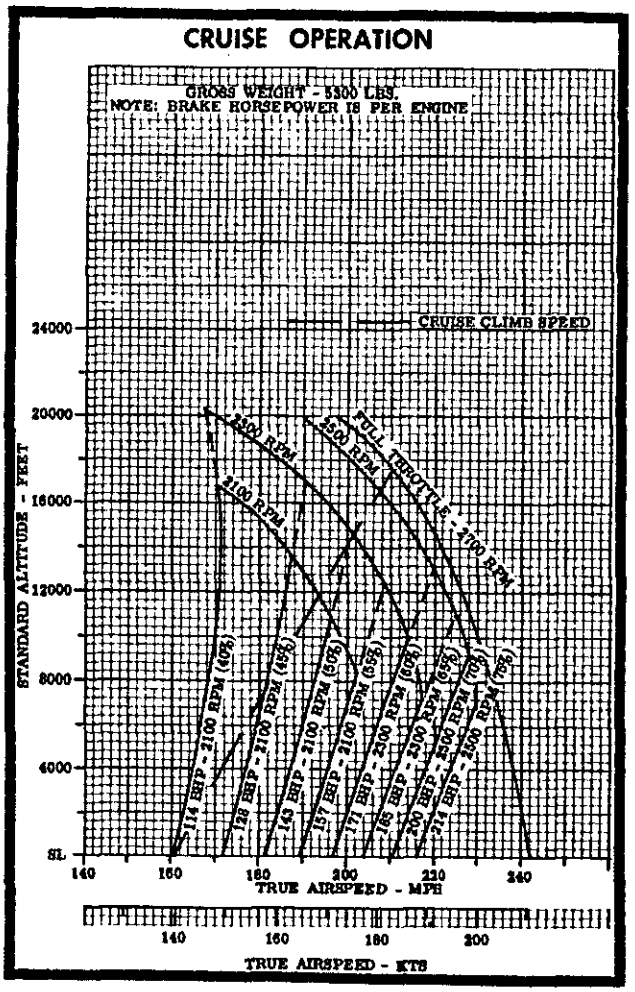


FIG. 11

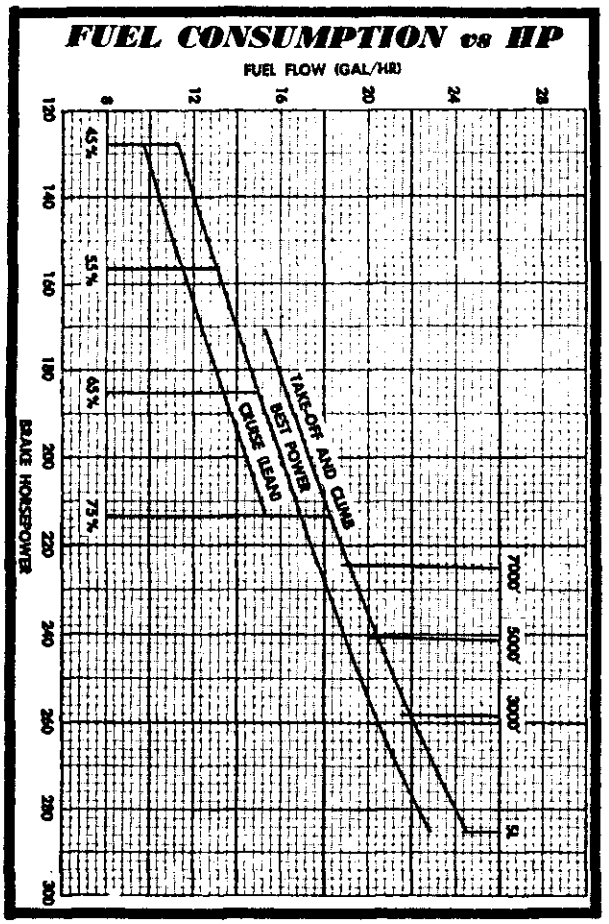


FIG. 12

158. What TAS should the airplane maintain at 16,000 feet with full throttle and 2300 RPM? (Fig. 11)
B36

1- 196 knots
2- 170 knots
3- 188 knots
4- 185 knots

159. What power setting is necessary to maintain 200 knots TAS at 7,000 feet? (Fig. 11)
B33

1- 2500 RPM and 3/4 throttle.
2- 2500 RPM and full throttle.
3- 2100 RPM and 54% throttle.
4- 2300 RPM and 60% throttle.

160. What power setting is necessary to maintain 186 knots TAS at 10,000 feet? (Fig. 11)
B33

1- 2100 RPM and 45% of available manifold pressure.
2- 2300 RPM and 60% of available manifold pressure.
3- 2300 RPM and full throttle.
4- Any combination that will produce 44% or 126 brake horsepower on each engine.

161. Determine the fuel flow for a climb at altitude using 75% power. (Fig. 12)
B34

1- 15.1 GPH
2- 16.2 GPH
3- 17.2 GPH
4- 18.3 GPH

162. What should be the fuel flow using takeoff power at sea level? (Fig. 12)
B34

1- 18.5 GPH
2- 25.5 GPH
3- 24.5 GPH
4- 26 GPH

163. What should be the fuel flow for cruise with 50% power and a lean mixture? (Fig. 12)
B34

1- 12.2 GPH
2- 11.5 GPH
3- 10.5 GPH
4- 8.6 GPH

TAKE-OFF DATA

TAKE-OFF DISTANCE WITH 10° FLAPS FROM HARD SURFACE RUNWAY

GROSS WEIGHT POUNDS	IAS @ 50 FT.	HEAD WIND KNOTS	@ SEA LEVEL & 59° F.		@ 2500 FT. & 50°F.		@ 5000 FT. & 41°F		@ 7500 FT. & 32°F	
			GROUND RUN	TOTAL TO CLEAR 50 FT. OBS.	GROUND RUN	TOTAL TO CLEAR 50 FT. OBS.	GROUND RUN	TOTAL TO CLEAR 50 FT. OBS.	GROUND RUN	TOTAL TO CLEAR 50 FT. OBS.
3800	82	0	1170	2030	1305	2210	1465	2425	1645	2665
		10	870	1510	985	1765	1115	1950	1270	2155
		20	615	1225	705	1360	810	1515	935	1695
3400	77	0	905	1605	1010	1745	1135	1905	1275	2085
		10	660	1255	745	1378	850	1510	965	1670
		20	455	945	520	1040	600	1160	695	1290
3000	72	0	680	1270	760	1375	850	1495	960	1635
		10	485	985	550	1070	625	1175	715	1290
		20	325	725	370	795	430	885	500	980

NOTES: 1. Increase distance 10% for each 20°F above standard temperature for particular altitude.
2. For operation on a dry, grass runway, increase distances (both "ground run" and "total to clear 50 ft. obstacle") by 5% of the "total to clear 50 ft. obstacle" figure.

FIG. 13

MAXIMUM RATE-OF-CLIMB DATA

Standard Conditions ..... Gear and Flaps Up

ALTITUDE FEET	IAS MPH	GROSS WEIGHT POUNDS	RATE OF CLIMB FT./MIN.	LBS. OF FUEL USED FROM S.L.
SEA LEVEL and 59° F	110	3800	930	12
		3400	1115	12
		3000	1340	12
5000 and 41°F	110	3800	910	27
		3400	1100	25
		3000	1330	23
10,000 and 23°F	110	3800	860	43
		3400	1060	38
		3000	1290	33
15,000 and 5°F	110	3800	790	60
		3400	980	52
		3000	1205	45
20,000 and -12°F	109	3800	630	81
		3400	810	68
		3000	1015	58
25,000 and -30°F	102	3800	350	108
		3400	510	86
		3000	695	71

NOTES: 1. Full throttle, 2700 RPM, mixture at recommended leaning schedule.
2. Fuel used includes warm-up and take-off allowance.
3. For hot weather, decrease rate of climb 45 ft/min for each 10°F above standard day temperature for particular altitude.

FIG. 14

164. B31 What is the approximate takeoff distance over a 50-foot obstacle if the temperature is standard at 3,500 feet, the airplane weight is 3,800 lbs., and the wind is calm? (Fig. 13)

1- 2,296 feet
2- 2,224 feet
3- 2,382 feet
4- 2,339 feet

165. B31 What effect, if any, should use of a dry, grass runway have on the takeoff ground run computed for a hard surface runway? (Fig. 13)

1- None.
2- Reduce the ground run by 10% of the total to clear a 50-foot obstacle.
3- Have about the same effect as increasing the headwind factor.
4- Increase the ground run by 5% of the total to clear a 50-foot obstacle.

166. B31 What is the approximate takeoff distance over a 50-foot obstacle if the temperature is 80°F. at sea level, the airplane weight is 3,400 lbs., and the headwind is 10 knots? (Fig. 13)

1- 1,770 feet
2- 1,450 feet
3- 1,380 feet
4- 1,130 feet

167. B32 Determine the approximate time to climb from sea level to 20,000 feet in standard conditions if the airplane weighs 3,000 pounds. (Fig. 14)

1- 19 1/2 minutes
2- 12 1/2 minutes
3- 14 minutes
4- 16 minutes

168. B32 What is the approximate time to climb from sea level to 15,000 feet in standard conditions if the airplane weighs 3,400 lbs.? (Fig. 14)

1- 13 minutes
2- 16 minutes
3- 14 minutes
4- 15 minutes

169. B32 What is the maximum climb rate for the airplane weighing 3,800 lbs. upon takeoff at an airport with an elevation of 7,500 feet and standard conditions? (Fig. 14)

1- 924 FPM
2- 825 FPM
3- 885 FPM
4- 896 FPM

170. B32 Determine the maximum climb rate at 10,000 feet on a standard day and the fuel required to climb from sea level to that altitude. The airplane weighs 3,500 lbs. (Fig. 14)

1- 960 FPM and 78 lbs.
2- 1,010 FPM and 39 lbs.
3- 910 FPM and 41 lbs.
4- 1,050 FPM and 37 lbs.

171. B32 Determine the maximum climb rate at 15,000 feet at a temperature of 25°F. for an aircraft gross weight of 3,600 pounds. (Fig. 14)

1- 975 FPM
2- 885 FPM
3- 840 FPM
4- 795 FPM

172. B42 What does the lower limit of the green arc on an airspeed indicator represent?

1- Power-off stall speed; gear and flaps retracted (CAS).
2- Power-off stall speed; gear and flaps extended (IAS).
3- Minimum controllable airspeed; gear and flaps extended.
4- Minimum controllable airspeed; gear and flaps retracted.

173. B54 What should be the indication on the magnetic compass as you roll in to a standard rate turn to the right from an easterly heading in the northern hemisphere?

1- The compass will indicate a turn to the right, but at a faster rate than is actually occurring.
2- The compass will initially indicate a turn to the left.
3- The compass will indicate the approximate correct magnetic heading if the roll-in to the turn is smooth.
4- The compass will remain on east for a short time, then gradually catch up to the magnetic heading of the airplane.

LANDING DISTANCE TABLE

LANDING DISTANCE WITH 30° FLAPS ON HARD SURFACED RUNWAY

GROSS WEIGHT POUNDS	APPROACH IAS MPH	@ SEA LEVEL & 59°F		@ 2500 FEET & 50°F		@ 5000 FEET & 41°F		@ 7500 FEET & 32°F	
		GROUND ROLL	TOTAL TO CLEAR 50 FT. OBS.	GROUND ROLL	TOTAL TO CLEAR 50 FT. OBS.	GROUND ROLL	TOTAL TO CLEAR 50 FT. OBS.	GROUND ROLL	TOTAL TO CLEAR 50 FT. OBS.
3800	82	765	1500	815	1595	865	1695	920	1805

NOTES: 1. Distances shown are based on zero wind, power off, and heavy braking.

2. Reduce ground roll 10% for each 5 knots headwind. For total landing distance, reduce "total to clear 50 ft obstacle figure by 10% for each 5 knots headwind.

FIG. 15

174. B35 What is the landing distance over a 50-foot obstacle under standard conditions at 1,500 feet with a 15-knot headwind? (Fig. 15)

1- 1,791 feet
2- 1,090 feet
3- 1,557 feet
4- 1,323 feet

175. B35 Determine the landing distance over a 50-foot obstacle under standard conditions at 5,000 feet with a headwind of 20 knots. (Fig. 15)

1- 1,017 feet
2- 1,627 feet
3- 1,619 feet
4- 1,026 feet

176. B51 What airspeed should be used on an approach when using a static source vented inside an unpressurized cabin?

1- The same indicated airspeed as normally used.
2- The same calibrated airspeed as normally used.
3- A lower indicated airspeed than normal.
4- A higher indicated airspeed than normal.

177. B51 On flights below 18,000 feet, how can you obtain the pressure altitude?

1- Use your computer to change the indicated altitude to pressure altitude.
2- Set your altimeter to 29.92.
3- Contact an FSS and ask for the pressure altitude.
4- Use the altitude shown on your altimeter.

178. B35 Determine the ground roll on a hard surface runway under standard conditions at sea level with a 10-knot headwind. (Fig. 15)

1- 740 feet
2- 688 feet
3- 612 feet
4- 588 feet

179. B35 What is the landing distance over a 50-foot obstacle under standard conditions at 4,000 feet with a calm wind? (Fig. 15)

1- 1,655 feet
2- 1,625 feet
3- 1,635 feet
4- 1,645 feet

180. B53 What is an operational difference between the turn coordinator indicator and the turn and slip indicator?

1- The turn coordinator is always electric; the turn and slip indicator is always vacuum-driven.
2- The turn coordinator indicates roll rate, rate of turn, and coordination; the turn and slip indicator indicates rate of turn and coordination.
3- The turn coordinator indicates bank angle only; the turn and slip indicator indicates only rate of turn.
4- The turn coordinator indicates angle of bank; the turn and slip indicator indicates turn rate in coordinated flight.

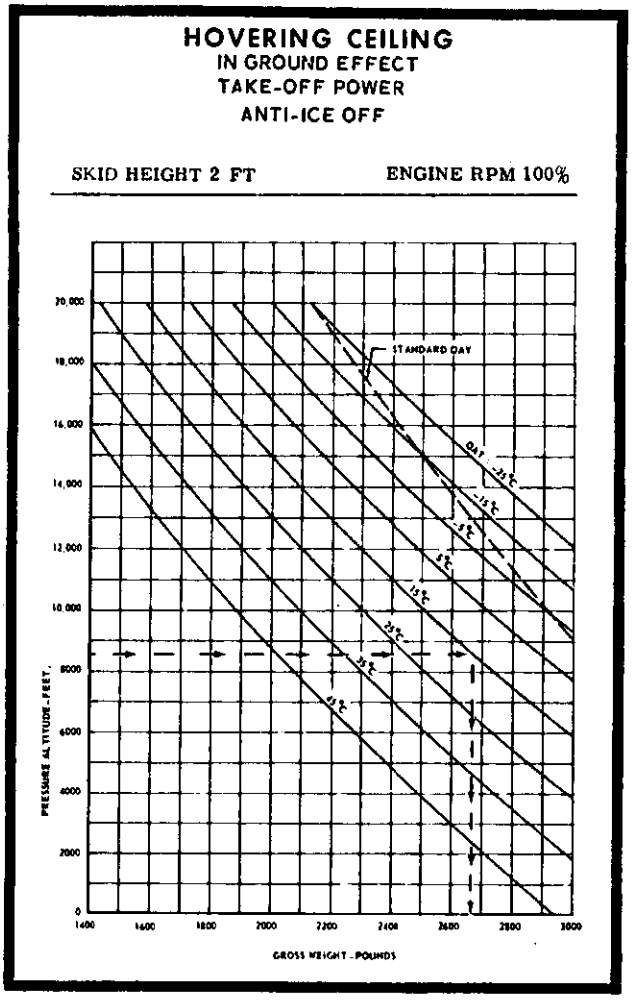


FIG. 16

181. B38 You plan to depart on a helicopter instrument flight from a heliport where the pressure altitude is 2,500 feet and the ATIS reported temperature is 104°F. (+40°C.). Determine the maximum gross weight at which you can expect to hover in ground effect. (Fig. 16)

1- 2,800 pounds
2- 2,700 pounds
3- 2,550 pounds
4- 2,350 pounds

182. B38 You plan to depart on an instrument flight from a heliport where the pressure altitude is 6,500 feet and the ATIS reported temperature is +82°F. (+28°C.). Determine the maximum gross weight at which you can expect to be able to hover in ground effect. (Fig. 16)

1- 3,000 pounds
2- 2,600 pounds
3- 2,850 pounds
4- 2,750 pounds

183. B38 You plan to depart on an instrument flight from a heliport where the pressure altitude is 6,500 feet and the ATIS reported temperature is +68°F. (+20°C.). Determine the maximum gross weight at which you can hover in ground effect. (Fig. 16)

1- 3,000 pounds
2- 2,600 pounds
3- 2,950 pounds
4- 2,800 pounds

184. B38 You plan to depart on an instrument flight from a heliport where the pressure altitude is 6,500 feet and the ATIS reported temperature is +58°F. (+14°C.). Determine the maximum gross weight at which you can hover in ground effect. (Fig. 16)

1- 2,850 pounds
2- 2,950 pounds
3- 2,650 pounds
4- 2,700 pounds

185. B38 You plan to depart on an instrument flight from a heliport where the pressure altitude is 7,500 feet and the ATIS reported temperature is +55°F. (+13°C.). Determine the maximum gross weight at which you can hover in ground effect. (Fig. 16)

1- 2,950 pounds
2- 2,750 pounds
3- 2,600 pounds
4- 2,850 pounds

186. B38 You plan to depart on a helicopter instrument flight from a heliport where the pressure altitude is 4,800 feet and the ATIS reported temperature is +95°F. (+35°C.). Determine the maximum gross weight at which you can expect to hover in ground effect. (Fig. 16)

1- 2,900 pounds
2- 2,550 pounds
3- 2,800 pounds
4- 2,650 pounds

187. B38 You plan to depart on an instrument flight from a heliport where the pressure altitude is 5,000 feet and the ATIS reported temperature is +73°F. (+23°C.). Determine the maximum gross weight at which you can expect to be able to hover in ground effect. (Fig. 16)

1- 3,000 pounds
2- 2,900 pounds
3- 2,750 pounds
4- 2,650 pounds

CRUISE PERFORMANCE

NORMAL LEAN MIXTURE

Standard Conditions — Zero Wind — Gross Weight- 3800 Pounds

10,000 FEET

RPM	MP	% BHP	TAS MPH	LBS./ HOUR	384 LBS. (NO RESERVE) ENDR. HOURS	384 LBS. (NO RESERVE) RANGE MILES	534 LBS. (NO RESERVE) ENDR. HOURS	534 LBS. (NO RESERVE) RANGE MILES
2500	27.5	75	193	98	3.9	755	5.4	1040
	26	70	188	92	4.2	785	5.8	1095
	24	64	180	84	4.6	825	6.4	1145
	22	57	170	76	5.0	860	7.0	1195
2400	27.5	70	188	92	4.2	785	5.8	1095
	26	66	183	87	4.4	810	6.2	1125
	24	60	174	79	4.9	845	6.7	1175
	22	54	165	72	5.3	875	7.4	1215
2300	27.5	66	183	87	4.4	810	6.2	1125
	26	62	177	82	4.7	835	6.6	1160
	24	56	169	75	5.1	865	7.1	1200
	22	51	159	68	5.6	890	7.8	1235
2200	27.5	62	178	82	4.7	835	6.5	1160
	26	58	172	77	5.0	855	6.9	1185
	24	53	163	71	5.4	880	7.5	1220
	22	48	153	65	5.9	900	8.2	1250
	20	43	140	59	6.5	905	9.0	1260

FIG. 17

CRUISE PERFORMANCE

NORMAL LEAN MIXTURE

Standard Conditions — Zero Wind — Gross Weight- 3800 Pounds

15,000 FEET

RPM	MP	% BHP	TAS MPH	LBS./ HOUR	384 LBS. (NO RESERVE) ENDR. HOURS	384 LBS. (NO RESERVE) RANGE MILES	534 LBS. (NO RESERVE) ENDR. HOURS	534 LBS. (NO RESERVE) RANGE MILES
2500	27.5	75	203	98	3.9	795	5.4	1105
	26	70	198	91	4.2	835	5.9	1165
	24	63	190	83	4.6	875	6.4	1215
	22	58	182	77	5.0	905	6.9	1260
2400	27.5	70	199	92	4.2	835	5.8	1160
	26	66	193	86	4.4	860	6.2	1195
	24	60	185	79	4.8	895	6.7	1245
	22	55	175	73	5.3	920	7.3	1280
2300	27.5	66	194	87	4.4	860	6.2	1195
	26	62	188	82	4.7	885	6.5	1230
	24	57	179	75	5.1	915	7.1	1270
	22	51	168	69	5.6	935	7.7	1300
2200	27.5	63	189	82	4.7	880	6.5	1225
	26	59	183	78	4.9	900	6.9	1255
	24	54	174	72	5.3	925	7.4	1285
	22	49	163	66	5.8	945	8.1	1315
	20	44	151	61	6.3	955	8.8	1330

TURBULENT AIR PENETRATION

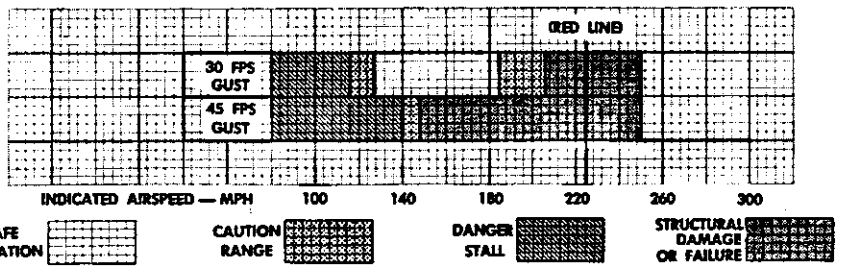


FIG. 18

AIRSPEED CORRECTION TABLE

FLAPS 0°	IAS	80	100	120	140	160	180	200
	CAS	81	101	121	140	160	180	200
*FLAPS 10°	IAS	70	80	90	100	120	140	160
	CAS	72	81	91	101	121	141	161
**FLAPS 30°	IAS	50	60	70	80	90	100	110
	CAS	60	68	76	85	94	104	113

*MAXIMUM SPEED, FLAPS EXTENDED-160 MPH CAS

**MAXIMUM SPEED, FLAPS EXTENDED-110 MPH CAS

FIG. 19

205. B33 At a constant TAS, in which type air mass would you obtain the highest indicated airspeed?

1- Dry, warm air.
2- Dry, cold air.
3- Moist, warm air.
4- Moist, cold air.

206. B41 What is the center of gravity of this airplane ready for takeoff on an IFR flight?

	Weight	MOM/1000
Empty weight	2334.7	91.8
Oil	21	-0.3
Fuel (tanks at 37.3" aft of datum)		
Pilot and Copilot	340	12.6
Passengers	340	24.1
Baggage	70	9.7

Fuel--sufficient for IFR flight at a burn rate of 12.3 gals./hr. 2.3 hours to destination, .7 hours to required alternate.

1- 48.1" aft of datum
2- 45.6" aft of datum
3- 43.8" aft of datum
4- 40.9" aft of datum

207. B41 Determine the center of gravity of this airplane ready for takeoff on an IFR flight.

	Weight	Arm	MOM
Empty weight	3,351	79.3	265734
Oil	45	19.0	
Fuel	480	84.1	
Pilot and Copilot	340	85.3	
Passengers	340	121.2	
Baggage	51	153.0	

1- 78.3" aft of datum
2- 81.1" aft of datum
3- 83.6" aft of datum
4- 85.3" aft of datum

208. B41 Your airplane, when loaded as planned, has a gross weight of 5,000 lbs., with the CG 96.8" aft of datum, which is .8" aft of limits. You have loaded 100 lbs. of baggage in the rear baggage compartment, located 145" aft of datum. If you remove this baggage, will the new CG be within limits, and what will be its position?

1- No; 96.5" aft of datum.
2- No; 97.5" aft of datum.
3- Yes; 95.5" aft of datum.
4- Yes; 95.8" aft of datum.

209. B41 This airplane is ready for an IFR flight with these loading conditions:

Loaded weight- - - - 2,830 lbs.
Loaded center of gravity - - - - - - 61.5" aft of datum

Before departure, these changes in loading are made:

20 gallons of aviation gas added to tanks at 65.5" aft of datum;
55 pounds of baggage removed from compartment 142.9 inches aft of datum.

What is the new center of gravity?

1- 63.9" aft of datum
2- 62.7" aft of datum
3- 61.5" aft of datum
4- 60.1" aft of datum

210. B41 What is the center of gravity of this airplane ready for takeoff on an IFR flight?

	Weight	MOM/1000
Empty weight	3,102	281.0
Oil	45	2.4
Fuel (tanks at 113" aft of datum)		
Pilot and Copilot	335	29.8
Passengers	287	36.2
Baggage	143	26.2

Fuel--sufficient for IFR flight at a burn rate of 14.8 gals./hr. 2.7 hours to destination, .9 hours to required alternate.

1- 87.8" aft of datum
2- 92.1" aft of datum
3- 97.5" aft of datum
4- 99.3" aft of datum

211. B41 This airplane is ready for an IFR flight with these loading conditions:

Loaded weight- - - -3,428 lbs.
Loaded center of gravity - - - - - -41.9" aft of datum

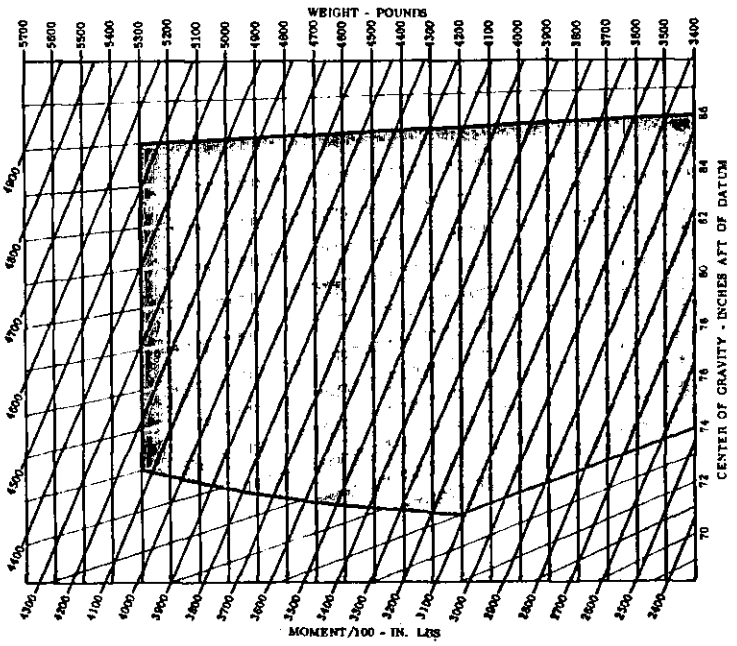
Before departure, these changes to loading are made:

One additional passenger who weighs 140 pounds, comes aboard with 20 pounds of baggage;
Passenger station is 101, and baggage station is 138.

What is the new CG?

1- 47.6" aft of datum
2- 44.7" aft of datum
3- 41.9" aft of datum
4- 39.8" aft of datum

GROSS WEIGHT MOMENT LIMITS



ENVELOPE BASED ON THE FOLLOWING WEIGHT AND CENTER OF GRAVITY LIMIT DATA (LANDING GEAR DOWN)

WEIGHT CONDITION:	FORWARD C.G. LIMIT	AFT C.G. LIMIT
3200 LB. (MAXIMUM TAKE-OFF OR LANDING)	78.0	86.0
4200 LBS. OR LESS	74.0	86.0

USEFUL LOAD WEIGHTS AND MOMENTS

OCCUPANTS

WEIGHT	PILOT OR COPILOT	CENTER SEATS		5TH & 6TH SEATS
		FWD POSITION	AFT POSITION	
	ARM 85	ARM 121	ARM 136	ARM 150
	MOMENT/100			
120	102	145	163	180
130	111	157	177	195
140	119	169	190	210
150	128	182	204	225
160	136	194	218	240
170	145	206	231	255
180	153	218	245	270
190	162	230	258	285
200	170	242	272	300

FUEL

GAL	WEIGHT	LEADING EDGE WING TANKS	AFT WING TANKS
		ARM 75	ARM 93
		MOMENT/100	
5	30	23	28
10	60	45	56
15	90	68	84
20	120	90	112
25	150	113	140
30	180	135	167
34	204	153	190
35	210	158	195
40	240	180	223
45	270	203	251
50	300	225	279
55	330	248	307
60	360	270	335
62	372	279	346
65	390	293	
70	420	315	
75	450	338	
80	480	360	

OIL

ARM 45		
GAL	WEIGHT	MOM/100
6.0	45	19

BAGGAGE

WEIGHT	FWD	REAR		FWD OF SPAR	AFT OF SPAR
		FS 131 TO 170	FS 170 TO 190		
	ARM 25	ARM 150	ARM 180	ARM 108	ARM 145
	MOMENT/100				
10	3	15	18	11	15
20	5	30	36	22	29
30	8	45	54	32	44
40	10	60	72	43	58
50	13	75	90	54	73
60	15	90	108	65	87
70	18	105	126	76	102
80	20	120	144	86	116
90	23	135	162	97	131
100	25	150	180	108	145
110	28	165	198	119	160
120	30	180	216	130	174
130	33	195		140	189
140	35	210		151	203
150	38	225		162	218
160	40	240		173	232
170	43	255		184	247
180	45	270		194	261
190	58	285		205	276
200	50	300		216	290
210	53	315			305
220	55	330			319
230	58	345			334
240	60	360			348
250	63	375			363
260	65	390			377
270	68	405			392
280	70	420			406
290	73	435			421
300	75	450			435
310		465			450
320		480			464
330		495			479
340		510			493
350		525			508
360		540			522
370		555			537
380		570			551
390		585			566
400		600			580

FIG. 21

212. B41 What flight characteristics should an airplane exhibit if it were flown at a weight of 5,000 lbs. and the CG at 88 inches aft of datum? (Fig. 21)

1- Critical in a stall with a tendency to "flat" spin.
2- Critically unstable in all flight conditions.
3- Critical upon landing by loss of control at slow speeds.
4- Stalls at higher speeds and has reduced takeoff and climb performance.

213. B41 Calculate the total weight and moment and determine if it is within the limits of the CG envelope. (Fig. 21)

Empty weight - 3,300 lbs. with moment 261,900
Fuel and oil - Full service
Pilot and front passenger - 340 lbs.
Center seat passenger (Sta. 121) - 340 lbs.
Baggage (Sta. 150) - 150 lbs.

	Weight	MOM/100	CG Limits
1-	4,317	4,271	NO-CG = 98.9
2-	4,982	4,252	YES-CG = 85.3
3-	4,817	4,252	NO-CG = 88.2
4-	5,027	4,271	YES-CG = 85

214. B41 What is the CG after a fuel burn of 50 gallons from the leading edge tanks? The airplane weighs 5,300 lbs. with the CG at 85 inches aft of the datum at takeoff. (Fig. 21)

1- 85.6
2- 83.4
3- 81.4
4- 80.5

215. B41 Prior to departure on an instrument flight, you determine that your helicopter's gross weight is 2,350 pounds and its total moment is 277,680.0 lb.-in. What is the amount and direction of CG movement resulting from the inflight fuel burn outlined below?

Fuel tank centroid - fuselage station 145.0
Fuel burn - 1.3 hours @ 180 lbs./hr.

1- 3.1 inches fwd
2- 1.5 inches aft
3- 2.9 inches fwd
4- .3 inches aft

216. B41 What flight characteristics should this airplane exhibit if it were flown at a weight of 5,600 lbs. and the CG at 81 inches aft of the datum? (Fig. 21)

1- Critically unstable in all flight conditions.
2- Stalls at higher speeds and has reduced takeoff and climb performance.
3- Critical upon landing by loss of control at slow speeds.
4- Critical in a stall with a tendency to "flat" spin.

217. B41 What flight characteristics should this airplane exhibit if it were flown at a weight of 5,000 pounds and the CG at 75 inches aft of the datum? (Fig. 21)

1- Stalls at higher speeds and has reduced takeoff and climb performance.
2- Critical upon landing by loss of control at slow speeds.
3- Critical in a stall with a tendency to "flat" spin.
4- Critically unstable in all flight conditions.

218. B41 What is the CG if you move 50 lbs. of the baggage from the most aft baggage compartment to the forward baggage compartment? The airplane gross weight is 5,000 lbs. with a moment of 430,000 before shifting the baggage. (Fig. 21)

1- 84.5
2- 85.0
3- 84.2
4- 86.3

219. B41 Prior to departure on an instrument flight, you determine that your helicopter's gross weight is 2,400 pounds and its CG is 113.1 inches aft of datum. What is the amount and direction of CG movement resulting from the inflight fuel burn outlined below?

Fuel tank centroid - fuselage station 85.0
Fuel burn - 1.4 hours @ 150 lbs./hr.

1- 2.7 inches aft
2- 3.4 inches fwd
3- 1.2 inches aft
4- 1.9 inches fwd

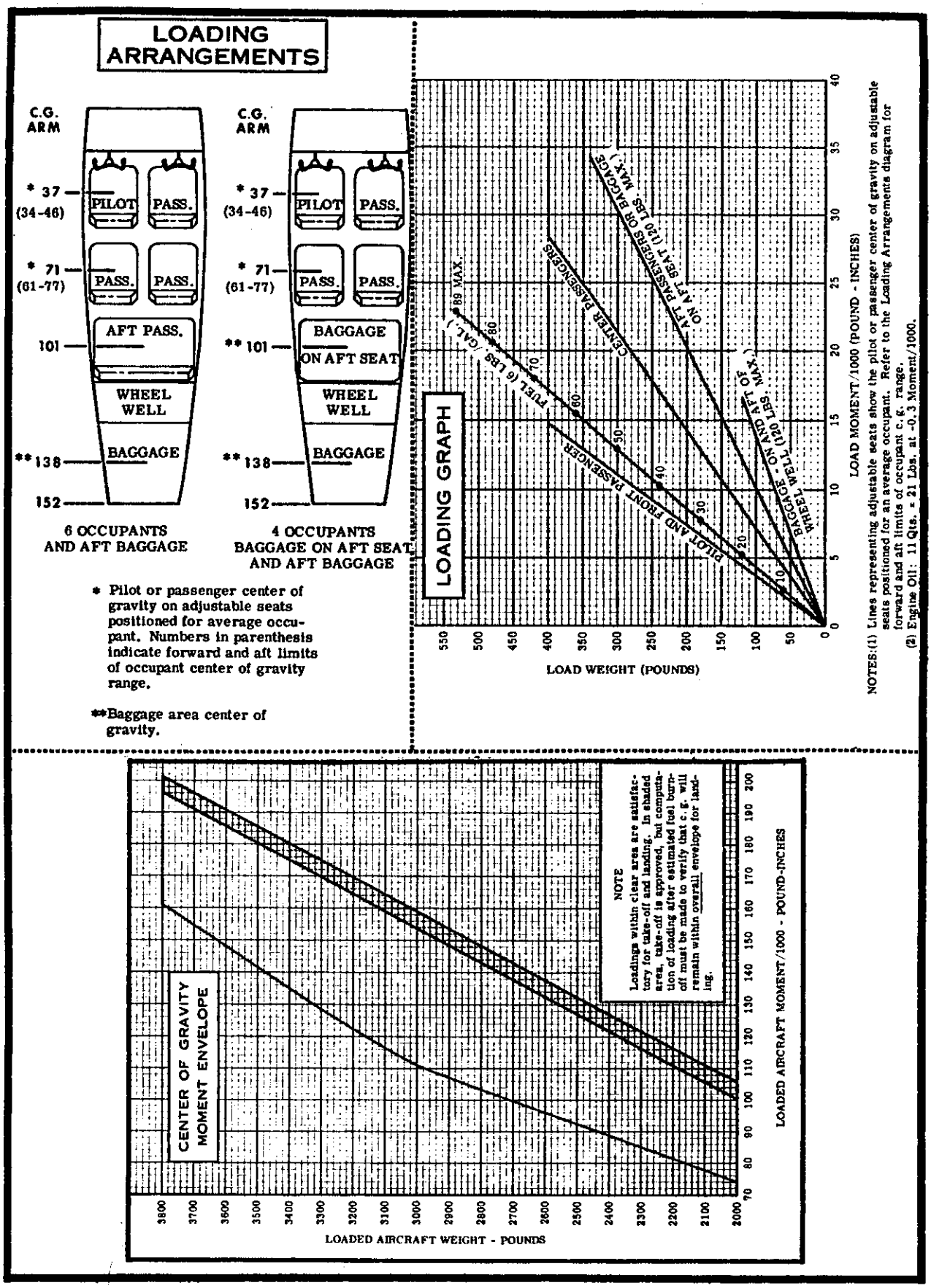

LOADING ARRANGEMENTS
C.G. ARM
* 37 (34-46)
* 71 (61-77)
101
** 138
152
PILOT
PASS.
AFT PASS.
WHEEL WELL
BAGGAGE
6 OCCUPANTS AND AFT BAGGAGE
BAGGAGE ON AFT SEAT
4 OCCUPANTS BAGGAGE ON AFT SEAT AND AFT BAGGAGE
* Pilot or passenger center of gravity on adjustable seats positioned for average occupant. Numbers in parenthesis indicate forward and aft limits of occupant center of gravity range.
**Baggage area center of gravity.
LOADING GRAPH
FUEL (6 LBS./GAL.)
PILOT AND FRONT PASSENGER
CENTER PASSENGERS
AFT PASSENGERS OR BAGGAGE (190 LBS. MAX.) ON AFT SEAT
BAGGAGE WELL (120 LBS. MAX.) ON AND AFT OF WHEEL WELL
LOAD WEIGHT (POUNDS)
LOAD MOMENT/1000 (POUND - INCHES)
NOTES:(1) Lines representing adjustable seats show the pilot or passenger center of gravity on adjustable seats positioned for an average occupant. Refer to the Loading Arrangements diagram for forward and aft limits of occupant c.g. range.
(2) Engine Oil: 11 Qts. = 21 Lbs. at -0.3 Moment/1000.
CENTER OF GRAVITY MOMENT ENVELOPE
NOTE
Loadings within clear area are satisfactory for take-off and landing. In shaded area, take-off is approved, but computation of loading after estimated fuel burn-off must be made to verify that c.g. will remain within overall envelope for landing.
LOADED AIRCRAFT WEIGHT - POUNDS
LOADED AIRCRAFT MOMENT/1000 - POUND-INCHES

FIG. 22

220. B41 Calculate the total weight and moment and determine if it is within the limits of the CG Envelope. (Fig. 22)

Empty weight - 2,348 lbs. with moment 92.1/1,000 lb.-in.
Oil - 21 lbs. at -0.3 moment
Usable fuel - 89 gal. at 6 lbs./gal.
Pilot and front passenger - 340 lbs.
Center passengers - 300 lbs.
Baggage on aft seat - 110 lbs.

	Weight	MOM/1,000	Within limits
1-	3,611 lbs.	160	Yes
2-	3,653 lbs.	190	No
3-	3,653 lbs.	160	Yes
4-	3,611 lbs.	190	No

221. B41 Calculate the total weight and moment and determine if it is within the limits of the CG Envelope. (Fig. 22)

Empty weight - 2,520 lbs. with moment 90.3/1,000 lb.-in.
Oil - 21 lbs. at -0.3 moment
Fuel - 89 gal. at 6 lbs./gal.
Pilot and front passenger - 400 lbs.

	Weight	MOM/ 1,000	Within limits
1-	3,433	137.5	Yes
2-	3,475	127.5	Yes
3-	3,433	128.1	No
4-	3,475	127.5	No

222. B41 What is the maximum aft baggage that can be loaded aboard this airplane which will permit the CG to remain within the clear area of the Moment Envelope? The gross weight of the airplane without baggage is 3,180 lbs. with a moment of 154,500 lb.-in. (Fig. 22)

1- 120 lbs.
2- 100 lbs.
3- 80 lbs.
4- 60 lbs.

223. B41 Which list of items makes up the useful load for an airplane?

1- Pilot, passengers, usable fuel, oil, and baggage.
2- Fuel on board, oil, passengers, and baggage.
3- Pilot, passengers, baggage, and total fuel.
4- Pilot, passengers, total fuel, oil, and cargo.

224. B41 Prior to departure on an instrument flight, you determine that your helicopter's gross weight is 2,450 pounds and its CG is 112.5 inches aft of datum. What is the amount and direction of CG movement resulting from the inflight fuel burn outlined below?

Fuel tank centroid - fuselage station 140.0
Fuel burn - 1.5 hours @ 180 lbs./hr.

1- 3.4 inches fwd
2- 2.8 inches fwd
3- 2.2 inches fwd
4- 1.6 inches aft

225. B41 What effect would a takeoff gross weight of 3,410 pounds with a moment of 180,000 have on this airplane CG if a fuel burn of 59 gallons is expected? (Fig. 22)

1- CG within limits for both takeoff and landing.
2- CG within limits for takeoff but aft of limits for landing.
3- CG aft of limits for both takeoff and landing.
4- CG aft of limits for takeoff but within limits for landing.

226. B41 What is the airplane CG with relation to the Moment Envelope both at takeoff and after a 39 gal. fuel burn? The airplane weighs 3,500 lbs. with a moment of 180,000 lb.-in. at takeoff. (Fig. 22)

1- The CG is within limits for takeoff but aft of limits for landing.
2- The CG is aft of limits for both takeoff and landing.
3- The CG is within limits for both takeoff and landing.
4- The CG is aft of limits for takeoff but within limits for landing.

227. B41 You determine that your helicopter's gross weight is 2,450 lbs. and its total moment is 275,650.0 lb.-in. What is the amount and direction of CG movement resulting from the inflight fuel burn outlined below?

Fuel tank centroid - fuselage station 148.0
Fuel burn - 1.5 hours @ 170 lbs./hr.

1- 1.6 inches aft
2- 2.8 inches aft
3- 3.4 inches fwd
4- 4.1 inches fwd

228. B41 This airplane is ready for an IFR flight with these loading conditions:

Loaded weight- - - 4,122 lbs.
Loaded center of gravity- - - - - 95.1" aft of datum

Before departure, these changes to loading are made:

One passenger who weighs 170 pounds, gets off with 25 pounds of baggage;
Passenger station is 89, and baggage station is 183.

What is the new CG?

1- 94.8" aft of datum
2- 96.2" aft of datum
3- 98.7" aft of datum
4- 100.1" aft of datum

229. B41 Determine the center of gravity of this airplane ready for takeoff on an IFR flight.

	Weight	Arm	MOM
Empty weight	1,856	83.7	155347
Oil	23	28.0	644
Fuel (inboards)	336	90.0	
Fuel (outboards)	180	95.0	
Pilot and passenger	340	84.8	
Passengers (aft)	280	120.5	
Baggage	40	142.0	

1- 94.1" aft of datum
2- 92.3" aft of datum
3- 90.1" aft of datum
4- 88.9" aft of datum

230. B41 This airplane is ready for an IFR flight with these loading conditions:

Loaded weight- - - 2,650 lbs.
Loaded center of gravity- - - - - 62.7" aft of datum

Before departure, these changes to loading are made:

30 gallons of aviation gas added to tanks at 67.5" aft of datum;
40 pounds of baggage removed from compartment 147.2 inches aft of datum.

What is the new center of gravity?

1- 67.0" aft of datum
2- 65.3" aft of datum
3- 63.1" aft of datum
4- 61.8" aft of datum

231. B41 Your airplane is loaded to a gross weight of 5,000 lbs., with three pieces of luggage in the rear baggage compartment. You determine the CG is 98" aft of datum, which is 2" aft of limits. If you move two pieces of luggage, which together weigh 100 lbs., from the rear baggage compartment (145" aft of datum) to the front compartment (45" aft of datum) what is the new CG?

1- 95.8" aft of datum
2- 96.0" aft of datum
3- 96.5" aft of datum
4- 97.0" aft of datum

232. B41 A pilot determines that a helicopter's gross weight is 2,450 lbs. and its total moment is 275,650.0 lb.-in. What is the amount and direction of CG movement resulting from the inflight fuel burn outlined below?

Fuel tank centroid--fuselage station 148.0
Fuel burn--1.5 hours @ 170 lbs./hr.

1- 1.6" aft
2- 2.8" aft
3- 4.1" fwd
4- 3.4" fwd

233. B51 You are climbing to altitude maintaining cruise climb pitch attitude and power setting. At 8,000 feet, you notice that your airspeed has increased 7 knots and you increase the pitch attitude. At 9,000 feet, the airspeed shows another 5-knot increase. What does this condition indicate?

1- You are lowering the pitch attitude as you climb.
2- Your airspeed indicator has failed and will need to be replaced.
3- The pitot head ram air opening and drain are probably blocked.
4- You are flying into colder air and the engine is developing more power.

234. B51 Your altimeter is indicating 4,000 feet with an altimeter setting of 29.92. ATC gives you a new altimeter setting of 29.89 and, with this setting, your altimeter indicates 3,970 feet. At what pressure altitude are you flying?

1- 4,030 feet
2- 3,970 feet
3- 4,000 feet
4- 3,950 feet

235. B52 At what point in a normal coordinated turn is the turn error in a vacuum driven attitude indicator at maximum?

1- 720°
2- 360°
3- 180°
4- 90°

236. B51 Your altimeter setting is 29.92 and your altimeter indicates 7,000 feet. ATC advises you that the altimeter setting is 30.03 and, with this setting, your altimeter indicates 7,100 feet. At what pressure altitude are you flying?

1- 6,900 feet
2- 7,000 feet
3- 7,100 feet
4- 7,150 feet

237. B54 What causes the northerly turning error in a magnetic compass?

1- The magnetic dip characteristic.
2- Oversensitivity when nearer one of the magnetic poles.
3- Coriolis force at the mid-latitudes.
4- Centrifugal force acting on the compass card.

238. B51 You are flying at an indicated altitude of 6,000 feet with an altimeter setting of 30.01. ATC gives you a new altimeter setting of 29.92 and, with this setting, your altimeter indicates 5,920 feet. At what pressure altitude are you flying?

1- 6,000 feet
2- 6,080 feet
3- 5,920 feet
4- 5,890 feet

239. B51 Your altimeter is indicating 4,000 feet with an altimeter setting of 29.92. ATC gives you a new altimeter setting of 29.89 and, with this setting, your altimeter indicates 3,970 feet. At what pressure altitude are you flying?

1- 3,970 feet
2- 4,000 feet
3- 3,950 feet
4- 4,030 feet

240. B51 Which altitude is indicated when the altimeter is set to 29.92?

1- Pressure
2- Density
3- Standard
4- True

241. B51 What effect does flying into a colder air mass have on true airspeed and true altitude if the airplane maintains a constant pressure altitude and CAS?

1- Higher TAS and a lower true altitude.
2- Higher TAS and a higher true altitude.
3- Lower TAS and a higher true altitude.
4- Lower TAS and a lower true altitude.

242. B51 You are at an airport <u>without</u> a tower or FSS. How can you determine the pressure altitude?

1- Set the altimeter to the current altimeter setting of a station within 100 miles and correct this indicated altitude for the temperature at the field.
2- Use your computer and correct the field elevation for temperature.
3- Multiply field elevation by 2% for each 10° the field temperature differs from standard. Subtract this value from field elevation if temperature is below standard; add if temperature is above standard.
4- Set the altimeter to 29.92 and read the altitude indicated.

243. B54 What should be the indication on the magnetic compass as you roll-in to a standard rate turn to the left from a westerly heading in the northern hemisphere?

1- The compass will indicate the approximate correct magnetic heading if the roll-in to the turn is smooth.
2- The compass will indicate a turn to the left, but at a faster rate than is actually occurring.
3- The compass will initially indicate a turn to the right.
4- The compass will remain on west for a short time, then gradually catch up to the magnetic heading of the airplane.

244. B54 On what headings will the magnetic compass read most accurately during a level 360° turn, with a bank of approximately 15°?

1- 45°, 135°, 225°, and 315°.
2- 135° through 225°.
3- 180° and 0°.
4- 90° and 270°.

245. B54 What should be the indication on the magnetic compass when you roll-in to a standard rate turn to the left from a southerly heading in the northern hemisphere?

1- The compass will initially indicate a turn to the right.
2- The compass will indicate a turn to the left, but at a faster rate than is actually occurring.
3- The compass will remain on south for a short time, then gradually catch up to the magnetic heading of the airplane.
4- The compass will indicate the approximate correct magnetic heading if the roll-in to the turn is smooth.

246. B54 What should be the indication on the magnetic compass as you roll-in to a standard rate turn to the left from an easterly heading in the northern hemisphere?

1- The compass will indicate the approximate correct magnetic heading if the roll-in to the turn is smooth.
2- The compass will indicate a turn to the left, but at a faster rate than is actually occurring.
3- The compass will initially indicate a turn to the right.
4- The compass will remain on east for a short time, then gradually catch up to the magnetic heading of the airplane.

247. B54 What should be the indication on the magnetic compass as you roll-in to a standard rate turn to the right from a southerly heading in the northern hemisphere?

1- The compass will initially indicate a turn to the left.
2- The compass will indicate a turn to the right, but at a faster rate than is actually occurring.
3- The compass will remain on south for a short time, then gradually catch up to the magnetic heading of the airplane.
4- The compass will indicate the approximate correct magnetic heading if the roll-in to the turn is smooth.

248. B54 What should be the indication on the magnetic compass as you roll-in to a standard rate turn to the left from a northerly heading in the northern hemisphere?

1- The compass will indicate a turn to the left, but at a faster rate than is actually occurring.
2- The compass will remain on north for a short time, then gradually catch up to the magnetic heading of the airplane.
3- The compass will initially indicate a turn to the right.
4- The compass will indicate the approximate correct magnetic heading if the roll-in to the turn is smooth.

249. B54 What should be the indication on the magnetic compass as you roll-in to a standard rate turn to the right from a northerly heading in the northern hemisphere?

1- The compass will indicate a turn to the right, but at a faster rate than is actually occurring.
2- The compass will remain on north for a short time, then gradually catch up to the magnetic heading of the airplane.
3- The compass will initially indicate a turn to the left.
4- The compass will indicate the approximate correct magnetic heading if the roll-in to the turn is smooth.

250. B54 What should be the indication on the magnetic compass as you roll-in to a standard rate turn to the right from a westerly heading in the northern hemisphere?

1- The compass will indicate a turn to the right, but at a faster rate than is actually occurring.
2- The compass will initially indicate a turn to the left.
3- The compass will indicate the approximate correct magnetic heading if the roll-in to the turn is smooth.
4- The compass will remain on west for a short time, then gradually catch up to the magnetic heading of the airplane.

251. C13 Under what condition will true altitude be lower than indicated altitude with an altimeter setting of 29.92 even with an accurate altimeter?

1- In colder than standard air temperature.
2- In warmer than standard air temperature.
3- When density altitude is higher than indicated altitude.
4- Under higher than standard pressure at standard air temperature.

252. C13 Under which condition(s) will pressure altitude be equal to true altitude?

1- When the atmospheric pressure is 29.92" of Hg.
2- When standard atmospheric conditions exist.
3- When indicated altitude is equal to the pressure altitude.
4- When the outside air temperature (OAT) is standard for that altitude.

253. C13 What type altitude does a pilot maintain at FL 210?

1- Indicated
2- Pressure
3- Density
4- Corrected (approximately true)

254. C13 Altimeter setting is the value to which the scale of the pressure altimeter is set so the altimeter indicates

1- density altitude at sea level.
2- pressure altitude at sea level.
3- true altitude at field elevation.
4- pressure altitude at field elevation.

255. C13 Under what condition is pressure altitude and density altitude the same value?

1- At sea level, when the temperature is 0°F.
2- When the altimeter has no installation error.
3- When the altimeter setting is 29.92.
4- At standard temperature.

256. C14 What causes surface winds to flow across the isobars at an angle rather than parallel to the isobars?

1- Surface friction.
2- Coriolis force.
3- Heat radiation from the surface.
4- The greater atmospheric pressure on the surface.

257. C14 Winds at 5,000 feet AGL on a particular flight are southwesterly while most of the surface winds are southerly. This difference in direction is primarily due to

1- a stronger pressure gradient at higher altitudes.
2- stronger Coriolis force at the surface.
3- friction between the wind and the surface.
4- the influence of pressure systems at the lower altitudes.

258. C15 Which conditions result in the formation of frost?

1- The freezing of dew.
2- The collecting surface's temperature is at or below freezing and small droplets of moisture fall on the collecting surface.
3- The temperature of the collecting surface is at or below the dewpoint of the adjacent air and the dewpoint is below freezing.
4- Small drops of moisture falling on the collecting surface when the surrounding air temperature is at or below freezing.

259. C15 You encounter wet snow during a cross-country flight. What does this indicate regarding temperatures in the area?

1- You are flying from a warm air mass into a cold air mass.
2- You are in an "inversion" with colder air below.
3- The temperature is above freezing at your altitude.
4- The temperature is above freezing at higher altitudes.

260. C15 The presence of ice pellets at the surface is evidence that

1- a cold front has passed.
2- there are thunderstorms in the area.
3- temperatures are above freezing at some higher altitude.
4- you can climb to a higher altitude without encountering more than light icing.

261. C15 What is indicated if you encounter ice pellets at 8,000 feet?

1- Freezing rain at higher altitude.
2- You are approaching an area of thunderstorms.
3- You will encounter hail if you continue your flight.
4- The formation of low clouds or fog.

262. What is meant by the term dewpoint?

C15

1- The temperature at which condensation and evaporation are equal.
2- The temperature at which dew will always form.
3- The temperature to which air must be cooled to become saturated.
4- The spread between actual temperature and the temperature during evaporation.

263. The amount of water vapor which air can hold largely depends on

C15

1- the dewpoint.
2- air temperature.
3- stability of air.
4- relative humidity.

264. Clouds, fog, or dew will always form when

C15

1- water vapor condenses.
2- relative humidity exceeds 100%.
3- water vapor is present.
4- the dewpoint is higher than the temperature.

265. What are the characteristics of unstable air?

C16

	Visibility	Type of precipitation	Type of clouds
1-	Poor	Intermittent	Cumulus
2-	Poor	Steady	Stratus
3-	Good	Showers	Cumulus
4-	Good	Steady	Stratus

266. What are characteristics of unstable air?

C16

1- Turbulence and good surface visibility.
2- Turbulence and poor surface visibility.
3- Nimbostratus clouds and good surface visibility.
4- Nimbostratus clouds and poor surface visibility.

267. What type of clouds will be formed if very stable moist air is forced upslope?

C16

1- Vertical clouds with increasing height.
2- Layer-like clouds with little vertical development.
3- First layer clouds and then vertical clouds.
4- First vertical clouds and then layer clouds.

268. What are some characteristics of unstable air?

C16

1- Poor visibility, intermittent rain, and clear icing.
2- Good visibility, intermittent rain, and rime icing.
3- Poor visibility, showers, and clear icing.
4- Good visibility, showers, and cumuliform clouds.

269. What is a characteristic of stable air?

C16

1- Stratiform clouds.
2- Unlimited visibility.
3- Fair weather cumulus clouds.
4- Temperature decreases rapidly with altitude.

270. Moist, stable air flowing upslope can be expected to

C16

1- dissipate cloudiness.
2- produce low stratus and fog.
3- develop convective turbulence.
4- cause showers and thunderstorms.

271. A temperature inversion forms

C16

1- only in summer.
2- only in winter.
3- an unstable layer of air.
4- a stable layer of air.

272. What are the characteristics of stable air?

C16

	Visibility	Type of precipitation	Type of clouds
1-	Good	Showers	Cumulus
2-	Poor	Intermittent	Cumulus
3-	Good	Steady	Stratus
4-	Poor	Steady	Stratus

273. Which family of clouds is <u>least</u> likely to contribute to structural icing on an aircraft?

C17

1- Low clouds.
2- Middle clouds.
3- High clouds.
4- Clouds with extensive vertical development.

274. Standing lenticular clouds (ACSL), in mountainous areas, indicate

C17

1- turbulence.
2- unstable air.
3- an inversion.
4- light variable winds.

275. C17 The presence of standing lenticular altocumulus clouds is a good indication of

1- heavy rain.
2- very strong turbulence.
3- heavy icing conditions.
4- an approaching storm.

276. C17 Clouds characterized by their lumpy, billowy appearance belong to which family of clouds?

1- High clouds.
2- Middle clouds.
3- Low clouds.
4- Clouds with extensive vertical development.

277. C17 The suffix nimbus, used in naming clouds, means

1- a cloud with extensive vertical development.
2- a rain cloud.
3- a middle cloud containing ice pellets.
4- an accumulation of clouds.

278. C17 Nimbostratus, a gray or dark massive cloud layer, belongs to which family of clouds?

1- High clouds.
2- Middle clouds.
3- Low clouds.
4- Clouds with extensive vertical development.

279. C18 Which weather phenomenon is always associated with the passage of a frontal system?

1- A wind shift.
2- An abrupt decrease in pressure.
3- Clouds, either ahead or behind the front.
4- An abrupt decrease in temperature.

280. C19 Where does wind shear occur?

1- Only at higher altitudes, usually in the vicinity of jetstreams.
2- At any level, and it can exist in both a horizontal and vertical direction.
3- Primarily at lower altitudes in the vicinity of mountain waves.
4- Only in the vicinity of thunderstorms.

281. C19 Where does wind shear occur?

1- Wind shear of any significance occurs only in connection with the jetstream.
2- Wind shear may be associated with either a wind shift or a wind-speed gradient at any level in the atmosphere.
3- It occurs primarily at lower altitudes in the vicinity of mountain waves.
4- It occurs only when there is a strong temperature inversion, or when the jetstream is associated with a strong low.

282. C19 Hazardous wind shear is commonly encountered near the ground in the vicinity of thunderstorms and with warm afternoon temperatures

1- during periods when the wind velocity is stronger than 35 knots.
2- near mountain valleys when the lapse rate is greater than normal.
3- during periods of strong low level temperature inversion.
4- on the windward side of a hill or mountain.

283. C19 What is an important characteristic of wind shear?

1- It occurs primarily at the lower levels and is usually associated with a mountain wave.
2- It exists in a horizontal direction only, and is normally found near a jetstream.
3- It can be present at any level and can exist in both a horizontal and vertical direction.
4- It exists only in the vicinity of thunderstorms.

284. C21 Why is frost considered hazardous to flight operation?

1- The increased weight requires a greater takeoff distance and a higher airspeed.
2- Frost changes the basic aerodynamic shape of an airfoil.
3- The air flows faster over the leading edge than over the upper and lower portion of an airfoil causing loss of lift.
4- Frost spoils the smooth flow of air over the airfoil, which in turn causes a higher stall speed.

285. C21 What are the characteristics of rime ice, and what conditions are most favorable for its formation?

1- Opaque, rough appearance, tending to spread back over an aircraft surface. Most frequently encountered in cumuliform clouds at temperatures slightly below freezing.
2- Smooth appearance and builds forward from leading surfaces into a sharp edge. Most common in cumuliform clouds at temperatures of -20°C. to -25°C.
3- Milky, granular appearance, forming on leading edges, and accumulating forward into the airstream. Stratiform clouds and temperatures of -10°C. to -20°C. are most conducive to its formation.
4- Transparent appearance and tendency to take the shape of the surface on which it freezes. Stratiform clouds and temperatures only slightly below freezing promote its formation.

286. C21 What is an operational consideration if you fly into rain which freezes on impact?

1- You have flown into an area of thunderstorms.
2- Temperatures are above freezing at some higher altitude.
3- You have flown through a cold front.
4- If you descend, you will fly out of this icing condition.

287. C21 In which conditions would you most likely encounter clear structural icing, and how would it normally appear?

1- Cumuliform clouds; large water droplets; temperatures between 0 and -15°C. Appears smooth and tends to spread back over an aircraft surface.
2- Stratiform clouds; small water droplets; temperatures between -10°C. and -20°C. Appears granular and tends to accumulate forward into the airstream.
3- Cumuliform clouds; small water droplets; temperatures -20°C. to -25°C. Appears transparent and tends to take the shape of the surface on which it freezes.
4- Stratiform clouds; large water droplets; temperatures well below freezing. Appears opaque and builds forward from leading surfaces into a sharp edge.

288. C21 If high humidity or visible moisture is present, in what temperature range would you expect to encounter the most severe structural icing?

1- 0°C. to -10°C.
2- -10°C. to -15°C.
3- -15°C. to -25°C.
4- -20°C. to -30°C.

289. C21 In which environment is aircraft structural ice most likely to have the highest accumulation rate?

1- Cumulus clouds.
2- Cirrus clouds.
3- Stratus clouds.
4- Freezing rain.

290. C22 What visible signs indicate extreme turbulence in thunderstorms?

1- Cumulonimbus clouds, very frequent lightning, and roll clouds.
2- Base of the clouds close to surface, heavy rain, and hail.
3- Low ceiling and visibility, hail, and precipitation static.
4- Lightning, roll clouds, low ceilings and visibility, and precipitation static.

291. C22 What is indicated when a current SIGMET forecasts "embedded thunderstorms"?

1- Thunderstorms have been visually sighted.
2- Severe thunderstorms are embedded within a squall line.
3- Thunderstorms are dissipating and present no serious problem to IFR flight.
4- Thunderstorms are obscured by massive cloud layers and cannot be seen.

292. C22 Which thunderstorms generally produce the most severe conditions, such as heavy hail and destructive winds?

1- Warm front thunderstorms.
2- Squall line thunderstorms.
3- Nocturnal air mass thunderstorms.
4- Daytime air mass thunderstorms.

293. C22 Which weather phenomenon is always associated with a thunderstorm?

1- Lightning.
2- Heavy rain showers.
3- Supercooled raindrops.
4- Hail.

294. C22 What conditions are necessary for the formation of a thunderstorm?

1- Frontal activity, cumulus clouds, and sufficient moisture.
2- Cumulus clouds, unbalance of static electricity, and turbulence.
3- Sufficient heat, moisture, and electricity.
4- Lifting action, unstable air, and sufficient moisture.

295. C23 What types of fog depend upon a wind in order to exist?

1- Radiation fog and ice fog.
2- Precipitation fog and steam fog.
3- Upslope fog and downslope fog.
4- Advection fog and upslope fog.

296. C23 What situation is most conducive to the formation of radiation fog?

1- Warm, moist air over low, flatland areas on clear, calm nights.
2- Moist, tropical air moving over cold, offshore water.
3- The movement of cold air over much warmer water.
4- A warm, moist air mass on the windward side of mountains.

297. C23 At times, fog is prevalent in industrial areas because of

1- atmospheric stabilization around cities.
2- an abundance of condensation nuclei from combustion products.
3- the high rate of evaporation from water used by factories.
4- a high concentration of steam from industrial plants.

298. C23 In which situation is advection fog most likely to form?

1- A warm, moist air mass on the windward side of mountains.
2- An air mass moving inland from the coast in winter.
3- A light breeze blowing colder air out to sea.
4- Warm, moist air settling over a warmer surface under no-wind conditions.

299. C23 In what localities is advection fog most likely to occur?

1- Coastal areas.
2- Mountain slopes.
3- Level inland areas.
4- Mountain valleys.

300. C33 For most effective use of the Radar Summary Chart during preflight planning, a pilot should

1- consult the chart to determine more accurate measurements of freezing levels, cloud cover, and wind conditions between reporting stations.
2- compare it with the Weather Depiction Chart to get a three-dimensional picture of clouds and precipitation.
3- utilize the chart as the only source of information regarding storms and hazardous conditions existing between reporting stations.
4- utilize the chart as the best source of information for ceilings, cloud tops, and cloud coverage between reporting stations.

301. C31 How is a ceiling defined? The height of the

1- highest layer of clouds or obscuring phenomena aloft that covers over six-tenths of the sky.
2- lowest layer of clouds that contributed to the overall overcast.
3- lowest layer of clouds which is at least thin broken.
4- lowest layer of clouds or obscuring phenomena aloft that is reported as broken or overcast.

302. C32 Interpret the Pilot Weather Report (PIREP).

UA/OV 20S ATL 1620 FL050/TP BE18/IC MDT RIME ICE.

1- Twenty minutes after the hour snow began at Atlanta, wind 160° at 20 knots; a Beech 18 reported moderate rime ice at 5,000 feet.
2- Twenty nautical miles south of Atlanta at 1620Z, a pilot flying at 5,000 feet in a Beech 18 reported moderate rime ice.
3- Snow encountered at 2,000 feet over Atlanta at 1620Z; a Beech 18 encountered rime ice at 5,000 feet.
4- Twenty minutes after the hour, south of Atlanta, wind was reported from 160° at 20 knots; moderate rime icing began 18 minutes after the hour at 5,000 feet.

253-096 O - 78 - 5

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INK CLR 15 106/77/63/1112G18/000
BOI 150 SCT 30 181/62/42/1304/015
LAX 7 SCT 250 SCT 6HK 129/60/59/2504/991
    LAX 6/38
MDW SP -X M7 OVC 11/2R+F 990/63/61/3205/
    980/RF2 RB12
JFK SP W5 X 1/2F 180/68/64/1804/006/R04RVR
    22V30 TWR VSBY1/4
```

FIG. 23

303. C31 Determine the local wind conditions at LAX. (Fig. 23)

1- 040° at 25 knots.
2- 250° at 4 knots with gusts 6 to 38 knots.
3- 250° at 4 knots.
4- 025° at 4 knots.

304. C31 What is the surface wind condition at INK? (Fig. 23)

1- 110° at 12 knots gusting to 18 knots.
2- 11° at 12 knots gusting to 18 knots.
3- 120° at 11 knots gusting to 18 knots.
4- 180° at 11 or 12 knots; gusty.

305. C31 Determine the sky condition and ceiling, if any, for MDW. (Fig. 23)

1- Sky obscured; ceiling not measurable.
2- Measured ceiling 700 overcast.
3- Overcast 1,100 feet.
4- Measured ceiling 700 and overcast at 1,100 feet.

306. C31 What is the visibility, weather, and obstruction to vision at MDW? (Fig. 23)

1- Visibility 11 miles, occasionally 2 miles, with rain + fog.
2- 11 miles visibility, except when rain + fog reduce it to 2 miles.
3- Visibility 1 1/2 miles, heavy rain, and fog.
4- Visibility 1 1/2 miles, rain, and heavy fog.

307. C31 What is the sky condition and ceiling at LAX? (Fig. 23)

1- Scattered; 700 to 2,500 feet; no ceiling.
2- Ceiling 700 feet; 2,500 feet scattered.
3- 700 feet scattered; 25,000 feet scattered; no ceiling.
4- Ceiling 600 feet; variable scattered 700 to 25,000 feet.

308. C31 Which of the reporting stations is reporting the lowest sea level pressure? (Fig. 23)

1- INK
2- MDW
3- LAX
4- JFK

309. C31 What portion of the sky at MDW is hidden by the obscuring phenomena as indicated by the Aviation Weather Report? (Fig. 23)

1- .1
2- .2
3- .3 to .5
4- 1/2

310. C31 What is the reported visibility at JFK for the purpose of determining if a landing may be made on RWY 4R after a successful instrument approach? (Fig. 23)

1- 2,200--3,000 feet RVR
2- 1/4 mile
3- 1/2 mile
4- 5 miles

311. C31 What is the reported ceiling at JFK? (Fig. 23)

1- 5,000 feet
2- 500 feet overcast
3- Indefinite--500 feet
4- 0--sky obscured

312. C31 Identify the wind conditions at JFK. (Fig. 23)

1- 360° at 6 knots
2- 180° at 4 knots
3- 040° at 22 variable to 30 knots
4- 040° at 18 knots

313. C31 What is the visibility, weather, and obstructions to vision reported at LAX? (Fig. 23)

1- Visibility 6 miles, haze, and smoke.
2- Unlimited visibility; no obstructions to vision.
3- Visibility 6 to 38 miles; snow crystals in thunderstorms.
4- Visibility 6 to 38 miles; scattered patches of haze and smoke.

PIREP

UA/OV MRB-PIT 1600 FL080/TP BE55/SK 004 BKN 012/022 BKN-OVC/TA 01/IC LGT-MDT RIME 035-060/RM WIND COMP HEAD 020 MH310 TAS 180.

FIG. 24

314. C32 What is the cloud condition reported by the BE55? (Fig. 24)

1- Broken 12,000 to 22,000 variable broken-overcast.
2- Sky obscured; 400 feet broken with tops 1,200 to 2,200 feet broken variable overcast.
3- 400 feet broken, tops 1,200 feet; second layer base 2,200 feet broken variable overcast.
4- Scattered 400 feet; second layer broken, 1,200 feet; third layer 2,200 feet broken variable overcast.

315. C32 Where did the BE55 encounter icing conditions? (Fig. 24)

1- Over MRB VOR at 8,000 feet.
2- On a flight from MRB to PIT at 8,000 feet.
3- On a flight from MRB to PIT at 3,500 to 6,000 feet.
4- Over MRB VOR from 3,500 to 6,000 feet.

316. C39 What flight planning information can a pilot derive from constant pressure charts?

1- Winds and temperatures aloft.
2- Levels of widespread cloud coverage.
3- Clear air turbulence and icing conditions.
4- Frontal systems and obstructions to vision aloft.

317. C33 What important information is provided by the Radar Summary Chart that is not shown on other weather charts?

1- Outlines turbulence between reporting stations.
2- Reveals ceilings and precipitation between reporting stations.
3- Depicts lines and cells of hazardous thunderstorms.
4- Depicts areas of cloud cover and icing levels within the clouds.

318. C32 Interpret the Pilot Weather Report (PIREP).

UA/OVR MRB FL060/SK INTMTLY BL/TB MDT/RM R TURBC INCRS WWD.

1- Ceiling 6,000 intermittently below moderate thundershowers; turbulence increasing westward.
2- Flight level 60,000, intermittently below clouds; moderate rain, turbulence increasing with the wind.
3- At 6,000 feet, intermittently between layers; thunderstorms moderate; rain and turbulence increasing with wind.
4- At 6,000 feet; intermittently between layers; moderate turbulence; moderate rain; turbulence increasing westward.

319. C33 Weather Radar Observations (SD) are of special interest to IFR pilots because they primarily report

1- large areas of low ceilings and fog.
2- severe weather.
3- depth and spread of clouds.
4- icing conditions.

320. C47 The Low Level Prognostic Chart depicts weather conditions

1- that existed at the time shown on the chart which is about 3 hours before the chart is received.
2- as they existed at the time the chart was prepared.
3- that are forecast to exist at a specific time shown on the chart as VT.
4- that are forecast to exist 6 hours after the chart was prepared.

321. C47 Which meteorological conditions does a prognostic chart depict?

1- Conditions existing at the time of the observation.
2- Conditions forecast to exist at a specific time shown on the chart.
3- Interpretation of weather conditions for geographical areas between reporting stations.
4- Representation of a past weather trend.

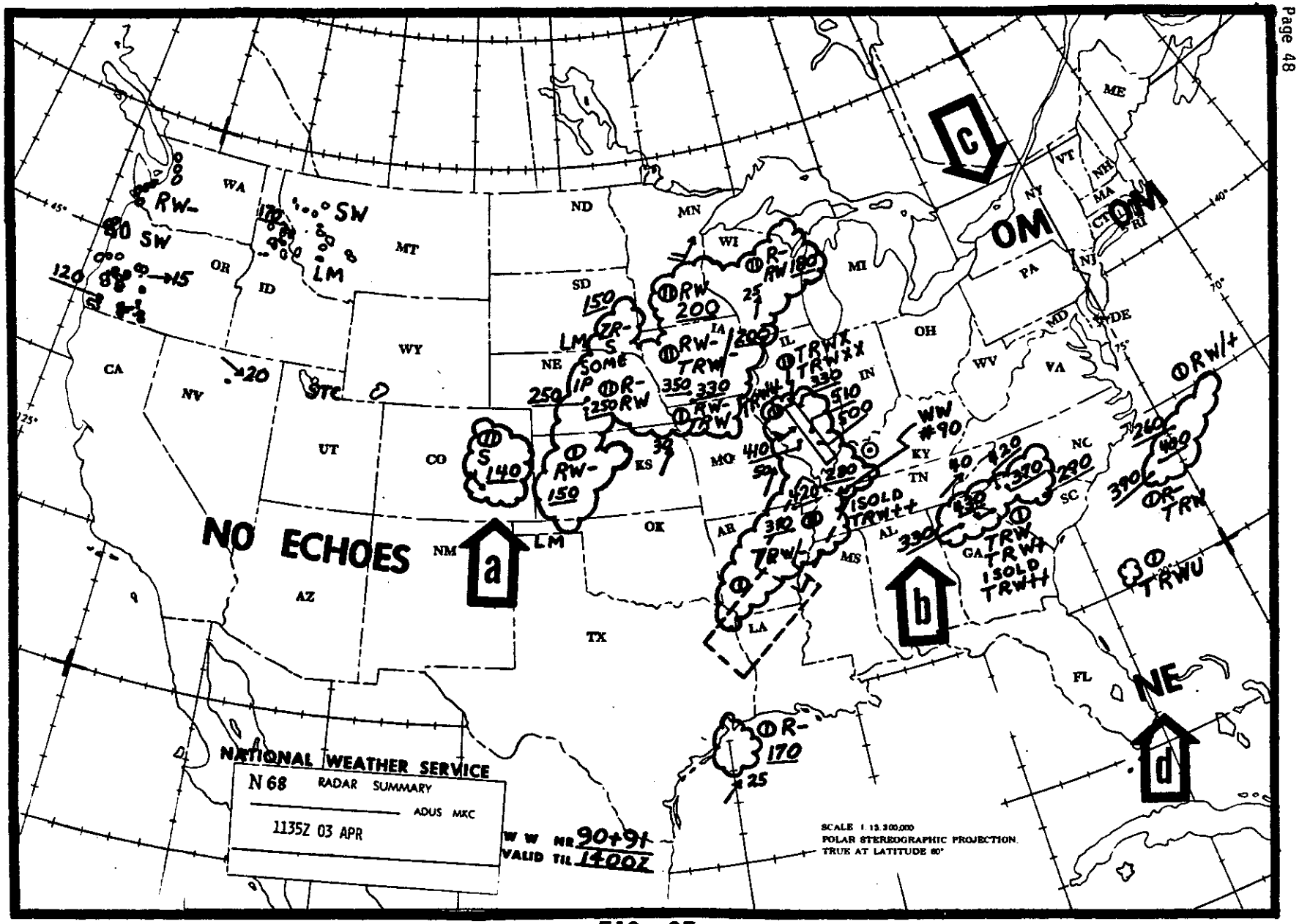

NO ECHOES
a
b
c
d
OM
NE
NATIONAL WEATHER SERVICE
N 68 RADAR SUMMARY
ADUS MKC
1135Z 03 APR
WW NR 90+91
VALID TIL 1400Z
SCALE 1:13,300,000
POLAR STEREOGRAPHIC PROJECTION
TRUE AT LATITUDE 60°

FIG. 25

322. C33 What is the significance of the symbol, "NE" (d), which appears near southern Florida? (Fig. 25)

1- There were no precipitation particles for echoes.
2- Information not available because radar equipment is out of service.
3- The entire area was clear of clouds.
4- There was one isolated thunderstorm in the area.

323. C33 What information is given on the Radar Summary Chart for New York (c)? (Fig. 25)

1- There were no cells or echoes in the area.
2- Radar information was missing.
3- The weather radar was out of service.
4- There was no precipitation within 200 miles of the radar center.

324. C33 Interpret the weather condition represented by the number 140 (a) for eastern Colorado. (Fig. 25)

1- The area of echoes in Colorado is moving in the direction of 140°.
2- Average bases of the clouds are 1,400 feet.
3- Average tops of the echoes are 14,000 feet.
4- The top of the highest cell is 14,000 feet.

325. C47 Which weather chart depicts the conditions forecast to exist at a specific time in the future?

1- Surface analysis.
2- Radar summary.
3- Weather depiction.
4- Prognostic.

326. C51 What icing intensity should a pilot report if a combination of rime and clear ice is accumulating at a rate which may create a problem if flight is prolonged in this environment over an hour?

1- Severe icing.
2- Moderate to severe mixed icing.
3- Moderate rime and clear icing.
4- Light mixed icing.

327. C33 In which areas were the severe weather watches in effect until 1400Z? (Fig. 25)

1- From east Texas, northeastward to western Tennessee.
2- Southern and central Illinois.
3- Northern Illinois below Lake Michigan.
4- Georgia and South Carolina.

328. C33 Interpret the weather condition represented by the number 330 (b) for northern Georgia. (Fig. 25)

1- Average tops of the echoes are 33,000 feet.
2- The top of the individual cell is 33,000 feet.
3- Average bases of the echoes are 3,300 feet.
4- The base of the individual cell is 330 feet.

329. C46 SIGMETs are issued as a warning of weather conditions hazardous

1- to all airplanes.
2- particularly to light airplanes.
3- to VFR operations only.
4- particularly to heavy airplanes.

330. C43 How are forecast winds aloft stated with respect to direction and speed? Direction relative to

1- magnetic north and speed in knots.
2- magnetic north and speed in miles per hour.
3- true north and speed in knots.
4- true north and speed in miles per hour.

331. C44 What information is provided by a CONVECTIVE OUTLOOK (AC)?

1- Forecast of low level cloudiness and fog conditions for the next 24 hours.
2- Clear air turbulence (CAT) expected at the lower wind shear levels for the following 12- to 18-hour period.
3- Outlined areas of stable and unstable air masses at the upper wind shear levels predicted for the next 12 hours.
4- Prospects of both general and severe thunderstorm activity during the following 24 hours.

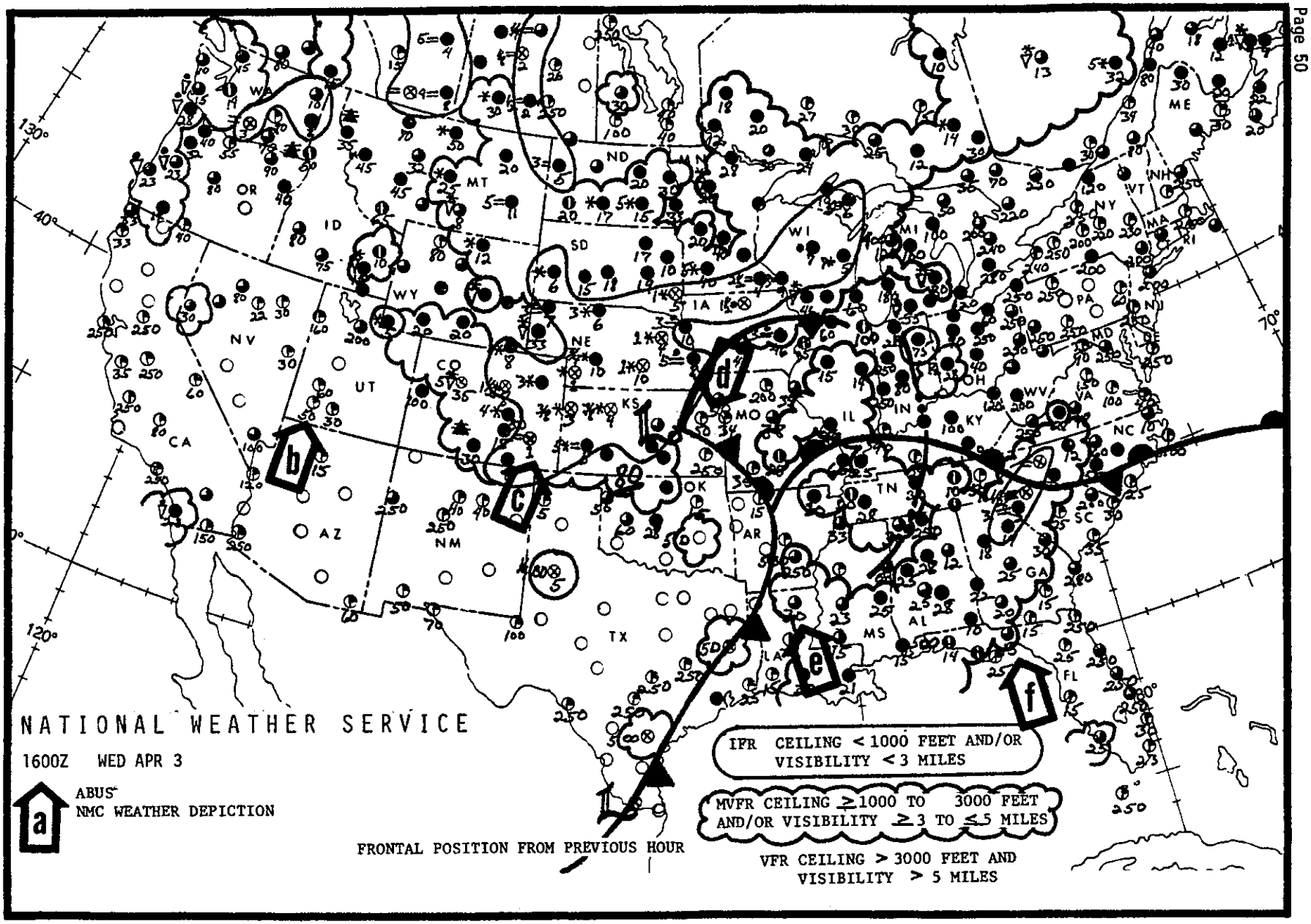

NATIONAL WEATHER SERVICE
1600Z WED APR 3
a
ABUS
NMC WEATHER DEPICTION
FRONTAL POSITION FROM PREVIOUS HOUR
IFR CEILING < 1000 FEET AND/OR VISIBILITY < 3 MILES
MVFR CEILING ≥ 1000 TO 3000 FEET AND/OR VISIBILITY ≥ 3 TO ≤ 5 MILES
VFR CEILING > 3000 FEET AND VISIBILITY > 5 MILES
b
c
d
e
f
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
GA
FL
SC
NC
VA
WV
OH
PA
NY
ME
VT
NH
MA
RI
NJ
MD
DE
130°
120°
40°
70°

FIG. 26

332. C35 Why is the weather in eastern Louisiana (e) and southern Mississippi classified as marginal VFR? (Fig. 26)

1- Because of the ceiling heights.
2- Due to the cold front moving eastward.
3- Because of low visibility.
4- Due to both ceiling height and visibility.

333. C35 What cloud condition and visibility is indicated for southwestern Utah (b) on the 1600Z Weather Depiction Chart? (Fig. 26)

1- Scattered clouds ranging from 3 to 6 thousand feet; visibility more than 6 miles.
2- Thin overcast from 3 to 6 thousand feet; visibility unlimited.
3- A broken overcast ranging from 3 to 6 thousand feet; visibility not reported.
4- Overcast 3 to 6 thousand; unlimited visibility below the overcast.

334. C35 The entry, "1600Z" (a), on the Weather Depiction Chart (Fig. 26) is the

1- time the chart was sent to the field.
2- time the weather data was collected for the chart.
3- time the depicted weather is forecast to exist.
4- valid time for the chart.

335. C52 Moderate turbulence exists when

1- rapid and somewhat rhythmic bumpiness is experienced without appreciable changes in altitude or attitude.
2- large, abrupt changes in altitude or attitude occur but the airplane may only be out of control momentarily.
3- changes in altitude or attitude occur but the aircraft remains in positive control at all times.
4- continued flight in this environment may result in structural damage.

336. C46 AIRMETs are issued as a warning of weather conditions hazardous

1- to all airplanes.
2- particularly to light airplanes.
3- to VFR operations only.
4- particularly to heavy airplanes.

337. C35 What was the ceiling and visibility range from central Louisiana (e) to northwestern Florida (f) at 1600Z? (Fig. 26)

1- Ceilings from less than 1,000 feet to 3,000 feet; visibility from less than 3 miles to 5 miles.
2- Ceilings from 1,000 to 3,000 feet; visibility more than 6 miles.
3- Ceilings from over 1,000 feet to 3,000 feet; visibility unlimited.
4- Ceilings from 1,000 to 3,000 feet; visibility 3 to 5 miles.

338. C35 Which area(s) had ceilings below 1,000 feet at 1600Z? (Fig. 26)

1- The area ahead of the cold front.
2- The area ahead of the warm front.
3- The areas enclosed by scalloped lines.
4- The areas enclosed by solid lines.

339. C35 You are on an IFR flight from northeast Kansas (d) to southeast Colorado (c) and experience complete electrical failure. Based on the information shown on the Weather Depiction Chart (Fig. 26), which would be your best escape route?

1- Fly northwest to Utah.
2- Reverse course and return to Kansas.
3- Fly south until VFR conditions are reached.
4- Continue your present heading until you reach an area of scattered clouds.

340. C41 Omission of a wind entry in a Terminal Forecast specifically implies that the wind is expected to be less than

1- 5 knots.
2- 10 knots.
3- 6 knots.
4- 12 knots.

341. C41 From which primary source should you obtain information regarding the weather expected to exist at your destination at your estimated time of arrival?

1- Low Level Prog Chart.
2- Weather Depiction Chart.
3- Terminal Forecast (FT).
4- Radar Summary and Weather Depiction Chart.

MEM 251Ø1Ø C5 X 1/2S-BS 3325G35 OCNL CØ X ØS+BS. 16Z C3Ø BKN 3BS BRF SW-. 22Z 3Ø SCT 3315. ØØZ CLR. Ø4Z VFR WIND..

BUF FT RTD 251615 162ØZ 1ØØ SCT 25Ø SCT 181Ø. 18Z 5Ø SCT 1ØØ SCT 1913 CHC C3Ø BKN 3TRW AFT 2ØZ. Ø3Z 1ØØ SCT C25Ø BKN. Ø9Z VFR..

FTW FT AMD 1 251410 1425Z C8 OVC 4F OVC V BKN. 15Z 2Ø SCT 25Ø-BKN. 19Z 4Ø SCT 12Ø SCT CHC C3Ø BKN 3TRW. Ø4Z MVFR CIG F..

FIG. 27

342. C41 What is the latest time the FTW FT AMD 1 is valid? (Fig. 27)

1- 1410Z, 26th day of the month.
2- 1425Z, 26th day of the month.
3- 1000Z, 26th day of the month.
4- 0400Z, 26th day of the month.

343. C41 What weather conditions are forecast to accompany the thundershowers at BUF? (Fig. 27)

1- Ceiling 3,000 broken; 3 miles visibility.
2- 5,000 feet scattered; 10,000 feet scattered; wind 190° at 13 knots.
3- 10,000 scattered; ceiling 25,000 broken.
4- 500 to 1,000 scattered with a chance of 300 feet ceiling broken.

344. C41 What conditions are forecast for FTW in the 6-hour categorical outlook portion of the amended terminal forecast? (Fig. 27)

1- 4,000 scattered; 12,000 scattered.
2- Marginal VFR conditions with low ceilings and fog.
3- Chance of ceiling 3,000 broken with 3 miles visibility in thundershowers.
4- 2,000 scattered, 25,000 thin broken and, after 1900Z, 4,000 scattered 12,000 scattered with a chance of ceiling 3,000 broken, 3 miles visibility in thundershowers.

345. C41 What are the lowest ceilings forecast for MEM during the period from 1000Z to 1600Z on the 25th? (Fig. 27)

1- 100 feet
2- 1,000 feet
3- 0
4- 500 feet

346. C41 What condition is expected to cause the low visibility at MEM? (Fig. 27)

1- Lowering of ceiling to 0.
2- Gusty winds and blowing sand.
3- Smoke plus blowing sand.
4- Blowing snow.

347. C41 In order to list Memphis as your alternate, your ETA at Memphis International can be no earlier than (Fig. 27)

1- 1800Z.
2- 1600Z.
3- 2200Z.
4- 0000Z.

348. C41 When are thundershowers expected in the vicinity of BUF? (Fig. 27)

1- After 2000Z.
2- After 1913Z.
3- Between 1800Z and 2000Z.
4- Between 1800Z and 0300Z.

349. C41 What is the latest time the MEM FT is valid? (Fig. 27)

1- Until 10Z on the 26th day of the month.
2- Until 10Z on the 25th day of the month.
3- Until 04Z on the 26th day of the month.
4- Until 04Z on the 25th day of the month.

350. C41 What conditions are forecast for MEM in the 6-hour categorical outlook portion of the FT? (Fig. 27)

1- Clouds 3,000 scattered; wind 330° at 15 knots.
2- Clear.
3- Ceiling 3,000; 3 miles visibility; wind 330° at 15 knots.
4- VFR conditions; wind 25 knots or stronger.

FA 121240
DFW FA 121240
13Z FRI-07Z SAT
OTLK 07Z-19Z SAT

NMEX OKLA TEX AND CSTL WTRS...

HGTS ASL UNLESS NOTED...

SYNS... LARGE INTNS LOW PRES AREA CNTRD OVR IA AT 13Z MOVG NEWD. CDFNT ALG JLN TUL FSI PVW LVS ALS LN AT 13Z MOVG SWD 25-30 KTS.

SIG CLDS AND WX...
CSTL WTRS... GENLY SCT CLDS 20-30 VRBL HI CI CLDS ABV. OTLK...MVFR PSBL BRF LIFR TRW.

SE OF DRT BWD MLC FSM LN EXCP FOR THE CSTL WTRS... LN TSTMS ALG AUS DRT LN AT 13Z MOVG SEWD ABT 15 KTS AND DCRG BY 15Z. TSTMS REDVLPG OVR SRN AND ERN OK BY 18Z. CIGS ARND 10 VSBYS BLO 3 MIS GUSTY SFC WNDS AND HAIL WITH CB TOPS TO 500 IN HVYR TSTMS. OUTSIDE TSTMS VRBL CONDS GENLY CIGS 8-18 BUT LCLY CIGS AND VSBYS ZERO ZERO IN FOG AT 13Z. FOG DSIPTG CIGS IPVG TO ABV 20 BY 17Z. CLRG AFT FROPA. OTLK... MOSTLY VFR.

N OF CDFNT... VRBL GENLY BKN CLDS CIGS 20-30. SFC WNDS OCNL 3625G45 WITH SOME DUST AND BLWG DUST VSBYS OCNLY LWRG 2-6 MIS MAINLY OVR NWRN TEX AND WRN OKLA. SNW OCNL OBSCD MTNS OVR NMEX. WNDS DCRG AFT DARK. COLDS DCRG BY 07Z. OTLK... MOSTLY VFR.

ELSW... GENLY CLR EXCP IN MTN SECS OF NMEX OCNL 100-150 SCT TO OVC WITH SNW OCNL OBSCG HIR MTNS TIL 00Z. OTLK... MOSTLY VFR.

ICG... RISK ISOLD SVR ICGIP ABV FRZG LVL. FRZG LVL SFC NRN OKLA NRN NMEX SLPG TO 140 OVR CSTL WTRS.

FIG. 28

351. C41 What is the valid time for the delayed terminal forecast at BUF? (Fig. 27)

1- 1620Z on the 25th, to 0900Z on the 26th.
2- 1615Z on the 25th, to 1620Z on the 26th.
3- 1600Z on the 25th, to 1500Z on the 26th.
4- 1615Z on the 25th, to 0900Z on the 26th.

352. C42 What is the outlook (07 - 19Z SAT) for the area north of the cold front? (Fig. 28)

1- Mostly VFR.
2- Variable, generally broken clouds with ceilings 2 to 3 thousand feet.
3- Low visibility due to blowing dust.
4- Clear of clouds after frontal passage.

353. C42 The freezing level for northern Oklahoma is forecast to be at what altitude? (Fig. 28)

1- 14,000 feet MSL
2- 10,000 feet MSL
3- 2,000 feet above surface
4- Surface

354. C42 What cloud condition is expected in the Coastal Water Area? (Fig. 28)

1- Generally scattered clouds at 2 to 3 thousand feet MSL with some high cirrus clouds.
2- Stratus clouds with bases at 2,000 feet MSL and tops at 3,000 feet MSL.
3- Low clouds, IFR conditions, and thunderstorms.
4- Ceilings from 2,000 to 3,000 feet.

355. C42 When is there a risk of encountering severe icing as outlined by the area forecast? (Fig. 28)

1- Anytime you fly above the freezing level.
2- Anytime you fly in the clouds.
3- When above freezing level and in precipitation.
4- Above 5,000 feet in the clouds.

356. C42 The area forecast (Fig. 28) is valid from

1- 1240Z Friday to 0700Z Saturday.
2- 1300Z Friday to 0700Z Saturday.
3- 1240Z Friday to 1900Z Saturday.
4- 1300Z Friday to 1900Z Saturday.

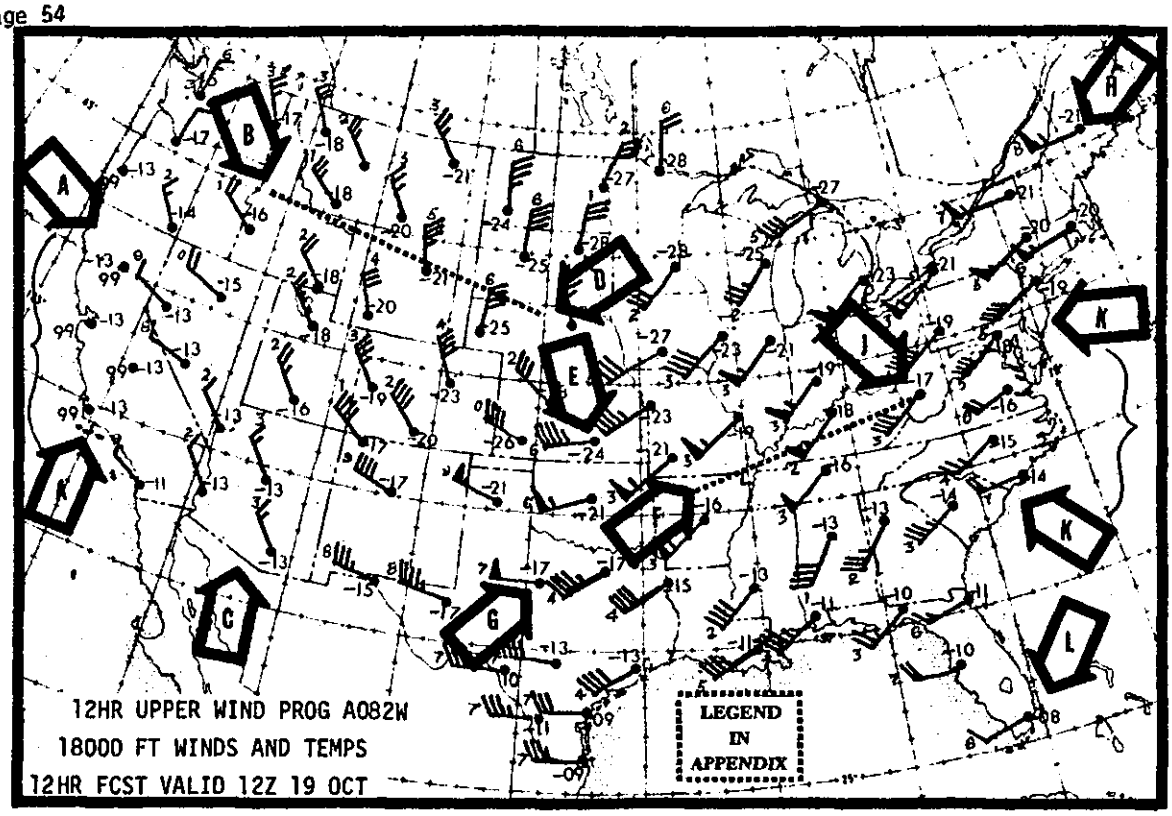


FIG. 29

357. C43 Determine the 18,000-foot wind and temperature forecast for Millinocket, Maine (H)? (Fig. 29)

1- 210° at 105 knots, 08°C.
2- 210° at 15 knots, 08°C.
3- 280° at 55 knots, -21°C.
4- 280° at 30 knots, -21°C.

358. C43 What is the wind direction and velocity forecast for Miami, Florida (L)? (Fig. 29)

1- 060°, 8 knots
2- 260°, 10 knots
3- 080°, 6 knots
4- 060°, 10 knots

359. C43 What would be an average wind for a flight from F to J at 18,000 feet? (Fig. 29)

1- 220° @ 60
2- 025° @ 35
3- 225° @ 50
4- 180° @ 30

360. C43 What is the 18,000-foot wind and temperature range for Arizona (C)? (Fig. 29)

1- 320° at 330° at 10 to 15 knots, -13°C.
2- 130° at 10 to 15 knots, 2° to 3°C.
3- 320° to 330° at 2 to 3 knots, -13°C.
4- 130° at 2 to 3 knots, -2° to -3°C.

361. C43 What would be an average wind for a flight from B to D at 18,000 feet? (Fig. 29)

1- 140° @ 35
2- 340° @ 30
3- 160° @ 35
4- 350° @ 50

362. C43 What is the 18,000-foot wind and temperature forecast for Wichita (E)? (Fig. 29)

1- 240° at 45 knots, -6°C.
2- 270° at 24 knots, -6°C.
3- 060° at 25 knots, -24°C.
4- 260° at 45 knots, -24°C.

363. C16 An unstable air mass is forced to ascend a mountain slope. What type clouds can be expected?

1- Clouds with considerable vertical development and associated turbulence.
2- Layer-like clouds with considerable associated turbulence.
3- Layer-like clouds with little vertical development.
4- Layer-like clouds with a temperature inversion.

364. C41 The absence of a visibility entry in a Terminal Forecast specifically implies that the surface visibility

1- exceeds basic VFR minimums.
2- is at least 1 mile above the minimum visibility requirement for an approach to the primary instrument runway.
3- is at least 15 miles in all directions from the center of the runway complex.
4- exceeds 6 miles.

365. C41 The word "wind" in the 6-hour categorical outlook in the Terminal Forecast means that the wind during that period is forecast to be

1- 25 knots or stronger.
2- less than 25 knots.
3- 15 to 20 knots.
4- 10 to 15 knots.

366. C41 The absence of a visibility entry in a Terminal Forecast specifically implies that the surface visibility is expected to be more than

1- 15 miles.
2- 10 miles.
3- 6 miles.
4- 3 miles.

367. C46 If you hear an AIRMET alert, how can you obtain the information in the AIRMET?

1- Listen to the weather broadcast of an FSS within 150 miles of your position.
2- ATC will announce the hazard and advise you when to listen to an FSS broadcast.
3- Contact the nearest FSS and ascertain whether the advisory is pertinent to your flight.
4- Contact a weather watch station.

368. C43 Determine the 18,000-foot wind and temperature forecast for Abilene (G). (Fig. 29)

1- 270° at 50 knots, -17°C.
2- 270° at 7 knots, -17°C.
3- 70° at 5 knots, -17°C.
4- 170° at 25 knots, 7°C.

369. C43 What are the 18,000-foot winds forecast to be along the west coast of the United States (A)? (Fig. 29)

1- Variable at 13 knots.
2- Southeasterly at 99 knots.
3- Light and variable.
4- Winds are missing or not forecast.

370. C43 What are the 18,000-foot winds forecast to be along the mid-atlantic coastal states (k)? (Fig. 29)

1- Southwesterly at 14 - 18 knots
2- Southwesterly at 20 - 40 knots
3- Northeasterly at 14 - 18 knots
4- Northeasterly at 25 - 40 knots

371. C44 Which weather message provides prospects of both general and severe thunderstorm activity during the following 24 hours?

1- Terminal Forecast.
2- Convective Outlook.
3- Special flight forecast.
4- Severe weather watch bulletin.

372. C46 At what time is the current AIRMET broadcast by the FSS?

1- 15 minutes after the hour only.
2- 15 and 45 minutes after the hour.
3- 15 and 30 minutes after the hour.
4- On the hour and each 15 minutes thereafter for 1 hour after issuance.

373. C54 What is the standard temperature at 20,000 feet?

1- -5°C.
2- -15°C.
3- -25°C.
4- -20°C.

374. C54 What is the standard temperature at 10,000 feet?

1- 5°C.
2- 0°C.
3- -10°C.
4- -5°C.

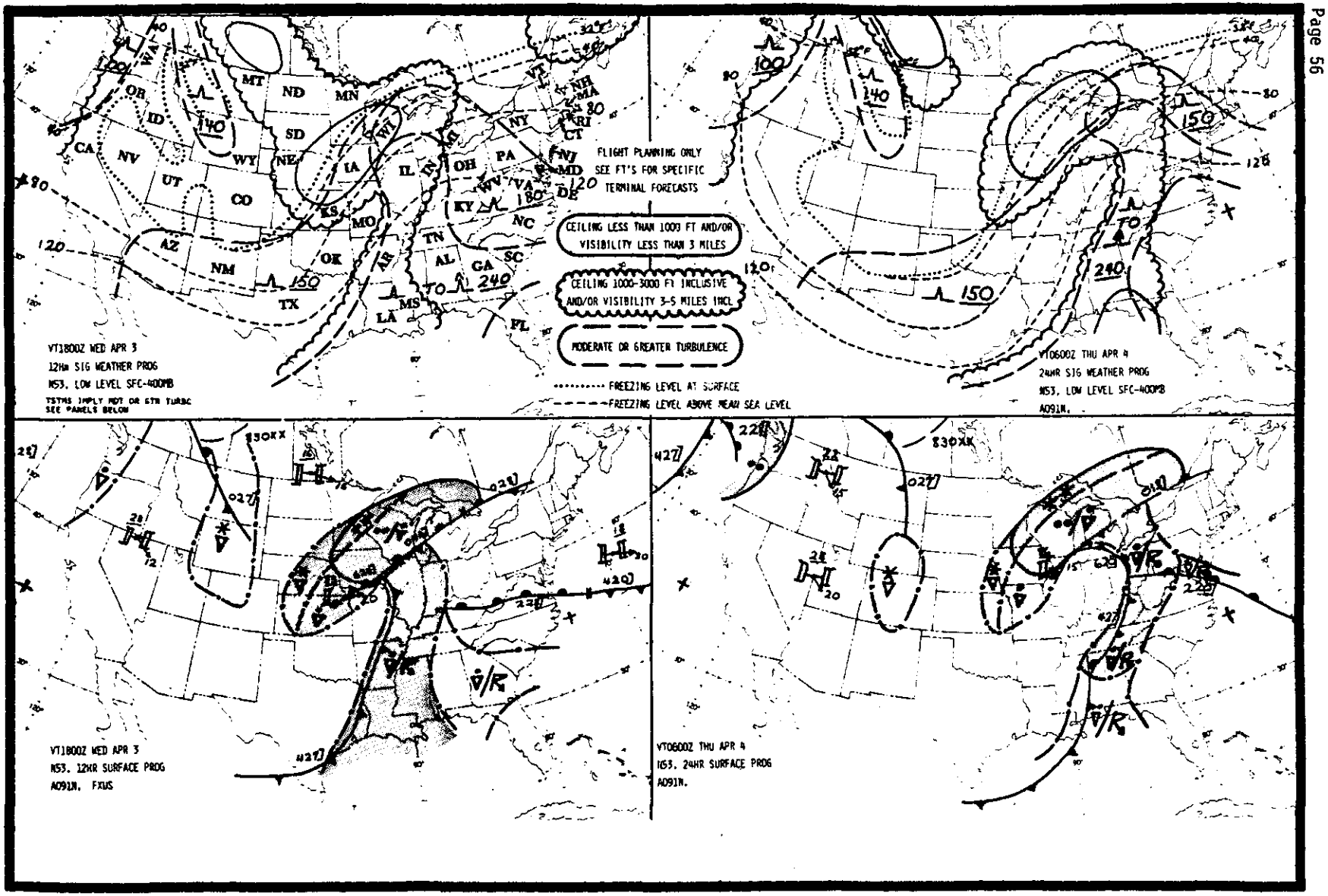

VT1800Z WED APR 3
12Hr SIG WEATHER PROG
N53, LOW LEVEL SFC-400MB
TSTMS IMPLY MDT OR STR TURBC
SEE PANELS BELOW
FLIGHT PLANNING ONLY
SEE FT'S FOR SPECIFIC
TERMINAL FORECASTS
CEILING LESS THAN 1000 FT AND/OR
VISIBILITY LESS THAN 3 MILES
CEILING 1000-3000 FT INCLUSIVE
AND/OR VISIBILITY 3-5 MILES INCL
MODERATE OR GREATER TURBULENCE
FREEZING LEVEL AT SURFACE
FREEZING LEVEL ABOVE MEAN SEA LEVEL
VT0600Z THU APR 4
24HR SIG WEATHER PROG
N53, LOW LEVEL SFC-400MB
A091N.
VT1800Z WED APR 3
N53. 12HR SURFACE PROG
A091N. FXUS
VT0600Z THU APR 4
N53. 24HR SURFACE PROG
A091N.

FIG. 30

375. C47 What type precipitation is expected in Louisiana at 1800Z? (Fig. 30)

1- Rain showers over the entire area.
2- Rain showers and thunderstorms affecting .5 or more of the area.
3- Continuous rain in .5 or more of the area.
4- Continuous rain over the entire area.

376. C47 Based on the low level prog chart (Fig. 30), where should you expect moderate to severe turbulence at approximately 1800Z on a flight from central Oklahoma through southern Missouri and then east to the Atlantic Coast?

1- From the cold front to approximately 20 miles beyond it.
2- From the cold front in Missouri to the Atlantic Coast.
3- Above 15,000 feet in Oklahoma and above 18,000 feet from eastern Kentucky to the Atlantic Coast.
4- From the cold front through central Kentucky.

377. C47 Where is snow expected at 1800Z? (Fig. 30)

1- Immediately behind and ahead of the cold front.
2- Northern Oregon and Washington.
3- In the central Great Lakes area.
4- From northwest Kansas to the Great Lakes and from northwest Colorado northward to Canada.

378. B51 What is your pressure altitude if your altimeter indicates 20,000 feet and the outside air temperature is -27°C?

1- 20,000 feet
2- 19,000 feet
3- 20,500 feet
4- 21,000 feet

379. B51 If the pitot cover is <u>not</u> removed on an aircraft with the static source on the side of the fuselage, which instrument(s) would be affected?

1- Vertical speed and airspeed only.
2- Altimeter and vertical speed only.
3- Airspeed, altimeter, and vertical speed.
4- Airspeed only.

380. C47 Which area(s) should have the lowest ceilings at 1800Z? (Fig. 30)

1- The area just ahead of the cold front.
2- The area extending from northern Kansas to western Wisconsin.
3- About 150 miles ahead and along the cold front.
4- The areas where precipitation is expected to occur--east of the cold front and west of the warm front.

381. C47 At what altitude is the freezing level in central Oklahoma as forecast on the 12-hour significant weather prog? (Fig. 30)

1- 800 feet
2- 4,000 feet
3- 8,000 feet
4- On the surface

382. C47 At what altitude is the freezing level in central Oklahoma as forecast on the 24-hour significant weather prog? (Fig. 30)

1- 4,000 feet
2- 8,000 feet
3- 400 feet
4- 800 feet

383. B51 You are flying at an indicated altitude of 6,000 feet with an altimeter setting of 30.01. ATC gives you a new altimeter setting of 29.92 and, with this setting, your altimeter indicates 5,920 feet. At what pressure altitude are you flying?

1- 6,000 feet
2- 6,080 feet
3- 5,920 feet
4- 5,890 feet

384. C62 The absence of the sky condition and visibility on ATIS signifies that

1- weather conditions have not been measured within the past 1 hour.
2- conditions are changing rapidly and the pilot is requested to contact the tower for the latest report.
3- the ceiling and visibility are above 5,000 feet and 5 miles.
4- sky condition is clear and visibility is unlimited.

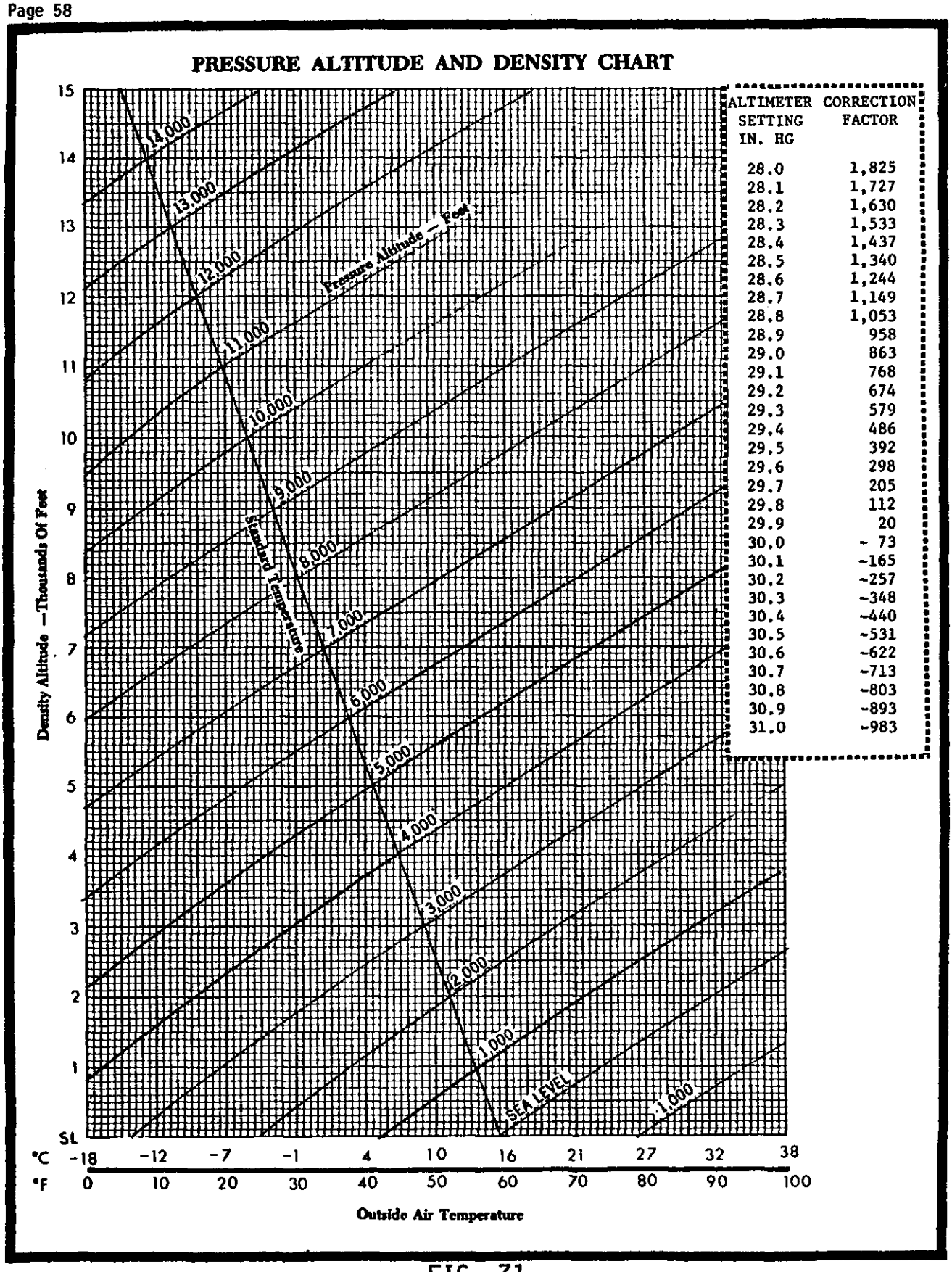

PRESSURE ALTITUDE AND DENSITY CHART
Density Altitude — Thousands Of Feet
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
SL
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
SEA LEVEL
-1,000
Pressure Altitude — Feet
Standard Temperature
°C -18 -12 -7 -1 4 10 16 21 27 32 38
°F 0 10 20 30 40 50 60 70 80 90 100
Outside Air Temperature
ALTIMETER SETTING IN. HG
CORRECTION FACTOR
28.0 1,825
28.1 1,727
28.2 1,630
28.3 1,533
28.4 1,437
28.5 1,340
28.6 1,244
28.7 1,149
28.8 1,053
28.9 958
29.0 863
29.1 768
29.2 674
29.3 579
29.4 486
29.5 392
29.6 298
29.7 205
29.8 112
29.9 20
30.0 - 73
30.1 -165
30.2 -257
30.3 -348
30.4 -440
30.5 -531
30.6 -622
30.7 -713
30.8 -803
30.9 -893
31.0 -983

FIG. 31

385. C55 Determine the density altitude for the following conditions. (Fig. 31)

Altimeter setting- - - 29.25
Runway temperature - - +81°F.
Airport elevation- - - 5,250 feet

1- 4,600 feet
2- 5,877 feet
3- 8,400 feet
4- 7,700 feet

386. C55 Determine the pressure altitude at an airport that is 3,563 feet MSL with an altimeter setting of 29.96. (Fig. 31)

1- 3,527 feet
2- 3,556 feet
3- 3,639 feet
4- 3,507 feet

387. C55 What is the effect of a temperature increase from 30° to 50°F. on the density altitude if the pressure altitude remains at 3,000 feet? (Fig. 31)

1- 900-foot increase
2- 1,100-foot increase
3- 1,500-foot increase
4- 1,300-foot increase

388. C55 What is the effect of a temperature increase from 25°F. to 50°F. on the density altitude if the pressure altitude remains at 5,000 feet? (Fig. 31)

1- 1,650-foot increase
2- 1,400-foot increase
3- 1,200-foot increase
4- 1,000-foot increase

389. C55 What is the effect of a temperature decrease and a pressure increase on the density altitude from 90°F. and 1,250 feet pressure altitude to 60°F. and 1,750 feet pressure altitude? (Fig. 31)

1- 500-foot increase
2- 1,300-foot decrease
3- 1,300-foot increase
4- 500-foot decrease

390. C55 Determine the pressure altitude at an airport that is 1,386 feet MSL with an altimeter setting of 29.97. (Fig. 31)

1- 1,451 feet
2- 1,562 feet
3- 1,684 feet
4- 1,341 feet

391. C55 Determine the density altitude for the following conditions. (Fig. 31)

Altimeter setting- - - - 29.97
Runway temperature - - - 48°F.
Airport elevation- - - - 3,045 feet

1- 3,500 feet
2- Sea level
3- 2,500 feet
4- 3,000 feet

392. C55 What is the effect of a temperature decrease from 85° to 65°F. on the density altitude if the pressure altitude remains at 1,250 feet? (Fig. 31)

1- 800-foot increase
2- 1,200-foot increase
3- 1,300-foot decrease
4- 800-foot decrease

393. C55 What is the effect of a pressure change from 3,000 to 5,000 feet pressure altitude on the density altitude if the temperature remains standard? (Fig. 31)

1- 1,800-foot increase
2- 2,000-foot increase
3- 1,800-foot decrease
4- 2,000-foot decrease

394. C55 Determine the density altitude for the following conditions. (Fig. 31)

Altimeter setting - - - 30.35
Runway temperature- - - +25°F.
Airport elevation - - - 3,894 feet

1- 2,900 feet
2- 3,500 feet
3- 3,800 feet
4- 2,100 feet

395. C62 Absence of the sky condition and visibility on an ATIS broadcast specifically implies that

1- the sky conditions are clear and visibility is unlimited.
2- the ceiling is at least 5,000 feet and visibility is 5 miles or more.
3- conditions are changing rapidly and the pilot is requested to contact the tower for the latest report.
4- weather conditions are at or above VFR minimums.

396. C12 Temperature in Aviation Weather is expressed in either Fahrenheit or Centigrade (Celsius). On which type of report is each used?

1- Fahrenheit on all weather reports, and Centigrade on all forecasts.
2- Fahrenheit on hourly aviation observations, and Centigrade on special observations.
3- Fahrenheit on all surface temperatures, and Centigrade on all temperatures aloft.
4- Fahrenheit on all general aviation weather reports, and Centigrade on all military and airline reports.

397. C12 The most frequent type of ground or surface based temperature inversion is that produced by

1- terrestrial radiation on a clear, relatively still night.
2- warm air being lifted rapidly aloft in the vicinity of mountainous terrain.
3- the movement of colder air under warm air, or the movement of warm air over cold air.
4- widespread sinking of air within a thick layer aloft resulting in heating by compression.

398. C61 All flight service stations having voice facilities on radio ranges (VORs) or radio beacons (NDBs) broadcast

1- weather reports at 15 and 45 minutes past each hour from reporting points within approximately 150 miles of the broadcast stations.
2- AIRMETs and SIGMETs at 15 minutes past the hour and each 15 minutes thereafter as long as they are in effect.
3- AIRMETs and SIGMETs during their valid period when they pertain to the area within 450 NM of the FSS.
4- weather reports at 15 minutes past each hour from reporting points within approximately 150 miles of the broadcast stations.

399. B10 The most current en route and destination flight information for an instrument flight should be obtained from

1- Ground Control.
2- Part 3A of AIM.
3- the ATIS broadcast.
4- the FSS.

400. D11 What responsibility do you as pilot in command on an IFR flight assume when you enter VFR conditions?

1- You must change altitude to a VFR altitude.
2- You must report VFR conditions to ARTCC so that an amended clearance may be issued.
3- You must change transponder to code 1200.
4- You must take over responsibility for avoiding other aircraft.

401. D11 What action, if any, is appropriate if ATC issues a clearance that would cause a pilot to deviate from a rule?

1- None; ATC is authorized to waive rules in the interest of efficient control of air traffic.
2- The pilot may accept the clearance but must file a written report to the chief of the facility within 10 days.
3- The pilot must request an amended clearance.
4- Unless the clearance is prefixed by "ATC advises," the pilot must adhere to the clearance.

402. D11 Who is responsible for aircraft avoidance during flight in VFR conditions on an IFR flight plan?

1- ATC.
2- Pilot if aircraft not on an IFR flight plan is responsible for avoiding IFR traffic.
3- Pilot of aircraft not flying on an airway is responsible for avoiding aircraft on an airway.
4- All pilots are responsible for avoiding other aircraft.

403. D11 What action should you take if you receive a clearance that will cause a deviation from a rule?

1- Accept the clearance, because the pilot is not responsible for the deviation.
2- Accept the clearance and advise ATC when deviation occurs.
3- Accept the clearance and advise ATC that you believe a rule deviation will occur.
4- Refuse the clearance as stated and request that it be amended.

404. When you accept an IFR clearance, you may
D11

1- deviate from that clearance if you believe the clearance is in error.
2- not deviate from the clearance unless you obtain an amended clearance, except in an emergency.
3- deviate from the clearance if you first advise ATC.
4- not deviate from that clearance under any circumstances unless you receive another clearance.

405. What action should the pilot in command take in the event of an emergency requiring immediate action during an IFR flight?
D12

1- Notify ATC of the nature of the emergency and request an amended clearance.
2- Any action except one that would be in violation of the rules.
3- Whatever action is necessary to meet the emergency.
4- Any action except one that would be in violation of the last clearance accepted.

406. When may a pilot deviate from a Federal Aviation Regulation?
D12

1- When an emergency occurs that requires immediate action.
2- When flying off airways.
3- Anytime the deviation is considered to be a safer procedure.
4- When the route given in the clearance will cause the flight to penetrate an area where storms exist.

407. If you, as pilot in command, deviate from a rule of the Federal Aviation Regulations during an emergency, when and to whom must you submit a written report of the deviation?
D13

1- You should submit a written report to the Administrator, if so requested.
2- You must submit a report to the facility that was in control at the time of the emergency, within 10 days.
3- Upon landing, you should complete a written report and send it to the nearest GADO or ATC facility.
4- You should send a report to the Administrator anytime another aircraft or person has been endangered by the deviation.

408. A pilot in command of an aircraft on an instrument flight who declares an emergency
D12

1- may deviate from the rules but not from the clearance.
2- is exempt from all rules and clearances during the emergency.
3- may deviate from the clearance but not from the rules.
4- may deviate from the rules to the extent necessary to meet the emergency.

409. What time sequence does ATC recommend for filing an IFR flight plan and requesting the clearance at airports having pre-taxi clearance procedures, in order to minimize departure delays?
D22

1- File at least 30 minutes prior to proposed departure time and request the clearance not more than 10 minutes prior to taxi.
2- File at least 30 minutes prior to proposed departure time and request the clearance at least 10 minutes prior to taxi.
3- File within 30 minutes of proposed departure time and request the clearance not more than 10 minutes prior to taxi.
4- File within 30 minutes of proposed departure time and request the clearance at least 10 minutes prior to taxi.

410. During what time sequence should you file an IFR flight and request the clearance at an airport having pre-taxi clearance procedures, in order to minimize departure delays?
D22

	File	Request Clearance
1-	Within 30 minutes of proposed departure time	At least 10 minutes prior to proposed taxi time
2-	At least 30 minutes prior to proposed departure time	At least 10 minutes prior to proposed taxi time
3-	Within 30 minutes of proposed departure time	Not more than 10 minutes prior to proposed taxi time
4-	At least 30 minutes prior to proposed departure time	Not more than 10 minutes prior to proposed taxi time

253-095 O - 78 - 6

FIG. 32

INSTRUMENT APPROACH PROCEDURES (CHARTS)
WEST CENTRAL UNITED STATES

▽IFR TAKE-OFF MINIMUMS AND DEPARTURE PROCEDURES

FAR 91.116(c) prescribes take-off rules and establishes standard take-off minimums as follows:

(1) Aircraft having two engines or less – one statute mile.

(2) Aircraft having more than two engines – one-half statute mile.

Aerodromes within this geographical area with IFR take-off minimums other than standard are listed below alphabetically by aerodrome name. Departure procedures and/or ceiling visibility minimums are established to assist pilots conducting IFR flight in avoiding obstructions during climb to the minimum enroute altitude.

Take-off minimums and departure procedures apply to all runways unless otherwise specified.

AERODROME NAME	TAKE-OFF MINIMUMS
ABERDEEN REGIONAL Aberdeen, South Dakota	Rwy 31, ½ mile
ALAMOSA MUNI Alamosa, Colorado Climb direct Alamosa VORTAC, continue climb in ALS VOR holding pattern NW, right turn 142° inbound to MCA for direction of flight: N-bound J-13, 10,500; NE-bound J-64, 10,500; S-bound J-13, V-83 8300.	
ALEXANDRIA MUNI Alexandria, Minnesota Rwys 14, 22, climb to 2100 on runway heading before proceeding on course.	Rwy 4, 200-1
ALGONA MUNI Algona, Iowa	Rwy 12, 500-1
AMES MUNI Ames, Iowa Rwys 1, 19, 13, 31, when weather is below 700-2, climb on runway heading to 1700 before proceeding W bound.	
ANOKA COUNTY JANES FIELD Minneapolis, Minnesota All runways. SE bound departures climb to 2380' on runway heading before proceeding on course.	
ARROWHEAD St. Louis, Missouri	Rwys 15, 20, 400-1
ATLANTIC MUNI Atlantic, Iowa When weather is below 500-1, Rwy 12: Maintain runway heading to 1600 before proceeding on course; Rwys 17, 26, 30, 35: When planned route of flight is E bound, maintain runway heading to 1600 before proceeding on course.	Rwy 8, 500-1
AUDUBON MUNI Audubon, Iowa Rwy 14: When planned route of flight is N bound and weather is below 300-1, climb runway heading to 1600 before turning.	Rwy 32, 300-1
BEATRICE MUNI Beatrice, Nebraska Rwys 13, 17, when weather is below 500-1 climb to 2200 on runway heading before departing on course.	
BEECH FACTORY Wichita, Kansas	Rwys 3, 18, 21, 36, 200-1 Rwy 31, 500-1
When weather is below 500-1 all W bound departures 180° to 360° climb runway heading to 1800 before turning.	
BELLEVILLE MUNI Belleville, Kansas Rwy 13, 31, 35 climb on runway heading to 1900 before turning.	
BENSON MUNI Benson, Minnesota When weather is below 500-2: Rwy 5, Climb to 2000 on runway heading before proceeding on course. Rwy 14: Right climbing turn to 2000 on 180° bearing from RBn before proceeding on course.	Rwy 5, 200-1
BERT MOONEY SILVER BOW COUNTY Butte, Montana Rwys 2, 11, 15, 20, 29, 33, 1500-2 Climb visually over the airport to 7000 climb direct to BTM VORTAC on R-096, continue climb on R-343 within 10 NM to cross BTM VORTAC at or above: E bound V86, 8800; SE bound V257, 9000; N bound V257, 8800, NE bound V113, 8000; SW bound V113, 8600. SE Bound Departures V257: When a ceiling of 4000-2 exists, aircraft may be cleared to climb visually over the airport to 9500, continue climb via the 11 DME arc BTM VORTAC CW to intercept BTM R-151 at or above 11,000.	
BILLINGS LOGAN INTL Billings, Montana Rwy 9, climb runway heading to 4300 before turning. *(FAR 135)	Rwy 9, RVR/24*

(Continued on page 2)

PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

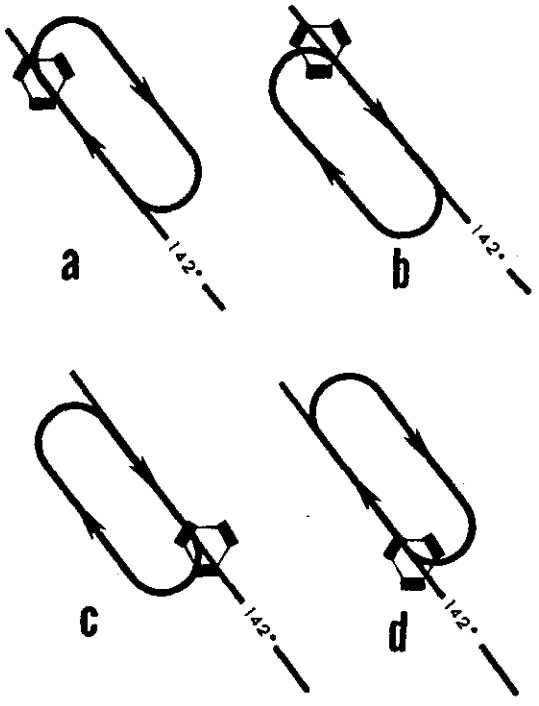
411. D51 What requirement, if any, must be met when operating under FAR Part 91, for a takeoff on Runway 21 at Beech Factory and departing on a course of 216° when the ceiling and visibility are below 500-1? (Fig. 32)

1- You must climb on the runway heading to 1,800 feet before turning.
2- You may not takeoff if you do not have at least 200-1.
3- There is no requirement if weather conditions are at least 200-1.
4- You are not permitted to takeoff when visibility is less than 1 mile.

412. D51 What conditions and/or procedures apply for takeoff and departure in a single-engine aircraft operating under FAR Part 91 on an IFR flight from Beatrice Municipal and departing on RWY 13? (Fig. 32)

1- The takeoff minimum is 1 mile visibility; maintain runway heading to at least 2,200 feet prior to departing on course.
2- No specific conditions or procedures apply if the weather conditions are at least 200-1.
3- A climb to 2,200 feet on the runway heading must be made prior to any turn if weather is below 500-1.
4- No takeoff is permitted if the visibility is less than 1 mile.

413. D51 Which holding pattern should you use to climb to the MCA for V-83 during a departure from Alamosa, Colorado? (Fig. 32)



1- a
2- b
3- c
4- d

414. D51 What conditions and/or procedures apply for takeoff and departure in a single-engine aircraft operating under FAR Part 91 on an IFR flight from Alexandria Municipal and departing on RWY 14? (Fig. 32)

1- The minimum takeoff visibility is 1/2 mile; after reaching 2,100 feet, turn left to course heading.
2- A ceiling of 200 feet and a visibility of 1 mile are the only conditions which apply.
3- Takeoff minimums are 200-1; maintain runway heading and climb to 2,100 feet prior to turn.
4- No ceiling and visibility minimums; maintain runway heading after takeoff; at 2,100 feet, turn on course.

415. D51 What conditions and/or procedures apply for takeoff and departure in a single-engine aircraft operating under FAR Part 91 on an IFR flight from Atlantic Municipal departing on RWY 12? (Fig. 32)

1- Takeoff minimum, 1 mile visibility; maintain runway heading to 1,600 feet before proceeding on course.
2- If weather is below 500, takeoff minimum 1 mile visibility; maintain runway heading to 1,600 feet before proceeding on course.
3- If weather is below 500-1, maintain runway heading to 1,600 feet before proceeding on course.
4- Takeoff minimum, 500-1; maintain runway heading to 1,600 feet before proceeding on course.

416. D51 What conditions and/or procedures apply for takeoff and departure if you are flying a single-engine airplane under FAR Part 91 and are making an IFR departure from RWY 9 at Billings Logan International? (Fig. 32) You must

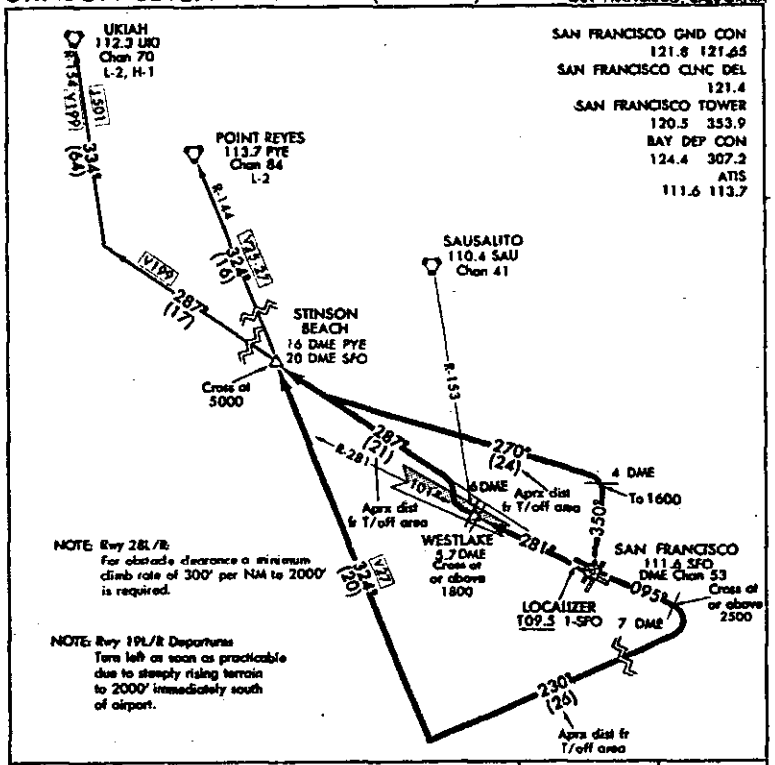
1- have at least 1 mile reported visibility and climb to 4,300 feet before turning.
2- climb to 4,300 feet before turning.
3- have at least 2,400 RVR reported and climb on the runway heading to 4,300 feet before turning.
4- have at least 1 mile reported visibility.

417. D51 What conditions and/or procedures apply for takeoff and departure in a single-engine aircraft operating under FAR Part 91 on an IFR flight from Ames Municipal and departing on RWY 1? (Fig. 32)

1- There are no minimum ceiling and visibility requirements; however, if conditions are less than 700-2, a climb must be made to 1,700 feet prior to proceeding westbound.
2- The reported visibility must be at least 1 mile; ceiling minimums are not applicable.
3- The reported visibility must be at least 1 mile, and the ceiling must be at least 200 feet for takeoff; however, if conditions are less than 700-2, you must climb to 1,700 feet before turning west.
4- The reported ceiling must be at least 200 feet; visibility minimums are not applicable.

STINSON SEVEN DEPARTURE (4SB7.4SB)

SAN FRANCISCO INTL
SAN FRANCISCO, CALIFORNIA



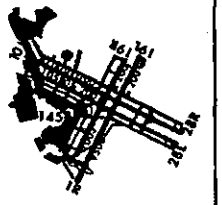
DEPARTURE ROUTE DESCRIPTION

Take-off Runway 1L/R: Climb via SAN FRANCISCO VOR R-350. After passing the 4 DME fix and reaching 1600, turn left heading 270° to intercept and proceed via SAN FRANCISCO R-287 to STINSON BEACH INT. Cross STINSON BEACH INT at 5000'. Thence via (transition) or (assigned route).

Take-off Runway 28L/R: Climb via SAN FRANCISCO VOR R-281 or west course of SAN FRANCISCO Rwy 28L ILS LOCALIZER to cross the 6 DME FIX or WEST—

(Continued on next page)

ELEV 12



Rwy 1R T/off 8900'

STINSON SEVEN DEPARTURE (4SB7.4SB)
SAN FRANCISCO, CALIFORNIA
SAN FRANCISCO INTL

STINSON SEVEN DEPARTURE (4SB7.4SB)
SAN FRANCISCO INTL
SAN FRANCISCO, CALIFORNIA

DEPARTURE ROUTE DESCRIPTION
(Continued)

LAKE INT at or above 1800' then turn right to intercept and proceed via SAN FRANCISCO R-287 to STINSON BEACH INT. Cross STINSON BEACH INT at 5000'. Thence via (transition) or (assigned route).

Take-off Runways 10L/R and 19L/R: Climb via SAN FRANCISCO VOR R-095 to cross the 7 DME FIX at or above 2500', then turn right heading 230° to intercept and proceed via POINT REYES R-144 to STINSON BEACH INT. Cross STINSON BEACH INT at 5000', thence via (transition) or (assigned route).

POINT REYES TRANSITION (4SB7.PYE): Via POINT REYES R-144 to POINT REYES VORTAC.

UKIAH TRANSITION (4SB7.UKI): Via SAN FRANCISCO R-287 and UKIAH R-154 to UKIAH VORTAC.

STINSON SEVEN DEPARTURE (4SB7.4SB)
SAN FRANCISCO, CALIFORNIA
SAN FRANCISCO INTL

FIG. 33

418. D51 What conditions and/or procedures apply for takeoff and departure in a single-engine aircraft operating under FAR Part 91 on an IFR flight from Benson Municipal and departing on RWY 5? (Fig. 32, page 62)

1- There are no minimum weather requirements; however, if conditions are less than 500-2, you must climb on runway heading to at least 2,000 feet before turning.
2- Ceiling at least 200 feet and visibility at least 1 mile.
3- Visibility at least 1 mile; however, if the visibility is less than 2 miles, you must climb on runway heading to at least 2,000 feet before making any turn.
4- Ceiling at least 200 feet and visibility at least 1 mile; however, if conditions are less than 500-2, you must climb on the runway heading to 2,000 feet before turning.

419. K13 What is the maximum indicated airspeed for an airplane with reciprocating engines after takeoff on RWY 1R at San Francisco International and during climbout to 10,000 feet? (Fig. 33)

1- 180 knots while in the TCA, then 200 knots.
2- 200 knots while in the TCA, then 250 knots.
3- 156 knots while in the Airport Traffic Area, then 250 knots.
4- 180 knots while in the Control Zone, then 200 knots.

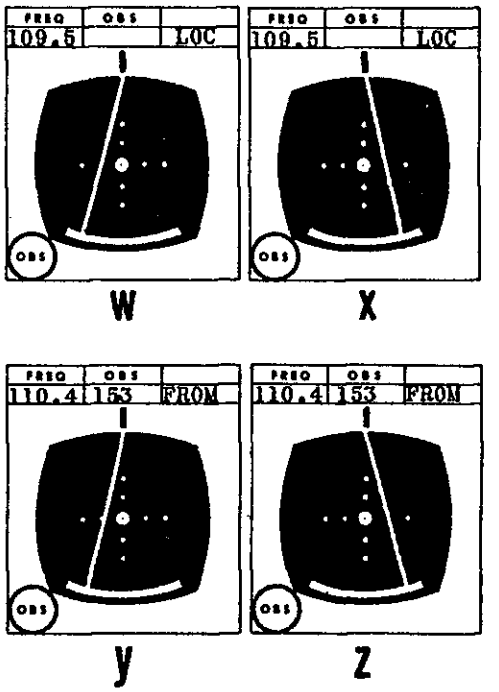
420. D54 What minimum rate of climb is required after takeoff on RWY 28L to WESTLAKE Intersection if the GS is maintained at 150 knots? (Fig. 33)

1- 300 ft./min.
2- 475 ft./min.
3- 790 ft./min.
4- 1,270 ft./min.

421. B23 Determine the ETE from takeoff on RWY 10L to STINSON BEACH Intersection if an average GS of 145 knots is maintained. (Fig. 33)

1- 19 minutes
2- 22 minutes
3- 25 minutes
4- 27 minutes

422. H24 Which combination of instrument indications confirms that you are approaching WESTLAKE Intersection on the left side of the localizer after a takeoff on 28L? (Fig. 33)



1- W and Y
2- W and Z
3- X and Y
4- X and Z

423. D13 During an emergency, a pilot in command deviates from the regulations but does not require priority action by ATC. Is the pilot required to submit a written report of those actions?

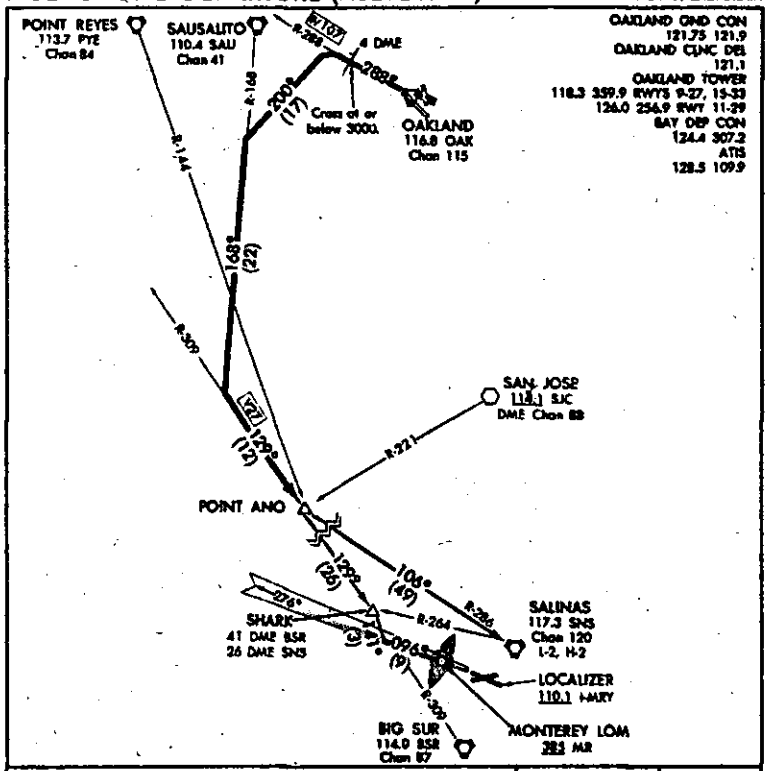
1- Yes, to the Chief of the General Aviation District Office.
2- Yes, to the chief of the facility in control at the time of the deviation.
3- Only upon request of the Administrator.
4- Only if there was damage to the aircraft or injury to a passenger.

424. D31 Every abbreviated IFR departure clearance (cleared as filed) will contain the

1- cruise altitude and SID, if appropriate.
2- clearance limit and cruise altitude.
3- clearance limit, SID, or STAR.
4- cruise altitude, SID, and STAR.

NUEVO ONE DEPARTURE (NUEVO1.4PA)

METROPOLITAN OAKLAND INTL
OAKLAND, CALIFORNIA



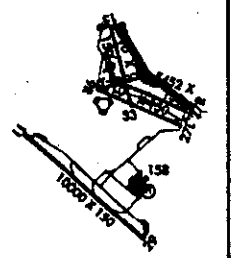
DEPARTURE ROUTE DESCRIPTION

Take-off Runways 27L/R and 29: Climb via OAK R-288 so as to cross the 4 DME at or below 3000'. Then turn left heading 200° to intercept and proceed via the SAU R-168 and BSR R-309 to POINT ANO INT.

MONTEREY TRANSITION (NUEVO1.MR): Via the BSR R-309 to SHARK INT thence via heading 141° and W course of MONTEREY LOC to MR LOM.

SALINAS TRANSITION (NUEVO1.SNS): Via the SNS R-286 to SNS VORTAC.

ELEV 6



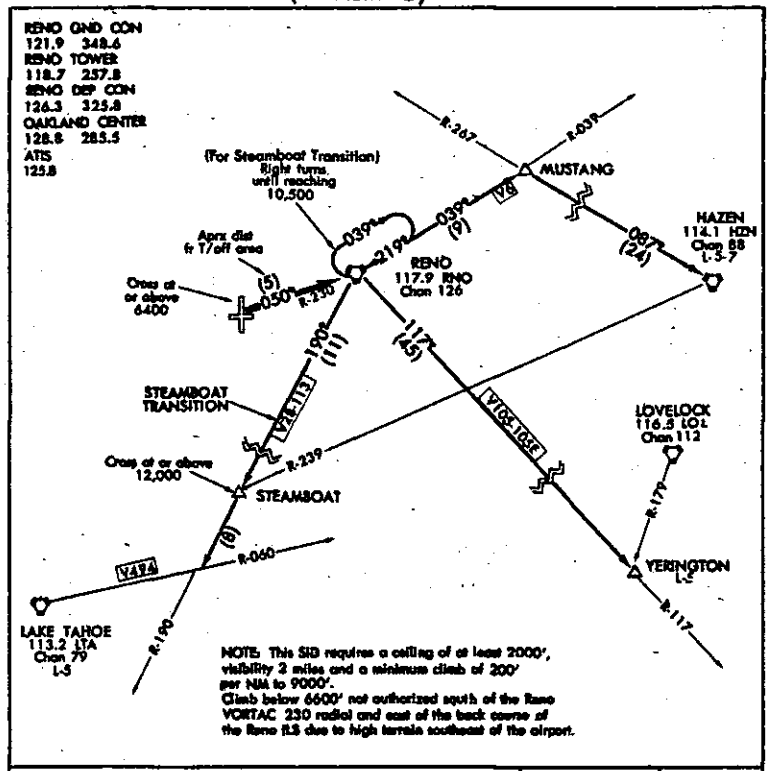
NUEVO ONE DEPARTURE (NUEVO1.4PA)

OAKLAND, CALIFORNIA
METROPOLITAN OAKLAND INTL

FIG. 34

VISTA SIX DEPARTURE (VSTA6.RNO)

RENO INTERNATIONAL
RENO, NEVADA



DEPARTURE ROUTE DESCRIPTION

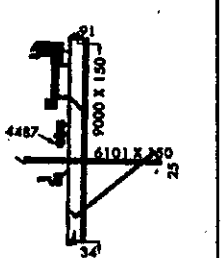
Runways 16 and 25 turn right, runways 7 and 34 turn left. Climb within 3 NM of RENO AIRPORT to cross the airport at or above 6400'. Thence via RNO R-230 to RNO VORTAC. Thence via (transition) or (assigned route).

HAZEN TRANSITION (VSTA6.HZN): Via RNO R-039 and HZN R-267 to HZN VORTAC.

STEAMBOAT TRANSITION (VSTA6.4MB): Hold NE of RNO VORTAC on R-039 right turns until reaching 10,500; thence via RNO R-190, to intercept V494. Cross STEAMBOAT INT at (minimum 12,000).

YERINGTON TRANSITION: Via RNO R-117 to intercept V105.

ELEV 4411



VISTA SIX DEPARTURE (VSTA6.RNO)

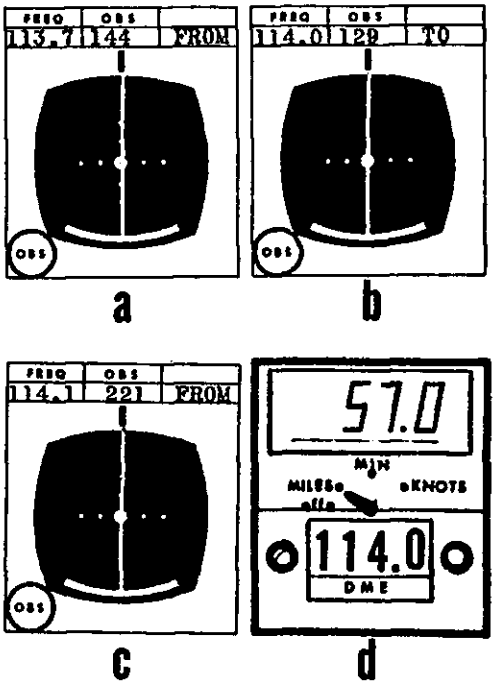
RENO, NEVADA
RENO INTERNATIONAL

FIG. 35

425. What navigation aids should be used to
D54 complete the Nuevo One Departure after a takeoff on Runway 29 at Metropolitan Oakland International? (Fig. 34)

1- OAK R-288 and DME, SAU R-168, BSR R-309 to SJC R-221.
2- OAK R-288, SAU R-168, BSR R-309, 1-MRY LOC, and Monterey LOM.
3- Runway heading to OAK 4 DME, SAU R-168, BSR R-309 to SHARK Intersection.
4- Runway heading to OAK 4 DME, OAK 4 DME Arc, SAU R-168, BSR R-129 to POINT ANO Intersection.

426. Which combination of radio navigation
H21 indications should you receive to properly identify POINT ANO Intersection as you are completing the Nuevo One Departure? (Fig. 34)



1- a and b
2- a and d
3- b and c
4- c and d

427. What is the purpose of the right turn
D54 after takeoff on RWY 16 on the Vista Six Departure? (Fig.35)

1- To avoid obstacles on the north side of the airport.
2- To separate IFR departures from aircraft remaining in the traffic pattern.
3- To provide obstacle clearance while climbing to 6,400 feet to cross the airport.
4- To intercept the R-230 of RNO VORTAC.

428. What is the approximate distance depicted
D54 for the Nuevo One Departure and the Monterey Transition? (Fig. 34)

1- 93 nautical miles
2- 122 nautical miles
3- 81 nautical miles
4- 89 nautical miles

429. SHARK Intersection may be identified by
H22 a combination of the (Fig. 34)

1- SALINAS 26 DME Arc and BIG SUR 41 DME Arc.
2- SALINAS R-264 and POINT ANO 26 DME Arc.
3- BIG SUR R-309 and 12 DME miles.
4- BIG SUR R-309 and 41 DME miles.

430. What is the minimum rate of climb required
D54 for the Vista Six Departure if an aircraft maintains a groundspeed of 120 knots during a climb to 9,000 feet? (Fig. 35)

1- 240 ft./min.
2- 400 ft./min.
3- 160 ft./min.
4- 200 ft./min.

431. What are the altitude restrictions for
D54 the Vista Six Departure and Steamboat Transition? (Fig. 35)

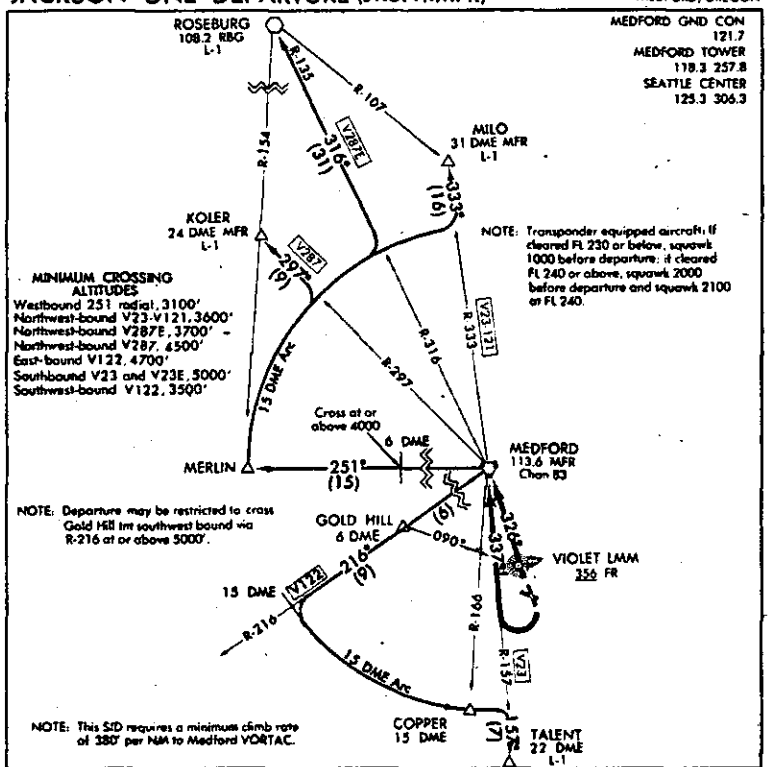
1- Cross the airport at 6,400 feet; climb to at least 10,500 feet before departing holding pattern; cross Steamboat at or above 12,000 feet.
2- Cross the airport at or above 6,400 feet; climb at least 200 feet per NM to 9,000 feet; leave holding pattern at or above 10,500 feet; cross Steamboat at or above 12,000 feet.
3- Cross the airport at 6,400 feet; cross RNO VORTAC at 10,500 feet; complete the transition at or above 12,000 feet.
4- After takeoff, climb at least 200 ft./min. to RNO VORTAC; depart RNO at 10,500; cross Steamboat at 12,000 feet; climb to assigned altitude.

432. What minimum time will elapse for a
D54 departure from the holding pattern of the Steamboat Transition if you cross the airport at 6,500 feet and climb at a steady rate of 500 feet/min? (Fig. 35)

1- 16 minutes
2- 21 minutes
3- 4 minutes
4- 8 minutes

JACKSON ONE DEPARTURE (JKSN1.MFR)

MEDFORD–JACKSON CO
MEDFORD, OREGON



DEPARTURE ROUTE DESCRIPTION

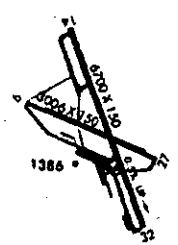
Climb direct to the MEDFORD VORTAC, (south take-off turn right), then climb on R-157 between the VORTAC and a point 5 NM south to (assigned crossing altitude), thence via (transition) or (assigned route).

COPPER TRANSITION (JKSN1.4QP): Via MEDFORD R-216 to 15 DME Fix, turn left via MEDFORD 15 DME Arc to COPPER INT.

KOLER TRANSITION (JKSN1.4KL): Via MEDFORD R-251 to the MERLIN INT, turn right via 15 DME Arc to intercept V287 to KOLER INT.

(Continued on next Page)

ELEV 1331



JACKSON ONE DEPARTURE (JKSN1.MFR)
MEDFORD, OREGON
MEDFORD–JACKSON CO

JACKSON-ONE DEPARTURE (JKSN1.MFR)

MEDFORD–JACKSON CO
MEDFORD, OREGON

DEPARTURE ROUTE DESCRIPTION
(Continued)

MILO TRANSITION (JKSN1.4MI): Via MEDFORD R-251 to the MERLIN INT, turn right via 15 DME Arc to intercept V23-121 to MILO INT.

ROSEBURG TRANSITION (JKSN1.RBG): Via MEDFORD R-251 to the MERLIN INT, turn right via 15 DME Arc to intercept V287E to ROSEBURG VOR.

TALENT TRANSITION (JKSN1.4TQ): Via MEDFORD R-216 to 15 DME Fix, turn left via MEDFORD 15 DME Arc to intercept V23 to TALENT INT.

JACKSON ONE DEPARTURE (JKSN1.MFR)
MEDFORD, OREGON
MEDFORD–JACKSON CO

FIG. 36

433. What are the altitude restrictions for the Vista Six Departure and Yerington Transition? (Fig. 35, page 66)
D54

1- Cross the airport at or above 6,400 feet, climb at least 200 feet/NM to 9,000 feet, and continue normal climb to assigned altitude.
2- Cross the airport at or above 6,400 feet and climb to at least 10,500 feet before departing the holding pattern, then climb en route to assigned altitude.
3- Cross the airport at or above 6,400 feet, cross RNO VORTAC at or above 10,500 feet, then climb to assigned altitude.
4- Climb at least 200 feet/NM to 9,000 feet, then make a normal climb to assigned altitude.

434. What is your ETE from Medford VORTAC to Roseburg VOR if you are cleared direct and expect to maintain 145 knots GS? (Fig. 36)
B23

1- 13 min.
2- 25 min.
3- 19 min.
4- 31 min.

435. What minimum rate of climb is required from takeoff at Medford-Jackson Co., to Medford VORTAC if a GS of 143 knots is maintained? (Fig. 36)
D54

1- 491 ft./min.
2- 720 ft./min.
3- 905 ft./min.
4- 380 ft./min.

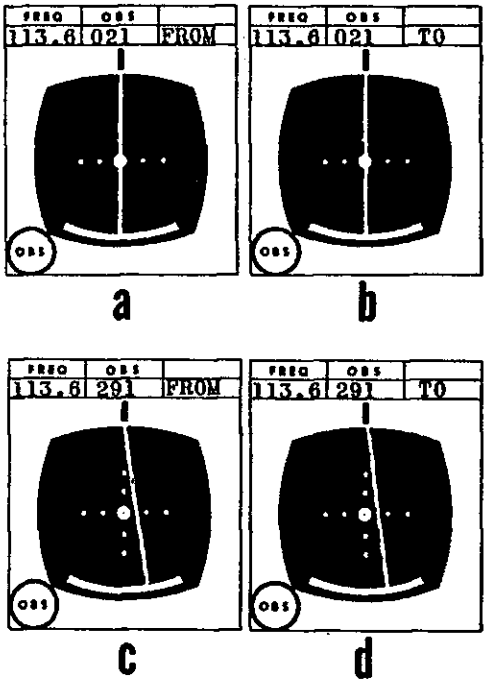
436. Which code should be set on the transponder at takeoff in preparation for a climbout to 15,000 feet? (Fig. 36)
D54

1- 1,200
2- 1,000
3- 1,400
4- 2,000

437. When may an amended clearance be issued?
D32

1- Only when the pilot requests a change in flight plan.
2- Only when an air traffic controller deems such action necessary or a pilot requests it.
3- Only in an emergency such as lost communications or aircraft malfunction.
4- Only if the amended clearance does not require priority.

438. Your clearance has the Jackson One Departure with the Koler Transition. Which illustration indicates that you are on the 15 DME Arc between Merlin and Koler? DME indication 15 NM; heading 21°. (Fig. 36)
H11



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

439. What is the MCA at Medford VORTAC when cleared southbound on V23? (Fig. 36)
J23

1- 5,000 feet
2- 3,100 feet
3- 3,500 feet
4- 4,000 feet

440. On the runup pad, you receive the following clearance from ground control:
D31

CLEARED AS FILED - MAINTAIN SIX THOUSAND - SQUAWK ZERO SEVEN ZERO ZERO JUST BEFORE DEPARTURE - DEPARTURE CONTROL WILL BE ONE TWO FOUR POINT NINER.

An abbreviated clearance, such as you have just received, will always contain the

1- departure control frequency.
2- altitude.
3- transponder code.
4- time or place to contact departure control.

INSTRUMENT APPROACH PROCEDURES (CHARTS)
EAST CENTRAL UNITED STATES
Δ IFR ALTERNATE MINIMUMS
(Not applicable to USAF/USN)

Standard alternate minimums for nonprecision approaches are 800-2 (NDB, VOR, LOC, TACAN, LDA, VORTAC, VOR/DME or ASR); for precision approaches 600-2 (ILS or PAR). Aerodromes within this geographical area that require alternate minimums other than standard or alternate minimums with restrictions are listed below. NA- means IFR minimums are not authorized for alternate use due to unmonitored facility or absence of weather reporting service. U. S. Army pilots refer to Army Reg. 95-2 for additional application. Civil pilots see FAR 91.83. USAF/USN pilots refer to appropriate regulations.

AERODROME NAME	ALTERNATE MINIMUMS
AKRON MUNI Akron, Ohio	LOC Rwy 25* NDB Rwy 25* *NA when control zone not effective.
ALLEN COUNTY Lima, Ohio	VOR Rwy 27 NA for those operators not having approved weather reporting service at the airport.
AURRA MUNI Aurora, Illinois	RNAV Rwy 9* *NA when control zone not effective.
BI-STATE PARKS East St. Louis, Illinois	NDB Rwy 30* LOC Rwy 30* VOR/DME-A, 1100-2* *NA when control zone not effective, except for operators with approved weather reporting service.
BLOOMINGTON-NORMAL Bloomington, Illinois	ILS Rwy 29* ILS BC R11* *NA when control zone not effective.
BURKE-LAKEFRONT Cleveland, Ohio	NDB Rwy 24R, 900-2 LOC Rwy 24R NA when control zone not effective.
CENTRAL WISCONSIN Mosinee, Wisconsin	ILS Rwy 8* LOC BC Rwy 26* *NA when UNICOM 122.8 not available.
CENTRALIA MUNI Centralia, Illinois	VOR Rwy 36 NA* *Standard minimums apply for operators with approved weather reporting service.
CHERRY CAPITAL Traverse City, Michigan	ILS Rwy 28, 800-2
CHICAGO-MIDWAY Chicago, Illinois	NDB Rwy 4R, 1000-2 ILS Rwy 4R* *ILS, 800-2
CHICAGO O'HARE INTL Chicago, Illinois	ILS Rwy 4R* ILS Rwy 22R† *ILS, 700-2; LOC, 1100-2 †LOC, 1000-2
CINCINNATI MUNI-LUNKEN FIELD Cincinnati, Ohio	NDB Rwy 20L, 900-2 NDB Rwy 24, 900-2 ILS Rwy 20L, 900-2 LOC BC Rwy 2R, 900-2
CLEVELAND HOPKINS INTL Cleveland, Ohio	ILS Rwy 23L ILS, 700-2
COLES-COUNTY MEMORIAL Mattoon-Charleston, Illinois	NDB Rwy 29* ILS Rwy 29* VOR Rwy 6* VOR Rwy 24* *NA when control zone not effective except for operators with approved weather reporting service.
CUYAHOGA COUNTY Cleveland, Ohio	RNAV Rwy 23* LOC BC Rwy 5* ILS Rwy 23* *NA when control zone not effective.
DELTA COUNTY Escanaba, Michigan	VOR Rwy 9 VOR Rwy 18 VOR Rwy 27 NA when control zone not effective, except for operators with approved weather reporting service.
DETROIT CITY Detroit, Michigan	ILS Rwy 33* *LOC, 900-2
EAU CLAIRE MUNI Eau Claire, Wisconsin	ILS Rwy 22 Category D, 800-2
ELKHART MUNI Elkhart, Indiana	NDB Rwy 9 NA* VOR R 9 NA* RNAV R 17 NA* VOR Rwy 27 NA* VOR/DME Rwy 35 NA* SDF Rwy 27 NA* SDF BC Rwy 9 NA* *Standard minimums authorized for operators with approved weather reporting service.

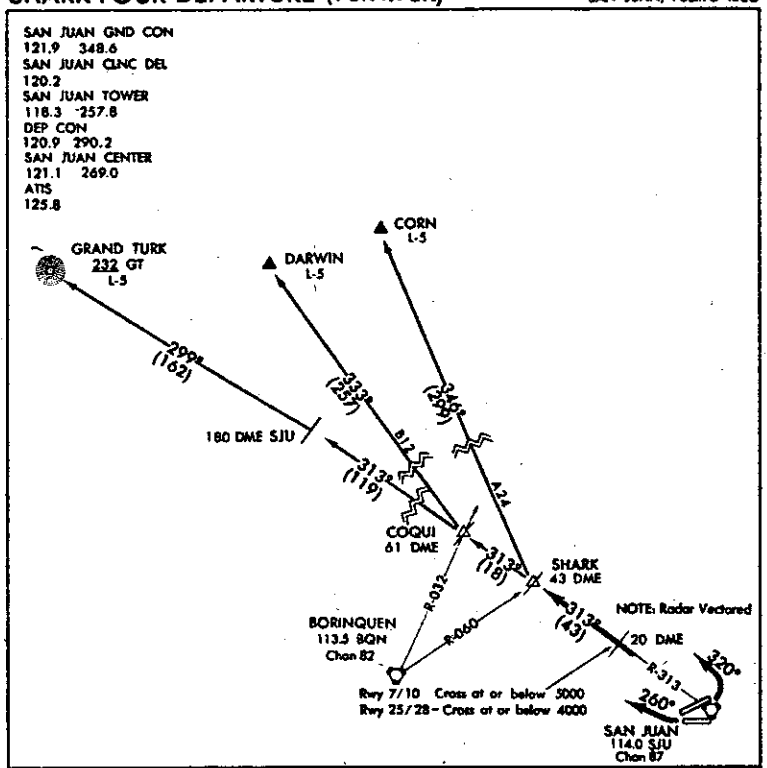
(Continued on page 2)

PUBLISHED BY NOS, NOAA, TO FACC SPECIFICATIONS

FIG. 37

SHARK FOUR DEPARTURE (9SK4.9SK)

PUERTO RICO INTERNATIONAL
SAN JUAN, PUERTO RICO



DEPARTURE ROUTE DESCRIPTION

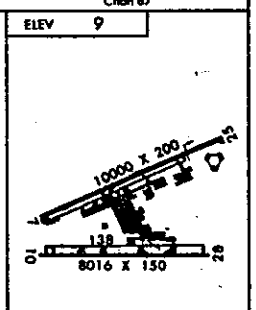
Take-off Runway 7/10: Turn left heading 320° for radar vector to SJU R-313, to SHARK INT. Cross SJU R-313/20 DME at or below 5000'. Then climb and maintain assigned altitude.

Take-off Runway 25/28: Turn left/right heading 260° for radar vector to SJU R-313 to SHARK INT. Cross SJU R-313/20 DME at or below 4000'. Then climb and maintain assigned altitude.

CORN TRANSITION (9SK4.CON): From SHARK INT direct CORN INT, thence as assigned by ATC.

DARWIN TRANSITION (9SK4.DWN): From SHARK INT proceed via the SJU R-313 to COQUI INT, then direct to DARWIN INT, thence as assigned by ATC.

GRAND TURK TRANSITION (9SK4.GT): From SHARK INT via the SJU R-313 to the 180 DME fix, then direct to GRAND TURK NDB, thence as assigned by ATC.



SHARK FOUR DEPARTURE (9SK4.9SK)

SAN JUAN, PUERTO RICO
PUERTO RICO INTERNATIONAL

FIG. 38

441. M57 What minimum weather conditions must be forecast for Detroit City in order to list it as an alternate airport on an IFR flight plan? The wind is forecast from the northwest, and you are equipped for ILS approaches. (Fig. 37)

1- 800-2
2- 900-2
3- 1000-3
4- 600-2

442. M57 What minimum weather conditions must be forecast for Akron Municipal in order to list it as an alternate airport on an IFR flight plan? The control zone will be in effect. (Fig. 37)

1- 600-2
2- 1000-1
3- 800-2
4- 1000-3

443. M57 When may you use Bi-State Parks as an alternate airport on your IFR flight plan? (Fig. 37)

1- Anytime wind conditions are forecast to be such that you can make a VOR/DME-A approach, the control zone is in effect, and the ceiling and visibility are forecast to be at least 800-2.
2- When the control zone is in effect and the forecast for ceiling and visibility is at least: (1) 800-2 if you can make an approach to Runway 30, or (2) 1100-2 if you must make a VOR/DME-A approach.
3- Anytime wind conditions are forecast to be such that you can land on Runway 12, and the ceiling and visibility are forecast to be at least 1100-2.
4- Anytime wind conditions are forecast to be such that you can land on Runway 30, and the ceiling and visibility are forecast to be at least 800-2.

444. M57 What minimum weather conditions must be forecast for Coles-County Memorial in order to list it as an alternate airport on an IFR flight plan? You have all the necessary equipment to make any of the available approaches; the control zone is in effect, and the wind is forecast to be calm. (Fig. 37)

1- 1000-2
2- 800-2
3- 600-2
4- 200-2

445. M57 What minimum weather conditions must be forecast for Chicago-Midway in order to list it as an alternate airport on an IFR flight plan? The wind is forecast to be from the northeast, and you are equipped for ILS approaches. (Fig. 37)

1- 1000-2
2- 800-2
3- 700-2
4- 600-2

446. M57 What minimum weather conditions must be forecast for Burke-Lakefront in order to list it as an alternate airport on an IFR flight plan? The control zone will be in effect, and you are equipped for any approach. (Fig. 37)

1- 900-2
2- 1000-2
3- 600-2
4- 800-2

447. D54 What course of action is necessary if your DME becomes inoperative in flight while on a clearance containing the Shark Four Departure and the Darwin Transition? (Fig. 38)

1- Advise Departure Control that your DME is inoperative and continue the SID.
2- Advise Departure Control that your DME is inoperative, and you will need a vector to COQUI Intersection.
3- Estimate your time to COQUI Intersection and continue the SID.
4- Contact Departure Control and abandon the SID.

448. D54 AVON FOUR THREE TWO SEVEN MIKE CLEARED AS FILED, SHARK FOUR DEPARTURE, GRAND TURK TRANSITION. MAINTAIN ONE ZERO THOUSAND. DEPARTURE CONTROL FREQUENCY WILL BE ONE TWO ZERO POINT NINER, SQUAWK ZERO FOUR THREE FIVE.

You receive the above clearance and are then cleared by the tower to takeoff on Runway 10. Which climb procedure should be followed? (Fig. 38)

1- Make a continuous climb to 10,000 feet.
2- Climb to and maintain 4,000 feet until 20 DME miles from SJU, then climb to 10,000 feet.
3- Maintain 5,000 feet or less until passing the 20 DME fix on the SJU 313 radial, then climb to and maintain 10,000 feet.
4- Climb to and maintain 5,000 feet until passing SHARK Intersection, then maintain 10,000 feet.

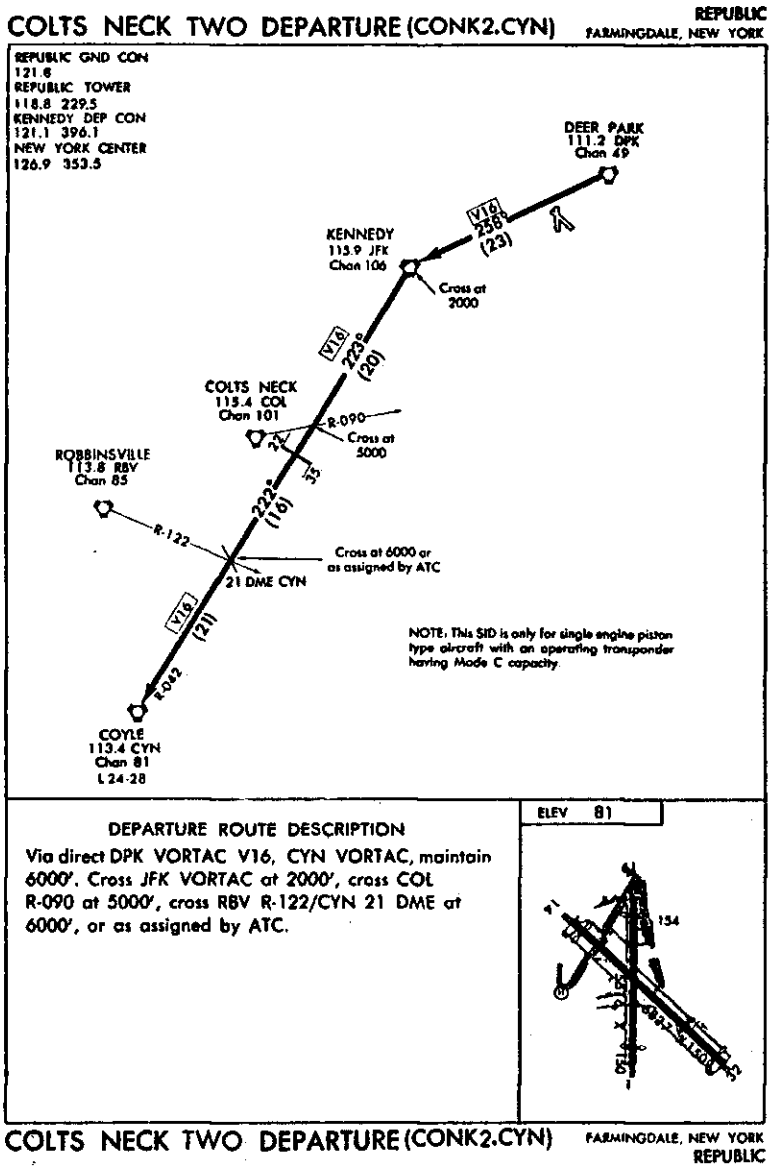


FIG. 39

449. D54 You were given the Shark Four Departure with the Darwin Transition and have been vectored to the SJU 20 DME Fix. What is the distance from this fix to the point where the Darwin Transition starts? (Fig. 38, page 70)

1- 43 miles
2- 61 miles
3- 18 miles
4- 23 miles

450. D54 Your aircraft is a single engine piston type and you have filed for the Colts Neck Two Departure with a requested en route altitude of 7,000 feet. What equipment, if any, is required in addition to that necessary for instrument flight in controlled airspace? (Fig. 39)

1- Dual VOR receivers.
2- A transponder having Mode C capacity.
3- No additional equipment is required.
4- A Mode A/3 transponder and a DME.

451. D54 You have been given the Colts Neck Two Departure and, before reaching Kennedy VORTAC, your DME becomes inoperative. What procedure should you follow? (Fig. 39, page 72)

1- Advise ATC that your DME is inoperative and you will be unable to identify the 21 DME CYN fix.
2- Contact Kennedy Departure Control and request that they advise you when you arrive at the 21 DME CYN fix, as your DME is inoperative.
3- Advise ATC that your DME is inoperative and continue the SID.
4- Calculate your groundspeed and determine your ETA for the 21 DME CYN fix.

452. D34 What is meant by the term "Clearance on Request" when advised by Clearance Delivery before an IFR flight?

1- The pilot is expected to request the clearance prior to taxi.
2- The clearance is not ready but has been requested from ATC.
3- The pilot will receive the clearance after takeoff.
4- The pilot should request the clearance when ready to copy.

453. D42 You receive the following clearance from Oklahoma City Clearance Delivery:

CLEARED AS FILED, MAINTAIN FIVE THOUSAND, TURN RIGHT TO ZERO SIX ZERO AFTER TAKE-OFF, SQUAWK ZERO SEVEN ZERO ZERO JUST BEFORE DEPARTURE, DEPARTURE CONTROL FREQUENCY ONE TWO FOUR POINT SIX....

When should you contact Departure Control?

1- After making power adjustment and aircraft is in trim.
2- When instructed by the tower.
3- Upon reaching at least 500 feet and past the runway boundary.
4- When established on a heading of 060.

454. D41 When are you required to utilize the Category II holding lines on airport taxiways?

1- When the pilot is operating a Category II equipped airplane.
2- When weather conditions are below Category I landing approach minimums.
3- Anytime Category II operations are in progress at that airport.
4- At all times on an airport that is approved for Category II operations.

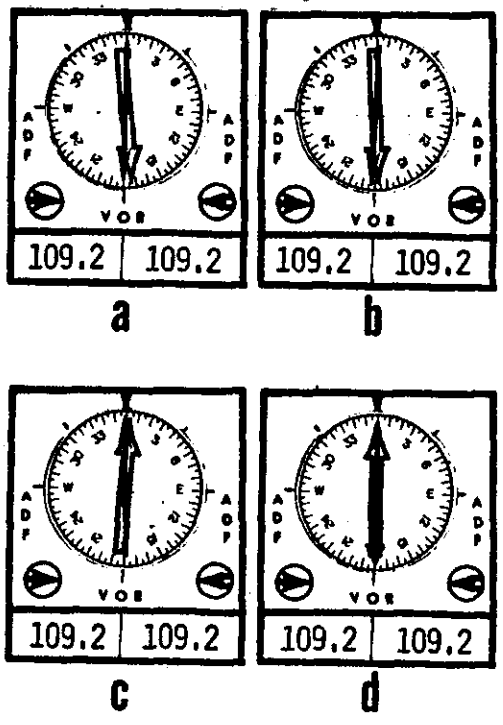
455. D53 Departure Control has given you a radar vector to intercept V45 and has instructed you to "Resume Own Navigation." What is meant by this instruction?

1- Radar service is terminated.
2- You are to assume responsibility for your own navigation.
3- Radar identification has been lost and you must do your own navigation.
4- You are to contact ARTCC on the appropriate frequency.

456. D33 When the pilot is ready to depart IFR from an airport where pre-taxi clearance procedures are established, on which frequency should the first contact be made and when?

1- Ground control frequency when ready to taxi.
2- Clearance delivery frequency not more than 10 minutes prior to taxi.
3- Clearance delivery frequency more than 10 minutes prior to taxi.
4- Ground control frequency when ready for takeoff.

457. E11 Which is an acceptable range of accuracy when performing an operational check of dual VORs using a VOT?



1- a
2- b
3- c
4- d

458. D54 You receive this clearance: COLT SIX FOUR THREE ALFA CLEARED AS FILED, COLTS NECK TWO DEPARTURE. MAINTAIN EIGHT THOUSAND, DEPARTURE CONTROL FREQUENCY WILL BE ONE TWO ONE POINT ONE, SQUAWK ZERO FOUR THREE THREE. Which procedure should be followed with regard to the altitude you maintain? (Fig. 39, page 72)

1- Climb at a rate to cross JFK at 2,000 feet; cross COL 090 radial at 5,000 feet, then climb and maintain 8,000 feet.
2- Climb to and maintain 7,000 feet.
3- Cross Kennedy VORTAC at or above 2,000 feet; cross Colts Neck 090 radial at or above 5,000 feet; and cross Robbinsville 122 radial or CYN 21 DME fix at or above 6,000 feet.
4- Climb to and maintain 2,000 feet until passing JFK VORTAC; climb and maintain 5,000 feet until passing COL 090 radial; climb and maintain 6,000 feet until passing RBV 122 radial; climb and maintain 8,000 feet.

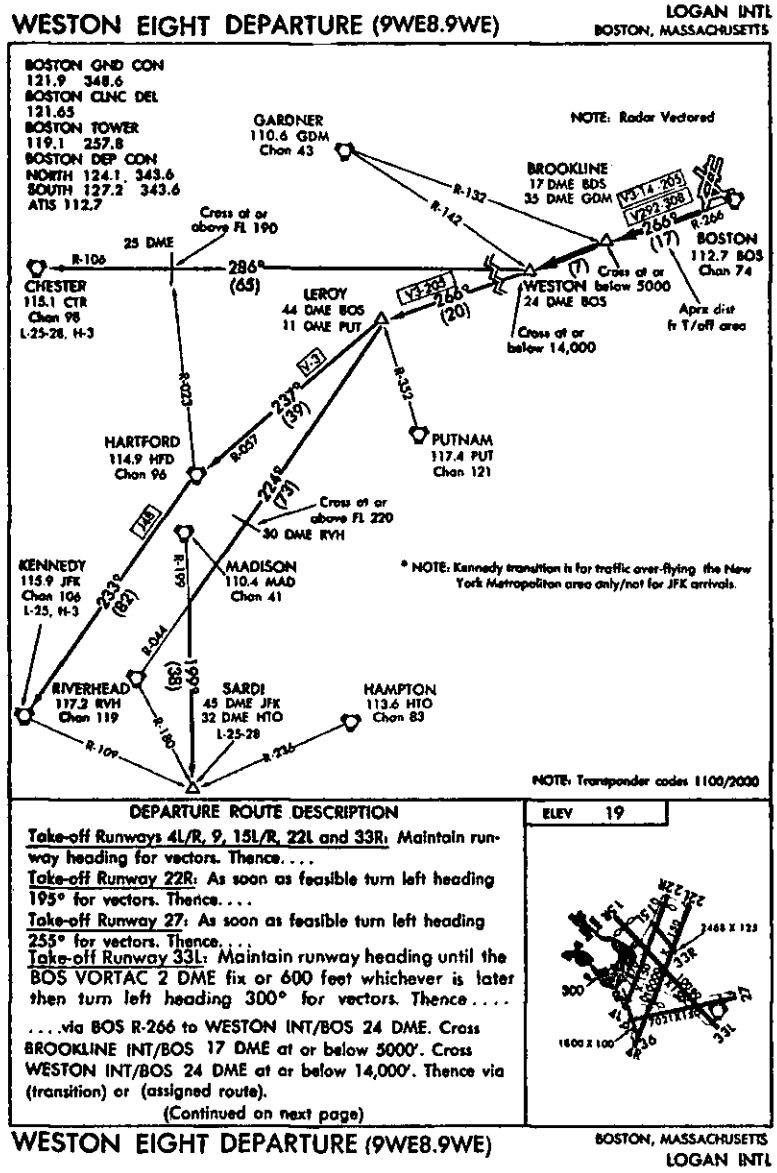


FIG. 40

459. D34 What is the procedure for receiving an IFR clearance on an uncontrolled airport that has no A/G communications?

1- You must fly to an airport that has adequate facilities for issuing an IFR clearance.
2- Fly the route as filed at the MEA until contact with ATC is made at the first compulsory reporting point.
3- Contact the nearest ARTCC once you are on an airway.
4- Contact an FSS by phone prior to takeoff or any ATC facility prior to entering IFR conditions in controlled airspace.

460. D54 Which transponder code should be used if the IFR flight is cleared via the Sardi Transition at flight level 220? (Fig. 40)

1- 1200
2- 1400
3- 2000
4- 2200

461. B23 At what time should you arrive over Kennedy VORTAC using V3 and J48 if you depart Logan at 0805? Plan to average 145 knots GS on climbout to WESTON Intersection and 188 knots to JFK. (Fig. 40)

1- 0855
2- 0900
3- 0905
4- 0910

462. A42 If you did not wish to utilize the Weston Eight Departure, what action should you take? (Fig. 40)

1- Do not list the SID on your flight plan.
2- Request radar vectors when handed off to Departure Control.
3- Put No SID in the "Remarks" section of the flight plan.
4- Substitute your requested departure on the flight plan.

463. D32 At which fix may N87438 start the final climb to 12,000 feet? (Fig. 40 & 41)

1- Carmel VORTAC
2- LEROY Intersection
3- WESTON Intersection
4- BROOKLINE Intersection

N87438 - CLEARED TO LA GUARDIA AIRPORT - WESTON EIGHT DEPARTURE EXCEPT CROSS BROOKLINE INTERSECTION AT OR BELOW FOUR THOUSAND - CROSS WESTON INTERSECTION AT OR BELOW TEN THOUSAND - I SAY AGAIN - CROSS BROOKLINE INTERSECTION AT OR BELOW FOUR THOUSAND - CROSS WESTON INTERSECTION AT OR BELOW TEN THOUSAND - THENCE VIA VICTOR THREE TO THE CARMEL VORTAC - VICTOR ONE TWENTY THREE TO THE LA GUARDIA VOR - MAINTAIN ONE TWO THOUSAND - DEPARTURE CONTROL FREQUENCY WILL BE ONE TWO SEVEN POINT TWO - SQUAWK ONE ONE ZERO ZERO.

FIG. 41

464. D32 If N87438 received the following amended clearance just after takeoff, at which position could the final climb to 12,000 feet be started? (Fig. 40 & 41)

N87438 - ALTITUDE RESTRICTIONS ARE CANCELLED, CLIMB AND MAINTAIN ONE TWO THOUSAND.

1- Immediately upon acknowledging the clearance.
2- At BROOKLINE Intersection.
3- At WESTON Intersection.
4- At LEROY Intersection.

465. D53 Which service is provided by Departure Control to an IFR pilot when the flight is operating from an airport with a Terminal Radar Service Area (TRSA, Stage III)?

1- Separation from IFR aircraft and participating VFR aircraft.
2- Separation from all aircraft operating in the TRSA.
3- Assurance that VFR aircraft operating in the area are in radar contact.
4- Position and altitude of all VFR traffic near the IFR traffic.

466. D55 What action is appropriate if a pilot receives a speed adjustment from ATC that is higher than cruise speed and is very difficult to attain?

1- The pilot must attempt to maintain the speed within 10 knots to avoid possible collision.
2- The pilot should cancel the IFR flight plan.
3- The pilot is expected to advise ATC of the speed that will be used.
4- The pilot may descend to MEA or turn off the airway in lieu of a speed adjustment.

467. E11 In addition to the Airport/Facility Directory (AIM-3), where can the VOT frequency for a particular airport be found?

1- On the Instrument Approach Procedure Chart for the airport.
2- In AIM, Part 3, with the VOR receiver checkpoints.
3- Listed in AIM, Part 4, under Airports with VOTs.
4- On the A/G voice communication panel of the Low Altitude Enroute Chart which contains that airport.

468. E11 When checking your VOR receiver by use of a VOT, which is a correct setting with the Course Deviation Indicator (CDI) centered?

	OBS	TO-FROM Indicator
1-	0	TO
2-	0	Either TO or FROM
3-	From 176 thru 184	FROM
4-	180	TO

469. E11 When checking your VOR receiver by use of a VOT, which is a correct setting with the Course Deviation Indicator (CDI) centered?

	OBS	TO-FROM Indicator
1-	180	FROM
2-	0	FROM
3-	180	Either TO or FROM
4-	From 356 thru 004	TO

470. E12 How should the pilot make a VOR receiver check when the airplane is located on the designated checkpoint on the airport surface?

1- With the aircraft headed directly toward the VOR and the TO-FROM indicator reading TO, set the OBS to 360°; the CDI should center within ± 4° of that radial.
2- Set the OBS on 180° ± 4°; the CDI should center with the TO-FROM indicator reading TO.
3- Set the OBS on the designated radial. The TO-FROM indicator should read FROM and the CDI must center within ± 4° of that radial.
4- Set the OBS on the designated radial with the aircraft headed directly away from the VOR; the CDI should center within ± 4° of 180° with the TO-FROM indicator reading FROM.

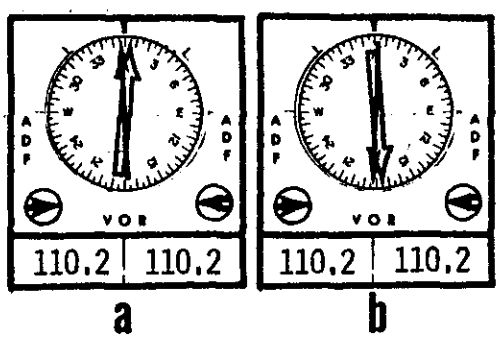
471. E13 Which is the maximum tolerance for the VOR indication when the CDI is centered and the airplane is directly over the airborne checkpoint?

1- Plus or minus 4° of the designated radial - FROM.
2- Plus or minus 6° of the designated radial - TO.
3- Plus or minus 6° of the designated radial - FROM.
4- Plus or minus 4° of the designated radial - TO.

472. E14 What is the maximum tolerance between the two indicators of a dual VOR system (units independent of each other--except the antenna) when making a check while airborne?

1- 4° between the two indicated bearings to a VOR.
2- Plus or minus 4° when set to identical radials of a VOR.
3- Plus or minus 6° when set to identical radials of a VOR.
4- 6° between the two indicated bearings to a VOR.

473. E14 Which is an acceptable range of accuracy when performing an operational check of dual VORs using one system against the other?



1- a
2- b
3- c
4- d

474. D33 What is the procedure for requesting an IFR clearance at an airport that has pre-taxi clearance delivery?

1- Advise ground control that you are IFR prior to taxi, so the clearance will be ready when you are on the runup pad.
2- Contact clearance delivery prior to taxi and request the clearance, so it is ready at the runup pad at least 10 minutes prior to takeoff.
3- Contact clearance delivery prior to taxi at least 30 minutes after filing and within 10 minutes of expected taxi time.
4- Contact ground control for your clearance prior to requesting taxi instructions.

475. D53 During a departure, the controller advises, "traffic 2 o'clock 6 miles southbound." Which direction should the pilot look for the traffic?

1- 20° to the right of the airplane's direction of travel.
2- 60° to the right of the airplane's nose.
3- 20° to the right of the airplane's nose.
4- 60° to the right of the airplane's direction of travel.

476. D41 Which safety hazard will be prevented if the pilot remains behind the CAT II holding line before receiving takeoff clearance during CAT II operations?

1- Interference with ILS guidance signals.
2- Interference on the radar altimeter scope.
3- Clutter on the PAR scope.
4- Distortion of the Inner Marker signal.

477. D42 During a takeoff into IFR conditions with low ceilings, when should the pilot contact Departure Control?

1- Before penetrating the clouds.
2- Upon reaching 1,000 feet above the airport.
3- When advised by the tower.
4- When clear of the airport and established on the heading given in the clearance.

478. D53 During a departure, the controller advises "traffic 2 o'clock 5 miles southbound." The pilot is holding 20° correction for a crosswind from the right. Which direction should the pilot look for the traffic?

1- 20° to the right of the airplane's nose.
2- 40° to the right of the airplane's nose.
3- Straight ahead.
4- 40° to the right of the airplane's direction of travel.

479. D44 What procedure should a pilot use when ATIS (Automatic Terminal Information Service) is available prior to an IFR departure?

1- Contact Departure Control for ATIS information prior to takeoff.
2- Receive ATIS information and advise ATC you "have numbers."
3- ATIS is for VFR information--request IFR information needed from Departure Control.
4- Receive ATIS information and advise ATC "information (alphabetical code) received."

480. D52 What climb procedure should be observed when a non-radar Departure Control instructs a flight to climb to the cruising altitude?

1- Maintain a continuous climb without intermediate level-offs.
2- Report passing each 1,000-foot level.
3- Climb to the right of the airway centerline.
4- Climb at the maximum rate of climb.

481. D53 Upon intercepting the assigned radial, the controller informs you that you are on the airway and to "RESUME OWN NAVIGATION." This phrase means that

1- you are to contact the center at the next compulsory reporting point.
2- you are to assume responsibility for your own navigation.
3- radar identification is lost and you should contact ARTCC on appropriate frequency.
4- radar services are terminated and you will be responsible for position reports.

VOR RECEIVER CHECK POINTS

Facility Name (arpt name) VOR/VORTAC	Type Check Pt. Gnd. Arbne.	Azimuth from Fac. Mag°	Dist. from Fac. N.M.	Check Point Description
MONTANA—*Continued*				
Havre	A/4000	278	8	Over dam
Helena (Helena Arpt)	G	235	0.7	Twy 2000' from apch end rnwy 26
Kalispell (Glacier Park Int'l Arpt)	A/4000	314	6.4	Apch end rwy 29
Lewiston (Muni Arpt)	A/5200	072	5.4	End of apch rwy 7
Livingston	A/6500	234	5.5	Over northernmost rdo twr NE of City
Livingston (Mission Fld)	G	208		E side of twy leading from ramp to rwy
Miles City (Miles City Arpt)	G	086	4.2	On twy leading to rwy 30
Missoula (Johnson-Bell Fld)	G	340	0.6	Edge of ramp in front of Admin Bldg
OKLAHOMA				
Ardmore (Muni Arpt)	G	042	9	Adj to NW end NW/SE rwy
Bartlesville (Phillips Arpt)	G	166	4.5	Opposite Trml on parallel taxi strip
Duncan (Halliburton Fld)	G	329	6	Trml ramp at intsxn N/S and ctr twys
Glenpool (Tulsa, Riverside Arpt)	G	848	4.8	Main ramp, NE of ctl twr
Hobart (Muni Arpt)	A/3500	343	9	Over railroad intersection east side of city
Lawton	G	351	4.6	Int of trml ramp and S taxi strip
McAlester (Muni)	G	350	2	Int ramp and taxi strip
Okmulgee (Muni Arpt)	G	241	4.8	Int of perimeter twy and twy to gas pumps
Pioneer (Ponca City Muni Arpt)	G	101	3.0	Taxi strip at junction to trml ramp
Sayre (Muni Arpt)	A/3000	175	8	Over rotg bcn
Stillwater (Searcy Arpt)	G	173	4	NW ramp and taxi strip
Wiley Post (Wiley Post Arpt)	G	155		Runup pad to rnwy 35R

AIRPORT/FACILITY DIRECTORY

OKLAHOMA CITY

S WILEY POST (PWA) *IFR* 8NW FSS: OKLAHOMA CITY on fld 1299 H72/17L-35R(4) (S-35, D-50, DT-90) 8L5,7A,10,13 S5 F18,34 Ox1,2,3,4 U2 VASI: Rwys 3, 12, 30, 35R, 17R, 35L, 21, 17L

Remarks: Rgt tfc rwys 12, 17L, 17R, 21. Trees apch rwy 3. Arpt clsd to all aircraft over 54,000 lbs GWT. Rwy 12-30 clsd to all jets. Rwy 12 clsd to takeoff and rwy 30 clsd for landings to all aircraft over 12,500 lbs. Rwy 12-30 clsd daily 2200-0600. Touch and go or stop and go opersn not authorized rwy 12-30. For MALSR rwy 17L key 119.7 7 times for hi, 5 times for med, 3 times for low intensity. VASI rwy 30 TCH 55', glide angle 4.00°. VASI rwy 17R TCH 55', glide angle 3.50°.

Wiley Post Tower 119.7 Gnd Con 121.7

ATIS: 113.4

Radar Services:

Oke City App Con 124.2 (351-169°) 119.3 (170-350°) 115.0T

Oke City Dep Con 124.6 (170-350°) 121.05 (351-169°) 124.2 115.0T

Stage I Clc app con on 119.3

ILS 108.7 I-PWA Rwy 17L

Wiley Post (T) VOR 113.4/PWA on fld.

Remarks: Twr opers 0600-2200, FSS provides AAS other hrs on 119.7.

FIG. 42

482. B12 The terminal forecast indicates a ceiling of 1,000 feet and wind conditions are such that you may land on Runways 3, 35L, 35R, and 30 at Wiley Post Airport, Oklahoma City. Which runway(s) has(have) glide slope information? (Fig. 42)

1- 3, 30, 35R, and 35L
2- 35L only
3- 35R only
4- 30 only

483. E13 How can you meet the VOR receiver check requirement at Hobart Municipal Airport? (Fig. 42)

1- Make a ground check at a marked spot on the ramp.
2- Make an airborne check at 3,500 feet MSL over the railroad intersection east of the city.
3- Make a ground check using the 343 radial of Hobart VORTAC.
4- Make a VOT check.

484. E13 How should you perform a VOR receiver accuracy check at Sayre? (Fig. 42)

1- Fly over the rotating beacon at 3,000 feet above the ground and check that the CDI is centered when the OBS is set to 175 ±4°.
2- Fly over the rotating beacon at 3,000 feet MSL and make the VOR receiver check. The CDI must be centered with the OBS set to 175 ±4°.
3- Fly over the rotating beacon at 3,000 feet MSL. The CDI must be centered with the OBS at or between 169 and 181.
4- Fly over the rotating beacon at 3,000 feet MSL. The CDI must be centered with the OBS set at or between 172 and 178.

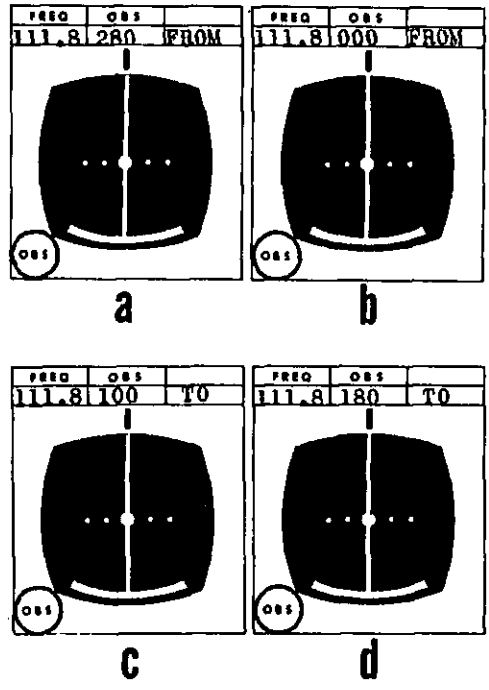
485. E13 What is the procedure for performing an operational check of the VOR equipment at the Lewiston Muni. Airport? (Fig. 42)

1- Fly over the approach end of RWY 7 at 5,200 feet and check for OBS (with CDI centered) between 066° and 078° with a FROM indication.
2- Tune to a VOT frequency, center the CDI, and check for OBS within 4° of 0° with a FROM indication.
3- Taxi to the approach end of RWY 7, tune to the local VOR, center the CDI, and check for OBS between 068° and 076° with a FROM indication.
4- Fly over the 5,200-foot antenna that is 072°, 5.4 NM from the approach end of RWY 7, and check for OBS (with CDI centered) within 6° of 0° with a FROM indication.

486. E12 Which method can be used and what tolerance is required for a VOR receiver check at Wiley Post Airport? (Fig. 42)

1- Make a ground check at the designated spot on the field; maximum permissible bearing error is ±4°.
2- Make an airborne check over a designated spot on the field; maximum permissible bearing error is ±6°.
3- Check one receiver against the other; maximum permissible bearing error is ±4°.
4- Make a VOT check; maximum permissible bearing error is ±4°.

487. E13 Which indications are acceptable for an operational check of the VOR system while over the designated VOR receiver checkpoint at Havre? (Fig. 42)

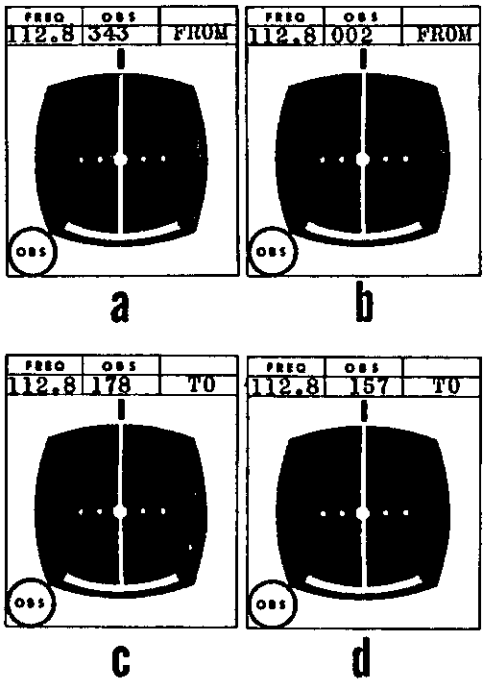


1- a and d
2- b and c
3- a and b
4- a and c

488. E12 What is the procedure for performing an operational check of the VOR equipment at Livingston (Mission Field)? (Fig. 42)

1- Taxi to the east side of the taxiway leading from the ramp to the runway, tune to the local VOR, center the CDI, and check for OBS between 204° and 212° with a FROM indication.
2- Fly over the east side of the taxiway leading from the ramp to the runway, tune to the local VOR, and check for OBS (with CDI centered) within 6° of 0° with a FROM indication.
3- Fly over the east side of the taxiway leading from the ramp to the runway, tune to the local VOR, and check for OBS (with CDI centered) between 202° and 214° with a FROM indication.
4- Tune to a VOT frequency, center the CDI, and check for OBS within 4° of 0° with a FROM indication.

489. E12 Which indications are acceptable for an operational check of the VOR system while at the designated VOR receiver checkpoint at Missoula (Johnson-Bell Field)? (Fig. 42, page 78)



1- a and b
2- a and d
3- a and c
4- b and c

490. E12 What OBS setting should you have when making a VOR receiver check for an aircraft located at Wiley Post? (Fig. 42, page 78)

1- 360 plus or minus 4°
2- 180 plus or minus 4°
3- 350 plus or minus 4°
4- 155 plus or minus 4°

491. E22 What pretakeoff check should be made of a vacuum driven heading indicator in preparation for an IFR flight?

1- After warmup, set magnetic heading and check for proper alignment after taxi turns.
2- Check that the gyro remains caged until just before takeoff.
3- After warmup, check that the card aligns itself with the appropriate magnetic heading.
4- Cage the gyro and make a turn while taxiing. Uncage the gyro and check that card realigns with the new heading.

492. E12 Where can the VOR receiver ground checkpoint(s) for a particular field be found?

1- Instrument Approach Chart.
2- Airman's Information Manual, Part 3.
3- Airman's Information Manual, Part 4.
4- Enroute Low Altitude Chart.

493. E21 What should these engine instruments indicate prior to the switches being turned on and engine started?

	Manifold Pressure	Oil Temp.	Oil Press.	Cyl. Head Temp.
1-	0"	0°	0#	0°
2-	0"	Lower limit of green	Lower limit of green	Lower limit of green
3-	Atmospheric pressure	Lower needle limit	Lower red line	Lower red line
4-	Atmospheric pressure	Lower needle limit	0#	Lower needle limit

494. E22 What indications should you get from the turn and slip indicator during taxi?

1- The ball deflects opposite the turn, but the needle remains centered.
2- The needle and ball should move freely in the direction of the turn.
3- The ball moves freely opposite the turn, and the needle deflects in the direction of the turn.
4- The needle deflects in the direction of the turn, but the ball remains centered.

495. E22 What pretakeoff check should be made of the attitude indicator in preparation for an IFR flight?

1- The miniature airplane should erect and become stable within 5 minutes.
2- The horizon bar should erect and become stable within 5 minutes.
3- Check that the gyro remains caged until just before takeoff.
4- The miniature airplane should deflect in the direction of taxi turns after a 5-minute warmup period.

496. E21 What check should be made of these aircraft instruments prior to turning on switches or starting an engine?

	Turn and Slip	Mag. Compass	Heading Indicator	Attitude Indicator
1-	Needle and ball centered	Proper heading	Same as Mag. compass	Level attitude
2-	Needle centered tube fluid level	Approx. MH/full fluid	Uncaged	Uncaged
3-	Needle and ball centered	Full fluid	Uncaged	Level attitude
4-	Needle centered tube fluid level	Full fluid card free	Same as Mag. compass	Uncaged

497. E22 Which condition during taxi is an indication that an attitude indicator is unreliable?

1- The miniature airplane is not lined up with the horizon bar.
2- The horizon bar does not remain in level position while taxiing.
3- The miniature airplane does not tilt sufficiently to indicate a turn while taxiing.
4- The horizon bar tilts more than 5° while making a taxi turn.

498. E22 On the taxi check, the magnetic compass should be full of fluid and

1- should swing opposite to direction of turn when turning from north.
2- consistently indicate the same as the heading indicator.
3- the card should swing freely.
4- checked for proper deviation.

499. E31 When should you adjust your transponder to mode C (altitude reporting) while on an IFR flight?

1- Only when ATC requests mode C.
2- At all times if the equipment has been calibrated.
3- When passing 12,500 feet MSL.
4- Only when entering Group I TCA.

500. E31 You are on an IFR flight in VFR conditions at 17,000 feet squawking 1100. Which transponder code should be set if you cancel your IFR flight plan and start a descent for landing?

1- Leave the transponder set to 1100 until passing through 10,000 feet, then set to 1200.
2- Set the transponder to 1200.
3- Set the transponder to 1400.
4- Leave the transponder on 1100 until reaching 12,500 feet, then set to 1400.

501. E31 Which action should you take if the ATC controller advises "Squawk Altitude"?

1- Switch the transponder to the code corresponding to the altitude you are maintaining.
2- Activate Mode C for automatic altitude reporting, if so equipped.
3- Advise the controller of current altitude and press IDENT.
4- Advise the controller of your present altitude.

502. E31 Which transponder code should you as a civil pilot never use?

1- 0000
2- 3333
3- 7500
4- 7777

503. E31 In which position should your transponder be while you are in the runup area?

1- STANDBY
2- OFF
3- ON
4- ALT

504. E32 Which transponder codes should you take caution not to switch through while changing codes?

1- 7777, 7700, 7600
2- 7700, 7600, 7500
3- 0000, 3100, 7700
4- 3333, 7600, 7700

505. E33 While in IFR weather conditions, your communications and navigation radios fail. If your transponder is still operating, which code should you use?

1- 0736 (code assigned by ATC)
2- 7777
3- 7700
4- 7600

506. E31 Which action should the pilot take if the ATC controller advises "Squawk 4523 and IDENT"?

1- Select code 4523, STANDBY, and IDENT.
2- Select mode C and code 4523, then IDENT for 5 seconds.
3- Select code 4523 and hold the IDENT control ON until the controller advises "Radar Contact."
4- Select code 4523, and then activate the IDENT feature and release.

507. E33 You are in IFR weather conditions and have two-way radio communication failure. If you do not exercise emergency authority, what procedure are you expected to follow?

1- Set transponder to code 7700 for 1 minute, then to 7600, and fly to an area with VFR weather conditions.
2- Set transponder to 7700 and fly to an area where you can let down VFR.
3- Set transponder to code 7600 and continue the flight as planned. Fly at the last assigned altitude or requested altitude, whichever is higher.
4- Set transponder to code 7700 for 1 minute, then to 7600. Continue flight on assigned route and fly at the last assigned altitude or the MEA, whichever is higher.

508. E33 When 30 minutes from the destination airport, you experience two-way communication failure. Which transponder operation should you use to alert ATC of this situation?

1- Squawk Mode C, code 7600.
2- Squawk code 7600 for 1 minute, then code 7700 for 15 minutes; repeat.
3- Squawk Mode C, code 7700.
4- Squawk code 7700 for 1 minute, then code 7600 for 15 minutes. Repeat as practicable.

509. F13 Which type of runway lighting consists of a pair of synchronized flashing lights, one on each side of the runway threshold?

1- VASI
2- HIRL
3- TDZL
4- REIL

510. E33 What procedure should you use to alert ATC that you are unable to contact them on any of the voice channels?

1- Squawk 7600 for 5 minutes, then 7700 for 1 minute (repeat as necessary).
2- Squawk 7600 for 1 minute, then 7700 for 15 minutes (repeat as necessary).
3- Squawk 7700 for 1 minute, then 7600 for 15 minutes (repeat as necessary).
4- Squawk 7700 for 2 minutes, then 7600.

511. F13 The primary purpose of Runway End Identifier Lights installed at many airfields, is to provide

1- a warning of the final 3,000 feet of runway remaining as viewed from the takeoff or approach position.
2- visual descent guidance information during an approach in reduced visibility.
3- an outline of the touchdown zone on runways with a displaced threshold.
4- rapid identification of the approach end of the runway during reduced visibility.

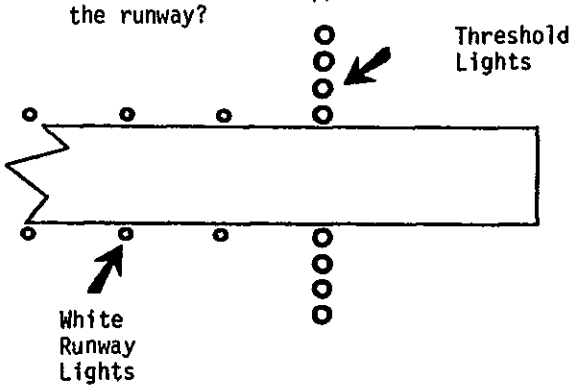
512. F12 Which runway marking indicates a displaced threshold on an instrument runway?

1- Cross mark in the non-landing portion of the runway.
2- Arrows leading to the threshold mark.
3- Centerline dashes starting at the threshold.
4- Red chevron marks in the non-landing portion of the runway.

513. F13 What does the operation of an airport rotating beacon during daylight hours signify?

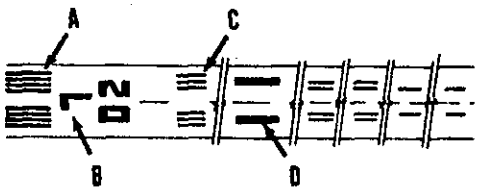
1- The ground visibility is less than 3 miles and/or the ceiling is less than 1,000 feet in the Control Zone.
2- An IFR clearance is required to operate within the Airport Traffic Area.
3- The prevailing visibility is less than 2 miles within the Airport Traffic Area.
4- The inflight visibility is less than 3 miles and the ceiling is less than 1,500 feet within the Control Zone.

514. F13 What night operations, if any, are authorized between the displaced threshold and the approach end of the runway?



1- Taxi operations only.
2- All operations are permitted, provided the pilot is aware of the overrun condition and weight bearing limitations.
3- Neither taxi, takeoff, nor landing operations are permitted.
4- Taxi and takeoff operations are permitted.

515. F12 Which marking designates the touchdown zone for this precision instrument runway?



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

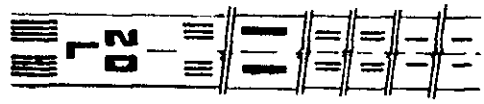
516. F12 What distance is the touchdown zone from the end of the runway?

1- 300 feet
2- 1,500 feet
3- 500 feet
4- 1,000 feet

517. G15 Under what condition are you required to have an instrument rating for flight in VFR weather conditions?

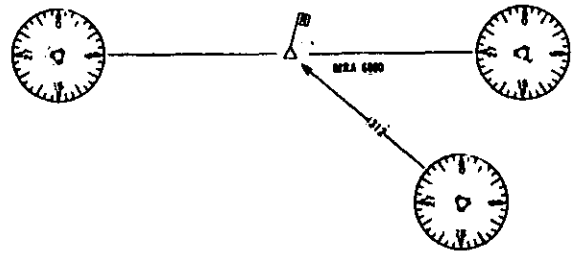
1- Flight through restricted areas.
2- Special VFR in TCAs.
3- Flight in Positive Control Area.
4- Flight into ADIZ.

518. F12 What is the distance from the end of the precision instrument runway to the fixed distance marker?



1- 500 feet
2- 1,000 feet
3- 750 feet
4- 1,500 feet

519. G11 The minimum reception altitude (MRA) depicted for a particular fix on a Victor Airway ensures adequate



1- navigation signals from both VORs (A & B) making up the portion of the airway on which the fix is located.
2- communications, reception, radar coverage, and navigation signals from VOR A.
3- radar coverage to determine the fix.
4- signals from an off-airway radio facility (C) used to determine the fix.

520. G11 You are planning a direct IFR flight from Airport A to Airport B on a magnetic course of 130° in a non-mountainous area. Part of the route between A and B is out of controlled airspace. What is the minimum altitude you can fly for the part out of controlled airspace?

1- The altitude assigned by ATC.
2- An altitude at least 1,000 feet above the highest obstacle shown on a Sectional Chart within a horizontal distance of 5 statute miles from the course to be flown and an odd-thousand foot level MSL.
3- An altitude which is the highest MEA found within 10 nautical miles on either side of the route.
4- An altitude 1,000 feet above the highest obstacle shown on the Low Altitude Enroute Chart within a horizontal distance of 10 nautical miles of the route and an odd-thousand foot level MSL.

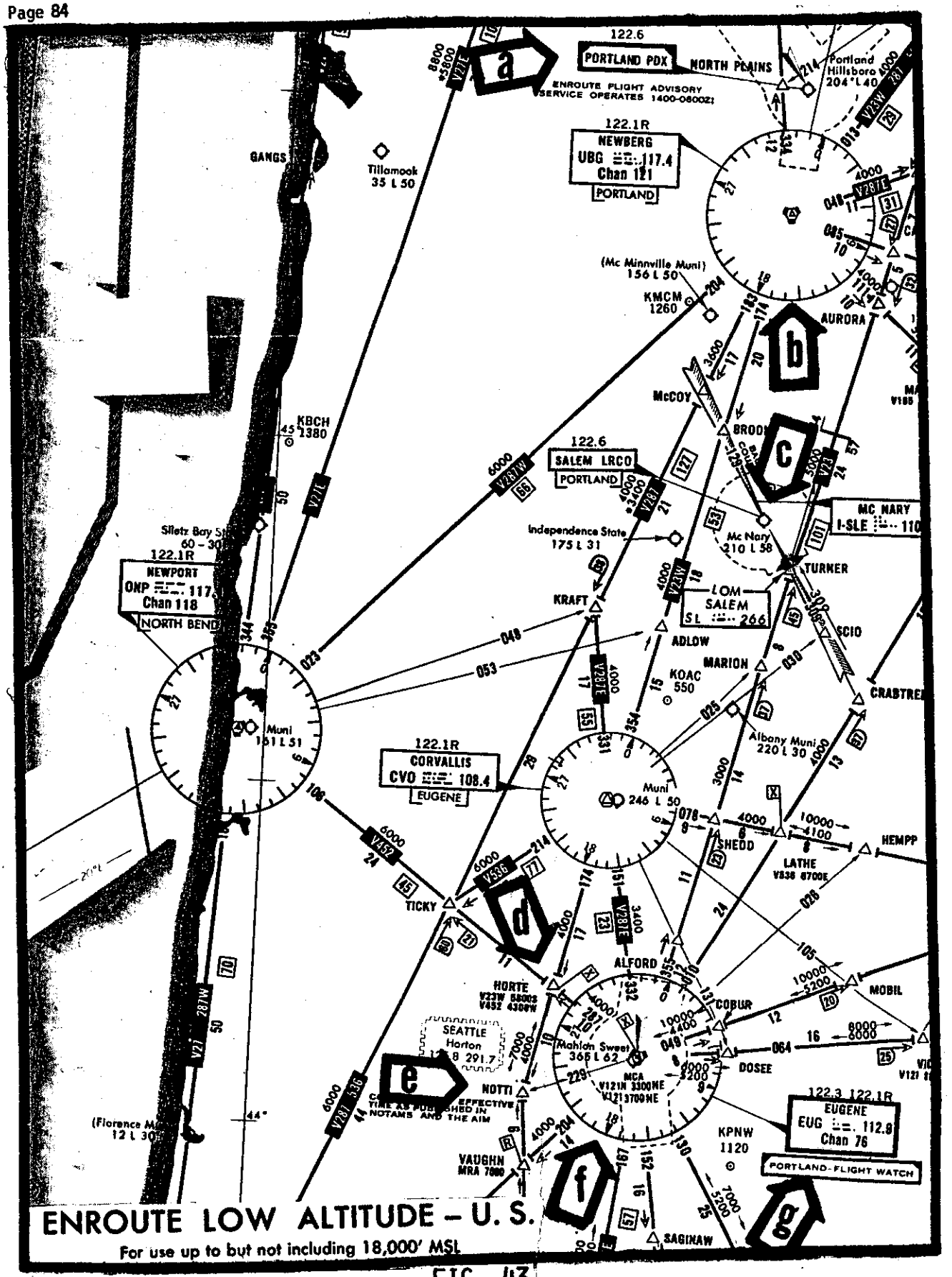

122.6
PORTLAND PDX
NORTH PLAINS
ENROUTE FLIGHT ADVISORY SERVICE OPERATES 1400-0800Z
122.1R
NEWBERG
UBG 117.4
Chan 121
PORTLAND
GANGS
Tillamook
35 L 50
(Mc Minnville Muni)
156 L 50
KMCM
1260
AURORA
McCOY
KBCH
1380
122.6
SALEM LRCO
PORTLAND
MC NARY
I-SLE 110
Siletz Bay
60 - 30
122.1R
NEWPORT
ONP 117
Chan 118
NORTH BEND
Independence State
175 L 31
Mc Nary
210 L 58
TURNER
KRAFT
LOM
SALEM
SL 266
ADLOW
SCIO
MARION
KOAC
550
CRABTREE
Albany Muni
220 L 30
122.1R
CORVALLIS
CVO 108.4
EUGENE
Muni
246 L 50
SHEDD
LATHE
HEMPP
TICKY
ALFORD
HORTE
MOBIL
COBUR
SEATTLE
Horton
DOSEE
NOTTI
Mahlon Sweet
365 L 62
MCA
V121N 3300NE
V121 3700NE
VAUGHN
MRA 7000
KPNW
1120
122.3 122.1R
EUGENE
EUG 112.9
Chan 76
PORTLAND-FLIGHT WATCH
SAGINAW
ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL

FIG. 43

521. F23 What facility is provided at McNary Airport (c) with communications for weather and flight plan service? (Fig. 43)

1- Flight Service Station
2- Long Range Control facility
3- Limited Remote Communications Outlet
4- Remote Flight Service Station

522. H32 If you crossed NOTTI Intersection (e) at 1338 and then crossed HORTE Intersection (d) at 1342, at what time should you expect to arrive at UBG VORTAC (b)? (Fig. 43)

1- 1414
2- 1410
3- 1406
4- 1402

523. J51 Which frequency should you use to contact Portland Flight Watch (g)? (Fig. 43)

1- 122.3
2- 121.9
3- 122.6
4- 122.0

524. J51 What VHF frequencies should you expect for Portland Flight Service Station (a)? (Fig. 43)

1- 122.6, 123.6, and 122.1R
2- 121.5, 122.0, 122.2, and 122.6
3- 122.6, 123.6, 122.1R, and 121.5
4- 122.6

525. J23 What is the lowest altitude permissible to cross HORTE Intersection (d) while en route on V452 to EUG VORTAC (f)? (Fig. 43)

1- 6,000 feet
2- 5,800 feet
3- 4,300 feet
4- 4,000 feet

526. G12 What cruising altitude is appropriate for "VFR Conditions On Top" on a westbound flight below 18,000 feet?

1- One thousand feet above the tops of the clouds.
2- Even thousand-foot levels.
3- Even thousand-foot levels plus 500 feet.
4- Odd thousand-foot levels plus 500 feet.

527. G11 Unless otherwise prescribed, what is the rule regarding minimum altitude for a helicopter instrument flight within 5 miles of an off-airway course?

1- 3,000 feet over designated mountainous terrain, and 2,000 feet over terrain elsewhere.
2- 2,000 feet over designated mountainous terrain, and 1,000 feet over terrain elsewhere.
3- 2,000 feet over all terrain.
4- 3,000 feet over all terrain.

528. G12 When must a pilot fly at a cardinal altitude plus 500 feet on an IFR flight plan?

1- When flying at an altitude of more than 3,000 feet above the surface and a "VFR Conditions On Top" clearance has been received.
2- Anytime VFR conditions exist and the pilot has requested a "VFR Conditions On Top" clearance.
3- Only when assigned that altitude by ATC.
4- Anytime ATC assigns a "VFR Conditions On Top" clearance.

529. G13 While climbing to your assigned altitude on the airway, you

1- should climb slightly on the right side of the airway even when in VFR conditions.
2- should climb far enough to the right side of the airway to avoid climbing or descending traffic coming from the opposite direction.
3- must climb as near as possible on the centerline of the airway under all conditions.
4- must climb on the centerline of the airway except when avoiding other aircraft or clearing in VFR conditions.

530. G13 When flying on a Victor Airway with an IFR clearance, you are required by regulations to

1- monitor the voice feature of the VOR you are using for navigation.
2- fly the airway centerline except to avoid other aircraft or when otherwise authorized by ATC.
3- designate all proposed altitude changes in your flight plan.
4- request an even thousand foot altitude for a course from 180° to 360°.

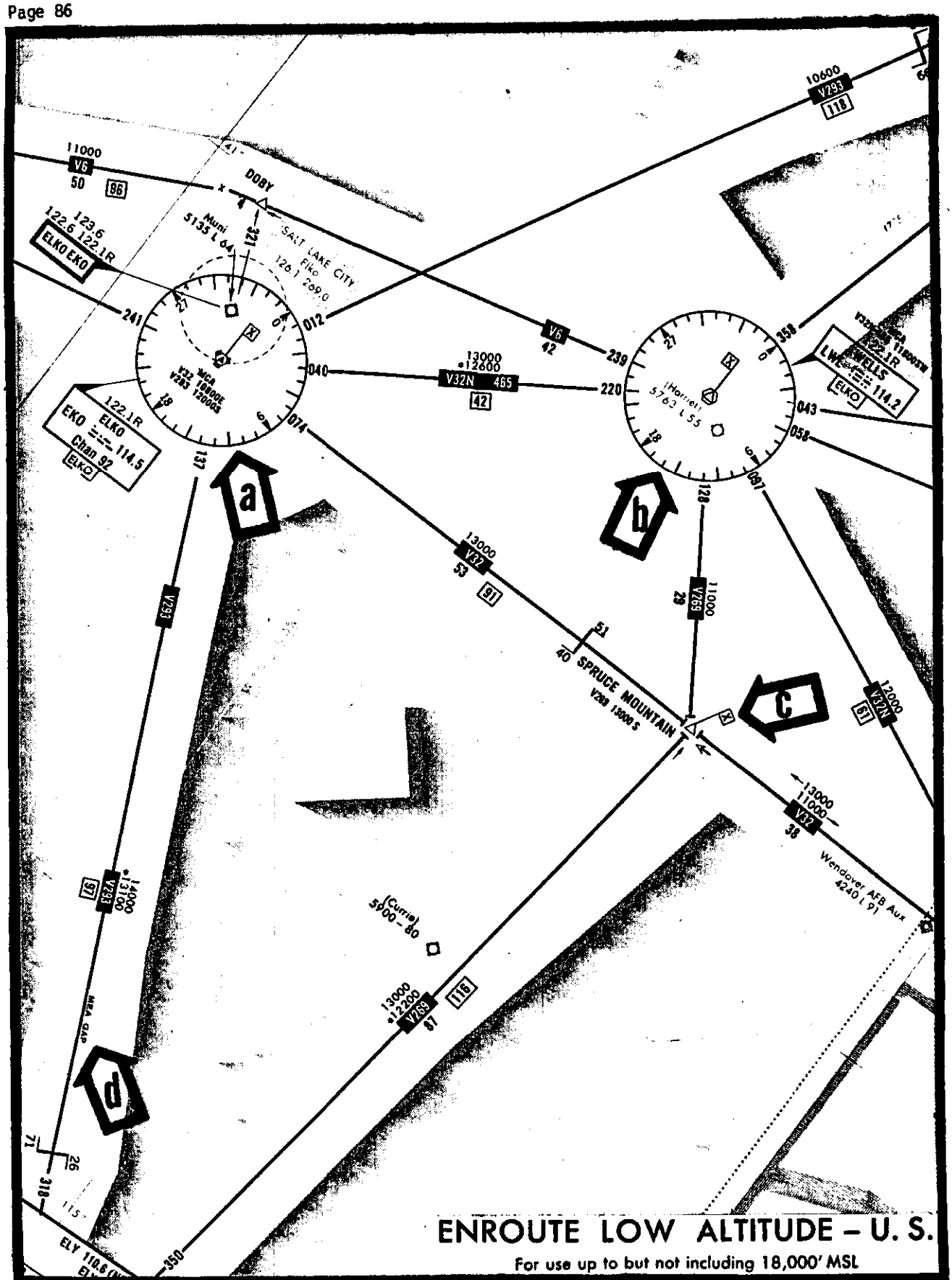

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
DOBY
SALT LAKE CITY
Muni
5135 L 64
Elko
126.1 269.0
123.6
122.6 122.1R
ELKO EKO
122.1R
ELKO
EKO
114.5
Chan 92
ELKO
WELLS
122.1R
114.2
ELKO
(Harriell)
5763 L 55
SPRUCE MOUNTAIN
V293 13000 S
(Currie)
5800 – 80
Wendover AFB Aux
4240 L 91
MEA GAP
ELY 110.6
V6
V293
V32
V32N
V269
V289
a
b
c
d

FIG. 44

531. J21 What are the lower and upper limits of V32 from Elko VORTAC (a) to SPRUCE MOUNTAIN Intersection (c)? (Fig. 44) From

1- 500 feet below the MEA to 18,000 feet inclusive.
2- 13,000 feet to 18,000 feet inclusive.
3- the surface up to but not including 18,000 feet.
4- 700 or 1,200 feet AGL up to but not including 18,000 feet MSL.

532. J23 Which route provides a crossing altitude at SPRUCE MOUNTAIN Intersection (c) that is less than 13,000 feet? (Fig. 44)

1- Eastbound on V32
2- Southeastbound on V269 turning east on V32
3- Northbound on V269
4- Northbound on V269 turning east on V32

533. J26 Where is the VOR changeover point westbound from Wells VOR (b) on V6? (Fig. 44)

1- 42 miles from Wells
2- 48 miles from Wells
3- 46 miles from Wells
4- 50 miles from Wells

534. J27 What type of airspace is designated below the airway structure at Harriet Airport (b)? (Fig. 44)

1- Airport Traffic Area only
2- Control Zone and Airport Traffic Area
3- Uncontrolled
4- Control Zone only

535. J41 What is the VHF discrete frequency for the ARTCC remote site at Elko (a)? (Fig. 44)

1- 126.1
2- 122.1
3- 114.5
4- 123.6

536. J23 What does the MEA GAP (d) indicate? (Fig. 44)

1- There is <u>not</u> an MEA established in this area.
2- The MEA does <u>not</u> afford obstacle clearance in this area.
3- The MEA is <u>not</u> established, but will be assigned when requested.
4- Navigation signal unreliable when at MEA in this area.

537. G22 For which airspeed variation should you notify ATC?

1- When the groundspeed changes more than 5 knots.
2- When the flight planned true airspeed is expected to vary by ± 10 knots.
3- When the true airspeed changes more than 5 knots.
4- Any time you change the true airspeed.

538. G22 What communications reports are required of a flight operating on an IFR clearance specifying "VFR conditions on top" in a nonradar environment?

1- All normal IFR reports except vacating altitudes.
2- All normal IFR reports except vacating altitudes and en route position reports.
3- Only the reporting of any unforecast weather.
4- The same reports that are required for any IFR flight.

539. G23 What cloud clearance must a pilot observe when operating "VFR conditions on top" above 10,000 feet?

1- Clear of clouds.
2- 1,000 feet below, 1,000 feet above, and 1 statute mile horizontally.
3- 500 feet below, 1,000 feet above, and 2,000 feet horizontally.
4- 1,000 feet below, 1,000 feet above, and 5 statute miles horizontally.

540. G23 What is the procedure for climbing to a newly assigned altitude while en route on an IFR flight?

1- Report vacating the altitude and climb to the new altitude on the centerline of the airway without intermediate level-offs.
2- Report vacating the altitude, climb at the maximum rate of climb, and report level at the new altitude.
3- Maintain the right side of the airway while climbing and report level at the new altitude.
4- Report vacating the altitude, climb on the right side of the airway, and rejoin the center of the airway when level at the new altitude.

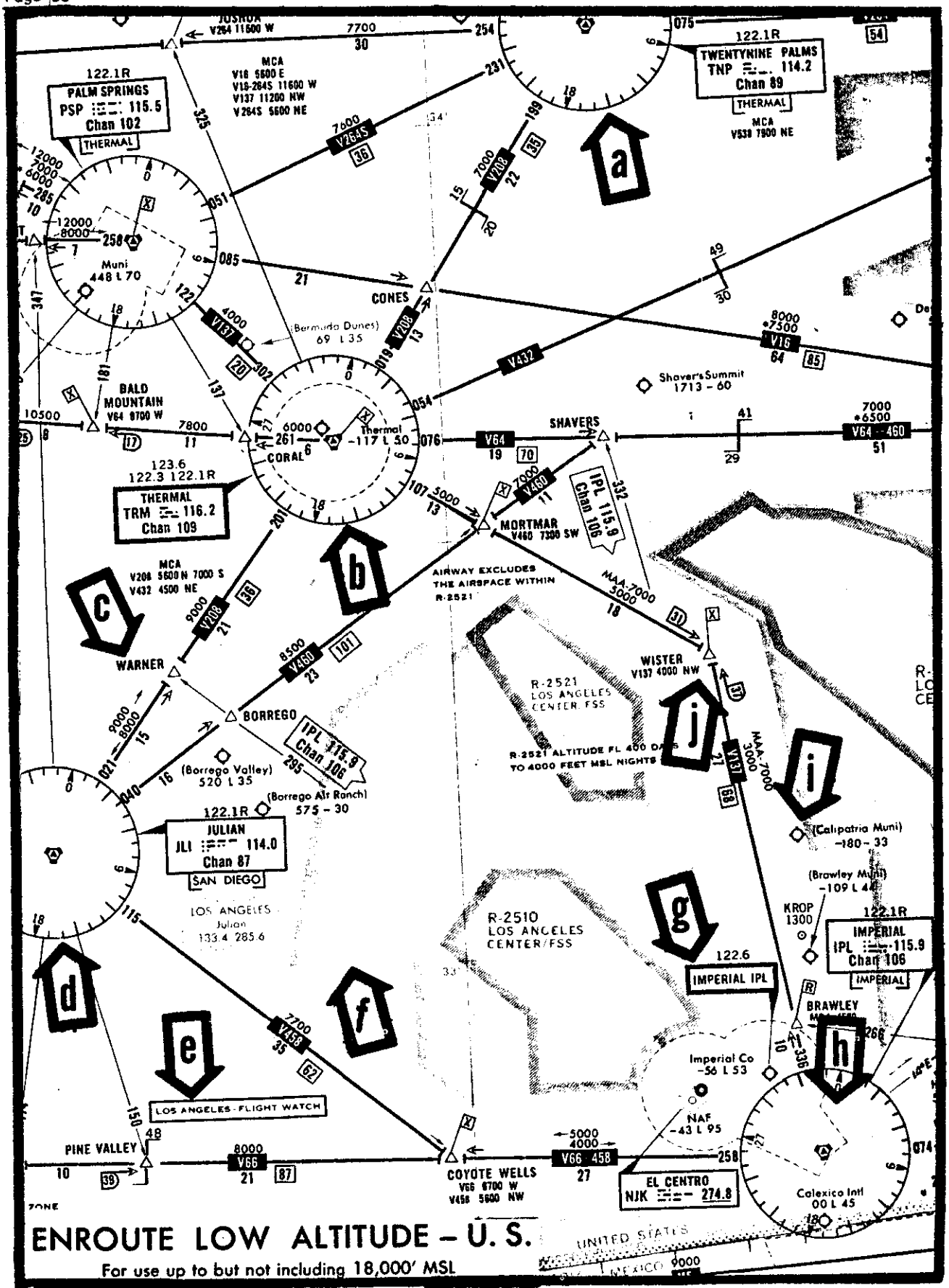

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
PALM SPRINGS
PSP 115.5
Chan 102
THERMAL
TWENTYNINE PALMS
TNP 114.2
Chan 89
THERMAL
MCA
V18 5600 E
V18-264S 11600 W
V137 11200 NW
V264S 5600 NE
MCA
V539 7900 NE
CONES
BALD MOUNTAIN
V64 8700 W
CORAL
Thermal
-117 L 50
SHAVERS
Shaver Summit
1713 – 60
THERMAL
TRM 116.2
Chan 109
MORTMAR
V460 7300 SW
IPL 115.9
Chan 106
AIRWAY EXCLUDES
THE AIRSPACE WITHIN
R-2521
MCA
V208 5600 N 7000 S
V432 4500 NE
WARNER
BORREGO
(Borrego Valley)
520 L 35
(Borrego Air Ranch)
575 – 30
WISTER
V137 4000 NW
R-2521
LOS ANGELES
CENTER FSS
R-2521 ALTITUDE FL 400 DA
TO 4000 FEET MSL NIGHTS
JULIAN
JLI 114.0
Chan 87
SAN DIEGO
LOS ANGELES
Julian
133.4 285.6
(Calipatria Muni)
-180 – 33
(Brawley Muni)
-109 L 44
KROP
1300
IMPERIAL
IPL 115.9
Chan 106
IMPERIAL
IMPERIAL IPL
122.6
R-2510
LOS ANGELES
CENTER/FSS
BRAWLEY
Imperial Co
-56 L 53
NAF
-43 L 95
Calexico Intl
00 L 45
LOS ANGELES-FLIGHT WATCH
PINE VALLEY
COYOTE WELLS
V66 8700 W
V458 5600 NW
EL CENTRO
NJK 274.8
UNITED STATES
MEXICO
a
b
c
d
e
f
g
h
i
j

FIG. 45

541. G54 If you experienced two-way radio communications failure about 20 miles from Imperial (h) while en route IFR to Thermal (b), what action should you take? You are now in VFR conditions but both Imperial and Thermal had reported IFR conditions at last radio contact. (Fig. 45)

1- Proceed to Thermal at assigned altitude or MEA, whichever is higher.
2- Land at Calipatria Municipal Airport and advise ATC of the situation.
3- Proceed to Thermal at 500 feet below MEA to avoid IFR traffic.
4- Return to Imperial and execute an instrument approach.

542. J23 What is the highest altitude for an IFR flight on V137 from Imperial VORTAC (h) to Thermal VORTAC (b)? (Fig. 45)

1- 6,000 feet
2- 17,000 feet
3- 7,000 feet
4- 18,000 feet

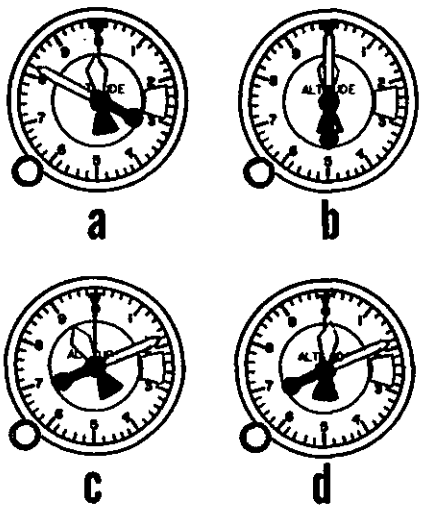
543. G24 You have filed a composite flight plan for a flight from Thermal (b) to Imperial (h) with the IFR portion from Thermal to WISTER Intersection (j). What action should you take if you are still in IFR conditions at WISTER? (Fig. 45)

1- Continue IFR on V137; inform ARTCC that you are still IFR and wish to continue your IFR clearance until you reach VFR conditions.
2- Hold west of WISTER on the TRM VORTAC 107 radial; advise ARTCC that you are in IFR conditions and continue holding until you receive further clearance.
3- Hold south of WISTER on the Imperial VORTAC 336 radial; advise ARTCC that you are in IFR conditions and request further clearance.
4- Continue on V137; advise ARTCC that you have passed WISTER and are descending to VFR conditions.

544. J27 What type airspace is depicted by the shaded area (F)? (Fig. 45)

1- Restricted
2- Special use
3- Military operations area
4- Uncontrolled

545. H41 Which instrument displays the proper altimeter indication upon landing at Calipatria Municipal Airport (i)? (Fig. 45)



1- a
2- b
3- c
4- d

546. F23 What frequencies, in addition to 122.6, should you expect for communications with Imperial FSS (g)? (Fig. 45)

1- 121.5, 122.0, and 122.2
2- 121.5, 122.0, 122.1R, and 122.2
3- 121.5, 122.0, 122.1R, 122.2, and 123.6
4- 121.5 and 122.2

547. H32 If you crossed Julian VORTAC (d) at 1435 and then crossed WARNER Intersection (c) at 1440 and 30 seconds, at what time should you expect to arrive at Twenty-nine Palms VORTAC (a)? (Fig. 45)

1- 1501
2- 1504
3- 1507
4- 1458

548. G11 What is the lowest altitude you are assured an adequate navigation signal to identify WISTER Intersection (j) when northbound on V137 if your DME is inoperative? (Fig. 45)

1- 3,000 feet
2- 5,000 feet
3- 4,000 feet
4- 7,000 feet

549. J51 What procedure should be used to contact the Los Angeles Flight Watch (e)? (Fig, 45, page 88)

1- Contact Los Angeles Flight Watch directly on 122.0.
2- Request a Flight Watch briefing through Los Angeles ARTCC on 133.4.
3- Contact the nearest FSS on the frequency indicated and request Flight Watch briefing.
4- Contact Imperial FSS on 122.6 for the Flight Watch briefing.

550. G23 What minimums must be considered in selecting an altitude when operating in "VFR Conditions on Top"?

1- MEA, or appropriate MOCA, at least 1,000 feet above the clouds and visibility appropriate to altitude selected.
2- At least 3,000 feet above the surface and 1,000 feet above the existing meteorological condition.
3- At least 500 feet above the lowest MEA, or appropriate MOCA, and at least 1,000 feet above the existing meteorological condition.
4- At least 1,000 feet above the lowest MEA, appropriate MOCA, or existing meteorological condition.

551. G31 While flying at 7,000 feet, the controller asks you to "verify at 8,000." Which procedure should you follow?

1- Immediately start a climb to 8,000 and advise ARTCC that you are climbing to 8,000.
2- Report that you were flying at 7,000, but are now climbing to 8,000.
3- Advise ARTCC that you are at 7,000.
4- Tell ARTCC how long you have been at 7,000, and that you did not receive the clearance to 8,000.

552. G31 During the en route phase of the flight, the pilot is advised "Radar Service Terminated." What action is appropriate?

1- Make a position report at the next intersection on the assigned route.
2- Set transponder to code 1200.
3- Resume normal position reporting.
4- Make a position report upon reaching the next radio facility.

553. G25 How should you establish contact with an En Route Flight Advisory Service station and what service would you normally expect?

1- Call "METRO" on 127.0 for routine weather, current reports on hazardous weather, and altimeter settings.
2- Call "FLIGHT WATCH" on 122.0 for information regarding routine weather and thunderstorm activity along your route.
3- Call "FLIGHT ASSISTANCE" on 122.5 for advisory service pertaining to severe weather.
4- Call "ARTCC" on assigned frequency and ask for Flight Watch services.

554. G31 What does the ATC term "Radar Contact" signify?

1- Your aircraft has been identified on the radar display and radar service may be provided until radar identification is lost or radar service is terminated.
2- You will be given radar advisories until advised the service has been terminated or that radar contact has been lost.
3- ATC is receiving your transponder and will furnish vectors and traffic advisories until you are advised that contact has been lost.
4- Your aircraft has been identified and you will receive separation from all aircraft while in contact with this radar facility.

555. G31 Which radio call and frequency should the pilot use to obtain En Route Flight Advisory Service in the Oakland area?

1- "OAKLAND Center En Route Advisory" on 122.0 MHz.
2- "OAKLAND Center En Route Advisory" on 121.5 MHz.
3- "OAKLAND Flight Watch" on 122.0 MHz.
4- "OAKLAND Flight Service En Route Advisory" on 123.6 MHz.

556. G41 What is the maximum pressure altitude you can fly for longer than 30 minutes without using supplemental oxygen in an unpressurized airplane?

1- 12,500 feet
2- 10,000 feet
3- 11,000 feet
4- 12,000 feet

557. G31 Which phraseology is recommended for a pilot contacting a designated facility when operating IFR in a radar environment with no position report required?

1- "Ft. Worth Center, Traveler 1234 Victor, Over."
2- "Air Route Traffic Control, Traveler 34 Victor, 10,000, estimating Dallas at 35, Over."
3- "Dallas Approach Control, Traveler 1234 Victor, 10,000 feet, squawking 1200, Over."
4- "Ft. Worth Center, Traveler 1234 Victor, Over."

558. G32 During a climb to assigned altitude, the controller advises a pilot, "Verify Assigned Altitude as 8,000 feet." If the pilot believes the assigned altitude was 6,000 feet, what action should be taken?

1- Inform the controller that you are climbing to 8,000.
2- Advise the controller of your present altitude and that you will continue climbing to 8,000.
3- Inform the controller that you are still climbing and will maintain 8,000.
4- Advise the controller that you have 6,000 as the assigned altitude.

559. G32 During the en route phase of the flight, the controller advises a pilot "Verify at 10,000." If the pilot is actually holding an altitude of 8,000 feet, what action should be taken?

1- Climb immediately to 10,000 feet.
2- Inform the controller of the actual altitude, but remain at 8,000 feet unless the controller authorizes a change.
3- Request a clearance change to 8,000 feet.
4- Inform the controller of the actual altitude, that you will initiate a climb, and will report on reaching 10,000 feet.

560. G55 Which equipment failure would require immediate notification to ATC when operating above 24,000 feet?

1- Transponder
2- DME
3- Emergency Locator Transmitter (ELT)
4- One of the VOR receivers

561. G32 What response is expected when ATC issues an IFR clearance to a pilot of an airborne aircraft?

1- The pilot should readback those parts of the clearance containing altitude assignments or vectors.
2- The pilot is required to readback the clearance as given.
3- A readback is required only when a clearance has been amended.
4- The pilot should readback all clearances as given by ATC.

562. G41 If you are assigned an altitude of 15,000 feet, what is the oxygen requirement in an unpressurized airplane?

1- You and your passengers must use oxygen for the entire time you are at this altitude.
2- You must use oxygen for the entire time you are above 14,000 feet, but the use of oxygen is not mandatory for your passengers unless you go above 15,000 feet.
3- You must start using oxygen at 12,500 feet and your passengers upon reaching 15,000 feet.
4- You must start using oxygen upon reaching 12,500 feet; your passengers must be supplied oxygen upon reaching 14,000 feet.

563. G42 What is the maximum IFR altitude you may fly in an unpressurized airplane without supplying passengers with supplemental oxygen?

1- 15,000 feet
2- 10,000 feet
3- 12,000 feet
4- 14,000 feet

564. G54 If, during an IFR flight in VFR conditions, you have two-way radio communications failure, which procedure should you follow?

1- Continue the flight at assigned altitude and route; start approach at your ETA; or, if late, start approach upon arrival.
2- Continue the flight under VFR and land as soon as practicable.
3- Land at the nearest airport that has VFR conditions.
4- Continue the flight along assigned route at the highest of the following altitudes: assigned altitude, MEA, or altitude ATC may have advised you to expect.

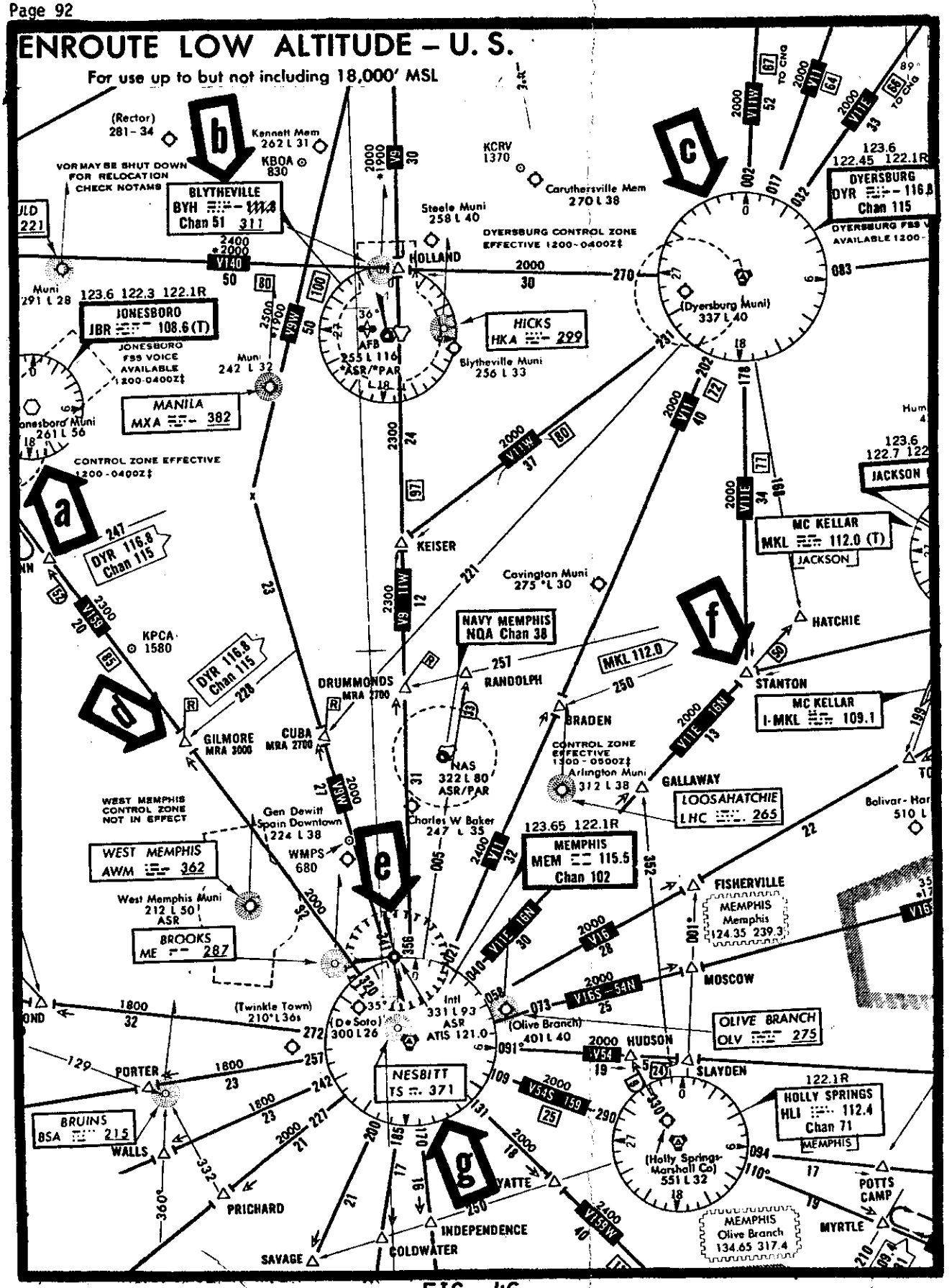
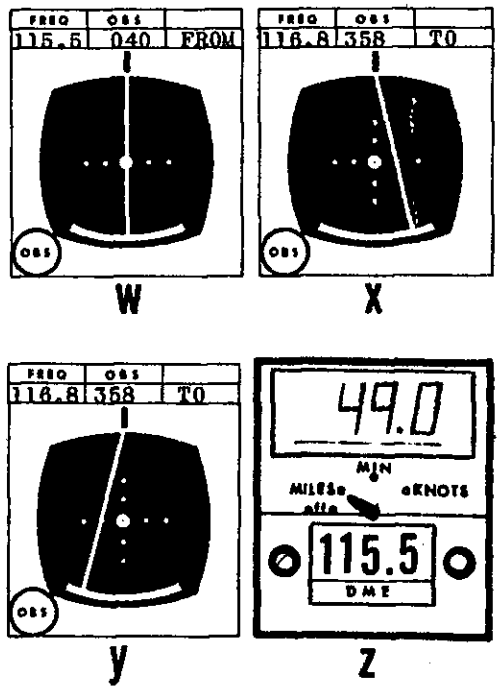

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
(Rector) 281-34
Kennett Mem 262 L 31
KBOA 830
VOR MAY BE SHUT DOWN FOR RELOCATION CHECK NOTAMS
BLYTHEVILLE BYH 111.4 Chan 51 311
KCRV 1370
Caruthersville Mem 270 L 38
Steele Muni 258 L 40
DYERSBURG CONTROL ZONE EFFECTIVE 1200-0400Z‡
DYERSBURG DYR 116.8 Chan 115
123.6 122.45 122.1R
DYERSBURG FSS AVAILABLE 1200-
HOLLAND
(Dyersburg Muni) 337 L 40
Muni 291 L 28
123.6 122.3 122.1R
JONESBORO JBR 108.6 (T)
JONESBORO FSS VOICE AVAILABLE 1200-0400Z‡
Muni 242 L 32
HICKS HKA 299
AFB 255 L 116 *ASR/*PAR L 18
Blytheville Muni 256 L 33
MANILA MXA 382
CONTROL ZONE EFFECTIVE 1200-0400Z‡
KEISER
Covington Muni 275 L 30
MC KELLAR MKL 112.0 (T)
JACKSON
123.6 122.7
JACKSON
HATCHIE
NAVY MEMPHIS NQA Chan 38
DYR 116.8 Chan 115
KPCA 1580
DRUMMONDS MRA 2700
RANDOLPH
MKL 112.0
STANTON
GILMORE MRA 3000
CUBA MRA 2700
BRADEN
MC KELLAR I-MKL 109.1
CONTROL ZONE EFFECTIVE 1300-0500Z‡
Arlington Muni 312 L 38
GALLAWAY
LOOSAHATCHIE LHC 265
NAS 322 L 80 ASR/PAR
WEST MEMPHIS CONTROL ZONE NOT IN EFFECT
Gen Dewitt Spain Downtown 224 L 38
Charles W Baker 247 L 35
123.65 122.1R
MEMPHIS MEM 115.5 Chan 102
WEST MEMPHIS AWM 362
WMPS 680
West Memphis Muni 212 L 50 ASR
FISHERVILLE
MEMPHIS Memphis 124.35 239.3
BROOKS ME 287
MOSCOW
(Twinkle Town) 210°L 36s
Intl 331 L 93 ASR ATIS 121.0
(D-Soto) 300 L 26
(Olive Branch) 401 L 40
OLIVE BRANCH OLV 275
HUDSON
PORTER
NESBITT TS 371
SLAYDEN
HOLLY SPRINGS HLI 112.4 Chan 71
MEMPHIS
BRUINS BSA 215
WALLS
(Holly Springs-Marshall Co) 551 L 32
PRICHARD
YATTE
POTTS CAMP
MYRTLE
INDEPENDENCE
SAVAGE
COLDWATER
MEMPHIS Olive Branch 134.65 317.4
a
b
c
d
e
f
g

FIG. 46

565. J11 What is the status of Blytheville VOR (b)? (Fig. 46)

1- May be shut down.
2- Undergoing maintenance.
3- Frequency change in progress.
4- Navigation signals unreliable.

566. H21 Which combination of indications is proper for beginning the turn at STANTON Intersection (f) while en route from MEM (g) to DYR (c) on V11E? (Fig. 46)



1- X and Z
2- W and Z
3- W and Y
4- W and X

567. J23 What restriction does the MRA at GILMORE Intersection (d) impose on IFR flights on V159? (Fig. 46)

1- Communications signals are unreliable below three thousand feet.
2- Three thousand feet is the minimum altitude to identify GILMORE by the R228 of DYR.
3- Three thousand feet is the minimum altitude to identify GILMORE by DME from MEM.
4- Navigation signals from both MEM and DYR are inadequate to identify GILMORE.

568. J11 Why is the service range of the JBR Terminal VOR (a) restricted to 25 NM at 12,000 feet? (Fig. 46)

1- Effect of terrain.
2- Inaccuracy of radials which exceed limits beyond 25 NM.
3- For frequency protection.
4- Low transmitting power.

569. J27 What is the restriction to the Control Zone at Memphis International Airport (e)? (Fig. 46)

1- Transponder required.
2- The Control Zone temporarily not effective.
3- Control only extends to overlying TCA.
4- No fixed-wing special VFR.

570. J23 What is the maximum IFR altitude that can be used on V11 from MEM (g) to DYR (c)? (Fig. 46)

1- 18,000 feet
2- 17,000 feet
3- 16,000 feet
4- 12,500 feet

571. G12 What altitude may a pilot select after receiving a "VFR Conditions On Top" clearance?

1- Any VFR altitude at least 1,000 feet above the meteorological condition.
2- Any VFR or IFR altitude above 3,000 feet AGL, the MEA, and at least 1,000 feet above the meteorological condition.
3- Any altitude at least 1,000 feet above the meteorological condition.
4- Any VFR altitude at least 1,000 feet above the meteorological condition and at or above the MEA.

572. G13 When is a pilot on an IFR flight plan responsible for avoiding other aircraft?

1- At all times when not in radar contact.
2- Only when advised by ATC.
3- Only when weather conditions permit visual contact.
4- During takeoff and landing and until established on the airway if not in radar control.

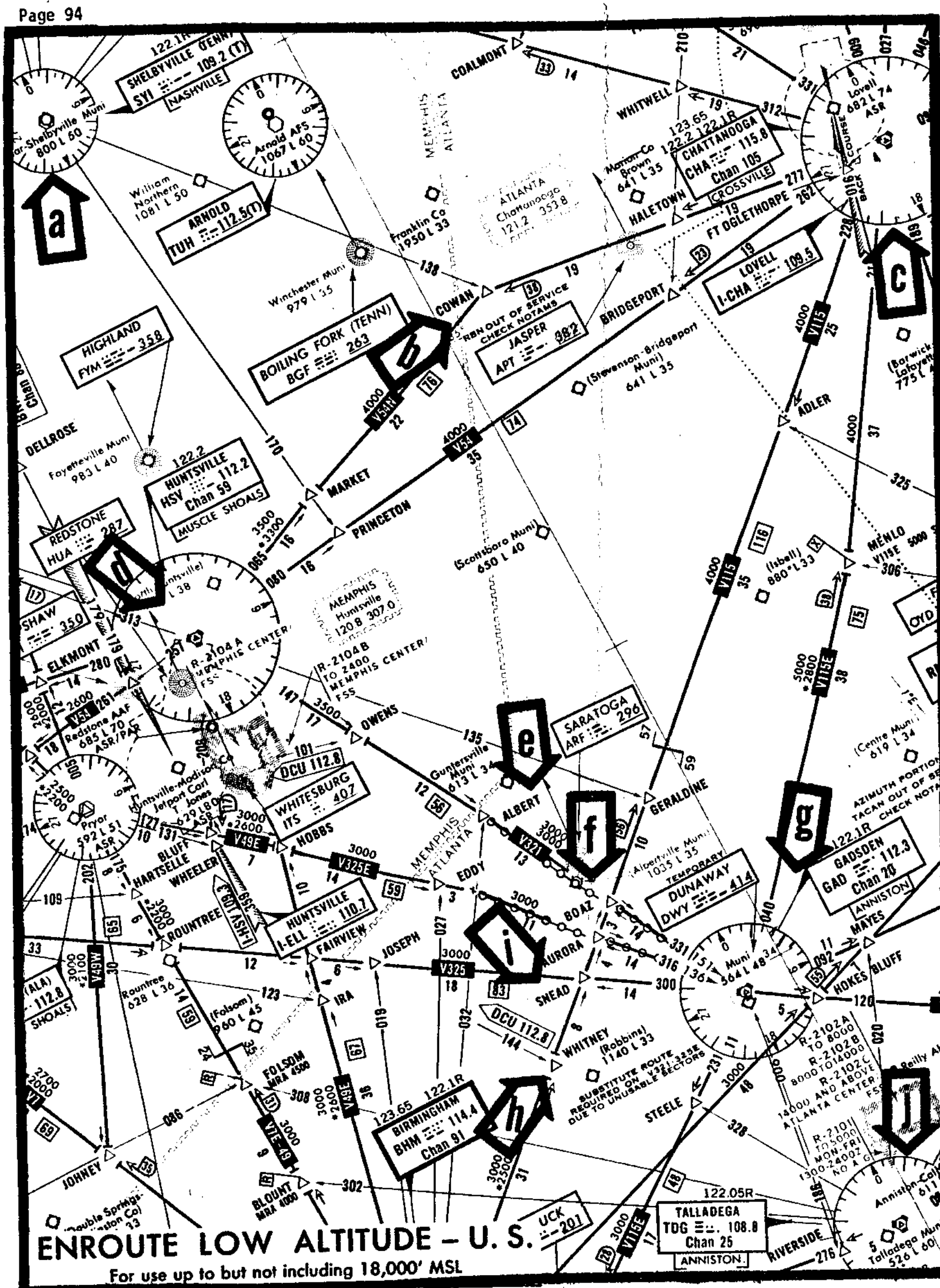
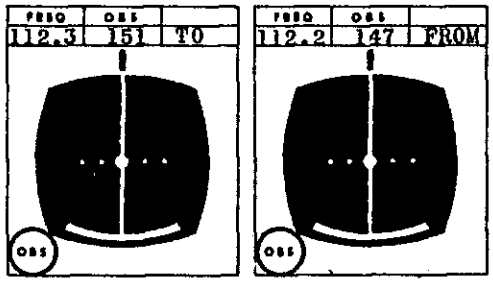
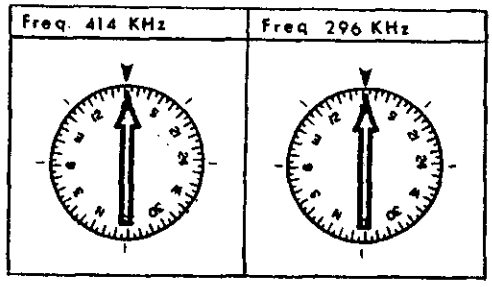

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
SHELBYVILLE (TENN) SYI 109.2 (T)
NASHVILLE
ARNOLD TUH 112.5(T)
CHATTANOOGA CHA 115.8 Chan 105
CROSSVILLE
LOVELL I-CHA 109.5
BOILING FORK (TENN) BGF 263
JASPER APT 382
RBN OUT OF SERVICE CHECK NOTAMS
HIGHLAND FYM 358
HUNTSVILLE HSV 112.2 Chan 59
MUSCLE SHOALS
REDSTONE HUA 287
SARATOGA ARF 296
WHITESBURG ITS 407
DCU 112.8
HUNTSVILLE I-ELL 110.7
DUNAWAY DWY 414
TEMPORARY
GADSDEN GAD 112.3 Chan 20
ANNISTON
BIRMINGHAM BHM 114.4 Chan 91
TALLADEGA TOG 108.8 Chan 25
ANNISTON
UCK 201
COALMONT
WHITWELL
HALETOWN
FT OGLETHORPE
COWAN
BRIDGEPORT
ADLER
MARKET
PRINCETON
MENLO
DELLROSE
ELKMONT
OWENS
GERALDINE
ALBERT
EDDY
HOBBS
BOAZ
AURORA
SNEAD
WHITNEY
JOSEPH
FAIRVIEW
IRA
ROUNTREE
HARTSELLE
WHEELER
BLUFF
FOLSOM
BLOUNT
JOHNEY
STEELE
RIVERSIDE
HOKES BLUFF
MAYES
MEMPHIS ATLANTA
ATLANTA Chattanooga 121.2 353.8
MEMPHIS Huntsville 120.8 307.0
R-2104A MEMPHIS CENTER/FSS
R-2104B TO 2400 MEMPHIS CENTER/FSS
R-2102A TO 8000 R-2102B 8000 TO 14000 R-2102C 14000 AND ABOVE ATLANTA CENTER/FSS
R-2101 TO 5000 MON-FRI 1300-2400Z NO A G
SUBSTITUTE ROUTE REQUIRED ON V321-325E DUE TO UNUSABLE SECTORS
AZIMUTH PORTION TACAN OUT OF SERVICE CHECK NOTAMS
V54N
V54
V115
V115E
V49E
V325E
V325
V321
V49W
V7
a
b
c
d
e
f
g
h
i
j

FIG. 47

573. H23 Which indication will provide proper guidance from ALBERT Intersection (e) to GAD VORTAC (g)? (Fig. 47)





1- W
2- X
3- Y
4- Z

574. J23 What is the minimum IFR altitude for crossing SNEAD Intersection (i) when northbound on V115? (Fig. 47)

1- 4,000 feet
2- 1,000 feet
3- 2,500 feet
4- 3,000 feet

575. G22 Which stations are compulsory reporting points for a portion of an IFR flight routed via TDG (j) DIRECT GAD (g) V321 HSV (d) DIRECT SYI (a)? (Fig. 47)

1- HSV only
2- GAD and HSV only
3- TDG, GAD, HSV, and SYI
4- TDG, GAD, and HSV only

576. H32 If you crossed over WHITNEY Intersection (h) at 1547 and 30 seconds, and then crossed over BOAZ Intersection (f) at 1555, what time should you arrive over Chattanooga VORTAC (c)? (Fig. 47)

1- 1630
2- 1625
3- 1635
4- 1640

577. G21 Which facility assumes control of an IFR flight from CHA VORTAC (c) on V54N after passing COWAN Intersection (b)? (Fig. 47)

1- Muscle Shoals FSS through the Huntsville remote site.
2- Memphis Center through the Huntsville remote site.
3- Atlanta Center through Huntsville VORTAC.
4- Memphis Center through direct communications.

578. G12 What is the required flight visibility and distance from clouds if you are operating in controlled airspace at 9,500 feet with a "VFR Conditions On Top" clearance?

	VIS	Distance From Clouds		
		Above	Below	Horizontal
1-	5 statute miles	1,000 feet	1,000 feet	1 mile
2-	3 statute miles	1,000 feet	500 feet	2,000 feet
3-	3 statute miles	500 feet	1,000 feet	2,000 feet
4-	5 statute miles	1,000 feet	500 feet	1 mile

579. G21 Which report should the pilot make without request when operating under IFR in controlled airspace <u>when in radar contact</u>?

1- A corrected estimate at any time if it becomes apparent that a previous estimate is in error of more than 3 minutes.
2- At the compulsory reporting points shown on the en route chart along the route of flight.
3- Time and altitude reaching a holding fix.
4- When an approach has been missed.

580. G56 When may ATC request a detailed report of an emergency even though a rule has <u>not</u> been violated?

1- Any time an emergency occurs.
2- When the emergency occurs in controlled airspace.
3- Only when an accident results from the emergency.
4- When priority has been given.

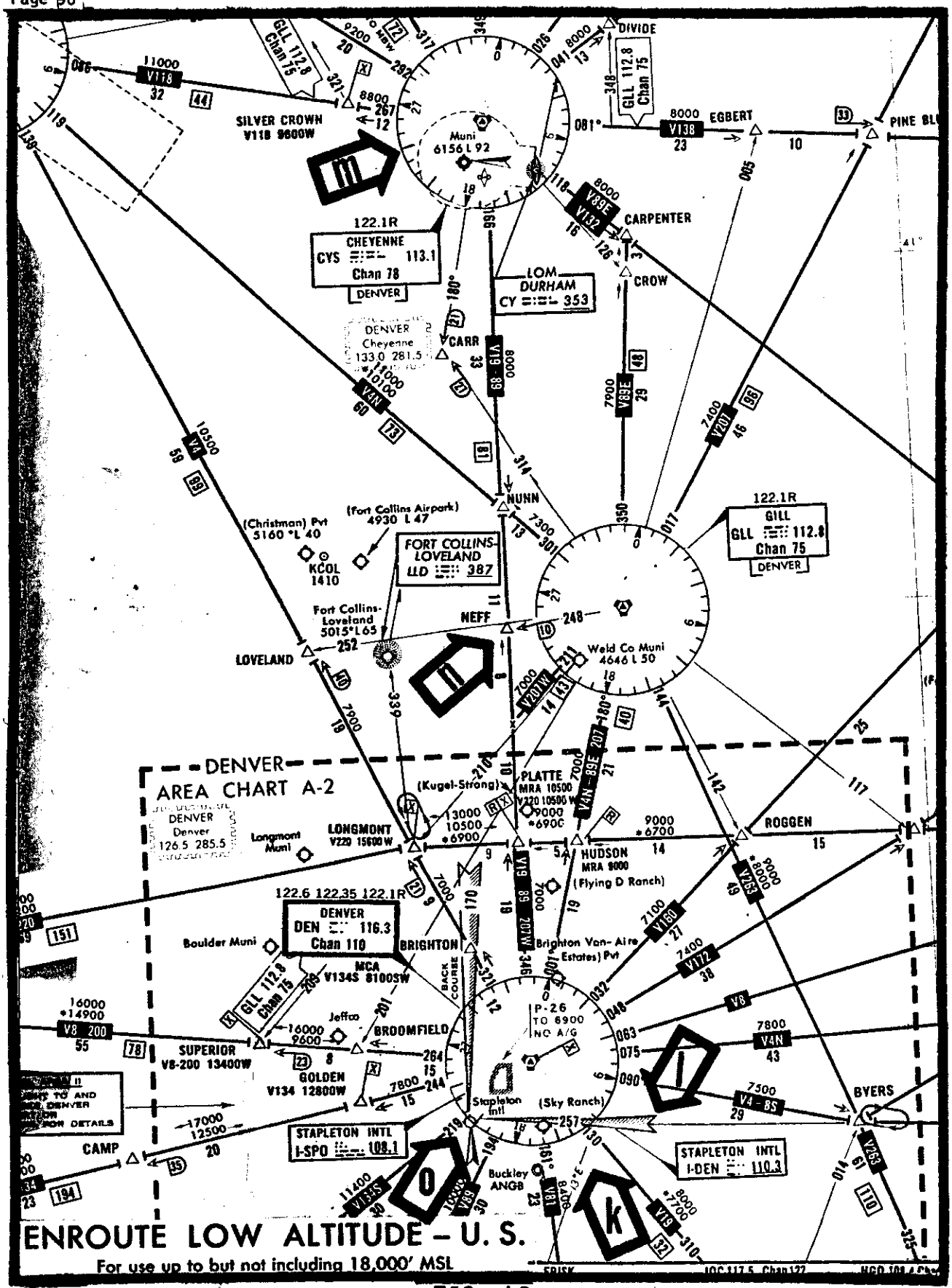
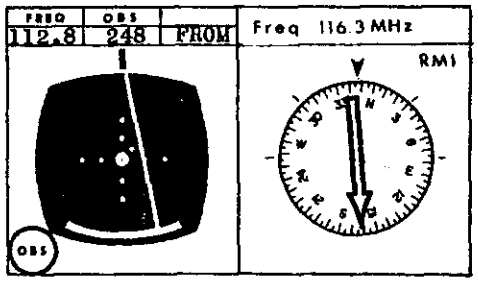

DENVER
AREA CHART A-2
ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
SILVER CROWN
V118 9600W
DIVIDE
EGBERT
PINE BL
CARPENTER
CROW
CHEYENNE
CYS 113.1
Chan 78
DENVER
DURHAM
CY 353
LOM
CARR
NUNN
FORT COLLINS-LOVELAND
LLD 387
(Christman) Pvt
5160 *L 40
KCOL
1410
(Fort Collins Airpark)
4930 L 47
Fort Collins-Loveland
5015*L65
LOVELAND
NEFF
Weld Co Muni
4646 L 50
GILL
GLL 112.8
Chan 75
DENVER
PLATTE
MRA 10500
(Kugel-Strong)
LONGMONT
V220 15600W
Longmont Muni
HUDSON
MRA 9000
(Flying D Ranch)
ROGGEN
DENVER
DEN 116.3
Chan 110
BRIGHTON
Boulder Muni
Brighton Van-Aire Estates) Pvt
MCA
V134S 8100SW
BACK COURSE
P-26
TO 6900
NO A/G
Jeffco
BROOMFIELD
SUPERIOR
V8-200 13400W
GOLDEN
V134 12800W
Stapleton Intl
(Sky Ranch)
BYERS
CAMP
STAPLETON INTL
I-SPO 108.1
STAPLETON INTL
I-DEN 110.3
Buckley ANGB
GLL 112.8 Chan 75
DENVER
Cheyenne
133.0 281.5
Denver
126.5 285.5
122.1R
122.6 122.35 122.1R

FIG. 48

581. H11 What is your position relative to V19 and NEFF Intersection (n) while proceeding from Denver VORTAC (k) to Cheyenne VORTAC (m) along V19? (Fig. 48)



1- Right of course, approaching NEFF Intersection.
2- Left of course, past NEFF Intersection.
3- Right of course, past NEFF Intersection.
4- Left of course, approaching NEFF Intersection.

582. B23 What is the estimated time en route from Denver VORTAC (k) to Cheyenne VORTAC (m) via V89E with these conditions? (Fig. 48)

Cruising altitude- - - 10,000 ft.
TAS - - - - - - 145 knots
Variation - - - 13°E.
Winds and Temperatures aloft - - - -

9,000 ft.	12,000 ft.
2926-06	3232-09

1- 41 minutes
2- 38 minutes
3- 43 minutes
4- 48 minutes

583. J23 What is the lowest altitude an IFR flight may cross the Denver VORTAC (k) inbound on V160 and outbound on V134S? (Fig. 48)

1- 11,400 feet MSL
2- 6,900 feet MSL
3- 7,100 feet MSL
4- 8,100 feet MSL

584. J23 What is the lowest altitude an IFR flight may cross the Denver VORTAC (k) southbound along V19? (Fig. 48)

1- 7,700 feet MSL
2- 8,000 feet MSL
3- 8,100 feet MSL
4- 7,000 feet MSL

585. J25 What is specifically indicated by the symbol at Arrow (l) for Stapleton International Airport? (Fig. 48)

1- In addition to providing ILS course guidance, the localizer has an ATC function.
2- The airport is served by a Category II ILS approach procedure.
3- A published Simplified Direction Finding (SDF) procedure is available.
4- A back course localizer approach is available.

586. J23 What is the lowest altitude an IFR flight may cross the Denver VORTAC (k) inbound from the southeast on V19 and outbound on V134S? (Fig. 48)

1- 8,000 feet MSL
2- 8,100 feet MSL
3- 11,400 feet MSL
4- 7,700 feet MSL

587. A32 In addition to two-way communications capability, what minimum equipment is specifically required for an airplane to operate IFR in the Group II TCA over Stapleton International Airport (o)? (Fig. 48)

1- VOR or TACAN.
2- VOR or TACAN, transponder, and DME.
3- VOR or TACAN, and transponder.
4- VOR or TACAN, and DME.

588. G56 As pilot in command, you exercise emergency authority and are given priority handling by ATC. If requested, within which time period shall you submit a detailed report to the chief of the ATC facility?

1- 7 days
2- 48 hours
3- 10 days
4- 24 hours

589. G56 While on an IFR flight, a pilot has an emergency which causes a deviation from an ATC clearance. What action must be taken?

1- Notify ATC of the deviation as soon as possible.
2- Squawk 7700 and fly the right side of the airway.
3- Submit a detailed report to the chief of the ATC facility within 48 hours.
4- Cancel the IFR flight plan.

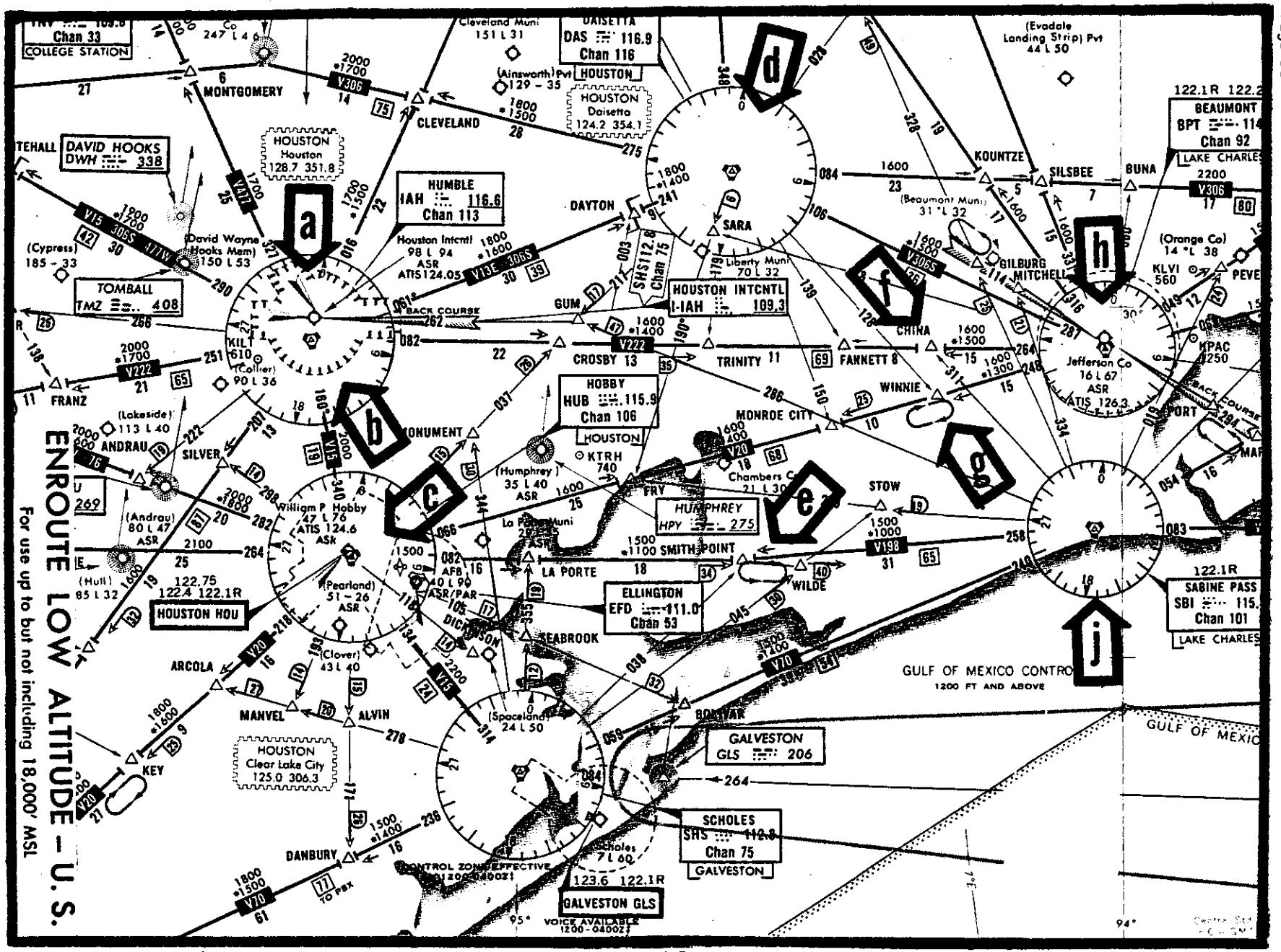

ENROUTE LOW ALTITUDE – U.S.
For use up to but not including 18,000' MSL
HOUSTON
Houston
128.7 351.8
HUMBLE
IAH 116.6
Chan 113
HOUSTON INTCNTL
I-IAH 109.3
HOBBY
HUB 115.9
Chan 106
HOUSTON
KTRH
740
DAVID HOOKS
DWH 338
TOMBALL
TMZ 408
DAISETTA
DAS 116.9
Chan 116
HOUSTON
Daisetta
124.2 354.1
HOUSTON
Clear Lake City
125.0 306.3
HOUSTON HOU
122.75
122.4 122.1R
ELLINGTON
EFD 111.0
Chan 53
HUMPHREY
HPY 275
GALVESTON
GLS 206
SCHOLES
SHS 112.8
Chan 75
GALVESTON
GALVESTON GLS
123.6 122.1R
VOICE AVAILABLE
1200-0400Z
GULF OF MEXICO CONTRO
1200 FT AND ABOVE
GULF OF MEXIC
BEAUMONT
BPT 114
Chan 92
LAKE CHARLES
SABINE PASS
SBI 115.
Chan 101
LAKE CHARLES
COLLEGE STATION
Chan 33
MONTGOMERY
CLEVELAND
DAYTON
SARA
TEHALL
FRANZ
TONUMENT
SILVER
ANDRAU
(Andrau)
80 L 47
ASR
William P Hobby
47 L 76
ATIS 124.6
ASR
(Pearland)
51 – 26
ASR
(Hull)
85 L 32
ARCOLA
MANVEL
ALVIN
KEY
DANBURY
(Clover)
43 L 40
(Spaceland)
24 L 50
SEABROOK
DICKINSON
LA PORTE
FRY
CROSBY 13
TRINITY 11
GUM
CHINA
FANNETT 8
MONROE CITY
WINNIE
STOW
WILDE
BONVAR
KOUNTZE
SILSBEE
BUNA
GILBURG
MITCHELL
(Beaumont Muni)
31 L 32
Liberty Muni
70 L 32
Jefferson Co
16 L 67
ASR
ATIS 126.3
(Orange Co)
14 L 38
KLVI
560
KPAC
1250
(Evadale
Landing Strip) Pvt
44 L 50
Cleveland Muni
151 L 31
(Ainsworth) Pvt
129 – 35
(Cypress)
185 – 33
David Wayne
Hooks Mem)
150 L 53
(Collier)
90 L 36
(Lakeside)
113 L 40
(Humphrey)
35 L 40
ASR
La Porte Muni
29 L 55
ASR
Chambers C
21 L 30
AFB
40 L 90
ASR/PAR
Scholes
7 L 60
CONTROL ZONE EFFECTIVE
1200-0400Z
TO PSX
BACK COURSE
a
b
c
d
e
f
g
h
j

FIG. 49

590. K21 What is the recommended procedure for entering the holding pattern depicted at SMITH POINT Intersection (e) when westbound on V198 from SBI VORTAC (j)? (Fig. 49)

1- Parallel entry from WILDE Intersection.
2- Teardrop entry from WILDE Intersection.
3- Intercept the inbound course 40 DME miles from SBI VORTAC.
4- Direct entry from SMITH POINT Intersection.

591. A32 What equipment is specifically required for an IFR flight to operate within the TCA over Houston Intercontinental Airport (a)? (Fig. 49)

1- VOR or TACAN and two-way communications only.
2- VOR, transponder, and two-way communications only.
3- VOR, DME, and two-way communications only.
4- VOR, DME, transponder, and two-way communications.

592. H32 At what time should you arrive at HUB VORTAC (c) if you cross over BPT VORTAC (h) at 0946, and then cross over WINNEY Intersection (g) at 0951 and 30 seconds? (Fig. 49)

1- 1009
2- 1013
3- 1011
4- 1015

593. H32 At what time should you arrive at IAH VORTAC (b) if you cross over BPT VORTAC (h) at 1436, and then cross over CHINA Intersection (f) at 1441? (Fig. 49)

1- 1459
2- 1456
3- 1502
4- 1505

594. G56 Under what condition may ATC request a detailed report of an emergency?

1- Any time ATC suspects a rule violation.
2- Whenever the emergency has required priority.
3- Any time the emergency occurs in controlled airspace.
4- When an accident occurs as a result of the emergency.

595. M61 Why is the ILS back-course symbol at Houston Intercontinental (a) displayed much larger than the two ILS front-course symbols? (Fig. 49)

1- All ILS back-course symbols are this size.
2- This back-course serves an ATC function.
3- This is the only approach approved for straight-in approaches.
4- This back-course is the primary approach facility at Houston.

596. J23 What is the lowest altitude an IFR flight can cross DAS VORTAC (d) eastbound on V306S? (Fig. 49)

1- 1,800 feet
2- 1,600 feet
3- 1,500 feet
4- 1,400 feet

597. G14 What is the procedure for setting the altimeter when assigned an IFR altitude of 18,000 or higher on a direct flight off airways?

1- Use the current reported altimeter setting for climbout and descent, and 29.92 when at 18,000 feet or higher.
2- The altimeter must be set to the current reported setting of a station within 100 nautical miles of the aircraft.
3- The altimeter must be set to the current reported setting of a station within 200 nautical miles of the aircraft.
4- Set the altimeter at the ground elevation prior to takeoff and reset only to the reported setting upon descent at the destination.

598. G21 What reports should the pilot make without request when operating under IFR in controlled airspace <u>when in radar contact</u>?

1- Time and altitude reaching a holding fix and leaving a holding fix.
2- Starting procedure turn inbound and any information relating to safety of flight.
3- A corrected estimate when an ETA is in error by more than 3 minutes and leaving final approach fix inbound.
4- When vacating previously assigned altitude and any unforecast weather.

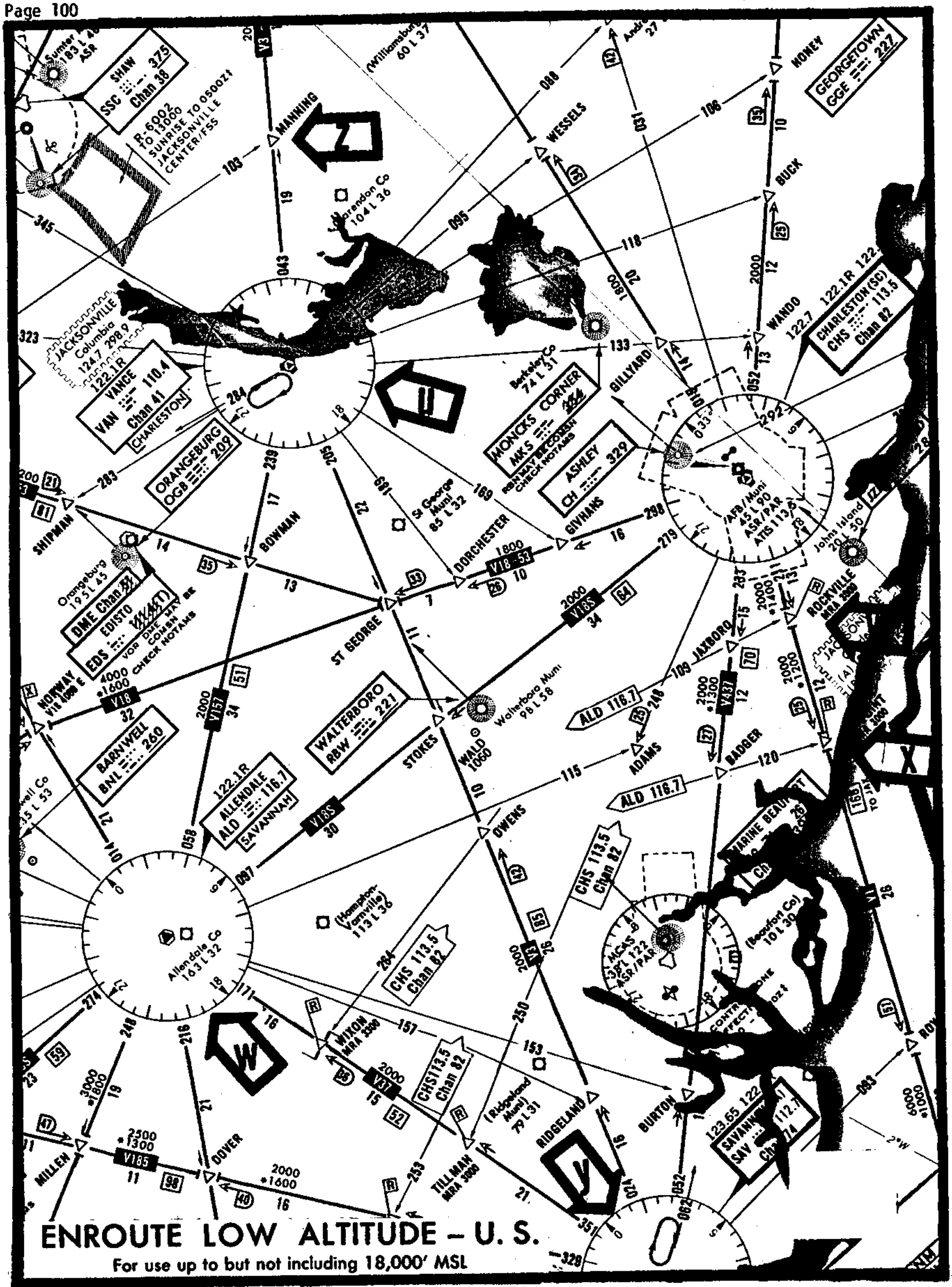

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
SHAW
SSC
Chan 38
R-6002
TO 13000
SUNRISE TO 0500Z‡
JACKSONVILLE
CENTER/FSS
MANNING
WESSELS
HONEY
GEORGETOWN
GGE 227
BUCK
WANDO
CHARLESTON (SC)
CHS 113.5
Chan 82
JACKSONVILLE
Columbia
124.7 298.9
122.1R
VANCE 110.4
VAN
Chan 41
CHARLESTON
ORANGEBURG
OGB 209
MONCKS CORNER
MKS
ASHLEY
CH 329
GILLYARD
GIVHANS
DORCHESTER
V18-53
SHIPMAN
BOWMAN
ST GEORGE
Orangeburg
195 L 45
DME Chan
EDISTO
EDS
NORWAY
V18
BARNWELL
BNL 260
WALTERBORO
RBW 221
Walterboro Muni
98 L 58
STOKES
WALD
1060
JAXBORO
ROCKVILLE
ALD 116.7
ADAMS
BADGER
V437
V185
V157
ALLENDALE
ALD 116.7
SAVANNAH
OWENS
CHS 113.5
Chan 82
Allendale Co
163 L 32
Hampton-Varnville
113 L 36
Beaufort Co
10 L 30
MCAS
ASR/PAR
MARINE BEAUFORT
WIXON
MRA 3300
V37
CHS 113.5
Chan 82
Ridgeland Muni
79 L 31
RIDGELAND
TILLMAN
MRA 3300
BURTON
MILLEN
DOVER
SAVANNAH
SAV 112.7

FIG. 50

599. J23 What is the significance of the MRA at BAY POINT Intersection (x)? (Fig. 50)

1- 3,000 feet is the minimum altitude to identify BAY POINT by use of the R-120 of ALD.
2- Communications signals are not reliable below 3,000 feet.
3- 3,000 feet is the minimum altitude to identify BAY POINT by DME from CHS.
4- Navigation signals from both CHS and ALD are not adequate to identify BAY POINT below 3,000 feet.

600. H32 While flying northeast along V3, you pass the Savannah VORTAC (y) at 1453Z, and the VOR changeover point between Savannah and the Vance VORTAC at 1509Z. Based on your calculated groundspeed, at what time should you pass the MANNING Intersection (z)? (Fig. 50)

1- 1519Z
2- 1532Z
3- 1525Z
4- 1536Z

601. K21 While approaching the Vance VORTAC (u) on V157 from the Allendale VOR (w), you are advised by ATC to hold in the depicted holding pattern while awaiting further clearance. If you are holding 25° to the left for drift correction, what is the recommended entry procedure? (Fig. 50)

1- Teardrop only
2- Direct only
3- Parallel or direct
4- Parallel only

602. K21 While inbound to the Vance VORTAC (u) on a heading of 025°, you are advised by ATC to hold in the depicted holding pattern while awaiting further clearance. What is the recommended entry procedure? (Fig. 50)

1- Parallel
2- Direct
3- Teardrop or Direct
4- Teardrop

603. J23 What is the minimum altitude to identify the ROCKVILLE Intersection (v) while proceeding northeast on V1? The DME is inoperative. (Fig. 50)

1- 1,200 feet MSL
2- 1,400 feet MSL
3- 3,000 feet MSL
4- 2,000 feet MSL

604. G11 What is the significance of the MRA at BAY POINT Intersection (x)? (Fig. 50)

1- Navigation signals from both CHS and ALD are not adequate to identify BAY POINT below 3,000 feet.
2- 3,000 feet is the minimum altitude which ensures adequate signal reception to identify BAY POINT without DME.
3- DME signal reception is unreliable below 3,000 feet.
4- 3,000 feet is the minimum altitude to identify BAY POINT by DME from CHS.

605. G54 You are flying in IFR weather conditions and have two-way radio communications failure. What altitude and route should be used?

1- Fly direct to an area that has been forecast to have VFR conditions; fly at an altitude that is at least 1,000 feet above the highest obstacles along the route.
2- Descend to 1,000 feet above the terrain and, if clear of clouds, proceed to the nearest appropriate airport; if not clear of clouds climb to an altitude of 1,000 feet above any obstacles on your route and fly to an area that has a ceiling of at least 1,000 feet.
3- Continue on your assigned route; fly a VFR altitude that is above the MEA for each leg.
4- Continue on the route specified in your clearance; fly at an altitude that is the highest of: last assigned altitude; altitude ATC has informed you to expect; or the MEA.

606. G54 You enter holding at 1800Z and receive an EAC time of 1814Z. At 1802Z, you experience complete two-way communications failure. (The holding fix is not the same as the approach fix.) Which procedure should you follow to execute the approach to a landing?

1- Depart the holding fix at the EAC time, and complete the approach.
2- Depart the holding fix on the flight planned ETA (as amended with ATC); proceed to the approach fix for the procedure in use.
3- Proceed to the approach fix, hold until EAC, and complete the approach.
4- Depart the holding fix to arrive at the approach fix as close as possible to the EAC time and complete the approach.

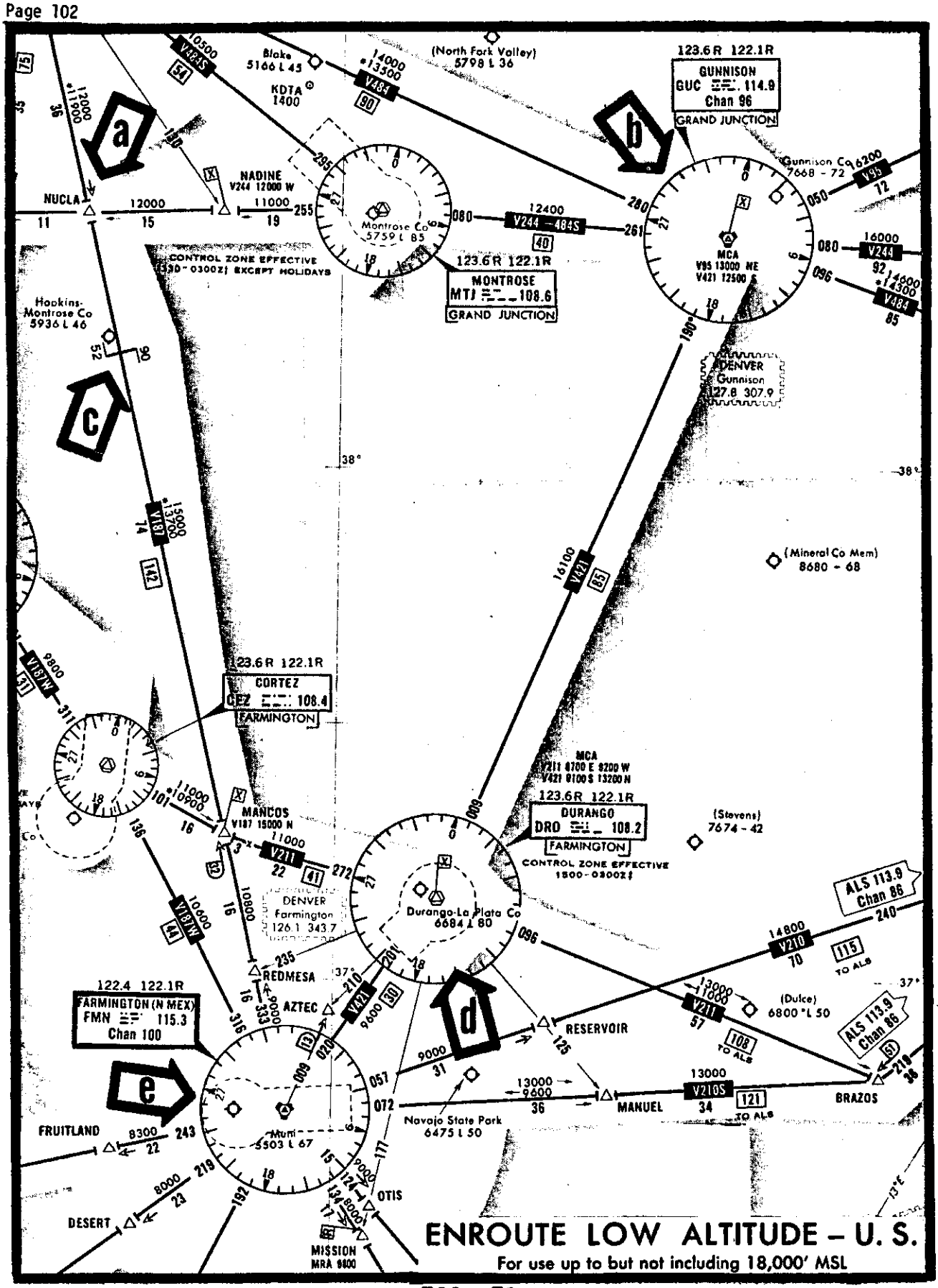

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
a
b
c
d
e
NUCLA
HADINE
V244 12000 W
MONTROSE
MTJ 108.6
GRAND JUNCTION
123.6R 122.1R
GUNNISON
GUC 114.9
Chan 96
GRAND JUNCTION
MCA
V95 13000 NE
V421 12500 S
CONTROL ZONE EFFECTIVE
0330-0300Z) EXCEPT HOLIDAYS
DENVER
Gunnison
127.8 307.9
CORTEZ
CEZ 108.4
FARMINGTON
MANCOS
V187 15000 N
DURANGO
DRO 108.2
FARMINGTON
CONTROL ZONE EFFECTIVE
1500-0300Z)
MCA
V21 8700 E 9200 W
V421 8100 S 13200 N
DENVER
Farmington
126.1 343.7
REDMESA
AZTEC
RESERVOIR
MANUEL
BRAZOS
FRUITLAND
DESERT
OTIS
MISSION
MRA 9800
122.4 122.1R
FARMINGTON (N MEX)
FMN 115.3
Chan 100
ALS 113.9
Chan 86
TO ALS
Navajo State Park
6475 L 50
Durango-La Plata Co
6684 L 80
Montrose Co
5759 L 85
Muni
5503 L 67
Hopkins-
Montrose Co
5936 L 46
Blake
5166 L 45
KDTA
1400
(North Fork Valley)
5798 L 36
Gunnison Co
7668 - 72
(Mineral Co Mem)
8680 - 68
(Stevens)
7674 - 42
(Dulce)
6800 L 50

FIG. 51

607. J23 What is the minimum crossing altitude for an IFR flight over GUC VORTAC (b) when proceeding northwest-bound on V484? (Fig. 51)

1- 14,600 feet
2- 13,500 feet
3- 14,000 feet
4- 14,300 feet

608. J41 Which facility controls IFR flights in the vicinity of Durango (d)? (Fig. 51)

1- Farmington Center
2- Farmington FSS
3- Durango FSS
4- Denver Center

609. G42 What are the oxygen requirements for the crew and passengers on an IFR flight on V421 between Durango VOR (d) and Gunnison VORTAC (b) in an unpressurized aircraft? (Fig. 51)

1- The minimum flight crew must use oxygen for the entire time and the passengers must be provided oxygen for that part of the flight of more than 30 minutes.
2- The minimum flight crew must use oxygen and the passengers must be provided oxygen for the entire time.
3- The minimum flight crew must be provided supplemental oxygen for that part of the flight of more than 30 minutes.
4- The minimum flight crew must use oxygen for that part of the flight of more than 30 minutes.

610. J27 What type airspace is depicted by the shaded areas between the major airways on Fig. 51?

1- Control area
2- Uncontrolled airspace
3- Restricted area
4- Military operations area

611. H32 At what time should you arrive at Farmington VORTAC (e) if you crossed over NUCLA Intersection (a) at 1008 and 30 seconds, and then crossed over the VOR changeover point (c) at 1014? (Fig. 51)

1- 1045
2- 1039
3- 1041
4- 1043

612. G23 You have requested an IFR clearance with a "VFR Conditions on Top" clearance. If you receive this clearance and fly a course of 180°, at what altitude should you fly?

1- An altitude assigned by ATC.
2- Any IFR altitude which will enable you to remain in VFR conditions.
3- An even-thousand foot MSL altitude + 500 feet.
4- An odd-thousand foot MSL altitude + 500 feet.

613. G54 What is the two-way radio communications failure procedure if you encounter VFR weather conditions?

1- Continue to your destination on the assigned route maintaining the last assigned altitude or MEA, whichever is higher.
2- Continue on your assigned route and maintain the MEA for each route segment.
3- Descend to an altitude that will keep you below all clouds and continue on the assigned route.
4- Continue flight under VFR, land as soon as practicable, and notify ATC.

614. G55 What action is necessary when a partial loss of ILS receiver capability occurs while operating in controlled airspace under IFR?

1- Continue as "cleared" and file a written report to the Administrator if requested.
2- If the aircraft is equipped with other approach radio gear, no further action is necessary.
3- Request a radar vector to an area where VFR conditions exist.
4- Report the malfunction immediately to ATC.

615. G55 What action should a pilot take if the air/ground communications receiver malfunctions intermittently while operating in controlled airspace under IFR?

1- Continue the flight as "cleared" and file a written report to the Administrator if requested.
2- Squawk 7600 and proceed as cleared.
3- Descend immediately to MEA/MOCA and squawk 7700 for 1 minute, then 7600 for 15 minutes.
4- Report the malfunction immediately to ATC.

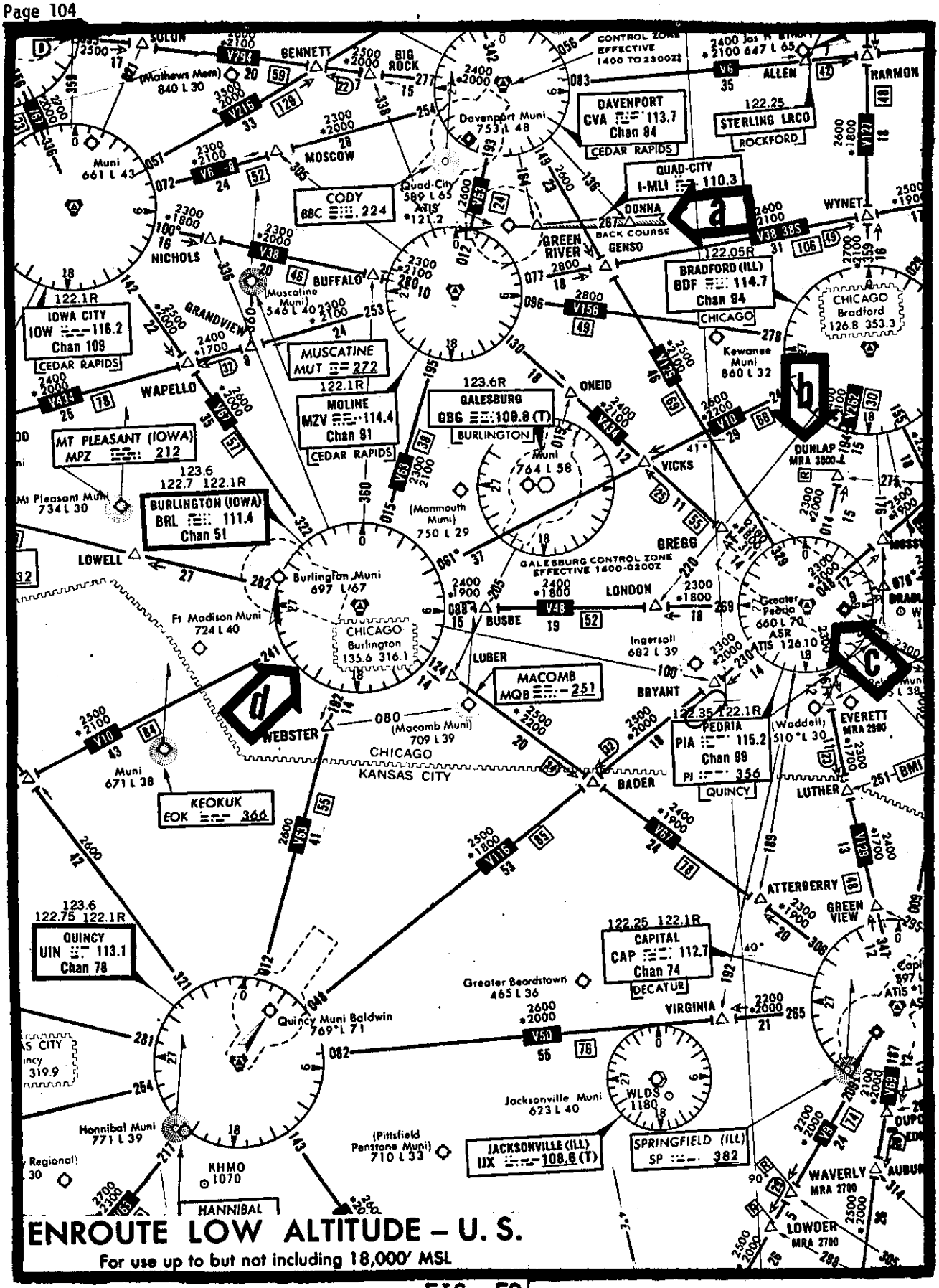

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
CONTROL ZONE EFFECTIVE 1400 TO 2300Z
GALESBURG CONTROL ZONE EFFECTIVE 1400-0200Z
DAVENPORT CVA 113.7 Chan 84 CEDAR RAPIDS
QUAD-CITY I-MLI 110.3
STERLING LRCO 122.25 ROCKFORD
BRADFORD (ILL) BDF 114.7 Chan 94 CHICAGO
IOWA CITY IOW 116.2 Chan 109 CEDAR RAPIDS
MT PLEASANT (IOWA) MPZ 212
BURLINGTON (IOWA) BRL 111.4 Chan 51
MOLINE MZV 114.4 Chan 91 CEDAR RAPIDS
GALESBURG GBG 108.8 (T) BURLINGTON
MUSCATINE MUT 272
CODY BBC .224
KEOKUK EOK 366
MACOMB MQB 251
PEORIA PIA 115.2 Chan 99 QUINCY
CAPITAL CAP 112.7 Chan 74 DECATUR
QUINCY UIN 113.1 Chan 78
JACKSONVILLE (ILL) IJX 108.6 (T)
SPRINGFIELD (ILL) SP 382
CHICAGO Burlington 135.6 316.1
CHICAGO KANSAS CITY
CHICAGO Bradford 126.8 353.3
HANNIBAL
KHMO 1070
BUFFALO
MOSCOW
NICHOLS
GRANDVIEW
WAPELLO
LOWELL
BUSBE
LONDON
GREGG
VICKS
ONEID
DUNLAP MRA 3800-L
WYNET
HARMON
ALLEN
BENNETT
BIG ROCK
SOLON
GENSO
DONNA
GREEN RIVER
LUBER
BRYANT
WEBSTER
BADER
ATTERBERRY
VIRGINIA
LUTHER
EVERETT MRA 2900
GREEN VIEW
LOWDER MRA 2700
WAVERLY MRA 2700
Davenport Muni 753 L 48
Quad-City 589 L 65
Muscatine Muni 546 L 40
Burlington Muni 697 L 67
Ft Madison Muni 724 L 40
Mt Pleasant Muni 734 L 30
(Manmouth Muni) 750 L 29
Muni 764 L 58
Kewanee Muni 860 L 32
Greater Peoria 660 L 70
Ingersoll 682 L 39
(Waddell) 510 L 30
(Macomb Muni) 709 L 39
Muni 671 L 38
Quincy Muni Baldwin 769 L 71
Greater Beardstown 465 L 36
Jacksonville Muni 623 L 40
(Pittsfield Penstone Muni) 710 L 33
Hannibal Muni 771 L 39
(Mathews Mem) 840 L 30
Muni 661 L 43
a
b
c
d

FIG. 52

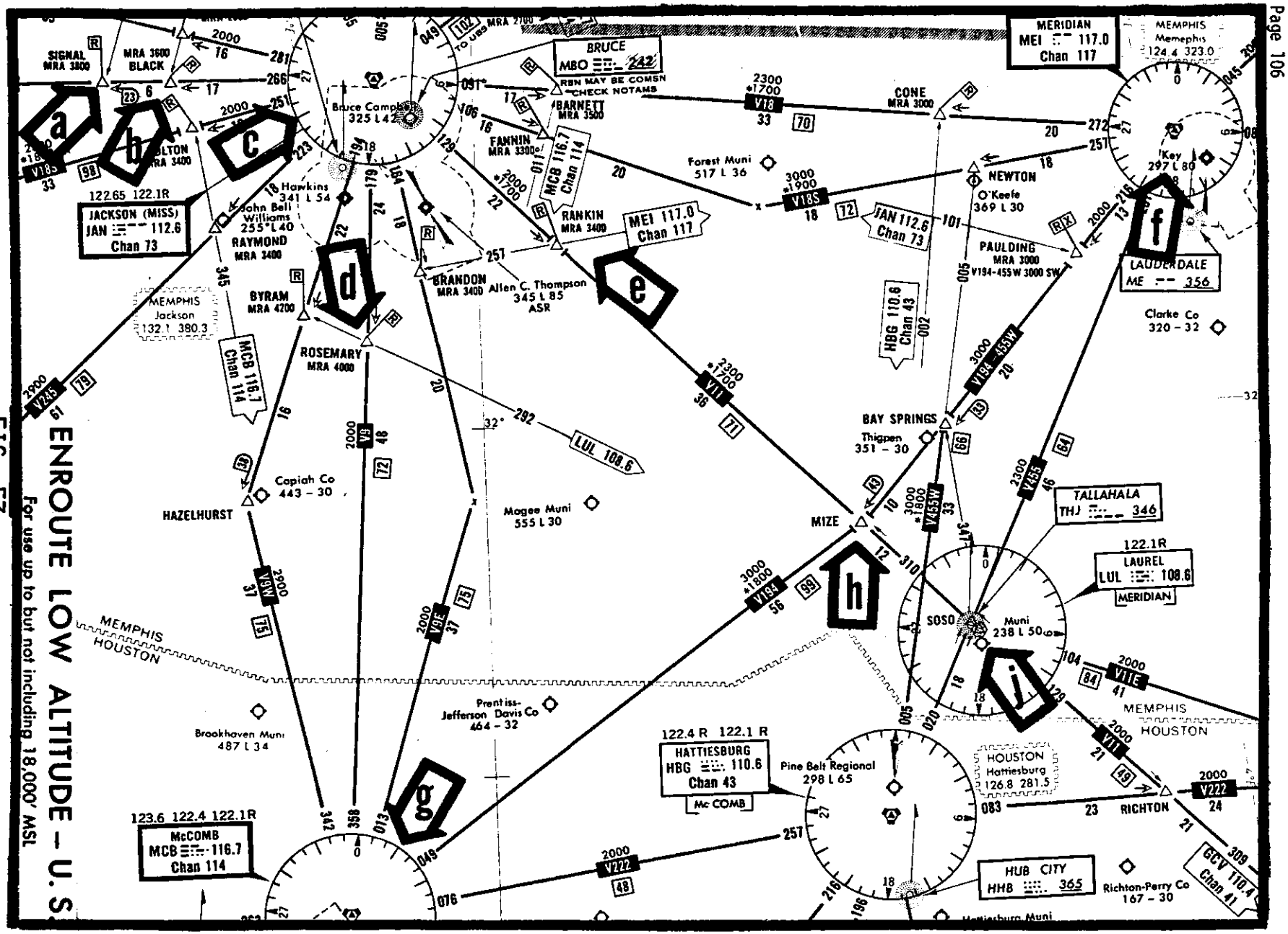

ENROUTE LOW ALTITUDE – U.S.
For use up to but not including 18,000' MSL
MERIDIAN
MEI 117.0
Chan 117
MEMPHIS
Memephis
124.4 323.0
BRUCE
MBO 242
RBN MAY BE COMSN
CHECK NOTAMS
SIGNAL
MRA 3800
MRA 3600
BLACK
CONE
MRA 3000
BARNETT
MRA 3500
FANNIN
MRA 3300
RANKIN
MRA 3400
MCB 116.7
Chan 114
MEI 117.0
Chan 117
JAN 112.6
Chan 73
JACKSON (MISS)
JAN 112.6
Chan 73
122.65 122.1R
RAYMOND
MRA 3400
BYRAM
MRA 4200
ROSEMARY
MRA 4000
BRANDON
MRA 3400
Allen C. Thompson
345 L 85
ASR
NEWTON
O'Keefe
369 L 30
PAULDING
MRA 3000
V194-455W 3000 SW
LAUDERDALE
ME 356
HBG 110.6
Chan 43
BAY SPRINGS
Thigpen
351 – 30
TALLAHALA
THJ 346
MIZE
HAZELHURST
Copiah Co
443 – 30
Magee Muni
555 L 30
LUL 108.6
122.1R
LAUREL
LUL 108.6
MERIDIAN
SOSO
Muni
238 L 50
MEMPHIS
HOUSTON
Brookhaven Muni
487 L 34
Prentiss-
Jefferson Davis Co
464 – 32
122.4 R 122.1 R
HATTIESBURG
HBG 110.6
Chan 43
Mc COMB
Pine Belt Regional
298 L 65
HOUSTON
Hattiesburg
126.8 281.5
RICHTON
HUB CITY
HHB 365
Richton-Perry Co
167 – 30
123.6 122.4 122.1R
McCOMB
MCB 116.7
Chan 114
MEMPHIS
Jackson
132.1 380.3
Clarke Co
320 – 32
Forest Muni
517 L 36
'Key
297 L 80
a
b
c
d
e
f
g
h
i
j

FIG. 53

616. J25 What is specifically indicated by the symbol at Arrow "A" for Quad-City Airport? (Fig. 52)

1- In addition to providing ILS course guidance, the localizer has an ATC function.
2- A published Simplified Direction Finding (SDF) procedure is available.
3- A published Localizer-Type Directional Aid (LDA).
4- The airport is served by a Category II ILS approach procedure.

617. J23 What are the minimum altitudes which assure acceptable signal coverage at BADER and BRYANT Intersections for navigation on V116 southwest of Peoria VORTAC (c)? (Fig. 52)

1- 2,500 feet at both BADER and BRYANT.
2- 2,500 feet at BADER and 2,300 feet at BRYANT.
3- 2,000 feet at both BADER and BRYANT.
4- 2,500 feet at BADER and 2,000 feet at BRYANT.

618. J23 What is the minimum altitude to identify the DUNLAP Intersection (b) when the DME is inoperative? (Fig. 52)

1- 2,000 feet MSL
2- 2,100 feet MSL
3- 3,000 feet MSL
4- 2,400 feet MSL

619. G52 What action should be taken if a pilot experiences complete generator failure while en route on an IFR flight?

1- Turn off all electrical equipment except one VOR until ready for the approach at the destination.
2- Turn off all electrical equipment except one VOR and the transponder. Select code 7600 on the transponder, and listen on the voice feature of the VOR for instructions.
3- Request an approach at the nearest suitable facility en route and turn off all unnecessary electrical equipment.
4- Turn off all electrical equipment except the transponder. Select code 7700 on the transponder and change course to an area of VFR weather.

620. J23 What is the lowest altitude which assures acceptable navigational signal coverage at GREGG and VICKS Intersections for navigation outbound on V434 northwest of Peoria VORTAC (c)? (Fig. 52)

1- 1,800 feet at GREGG and 2,400 feet at VICKS.
2- 2,300 feet at GREGG and 2,400 feet at VICKS.
3- 1,800 feet at GREGG and 2,100 feet at VICKS.
4- 2,300 feet at both GREGG and VICKS.

621. B21 Determine the approximate TH for a flight southbound from the Burlington VORTAC (d) on V63 using a TAS of 156 knots. According to the Winds and Temperatures Aloft Forecast (FD) the predicted wind at your cruising altitude should be 270° at 25 knots. Variation is 4°E. (Fig. 52)

1- 205°
2- 180°
3- 186°
4- 198°

622. G55 Your aircraft is equipped with two VOR receivers: the No. 1 receiver has Omni/Localizer/Glide Slope capability, and the No. 2 has only Omni. What action, if any, should you take if your No. 1 receiver malfunctions while operating in controlled airspace under IFR?

1- Advise the controller only if you believe you may be required to identify an intersection.
2- Report the malfunction immediately to ATC.
3- Continue the flight "as cleared"; no report is required.
4- No action is required if your aircraft is equipped with ADF.

623. G55 What action should you take if your DME fails at FL 350?

1- Notify ATC that it will be necessary for you to go to a lower altitude, since your DME has failed.
2- Notify ATC that your DME has failed and continue the flight to destination airport as cleared.
3- Continue to your destination and have the DME repaired before takeoff.
4- Continue your flight as planned, since a DME is not required.

633. H32 On a portion of an IFR flight, you were cleared "...SYR (i), V84, V501 ELZ, V119 BFD (j)...." You observed station passage at SYR at 1749Z and passed the VOR changeover point between SYR and ELZ at 1807Z. Based on your calculated groundspeed, at what time should you pass BFD? (Fig. 54)

1- 1830Z
2- 1852Z
3- 1845Z
4- 1904Z

634. K21 What is the recommended entry procedure to hold in the depicted holding pattern if you approach FISHERS Intersection (h) on a heading of 070°? (Fig. 54)

1- Direct only
2- Parallel or Direct
3- Teardrop only
4- Parallel only

635. K21 What is the recommended entry procedure to the depicted holding pattern if you arrive over CLIFTON Intersection (f) on a heading of 327°? (Fig. 54)

1- Teardrop only
2- Teardrop or Direct
3- Parallel only
4- Direct only

636. J25 What is specifically indicated by the symbol at Arrow "g" for Syracuse Hancock International Airport? (Fig. 54)

1- In addition to providing course guidance, the localizer has an ATC function.
2- The airport is served by a Category II ILS approach procedure.
3- The airport is served by an LDA approach procedure.
4- A published Simplified Direction Finding (SDF) procedure is available.

637. J23 What is the minimum altitude to identify LYSANDER Intersection (e) while proceeding westbound from the Syracuse VORTAC on V2N? The aircraft is equipped with dual VORs and DME. (Fig. 54)

1- 1,600 feet MSL
2- 3,000 feet MSL
3- 2,300 feet MSL
4- 1,900 feet MSL

638. G55 If the ADF navigation receiver malfunctions while operating in controlled airspace under IFR, the pilot in command must

1- advise ATC not to issue any clearance that requires ADF equipment.
2- continue as "cleared" and request an amended clearance only if the malfunction will cause deviations.
3- continue flight as planned; if assigned ADF approach, request another approach explaining that your ADF is inoperative.
4- report the malfunction immediately to ATC.

639. H11 After passing a VORTAC, the CDI shows 1/2 scale deflection to the right and the TO-FROM indicator shows FROM. What is indicated if the deflection remains constant for a period of time?

1- The VORTAC is undergoing maintenance.
2- The airplane is getting closer to the radial.
3- The airplane is flying away from the radial.
4- The OBS is erroneously set on the reciprocal heading.

640. H11 While flying from VOR A to VOR B, you tune your receiver to VOR B and set the OBS to your course of 010 (TO). The CDI indicates 1/4 scale to the right of center. It remains in the same position for several minutes. This indicates the airplane is

1- flying away from the radial.
2- flying closer to the radial.
3- maintaining the same distance from the radial.
4- gradually changing heading.

641. H22 Which indication should you receive when you are directly over a VORTAC NAVAID by using only the DME for this situation?

Flight altitude- - - - - 6,500 feet
NAVAID site elevation- - 500 feet MSL

1- The DME would indicate approximately 1 NM.
2- The DME would indicate "0" miles.
3- The DME would indicate approximately .5 NM.
4- The DME would "breaklock" as you passed directly overhead.

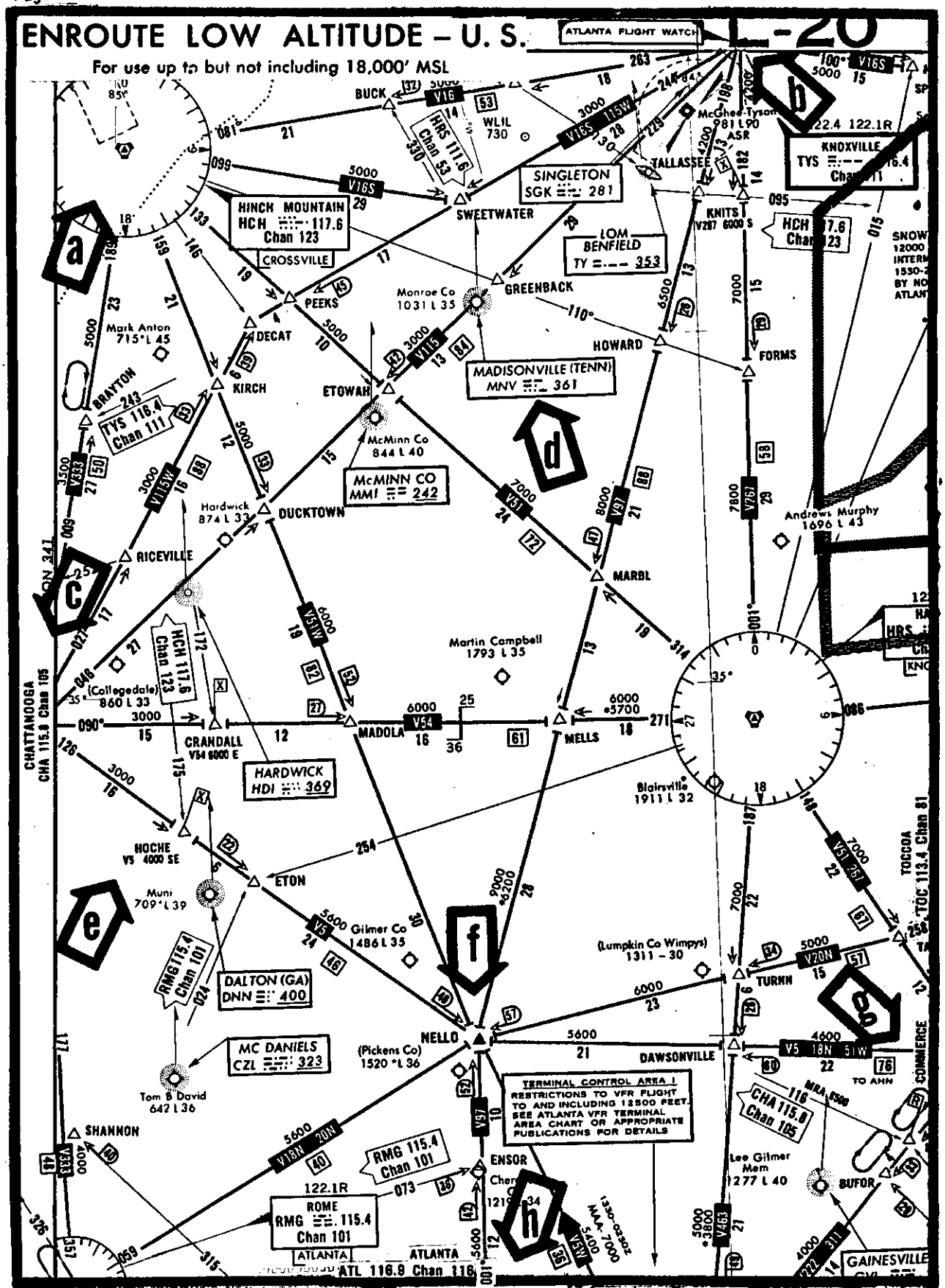

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
ATLANTA FLIGHT WATCH
L-28
BUCK
WLIL 730
HRS 111.6 Chan 53
SINGLETON SGK 281
SWEETWATER
HINCH MOUNTAIN HCH 117.6 Chan 123
CROSSVILLE
TALLASSEE
McGhee-Tyson 981 L 90 ASR
KNOXVILLE TYS 122.4 122.1R
KNITS VZ87 6000 S
HCH 117.6 Chan 123
LOM BENFIELD TY 353
GREENBACK
PEEKS
DECAT
Monroe Co 1031 L 35
Mark Anton 715 L 45
BRAYTON
TYS 116.4 Chan 111
KIRCH
ETOWAH
HOWARD
FORMS
MADISONVILLE (TENN) MNV 361
McMinn Co 844 L 40
McMINN CO MMI 242
Hardwick 874 L 33
DUCKTOWN
RICEVILLE
MARBL
Andrews Murphy 1696 L 43
Martin Campbell 1793 L 35
(Collegedale) 860 L 33
HCH 117.6 Chan 123
CRANDALL V54 6000 E
MADOLA
MELLS
HARDWICK HDI 369
Blairsville 1911 L 32
HOCHE V5 4000 SE
ETON
Muni 709 L 39
Gilmer Co 1486 L 35
(Lumpkin Co Wimpys) 1311 – 30
TURNN
RMG 115.4 Chan 101
DALTON (GA) DNN 400
MC DANIELS CZL 323
Tom B David 642 L 36
NELLO
(Pickens Co) 1520 *L 36
DAWSONVILLE
TERMINAL CONTROL AREA I
RESTRICTIONS TO VFR FLIGHT TO AND INCLUDING 12500 FEET. SEE ATLANTA VFR TERMINAL AREA CHART OR APPROPRIATE PUBLICATIONS FOR DETAILS
CHA 115.8 Chan 105
Lee Gilmer Mem 1277 L 40
BUFOR
SHANNON
RMG 115.4 Chan 101
ENSOR
ROME RMG 115.4 Chan 101
ATLANTA
ATL 116.9 Chan 116
GAINESVILLE
TOCCOA TOC 113.4 Chan 81
CHATTANOOGA CHA 115.8 Chan 105
TO AHN
COMMERCE
a
b
c
d
e
f
g
h

FIG. 55

188. What effect does an increase in altitude have on performance while maintaining the same power output? (Fig. 17)
B33

1- TAS, fuel consumption, and range are increased.
2- TAS and fuel consumption are increased while endurance and range remain the same.
3- TAS and range are increased while endurance and fuel consumption remain the same.
4- TAS, range, and endurance drop while fuel consumption remains the same.

189. Determine the fuel flow for a flight at 12,000 feet using 2300 RPM and 23" manifold pressure. (Fuel weighs 6 lbs./gallon.) (Fig. 17)
B34

1- 11.9 GPH
2- 8.6 GPH
3- 9.7 GPH
4- 10.8 GPH

190. How does cruising at 15,000 feet, as opposed to 10,000 feet, affect the TAS? (Fig. 17)
B33

1- TAS will be increased with a corresponding increase in fuel consumption.
2- TAS will be increased an average of 10 MPH at the same power settings.
3- TAS will be decreased unless an increase in power is made.
4- TAS will be decreased with the same power output, but IAS will be increased.

191. What indicated airspeed range is within the safe operating range for encountering turbulent air with approximately 30 FPS gusts? (Fig. 18)
B44

1- 114 - 182 MPH
2- 118 - 205 MPH
3- 124 - 182 MPH
4- 128 - 184 MPH

192. Your altimeter setting is 29.92 and the altimeter is indicating 7,000 feet. ATC advises you that the altimeter setting is 30.03 and, with this setting, your altimeter indicates 7,100 feet. At what pressure altitude are you flying?
B51

1- 6,900 feet
2- 7,000 feet
3- 7,100 feet
4- 7,150 feet

193. Which is the safest procedure to use when turbulent air with gusts of 45 FPS are encountered? (Fig. 18)
B44

1- Maintain level flight attitude with a power setting that will average 144 MPH.
2- Maintain 140 to 148 MPH with throttle at all times.
3- Maintain an airspeed of 140 MPH or slower.
4- Slow the airplane to 80 MPH or slower.

194. Determine the indicated airspeed for "Maximum Speed, Flaps Extended 30°." (Fig. 19)
B36

1- 111 MPH
2- 110 MPH
3- 113 MPH
4- 107 MPH

195. Determine the indicated airspeed for a calibrated airspeed of 65 MPH, flaps extended 30°. (Fig. 19)
B36

1- 58 MPH
2- 56 MPH
3- 54 MPH
4- 52 MPH

196. Determine the calibrated airspeed for an indicated airspeed of 66 MPH, flaps extended 30°. (Fig. 19)
B36

1- 71 MPH
2- 75 MPH
3- 74 MPH
4- 73 MPH

197. What is an advantage of an electric turn coordinator if the airplane has a vacuum system for other gyroscopic instruments?
B53

1- It will not tumble as will vacuum-driven turn indicators.
2- It is a backup in case of vacuum system failure.
3- It is easier to interpret than the vacuum driven indicators.
4- It is more accurate than vacuum-driven turn indicators.

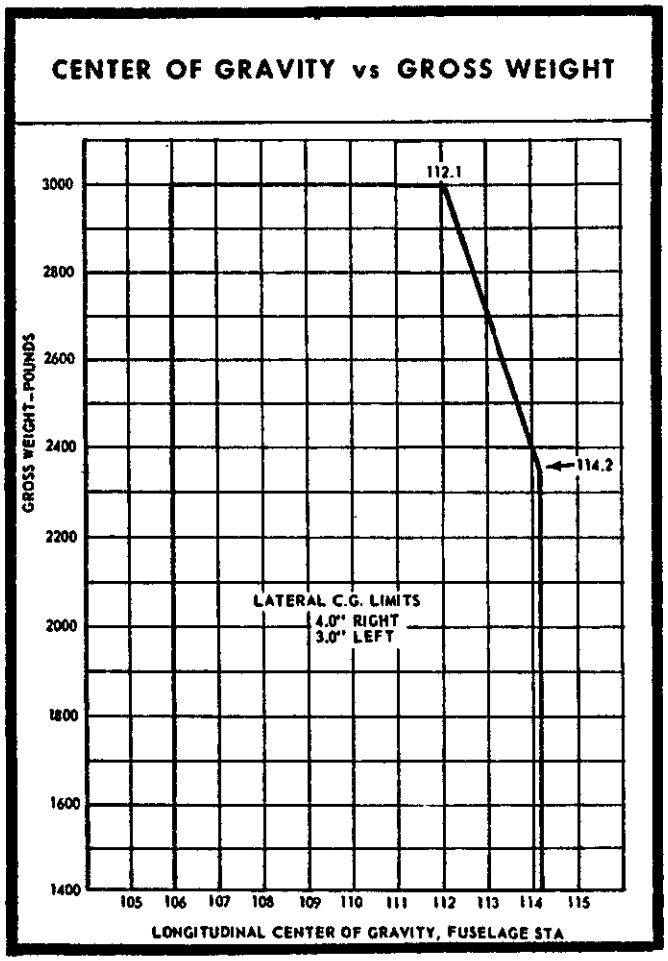


FIG. 20

198. B41 You are preparing to depart on an instrument flight in a helicopter that has a gross weight of 2,500 pounds. What is its aft CG limit? (Fig. 20)

1- 112.0
2- 113.0
3- 113.7
4- 114.2

199. B41 Prior to departure on an instrument flight, you determine that the gross weight of your helicopter is 2,450 pounds. What is its aft CG limit? (Fig. 20)

1- 114.2
2- 112.8
3- 113.8
4- 113.3

200. B41 Prior to departure on an instrument flight, you determine that the gross weight of your helicopter is 2,900 pounds. What is its aft CG limit? (Fig. 20)

1- 112.3
2- 112.1
3- 113.0
4- 114.2

201. B41 Prior to departure on an instrument flight, you determine that the gross weight of your helicopter is 3,000 pounds. What is its forward CG limit? (Fig. 20)

1- 104.0
2- 105.0
3- 106.0
4- 112.1

202. B41 Prior to departure on an instrument flight, you determine that the gross weight of your helicopter is 2,400 pounds. What is its aft CG limit? (Fig. 20)

1- 114.0
2- 114.2
3- 113.2
4- 113.8

203. B41 Prior to departure on an instrument flight, you determine that the gross weight of your helicopter is 2,600 pounds. What is its aft CG limit? (Fig. 20)

1- 113.8
2- 112.2
3- 112.8
4- 113.4

204. B41 Prior to departure on an instrument flight, you determine that the gross weight of your helicopter is 2,850 pounds. What is its aft CG limit? (Fig. 20)

1- 114.2
2- 113.0
3- 112.5
4- 112.0

624. J23 The purpose of the 4,000-foot MRA at ROSEMARY Intersection (d) is to provide (Fig. 53)

1- an adequate altitude to navigate on V9 in this area.
2- the minimum altitude to receive R-179 and DME signals from JAN VORTAC.
3- the minimum altitude to receive adequate navigation signals from LUL VOR.
4- the minimum altitude to receive navigation signals from MCB VORTAC and JAN VORTAC.

625. H32 What should be the ETA over Meridian VORTAC (f) if you cross SIGNAL Intersection (a) at 1756 and BLACK Intersection (b) at 1758? (Fig. 53)

1- 1827
2- 1829
3- 1823
4- 1825

626. B21 Determine the approximate MH for a flight on V9 southbound from JAN VORTAC (c) if the wind is at 25 knots from 030°, the TAS is 170 knots, and the variation is 5°E. (Fig. 53)

1- 171°
2- 175°
3- 183°
4- 180°

627. J23 What is the minimum altitude to identify RANKIN Intersection (e) when southbound on V11? (Your aircraft is equipped with dual VORs and DME.) (Fig. 53)

1- 3,400 feet
2- 2,300 feet
3- 2,000 feet
4- 1,700 feet

628. H21 Which is an acceptable method of identifying MIZE Intersection (h) on an IFR flight on V11 from LUL VOR (j) to JAN VORTAC (c)? (Fig. 53)

1- R-310 of THJ NDB and R-216 of MEI VORTAC.
2- R-310 of LUL VOR and R-216 of MEI VORTAC.
3- R-310 and 12 DME miles from LUL VOR.
4- R-310 of LUL VOR and 43 DME miles from MEI VORTAC.

629. G55 What is the procedure for reporting a malfunction of required DME equipment which occurs above 24,000 feet?

1- Notify ATC immediately, but continue to the next airport of intended landing where repairs can be made.
2- Notify ATC of the malfunction and land at the nearest airport where repairs can be made.
3- Notify ATC immediately and request an altitude below 24,000 feet.
4- Continue to your destination, but request an altitude below 24,000 feet.

630. G55 Your aircraft is equipped with two VOR receivers: the No. 1 receiver has Omni/Localizer/Glide Slope capability and the No. 2 has only Omni. What action, if any, should you take if your No. 2 receiver malfunctions while operating in controlled airspace under IFR?

1- Continue the flight "as cleared"; no report is required.
2- If you are not equipped with a working ADF, ATC should be advised.
3- ATC should be advised only if you believe you will be required to identify an intersection.
4- Report the malfunction immediately to ATC.

631. G56 In an emergency requiring immediate action, if you deviate from your clearance, what is your responsibility as pilot in command?

1- Send a written report of the deviation to the Administrator within 24 hours.
2- Cancel your flight plan as soon as practicable.
3- Notify ATC of the deviation as soon as practicable.
4- Land at the first available airport and report the deviation to ATC.

632. H22 Which distance is displayed by the DME indicator?

1- Ground track distance in nautical miles.
2- Line of sight direct distance from aircraft to VORTAC in statute miles.
3- Slant range distance in nautical miles.
4- Slant range distance in statute miles.

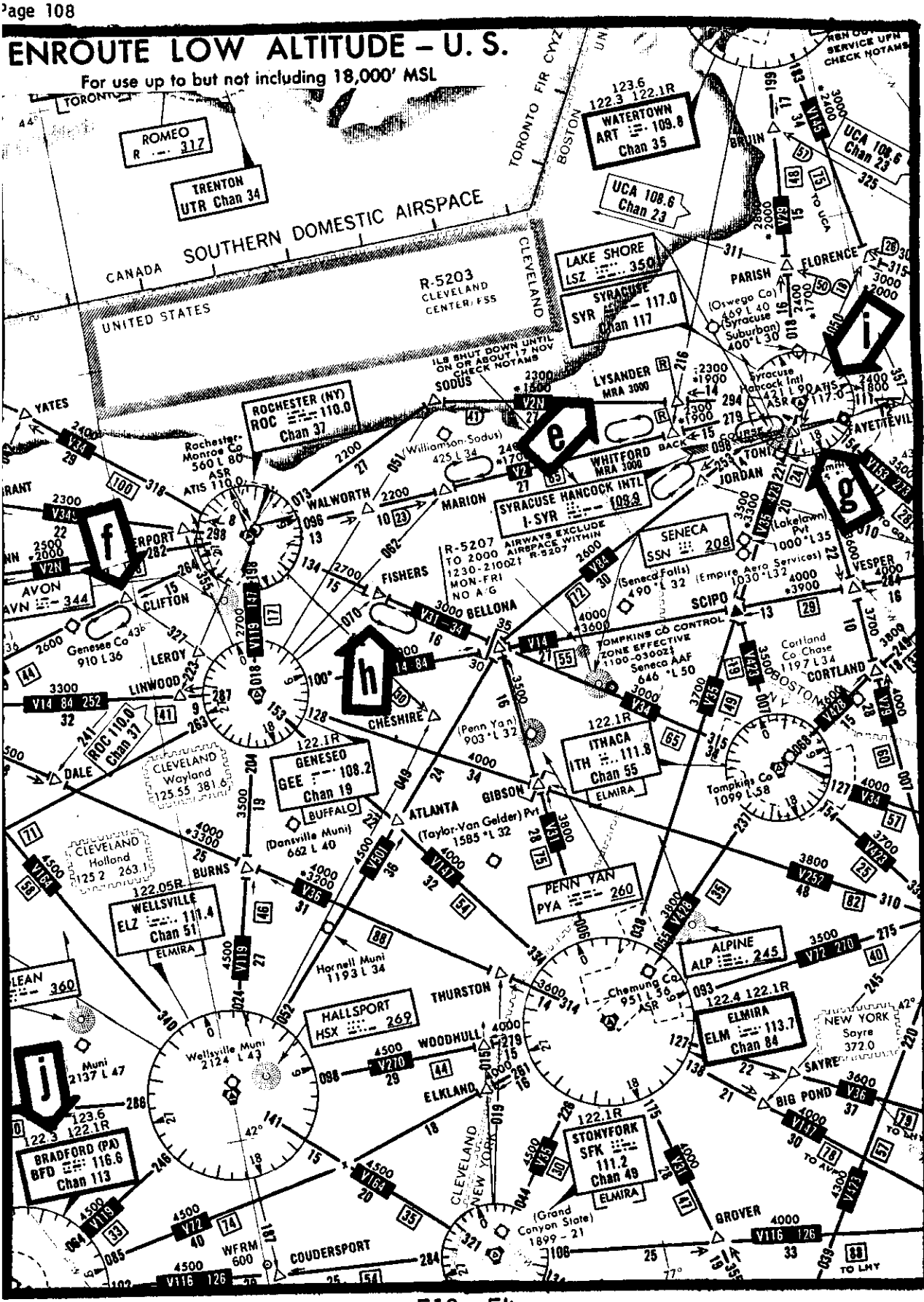

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
SOUTHERN DOMESTIC AIRSPACE
CANADA
UNITED STATES
R-5203
CLEVELAND CENTER/FSS
TORONTO FIR CYYZ
BOSTON
CLEVELAND
ROMEO
R 317
TRENTON
UTR Chan 34
WATERTOWN
ART 109.8
Chan 35
123.6
122.3 122.1R
UCA 108.6
Chan 23
LAKE SHORE
LSZ 350
SYRACUSE
SYR 117.0
Chan 117
ROCHESTER (NY)
ROC 110.0
Chan 37
SYRACUSE HANCOCK INTL
I-SYR 108.9
SENECA
SSN 208
GENESEO
GEE 108.2
Chan 19
ITHACA
ITH 111.8
Chan 55
PENN YAN
PYA 260
WELLSVILLE
ELZ 111.4
Chan 51
HALLSPORT
HSX 269
ELMIRA
ELM 113.7
Chan 84
STONYFORK
SFK 111.2
Chan 49
BRADFORD (PA)
BFD 116.6
Chan 113
ALPINE
ALP 245
COUDERSPORT
GROVER
BIG POND
SAYRE
NEW YORK
Sayre
372.0
R-5207
CLEVELAND
CENTER/FSS
ILS SHUT DOWN UNTIL
ON OR ABOUT 17 NOV
CHECK NOTAMS
LYSANDER
MRA 3000
WHITFORD
MRA 3000
SODUS
WALWORTH
MARION
JORDAN
FISHERS
BELLONA
SCIPO
CHESHIRE
ATLANTA
GIBSON
BURNS
THURSTON
WOODHULL
ELKLAND
PARISH
FLORENCE
LEROY
LINWOOD
CLIFTON
DALE
AVON
YATES
CORTLAND
VESPER
TOMPKINS CO CONTROL
ZONE EFFECTIVE
1100-0300Z‡
Seneca AAF
646 *L 50
R-5207 AIRWAYS EXCLUDE
TO 2000 AIRSPACE WITHIN
1230-2100Z‡ R-5207
MON-FRI
NO A/G
Rochester-
Monroe Co
560 L 80
ASR
ATIS 110.0
(Williamson-Sodus)
425 L 34
Syracuse
Hancock Intl
421 L 90
ASR
ATIS 117.0
(Otsego Co)
469 L 40
(Syracuse
Suburban)
400 *L 30
(Seneca Falls)
490 *L 32
(Empire Aero Services)
1030 *L 32
(Lakeland)
Pvt
1000 *L 35
Genesee Co
910 L 36
Cortland
Co Chase
1197 L 34
(Penn Yan)
903 *L 32
(Taylor-Van Gelder) Pvt
1585 *L 32
Tompkins Co
1099 L 58
Chemung Co
951 L 56
ASR
Hornell Muni
1193 L 34
Wellsville Muni
2124 L 43
(Dansville Muni)
662 L 40
(Grand
Canyon State)
1899 – 21
WFRM
600
CLEVELAND
Wayland
125.55 381.6
CLEVELAND
Holland
125.2 263.1
CLEVELAND
NEW YORK
TO UCA
TO AVP
TO LHY
SERVICE UFN
CHECK NOTAMS

FIG. 54

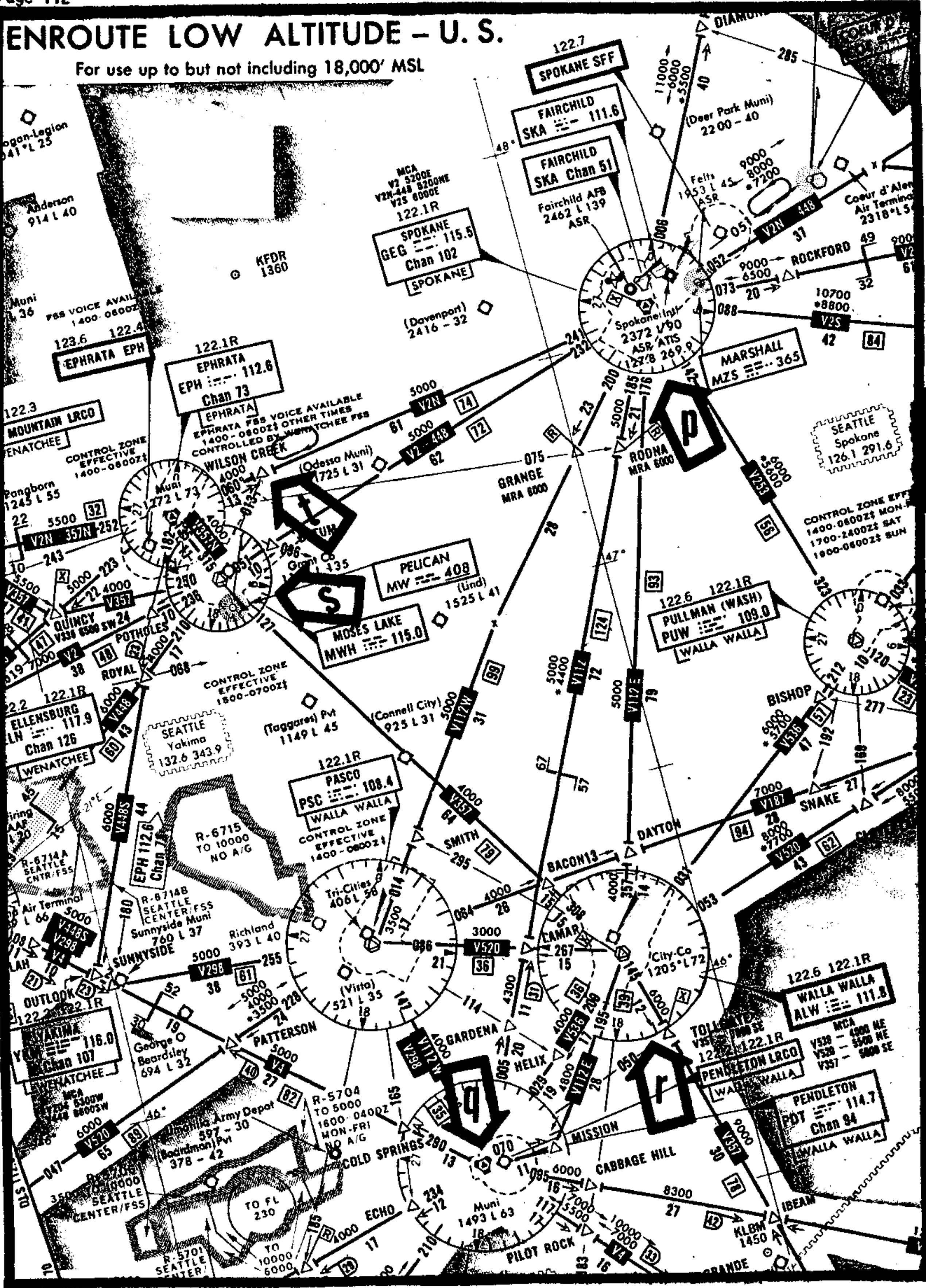

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
SPOKANE SFF
FAIRCHILD SKA 111.6
FAIRCHILD SKA Chan 51
Fairchild AFB 2462 L 139 ASR
SPOKANE GEG 115.5 Chan 102
SPOKANE
Spokane Intl 2372 L 90 ASR ATIS 127.8 269.9
(Deer Park Muni) 2200 - 40
ROCKFORD
MARSHALL MZS 365
EPHRATA EPH 112.6 Chan 73
EPHRATA
MOUNTAIN LRCO
WENATCHEE
WILSON CREEK
(Odessa Muni) 1725 L 31
(Davenport) 2416 - 32
KFDR 1360
GRANGE MRA 6000
RODNA MRA 6000
SEATTLE Spokane 126.1 291.6
PELICAN MW 408
MOSES LAKE MWH 115.0
QUINCY
POTHOLES
ROYAL
ELLENSBURG ELN 117.9 Chan 126
SEATTLE Yakima 132.6 343.9
(Taggares) Pvt 1149 L 45
(Connell City) 925 L 31
PASCO PSC 108.4
WALLA WALLA
PULLMAN (WASH) PUW 109.0
BISHOP
SNAKE
DAYTON
BACON
SMITH
R-6715 TO 10000 NO A/G
Tri-Cities 406 L 56
LAMAR
City-Co 1205 L 72
SUNNYSIDE
Sunnyside Muni 760 L 37
Richland 393 L 40
(Vista) 521 L 35
PATTERSON
OUTLOOK
YAKIMA YKM 116.0 Chan 107
GARDENA
HELIX
WALLA WALLA ALW 111.8
PENDLETON LRCO
PENDLETON PDT 114.7 Chan 94
Umatilla Army Depot 597 - 30
(Boardman) Pvt 378 - 42
R-5704 TO 5000 1600-0400Z MON-FRI NO A/G
COLD SPRINGS
MISSION
CABBAGE HILL
ECHO
Muni 1493 L 63
PILOT ROCK
IBEAM
KLBM 1450
R-5701 SEATTLE CENTER
p
q
r
s
t

FIG. 56

642. J26 Where is the VOR changeover point when flying from Knoxville (b) to Atlanta (h) on V97? (Fig. 55)

1- MARBL Intersection
2- NELLO Intersection
3- MELLS Intersection
4- Halfway point

643. J20 What are the functions or uses of NELLO Intersection (f)? (Fig. 55)

1- Geographical fix, compulsory reporting point, DME fix and VOR changeover point.
2- Geographical fix and compulsory reporting point.
3- Compulsory reporting point and bypass hub for Atlanta.
4- Compulsory reporting point; DME fix and VOR changeover point.

644. J12 What type of navigational facility is located at Madisonville (d)? (Fig. 55) (Facility printed in brown.)

1- A low frequency directional beacon.
2- A VHF beacon.
3- A marker beacon for an instrument approach.
4- A low frequency non-directional beacon.

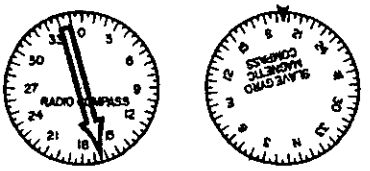
645. G54 You experience two-way radio communications failure between CHATTANOOGA (c) and HOCHE Intersection (e). If your last assigned altitude was 3,000 feet, what altitudes would you fly and where would you make altitude changes during a flight to COMMERCE (g)? (Fig. 55)

1- Climb to 4,000 feet or above to cross HOCHE; continue climb to 6,000 feet and maintain to DAWSONVILLE; descend to and maintain 5,000 feet to COMMERCE.
2- Climb to 4,000 feet or above to cross HOCHE; continue climb to 5,600 feet and maintain to DAWSONVILLE; descend to and maintain 4,600 feet to COMMERCE.
3- Maintain 3,000 feet to HOCHE, then climb to 4,000 feet; climb to and maintain 5,600 feet from ETON to DAWSONVILLE; descend to and maintain 4,600 feet to COMMERCE.
4- Maintain 3,000 feet to HOCHE; climb to and maintain 4,000 feet to ETON; climb to and maintain 6,000 feet to DAWSONVILLE; descend to and maintain 5,000 feet to COMMERCE.

646. J25 Which radials form NELLO Intersection (f)? (Fig. 55)

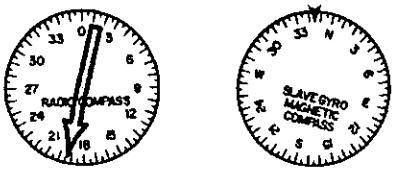
1- The TYS 198 radial and the CHA 126 radial.
2- HCH 159 radial and either the TOC 258 radial or the radial making up V5-18N-51W.
3- Any two of the following radials: CHA 126, ATL 001, and TOC 258.
4- Any two radials that intersect at NELLO at an angle greater than 40° and less than 140°.

647. H12 What is your position with respect to the 190° course and the beacon while making an NDB RWY 19 approach?



1- You are right of course and inbound to the beacon.
2- You are on course and outbound from the beacon.
3- You are on course and past the beacon inbound.
4- You are left of course and past the beacon inbound.

648. H12 What is your position with respect to the 180° bearing to the beacon while making an NDB RWY 18 approach?



1- You are right of course and outbound.
2- You are right of course and inbound.
3- You are proceeding outbound and on course.
4- You are left of course and outbound.

649. H25 What is the designation for a geographical location used for route definition on an RNAV flight?

1- A waypoint.
2- A DME fix.
3- A stepdown fix.
4- A TACAN installation.

650. K24 Which is a correct procedure for determining when to start the turn outbound when holding at Wilson Creek Fix (t)? (Fig. 56)

1- When your DME indicates 61 miles from GEG.
2- Fly on the GEG 241 radial by use of the #1 receiver and with the #2 receiver OBS set to the MWH 013 radial; start turn when the CDI passes the 0° deflection to the right.
3- When your DME indicates 13 miles from EPH.
4- Fly on the EPH 060 radial by use of the #1 receiver and with the #2 receiver OBS set to the MWH 013 radial; start turn when the CDI passes the 0° deflection to the left.

651. J23 What is the lowest altitude an IFR flight may cross the Walla Walla VOR (r) while proceeding southeast along V357? (Fig. 56)

1- 6,000 feet MSL
2- 7,000 feet MSL
3- 4,000 feet MSL
4- 5,000 feet MSL

652. J23 What is the lowest altitude an IFR flight may cross the Spokane VORTAC (p) while proceeding northeast along V2N? (Fig. 56)

1- 9,000 feet MSL
2- 5,200 feet MSL
3- 7,200 feet MSL
4- 5,000 feet MSL

653. H32 What is the ETA at the Spokane VORTAC (p) if you passed the Pendleton VORTAC (q) at 1833Z and the VOR changeover point along V112 at 1851Z? (Fig. 56)

1- 1909Z
2- 1915Z
3- 1912Z
4- 1933Z

654. K21 Outbound from the Moses Lake VOR (s) on a heading of 013°, you are advised by ATC to hold at the WILSON CREEK Intersection (t) in the depicted holding pattern. What is the recommended entry procedure? (Fig. 56)

1- Teardrop
2- Direct
3- Parallel or Direct
4- Parallel

655. J23 What is the lowest altitude an IFR flight may cross the Walla Walla VOR (r) while proceeding inbound from the Pendleton VORTAC (q) on V536 and outbound toward the northeast on V520? (Fig. 56)

1- 8,000 feet MSL
2- 5,500 feet MSL
3- 7,700 feet MSL
4- 4,000 feet MSL

656. H12 What would be the result of flying toward an NDB and holding a zero degree relative bearing when there is a wind from the left?

1- The ground track will curve to the upwind side of the NDB.
2- The airplane will make a slow but continuous turn to the right.
3- The heading will remain constant.
4- The ground track will curve to the downwind side of the NDB.

657. H22 Where does the DME indicator have the greatest error between ground distance to the VORTAC and displayed distance?

1- High altitudes close to the VORTAC.
2- Low altitudes far from the VORTAC.
3- Low altitudes close to the VORTAC.
4- High altitudes far from the VORTAC.

658. H22 How can station passage of a VORTAC be determined by use of the DME?

1- The range indicator will decrease until indicating the height above the station, then it will start increasing.
2- The range indicator will read zero upon station passage.
3- The range indicator will stop decreasing at 1/4 mile from the station and, at 1/4 mile past the station, will start increasing.
4- The range indicator will unlock when 1/4 mile from the station and will "search" until 1/4 mile past the station, when it will lock on.

659. H33 Determine the approximate CAS you should use to obtain 180 knots TAS with a pressure altitude of 8,000 feet and a temperature of +4°C.

1- 160 knots
2- 158 knots
3- 162 knots
4- 164 knots

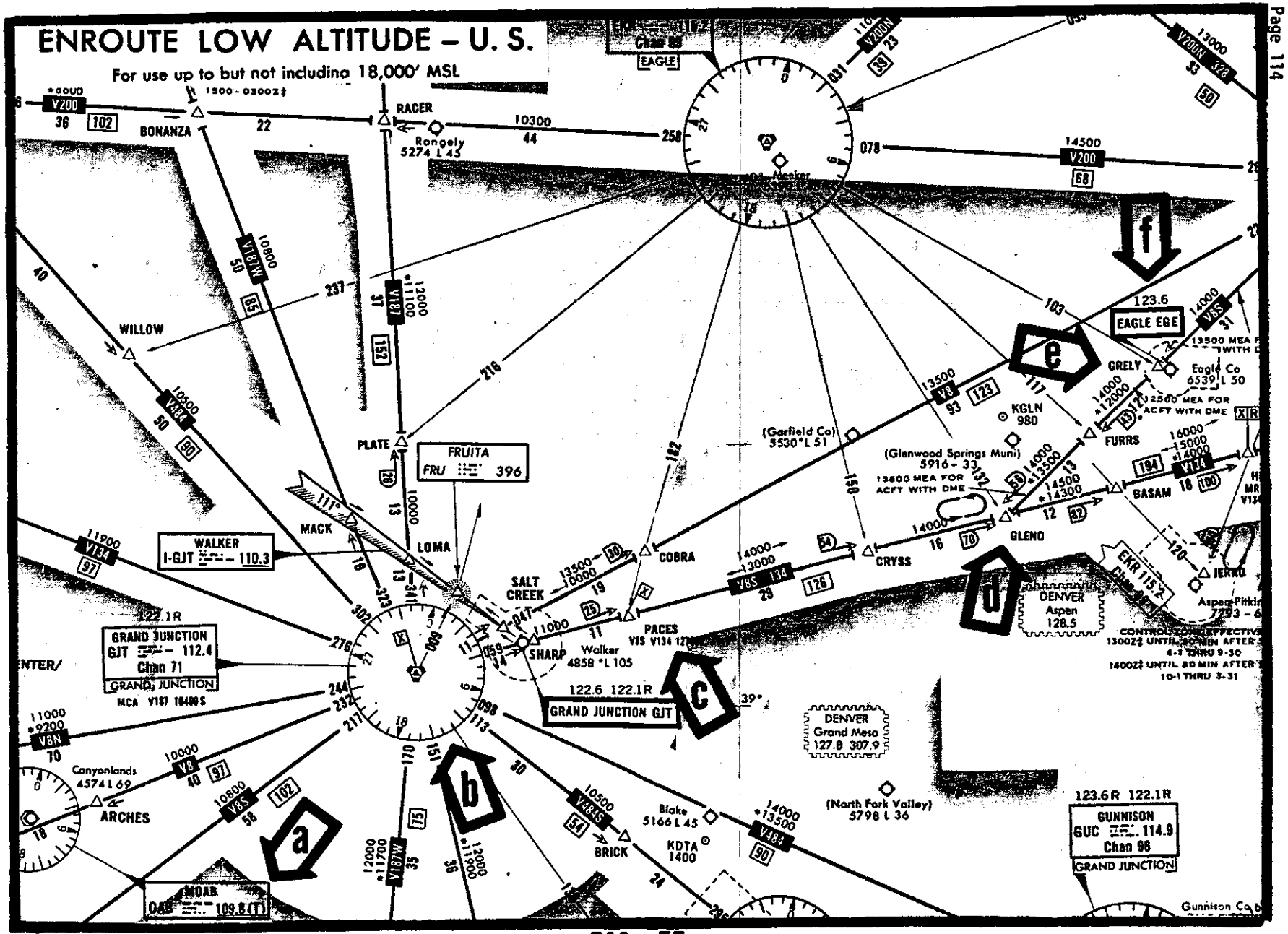

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
EAGLE
RACER
Rangely
5274 L 45
BONANZA
WILLOW
PLATE
FRUITA
FRU 396
MACK
LOMA
WALKER
I-GJT 110.3
SALT CREEK
SHARP
Walker
4858 *L 105
COBRA
PACES
CRYSS
GLENO
BASAM
FURRS
GRELY
EAGLE EGE
123.6
Eagle Co
6539 L 50
KGLN
980
(Garfield Co)
5530*L 51
(Glenwood Springs Muni)
5916 – 33
13600 MEA FOR ACFT WITH DME
2500 MEA FOR ACFT WITH DME
JERKO
EKR 115.2
Aspen-Pitkin
7293 – 6
DENVER
Aspen
128.5
DENVER
Grand Mesa
127.8 307.9
(North Fork Valley)
5798 L 36
Blake
5166 L 45
KDTA
1400
BRICK
ARCHES
Canyonlands
4574 L 69
MOAB
MOAB 109.8 (T)
GRAND JUNCTION
GJT 112.4
Chan 71
GRAND JUNCTION
MCA V187 18400S
122.1R
122.6 122.1R
GRAND JUNCTION GJT
GUNNISON
GUC 114.9
Chan 96
GRAND JUNCTION
123.6R 122.1R
Gunnison Co
CONTROL ZONE EFFECTIVE
1300Z‡ UNTIL 30 MIN AFTER
4-1 THRU 9-30
1400Z‡ UNTIL 30 MIN AFTER
10-1 THRU 3-31
a
b
c
d
e
f

FIG. 57

660. J23 What are the minimum en route altitudes (MEAs) northeast-bound on V8S from PACES Intersection (c) to GRELY Intersection (e) in an airplane equipped with dual VORs and DME? (Fig. 57)

1- 14,000 feet for each segment.
2- 13,000 feet halfway to CRYSS Intersection and 14,000 feet to GRELY Intersection.
3- 14,000 feet to GLENO Intersection, 13,600 feet to FURRS Intersection, and 12,500 feet to GRELY Intersection.
4- 14,000 feet to GLENO Intersection, 13,500 feet to FURRS Intersection, and 12,000 feet to GRELY Intersection.

661. K24 When should you initiate the turn to the inbound leg upon entry to the holding pattern depicted at GLENO Intersection (d) if you are maintaining 16,000 feet in a propeller-driven airplane? (Fig. 57)

1- At 2 minutes on the outbound leg.
2- At 65 DME miles.
3- At 1 minute on the outbound leg.
4- At 1 and 1/2 minutes on the outbound leg.

662. F20 What type facility is EAGLE EGE (f)? (Fig. 57)

1- Flight Service Station.
2- Flight watch station.
3- Control tower for Eagle Co. Airport.
4- Remote Communications Outlet.

663. J11 What service is provided by Moab VOR (a)? (Fig. 57)

1- VOR with TACAN and compatible DME.
2- VOR with range limited to 25 nautical miles.
3- Temporary VOR and TWEB at 15 minutes past the hour.
4- Long range VOR and temporary TWEB at 15 minutes past the hour.

664. J23 What is the lowest altitude an IFR flight may cross Grand Junction VORTAC (b) southbound on V187? (Fig. 57)

1- 12,000 feet
2- 10,000 feet
3- 10,400 feet
4- 11,900 feet

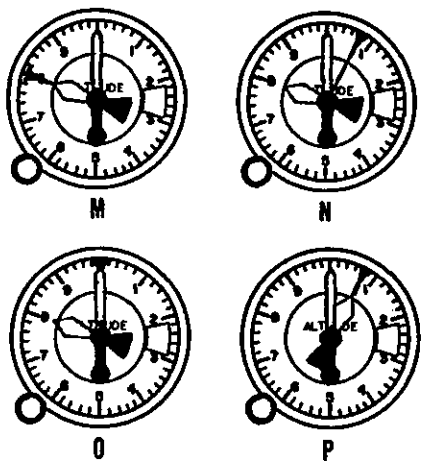
665. H33 At speeds below 200 knots (where compressibility is not a factor), true airspeed can be found by correcting

1- indicated airspeed for indicated altitude and temperature.
2- indicated airspeed for true altitude and temperature.
3- calibrated airspeed for pressure altitude and temperature.
4- calibrated airspeed for atmospheric pressure and temperature.

666. H33 What calibrated airspeed is required to obtain 170 knots TAS with a pressure altitude of 11,500 feet and a temperature of -8°C?

1- 143 knots
2- 151 knots
3- 148 knots
4- 145 knots

667. H41 Which altimeter depicts 8,000 feet?



1- M
2- N
3- O
4- P

668. H42 Which instrument gives you the most pertinent information for pitch control in straight-and-level flight?

1- Heading indicator
2- Attitude indicator
3- Airspeed indicator
4- Altimeter

669. H43 The rate of descent on the glide slope is dependent upon

1- windspeed.
2- true airspeed.
3- calibrated airspeed.
4- groundspeed.

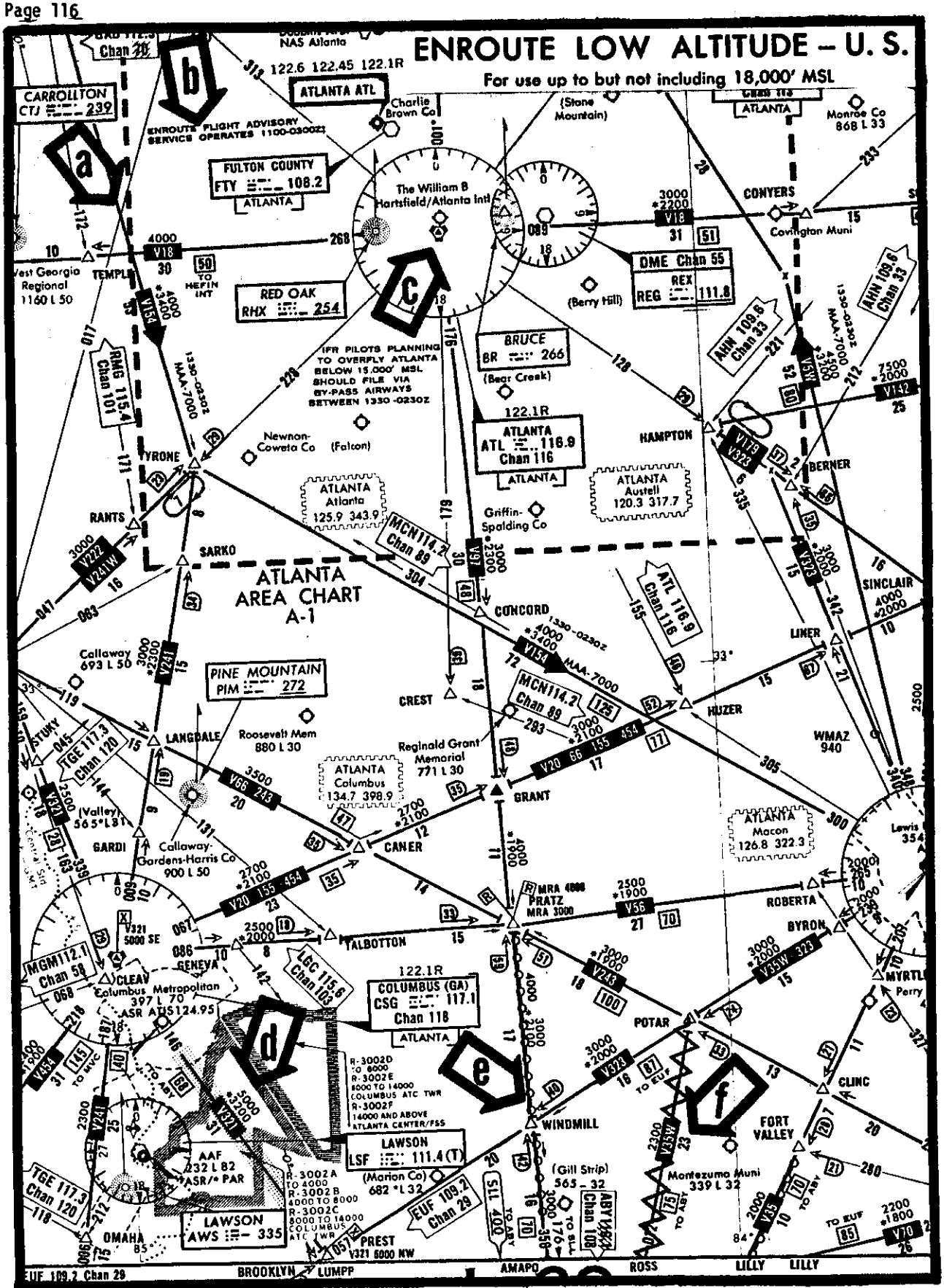

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
ATLANTA AREA CHART
A-1
ENROUTE FLIGHT ADVISORY SERVICE OPERATES 1100-0300Z
IFR PILOTS PLANNING TO OVERFLY ATLANTA BELOW 15,000' MSL SHOULD FILE VIA BY-PASS AIRWAYS BETWEEN 1330-0230Z
CARROLLTON CTJ 239
FULTON COUNTY FTY 108.2 ATLANTA
ATLANTA ATL 122.6 122.45 122.1R
The William B Hartsfield/Atlanta Intl
RED OAK RHX 254
BRUCE BR 266
(Bear Creek)
ATLANTA ATL 116.9 Chan 116
ATLANTA
DME Chan 55 REX REG 111.8
CONYERS
Covington Muni
HAMPTON
BERNER
SINCLAIR
LINER
HUZER
WMAZ 940
CONCORD
CREST
GRANT
CANER
PRATZ MRA 3000
ROBERTA
BYRON
POTAR
CLINC
FORT VALLEY
WINDMILL
TALBOTTON
GENEVA
LANGDALE
PINE MOUNTAIN PIM 272
Roosevelt Mem 880 L 30
Reginald Grant Memorial 771 L 30
Callaway-Gardens-Harris Co 900 L 50
Callaway 693 L 50
West Georgia Regional 1160 L 50
Newnan-Coweta Co (Falcon)
Griffin-Spalding Co
(Stone Mountain)
(Berry Hill)
Monroe Co 868 L 33
Montezuma Muni 339 L 32
(Gill Strip) 565 – 32
(Marion Co) 682 *L 32
Columbus Metropolitan 397 L 70 ASR ATIS 124.95
AAF 232 L 82 *ASR/* PAR
LAWSON AWS 335
LAWSON LSF 111.4 (T)
COLUMBUS (GA) CSG 117.1 Chan 118
R-3002A TO 4000
R-3002B 4000 TO 8000
R-3002C 8000 TO 14000 COLUMBUS ATC TWR
R-3002D TO 6000
R-3002E 6000 TO 14000 COLUMBUS ATC TWR
R-3002F 14000 AND ABOVE ATLANTA CENTER/FSS
RMG 115.4 Chan 101
MCN 114.2 Chan 89
AHN 109.6 Chan 33
ATL 116.9 Chan 116
TGE 117.3 Chan 120
LGC 115.6 Chan 103
MGM 112.1 Chan 58
EUF 109.2 Chan 29
SLL 400
ABY 116.6 Chan 108
OMAHA
PREST V321 6000 NW
BROOKLYN
LUMPP
AMAPO
ROSS
LILLY
LILLY

FIG. 58

670. J26 Determine the VOR changeover point on V97 between Atlanta VORTAC (c) and Albany (ABY) VORTAC, 42 DME miles south of WINDMILL Intersection (e)? (Fig. 58)

1- PRATZ Intersection.
2- WINDMILL Intersection.
3- Halfway between GRANT and PRATZ Intersections.
4- GRANT Intersection.

671. J41 Which ATC facility controls the IFR flights on V154 (a) through the Atlanta TCA? (Fig. 58)

1- The William B. Hartsfield Atlanta International Control Tower.
2- Atlanta Approach Control.
3- Atlanta remote site for Atlanta Center.
4- Enroute Flight Advisory Service.

672. G16 What effect does the airway restriction on V321 (d) have on an IFR flight? (Fig. 58)

1- You may only request altitudes below 4,000 feet or above 14,000 feet.
2- None, ATC automatically clears your flight when the clearance routes you on this airway.
3- You must request clearance from Lawson AAF prior to penetrating the special use airspace.
4- You must request permission to penetrate this special use airspace through Columbus Tower.

673. J23 What IFR altitudes on the eastbound bypass airway, V154, (a) are designated for use during the hours 1330--0230Z? (Fig. 58)

1- Only altitudes from 4,000 to 7,000 feet.
2- Any altitude below 15,000 feet.
3- Any altitude above 15,000 feet.
4- Any altitudes from 7,000 to 15,000 feet.

674. J22 Which navigation facility forms the substitute route (e) on V97? (Fig. 58)

1- Atlanta (ATL) VORTAC.
2- Sasser (SLL) NDB.
3- Albany (ABY) VORTAC.
4- Sasser (SLL) VOR.

675. J22 What is the status of V35W (f)? (Fig. 58)

1- Segment is unreliable at certain times.
2- DME portion of VORTAC is out of service.
3- Radial usable except for identifying POTAR Intersection.
4- Segment is unusable or closed.

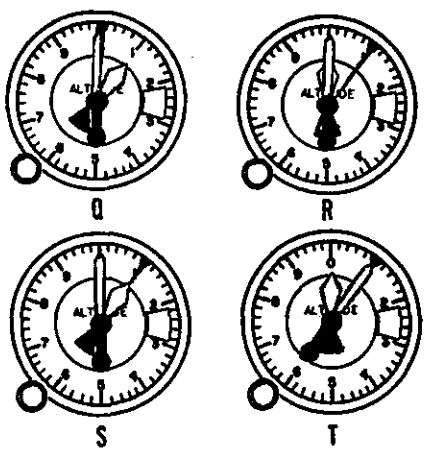
676. G25 How can a pilot request En Route Flight Advisory Service (EFAS) in the Atlanta area (b)? (Fig. 58)

1- Contact the Atlanta FSS by transmitting on 122.1 and receiving on 116.9 MHz.
2- Request EFAS through Atlanta Center on 125.9 or 120.3 MHz.
3- Contact the Atlanta FSS on 122.0 MHz.
4- Contact the Atlanta Flight Watch on 122.6, 122.45, or transmit on 122.1 and receive on 108.2 MHz.

677. H34 Upon arrival at your alternate, you have 45 minutes of fuel at normal cruise--30 gals./hr. How much additional time will you have for holding if you reduce power to a fuel flow of 22 gals./hr.?

1- 22 minutes
2- 25 minutes
3- 19 minutes
4- 16 minutes

678. H41 Which altimeter depicts 10,000 feet?



1- Q
2- R
3- S
4- T

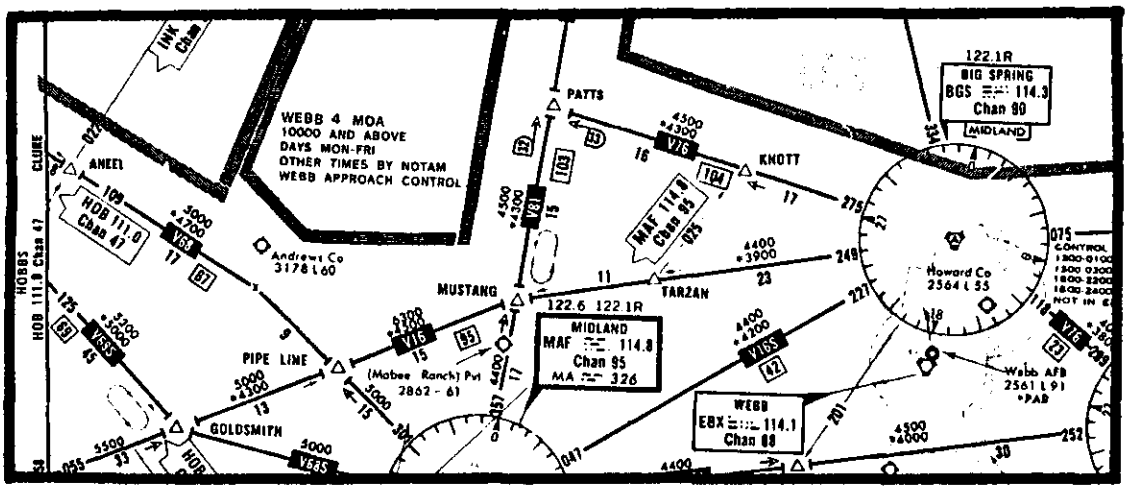
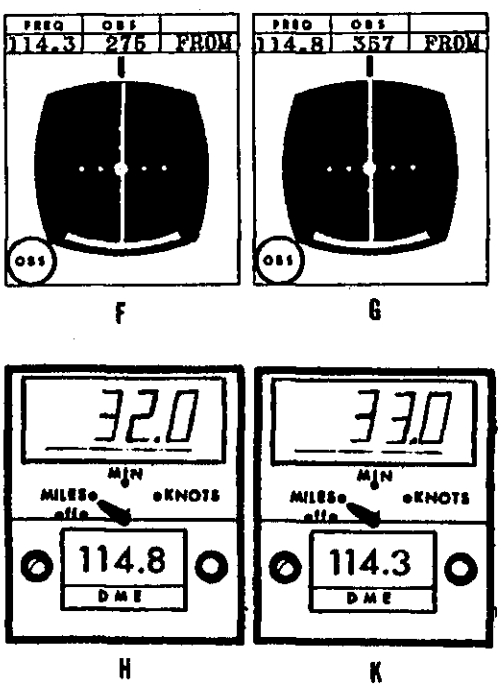


FIG. 59

679. H22 Which illustrations indicate the correct settings and the instruments to be used to most accurately identify PATTS Intersection when flying from Big Spring on V76? (Fig. 59)



F G H K

1- F and K
2- F and G
3- F and H
4- G and H

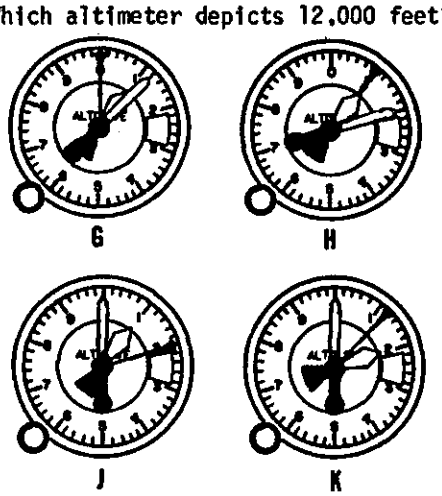
680. F23 On which VHF frequencies can Midland FSS transmit? (Fig. 59)

1- 122.6 and 122.1 only.
2- 121.5, 122.1, 122.2, and 122.6.
3- 121.5, 122.2, 122.6, and 114.8.
4- 122.6 and 114.8 only.

681. G54 You are flying west on V16 at an assigned altitude of 5,000 feet. You have been advised to expect 8,000 at Big Spring. Before reaching Big Spring, you have two-way communications failure. What altitude(s) should you fly from Big Spring to GOLDSMITH Intersection? (Fig. 59)

1- 5,000 feet to MUSTANG Intersection; 6,300 feet to PIPE LINE Intersection; and 5,000 feet to GOLDSMITH Intersection.
2- 8,000 feet.
3- 4,400 feet to MUSTANG Intersection; 6,300 feet to PIPE LINE Intersection; and 5,000 feet to GOLDSMITH Intersection.
4- 5,000 feet to MUSTANG Intersection; 7,000 feet to PIPE LINE Intersection; and 5,000 feet to GOLDSMITH Intersection.

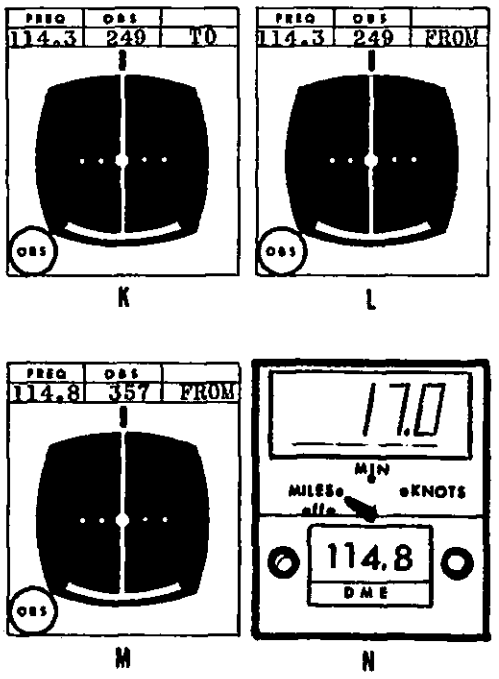
682. H41 Which altimeter depicts 12,000 feet?



G H J K

1- G
2- H
3- J
4- K

683. H21 Which instrument indications illustrated below have the correct settings and should be used to identify MUSTANG Intersection when flying from Big Spring on V16? (Fig. 59)



1- K and N
2- L and N
3- L and M
4- K and M

684. G54 What procedure should you use to change altitude at PIPE LINE Intersection if you are maintaining MEAs under lost communication rules? (En route from BGS to HOB via V16 to PIPE LINE, and V68 to HOB, Fig. 59.)

1- Climb from 4,500 feet to 4,700 feet prior to PIPE LINE.
2- Climb from 4,500 feet to 4,700 feet after passing PIPE LINE.
3- Descend from 6,300 feet to 5,000 feet prior to PIPE LINE.
4- Descend from 6,300 feet to 5,000 feet after passing PIPE LINE.

685. H42 Which instrument(s) should be used to make a pitch correction when you have deviated from your assigned altitude?

1- Manifold pressure gauge.
2- Manifold pressure gauge and airspeed indicator.
3- Attitude indicator.
4- Altimeter.

686. G24 While proceeding west from Big Spring (BGS) on V16, you are cleared to hold at MUSTANG Intersection. Which entry procedure is recommended? (Fig. 59)

1- Parallel or Direct
2- Teardrop only
3- Direct or Teardrop
4- Parallel only

687. H42 Which instruments are grouped as pitch instruments?

1- Altimeter, airspeed, and manifold pressure or RPM.
2- Attitude indicator, airspeed indicator, and manifold pressure or RPM.
3- Attitude indicator, altimeter, and manifold pressure gauge.
4- Attitude indicator, altimeter, airspeed indicator, and vertical speed indicator.

688. H42 Which instrument gives you the most pertinent information for bank control in straight-and-level flight?

1- Turn-and-slip indicator
2- Heading indicator
3- Attitude indicator
4- Magnetic compass

689. H44 While recovering from an unusual flight attitude without the aid of the attitude indicator, approximate level pitch attitude is reached when the

1- airspeed arrives at cruising speed, the altimeter reverses its trend, and the vertical-speed stops its movement.
2- airspeed and altimeter stop their movement and the vertical-speed indicator reverses its trend.
3- altimeter and vertical speed reverse their trend and the airspeed stops its movement.
4- vertical speed stops its movement and the airspeed and altimeter reverse their trend.

690. H51 Which is the most common hazard of lightning strikes on airplanes?

1- Temporary blindness of the pilot.
2- Igniting fuel in the tanks.
3- Electrocution of occupants.
4- Structural damage of major components of the airplane.

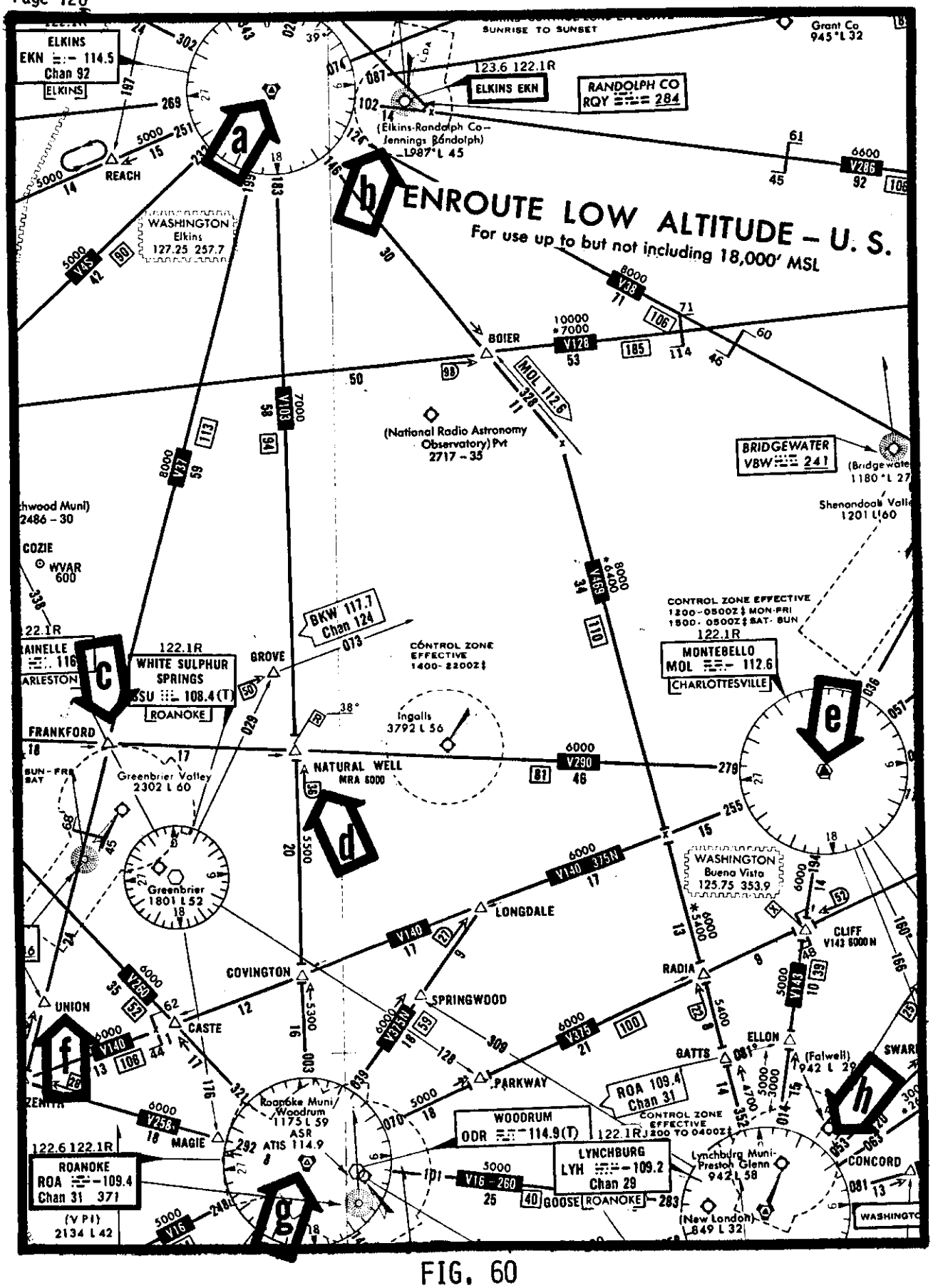

ENROUTE LOW ALTITUDE – U. S.
For use up to but not including 18,000' MSL
SUNRISE TO SUNSET
ELKINS
EKN 114.5
Chan 92
ELKINS
REACH
WASHINGTON
Elkins
127.25 257.7
ELKINS EKN
123.6 122.1R
RANDOLPH CO
RQY 284
(Elkins-Randolph Co–Jennings Randolph)
L987' L 45
Grant Co
945' L 32
BOIER
MOL 112.6
(National Radio Astronomy Observatory) Pvt
2717 – 35
BRIDGEWATER
VBW 241
Shenandoah Valley
1201 L 60
COZIE
WVAR
600
BKW 117.7
Chan 124
122.1R
WHITE SULPHUR SPRINGS
SSU 108.4 (T)
ROANOKE
GROVE
CONTROL ZONE EFFECTIVE
1400-2200Z‡
CONTROL ZONE EFFECTIVE
1200-0500Z‡ MON-FRI
1500-0500Z‡ SAT-SUN
122.1R
MONTEBELLO
MOL 112.6
CHARLOTTESVILLE
FRANKFORD
Greenbrier Valley
2302 L 60
Ingalls
3792 L 56
NATURAL WELL
MRA 6000
Greenbrier
1801 L 52
WASHINGTON
Buena Vista
125.75 353.9
LONGDALE
COVINGTON
SPRINGWOOD
RADIA
CLIFF
V143 6000N
UNION
CASTE
ELLON
GATTS
(Falwell)
1942 L 29
PARKWAY
ROA 109.4
Chan 31
CONTROL ZONE EFFECTIVE
0200 TO 0400Z‡
Roanoke Muni/Woodrum
1175 L 59
ASR
ATIS 114.9
WOODRUM
ODR 114.9 (T)
122.1R
LYNCHBURG
LYH 109.2
Chan 29
Lynchburg Muni-Preston Glenn
942 L 58
CONCORD
ROANOKE
ROA 109.4
Chan 31 371
(V PI)
2134 L 42
MAGIE
GOOSE
(New London)
L 849 L 32
WASHINGTC
a
b
c
d
e
f
g
h

FIG. 60

691. G10 While maintaining minimum cruising altitude on a "VFR on Top" clearance from Roanoke VORTAC (g) to Elkins VORTAC (a), you are instructed to report NATURAL WELL Intersection (d). If clouds are not a factor and the DME is inoperative, what minimum altitude is required at NATURAL WELL and what is the minimum cruising altitude from NATURAL WELL to Elkins? (Fig. 60)

1- 6,000 feet and 7,500 feet
2- 5,500 feet and 6,500 feet
3- 5,500 feet and 7,000 feet
4- 6,000 feet and 7,000 feet

692. J42 Which center will control your flight from Elkins (a) to Lynchburg (h)? (Fig. 60)

1- Indianapolis
2- Jacksonville
3- Washington
4- Atlanta

693. J41 Which discrete VHF frequencies are depicted at the ARTCC remote sites for flights from Elkins VORTAC (a) to Lynchburg (h)? (Fig. 60)

1- 123.6 and 124.25
2- 127.25 and 125.75
3- 125.55 and 124.25
4- 123.6 and 122.1

694. G10 While maintaining minimum cruising altitude on a "VFR on Top" clearance from Roanoke VORTAC (g) to Elkins VORTAC (a), you are instructed to report NATURAL WELL Intersection (d). If clouds are not a factor and you have DME, what minimum altitude is required at NATURAL WELL and what is the minimum cruising altitude from NATURAL WELL to Elkins? (Fig. 60)

1- 6,000 feet and 7,500 feet
2- 5,500 feet and 6,500 feet
3- 5,500 feet and 7,500 feet
4- 6,000 feet and 7,000 feet

695. B21 What is your ETA over Lynchburg (h) with the following conditions? (Fig. 60)

Cross Elkins (a) at 1200Z on V469
Wind report (Avg.) 345° @ 45 knots
Temp. at cruising altitude of 9,000 0°C.
Var. 6°W.
CAS = 130 knots

1- 1311Z
2- 1314Z
3- 1237Z
4- 1234Z

696. J26 Where is the VOR changeover point on V140 for a flight from Montebello (e)? (Fig. 60)

1- LONGDALE Intersection.
2- CASTE Intersection.
3- Mileage breakdown point SW of CASTE Intersection.
4- 53 miles SW of MOL VORTAC.

697. K21 When approaching Roanoke VORTAC (g), ATC instructs you to hold west of MAGIE Intersection on the Roanoke 292 radial, left turns. What is the recommended entry if you are vectored to the intersection on a heading of 176°? (Fig. 60)

1- Parallel
2- Teardrop
3- Parallel or direct
4- Direct

698. H32 At what time should you arrive at Elkins VORTAC (a) if you pass over UNION Intersection (f) at 1203 and 30 seconds and over FRANKFORT Intersection (c) at 1214? (Fig. 60)

1- 1243
2- 1246
3- 1237
4- 1240

699. J12 What is the frequency of the NDB located on the Elkins-Randolph Co. Airport (b)? (Fig. 60)

1- 284
2- 987
3- 123.6
4- 114.5

700. H51 What precautions, in addition to controlling the airplane, should you take if you cannot avoid a thunderstorm penetration?

1- Tighten safety belts, turn on pitot heat, turn on carburetor heat or alternate air, and turn up high intensity cockpit lights.
2- Tighten safety belts; turn on autopilot to speed hold mode; turn off all other electrical equipment except transponder.
3- Adjust altitude to below the freezing level; turn on autopilot to speed hold mode; turn on high intensity cockpit lights.
4- Turn on pitot heat, carburetor heat or alternate air, deicing and anti-icing equipment, and turn up high intensity cockpit lights.

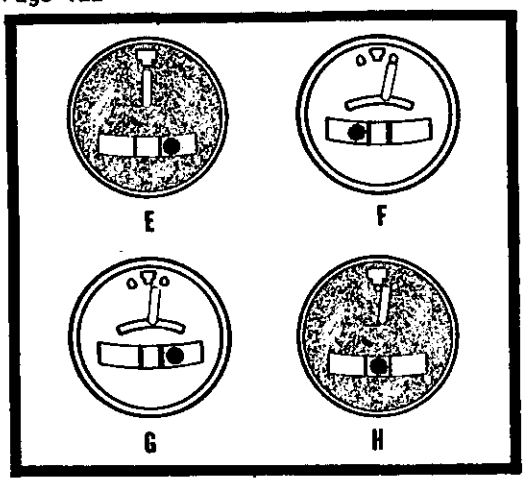


FIG. 61

701. H41 What rate of turn, if any, is indicated by illustration G? (Fig. 61)

1- 1 1/2° per second.
2- None, the right wing is low.
3- 3° per second.
4- 10° per second.

702. H41 Which illustration indicates that the aircraft is making a standard rate turn, but is skidding? (Fig. 61)

1- E
2- F
3- G
4- H

703. H44 If your airplane is in an unusual flight attitude and the attitude indicator has exceeded its limits, which instruments should you first rely on to determine pitch attitude before starting recovery?

1- Airspeed and altimeter to detect a nose high or low condition.
2- Rate of climb and airspeed to detect approaching V_{S1} or V_{MO}.
3- Turn indicator and rate of climb to determine if the airplane is not in a level flight attitude.
4- Turn indicator and ball to detect a turning condition.

704. H51 If you fly into severe turbulence, which should you attempt to maintain?

1- Constant altitude.
2- Level flight attitude.
3- Constant airspeed (V_A).
4- Constant altitude and constant airspeed.

705. H41 Which illustrations indicate a 3° per second turn? (Fig. 61)

1- E and F
2- F and G
3- F and H
4- G and H

706. H51 What is the best procedure for controlling an airplane if a thunderstorm is penetrated?

1- Maintain altitude at minimum controllable airspeed--don't turn back.
2- Maintain airspeed in safe operating range--turn 90° to the right.
3- Maintain a constant attitude and safe operating range power setting--don't turn back.
4- Reduce airspeed to maneuvering speed--turn 180° as soon as possible.

707. H52 Your clearance is, "CLEARED AS FILED, MAINTAIN 12,000." You encounter ice pellets from takeoff to 11,500 feet, at which point you fly into freezing rain. What clearance amendment should you request?

1- A lower altitude.
2- An increase in airspeed.
3- Both an increase in airspeed and a higher altitude.
4- A higher altitude.

708. H53 You are flying in the clouds in a reciprocating engine powered airplane not equipped with fuel injection. If you notice a manifold pressure decrease of approximately 1 inch and a decrease in airspeed, what action should you take?

1- If temperature is above freezing, adjust power to return to cruise airspeed, then set original power.
2- If temperature is below freezing, use full power to return to cruise airspeed. Reduce to cruise power and place carburetor heat to full-on position.
3- Increase manifold pressure above the original setting until you have returned to cruise airspeed, then reduce power to original setting.
4- Apply carburetor heat to full-on position. If manifold pressure increases, follow instructions for carburetor icing.

709. H44 Which is the correct sequence for recovery from a spiraling, nose-low, increasing airspeed, unusual flight attitude?

1- Reduce power, correct the bank attitude, and raise the nose to the horizon.
2- Correct the bank attitude, center the turn needle, and reduce power.
3- Correct the bank attitude, reduce power, and raise the nose until the altimeter has reversed direction of travel.
4- Raise the nose to the horizon, correct the bank attitude, and reduce power to avoid excessive airspeeds.

710. J11 If an IFR flight attempted to cruise at a higher altitude than the MAA designated for a route segment,

1- communications and radar identification would be impaired.
2- no separation would be provided from traffic on the overlying jet airway.
3- there would be danger of collision with military aircraft which are controlled by a different agency.
4- navigation signals might not be usable, due to nearby VORs on the same frequency.

711. J11 A particular VOR station is undergoing routine maintenance. This is evidenced by

1- transmitting a series of "dots" after each identification signal.
2- removal of the navigational feature.
3- broadcasting a maintenance alert signal on the voice channel.
4- removal of the identification feature.

712. J11 After tuning both your VOR receiver and DME to a VORTAC station, you listen to the identification and receive only one 3-letter code identifier every 37 1/2 seconds. What does this indicate?

1- The DME only is operative.
2- The VOR only is operative.
3- Maintenance is being performed at the VORTAC.
4- The audio feature of your receiver is not functioning properly.

713. J11 What indication should a pilot receive when a VOR station is undergoing maintenance and may be considered unreliable?

1- Coded identification but no navigation indications.
2- Navigation indications but no coded identification.
3- Navigation and coded signals but an intermittent "OFF" flag.
4- A voice recording on the VOR frequency announcing that the VOR is out of service for maintenance.

714. J23 The Minimum Enroute Altitude (MEA) ensures acceptable navigational signal coverage and

1- meets obstruction clearance requirements.
2- intersection identification.
3- DME response.
4- radar coverage.

715. J23 Why are IFR flight operations at the MOCA limited to within 22 NM of a VOR? The MOCA only assures

1- obstacle clearance for 22 NM.
2- acceptable radio signals for accurate navigation within 22 NM.
3- obstacle clearance and acceptable radio signals for accurate navigation and communications within 22 NM.
4- radio signals for accurate navigation, DME, radar, and obstacle clearance for 22 NM.

716. J23 Which condition applies to all of the following altitude limits: MAA, MCA, MRA, MOCA, and MEA? (Non-mountainous area.)

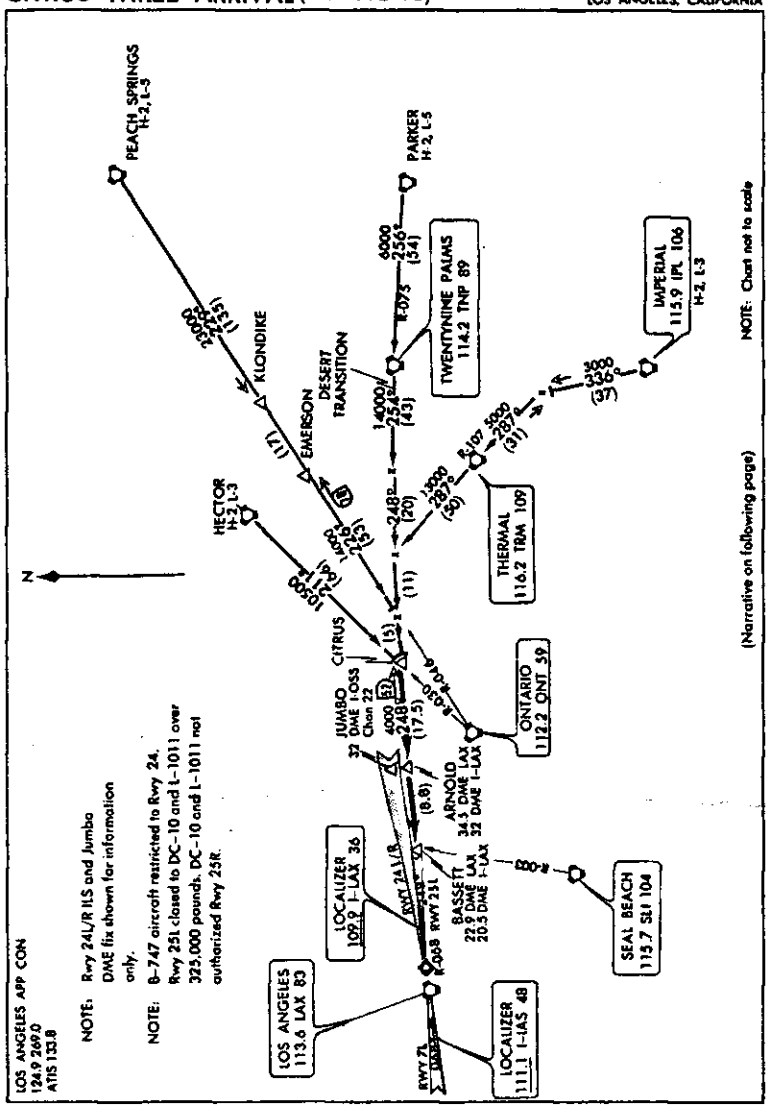
1- 1,000 feet for obstacle clearance.
2- Adequate navigation signals.
3- Adequate communication signals.
4- Radar coverage for transponder equipped aircraft.

717. J25 What is a "waypoint" when used for an IFR flight?

1- A geographical position or fix on an RNAV route.
2- A reporting point defined by the intersection of two VOR radials.
3- A fix used for final approach during a DME Arc approach.
4- A location on a Victor Airway which can only be identified by VOR and DME signals.

CITRUS THREE ARRIVAL (4CW.4CW3)

LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA



CITRUS THREE ARRIVAL (4CW.4CW3)
LOS ANGELES, CALIFORNIA
LOS ANGELES INTERNATIONAL

CITRUS THREE ARRIVAL (4CW.4CW3)
LOS ANGELES INTERNATIONAL
LOS ANGELES, CALIFORNIA

ARRIVAL ROUTE DESCRIPTION

DESERT TRANSTION (TNP.4CW3) : From over TWENTYNINE PALMS VORTAC via TWENTYNINE PALMS R-254 and LOS ANGELES R-068 to CITRUS INT. Thence . . . .

HECTOR TRANSITION (HEC.4CW3): From over HECTOR VORTAC via HECTOR R-211 and ONTARIO R-030 to CITRUS INT. Thence . . . .

IMPERIAL TRANSITION (IPL.4CW3): From over IMPERIAL VORTAC via IMPERIAL R-336 and THERMAL R-107 and R-287 and LOS ANGELES R-068 to CITRUS INT. Thence . . . .

PARKER TRANSITION (PKE.4CW3): From over PARKER VORTAC via PARKER R-256 and TWENTYNINE PALMS R-075 to TWENTYNINE PALMS VORTAC. Via TWENTYNINE PALMS R-254 and LOS ANGELES R-068 to CITRUS INT. Thence . . . .

PEACH SPRINGS TRANSITION (PGS.4CW3): From over PEACH SPRINGS VORTAC via PEACH SPRINGS R-229 and ONTARIO R-046 and LOS ANGELES R-068 to CITRUS INT. Thence . . . .

. . . . From CITRUS INT. via LOS ANGELES ILS Rwy 25L Localizer east course/LAX R-068 via ARNOLD DME Fix to BASSETT INT.

Runways 24 and 25: From BASSETT INT expect ILS approach procedure to LOS ANGELES airport.

CITRUS THREE ARRIVAL (4CW.4CW3)
LOS ANGELES, CALIFORNIA
LOS ANGELES INTERNATIONAL

FIG. 62

718. What is the approach control frequency established for arrivals on the Imperial
M11 Transition? (Fig. 62)

1- 113.6
2- 115.9
3- 106.0
4- 124.9

719. Where should you change radio frequencies for navigation purposes after departing
J26 Twentynine Palms VORTAC on the Desert Transition? (Fig. 62)

1- At 63 miles from TNP VORTAC.
2- At 43 miles from TNP VORTAC.
3- At 67 miles from TNP VORTAC.
4- At CITRUS Intersection.

720. Determine the distance for the Citrus Three Arrival to the Los Angeles VORTAC
K11 including the Imperial Transition. (Fig. 62)

1- 186 NM
2- 178.2 NM
3- 183.8 NM
4- 181 NM

721. At what position should a climb be initiated to 14,000 feet on the Imperial
D54 Transition if maintaining the MEA? (Fig. 62)

1- At the mileage breakdown point 8 miles east of CITRUS Intersection.
2- Prior to the mileage breakdown point on TRM R-287.
3- At the mileage breakdown point on TRM R-287.
4- Prior to the mileage breakdown point 8 miles east of CITRUS Intersection.

722. The Minimum Enroute Altitude (MEA) is
J23 an altitude which assures

1- a 500-foot clearance above the highest obstacle and an accurate navigational signal between VORTACs.
2- obstacle clearance, accurate navigational signals from more than one VORTAC, and accurate DME mileage.
3- a 1,000-foot clearance within 2 miles of an airway and assures accurate DME mileage.
4- acceptable navigational signal coverage and meets obstruction clearance requirements.

723. Which airspace is defined as a Transi-
J27 tion Area when designated in conjunction with an airport which has a prescribed instrument approach procedure?

1- That airspace extending from the surface and terminating at the base of the Continental Control Area.
2- The airspace extending from the surface to the MEA.
3- The airspace within a 5-statute mile radius of the airport and extending from the surface to 3,000 feet AGL.
4- The airspace extending upward from 700 feet or more above the surface and terminating at the base of the overlying controlled airspace.

724. Which controlled airspaces are depicted
J27 on the Enroute Low Altitude Chart?

1- Control Zones, Victor Airways, and Special Use Airspace.
2- Airport Traffic Areas and Low Altitude Airways.
3- Positive Control Areas, Special Use Airspace, Control Zones, and Transition Areas.
4- Special Use Airspace, Transition Areas, Airport Traffic Areas, Terminal Control Areas, and Air Defense Identification Zones.

725. What are the vertical limits of a transi-
J27 tion area when it is designated in conjunction with an airport having a prescribed instrument approach procedure?

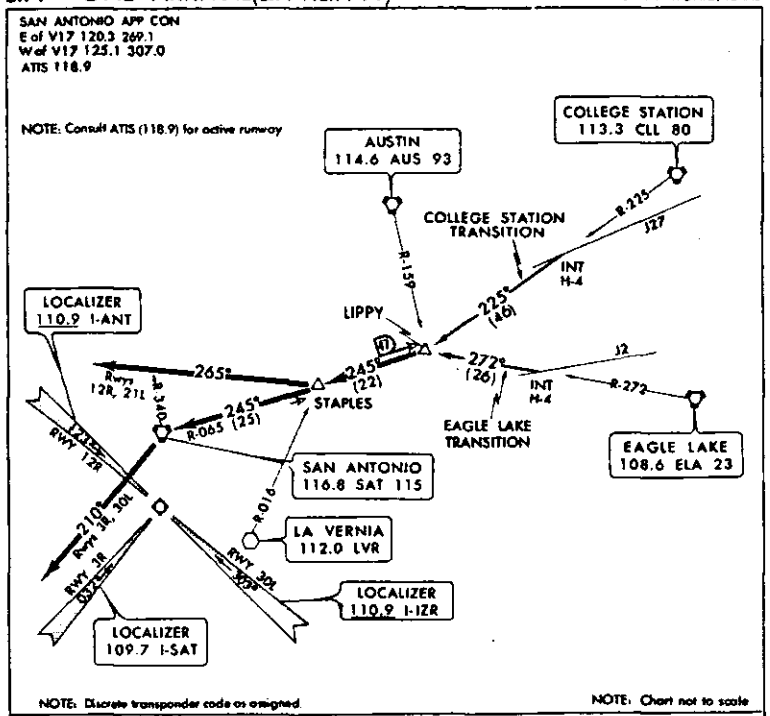
1- 1,200 feet AGL to the overlying control area.
2- 700 feet AGL to the overlying control area.
3- Surface to 700 feet AGL or the overlying control area.
4- Surface to 1,200 feet AGL or the overlying control area.

726. How does the pilot normally obtain the
J43 current altimeter setting during an IFR flight in controlled airspace below 18,000 feet?

1- Contact ARTCC at least every 100 nautical miles and request the altimeter setting.
2- ATC will periodically advise you of the proper altimeter setting.
3- Monitor the weather reports from the FSS stations along the route.
4- Contact the nearest FSS at least every 100 nautical miles and request the altimeter setting.

LIPPY ONE ARRIVAL(LIPPY.LIPPY1)

SAN ANTONIO INTL
SAN ANTONIO, TEXAS



COLLEGE STATION TRANSITION (CLL.LIPPY1): From over the intersection of J27 and CLL R-225, then via CLL R-225 to LIPPY INT. Thence....

EAGLE LAKE TRANSITION (ELA.LIPPY1): From over the intersection of J2 and ELA R-272, then via ELA R-272 to LIPPY INT. Thence....

....For Runways 12R and 21L: Depart LIPPY INT via SAT R-065 to STAPLES INT, then via heading 265° for radar vector to final approach course. (Expect descent from assigned altitude at SAT R-340.)

....For Runways 3R and 30L: Depart LIPPY INT via SAT R-065 to SAT VORTAC, thence via heading 210° for radar vector to final approach course. (Expect descent from assigned altitude at SAT VORTAC.)

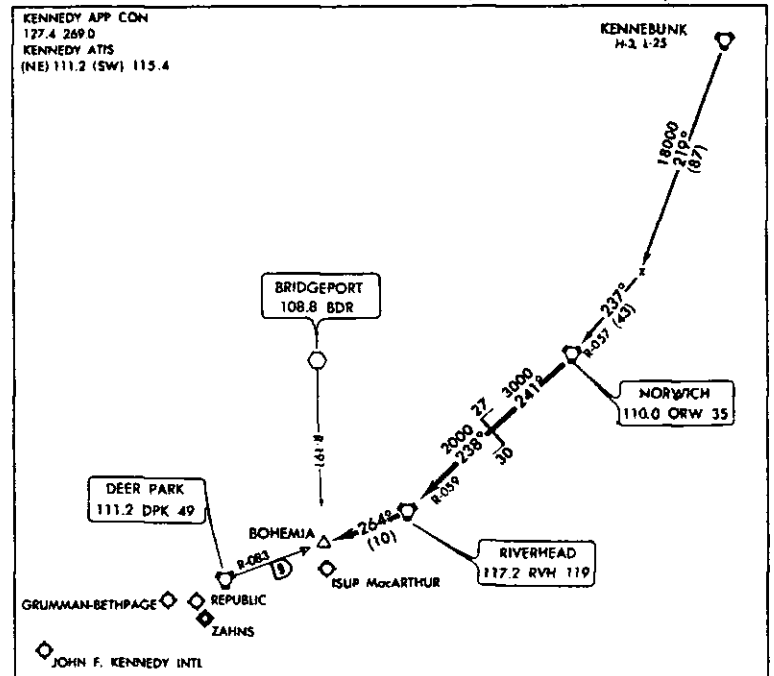
LIPPY ONE ARRIVAL(LIPPY.LIPPY1)

SAN ANTONIO, TEXAS
SAN ANTONIO INTL

FIG. 63

SAYBROOK TWO ARRIVAL(ORW.SAYO2)

NEW YORK, NEW YORK



KENNEBUNK TRANSITION (ENE.SAYØ2): From over KENNEBUNK VORTAC via ENE R-219 to ORW R-057 to NORWICH VORTAC. Thence....

....From over NORWICH VORTAC via ORW R-241 to RVH R-059 to RIVERHEAD VORTAC, RVH R-264 intercept DPK R-083 to BOHEMIA INT.

SAYBROOK TWO ARRIVAL(ORW.SAYO2)

NEW YORK, NEW YORK

FIG. 64

727. K13 What maximum speed may be used for an airplane with reciprocating engines during that phase of the arrival below 10,000 feet? (Fig. 63)

1- 200 knots to the boundary of the TCA, then 156 knots.
2- 250 knots to the boundary of the airport traffic area, then 156 knots.
3- 250 knots to the boundary of the control zone, then 180 knots.
4- 200 knots to the boundary of the control zone, then 180 knots.

728. H33 What minimum rate of descent would be necessary if you were instructed to descend from 10,000 feet to 3,000 feet between STAPLES Intersection and SAT VORTAC while maintaining a 150-knot groundspeed? (Fig. 63)

1- 700 ft./min.
2- 320 ft./min.
3- 480 ft./min.
4- 550 ft./min.

729. K11 At what point should you expect descent from the assigned altitude while being radar vectored to ILS 12R at San Antonio? (Fig. 63)

1- At STAPLES Intersection.
2- When crossing R-340 of SAT VORTAC.
3- When intercepting the LOC course.
4- At LIPPY Intersection.

730. J27 The vertical extent of the positive control area throughout the conterminous United States is from

1- 14,500 feet to FL 450.
2- 18,000 feet to FL 450.
3- 18,000 feet to FL 600.
4- FL 240 to FL 600.

731. J61 Lift produced by an airfoil is the net force developed perpendicular to the

1- earth's surface.
2- relative wind.
3- chord.
4- longitudinal axis of the aircraft.

732. J75 In a helicopter, low frequency vibrations (100 to 400 cycles per minute) are normally associated with the

1- cooling fan.
2- main rotor.
3- tail rotor.
4- engine.

733. K11 What is the routing of the Saybrook Two Arrival? (Fig. 64)

1- ORW R-241 for 30 NM, RVH R-238 to RVH, RVH R-264 to DPK R-083, BOHEMIA INT.
2- ORW R-241 for 30 NM, RVH R-238 to RVH, RVH R-264 to BOHEMIA INT., DPK R-083, DPK VORTAC.
3- ORW R-241 for 27 NM, RVH R-059 to RVH, RVH R-264 to DPK R-083, BOHEMIA INT.
4- ORW R-241 for 27 NM, RVH R-059 to RVH, RVH R-264 to DPK R-083, DPK VORTAC.

734. K11 Determine the distance for the Saybrook Two Arrival including the Kennebunk Transition. (Fig. 64)

1- 197 NM
2- 140 NM
3- 149 NM
4- 170 NM

735. K11 What minimum rate of descent is necessary to descend from 18,000 feet at Norwich VORTAC to 2,000 feet at Riverhead VORTAC at a constant groundspeed of 250 knots? (Fig. 64)

1- 1,460 ft./min.
2- 705 ft./min.
3- 855 ft./min.
4- 1,170 ft./min.

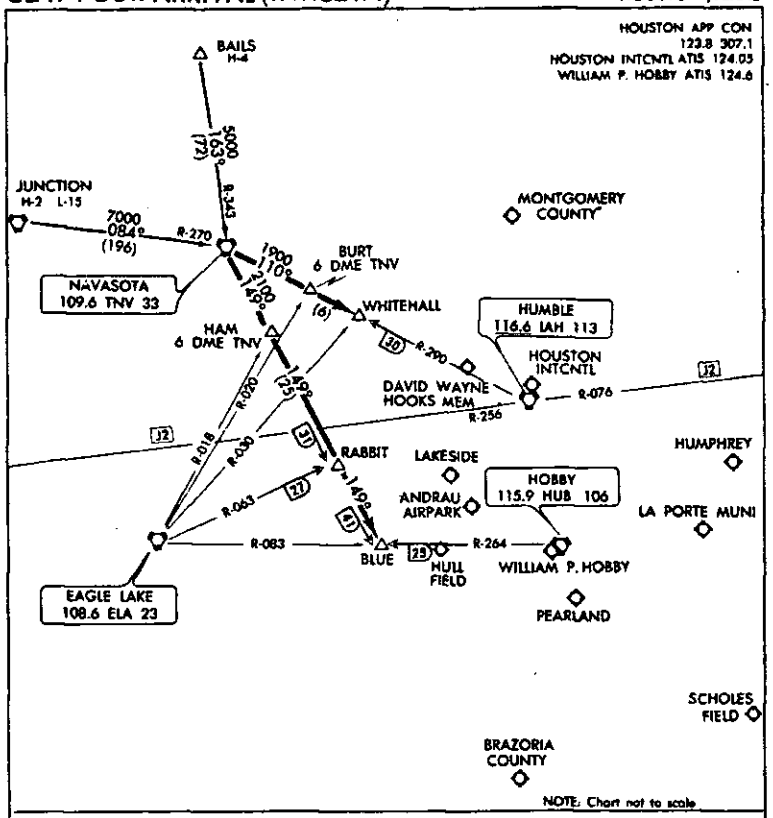
736. J74 The purpose of the lead-lag (drag) hinge in a three-bladed, fully-articulated helicopter rotor system is to compensate for

1- coriolis effect.
2- lateral instability during autorotation.
3- geometric unbalance.
4- dissymetry of lift.

737. J75 A pilot on an instrument flight in a heavily loaded helicopter is most likely to encounter retreating blade stall under which conditions?

1- Smooth air, lower than standard air temperature, and low rotor RPM.
2- Turbulent air, high rotor RPM, and lower than standard temperature.
3- Lower than standard air temperature, smooth air, and high rotor RPM.
4- Low rotor RPM, turbulent air, and higher than standard air temperature.

CLAY FOUR ARRIVAL (TNV.CLAY4) — HOUSTON, TEXAS

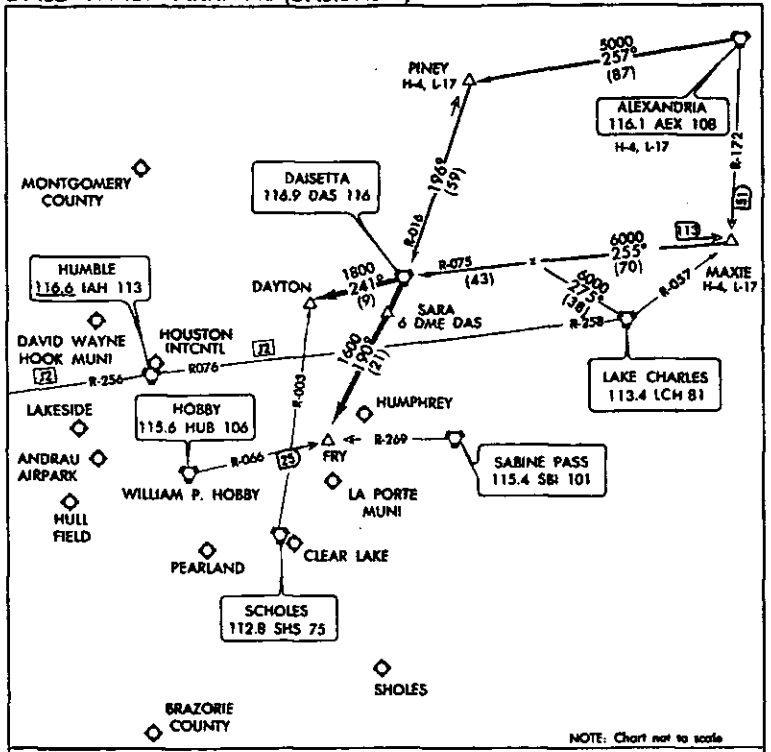


BAILS TRANSITION (BAILS.CLAY4): From over BAILS INT via TNV R-343 to TNV VORTAC. Thence . . . .
JUNCTION TRANSITION (JCT.CLAY4): From over JUNCTION VORTAC via JUNCTION R-084 and TNV R-270 to TNV VORTAC. THENCE . . . .
. . . . For airports north of J2: Depart TNV VORTAC via TNV R-110 to WHITEHALL INT. Radar vector to final approach course.
. . . . For airports south of J2: Depart TNV VORTAC via TNV R-149 to BLUE INT. Radar vector to final approach course.

CLAY FOUR ARRIVAL (TNV.CLAY4) — HOUSTON, TEXAS

FIG. 65

DALE THREE ARRIVAL (DAS.DALE3) — HOUSTON, TEXAS



ALEXANDRIA TRANSITION (AEX.DALE3): From over AEX VORTAC via AEX R-257 and DAS R-016 to DAS VORTAC. Thence . . . .
LAKE CHARLES TRANSITION (LCH.DALE3): From over LCH VORTAC via LCH R-275 and DAS R-075 to DAS VORTAC. Thence . . . .
MAXIE TRANSITION (8XE.DALE3): From over MAXIE INT via DAS R-075 to DAS VORTAC. Thence . . . .
PINEY TRANSITION (8PF.DALE3): From over PINEY INT VIA DAS R-016 to DAS VORTAC. Thence . . . .
. . . . For airports north of J2: Depart DAS VORTAC via R-241 to DAYTON INT. Radar vector to final approach course.
. . . . For airports south of J2: Depart DAS VORTAC via DAS R-190 to FRY INT. Radar vector to final approach course.

DALE THREE ARRIVAL (DAS.DALE3) — HOUSTON, TEXAS

FIG. 66

738. H33 What minimum rate of descent is necessary to descend from 16,000 feet at Navasota VORTAC to 3,000 feet at BLUE Intersection, if a 170-knot groundspeed is maintained? (Fig. 65)

1- 900 ft./min.
2- 450 ft./min.
3- 1,110 ft./min.
4- 1,300 ft./min.

739. H33 What minimum rate of descent is necessary to descend from 18,000 feet at Navasota VORTAC to 3,000 feet at Humble VORTAC if a 168-knot groundspeed is maintained? (Fig. 65)

1- 1,100 ft./min.
2- 1,200 ft./min.
3- 900 ft./min.
4- 1,000 ft./min.

740. K11 Which route should you use if you are given the DALE THREE ARRIVAL with the LAKE CHARLES TRANSITION and your destination is Houston Intercontinental? (Fig. 66)

1- From LCH, proceed via the 258 radial to Houston Intercontinental or until Houston Approach Control gives you radar vectors.
2- Proceed via the LCH 275 radial and the DAS 075 radial to DAS VORTAC. Proceed from DAS VORTAC via the 241 radial to DAYTON Intersection; radar vectors to final approach course.
3- Proceed via LCH 275 radial to DAS 075 radial to DAS VORTAC. Proceed from DAS VORTAC via the 190 radial to FRY Intersection; radar vectors to final approach course.
4- From LCH VORTAC, proceed to DAS VORTAC via the LCH 275 radial and the DAS 075 radial. Radar vectors to Houston Intercontinental final approach course.

741. K11 What is the approximate mileage from Alexandria to the fix from which you will be radar vectored, if you are flying to William P. Hobby Airport and your clearance contains the Dale Three Arrival? (Fig. 66)

1- 167 miles
2- 201 miles
3- 46 miles
4- 155 miles

742. K11 What is the purpose of the Scholes 003 radial as indicated on the Dale Three Arrival? (Fig. 66)

1- Course guidance for aircraft proceeding from Scholes VORTAC and for identification of DAYTON Intersection.
2- For use in determining DAYTON Intersection when DME is not used.
3- Course guidance for aircraft that arrive at Scholes VORTAC when their destination is Houston Intercontinental Airport.
4- Course guidance of aircraft departing Clear Lake Airport for DAYTON Intersection.

743. K11 What is the approximate mileage from Lake Charles VORTAC to the point from which you will be radar vectored, if your destination is Houston Intercontinental and your clearance contains the Dale Three Arrival? (Fig. 66)

1- 122 miles
2- 102 miles
3- 90 miles
4- 108 miles

744. J75 While en route IFR, in level cruising flight in a helicopter, a pilot experiences low frequency vibrations (100 to 400 cycles per minute). These vibrations are normally associated with the

1- tail rotor.
2- engine.
3- cooling fan.
4- main rotor.

745. J81 Why is hypoxia particularly dangerous during flights with one pilot?

1- Hypoxia can cause panic and eventual loss of control.
2- Night vision may be so impaired that the pilot cannot see other aircraft.
3- Symptoms of hypoxia are difficult to recognize before the pilot's reactions are affected.
4- The pilot may not be able to control the aircraft even if using oxygen.

746. J83 How can an instrument pilot best overcome vertigo?

1- Avoid turns of more than 30°.
2- Use supplemental oxygen.
3- Use a very rapid cross-check.
4- Rely on the sense of sight.

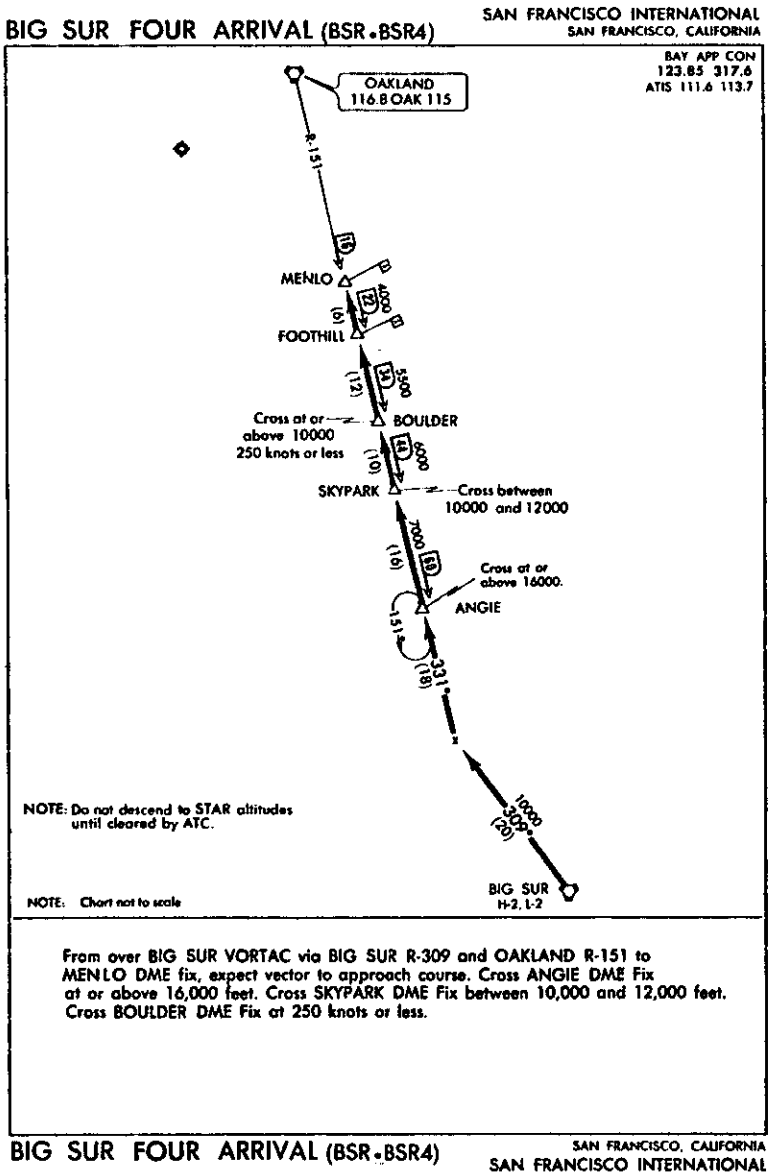


FIG. 67

747. K11 Having received a Big Sur Four Arrival clearance with a visibility of at least 2 miles, what procedure should you expect from MENLO Intersection to the airport? (Fig. 67)

1- Fly direct to the airport and land.
2- To be given either a contact or visual approach.
3- Radar vectors to approach course.
4- Fly to OAKLAND VORTAC and then make an assigned approach.

748. K11 Approximately 10 DME miles before reaching Big Sur VORTAC, you are cleared to descend and maintain flight level 180 and are given the Big Sur Four Arrival. When should you start descent from 18,000? (Fig. 67)

1- When cleared to do so by ATC.
2- In time to cross Big Sur VORTAC at 16,000.
3- Upon arrival at Big Sur VORTAC.
4- At your convenience.

749. K11 When flying the Big Sur Four Arrival, where is the VOR changeover point between Big Sur VORTAC and Oakland VORTAC? (Fig. 67)

1- 19 DME miles from Big Sur.
2- 60 DME miles from OAK.
3- Halfway, or 50 DME miles from OAK.
4- Where the Big Sur R-309 intercepts the Oakland R-151.

750. K11 You are cleared via the Big Sur Four Arrival, maintain 8,000. If you are at 18,000, when may you descend to 12,000? (Fig. 67)

1- At SKYPARK Intersection.
2- Between ANGIE and SKYPARK Intersections.
3- Immediately.
4- At your convenience.

751. J75 A helicopter pilot, during the en route phase of an instrument flight, should remain below the V_{NE} (never-exceed speed). This speed, in most helicopters

1- is the same at all altitudes.
2- increases as altitude increases.
3- is higher at low altitude than at high altitude.
4- remains the same up to critical altitude and decreases above critical altitude.

752. J76 Which procedure will result in recovery from "settling-with-power" in a helicopter with the least loss of altitude?

1- Maintain constant collective pitch and increase throttle.
2- Increase forward speed and partially lower collective pitch.
3- Increase collective pitch and power.
4- Reduce collective pitch to the minimum and increase throttle.

753. J79 Helicopter climb performance is most adversely affected by

1- lower than standard temperature and low relative humidity.
2- higher than standard temperature and low relative humidity.
3- lower than standard temperature and high relative humidity.
4- higher than standard temperature and high relative humidity.

754. J83 A pilot is more subject to vertigo if

1- strapped tightly to the seat and unable to feel motions of the aircraft.
2- eyes are moved often in the process of cross-checking the flight instruments.
3- sense of sight conflicts with other senses.
4- ignoring or overcoming the sensations of muscles and inner ear.

755. J83 Which procedure is recommended to prevent or overcome vertigo?

1- Use a combination of feel and sight.
2- Avoid steep turns and rough control movements.
3- Rely entirely upon the indications of the flight instruments.
4- Use a very rapid cross-check.

756. J83 How may sensations of vertigo, which occur during actual or simulated instrument flight, be best overcome?

1- Believing in and reacting to instrument indications.
2- Ventilating the lungs with deep breathing for a short time.
3- Breathing oxygen for a short time.
4- Turning the head from side to side rapidly.

757. K10 Which clearance items may be issued by ATC without prior pilot request?

1- SID, STAR, and Visual Approach.
2- SID, STAR, and Contact Approach.
3- Contact and Visual Approaches.
4- SID, STAR, Contact and Visual Approaches.

758. K11 What technique should be used to make a "No Gyro Approach"?

1- Make all turns at standard rate and descend at 500 feet per minute.
2- Start and stop all turns when advised by Approach Control.
3- Make all turns at 1/2 standard rate.
4- Use descent rates and power settings as advised by Approach Control.

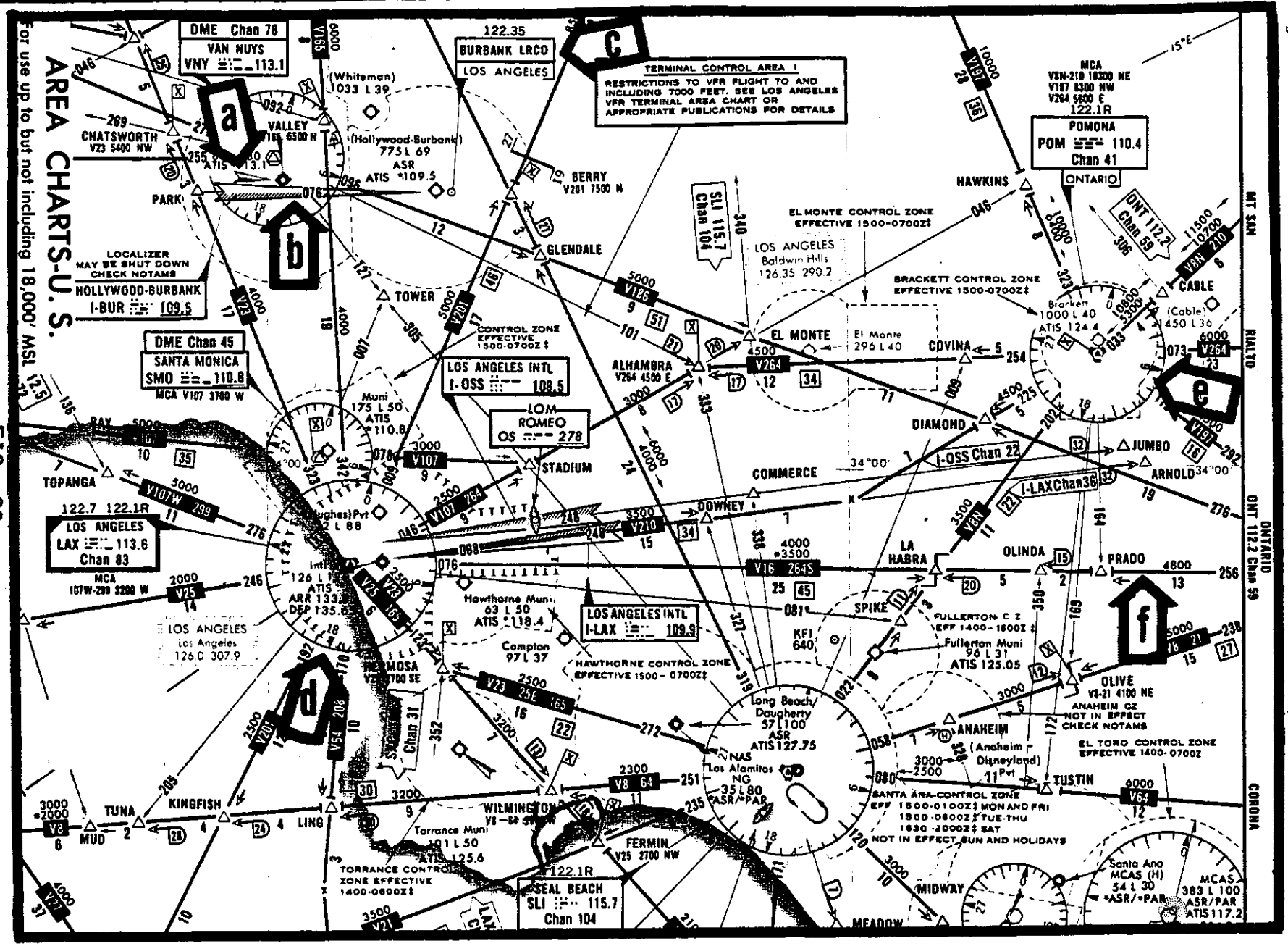

AREA CHARTS-U. S.
For use up to but not including 18,000' MSL
DME Chan 78
VAN NUYS
VNY 113.1
122.35
BURBANK LRCO
LOS ANGELES
TERMINAL CONTROL AREA
RESTRICTIONS TO VFR FLIGHT TO AND INCLUDING 7000 FEET. SEE LOS ANGELES VFR TERMINAL AREA CHART OR APPROPRIATE PUBLICATIONS FOR DETAILS
MCA V8N-219 10300 NE V187 8300 NW V264 9600 E
122.1R
POMONA
POM 110.4
Chan 41
ONTARIO
CHATSWORTH V23 5400 NW
VALLEY
(Whiteman) 1033 L 39
(Hollywood-Burbank) 7751 L 69
ASR
ATIS 109.5
BERRY V201 7500 N
PARK
HAWKINS
SLI 115.7 Chan 104
EL MONTE CONTROL ZONE EFFECTIVE 1500-0700Z‡
LOS ANGELES Baldwin Hills 126.35 290.2
ONT 112.2 Chan 59
LOCALIZER MAY BE SHUT DOWN CHECK NOTAMS
HOLLYWOOD-BURBANK I-BUR 109.5
GLENDALE
BRACKETT CONTROL ZONE EFFECTIVE 1500-0700Z‡
CABLE
(Cable) 1450 L 36
TOWER
CONTROL ZONE EFFECTIVE 1500-0700Z ‡
EL MONTE
El Monte 296 L 40
COVINA
DME Chan 45
SANTA MONICA
SMO 110.8
MCA V107 3700 W
LOS ANGELES INTL
I-OSS 108.5
ALHAMBRA V264 4500 E
LOM
ROMEO
OS 278
Muni 175 L 50 ATIS 110.8
DIAMOND
JUMBO
ARNOLD
I-OSS Chan 22
I-LAX Chan 36
STADIUM
COMMERCE
DOWNEY
TOPANGA
122.7 122.1R
LOS ANGELES
LAX 113.6
Chan 83
MCA 107W-299 3200 W
LA HABRA
OLINDA
PRADO
SPIKE
KFI 640
FULLERTON CZ EFF 1400-1600Z ‡
Fullerton Muni 96 L 31 ATIS 125.05
LOS ANGELES INTL
I-LAX 109.9
Hawthorne Muni 63 L 50 ATIS 118.4
Compton 97 L 37
HAWTHORNE CONTROL ZONE EFFECTIVE 1500-0700Z‡
LOS ANGELES
Los Angeles 126.0 307.9
Long Beach/ Daugherty 57 L 100 ASR ATIS 127.75
NAS Los Alamitos NG 35 L 80 ASR/*PAR
ANAHEIM
OLIVE
V8-21 4100 NE
ANAHEIM CZ NOT IN EFFECT CHECK NOTAMS
EL TORO CONTROL ZONE EFFECTIVE 1400-0700Z
(Anaheim Disneyland) Pvt
TUSTIN
SANTA ANA CONTROL ZONE EFF 1500-0100Z‡ MON AND FRI 1500-0800Z‡ TUE-THU 1630-2000Z‡ SAT NOT IN EFFECT SUN AND HOLIDAYS
TUNA
KINGFISH
LING
MUD
TORRANCE CONTROL ZONE EFFECTIVE 1400-0800Z‡
Torrance Muni 101 L 50 ATIS 125.6
WILMINGTON
FERMIN V25 2700 NW
122.1R
SEAL BEACH
SLI 115.7
Chan 104
MIDWAY
MEADOW
Santa Ana MCAS (H) 54 L 30 *ASR/*PAR
MCAS 383 L 100 ASR/PAR ATIS 117.2
MT SAN
RIALTO
ONTARIO
ONT 112.2 Chan 59
CORONA

FIG. 68

769. L24 How is the final approach fix identified on the VOR RWY 21 approach at Mohave County Airport? (Fig. 69)

	AURAL SIGNAL	MB LIGHT
1-	Series of dashes	purple or blue
2-	Two dashes/sec.	purple or blue
3-	Dot, dash, dot	white
4-	Alternate dots and dashes	amber or yellow

770. K41 When is the procedure turn a required maneuver for the VOR RWY 21 approach at Mohave County? (Fig. 69)

1- For all approaches.
2- When starting approach over IGM VOR.
3- For approaches when circling to land.
4- For all approaches except when radar vectored to the final approach course.

771. K52 How should a pilot determine the MAP on a straight-in VOR RWY 21 approach? (Fig. 69)

1- Arriving at 4,240 feet after passing Walapai FM.
2- Timing for 7.9 NM past the FAF.
3- TO/FROM reversal on VOR receiver.
4- Arriving at 4,440 feet after passing Walapai FM.

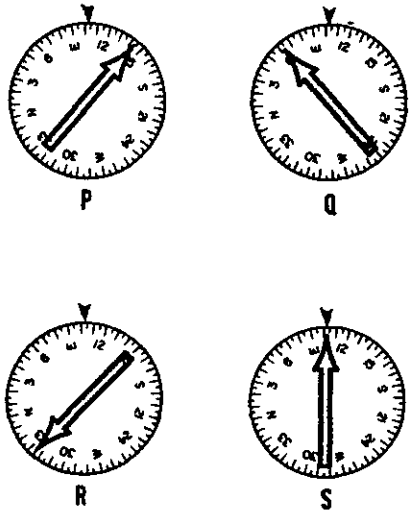
772. K41 The note, "Remain within 10 NM," on the VOR RWY 21 approach chart profile (Fig. 69) indicates that the pilot should remain within 10 NM of

1- MUSIC Intersection to complete the procedure turn.
2- the airport throughout the approach.
3- the course (IGM R-010) during the missed approach.
4- the course (IGM R-010) during the procedure turn.

773. K14 Is a procedure turn a required maneuver for the NDB RWY 16 approach at Bellingham International? (Fig. 70)

1- No, the depicted holding pattern may substitute for the procedure turn.
2- Yes, at all times.
3- No, only if it is necessary to reverse the course to intercept the final approach course.
4- No, radar vectoring may substitute for the procedure turn.

774. L26 Which instrument indicates when to turn to intercept the final approach course from the procedure turn during the NDB RWY 16 approach at Bellingham International? (Fig. 70)



1- P
2- Q
3- R
4- S

775. K52 How should a pilot determine when to initiate a missed approach on the NDB RWY 16, circle to land, approach at Bellingham International if visual contact with the runway is not made? (Fig. 70)

1- When arriving at 760 feet on the descent.
2- Upon expiration of time for 9.6 miles from BLI.
3- At the ADF needle reversal on LUM NDB.
4- When over the runway threshold.

776. K45 What is the MDA for a Category A aircraft on a Straight-in NDB RWY 16 approach at Bellingham International if the Ferndale FM is determined? (Fig. 70)

1- 700 feet
2- 760 feet
3- 600 feet
4- 660 feet

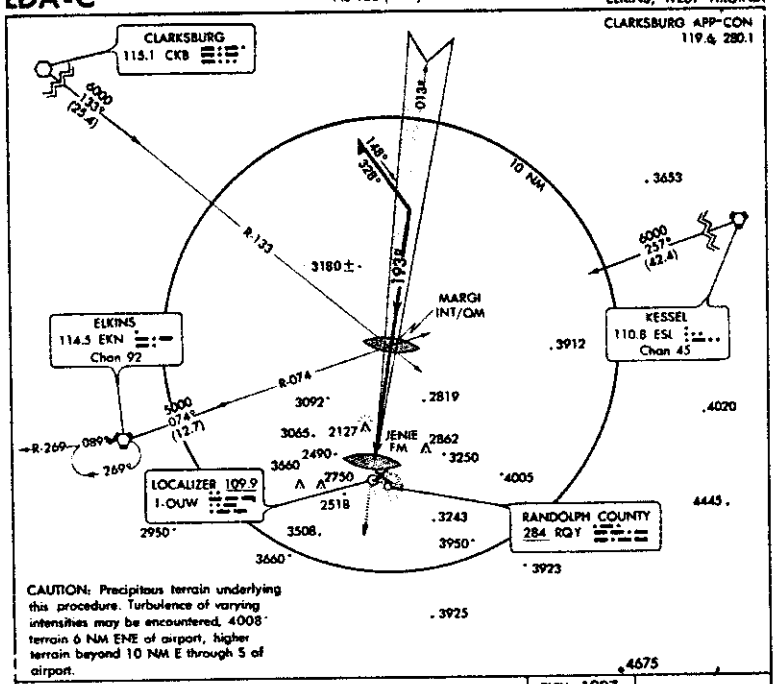
777. K63 What is the straight-in MDA and landing minimum for a helicopter at Bellingham International if the Ferndale Fan Marker is identified on final approach? (Fig. 70)

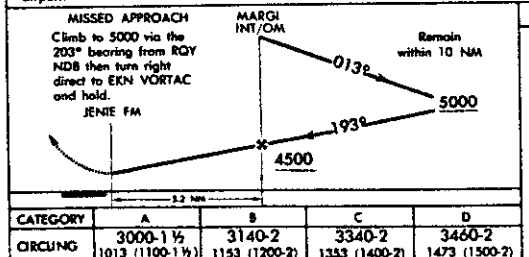
1- 330 feet and 1/2 mile
2- 330 feet and 1 mile
3- 660 feet and 1 mile
4- 660 feet and 1/2 mile

Amdt 1

LDA-C

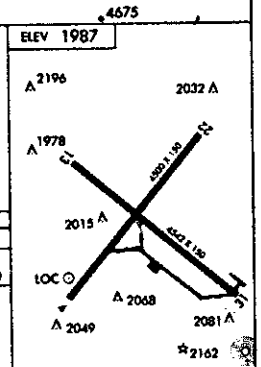
ELKINS-RANDOLPH COUNTY-JENNINGS RANDOLPH FIELD
AL-128 (FAA)
ELKINS, WEST VIRGINIA





CATEGORY	A	B	C	D
CIRCLING	3000-1½ 1013 (1100-1½)	3140-2 1153 (1200-2)	3340-2 1353 (1400-2)	3460-2 1473 (1500-2)

Night minimums not authorized.
▽
△ NA



FAF to MAP 5.2 NM

Knots	60	90	120	150	180
Min:Sec	5:12	3:28	2:36	2:04	1:44

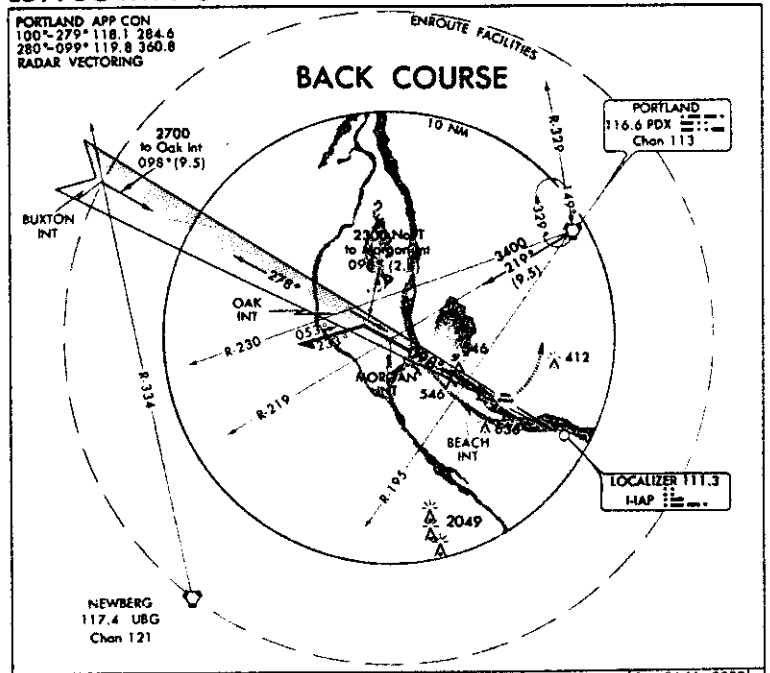
LDA-C
38°53'N - 79°51'W
ELKINS, WEST VIRGINIA
ELKINS-RANDOLPH CO TY-JENNINGS RAND 4 FIELD
PUB NOS, NOAA, TO IACC SPECIFN

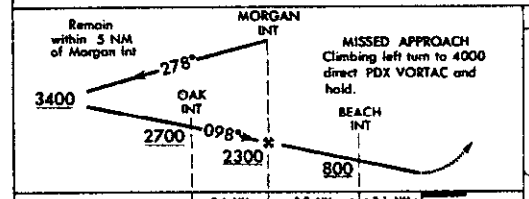
FIG. 71

Orig

LDA BC RWY 8

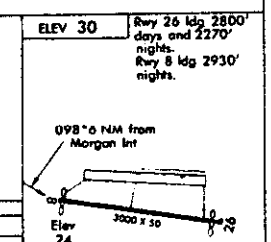
AL-5807 (FAA)
PEARSO IRPARK
VANCOUVER, WASHINGTON





CATEGORY	A	B	C	D
S-8	540-1 516 (600-1)	NA		
CIRCLING	940-1¼ 910 (1000-1¼)			

Use Portland International altimeter setting.
Dual VOR receivers required.
▽
△ NA



FAF to MAP 6 NM

Knots	60	90	120	150	180
Min:Sec	6:00	4:00	3:00	2:24	2:00

LDA BC RWY 8
45°37'N - 122°39'W
VANCOUVER, WASHINGTON
PEARSON AIRPARK
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

FIG. 72

778. K64 What is the recommended procedure for closing an IFR flight plan upon completing the LDA-C approach at Elkins, West Virginia? (Fig. 71)

1- Contact the nearest FSS (Elkins).
2- ATC will automatically close it when you land.
3- Contact the ARTCC on the last assigned frequency prior to landing.
4- ARTCC will automatically close it when you are cleared for the approach.

779. K63 What Category A landing minimum applies to the LDA-C approach at Elkins, West Virginia? (Fig. 71)

1- Ceiling 1,000 feet; visibility 1 1/2 miles.
2- Ceiling 1,100 feet; visibility 1 1/2 miles.
3- Visibility 1 1/2 miles.
4- Ceiling 3,000 feet; visibility 1 1/2 miles.

780. K41 To which minimum altitude may a pilot immediately descend upon being "cleared for approach" at BUSTON Intersection on the LDA BC RWY 8 approach at Pearson Airpark? (Fig. 72)

1- 3,400 feet
2- 2,300 feet
3- 2,700 feet
4- 800 feet

781. K63 Could a helicopter pilot request and expect to successfully complete a straight-in approach to RWY 8 at Pearson Airpark if the ceiling and visibility are reported to be 600 feet and 1/2 mile? (Fig. 72)

1- The pilot may attempt an approach and, if the runway is in sight at the MDA, a descent and landing may be completed regardless of the visibility.
2- The pilot may descend below the MDA if the runway is in sight and may land if the visibility is at least 1/2 mile.
3- No, because the ceiling and visibility are below approach and landing minimums.
4- The pilot could attempt an approach, but the visibility is less than that required for landing.

782. K63 What is the landing minimum for a helicopter on the LDA-C approach at Elkins, West Virginia? (Fig. 71)

1- 1 1/2 miles
2- 1,013 feet and 1 1/2 miles
3- 507 feet and 3/4 mile
4- 3/4 mile

783. K21 Which is the recommended entry for the holding pattern at Elkins if you cross the EKN VORTAC on a heading of 300° during the missed approach? (Fig. 71)

1- Parallel
2- Teardrop or parallel
3- Direct
4- Direct or parallel

784. K63 A helicopter arrives at the MDA for a straight-in approach to RWY 8 at Pearson Airpark with the reported visibility at 3/4 mile. If the pilot can see the runway, what action is appropriate? (Fig. 72)

1- The pilot may descend below the MDA but may not land with less than 1 mile visibility.
2- The pilot may descend and land because the landing visibility for helicopters is 1/8 mile.
3- The pilot must initiate a missed approach because the landing minimum is 1 mile visibility.
4- The pilot may descend and land because the helicopter landing minimum is 50% lower than for a Category A airplane.

785. K52 How should a pilot determine the MAP when on final approach of the LDA BC RWY 8 at Pearson Airpark? (Fig. 72)

1- At the threshold of the runway.
2- When time has expired from FAF to MAP.
3- When 540 feet is reached on the LOC.
4- At 6 DME miles from the final approach fix.

786. M41 What length landing surface is available during the day for a landing on RWY 8 at Pearson Airpark? (Fig. 72)

1- 3,000 feet
2- 2,270 feet
3- 2,800 feet
4- 2,930 feet

787. M62 What characteristic of the approach facility depicted at Elkins determines the classification as an LDA rather than a localizer approach? (Fig. 71, page 136)

1- The LDA course is not aligned with a runway.
2- The LDA course width is always wider than a localizer course.
3- The missed approach point is a fan marker.
4- The LDA has no glide slope transmitter.

788. M43 What is the touchdown zone elevation (TDZE) on a straight-in approach to RWY 8 at Pearson Airpark? (Fig. 72, page 136)

1- 540 feet
2- 516 feet
3- 24 feet
4- 30 feet

789. K52 At what point should the missed approach be initiated on the SDF BC RWY 9 approach at Elkhart Municipal? (Fig. 73)

1- When time has expired for 6 NM from CORVY Intersection.
2- When at 1,240 feet on the glide slope.
3- When over the runway threshold.
4- Station passage at EKM SDF.

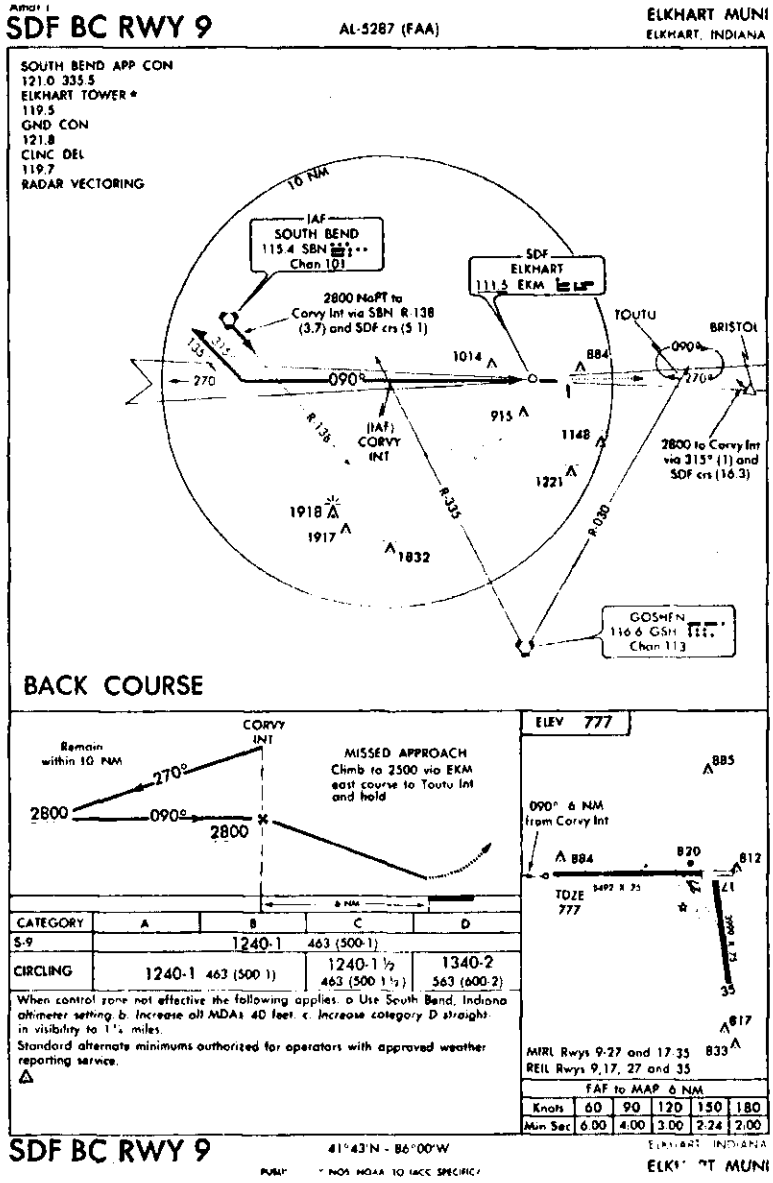
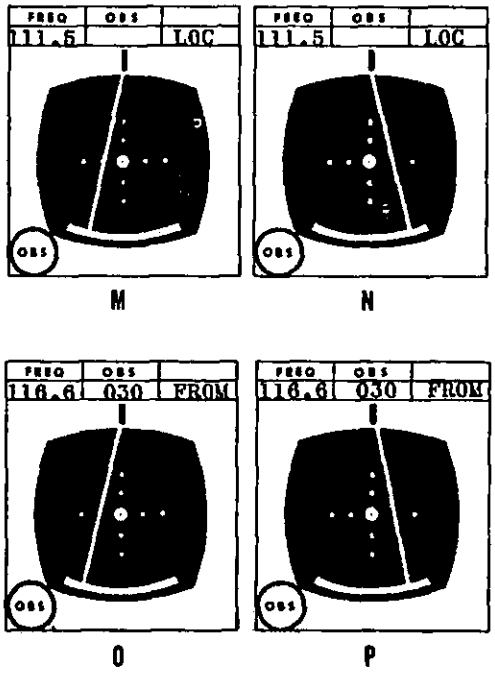


FIG. 73

790. L28 Which indications represent the position of the aircraft just after initiating the turn to the outbound leg of the holding pattern at TOUTU Intersection? (Fig. 73)



1- N and O
2- N and P
3- M and O
4- M and P

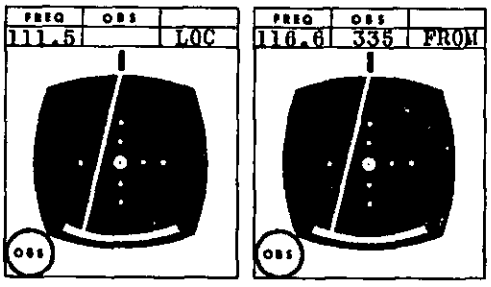
791. K63 What is the landing minimum for a helicopter on the SDF BC RWY 9 approach at Elkhart Municipal? (Fig. 73)

1- 1 mile
2- 1/2 mile
3- 1,240 feet and 1 mile
4- 620 feet and 3/4 mile

792. M52 What are the Category A approach and landing minimums for a straight-in SDF BC RWY 9 approach when Elkhart Tower is not in operation? (Fig. 73)

1- MDA 503 feet, visibility 1 mile.
2- MDA 1,280 feet, visibility 1 mile.
3- Ceiling 540 feet, visibility 1 mile.
4- Ceiling 1,280 feet, visibility 1 1/4 miles.

793. L28 What is the position of this aircraft on final approach of the SDF BC RWY 9 at Elkhart Municipal? (Fig. 73)



1- Left of course and approaching CORVY Intersection.
2- Right of course and approaching CORVY Intersection.
3- Left of course and past CORVY Intersection.
4- Right of course and past CORVY Intersection.

794. K41 What procedure should you follow to reverse course when cleared for the SDF BC RWY 9 at BRISTOL Intersection? (Fig. 73)

1- Enter the depicted holding pattern and then proceed along the SDF course to the depicted procedure turn.
2- Proceed to GSH VORTAC, then outbound on R-315 to the SDF course, then outbound on the SDF course for the depicted procedure turn.
3- Intercept the 315° Radial of GSH, proceed outbound to intercept the SDF course, and complete the procedure turn as depicted.
4- Fly a heading of 315° to intercept the SDF course, then maintain the SDF course to the position depicted for the procedure turn.

795. K15 What does authorization to perform a "contact approach" mean to the pilot of a helicopter at the termination of an IFR flight?

1- The ceiling is at least 1,000 feet.
2- The visibility is at least 2 statute miles.
3- The pilot assumes responsibility for obstruction clearance.
4- ATC does not provide separation between the helicopter and other IFR or Special VFR aircraft.

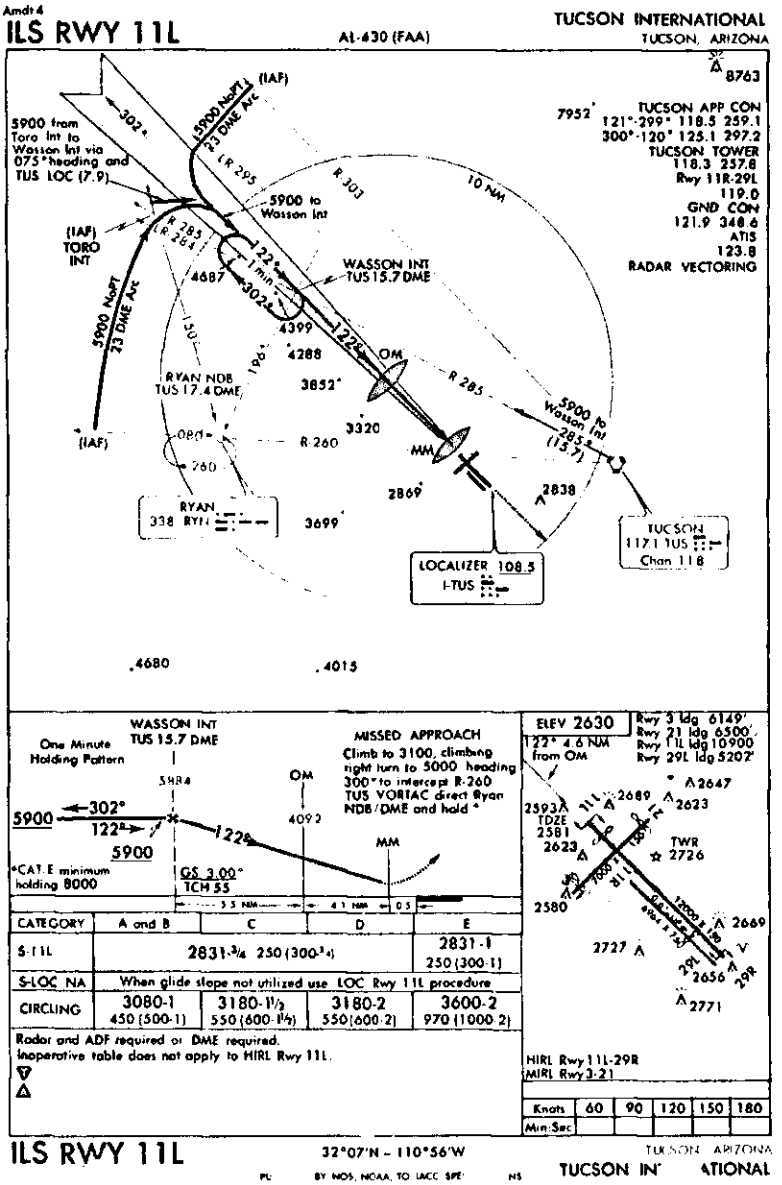


FIG. 74

796. K63 What is the straight-in DH and landing minimum for a helicopter at Tucson International? (Fig. 74)

1- 2,831 feet and 3/4 mile
2- 2,706 feet and 3/4 mile
3- 2,831 feet and 3/8 mile
4- 2,706 feet and 3/8 mile

797. K51 What is the minimum Category A altitude for holding upon completing a missed approach on the ILS RWY 11L approach at Tucson? (Fig. 74)

1- 5,000 feet
2- 3,100 feet
3- 5,900 feet
4- 8,000 feet

798. K14 What procedure should be used to reverse course to get established on the final approach of the ILS RWY 11L approach at Tucson? (Fig. 74)

1- Fly out to either IAF on the 23 DME Arc and return to the LOC course.
2- Use an entry to the holding pattern depicted at WASSON Intersection.
3- Make a procedure turn to the left at WASSON Intersection.
4- Make a procedure turn toward the west just beyond the 23 DME Arc.

799. K37 What action should a pilot take if the Glide Slope receiver becomes inoperative when attempting a straight-in ILS RWY 11L approach at Tucson? (Fig. 74)

1- Advise ATC of the radio failure and request a circling approach.
2- Continue the approach but use 3,080 feet as the MDA.
3- Advise ATC of the Glide Slope failure and request LOC RWY 11L approach.
4- Advise ATC of the radio failure and add 50 feet to the DH.

800. M26 What minimum airborne equipment is required to be operative in a helicopter for the ILS RWY 11L at Tucson International? (Fig. 74)

1- VOR/LOC/GS, DME, and marker beacon receivers.
2- VOR/LOC/GS, ADF, Radar, and DME.
3- VOR/LOC and marker beacon receivers.
4- VOR/LOC/GS and marker beacon receivers.

801. M23 What is the purpose of R-284 of TUS depicted on the ILS RWY 11L approach chart for Tucson? (Fig. 74)

1- Identify TORO Intersection.
2- Lead radial to start turn from arc.
3- Indicate turn-in position on holding pattern.
4- Identify intermediate approach fix.

802. K32 How is radar used for instrument approaches when the facility is approved for ATC purposes?

1- ASR and PAR approaches, emergencies, and to eliminate the need for position reports on non-radar approaches.
2- ASR and PAR approaches, weather surveillance, and course guidance by approach control.
3- Course guidance to final approach fix or position, ASR and PAR approaches, and monitoring non-radar approaches.
4- Precision approaches, weather surveillance, and a substitute for any inoperative component of a navigation aid used for approaches.

803. M26 What minimum airborne equipment is required for the ILS RWY 11L approach at Tucson? (Fig. 74)

1- VOR/LOC and marker beacon receivers.
2- VOR/LOC/GS, DME, and marker beacon receivers.
3- VOR/LOC/GS and marker beacon receivers.
4- VOR/LOC/GS, ADF, Radar, DME, and marker beacon receivers.

804. K15 You arrive at your destination after an IFR flight in a helicopter. Which is a prerequisite condition for the performance of a "contact approach"?

1- Request to perform the approach by the pilot.
2- Assignment of the approach by the control tower.
3- A ceiling of at least 1,000 feet.
4- A visibility of at least 3 statute miles.

805. K15 Approaching your destination on an IFR flight plan, you are cleared for a "visual approach." This means that

1- as soon as you sight the field, you are cleared to land.
2- you are within 1 statute mile and can make the approach by visual reference to the surface.
3- you may deviate from the prescribed instrument approach procedures and proceed to the airport visually.
4- your IFR flight plan has been cancelled and you may proceed VFR.

806. K36 When must you initiate a missed approach procedure from an ILS approach if you are in position for a normal approach to the runway?

1- Only at the DH when the runway environment is not clearly visible.
2- Only after the time has expired after reaching the DH and the runway environment is not clearly visible.
3- Any time the runway environment is not visible after the time has expired after the FAF.
4- At the DH, if the runway or its environment is not clearly visible or any time thereafter that visual reference is lost.

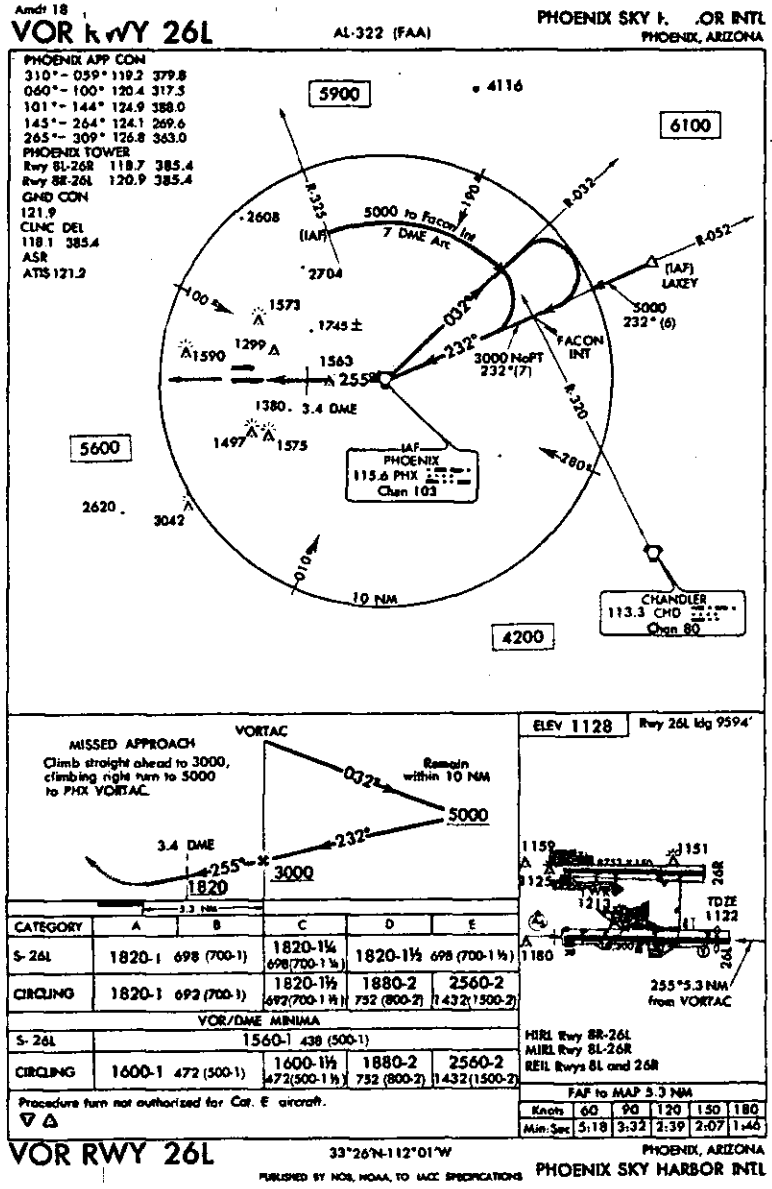

Amdt 18
VOR RWY 26L
AL-322 (FAA)
PHOENIX SKY HARBOR INTL
PHOENIX, ARIZONA
PHOENIX APP CON
310°-059° 119.2 379.8
060°-100° 120.4 317.5
101°-144° 124.9 388.0
145°-264° 124.1 269.6
265°-309° 126.8 363.0
PHOENIX TOWER
Rwy 8L-26R 118.7 385.4
Rwy 8R-26L 120.9 385.4
GND CON
121.9
CLNC DEL
118.1 385.4
ASR
ATIS 121.2
5900
6100
5600
4200
4116
2608
2704
1573
1745±
1299
1590
1563
1380
3.4 DME
1497
1575
2620
3042
5000 to Facon Int
7 DME Arc
(IAF)
R-325
R-190
R-032
R-052
[IAF]
LAXEY
5000
232° (6)
FACON INT
3000 NoPT
232°(7)
R-220
R-280
R-010
10 NM
IAF
PHOENIX
115.6 PHX
Chan 103
CHANDLER
113.3 CHD
Chan 80
MISSED APPROACH
Climb straight ahead to 3000, climbing right turn to 5000 to PHX VORTAC.
VORTAC
032°
Remain within 10 NM
5000
232°
3000
255°
1820
3.3 NM
ELEV 1128
Rwy 26L ldg 9594'
1159
1151
1125
1213
1180
TDZE 1122
26L
26R
255° 5.3 NM from VORTAC
HIRL Rwy 8R-26L
MIRL Rwy 8L-26R
REIL Rwys 8L and 26R
FAF to MAP 5.3 NM
Knots 60 90 120 150 180
Min:Sec 5:18 3:32 2:39 2:07 1:46
CATEGORY A B C D E
S-26L 1820-1 698 (700-1) 1820-1¼ 698(700-1¼) 1820-1½ 698 (700-1½)
CIRCLING 1820-1 692 (700-1) 1820-1½ 692(700-1½) 1880-2 752 (800-2) 2560-2 1432(1500-2)
VOR/DME MINIMA
S-26L 1560-1 438 (500-1)
CIRCLING 1600-1 472 (500-1) 1600-1½ 472(500-1½) 1880-2 752 (800-2) 2560-2 1432(1500-2)
Procedure turn not authorized for Cat. E aircraft.
VOR RWY 26L
33°26'N-112°01'W
PHOENIX, ARIZONA
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS
PHOENIX SKY HARBOR INTL

FIG. 75

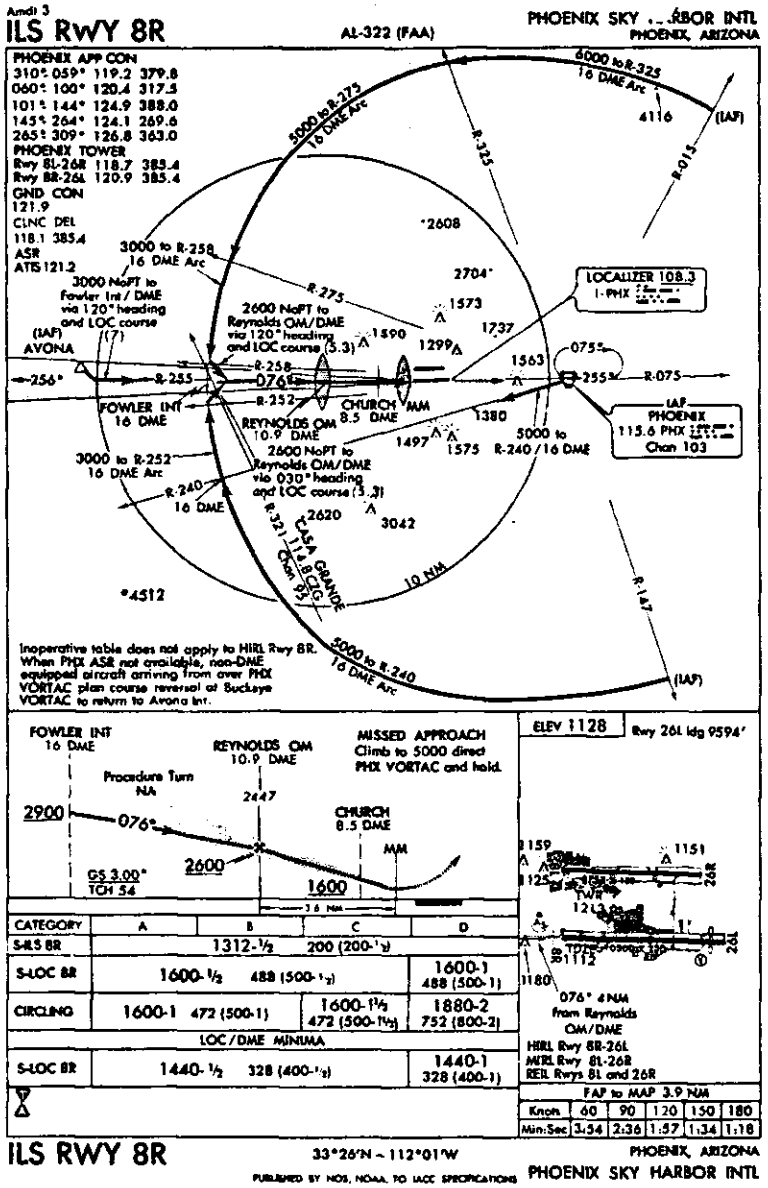

Amdt 3
ILS RWY 8R
AL-322 (FAA)
PHOENIX SKY HARBOR INTL
PHOENIX, ARIZONA
PHOENIX APP CON
310°-059° 119.2 379.8
060°-100° 120.4 317.5
101°-144° 124.9 388.0
145°-264° 124.1 269.6
265°-309° 126.8 363.0
PHOENIX TOWER
Rwy 8L-26R 118.7 385.4
Rwy 8R-26L 120.9 385.4
GND CON
121.9
CLNC DEL
118.1 385.4
ASR
ATIS 121.2
5000 to R-325
16 DME Arc
5000 to R-275
16 DME Arc
4116
(IAF)
R-325
R-015
2608
3000 to R-258
16 DME Arc
2704
3000 NoPT to Fowler Int / DME via 120° heading and LOC course (7)
2600 NoPT to Reynolds OM/DME via 120° heading and LOC course (5.3)
R-275
1573
1737
1590
1299
LOCALIZER 108.3
I-PHX
(IAF)
AVONA
R-256
R-258
R-255
076°
R-252
1563
075°
255°
R-075
FOWLER INT
16 DME
REYNOLDS OM
10.9 DME
CHURCH MM
8.5 DME
1380
1497
1575
5000 to
R-240/16 DME
IAF
PHOENIX
115.6 PHX
Chan 103
3000 to R-252
16 DME Arc
2600 NoPT to Reynolds OM/DME via 030° heading and LOC course (5.3)
R-240
16 DME
2620
3042
R-321
TUCSON
114.8 TUC
Chan 91
4512
10 NM
R-147
5000 to R-240
16 DME Arc
(IAF)
Inoperative table does not apply to HIRL Rwy 8R. When PHX ASR not available, non-DME equipped aircraft arriving from over PHX VORTAC plan course reversal at Buckeye VORTAC to return to Avona Int.
FOWLER INT
16 DME
REYNOLDS OM
10.9 DME
MISSED APPROACH
Climb to 5000 direct PHX VORTAC and hold.
Procedure Turn
NA
2447
CHURCH
8.5 DME
MM
2900
076°
2600
1600
GS 3.00°
TCH 54
3.6 NM
ELEV 1128
Rwy 26L ldg 9594'
1159
1151
1125
1213
1180
TDZE 1122
26L
26R
076° 4 NM from Reynolds OM/DME
HIRL Rwy 8R-26L
MIRL Rwy 8L-26R
REIL Rwys 8L and 26R
FAF to MAP 3.9 NM
Knots 60 90 120 150 180
Min:Sec 3:54 2:36 1:57 1:34 1:18
CATEGORY A B C D
S-ILS 8R 1312-½ 200 (200-½)
S-LOC 8R 1600-½ 488 (500-½) 1600-1 488 (500-1)
CIRCLING 1600-1 472 (500-1) 1600-1½ 472 (500-1½) 1880-2 752 (800-2)
LOC/DME MINIMA
S-LOC 8R 1440-½ 328 (400-½) 1440-1 328 (400-1)
ILS RWY 8R
33°26'N-112°01'W
PHOENIX, ARIZONA
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS
PHOENIX SKY HARBOR INTL

FIG. 76

807. M27 What minimum altitudes should be observed if you are vectored to FALCON Intersection at 5,000 feet and cleared for a straight-in VOR RWY 26L approach with DME operative? (Fig. 75)

1- 4,000 feet for the teardrop--2,700 feet to PHX--1,820 feet to HAYDEN Intersection--1,600 feet to MAP.
2- 5,000 feet to PHX--4,000 feet to complete the teardrop turn--2,700 feet to PHX--1,820 feet to HAYDEN Intersection--1,600 feet to MAP.
3- 4,000 feet to PHX--2,700 feet to HAYDEN Intersection--1,820 feet to MAP.
4- 3,000 feet to PHX--1,820 feet to 3.4 DME Fix--1,560 feet to MAP.

808. K46 What are the MDA and landing minimums if the High Intensity Runway Lights are inoperative while making a straight-in (Cat A) VOR RWY 26L approach to Phoenix Sky Harbor International? (Fig. 75)

1- 1,820 - 1 1/4
2- 1,870 - 1
3- 1,870 - 1 1/4
4- 1,820 - 1

809. K14 What procedure is required for a Category A aircraft when a course reversal is necessary to get established on the final approach course of the VOR R26L approach at Phoenix? (Fig. 75)

1- Make a teardrop procedure turn beyond the 7-mile DME Arc with the turn intercepting the 10-mile DME Arc.
2- Make a teardrop procedure turn as depicted within 10 NM of PHX.
3- Procedure turns are not authorized--request radar guidance.
4- Fly outbound on the 032° Radial of PHX to the 10-mile DME Arc and intercept the 052° Radial inbound to PHX.

810. K51 When should the missed approach be initiated on a straight-in ILS RWY 8R approach at Phoenix if the runway environment is not in sight? (Fig. 76)

1- At the expiration of time required to descend from the FAF to MAP.
2- At the MM.
3- 4 NM from Reynolds OM/DME.
4- At 1,312 feet on the glide slope.

811. M43 What is the touchdown zone elevation for RWY 26L at Phoenix Sky Harbor? (Fig. 75)

1- 1,122 feet
2- 1,128 feet
3- 438 feet
4- 698 feet

812. M21 Which frequency should you use to communicate with Phoenix Approach Control when approaching from the south? (Fig. 75)

1- 115.6 MHz
2- 124.1 MHz
3- 119.2 MHz
4- 124.9 MHz

813. K51 How should a helicopter pilot determine the missed approach point (MAP) for a straight-in ILS approach to RWY 8R at Phoenix Sky Harbor International? (Fig. 76)

1- When at 1,312 feet on the glide slope.
2- At the middle marker.
3- At the expiration of time from FAF to MAP.
4- When at 50% of the airplane DH or 1,062 feet on the glide slope.

814. K14 What provision is made for a course reversal from over PHX VORTAC for a DME equipped aircraft on the ILS RWY 8R approach at Phoenix? (Fig. 76)

1- Use the holding pattern depicted at PHX VORTAC.
2- Fly to Buckeye VORTAC for a course reversal and return to AVONA Intersection.
3- Fly outbound on the 240° Radial of PHX to intercept and proceed on the 16 DME Arc to FOWLER Intersection.
4- None--procedure turns are not authorized for this approach.

815. K37 What are the DH and landing minimums for a straight-in ILS RWY 8R approach at Phoenix when the HIRL is inoperative? (Fig. 76)

1- 200 feet and 1/2 mile
2- 1,312 feet and 1/2 mile
3- 1,362 feet and 1/2 mile
4- 1,362 feet and 1 mile

816. M42 What type instrument approach lights should a pilot observe on the ILS approach to RWY 8R at Phoenix? (Fig. 76, page 142)

1- MALSR with sequenced flashers.
2- HIRL, MIRL, and REIL.
3- REIL only.
4- HIRL, MIRL, and REIL with sequenced flashers.

817. M32 What is the recommended glide slope intercept altitude for the ILS RWY 8R approach at Phoenix? (Fig. 76, page 142)

1- 3,000 feet
2- 2,447 feet
3- 2,600 feet
4- 2,900 feet

818. M27 What are the IFR minimums if you are cleared for a straight-in LOC BC RWY 13 approach from the IAF on the north 12 DME Arc (R-346) at Sarasota-Bradenton? (Fig. 77)

1- 1,500 feet to LONGBOAT, to 380 feet on simulated glide slope, 1 mile visibility for landing.
2- Assigned altitude to LOC course, 1,500 feet to LONGBOAT, to 380 feet on simulated glide slope, 1 mile visibility for landing.
3- Assigned altitude to LOC course, 1,500 feet to LONGBOAT, 380 feet to MAP, 1 mile visibility for landing.
4- 1,600 feet to LOC course, 1,500 feet to LONGBOAT, 380 feet to MAP, 1 mile visibility for landing.

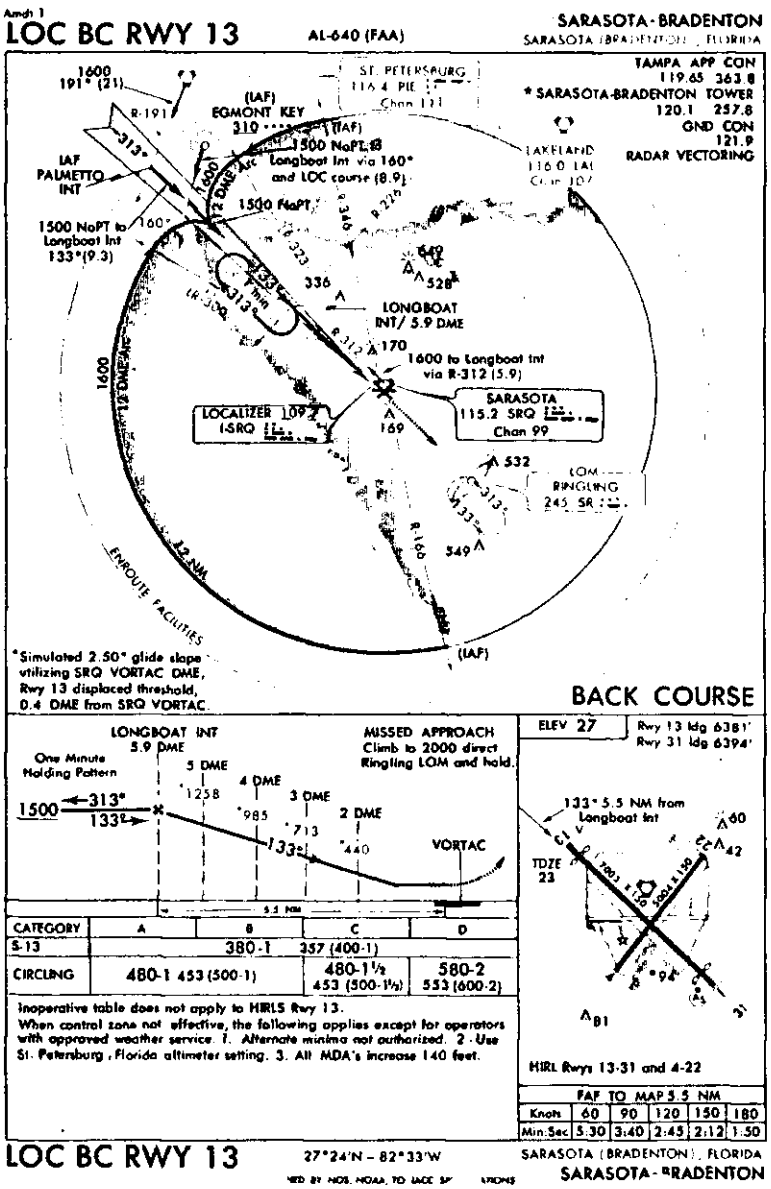
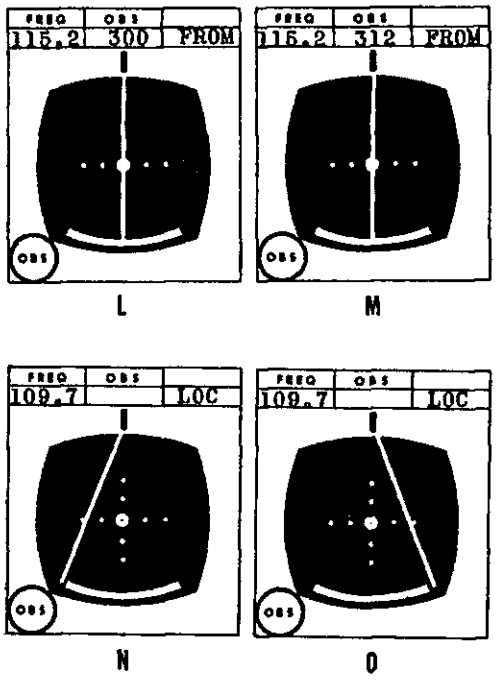


FIG. 77

819. L21 Which indications show that you should turn from the 12 DME Arc to the final approach course on the LOC? (Fig. 77)



1- L and N
2- M and N
3- L and O
4- M and O

820. K46 What effect, if any, does inoperative HIRLS have on approach and landing minima for the LOC BC RWY 13 approach at Sarasota-Bradenton Airport? (Fig. 77)

1- Increases MDA to 520 feet and landing minimum to 1 1/4 miles visibility.
2- Has no effect on minima.
3- Increases landing minimum to 1 1/4 miles visibility.
4- Increases MDA to 410 feet.

821. K41 What procedure should be used to reverse course to get established on the final approach course of the LOC BC RWY 13 at Sarasota-Bradenton Airport? (Fig. 77)

1- Make a standard procedure turn on the same side of the LOC course as the holding pattern.
2- Make a standard procedure turn beyond the 12 DME Arc.
3- Use a standard entry to the holding pattern depicted at LONGBOAT Intersection.
4- Proceed to either IAF on the 12 DME Arc and track inbound to intercept the LOC.

822. M32 What approximate rate of descent should result if you maintain 120 knots ground-speed on the simulated glide slope of the LOC BC RWY 13 approach at Sarasota-Bradenton? (Fig. 77)

1- 490 ft./min.
2- 545 ft./min.
3- 680 ft./min.
4- 410 ft./min.

823. K52 How should the pilot determine when at the MAP on the LOC BC RWY 13 approach at Sarasota-Bradenton Airport? (Fig. 77)

1- When time has expired for 5.5 NM beyond LONGBOAT Intersection.
2- When arriving at 380 feet on the simulated glide slope.
3- When over the displaced threshold.
4- At 0.4 DME miles from the VORTAC.

824. K15 When may you obtain a contact approach?

1- Only if you request the approach and the reported visibility is at least 1 mile.
2- ATC may assign you a contact approach if VFR conditions exist at the airport.
3- ATC may assign you a contact approach if you are below the clouds and the visibility is at least 1 mile.
4- ATC will only assign you a contact approach if you have the field in sight and VFR conditions exist at the field.

825. K15 What are the main differences between a visual and a contact approach?

1- The pilot must request a contact approach; the pilot may be assigned a visual approach and higher weather minimums must exist.
2- The pilot must have the field in sight in VFR conditions for a contact approach; the pilot must request a visual approach.
3- The pilot must request a visual approach and report having the field in sight; ATC may assign a contact approach if VFR conditions exist.
4- Anytime the pilot reports the field in sight, ATC may clear the pilot for a contact approach; for a visual approach, the pilot must advise that the approach can be made under VFR conditions.

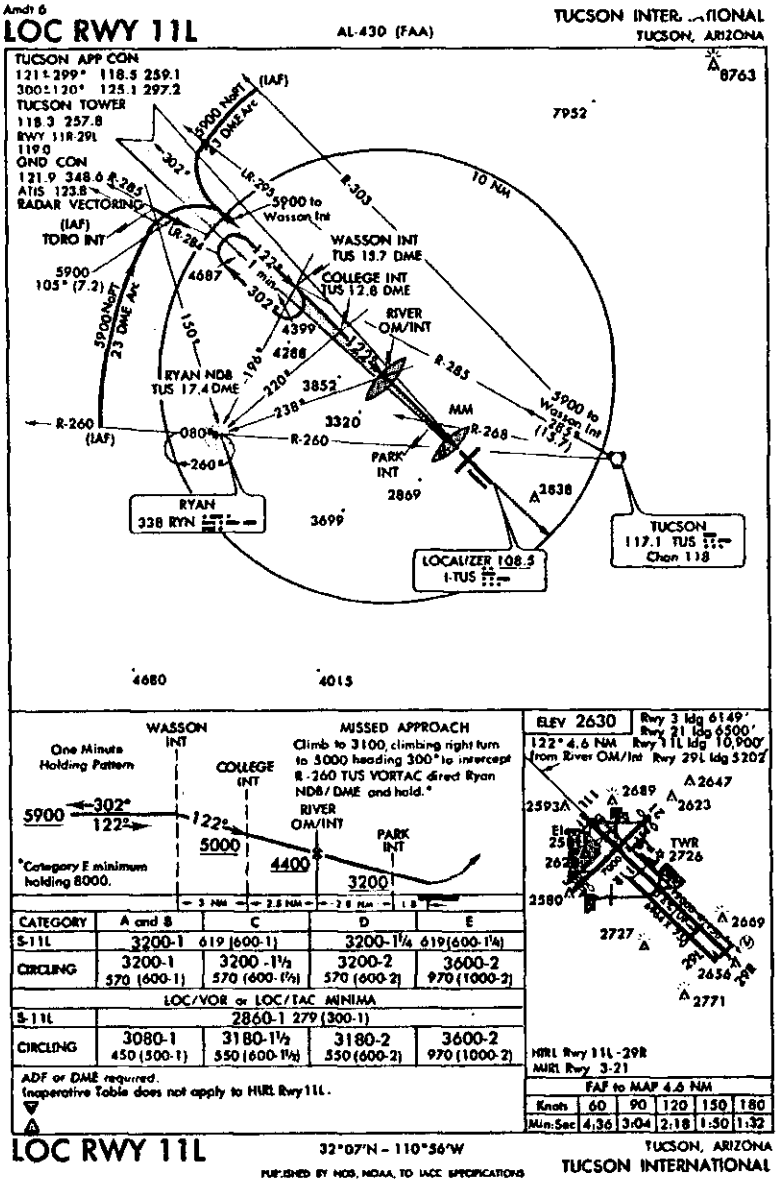


FIG. 78

826. M52 What is the MDA for a Category B aircraft on a circle to land LOC RWY 11L approach at Tucson if the aircraft is equipped with dual VOR/ILS, and ADF? (Fig. 78)

1- 3,180 feet
2- 3,200 feet
3- 2,860 feet
4- 3,080 feet

827. M27 What type altitude is the 5,900 feet depicted for the 23 DME Arc on the LOC RWY 11L approach at Tucson? (Fig. 78)

1- Mandatory altitude
2- Recommended altitude
3- Minimum altitude
4- Vector altitude

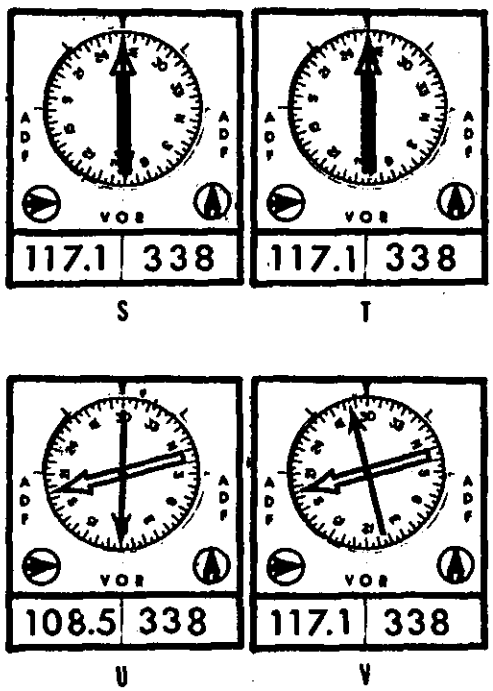
828. M23 What is a function of each intersection on the Tucson LOC RWY 11L approach? (Fig. 78)

	WASSON	COLLEGE	RIVER	PARK
1-	Holding fix	Step down fix	FAF	MAP
2-	IAF	Intermediate approach fix	FAF	MAP
3-	IAF	Intermediate approach fix	Step down fix	FAF
4-	Holding fix	Step down fix	FAF	Step down fix

829. K52 When should the missed approach be initiated if the runway environment is not sighted when on a LOC RWY 11L approach at Tucson? (Fig. 78)

1- When time calculated for the groundspeed from FAF to MAP has expired.
2- When arriving at 3,080 feet on the final approach course.
3- When time calculated for the airspeed from FAF to MAP has expired.
4- When crossing the 260° Radial of TUC.

830. L20 Which indication confirms that you are approaching the proper holding pattern after a missed approach at Tucson International? (Fig. 78)



1- S
2- T
3- U
4- V

831. K37 Which of these facilities may be substituted for a middle marker (MM) during a complete ILS instrument approach procedure?

1- Surveillance or precision radar.
2- A VOR/DME fix.
3- Compass locator or precision radar.
4- DME and compass locator.

832. M41 How much runway length is available for landing if a circling approach to RWY 11R at Tucson is made? (Fig. 78)

1- 6,964 feet
2- 5,202 feet
3- 10,900 feet
4- 12,000 feet

833. K15 ATC authorizes the pilot of a helicopter to execute a "visual approach" at the termination of an IFR flight. A necessary condition associated with the performance of this approach is

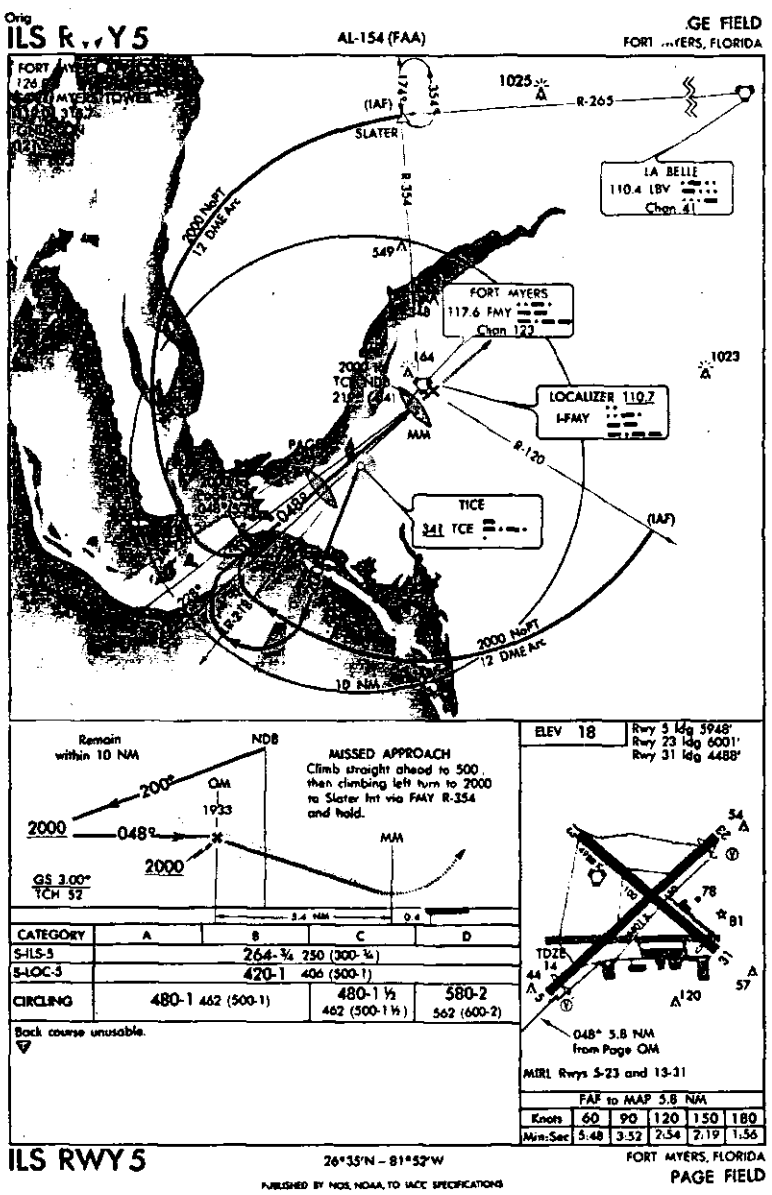
1- a reported ceiling of 700 feet or more above the minimum vectoring altitude.
2- a visibility of at least 5 statute miles.
3- the continuation of radar separation between the helicopter and any preceding aircraft.
4- the acceptance by the pilot of responsibility for proper positioning behind preceding aircraft.

834. K24 You have been notified to leave the holding fix at 1025 for a timed approach. It is now 1018 as you pass over the holding fix. How should you adjust the holding pattern so as to depart the holding fix on time?

1- Make 1 1/2°/sec. turns and fly outbound 1 1/2 minutes.
2- Adjust turning rate to complete two 360° turns in 7 minutes.
3- Make one standard pattern and fly outbound 30 seconds on the second one.
4- Fly outbound for 2 1/2 minutes.

835. K37 Which pilot action is appropriate if more than one component or aid of an ILS is unusable?

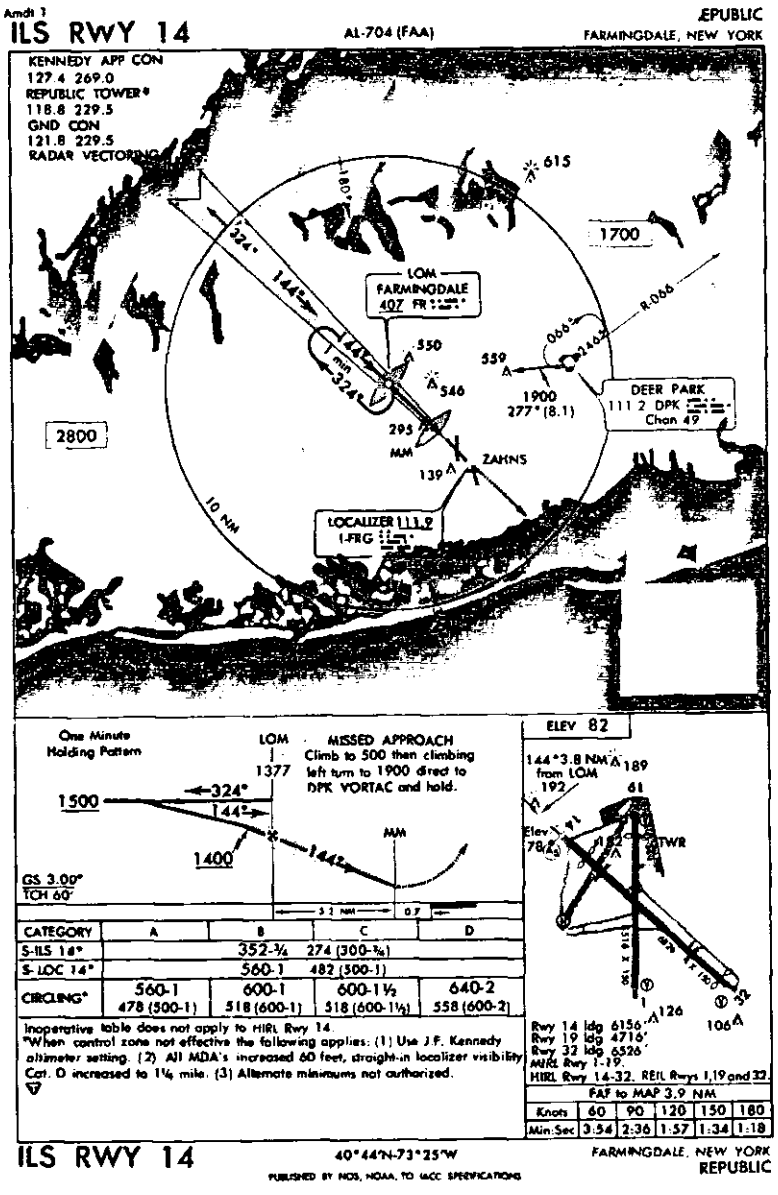
1- Request another approach appropriate to the equipment that is usable.
2- Raise the minimums a total of that required by each component or aid that is unusable.
3- Raise the DH by 50 feet and landing minimum by 1/4 mile for each component or aid that is unusable.
4- Use the highest minimum required by any one of the components or aids that are unusable.



CATEGORY	A	B	C	D
S-ILS-5	264-¾ 250 (300-¾)			
S-LOC-5	420-1 406 (500-1)			
CIRCLING	480-1 462 (500-1)		480-1½ 462 (500-1½)	580-2 562 (600-2)

ILS RWY 5
26°35'N – 81°52'W
FORT MYERS, FLORIDA
PAGE FIELD
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

FIG. 79



CATEGORY	A	B	C	D
S-ILS 14*	352-¾ 274 (300-¾)			
S-LOC 14*	560-1 482 (500-1)			
CIRCLING*	560-1 478 (500-1)	600-1 518 (600-1)	600-1½ 518 (600-1½)	640-2 558 (600-2)

ILS RWY 14
40°44'N-73°25'W
FARMINGDALE, NEW YORK
REPUBLIC
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

FIG. 80

836. K63 The reported weather at Fort Myers is 300 feet indefinite ceiling and 1/8-mile visibility. Do FARs allow you to make the straight-in ILS RWY 31 approach and land, in a helicopter? (Fig. 79)

1- No, the ceiling meets the requirements of regulations, but the visibility must be at least 3/4 mile.
2- No, you may reduce the prescribed visibility for Category A airplanes by no more than 50%.
3- Yes, you may reduce the prescribed visibility for Category A airplanes by 60%, but not less than 1/8 mile.
4- Yes, the minimum ceiling required is 200 feet and you may disregard the visibility minimums.

837. K31 Which course reversal procedure is appropriate if cleared for an ILS RWY 5 approach over Fort Myers VORTAC? (Fig. 79)

1- A radar vector will be used unless the pilot requests a procedure turn.
2- The teardrop procedure turn from TCE NDB is mandatory unless further clearance is given.
3- It is at the pilot's discretion to proceed to either IAF depicted for the 12 DME Arc.
4- It is at the pilot's discretion to use either arc approach; the teardrop or a radar vector.

838. K37 To which minimum altitude may you descend in instrument conditions if the glide slope becomes inoperative while executing an ILS RWY 5 approach at Page Field? (Fig. 79)

1- 314 feet
2- 364 feet
3- 480 feet
4- 420 feet

839. K31 When should the turn to final approach be made on the teardrop procedure turn of the ILS RWY 5 approach at Fort Myers? (Fig. 79)

1- Execute the turn within 10 NM of the TCE NDB.
2- Beyond the 12 DME Arc.
3- Start the turn 12 miles from TCE NDB.
4- Start the turn immediately upon receiving a full off-course indication on the LOC.

840. M43 What is the touchdown zone elevation for the ILS RWY 5 approach at Fort Myers? (Fig. 79)

1- 44 feet
2- 52 feet
3- 14 feet
4- 18 feet

841. M32 At what altitude does the glide slope intercept the OM on the ILS RWY 5 approach at Page Field? (Fig. 79)

1- 1,933 feet
2- 2,000 feet
3- 250 feet
4- 264 feet

842. M42 What instrument approach lighting is provided for the ILS RWY 14 approach at Farmingdale? (Fig. 80)

1- MALSR with sequenced flasher
2- VASI
3- MIRL and REIL
4- HIRL, MIRL, REIL, and VASI

843. K37 What action is appropriate if the MM is inoperative during an ILS approach at Farmingdale? (Fig. 80)

1- Substitute PAR and continue the approach.
2- Abandon the approach and request an approach on a different facility.
3- Continue the approach but use 402 feet as the DH.
4- Continue the approach but use straight-in LOC minimums.

844. L24 What visual or aural signal should a pilot receive upon passing over the 75 MHz outer marker at Farmingdale? (Fig. 80)

1- Continuous dashes
2- FR in code
3- Alternate dots and dashes
4- Two dash combinations

845. K45 What is the MDA for the straight-in localizer approach when the Farmingdale Control Zone is not effective? (Fig. 80)

1- 610 feet
2- 620 feet
3- 402 feet
4- 560 feet

846. The holding pattern depicted at
K14 Farmingdale LOM (Fig. 80, page 148) is used only for

1- missed approach.
2- missed approach and delays.
3- missed approach, course reversals, and delays.
4- course reversals and delays.

847. What is the inbound course of the
M22 holding pattern used upon missed approach after attempting a LOC BC RWY 13 approach at Dothan? (Fig. 81)

1- 133°
2- 313°
3- 199°
4- 019°

848. At Dothan, the reported weather is a
K63 400-foot ceiling and 1/2 mile visibility. Do FARs permit you to make a straight-in LOC BC RWY 13 approach and landing in a helicopter? (Fig. 81)

1- Yes, the only requirement for helicopters is a 200-foot ceiling.
2- Yes, you may reduce the visibility prescribed for Category A airplanes by 50%.
3- No, the reported ceiling meets the helicopter minimums but the visibility does not.
4- No, neither the ceiling nor visibility meets the required minimums.

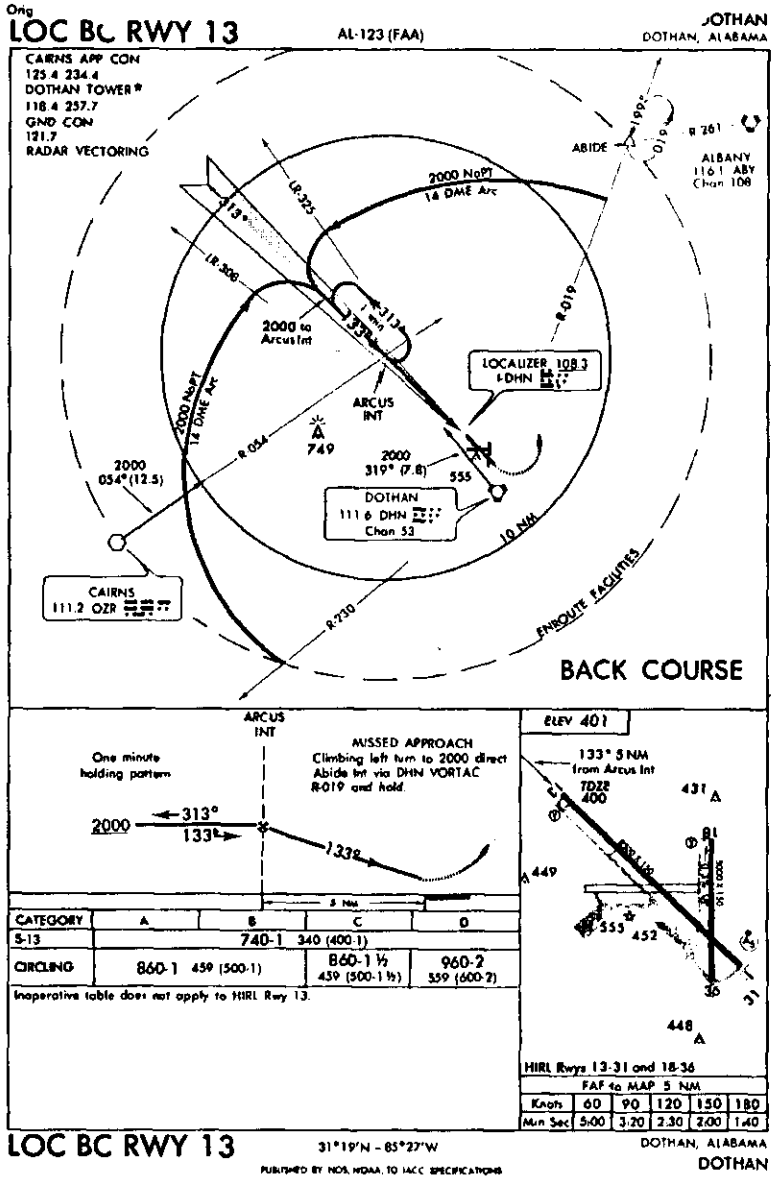
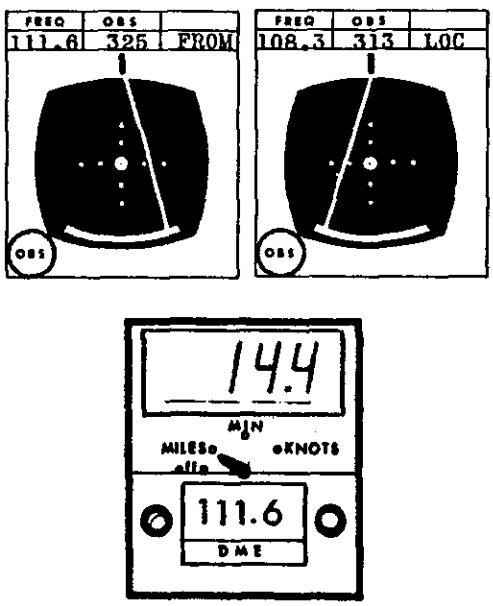


FIG. 81

849. K41 What procedure is required when it is necessary to reverse course to get established on the final approach course of the LOC BC RWY 13 approach at Dothan? (Fig. 81)

1- Proceed outbound on the DHN R-230 or R-019 and return on the 14 DME Arc.
2- Execute an entry to the 1-minute holding pattern as depicted.
3- Proceed outbound on the DHN R-325 or R-308 beyond the 10 NM circle and make a 180° turn toward the LOC course.
4- Execute a procedure turn on the NE side of the LOC course in the area of the holding pattern.

850. L20 You are flying the 14 DME Arc to intercept the localizer for the LOC BC RWY 13 approach. What is your position if your navigation instruments indicate as shown below? (Fig. 81)



1- North-northeast of the intersection of the Dothan 325 radial and the Dothan 14 DME Arc.
2- West of the intersection of the Dothan 325 radial and the Dothan 14 DME Arc.
3- North of the intersection of the Dothan 308 radial and the Dothan 14 DME Arc.
4- .4 DME miles outside the 14 DME Arc and on the south side of the localizer course.

851. K45 Under what condition may you use an MDA of 740 feet on the LOC BC RWY 13 approach at Dothan? (Fig. 81)

1- Only when using the arc approach as depicted on the approach chart.
2- Only when vectored straight-in on the LOC course without a procedure turn.
3- Only when making a straight-in localizer approach in a Category B or C aircraft.
4- Only when a landing on RWY 13 is intended.

852. M23 What is the purpose of the DHN Radial 325 on the LOC BC RWY 13 approach to Dothan? (Fig. 81)

1- Lead radial from 14 DME Arc.
2- Forms ARCUS Intersection.
3- Sets course limits for the LOC course.
4- Indicates time to turn inbound on holding pattern.

853. M21 What is indicated by the star following "Dothan Tower" in the upper left corner of the LOC BC RWY 13 Approach Chart? (Fig. 81)

1- There is a landing fee for transient aircraft.
2- There are restrictions to aircraft over 12,500 pounds.
3- The control tower operates non-continuously.
4- A rotating aerodrome beacon is on the cab of the control tower.

854. K38 In addition to advising of a missed approach (if appropriate), what position reports should be made without request on an ILS approach when not in "Radar Contact"?

1- LOM inbound and runway in sight.
2- LOM inbound.
3- LOM outbound, LOM inbound, and runway in sight.
4- LOM outbound, procedure turn inbound, and MM.

855. K64 When may a pilot cancel the IFR flight plan prior to completing the flight?

1- Anytime.
2- Only if an emergency occurs.
3- Only in VFR conditions outside positive control airspace.
4- Only in uncontrolled airspace.

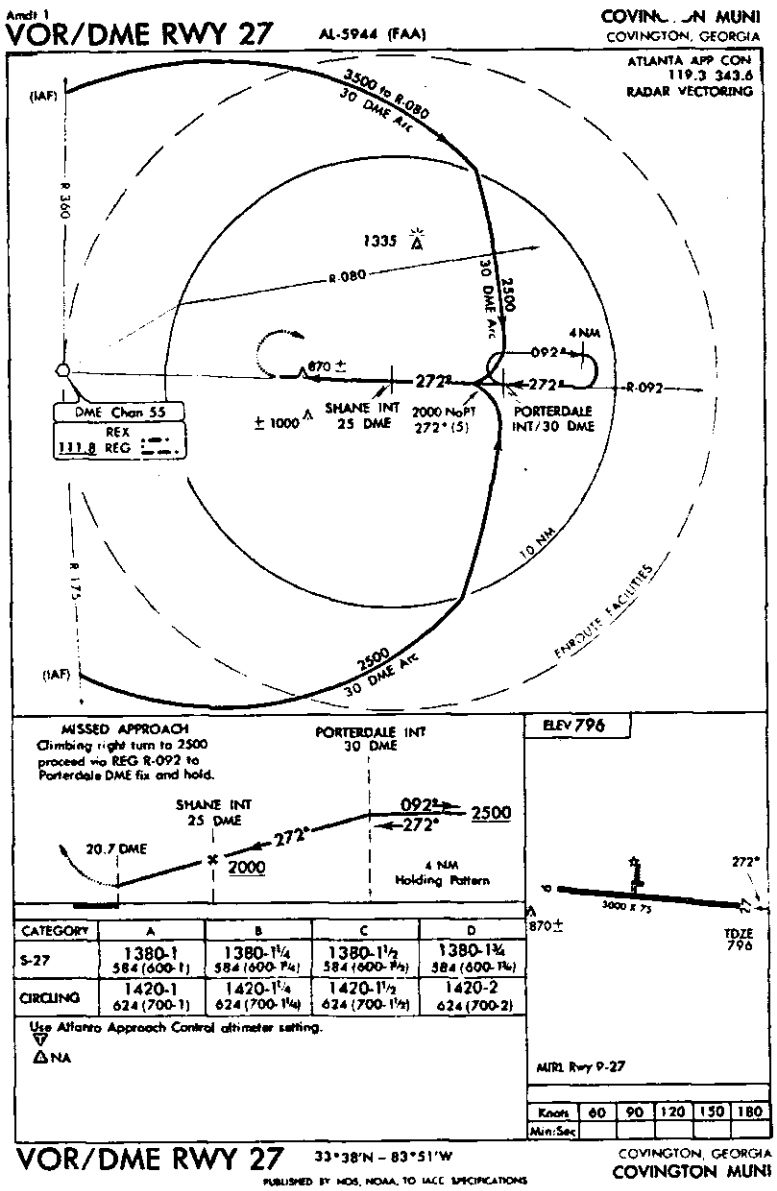

Amdt 1
VOR/DME RWY 27
AL-5944 (FAA)
COVIN..ON MUNI
COVINGTON, GEORGIA
ATLANTA APP CON
119.3 343.6
RADAR VECTORING
(IAF)
3500 to R-080
30 DME Arc
R-360
1335
R-080
2500
30 DME Arc
4 NM
092°
670 ±
272°
272°
R-092
DME Chan 55
REX
113.8 REG
± 1000
SHANE INT
25 DME
2000 NoPT
272° (5)
PORTERDALE
INT/30 DME
10 NM
R-175
(IAF)
2500
30 DME Arc
ENROUTE FACILITIES
MISSED APPROACH
Climbing right turn to 2500
proceed via REG R-092 to
Porterdale DME fix and hold.
PORTERDALE INT
30 DME
SHANE INT
25 DME
092°
272°
2500
272°
20.7 DME
2000
4 NM
Holding Pattern
ELEV 796
272°
10
3000 X 75
870±
TDZE
796
CATEGORY
A
B
C
D
S-27
1380-1
584 (600-1)
1380-1¼
584 (600-1¼)
1380-1½
584 (600-1½)
1380-1¾
584 (600-1¾)
CIRCLING
1420-1
624 (700-1)
1420-1¼
624 (700-1¼)
1420-1½
624 (700-1½)
1420-2
624 (700-2)
Use Atlanta Approach Control altimeter setting.
NA
MIRL Rwy 9-27
Knots
60
90
120
150
180
Min:Sec
VOR/DME RWY 27
33°38'N – 83°51'W
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS
COVINGTON, GEORGIA
COVINGTON MUNI

FIG. 82

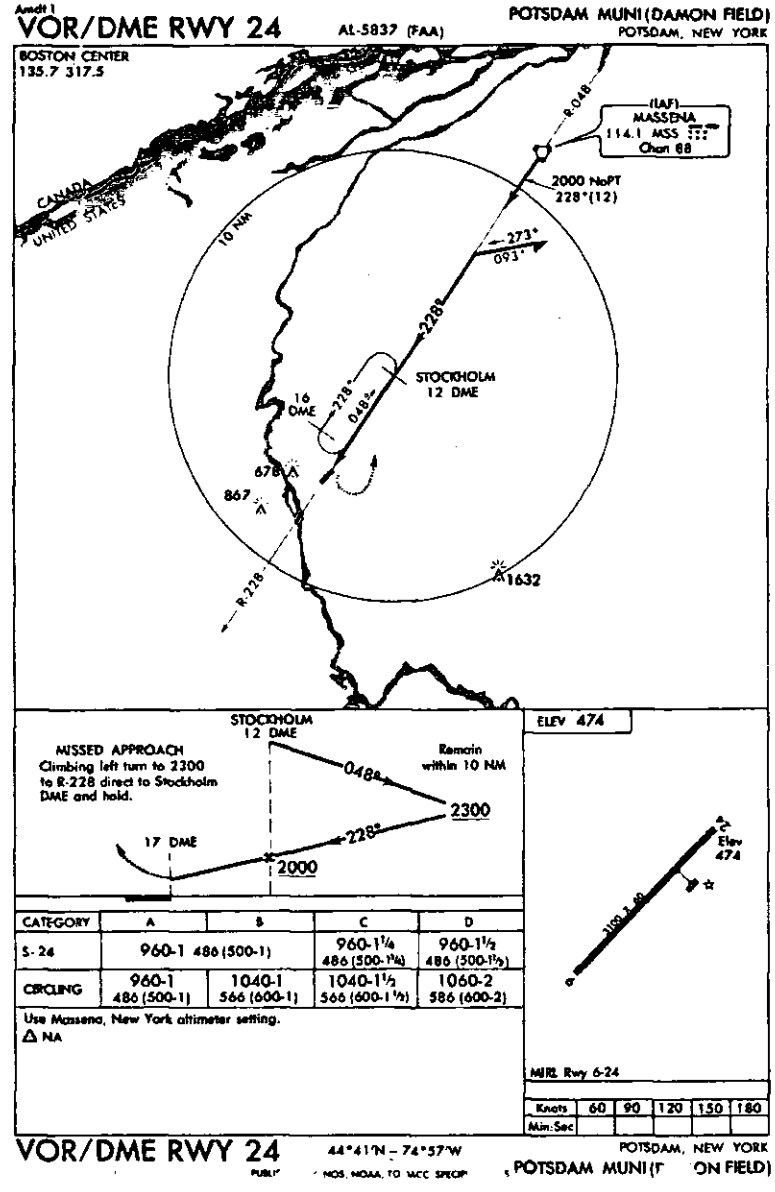
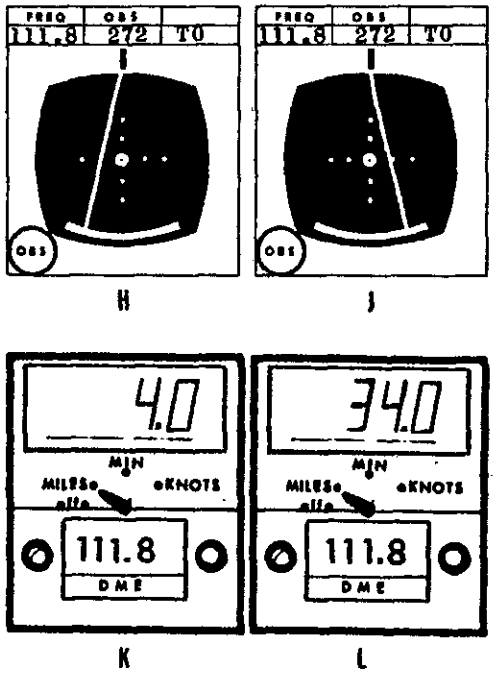

Amdt 1
VOR/DME RWY 24
AL-5837 (FAA)
POTSDAM MUNI (DAMON FIELD)
POTSDAM, NEW YORK
BOSTON CENTER
135.7 317.5
CANADA
UNITED STATES
(IAF)
MASSENA
114.1 MSS
Chan 68
R-048
2000 NoPT
228°(12)
10 NM
273°
093°
228°
STOCKHOLM
12 DME
16
DME
228°
048°
678
867
1632
R-228
STOCKHOLM
12 DME
MISSED APPROACH
Climbing left turn to 2300
to R-228 direct to Stockholm
DME and hold.
Remain
within 10 NM
048°
2300
17 DME
228°
2000
ELEV 474
Elev
474
3000 X 60
CATEGORY
A
B
C
D
S-24
960-1 486 (500-1)
960-1¼
486 (500-1¼)
960-1½
486 (500-1½)
CIRCLING
960-1
486 (500-1)
1040-1
566 (600-1)
1040-1½
566 (600-1½)
1060-2
586 (600-2)
Use Massena, New York altimeter setting.
NA
MIRL Rwy 6-24
Knots
60
90
120
150
180
Min:Sec
VOR/DME RWY 24
44°41'N – 74°57'W
PUBLI
NOS, NOAA, TO IACC SPECIF
POTSDAM, NEW YORK
POTSDAM MUNI (D ON FIELD)

FIG. 83

856. K46 What action should a pilot take if the DME becomes inoperative while executing a VOR/DME RWY 27 approach at Covington Municipal? (Fig. 82)

1- Abandon the approach and request an approach appropriate to the operative aircraft equipment.
2- Increase the MDA by 50 feet.
3- Determine the MAP by timing 4.3 NM past SHANE Intersection.
4- Increase the MDA by 100 feet and the landing minimum by 1/4 mile.

857. K24 What indications show that you should turn inbound when established in the holding pattern depicted on the VOR/DME RWY 27 approach at Covington Municipal? (Fig. 82)



1- H and L
2- H and K
3- J and K
4- J and L

858. K41 How should a pilot reverse course to get established on the inbound course of the VOR/DME RWY 27 approach if radar vectoring or the DME Arcs depicted are not utilized? (Fig. 82)

1- Use any standard course reversal turn within 10 NM of the FAF.
2- Use any standard course reversal turn only in the protected area of the depicted holding pattern.
3- Use a standard entry to the depicted holding pattern.
4- Make a standard 45° procedure turn on the same side as the depicted holding pattern.

859. K40 What are the IFR approach and landing minima for a straight-in VOR/DME RWY 27 approach to Covington if you are cleared for the approach at the IAF (R-360 of REX VOR) while at an assigned altitude of 4,000 feet? (Fig. 82)

1- 3,500 feet until starting turn on to final approach course; 2,000 feet to SHANE Intersection; 1 mile visibility to continue approach; MDA 1,380.
2- 3,500 feet until crossing the REX R-080; 2,500 feet until established on the final approach course; 2,000 feet to SHANE Intersection; MDA 1,380; 1 mile visibility for landing.
3- 4,000 feet until established on the final approach course; 2,000 feet to SHANE Intersection; MDA of 1,380 feet; and 1 mile visibility for landing.
4- 4,000 feet until crossing the REX R-080; 2,500 feet until established on the final approach; 2,000 feet to SHANE Intersection; 1,380 feet to the MAP; 1 mile visibility.

860. K64 What is the recommended procedure for closing an IFR flight plan at the completion of an IFR flight to Covington Municipal? (Fig. 82)

1- Request Atlanta Approach Control to close it when cleared for approach.
2- Atlanta Approach Control will automatically close it when the aircraft is observed by radar to be landing.
3- The pilot should contact the nearest FSS after landing.
4- The flight plan is automatically closed when the pilot reports VFR conditions.

861. M53 What is the height above the touchdown zone (HAT) for a Category B aircraft that will be landing on RWY 24 at Potsdam Municipal? (Fig. 83)

1- 566 feet
2- 600 feet
3- 486 feet
4- 500 feet

862. K21 What is the recommended entry to the holding pattern at Potsdam Municipal after a missed approach? (Fig. 83)

1- Teardrop
2- Parallel
3- Teardrop or parallel
4- Direct

863. K24 When should you start the turn inbound on the depicted holding pattern at Potsdam Municipal? (Fig. 83, page 152).

1- At 16 DME miles from MSS VORTAC.
2- At the end of 1-minute elapsed time on the outbound leg.
3- At the end of 2-minutes elapsed time on the outbound leg.
4- At 12 DME miles from MSS VORTAC.

864. K63 What are the minimum weather conditions for landing upon completion of an IFR approach at Potsdam Municipal (Cat A)? (Fig. 83, page 152)

1- 486-foot ceiling and 1 statute mile visibility.
2- 1 statute mile visibility.
3- 960-foot ceiling and 1,000-foot RVR.
4- 960-foot ceiling and 1 statute mile visibility.

865. K41 What is the meaning of the note, "Remain within 10 NM," depicted in the profile section of the Potsdam VOR/DME RWY 24 approach chart? (Fig. 83, page 152)

1- Perform the procedure turn within 10 NM of STOCKHOLM DME fix.
2- Perform the procedure turn within 10 NM of the airport.
3- Maintain the entire approach within 10 NM of STOCKHOLM DME fix.
4- Perform the procedure turn within 10 NM of MSS VORTAC.

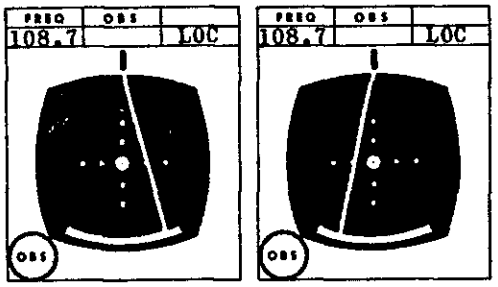
866. K24 What timing procedure should be used when performing a VOR holding pattern at 8,000 feet?

1- The initial outbound leg should be flown for 1 1/2 minutes.
2- Timing for the inbound leg begins when over the VOR.
3- Adjustments in timing of each pattern should be made on the inbound leg.
4- Timing for the outbound leg begins over or abeam the fix, whichever occurs later.

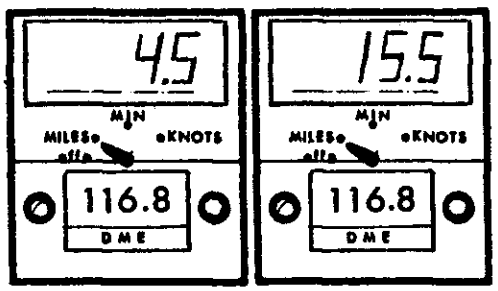
867. M32 What rate of descent will be necessary to descend from 3,000 feet to 1,500 feet between ALCATRAZ Intersection and the FAF if the approach groundspeed is 100 knots? (Fig. 84)

1- 1,800 FPM
2- 320 FPM
3- 500 FPM
4- 960 FPM

868. L21 Which combination of indications should establish your approximate position over COMMODORE Intersection inbound on the LOC BC RWY 11 approach at Oakland International? (Fig. 84)



F G



H I

1- G and H
2- G and I
3- F and H
4- F and I

869. K63 What minimum weather conditions are required to execute a straight-in LOC BC RWY 11 approach and complete a landing at Oakland International? (Fig. 84)

1- 460-foot ceiling and 5,000 feet RVR.
2- 400-foot ceiling and 1 mile visibility.
3- Be able to see the runway environment when at MDA (360 feet).
4- 5,000 feet RVR.

870. M21 What approach control and tower frequencies are appropriate for communications during a straight-in LOC BC RWY 11 approach at Oakland? (Fig. 84)

	Approach Control	Tower
1-	351.8	118.3
2-	135.1	126.0
3-	135.1	351.8
4-	135.4	118.3

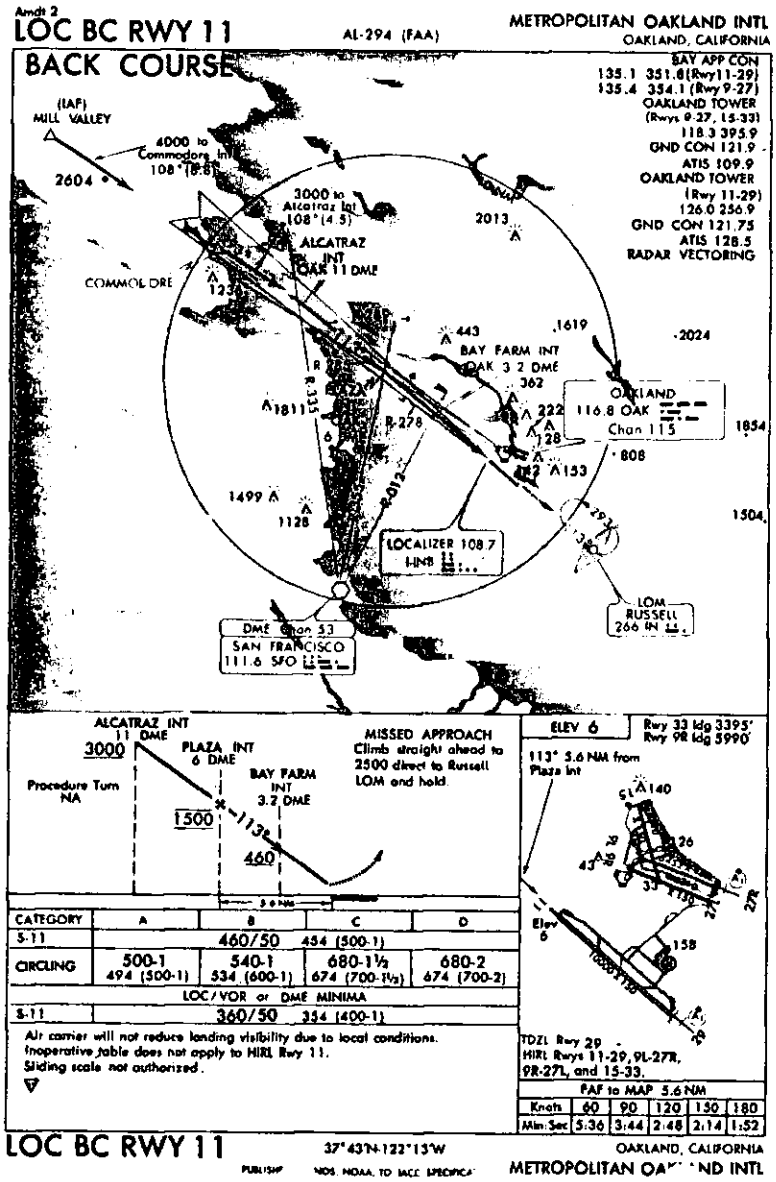


FIG. 84

871. K63 At Oakland, the reported RVR for RWY 11 is 2,500 feet. Do regulations authorize you to execute a straight-in LOC BC RWY 11 approach in a helicopter? (Fig. 84)

1- Yes, both the prescribed ceiling and visibility minimums may be reduced by 50%.
2- No, you must have 5,000 feet RVR to perform this approach.
3- Yes, regulations permit you to reduce the prescribed visibility minimum for Category A airplanes by 50%.
4- No, the minimums required to perform this procedure are 5,000 feet RVR and a ceiling of 460 feet.

872. M31 What type altitude is the 1,500-feet depicted for PLAZA Intersection on the LOC BC RWY 11 approach at Oakland? (Fig. 84)

1- Recommended altitude.
2- Minimum altitude.
3- Minimum altitude for both outbound and final approach course.
4- Mandatory altitude.

873. K63 When a pilot elects to proceed to the selected alternate airport, which approach minimums apply?

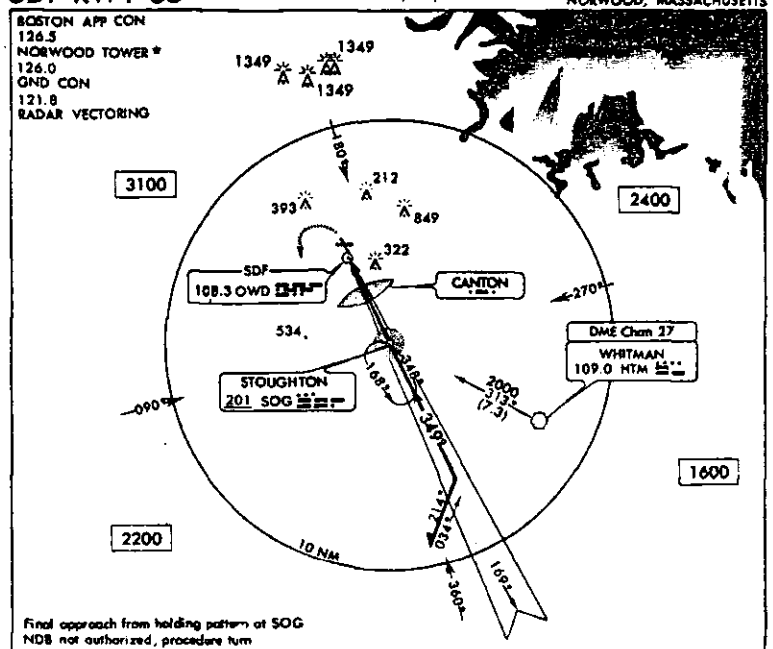
1- The published landing minimums.
2- 1500-2 if an instrument approach is not available.
3- 600-1 if the airport has an ILS.
4- IFR alternate minimums.

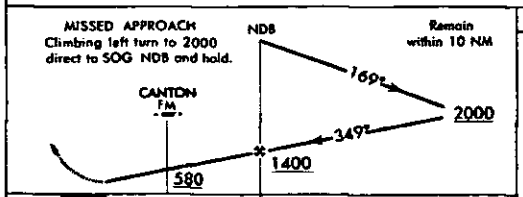
Amdt 2

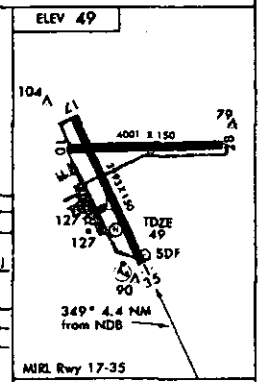
SDF RWY 35

AL-725 (FAA)

NORWOOD MEMORIAL
NORWOOD, MASSACHUSETTS







CATEGORY	A	B	C	D
S-35*	580-1 531 (600-1)			580-1¼ 531 (600-1¼)
CIRCLING*	640-1 590 (600-1)		640-1½ 590 (600-1½)	740-2 690 (700-2)
SDF/FM MINIMA				
S-35*	460-1 411 (500-1)			

FAF to MAP 4.4 NM					
Knots	60	90	120	150	180
Min:Sec	4:24	2:56	2:12	1:46	1:28

* Use Boston, Massachusetts altimeter setting when local control zone not effective, and increase all MDA's 40 feet.
Night minimums not authorized Rwy 10-28.
Inoperative table does not apply to MALS Rwy 35.
△ NA

SDF RWY 35

42°11'N – 71°10'W

NORWOOD, MASSACHUSETTS
NORWOOD MEMORIAL

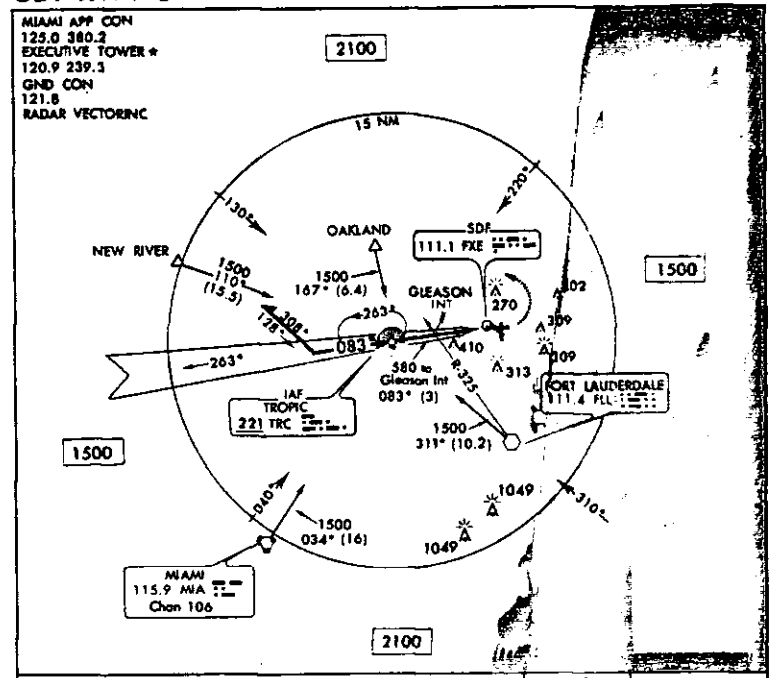
FIG. 85

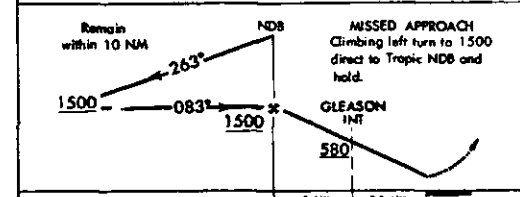
Amdt 3

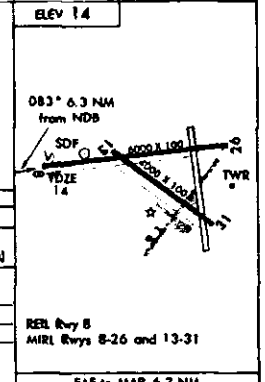
SDF RWY 8

AL-5942 (FAA)

FORT LAUDERDALE-EXECUTIVE
FORT LAUDERDALE, FLORIDA







CATEGORY	A	B	C	D
S-8	580-1 566 (600-1)			580-1¼ 566 (600-1¼)
CIRCLING	580-1 566 (600-1)		580-1½ 566 (600-1½)	640-2 626 (700-2)
SDF/VOR MINIMA				
S-8	400-1 386 (400-1)			

FAF to MAP 6.3 NM					
Knots	60	90	120	150	180
Min:Sec	6:18	4:12	3:09	2:31	2:06

When control zone not effective, the following applies: (1) Use Fort Lauderdale- Hollywood Intl Tower altimeter setting. (2) Alternate minimums not authorized.
△

SDF RWY 8

26°12'N – 80°10'W

FORT LAUDERDALE, FLORIDA
FORT LAUDERDALE-EXECUTIVE

FIG. 86

874. M66 What is the function of the Canton FM on the SDF RWY 35 approach at Norwood Memorial? (Fig. 85)

1- Facility monitor.
2- Missed approach when glide slope is in use.
3- Final approach fix.
4- Stepdown fix.

875. M42 What type instrument approach lighting is provided on RWY 35 at Norwood Memorial? (Fig. 85)

1- SALS with sequenced flashers.
2- MALS with sequenced flashers.
3- MIRL and REIL.
4- TDZL.

876. K45 What is the MDA on the SDF RWY 35 straight-in approach at Norwood Memorial if the Canton FM is out of service? (Fig. 85)

1- 580 feet
2- 510 feet
3- 630 feet
4- 640 feet

877. M31 What is the altitude depicted at Canton FM on the profile section of the SDF RWY 35 approach at Norwood Memorial? (Fig. 85)

1- The minimum descent altitude for all straight-in approaches.
2- The minimum altitude to cross Canton FM.
3- The MDA for a straight-in approach to RWY 35.
4- The altitude that Canton FM intersects the glide slope.

878. M63 What minimum radio navigation equipment is necessary to utilize the 400-foot MDA at Ft. Lauderdale-Executive? (Fig. 86)

1- VOR
2- Dual VORs
3- NDB and VOR
4- NDB, dual VORs and marker beacon

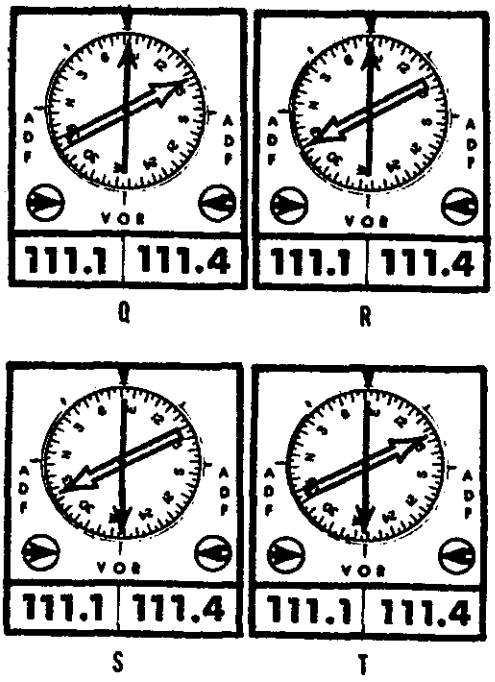
879. M63 How wide is an SDF course?

1- Either 3° or 6°
2- Varies from 5° to 10°
3- Either 6° or 12°
4- 10°

880. K41 When must the procedure turn be used on the SDF RWY 8 approach at Ft. Lauderdale-Executive? (Fig. 86)

1- On every approach except when vectored to the final approach and when using MIA VORTAC as an IAF.
2- On every approach except when vectored to the final approach and when using MIA VORTAC or NEW RIVER Intersection as an IAF.
3- On every approach.
4- On every approach except when vectored to the final approach.

881. L28 Which indication identifies GLEASON Intersection on the SDF RWY 8 approach at Fort Lauderdale-Executive? (Fig. 86)



1- Q
2- R
3- S
4- T

882. M57 What is the status of Ft. Lauderdale-Executive for use as an alternate airport when the tower is in operation? (Fig. 86)

1- Alternate minimums are non-standard.
2- Not authorized for use as an alternate.
3- Alternate minimums 600 feet and 2 miles.
4- Alternate minimums 800 feet and 2 miles.

253-096 O - 78 - 12

883. K45 Under what condition may a pilot descend to an MDA of 400 feet during an SDF RWY 8 approach at Ft. Lauderdale-Executive? (Fig. 86, page 156)

1- The control zone must be effective and Miami Approach Control must give clearance.
2- The aircraft must be operated as a Category B or C.
3- The pilot must identify GLEASON Intersection.
4- The aircraft must be equipped with at least the minimum navigation equipment required.

884. K41 What geographical limits are imposed on the procedure turn as depicted on the VOR-A approach at Civic Memorial? (Fig. 87)

1- Must be performed between the 21 DME Arc and FIDELITY Intersection.
2- Must be performed within 10 NM of TOPAZ Intersection.
3- May be performed from any position from TOY VORTAC to 10 NM beyond TOPAZ Intersection.
4- Must be performed within 10 NM of the airport.

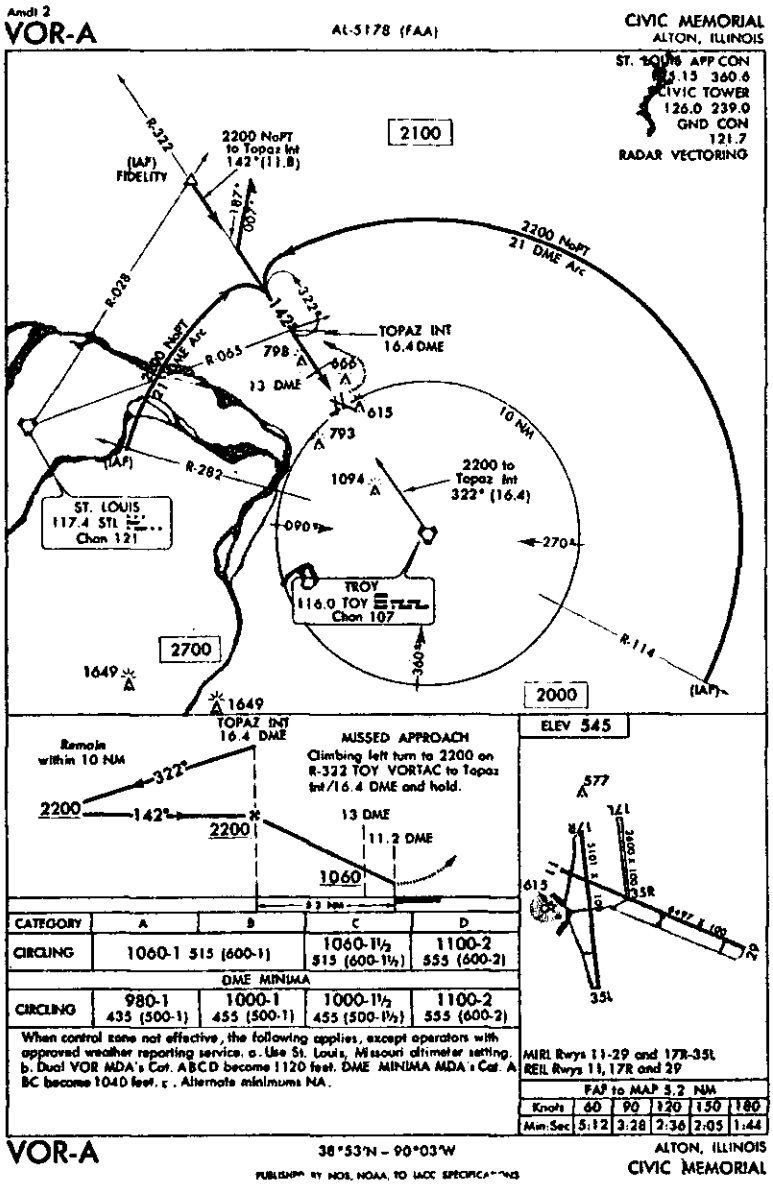
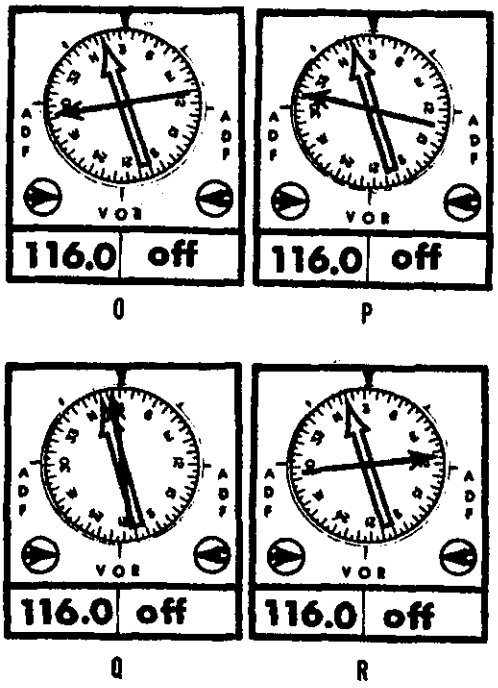


FIG. 87

885. L27 Which instrument indicates the proper right crosswind correction when established on the 21 DME Arc (TOY R-114)? (Fig. 87)



1- O
2- P
3- Q
4- R

886. M55 What is the Category A landing minimum for a VOR-A approach at Civic Memorial when the control zone is not effective? (Fig. 87)

1- 600-foot ceiling and 1 mile visibility.
2- 600-foot ceiling and 1 1/4 mile visibility.
3- 700-foot ceiling and 1 1/4 mile visibility.
4- 1-mile visibility.

887. K36 Assuming that all ILS components are operating and the runway environment is not in sight, the missed approach should be initiated upon

1- arrival over the threshold of the runway.
2- arrival at the middle marker.
3- expiration of the time listed on the approach chart for missed approach.
4- arrival at the DH on the glide slope.

888. L27 How should you identify the necessary fixes to execute a VOR-A approach to Civic Memorial if you are vectored to FIDELITY Intersection and cleared for the approach? The control zone is effective, but your DME equipment is inoperative. (Fig. 87)

	TOPAZ	13 DME	MAP
1-	TOY R-322 STL R-065	NA	Time 5.2 mi from TOPAZ
2-	TOY R-142 STL R-065	NA	Time 5.2 mi from TOPAZ
3-	TOY R-322 Time 11.8 mi from FIDELITY	Time 3.4 mi from TOPAZ	Time 5.2 mi from TOPAZ
4-	TOY R-142 Time 11.8 mi from FIDELITY	Time 3.4 mi from TOPAZ	Time 1.8 mi from 3.4 DME

889. K62 What is the responsibility of the pilot in command when approaching to land on a runway served by both an ILS and a visual approach slope indicator?

1- A pilot on an IFR flight plan shall maintain the electronic glide slope regardless of weather conditions.
2- A pilot on an IFR flight plan is not obligated to maintain a relationship with the approach slope lights, even though the electronic glide slope is out of commission.
3- The pilot shall stay above the glide slope and land beyond the approach slope lights on the runway.
4- The pilot shall maintain an altitude at or above the glide slope until a lower altitude is necessary to land.

890. M52 What is the MDA for a Category B aircraft at Civic Memorial if the control zone is not effective and the aircraft is dual VOR equipped? (Fig. 87)

1- 1,040 feet
2- 1,050 feet
3- 1,060 feet
4- 1,120 feet

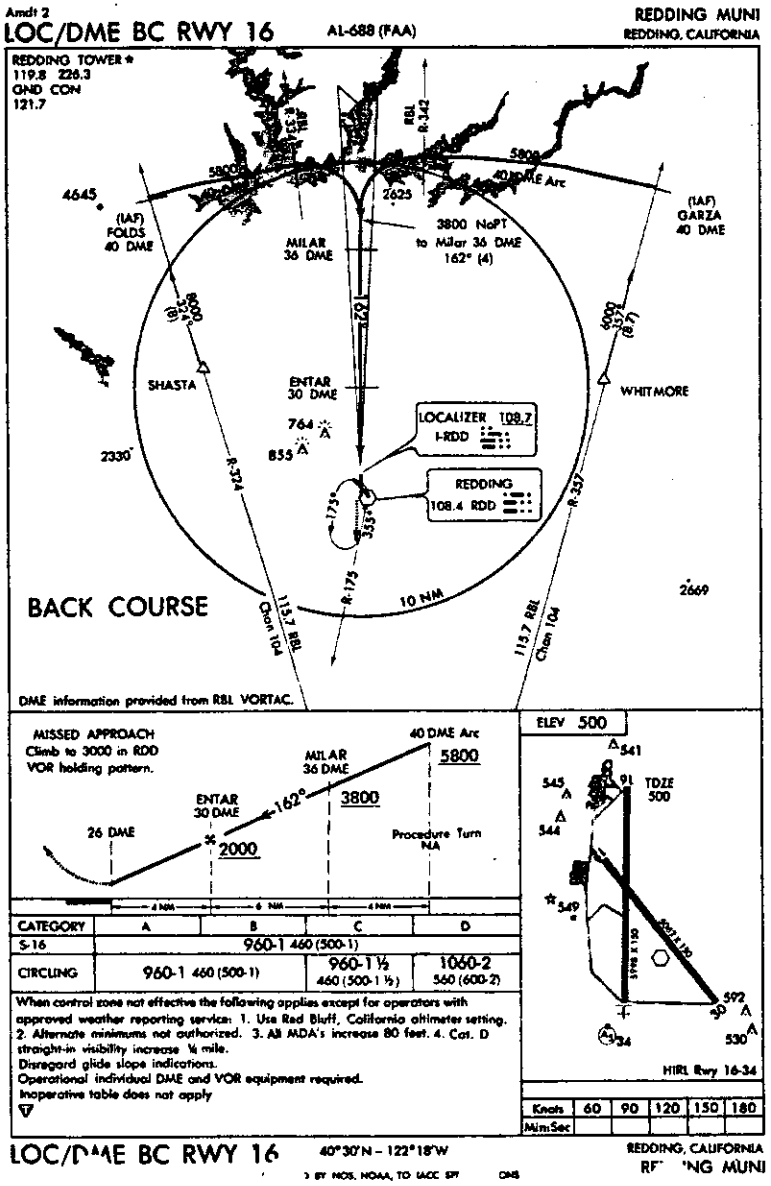

Amdt 2
LOC/DME BC RWY 16
AL-688 (FAA)
REDDING MUNI
REDDING, CALIFORNIA
REDDING TOWER
119.8 Z26.3
GND CON
121.7
(IAF)
FOLDS
40 DME
MILAR
36 DME
3800 NoPT
to Milar 36 DME
162° (4)
(IAF)
GARZA
40 DME
SHASTA
ENTAR
30 DME
WHITMORE
LOCALIZER 108.7
I-RDD
REDDING
108.4 RDD
BACK COURSE
DME information provided from RBL VORTAC.
MISSED APPROACH
Climb to 3000 in RDD
VOR holding pattern.
40 DME Arc
MILAR
36 DME
ENTAR
30 DME
26 DME
162°
3800
5800
2000
Procedure Turn
NA
ELEV 500
TDZE
500
HIRL Rwy 16-34
CATEGORY | A | B | C | D
S-16 | 960-1 460 (500-1)
CIRCLING | 960-1 460 (500-1) | 960-1½ 460 (500-1½) | 1060-2 560 (600-2)
When control zone not effective the following applies except for operators with approved weather reporting service: 1. Use Red Bluff, California altimeter setting. 2. Alternate minimums not authorized. 3. All MDA's increase 80 feet. 4. Cat. D straight-in visibility increase ¼ mile.
Disregard glide slope indications.
Operational individual DME and VOR equipment required.
Inoperative table does not apply
Knots | 60 | 90 | 120 | 150 | 180
Min:Sec
LOC/DME BC RWY 16
40°30'N – 122°18'W
REDDING, CALIFORNIA
REDDING MUNI

FIG. 88

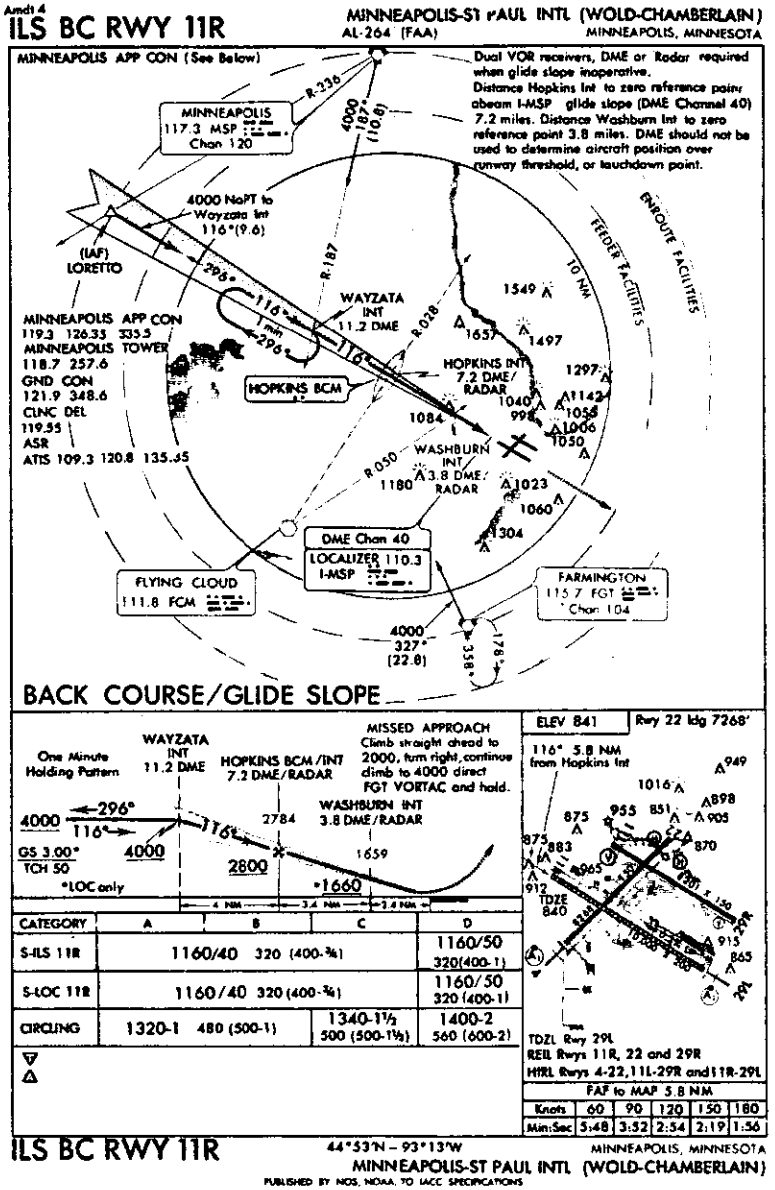

Amdt 4
ILS BC RWY 11R
AL-264 (FAA)
MINNEAPOLIS-ST PAUL INTL (WOLD-CHAMBERLAIN)
MINNEAPOLIS, MINNESOTA
MINNEAPOLIS APP CON (See Below)
Dual VOR receivers, DME or Radar required when glide slope inoperative.
Distance Hopkins Int to zero reference point abeam I-MSP glide slope (DME Channel 40) 7.2 miles. Distance Washburn Int to zero reference point 3.8 miles. DME should not be used to determine aircraft position over runway threshold, or touchdown point.
MINNEAPOLIS
117.3 MSP
Chan 120
4000 NoPT to Wayzata Int
116°(9.6)
(IAF)
LORETTO
WAYZATA
INT
11.2 DME
HOPKINS BCM
HOPKINS INT
7.2 DME/
RADAR
WASHBURN INT
3.8 DME/RADAR
MINNEAPOLIS APP CON
119.3 126.35 335.5
MINNEAPOLIS TOWER
118.7 257.6
GND CON
121.9 348.6
CLNC DEL
119.55
ASR
ATIS 109.3 120.8 135.65
DME Chan 40
LOCALIZER 110.3
I-MSP
FLYING CLOUD
111.8 FCM
FARMINGTON
115.7 FGT
Chan 104
ENROUTE FACILITIES
FEEDER FACILITIES
10 NM
BACK COURSE/GLIDE SLOPE
One Minute Holding Pattern
WAYZATA INT 11.2 DME
HOPKINS BCM/INT 7.2 DME/RADAR
WASHBURN INT 3.8 DME/RADAR
MISSED APPROACH
Climb straight ahead to 2000, turn right, continue climb to 4000 direct FGT VORTAC and hold.
GS 3.00°
TCH 50
*LOC only
ELEV 841
Rwy 22 ldg 7268'
116° 5.8 NM from Hopkins Int
TDZE
840
TDZL Rwy 29L
REIL Rwys 11R, 22 and 29R
HIRL Rwys 4-22, 11L-29R and 11R-29L
FAF to MAP 5.8 NM
CATEGORY | A | B | C | D
S-ILS 11R | 1160/40 320 (400-¾) | 1160/50 320(400-1)
S-LOC 11R | 1160/40 320 (400-¾) | 1160/50 320 (400-1)
CIRCLING | 1320-1 480 (500-1) | 1340-1½ 500 (500-1½) | 1400-2 560 (600-2)
Knots | 60 | 90 | 120 | 150 | 180
Min:Sec | 5:48 | 3:52 | 2:54 | 2:19 | 1:56
ILS BC RWY 11R
44°53'N – 93°13'W
MINNEAPOLIS, MINNESOTA
MINNEAPOLIS-ST PAUL INTL (WOLD-CHAMBERLAIN)

FIG. 89

891. K52 Which is a recommended procedure for the missed approach after a LOC/DME BC RWY 16 approach at Redding Municipal? (Fig. 88)

1- Make a climbing turn to approximately 175° and complete a parallel entry to the holding pattern while climbing to 3,000 feet.
2- Climb to 3,000 feet, reverse course, and make a direct entry into the holding pattern.
3- Perform a teardrop entry into the holding pattern, then climb to 3,000 feet.
4- Make a climbing turn to approximately 145° and complete a teardrop entry to the holding pattern while climbing to 3,000 feet.

892. J13 Why is individual DME and VOR equipment required for the LOC/DME BC RWY 16 approach at Redding Municipal? (Fig. 88)

1- The LOC and DME signals are transmitted from different locations.
2- DME can only originate from a TACAN or VORTAC station.
3- For safety purposes in the event one radio fails.
4- A DME will not work accurately with LOC equipment.

893. M42 What instrument approach lighting, if any, is available on the LOC/DME BC RWY 16 approach at Redding Municipal? (Fig. 88)

1- Medium intensity short approach lights.
2- HIRL.
3- Medium and high intensity approach lighting on RWYs 16 and 34 only.
4- None.

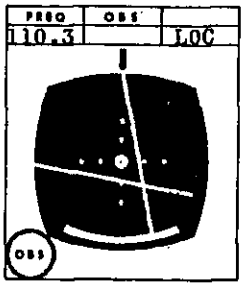
894. K43 When may you start the descent from 5,800 feet to 3,800 feet if you are cleared for the LOC/DME BC RWY 16 approach at GARZA 40 DME Fix? (Fig. 88)

1- Prior to RBL R-342, so that you cross the radial at 3,800 feet.
2- Upon crossing the RBL R-342.
3- When established on the final approach course (LOC).
4- In the turn between RBL R-342 as soon as you are inside the 10 NM ring.

895. M42 What approach and runway lighting is available for a straight-in ILS BC RWY 11R approach at Minneapolis-St. Paul International? (Fig. 89)

1- VASI, ALSF-1 (with strobe), REIL, HIRL, and centerline lighting.
2- REIL and HIRL only.
3- REIL, HIRL, and centerline lighting only.
4- VASI, REIL, HIRL, and centerline lighting only.

896. L23 What is your position as indicated by this instrument while on final approach of the ILS BC RWY 11R approach at Minneapolis-St. Paul International? (Fig. 89)



1- Below the glide slope and right of course.
2- Above the glide slope and right of course.
3- Below the glide slope and left of course.
4- Above the glide slope and left of course.

897. K63 What is the Category A landing minimum for the straight-in ILS BC RWY 11R approach at Minneapolis-St. Paul Municipal? (Fig. 89)

1- 400-foot ceiling.
2- 400-foot ceiling and 4,000 feet RVR.
3- 400-foot ceiling and 3/4 mile visibility.
4- 4,000 feet RVR.

898. K51 What is the recommended means of identifying the MAP during a straight-in ILS BC RWY 11R approach to Minneapolis-St. Paul International? (Fig. 89)

1- At 0 DME miles.
2- When time has expired from FAF.
3- At 1,160 feet on the glide slope.
4- At the runway threshold.

899. K63 Refer to the "minimums section" for Minneapolis-St. Paul International. At this airport, the reported RVR for RWY 11R is 2,400 feet. Do FARs permit you to make a straight-in approach to RWY 11R and land, in a helicopter? (Fig. 89, page 160)

1- No, the minimum requirements to perform this procedure are 4,000 feet RVR and a ceiling of 1,160 feet.
2- Yes, however, both you and the helicopter must be authorized for Category II operations.
3- No, the minimum visibility required for helicopters is 1 mile.
4- Yes, you may reduce the visibility for Category A aircraft by 50%.

900. K37 What action is recommended if the pilot is not able to identify the Hopkins back course marker with the marker beacon receiver? (Fig. 89, page 160)

1- Advise ATC of the problem and request an approach appropriate to the operable equipment.
2- Substitute the FCM R-028, 7.2 DME, or Radar.
3- Continue the approach and add 50 feet to the MDA.
4- Continue the approach, but do not descend below 2,800 feet until identifying WASHBURN Intersection.

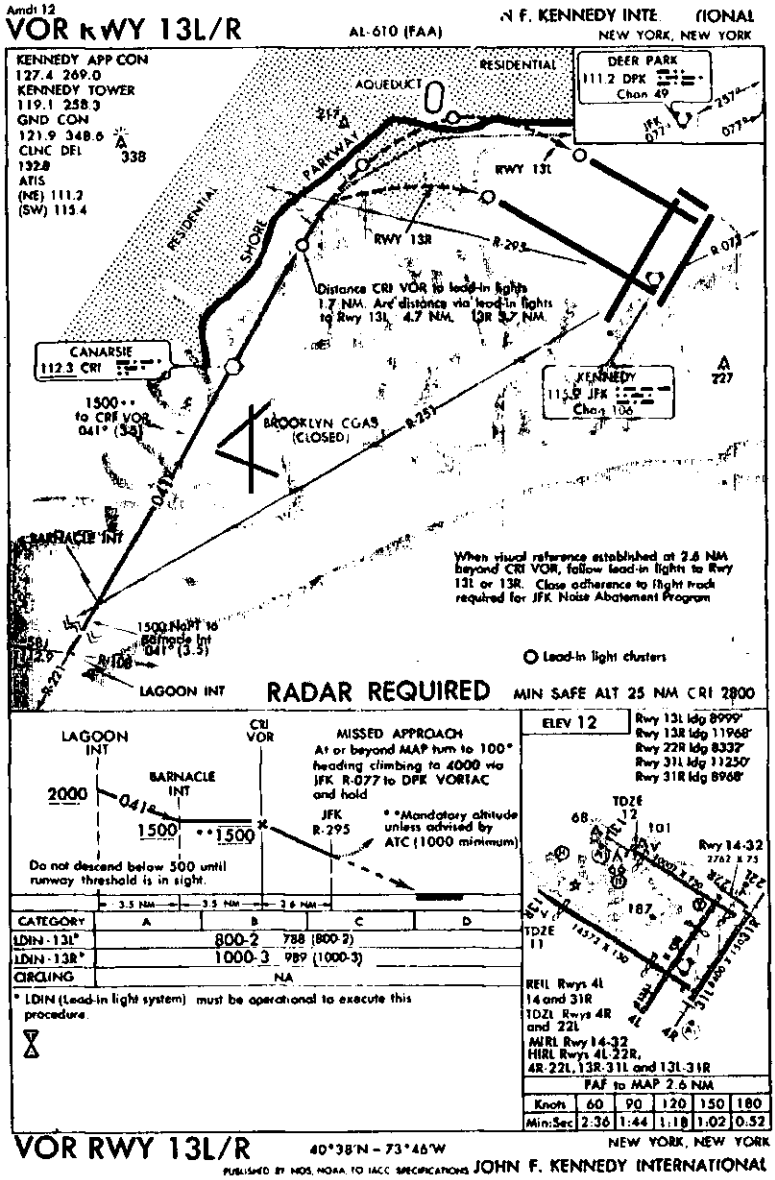


FIG. 90

901. K63 The weather at JFK is an 800-foot ceiling and 1 mile visibility. Do regulations permit you to perform a VOR RWY 13L approach in a helicopter? (Fig. 90)

1- No, the reported ceiling meets the minimum prescribed for helicopters, but the visibility does not.
2- Yes, the only landing requirement for helicopters is a 200-foot ceiling.
3- No, neither the ceiling nor the visibility meets the required minimums.
4- Yes, you may reduce the visibility prescribed for Category A airplanes by 50%.

902. M52 What is the lowest altitude to which a pilot may descend upon visual contact with the first lead-in lights at 1.7 NM past CRI VOR on an LDIN-13L approach to JFK? (Fig. 90)

1- 800 feet
2- 1,000 feet
3- Runway elevation
4- 500 feet

903. M31 What type altitude is the 1,500 feet depicted at the FAF on the VOR RWY 13 L/R approach chart for JFK International? (Fig. 90)

1- Maximum altitude.
2- Helicopter and airplane minimum altitude.
3- Mandatory altitude.
4- Recommended altitude.

904. M22 What action should a pilot take if the lead-in light 1.7 NM past CRI VOR is not observed as the flight progresses over it on an approach to RWY 13R at JFK? (Fig. 90)

1- Execute a missed approach.
2- Advise ATC immediately and request a substitute approach.
3- Continue approach to MAP.
4- Continue approach and increase landing minimums 1/4 mile.

905. K52 How can a pilot determine when the missed approach point has been reached on a VOR LDIN 13 L/R approach at JFK International? (Fig. 90)

1- At JFK R-295.
2- Upon descent to 800 feet.
3- At the second lead-in light.
4- At 2.6 DME miles past the FAF.

906. K42 By what method does a flight get established on final approach course if it has made a missed approach and is in the holding pattern at DPK VORTAC? (Fig. 90)

1- Proceed direct to the IAF at Colts Neck and turn inbound.
2- Radar vectors.
3- Proceed direct to BARNACLE Intersection via the JFK R-251 and execute a procedure turn.
4- Intercept the CRI R-221 and execute a procedure turn within 10 NM of CRI VOR.

907. M51 What determines the approach category for an aircraft?

1- The maximum certificated gross landing weight and the speed based on 1.3 times the stalling speed in landing configuration at this weight.
2- The number of engines and the approach speed in landing configuration at maximum gross landing weight.
3- The maximum certificated gross weight and the approach speed at this weight.
4- The maximum gross weight and the speed based on 1.3 times V_{SO}.

908. K37 What facilities may be substituted for an inoperative middle marker during an ILS approach without affecting the straight-in minimums?

1- Compass locator or PAR.
2- Compass locator, PAR, or ASR.
3- Compass locator, PAR, ASR, or airborne radar.
4- PAR or ASR.

909. K62 When should you contact ground control upon landing at a controlled airport?

1- Prior to turning off the runway.
2- Upon crossing the runway-taxiway boundary.
3- When the tower instructs you to do so.
4- After crossing the runway holding lines.

910. K62 Upon landing at a controlled airport, you should switch to ground control

1- only if the tower hands you off to ground control.
2- only upon crossing the runway holding lines.
3- prior to turning off the runway.
4- only upon crossing the runway-taxiway boundary.

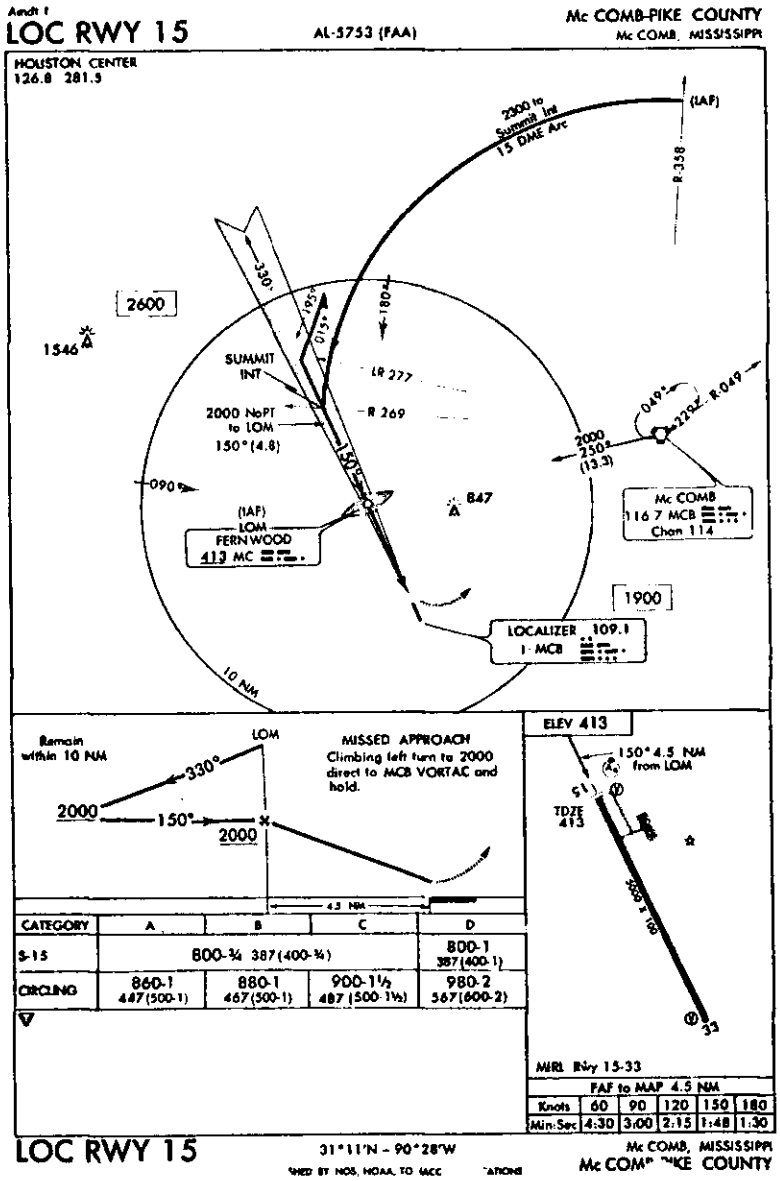


FIG. 91

911. K41 What is indicated by the note, "Remain within 10 NM," in the profile section of the LOC RWY 15 approach chart for McComb-Pike County Airport? (Fig. 91)

1- Maintain the entire approach within 10 NM of the airport.
2- Perform the procedure turn within 10 NM of SUMMIT Intersection.
3- Perform the procedure turn within 10 NM of the LOM.
4- Maintain the procedure turn within 10 NM of the LOC course.

912. K41 Which procedure should you use when cleared for a LOC RWY 15 approach to McComb-Pike County Airport from over McComb VORTAC? (Fig. 91)

1- Request a radar vector to the final approach course.
2- Proceed direct to the LOM, turn outbound, perform a procedure turn, and complete the approach.
3- Proceed direct to the IAF 15 DME Arc and track inbound to the final approach course.
4- Proceed direct to the LOM and turn inbound on final approach.

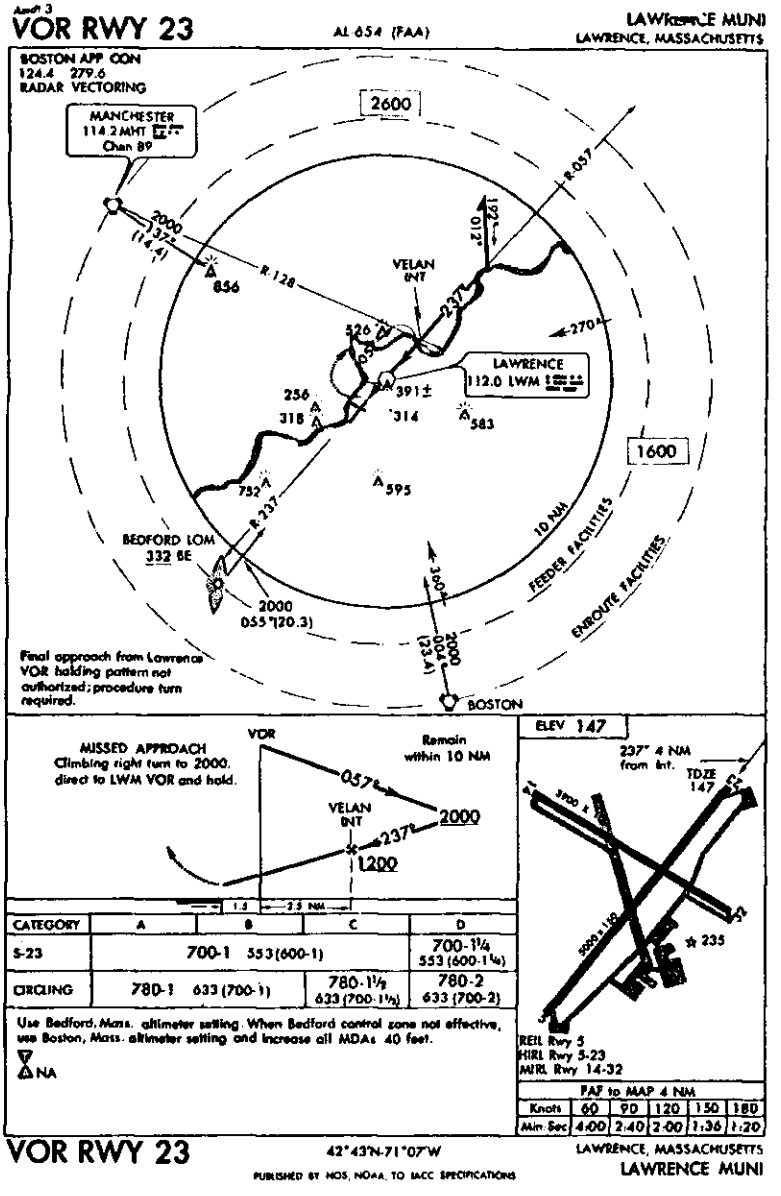


FIG. 92

919. K63 What is the helicopter landing minimum for the VOR RWY 23 approach at Lawrence Municipal? (Fig. 92)

1- 700 feet and 1 mile
2- 1 mile
3- 600 feet and 1/2 mile
4- 1/2 mile

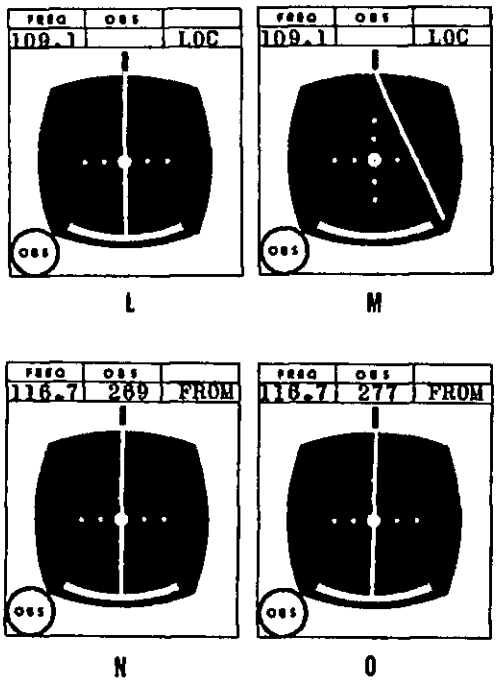
920. M40 What is the ETE from the FAF to the MAP for the Lawrence Municipal VOR RWY 23 approach if an 80-knot GS is maintained? (Fig. 92)

1- 3 minutes
2- 3 minutes 06 seconds
3- 3 minutes 20 seconds
4- 2 minutes 51 seconds

921. K52 When should you initiate the missed approach during a straight-in VOR RWY 23 approach at Lawrence Municipal? (Fig. 92)

1- When ETA to runway threshold has expired, if runway is not in sight or you are not in position to land.
2- When time has expired for 1.5 NM past the FAF, and the runway is not in sight or you are not in position to land.
3- Upon arriving at the MDA prior to having the runway environment in sight.
4- Upon passing Lawrence VOR inbound, if the runway environment is not in sight.

913. What instrument indications should you have when it is time to turn onto final approach course from the 15 DME Arc at McComb-Pike County Airport? (Fig. 91)
L21



1- L and O
2- M and N
3- M and O
4- L and N

914. What are the IFR minimums when cleared for a straight-in approach at McComb from the initial approach fix on the 15 DME Arc? (Fig. 91)
M27

1- 2,300 feet to SUMMIT Intersection, 2,000 feet to LOM, 800 feet and 3/4 mile to MAP, and 1 mile visibility for landing.
2- 2,300 feet to SUMMIT Intersection, 2,000 feet to LOM, 800 feet to MAP, and 3/4 mile visibility for landing.
3- Assigned altitude on the arc, 2,300 feet to LOM, 800 feet and 3/4 mile visibility for landing.
4- Assigned altitude on the arc, 2,300 feet at SUMMIT Intersection, 2,000 feet to LOM, 800 feet and 3/4 mile to MAP, and 1 mile visibility for landing.

915. What effect does an inoperative MALS have on the McComb-Pike County LOC RWY 15 (Fig. 91) approach and landing minimums?
K46

1- MDA increased to 850 feet.
2- Landing minimum increased to 1 1/4 mile.
3- MDA and landing minimums increased to 850 feet and 1 mile.
4- Landing minimum increased to 1 mile.

916. The final approach on the LOC RWY 15 approach at McComb-Pike County Airport (Fig. 91) begins
K44

1- when at the MAP "in the clear."
2- when you start the procedure turn.
3- when you turn to the final approach course inbound from the procedure turn.
4- over the LOM.

917. What instrument approach lighting is available for an LOC RWY 15 approach at McComb-Pike County Airport? (Fig. 91)
M42

1- MIRL and VASI.
2- MALS with sequenced flashers.
3- TDZE.
4- MIRL.

918. Do regulations authorize you to execute a straight-in LOC RWY 15 approach and landing at McComb-Pike County Airport in a helicopter, if the reported airport weather is 400 feet indefinite ceiling and 1/8 mile visibility? (Fig. 91)
K63

1- No, you may reduce the prescribed visibility for Category A aircraft by no more than 50%.
2- No, the ceiling meets the requirements of regulations, but the visibility must be at least 3/4 mile.
3- Yes, the minimum ceiling required is 400 feet and you may disregard the visibility minimums.
4- Yes, you may reduce the prescribed visibility for Category A aircraft by 60% but not less than 1/8 mile.

922. M31 What procedure should you use to establish the airplane on the final approach of the Lawrence VOR RWY 23 approach if you are holding in the depicted holding pattern at 3,000 feet? (Fig. 92)

1- Descend to 1,200 feet while in the holding pattern. Upon reaching 1,200 feet and the Manchester 128 radial, start a 180° turn to the 237° approach course and continue the approach as depicted.
2- Intercept the 057 radial outbound and make a procedure turn after passing VELAN Intersection; maintain at least 2,000 feet until inbound on the 057 radial and continue the approach as depicted.
3- Descend immediately and fly outbound on the Lawrence 057° radial. Upon reaching 2,000 feet, start a procedure turn while still descending to 1,200 feet. After passing VELAN Intersection, continue descent to the MDA of 700 feet.
4- Descend to 2,000 feet while in the holding pattern. Upon reaching the Manchester 128 radial, start a 180° turn to the 237° approach course and continue the approach.

923. K40 What procedural changes are effective at Lawrence Municipal when Bedford Control Zone is not in effect? (Fig. 92)

1- Use the Bedford altimeter setting; MDA 700 feet.
2- Use the Bedford altimeter setting; MDA 740 feet.
3- Use the Boston altimeter setting; MDA 740 feet.
4- Use the Lawrence Municipal altimeter setting; MDA 700 feet.

924. K45 What is helicopter MDA for a straight-in VOR RWY 23 approach at Lawrence Municipal? (Fig. 92)

1- 600 feet
2- 700 feet
3- 350 feet
4- 226 feet

925. K15 You have been vectored to the traffic pattern of your destination airport at the termination of a helicopter instrument flight, and thereafter have been cleared for a "visual approach." In this situation, you should

1- disregard sequencing instructions from ATC since they apply exclusively to fixed-wing aircraft.
2- follow the preceding aircraft, if so cleared.
3- continue your approach without further advising ATC if the visibility is one-half mile or more.
4- position your helicopter behind all visible fixed-wing aircraft.

926. K63 What approach and landing minimums must prevail for an IFR flight cleared for a visual approach?

1- The same minimums as the IFR approach to that runway.
2- Basic VFR conditions (VMC).
3- Ceiling which permits at least a 1,000-foot obstacle clearance.
4- 1,000-foot ceiling and 1-mile visibility.

927. K63 An instrument approach procedure requires an RVR of 2,400 feet as the visibility criteria. If the RVR is inoperative, how would the visibility requirement be reported in lieu of the published RVR?

1- As an RVV of 2,400 feet.
2- As a ground visibility of 1/4 statute mile.
3- As a slant range visibility of 2,400 feet for the final approach segment of the published approach procedure.
4- As a ground visibility of 1/2 statute mile.

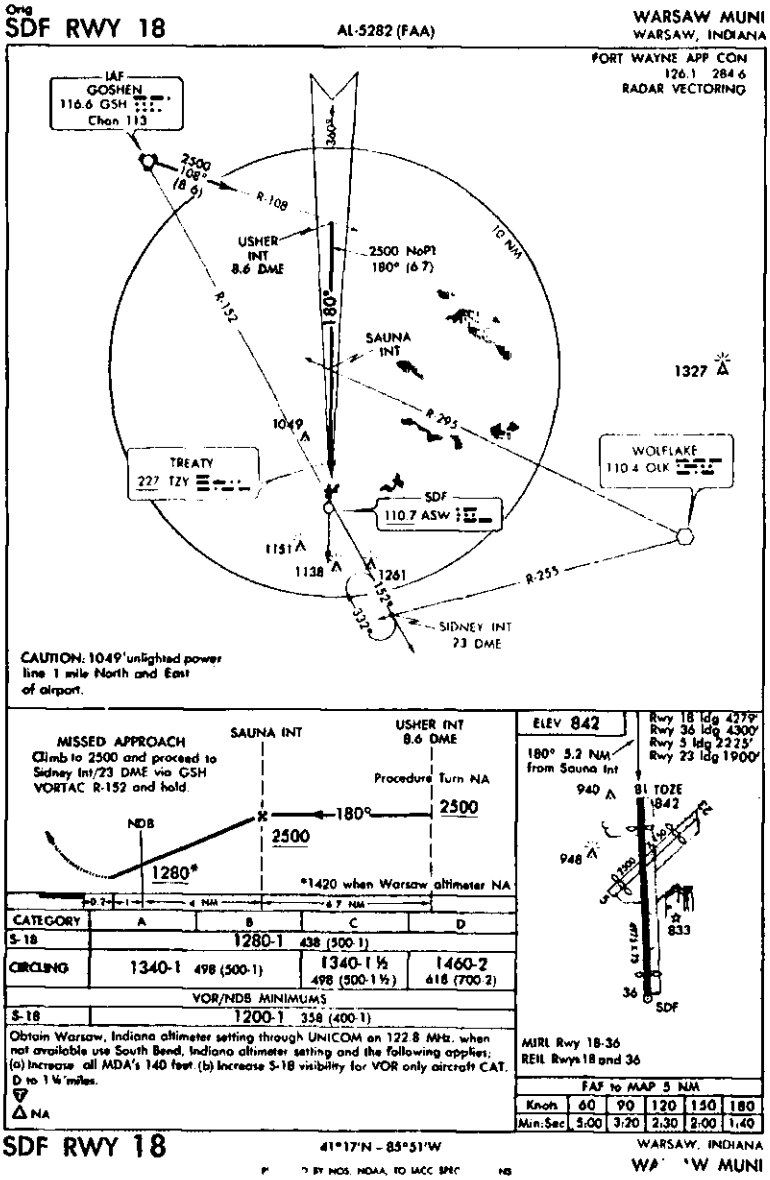


FIG. 93

928. M50 What is the MDA and landing minimum for the SDF RWY 18 straight-in approach at Warsaw in an ADF equipped aircraft if the South Bend altimeter setting is used? (Fig. 93)

1- 1,420 feet and 1 mile
2- 1,420 feet and 1 1/4 mile
3- 1,340 feet and 1 mile
4- 1,280 feet and 1 mile

929. K52 Where is the missed approach point for the Warsaw SDF RWY 18 approach? (Fig. 93)

1- Wherever you reach 1,280 feet on the glide path.
2- The runway threshold.
3- The NDB.
4- The point 5 miles from the FAF.

930. M22 Is a procedure turn authorized for the SDF RWY 18 approach at Warsaw and, if so, when? (Fig. 93)

1- No.
2- Yes, if the approach starts at the NDB.
3- Yes, anytime it becomes necessary to reverse course.
4- No, except when radar is unable to vector you to the final approach course.

931. K63 What is the helicopter VOR/DME landing minimum for the SDF RWY 18 approach at Warsaw Municipal? (Fig. 93)

1- 1 mile
2- 1,200 feet and 1 mile
3- 600 feet and 3/4 mile
4- 1/2 mile

932. K52 What is the published missed approach procedure for the Warsaw SDF RWY 18 approach? (Fig. 93)

1- Start a climbing turn to 2,500 feet and call Warsaw Muni on 122.8 and inform them you are making a missed approach. Call Fort Wayne Approach Control and ask for further instructions.
2- Climb to 2,500 feet and intercept the GSH 152 radial; proceed to SIDNEY Intersection and hold. Inform Fort Wayne Approach Control of your intentions.
3- Climb to 2,500 feet. If you have DME, proceed to SIDNEY Intersection; if no DME, proceed to Goshen VORTAC. Request further clearance from Fort Wayne Approach Control.
4- Start a climbing turn to the right and proceed to Goshen VORTAC on the GSH 152 radial maintaining 2,500 feet. Contact Fort Wayne Approach Control and inform them of your intentions.

933. M32 What is the function of the NDB shown in the profile view of the Warsaw SDF RWY 18 approach? (Fig. 93)

1- The missed approach point.
2- The point where the aircraft should be at an altitude of 1,280 feet if making the proper descent.
3- A stepdown fix which, when identified, authorizes a lower MDA.
4- The point where descent must be stopped unless the runway is in sight.

934. M51 The speeds used to determine the aircraft approach categories found in the Minimums Section of the Instrument Approach Procedure Charts are based on

1- 1.3 times the stalling speed in landing configuration at maximum gross weight.
2- 1.3 times the stalling speed in landing configuration at maximum certificated gross landing weight.
3- 1.3 V_{SO} at maximum certificated weight.
4- 1.3 V_A at maximum certificated landing weight.

935. K64 How is your flight plan closed when your destination airport has IFR conditions and there is no control tower or FSS on the field?

1- Upon landing, you may close your flight plan by radio if a remote communication site is near, or by telephoning any FSS or ATC facility.
2- You may close your flight plan any time after starting the approach by contacting any FSS or ATC facility.
3- Upon reaching the final approach fix, you should contact the nearest FSS and close your flight plan.
4- The ARTCC controller will close your flight plan upon clearing you for the approach.

936. L12 A pilot is practicing instrument maneuvers in simulated instrument conditions in a helicopter. The pilot may utilize an individual as safety pilot in the other control position if that person holds

1- an Instrument Rating in either helicopters or airplanes.
2- a rotorcraft category and a helicopter class rating.
3- a Flight Instructor Certificate with airplane and instrument ratings.
4- a student pilot certificate and is receiving helicopter training.

937. K15 Upon arrival at your destination after a flight under IFR in a helicopter, you may be authorized to execute a "contact approach"

1- regardless of visibility if you operate at a speed that allows you to see any air traffic or obstruction in time to avoid collision, and ATC assigns you this approach.
2- if the ceiling is at least 1,000 feet, the visibility is at least 1 statute mile, and ATC assigns you this approach.
3- if you request it from ATC, the ground visibility is 1/2 statute mile or more, and the ceiling is at least 500 feet.
4- if you request it from ATC, the ground visibility is at least 1 statute mile, and you remain clear of clouds.

938. Which flight time may be logged as instrument time when on an instrument flight plan?
L11

1- All of the time the airplane cannot be controlled by reference to the ground.
2- Only the time you are controlling the airplane solely by reference to flight instruments.
3- Only the time you are flying in IFR weather conditions.
4- All of the time from lift-off until touchdown.

939. Ten miles from your destination airport, you cancel your IFR flight plan. When are you required to establish communication with the tower at the airport?
K62

1- Immediately after canceling the flight plan.
2- As soon as you have the field in sight.
3- At least by the time you enter the traffic pattern.
4- At least 5 miles from the center of the airport.

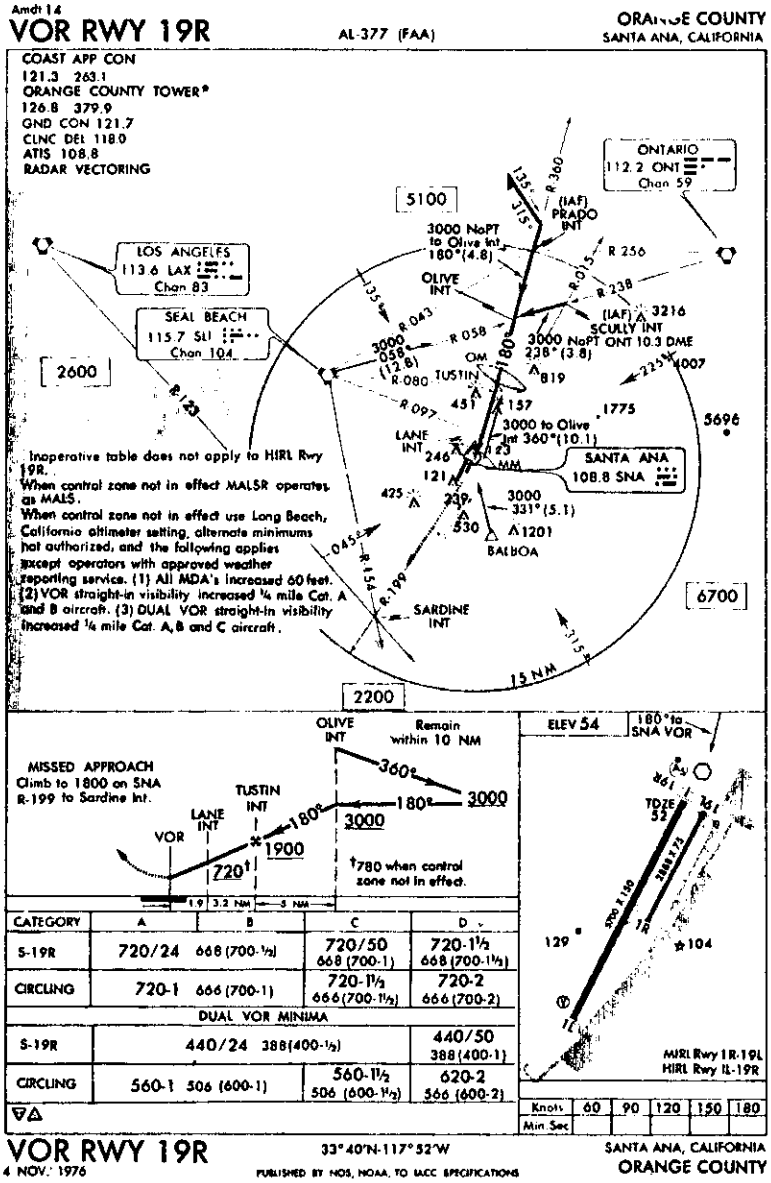
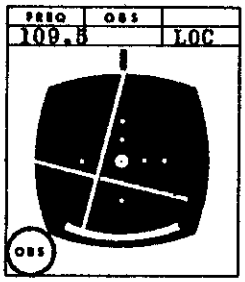


FIG. 94

949. What is your position relative to the Glide Slope and LOC?
L23



1- Low and to the left.
2- Low and to the right.
3- High and to the right.
4- High and to the left.

950. If a pilot enters the condition of flight in the pilot logbook as simulated instrument conditions, what additional information must be entered?
L13

1- Place and type of each instrument approach completed and name of safety pilot.
2- Name and pilot certificate number of safety pilot and type of approaches completed.
3- Number and type of instrument approaches completed and route of flight.
4- Number, type, and place of instrument approaches completed; name and pilot certificate number of an instructor pilot.

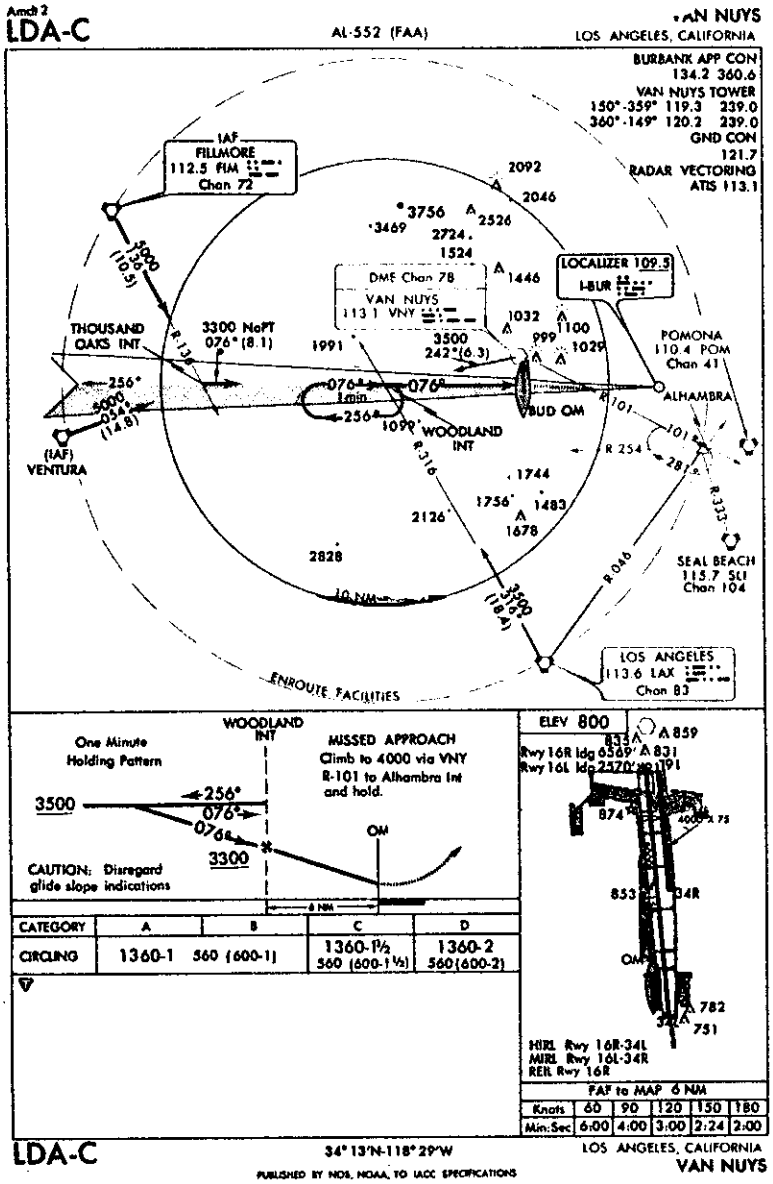


FIG. 95

940. M50 What is the MDA and landing minimum for the Orange County VOR RWY 19R straight-in approach if the airplane has only one operative VOR receiver? (Fig. 94) (Control Zone in effect.)

1- MDA 720 feet; visibility 1 mile.
2- MDA 770 feet; visibility 1 mile.
3- MDA 720 feet; visibility RVR 2,400 feet.
4- MDA 700 feet; visibility 1/2 mile.

941. M21 What radar service is available at Orange County Airport? (Fig. 94)

1- Radar control of all traffic.
2- Long Beach Approach Control will vector you and Coast Approach Control controls ASR approaches.
3- Radar vectoring, but not radar approaches.
4- Radar vectors and ASR approaches.

942. K46 What is the MDA and landing minimum for a straight-in VOR RWY 19R approach at Orange County in a Category A airplane equipped with dual VOR receivers? (Fig. 94) (HIRL inoperative and Control Zone not in effect.)

1- MDA 780 feet; visibility 3/4 mile.
2- MDA 720 feet; visibility 1/2 mile.
3- MDA 440 feet; visibility 1/2 mile.
4- MDA 500 feet; visibility 3/4 mile.

943. K63 What is the MDA and landing minimum for a helicopter equipped with dual VOR receivers if cleared for the VOR straight-in approach to RWY 19R at Orange County when the control zone is not in effect? (Fig. 94)

1- 440 feet and 1,200 feet RVR
2- 500 feet and 4,000 feet RVR
3- 500 feet and 3/8 mile
4- 440 feet and 3/4 mile

944. K44 What is the purpose of LANE Intersection? (Fig. 94)

1- To aid the pilot in establishing position when executing a circling approach.
2- To authorize a lower MDA after passing an obstruction.
3- To establish the MDA at 720 feet.
4- To aid the pilot in establishing a proper glide path.

945. M27 What are the minimum altitudes for a straight-in VOR RWY 19R approach at Orange County if you are cleared for the approach upon passing Ontario VORTAC at 5,000 feet? (Fig. 94) Your aircraft is equipped with dual VORs, DME, and ADF. The control zone is in effect.

1- 3,000 feet to OLIVE Intersection; 1,900 feet to TUSTIN Intersection; and an MDA of 720 feet.
2- 5,000 feet to SCULLY Intersection; 3,000 feet to OLIVE Intersection; 1,900 feet to TUSTIN Intersection; and an MDA of 720 feet.
3- 5,000 feet to SCULLY Intersection; 3,000 feet to OLIVE Intersection; 1,900 feet to TUSTIN Intersection; 720 feet to LANE Intersection; and an MDA of 440 feet.
4- 5,000 feet until inbound on the Santa Ana 360 radial; 3,000 feet to OLIVE Intersection; 1,900 feet to TUSTIN Intersection; and an MDA of 720 feet.

946. M67 Which is the proper indication for ON GLIDE PATH when using the standard FAA 2-Bar VASI?

1-	White Red	Runway	White Red
2-	White Green	Runway	White Green
3-	Red White	Runway	Red White
4-	White Amber	Runway	White Amber

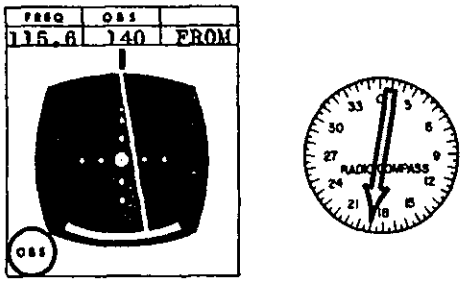
947. M67 What indications are correct for the glide slope positions on a tricolor VASI?

	Below GS	On GS	Above GS
1-	Red	Pink	White
2-	Red	White	Amber
3-	Red	Green	White
4-	Red	Green	Amber

948. L24 Which range facility associated with the ILS is identified by the last two letters of the localizer identification group?

1- Middle compass locator.
2- Inner marker.
3- Outer marker.
4- Outer compass locator.

969. L26 During the missed approach for the NDB RWY 5 approach at New Bedford, you are cleared for another approach. If your VOR and NDB receivers indicate as shown and your heading is 223°, what is your position? (Fig. 97)



1- Approaching BONNI Intersection outbound from the LOM and west of course.
2- Past BONNI Intersection outbound from the LOM and west of course.
3- Past BONNI Intersection outbound from the LOM on course.
4- Approaching BONNI Intersection outbound from the LOM and on course.

970. M27 What is the minimum safe altitude for the sector in which the missed approach is made for the New Bedford NDB RWY 5 approach? (Fig. 97)

1- 1,700 feet
2- 2,100 feet
3- 1,500 feet
4- 1,600 feet

971. K40 Upon arrival at Providence VORTAC (PVD) at 3,000 feet, you are cleared for the NDB RWY 5 approach via the PVD 140 radial. What are the minimum altitudes for this approach? (Fig. 97)

1- 2,000 feet when established on the PVD 140 radial to procedure turn; 1,700 feet in procedure turn; 1,500 feet from procedure turn to LOM; MDA 700 feet.
2- 2,000 feet when established on the PVD 140 radial; 1,500 feet when established on the 053° bearing inbound to the LOM; MDA 700 feet.
3- 3,000 feet until established inbound on the 053° bearing; 1,500 feet to the LOM; MDA 700 feet.
4- 3,000 feet until starting a procedure turn, then 1,700 feet; 1,500 feet after established on the 053° bearing to the LOM; MDA 631 feet.

972. K41 When is a procedure turn required for the NDB RWY 5 approach at New Bedford? (Fig. 97)

1- At all times except when the transition from Providence is flown or you are vectored to the final approach course.
2- At all times unless you receive a radar vector to the final approach course.
3- Only when cleared for the approach from TURNER Intersection.
4- Only when you approach the terminal area from the north.

973. K41 Under what condition is the procedure turn not required for the NDB approach at La Junta? (Fig. 98)

1- When the en route phase terminates at a VOR shown on the Enroute Facilities ring.
2- When the initial approach begins at any of the intersections or VORs on or within the 10 NM ring.
3- Only when the initial approach is over FAYETTE Intersection.
4- When the en route phase terminates within the inner 10 NM ring.

974. M31 What is the maximum altitude, if any, to enter the holding pattern after executing a missed approach on the NDB RWY 8 approach at La Junta Municipal? (Fig. 98)

1- No maximum
2- 5,600 feet
3- 5,500 feet
4- 5,800 feet

975. M41 What length of RWY 8 is available for takeoff and landing at La Junta? (Fig. 98)

1- 8,000 feet for takeoff and landing.
2- 6,845 feet for takeoff and landing.
3- 6,845 feet for takeoff and 8,000 feet for landing.
4- 8,000 feet for takeoff and 6,845 feet for landing.

976. M31 What is the maximum altitude over the final approach fix during an NDB approach straight in to RWY 8 at La Junta Municipal? (Fig. 98)

1- 5,500 feet
2- 5,600 feet
3- 5,800 feet
4- 4,720 feet

977. K64 What is the procedure for closing an IFR flight plan at La Junta Municipal? (Fig. 98, page 178)

1- The pilot should request La Junta FSS to close the flight plan after landing.
2- Denver Center will automatically close the flight plan upon issuance of an approach clearance.
3- La Junta Radio will automatically close the flight plan when the aircraft lands.
4- The pilot should request Denver Center to close the flight plan when cleared for approach.

978. K64 When may a pilot cancel the IFR flight plan?

1- Any time when not operating in Positive Control Airspace.
2- At any time.
3- Any time when operating in VFR weather conditions outside of Positive Control Airspace.
4- Only during an emergency or when the destination airport is in sight.

979. K64 Under what condition would you be able to cancel your IFR flight plan prior to completion of the flight, if outside positive controlled airspace?

1- Only in the event of an emergency.
2- Anytime you are unable to comply with the clearance.
3- Only if you can proceed under VFR conditions.
4- Anytime you desire, if you first get permission from ATC.

980. L12 What are the minimum qualifications for a person who occupies the other control seat as safety pilot during simulated instrument flight?

1- Designated as a competent observer.
2- Rated in the aircraft.
3- Instrument rated.
4- Pilot with Instrument Rating or taking instrument instruction.

981. L24 Which range facility associated with the ILS can be identified by a two-letter coded signal?

1- Outer Marker (OM).
2- Compass Locator.
3- Inner marker (IM).
4- Middle marker (MM).

982. L11 Which altitude shown below, when published on an Instrument Approach Procedure Chart, indicates you must be at 4,500 feet MSL?

A	B	C	D
4500	4500	4500	4500

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

983. L24 What is the correct sequence of visual and aural signals for an ILS approach?

	OM	MM	IM
1-	AMBER — — —	WHITE • — • —	PURPLE • • • •
2-	PURPLE — — —	AMBER • — • —	WHITE • • • •
3-	PURPLE — — —	AMBER • • • •	WHITE • — • —
4-	WHITE — — —	AMBER • • • •	PURPLE • — • —

984. L27 While flying a 10 DME Arc to the right using an RMI, you experience a crosswind component from the right. How should you compensate for the crosswind?

1- Place the RMI needle on a reference point behind the right wingtip.
2- Keep the RMI needle on the right wingtip.
3- Place the RMI needle 10° behind the right wingtip and maintain this reference point.
4- Place the RMI needle on a reference point ahead of the right wingtip.

985. L34 What effect would a light crosswind of approximately 7 knots have on vortex behavior?

1- Both vortices would move downwind at a greater rate than if the surface wind was down the landing runway.
2- A light crosswind would rapidly dissipate vortex strength.
3- The upwind vortex would tend to remain in the touchdown zone.
4- The downwind vortex would tend to remain in the touchdown zone.

986. L31 When landing behind a large aircraft, which procedure should be followed for vortex avoidance?

1- Stay to one side of its final approach flight path and land near the edge of the runway.
2- Stay above its final approach flight path all the way to touchdown.
3- Stay well below its final approach flight path and land at least 2,000 feet behind.
4- Stay below and to one side of its final approach flight path.

987. L32 To avoid possible wake turbulence from a large jet aircraft that has just landed prior to your takeoff, at which point on the runway should you plan to become airborne?

1- At the point where it touched down, or just prior to this point.
2- Past the point where it touched down.
3- Approximately 500 feet prior to the point where it touched down.
4- At least 1,000 feet past its touchdown point.

988. L33 Which procedure should you follow to avoid wake turbulence if a large jet crosses your course from left to right approximately 1 mile ahead and at your altitude?

1- Make sure you are slightly above the path of the jet.
2- Pass under the jet's path by 100 feet.
3- Descend 200 feet and turn 20° left; return to course and altitude after passing the jet's path.
4- Slow your airspeed to V_A and maintain altitude and course.

989. L34 Wake turbulence is near maximum behind a jet transport just after takeoff because

1- of the high angle of attack and high gross weight.
2- acceleration to higher speeds amplifies the turbulence.
3- the engines are at maximum thrust output at slow airspeed.
4- the gear and flap configuration increases the turbulence to maximum.

990. L34 What wind condition prolongs the hazards of wake turbulence on a landing runway for the longest period of time?

1- Straight headwind.
2- Light quartering tailwind.
3- Straight tailwind.
4- Light quartering headwind.

991. M12 If a control tower and an FSS are located on the same airport, which tower function is assumed by the FSS during those periods when the tower is closed?

1- Clearance to land.
2- Terminal weather forecasts.
3- Automatic closing of IFR flight plans.
4- Traffic advisories.

992. M67 Which approach and landing objective is assured when the pilot remains on the proper glide path of the VASI?

1- Touchdown at the runway threshold.
2- Obstruction clearance in the approach area.
3- Course guidance to the runway centerline.
4- Interception of the Middle Marker at the DH.

993. M21 When "Radar Vectoring" is listed on an approach chart, what does it signify?

1- Radar vectoring is available only for aircraft making an instrument approach.
2- Radar vectoring is available for ASR and PAR approaches.
3- Radar vectoring is available only for aircraft on an IFR flight plan.
4- Radar vectoring is available, but radar instrument approaches are not available.

994. M23 Initial Approach Fixes may be identified on Instrument Approach Procedure Charts as

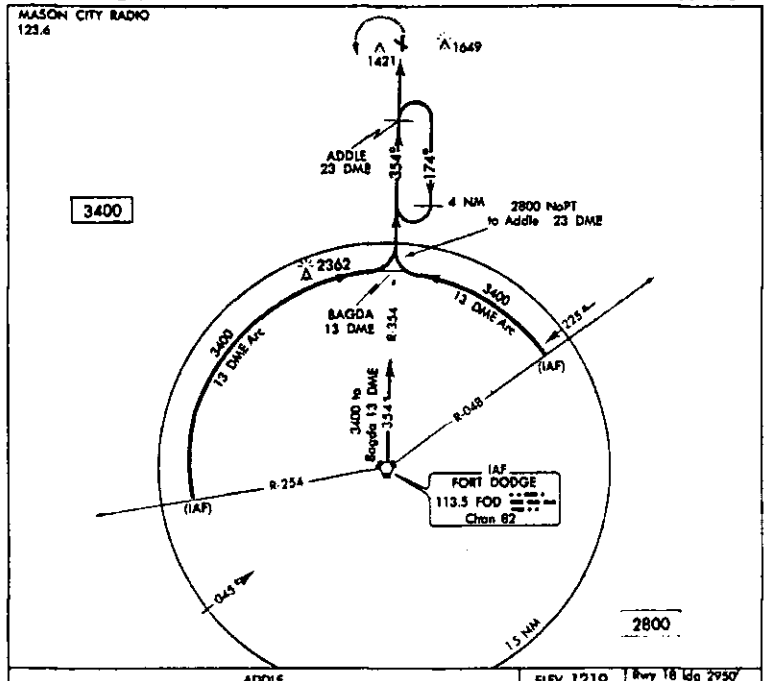
1- the procedure turn and the fixes on the feeder facility ring.
2- the fixes labeled IAF.
3- any fix that is within the 10-mile ring other than the final approach or intermediate approach fixes.
4- any of the fixes illustrated between the 10-mile ring and the en route facilities ring.

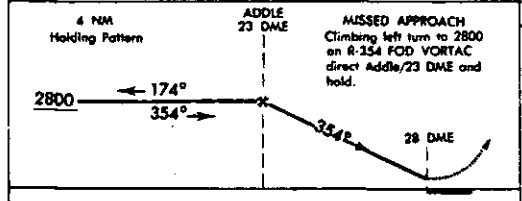
Orig

VORTAC-A

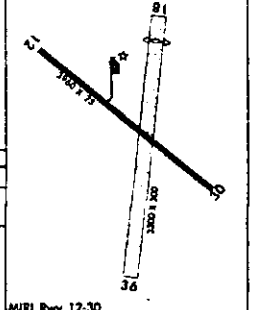
AL-6144 (FAA)

ALGONA MUNI
ALGONA, IOWA





ELEV 1219 | Rwy 18 Idg 2950'



CATEGORY	A	B	C	D
CIRCLING	1980-1 761 (800-1)	1980-1 ¼ 761 (800-1 ¼)	1980-1 ½ 761 (800-1 ½)	2140-2 921 (1000-2)

Use Mason City, Iowa altimeter setting.

▽
△NA

MIRL Rwy 12-30
REIL Rwys 12 and 30

Knots	60	90	120	150	180
Min:Sec					

VORTAC-A

43°05'N – 94°16'W

ALGONA, IOWA
ALGONA MUNI

PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

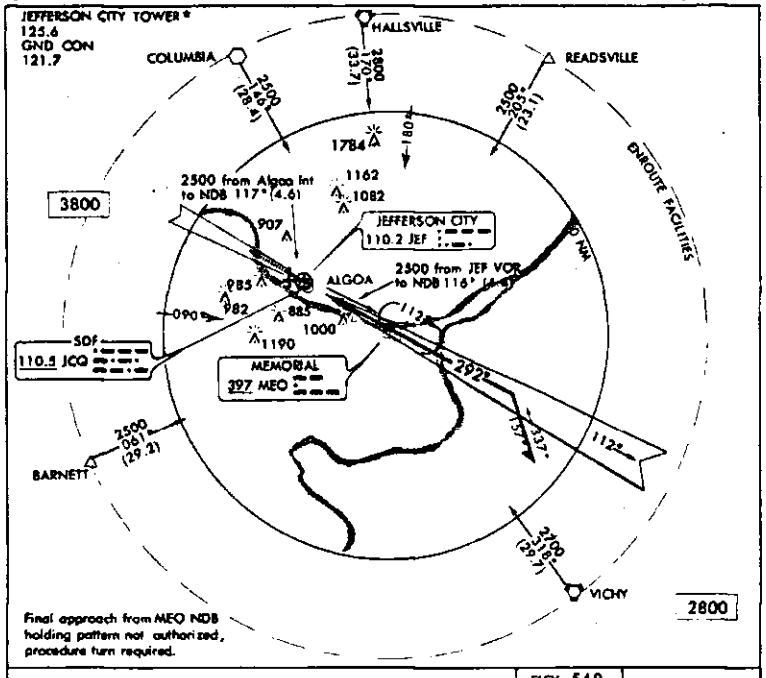
FIG. 99

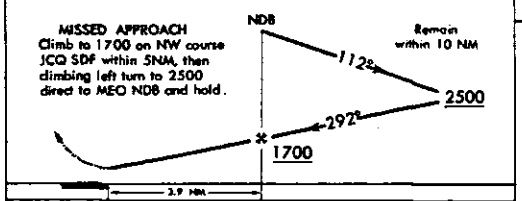
Amdt 3

SDF RWY 30

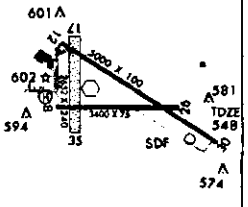
AL-796 (FAA)

JEFFERSON CITY MEMORIAL
JEFFERSON CITY, MISSOURI





ELEV 548



CATEGORY	A	B	C	D
S-30	980-1 432 (500-1)			
CIRCLING	1220-1 672 (700-1)		1220-1 ½ 672 (700-1 ½)	1300-2 752 (800-2)

When Control Zone not effective, procedure not authorized.

▽

HIRL Rwy 12-30
REIL Rwy 12 and 30

FAF to MAP 3.9 NM

Knots	60	90	120	150	180
Min:Sec	3:54	2:36	1:57	1:34	1:18

SDF RWY 30

38°36'N – 92°10'W

JEFFERSON CITY, MISSOURI
JEFFERSON CITY MEMORIAL

PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

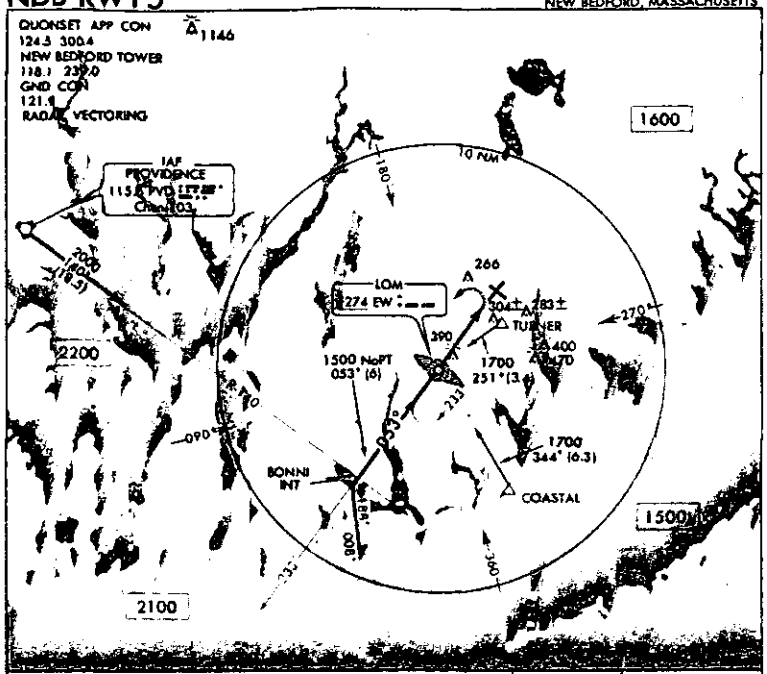
FIG. 100

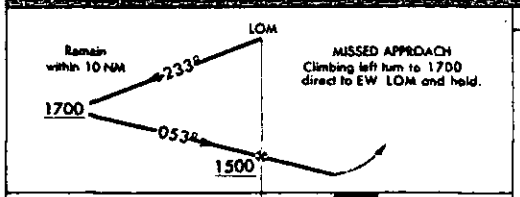
Amdt 4

NDB RWY 5

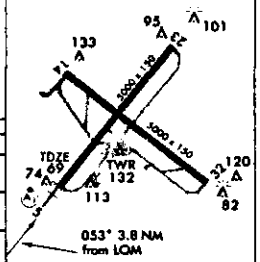
AL-644 (FAA)

NEW BEDFORD MUNI
NEW BEDFORD, MASSACHUSETTS





ELEV 79



CATEGORY	A	B	C	D
S-5 #	700-¾ 631 (700-¾)			700-1½ 631 (700-1½)
CIRCLING	700-1 621 (700-1)		700-1½ 621 (700-1½)	700-2 621 (700-2)

When control zone not effective, the following applies:
1. Use Providence, Rhode Island altimeter setting. 2. Increase all MDAs 80 feet.
3. Alternate minimums not authorized.
Inoperative table does not apply to CAT. C. When ALS inoperative CAT. C visibility becomes 1¼ miles.

MIRL Rwy 14-32
MIRL Rwy 5-23
REIL Rwy 23

FAF to MAP 3.8 NM					
Knots	60	90	120	150	180
Min:Sec	3:48	2:32	1:54	1:31	1:16

NDB RWY 5

41°41'N-70°58'W

NEW BEDFORD, MASSACHUSETTS
NEW BEDFORD MUNI

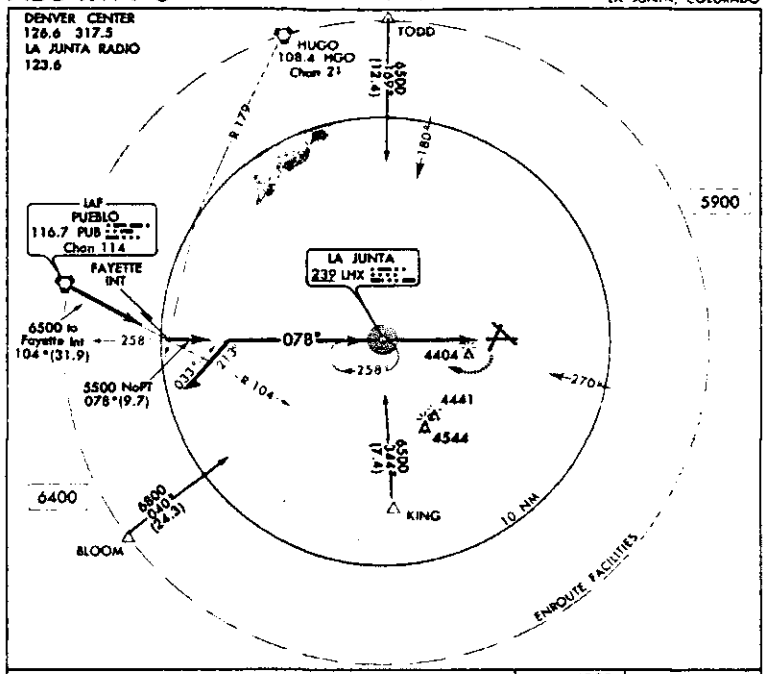
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

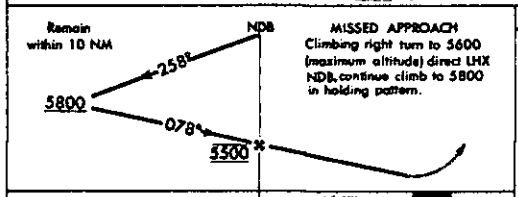
FIG. 97

NDB RWY 8

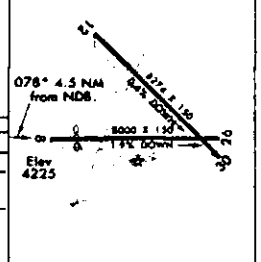
AL-221 (FAA)

LA JUNTA MUNI
LA JUNTA, COLORADO





ELEV 4238 Rwy 8 Idg 6845'



CATEGORY	A	B	C	D
S-8	4720-1 495(500-1)			
CIRCLING	4720-1 482(500-1)		4720-1½ 482(500-1½)	4800-2 562(600-2)

CAUTION: La Junta Oil Burner Route (OB-18) operations.
Night minimums NA Rwys 12-30.

Rwy 12-30 unlighted
MIRL Rwys 8-26

FAF to MAP 4.5 NM					
Knots	60	90	120	150	180
Min:Sec	4:30	3:00	2:15	1:48	1:30

NDB RWY 8

38°03'N - 103°31'W

LA JUNTA, COLORADO
LA JUNTA MUNI

PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

FIG. 98

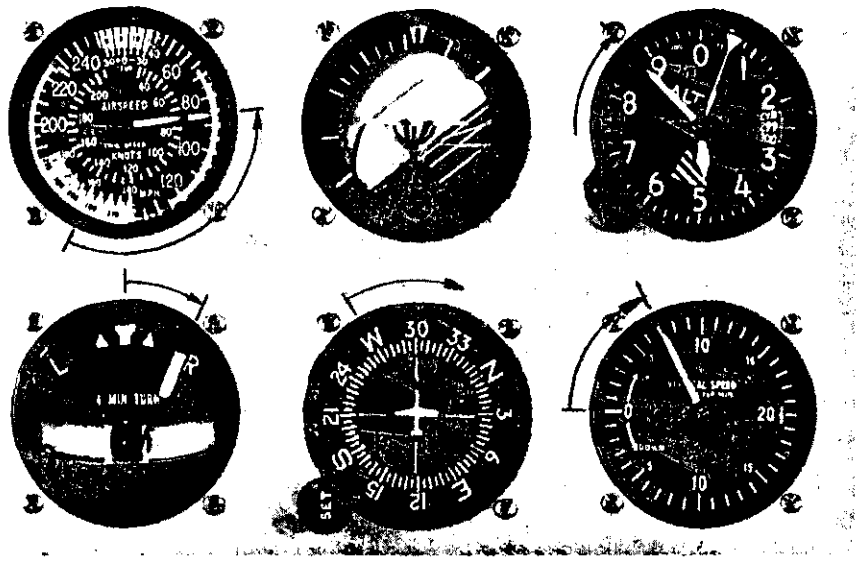


FIG. 96

964. H44 Which is the correct sequence for recovery from this unusual attitude? (Fig. 96)

1- Stop turn by raising right wing; lower nose until airspeed stops decreasing; add power to obtain cruise airspeed; return to proper heading and altitude.
2- Add power; lower nose; level wings; return to original altitude and heading.
3- Lower nose until descent is started; turn left to return to proper heading. Upon reaching original altitude, level off and use power as necessary.
4- Level wings; add power; lower nose; descend to original altitude and heading.

965. L11 Which time can you log as instrument flight time on an IFR flight?

1- The block to block time while on an IFR flight plan.
2- The total time during which you are flying in visibility conditions which are less than basic VFR minimums.
3- The time during which you control the aircraft solely by reference to flight instruments.
4- When flying in clouds, and when a safety pilot occupies the copilot's seat.

966. L11 When you complete an instrument flight, you may log as instrument time

1- all of the time when the aircraft cannot be controlled by reference to the ground or objects on the ground.
2- only the time you were controlling the aircraft solely by reference to flight instruments.
3- only the time you are flying in IFR weather conditions.
4- the time from lift-off until touchdown.

967. K42 Which information, in addition to headings, does the radar controller provide without request during an ASR approach?

1- The recommended altitude for each mile from the runway.
2- When to commence descent and the aircraft's position each mile from the runway.
3- When reaching minimum altitude.
4- When over the end of the runway.

968. M63 What is one important difference between the simplified directional facility (SDF) and the ILS localizer?

1- SDF generally has a wider course.
2- SDF is specifically designed for STOL operations.
3- SDF range information is provided by DME.
4- SDF utilizes lower frequency band.

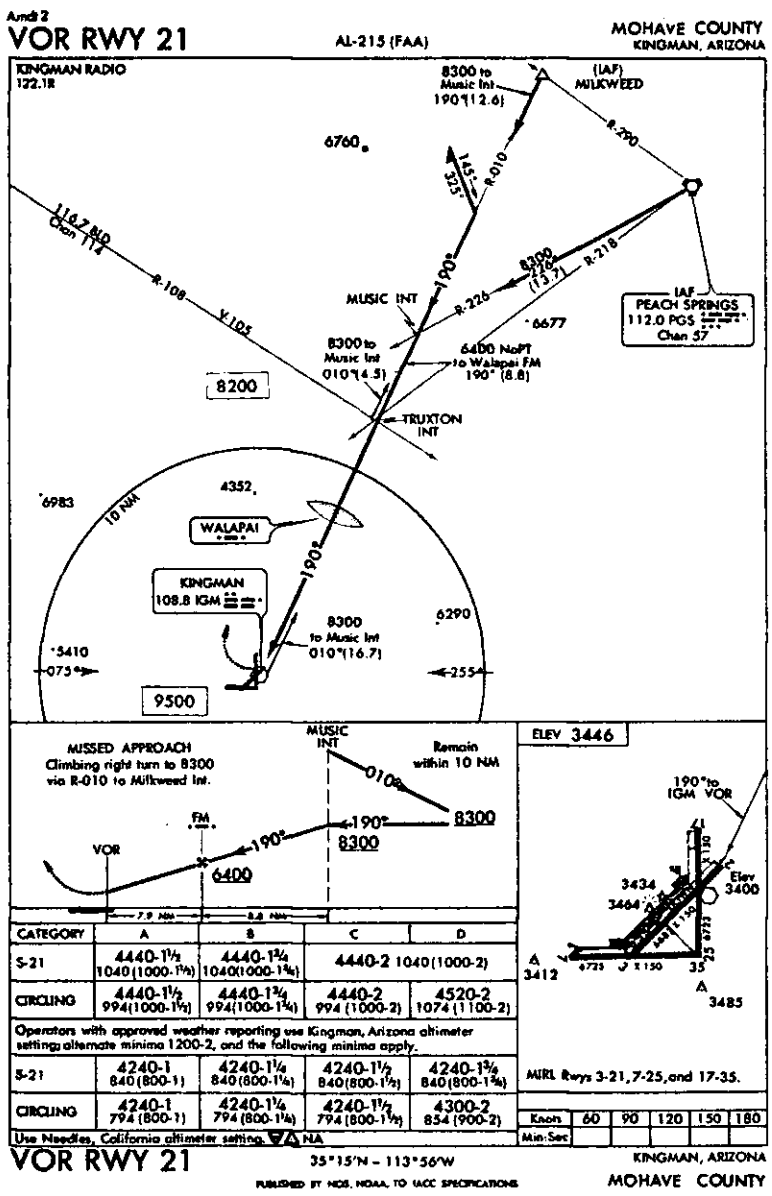

Amdt 2
VOR RWY 21
AL-215 (FAA)
MOHAVE COUNTY
KINGMAN, ARIZONA
KINGMAN RADIO
122.1R
8300 to Music Int 190°(12.6)
(IAF) MILKWEED
6760
R-290
R-010
325°
145°
116.7 BAR Chan 114
R-108
V-105
8200
MUSIC INT
190°
R-226
8200 (13.7)
R-218
IAF PEACH SPRINGS 112.0 PGS Chan 57
6677
8300 to Music Int 010°(4.5)
6400 NoPT to Walapai FM 190° (8.8)
TRUXTON INT
6983
4352
10 NM
WALAPAI
KINGMAN 108.8 IGM
190°
8300 to Music Int 010°(16.7)
6290
5410
075°
255°
9500
MISSED APPROACH
Climbing right turn to 8300 via R-010 to Milkweed Int.
MUSIC INT
010°
Remain within 10 NM
FM
190°
8300
VOR
190°
6400
7.9 NM
8.8 NM
ELEV 3446
190° to IGM VOR
3434
3464
Elev 3400
3412
3485
MIRL Rwys 3-21, 7-25, and 17-35.
CATEGORY | A | B | C | D
S-21 | 4440-1½ 1040 (1000-1½) | 4440-1¾ 1040(1000-1¾) | 4440-2 1040(1000-2) |
CIRCLING | 4440-1½ 994(1000-1½) | 4440-1¾ 994(1000-1¾) | 4440-2 994 (1000-2) | 4520-2 1074 (1100-2)
Operators with approved weather reporting use Kingman, Arizona altimeter setting; alternate minima 1200-2, and the following minima apply.
S-21 | 4240-1 840(800-1) | 4240-1¼ 840(800-1¼) | 4240-1½ 840(800-1½) | 4240-1¾ 840(800-1¾)
CIRCLING | 4240-1 794 (800-1) | 4240-1¼ 794 (800-1¼) | 4240-1½ 794 (800-1½) | 4300-2 854 (900-2)
Use Needles, California altimeter setting. NA
Knots | 60 | 90 | 120 | 150 | 180
Min:Sec
VOR RWY 21
35°15'N – 113°56'W
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS
KINGMAN, ARIZONA
MOHAVE COUNTY

FIG. 69

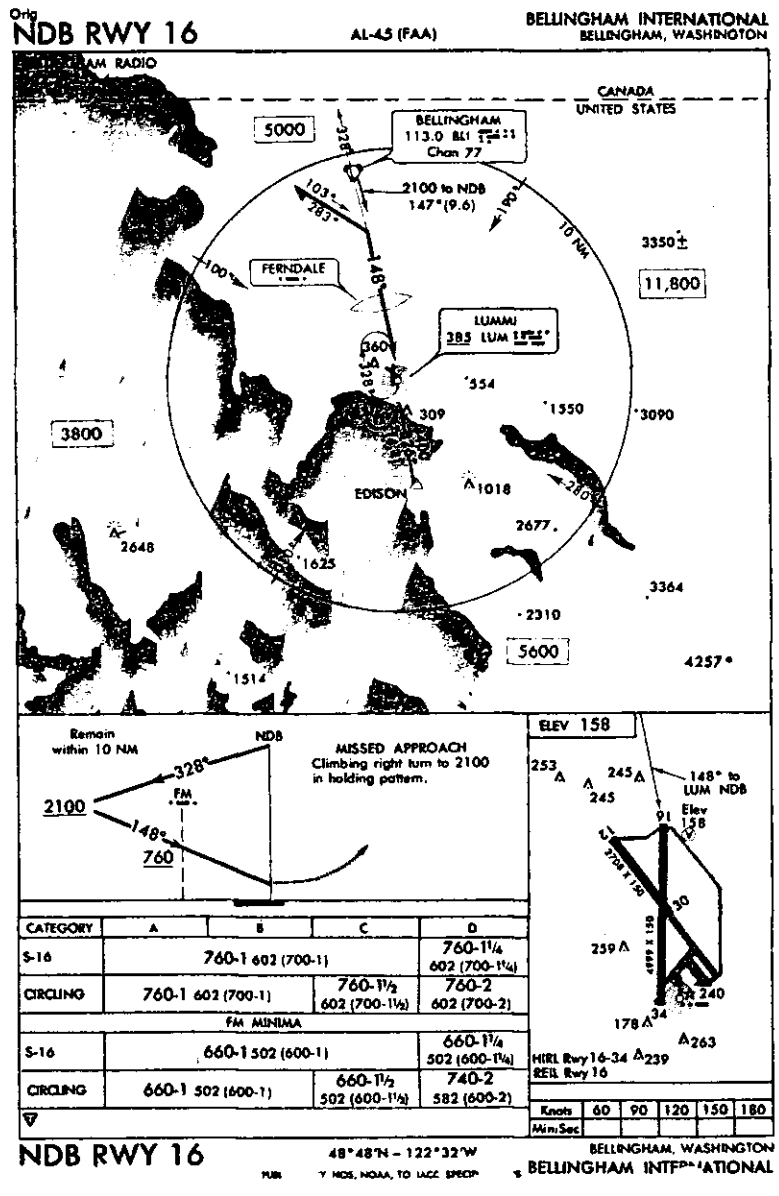

Orig
NDB RWY 16
AL-45 (FAA)
BELLINGHAM INTERNATIONAL
BELLINGHAM, WASHINGTON
AM RADIO
CANADA
UNITED STATES
5000
BELLINGHAM 113.0 BLI Chan 77
2100 to NDB 147°(9.6)
328°
103°
285°
190°
10 NM
3350±
11,800
FERNDALE
100°
148°
LUMMI 385 LUM
360°
328°
354
309
1550
3090
3800
EDISON
1018
280°
2677
2648
1625
3364
2310
5600
4257
1514
Remain within 10 NM
NDB
MISSED APPROACH
Climbing right turn to 2100 in holding pattern.
328°
2100
FM
148°
760
ELEV 158
253
245
245
148° to LUM NDB
Elev 158
91
3708 X 150
20
259
4999 X 150
178
34
240
263
239
MIRL Rwy 16-34
REIL Rwy 16
CATEGORY | A | B | C | D
S-16 | 760-1 602 (700-1) | | | 760-1¼ 602 (700-1¼)
CIRCLING | 760-1 602 (700-1) | | 760-1½ 602 (700-1½) | 760-2 602 (700-2)
FM MINIMA
S-16 | 660-1 502 (600-1) | | | 660-1¼ 502 (600-1¼)
CIRCLING | 660-1 502 (600-1) | | 660-1½ 502 (600-1½) | 740-2 582 (600-2)
Knots | 60 | 90 | 120 | 150 | 180
Min:Sec
NDB RWY 16
48°48'N – 122°32'W
BELLINGHAM, WASHINGTON
BELLINGHAM INTERNATIONAL

FIG. 70

759. M61 What is the difference between the ILS at Hollywood-Burbank (b), and the ILSs at Van Nuys (a)? (Fig. 68)

1- I-BUR is remotely controlled by Los Angeles Center.
2- I-BUR has a more powerful signal strength.
3- I-BUR is usable at greater distances.
4- I-BUR has an ATC function.

760. F23 What type facility is Burbank LRCO (c)? (Fig. 68)

1- Limited Remote Communications Outlet for LAX FSS.
2- Burbank FSS remotely controlled by Los Angeles Center.
3- Burbank sector remotely controlled by Los Angeles Center.
4- Long range control outlet for Los Angeles Center.

761. J23 What is the minimum crossing altitude at Pomona VORTAC (e) while en route to Los Angeles (d) on V210? (Fig. 68)

1- 10,300 feet
2- 10,700 feet
3- 4,500 feet
4- 5,300 feet

762. J23 At what point could a pilot descend to 3,500 feet while en route to Los Angeles (d) on V16 (f) with a cruise clearance? (Fig. 68)

1- OLINDA Intersection.
2- LA HABRA Intersection.
3- 22 NM from LAX VORTAC.
4- PRADO Intersection.

763. J51 How may an IFR flight obtain En Route Flight Advisory Service in the Los Angeles area (d)? (Fig. 68)

1- Call LAX FSS on 122.7 MHz.
2- Call Los Angeles Flight Watch on 122.0 MHz.
3- Call Los Angeles Center on 126.0 MHz.
4- Monitor Los Angeles International ATIS on 133.8 MHz.

764. K37 Which lighting aid, if inoperative, requires an increase in visibility on an instrument approach?

1- Touchdown zone lights
2- Approach light system
3- Runway end identifier lights
4- High intensity runway lights

765. K11 Under which condition does ATC issue a STAR?

1- To any pilot only upon request.
2- Only if the pilot requests a STAR in the "Remarks" section of the flight plan.
3- Only when ATC deems it appropriate, unless the pilot requests "No STAR."
4- Only to airlines or military pilots without request.

766. K15 A contact approach is an approach procedure that may be used

1- when a pilot has filed to an airport with an approved instrument approach procedure and wishes to land at a nearby airport that does not have an authorized instrument approach procedure.
2- if assigned by ATC and will facilitate the approach.
3- in lieu of conducting a standard instrument approach procedure.
4- in lieu of a visual approach.

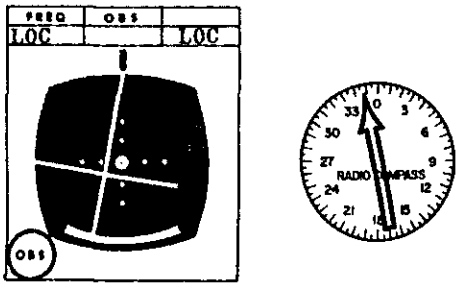
767. K15 At the termination of an IFR flight in a helicopter, you have been vectored to the traffic pattern of your destination airport and then cleared by the control tower for a "visual approach." This clearance signifies that

1- approved separation between your helicopter and other aircraft is the responsibility of ATC.
2- the "visual approach" has been approved in response to your request.
3- radar service is terminated.
4- the visibility is at least 3 miles.

768. M51 Which speed is used in determining the approach category of an aircraft?

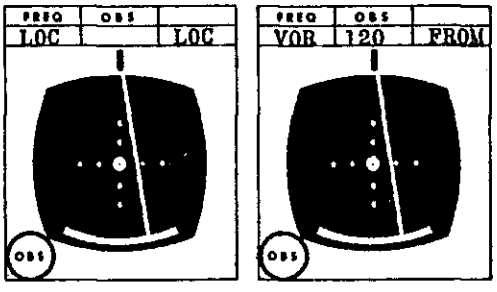
1- 1.3 times the stall speed in the landing configuration at the maximum certificated gross landing weight.
2- The stall speed in approach configuration at the maximum certificated landing gross weight.
3- 1.3 times the stall speed in the approach configuration at the maximum certificated gross weight.
4- Stalling speed in the landing configuration at maximum certificated gross weight.

958. What is your position relative to the ILS RWY 36 course and the LOM?
L23



1- Outbound from the LOM and right of course.
2- Inbound from the LOM, right of course, and below the glide slope.
3- Inbound to the LOM, right of course, and above glide slope.
4- Inbound from the LOM, left of course, and above the glide slope.

959. You are making a LOC BC RWY 17 approach with receiver A tuned to the localizer and receiver B to the VORTAC. The 120 radial may be used to determine the final fix. What is your position with respect to the final fix and the center line of the localizer as indicated in the illustration?
L21

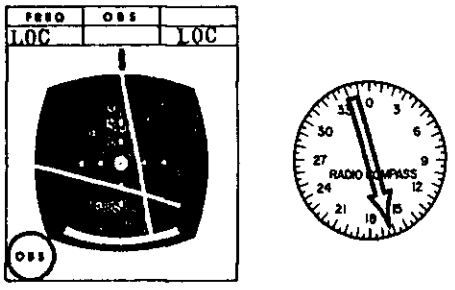


1- North of the final fix and west of the localizer.
2- North of the final fix and east of the localizer.
3- South of the final fix and east of the localizer.
4- South of the final fix and west of the localizer.

960. Which code signal should you observe on the marker beacon lights as you pass over the OM on an ILS approach?
L24

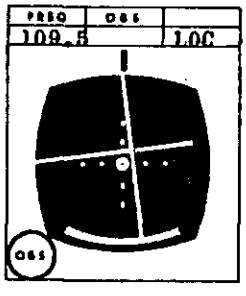
1- Alternate dots and dashes.
2- Code for OM (---,--).
3- A series of dots.
4- A series of dashes.

961. What is your position relative to the ILS RWY 36 course and LOM?
L23



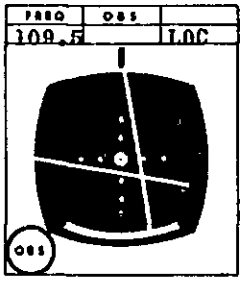
1- Inbound from the LOM, west of course, and above the glide slope.
2- Outbound from the LOM, west of the localizer, and below glide slope.
3- Inbound from the LOM, west of course, and below the glide slope.
4- Inbound from the LOM, east of course, and below the glide slope.

962. What is your position with relation to the Glide Slope and LOC?
L23



1- Low and to the right.
2- High and to the left.
3- High and to the right.
4- Low and to the left.

963. What is your position with relation to the Glide Slope and LOC?
L23



1- Low and to the right.
2- High and to the left.
3- High and to the right.
4- Low and to the left.

951. M50 Upon arrival at Fillmore VORTAC maintaining 7,000 feet, you are cleared for the Van Nuys LDA-C approach. What are the minimum altitudes until you have the runway in sight or execute a missed approach? (Fig. 95)

1- 5,000 feet to THOUSAND OAKS Intersection; 3,300 feet to WOODLAND Intersection; 1,360 feet to OM or 6 NM from FAF.
2- 7,000 feet to THOUSAND OAKS Intersection; 3,300 feet to WOODLAND Intersection; 1,360 feet to BUD outer marker.
3- 7,000 feet to THOUSAND OAKS; 3,500 feet until starting final approach; 3,300 feet to FAF; 1,360 feet to runway threshold.
4- 5,000 feet to THOUSAND OAKS Intersection; 3,500 feet until starting final approach; 3,300 feet to WOODLAND Intersection; 1,360 feet until 6 NM from FAF.

952. M27 How should you get established on final approach if you are cleared for the Van Nuys LDA-C approach at Los Angeles (LAX) VORTAC? (Fig. 95)

1- Maintain 3,500 feet on LAX R-316 and outbound on the LOC course to THOUSAND OAKS for a 45° procedure turn, then 3,300 feet inbound on the localizer course.
2- Maintain at least 3,500 feet on LAX R-316, then 3,300 feet for a 45° procedure turn within 10 NM of WOODLAND Intersection and inbound to the FAF.
3- Maintain your last assigned altitude on LAX R-316 and a parallel entry to the holding pattern, then 3,300 feet to the FAF.
4- Maintain at least 3,500 feet on LAX R-316, the parallel entry to the holding pattern, and until established on the localizer course, then at least 3,300 feet to the FAF.

953. K46 What is the landing minimum for landing on RWY 16R after executing the Van Nuys LDA-C approach when the REIL is out of service? (Fig. 95)

1- 560-foot ceiling; visibility 1 mile.
2- 600-foot ceiling; visibility 1 1/4 mile.
3- Visibility 1 mile.
4- Visibility 1 1/4 mile.

253-096 O - 78 - 13

954. K52 What is the published missed approach procedure for the Van Nuys LDA-C approach? (Fig. 95)

1- Proceed to Van Nuys VOR while climbing, then fly the 101 radial continuing climb to 4,000 feet. Hold at ALHAMBRA Intersection.
2- Maintain the LDA and fly the localizer course until intercepting the Van Nuys 101 radial. Climb to 4,000 feet while flying the 101 radial to ALHAMBRA Intersection to hold.
3- At BUD OM, turn to intercept the VNY 101 radial, then proceed to the POM 254 radial while climbing to 4,000 feet. Hold in the depicted pattern.
4- Start climbing to 4,000 feet at the MAP and, upon intercepting the Van Nuys VOR 101 radial, proceed to ALHAMBRA Intersection and hold.

955. M20 What is the function of the Los Angeles (LAX) R-316? (Fig. 95)

1- To establish a transition route from LAX VORTAC, a holding pattern in lieu of procedure turn, and a final fix.
2- To establish an initial point for the procedure turn, an arrival holding pattern, and a final fix.
3- To establish the fix for the arrival and missed approach holding pattern.
4- To establish the glide slope intercept at 3,300 feet.

956. M21 Select the correct VHF tower frequency(ies) for an aircraft flying on a 130° course to Van Nuys. (Fig. 95)

1- 120.2 and 239.0
2- 119.3
3- 120.2
4- 134.2

957. M67 Which is a feature of the tricolor VASI?

1- One light projector with three colors: red, green, and amber.
2- Three light bars on each side of the runway.
3- Two visual glide paths for the runway.
4- Three glide paths, with the center path indicated by a white light.

995. K14 How is a procedure turn accomplished on the VORTAC-A approach at Algona if the turn is required for a course reversal? (Fig. 99)

1- Make a standard 45° type procedure turn at the holding pattern location.
2- Proceed to FOD VORTAC and then direct to the 13 DME Arc IAF.
3- Make a standard 45° type or a teardrop procedure turn between FOD VORTAC and BAGDA Intersection.
4- Make an entry to the depicted holding pattern.

996. K24 What indication should the pilot get when it is time to turn inbound in the depicted holding pattern? (Fig. 99)

1- 2 minutes on the outbound leg
2- 19 DME miles
3- 4 DME miles
4- 23 DME miles

997. K64 What is the flight plan closing procedure at Algona Municipal? (Fig. 99)

1- Close the flight plan with the controller that clears you for approach.
2- Contact Mason City FSS on 123.6 MHz or by telephone.
3- Upon receiving the clearance for the approach, the flight plan will be automatically closed.
4- The flight plan will be automatically closed when you land.

998. M52 What is the MDA for a Category A aircraft when all components and facilities are operative except the MIRL and REIL if a landing on RWY 12 is proposed? (Fig. 99)

1- 2,040 feet
2- 2,140 feet
3- 1,980 feet
4- 2,030 feet

999. K41 When is a procedure turn required for the Jefferson City SDF RWY 30 approach? (Fig. 100)

1- It is required except when a radar vector is requested.
2- It is required unless holding in the depicted holding pattern.
3- It is required at all times.
4- It is required unless the turn to the final approach is 30° or less, or you are in the depicted holding pattern.

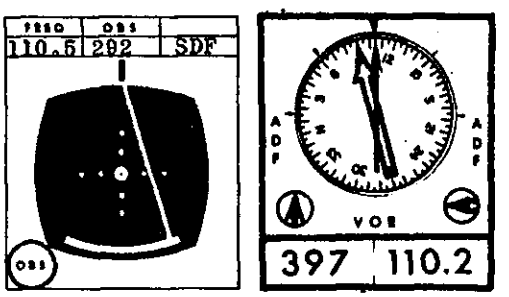
1000. M27 You are cleared for the Jefferson City SDF RWY 30 approach and assigned the Readsville transition. When may you descend below 2,500 feet? (Fig. 100)

1- When established inbound on the SDF course.
2- When arriving at the NDB.
3- Upon starting the procedure turn.
4- Inbound in the procedure turn.

1001. K52 What is the maximum distance from the missed approach point to your first turn when flying the Jefferson City SDF RWY 30 missed approach? (Fig. 100)

1- 5 miles.
2- Whatever the distance flown while climbing to 1,700 feet.
3- Distance necessary to climb to 1,200 feet.
4- 4.6 miles.

1002. H10 During the missed approach procedure for the Jefferson City SDF RWY 30 approach, you have one VOR receiver tuned to the SDF and the RMI tuned to the Jefferson City VOR and the Memorial NDB. What is your position relative to the SDF course and the VOR facility? (Fig. 100)



1- On the north side of the SDF course and west of the VOR.
2- On the south side of the SDF course and west of the VOR.
3- On the north side of the SDF course and east of the VOR.
4- On the south side of the SDF course and east of the VOR.

1003. K21 Upon arrival at Hallsville VORTAC, you are instructed to proceed direct to Memorial NDB and hold. Which type entry should you make? (Fig. 100)

1- Teardrop
2- Direct
3- Parallel or Direct
4- Parallel

1004. K32 While approaching the terminal area, ATC clears you for the ILS approach. What altitudes does this authorize you to fly?

1- You are to maintain your last assigned altitude until established on a segment of a published route or segment of the approach with published altitudes; you may then fly these altitudes.
2- You may descend to the glide slope interception altitude at this time.
3- You may descend from your assigned altitude only when you are established on the final approach course, after which you may descend to the minimum altitudes depicted for the segment being flown.
4- You may begin a descent to the procedure turn altitude and, after established on the inbound course, may descend to the depicted altitude for the segment being flown.

1005. L31 When landing behind a large jet aircraft, at which point on the runway should you plan to land?

1- At least 500 feet prior to the jet's touchdown point.
2- If any crosswind, land on the windward side of the runway and prior to the jet's touchdown point.
3- Beyond the jet's touchdown point.
4- At least 1,000 feet beyond the jet's touchdown point.

1006. M12 Which service is provided for IFR arrivals by a Flight Service Station located on an airport without a control tower?

1- Clearance to land.
2- Traffic control.
3- Automatic closing of the IFR flight plan.
4- Traffic advisories.

1007. M51 What weight is used in determining the approach category of an aircraft?

1- The maximum certificated gross landing weight.
2- The maximum certificated ramp weight.
3- The weight at which the aircraft lands.
4- The maximum gross weight.

1008. M51 A pilot is planning an instrument flight in a helicopter and is using NOS approach procedure charts designed for fixed-wing aircraft. Which aircraft approach category should be used to determine landing minimums?

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

1009. M55 What does the Runway Visual Range (RVR) value depicted on certain straight-in instrument approach procedure charts represent?

1- The horizontal distance a pilot will see down the runway from the approach end.
2- The horizontal distance down the runway a pilot can see unlighted objects.
3- The slant visual range a pilot will see down the final approach during landing.
4- The actual visibility or distance an instrument can see (detect) an object located on the runway.

1010. M51 Your aircraft was certificated for a maximum weight of 6,200 lbs.; a maximum takeoff weight of 6,100 lbs.; and a maximum landing weight of 6,000 lbs. The speed used to determine the approach category is 1.3 times 90 knots. Which speed is the 90 knots?

1- The stalling speed in landing configuration at 6,200 lbs.
2- The approach speed in landing configuration at 6,100 lbs.
3- The stalling speed in landing configuration at 6,000 lbs.
4- The approach speed in landing configuration at 6,200 lbs.

1011. M67 Which is the indication for ABOVE GLIDE PATH when using the standard FAA 2-Bar VASI?

1-	Red White	RWY	Red White
2-	Pink Red	RWY	Pink Red
3-	White White	RWY	White White
4-	White Red	RWY	White Red

1012. You may use a surveillance approach
M58

1- at airports for which civil radar instrument approach minimums have been published.
2- only when you declare an emergency or you have had a loss of navigational equipment.
3- at any airport that has an approach control.
4- at any airport which AIM (Part 3) lists as having radar service.

1013. What is the difference between a localizer type directional aid (LDA) and the ILS localizer?
M62

1- The LDA uses a course width of 6° or 12°, while an ILS uses only 5°.
2- The LDA does not use OMs or LOMs for the outer marker.
3- The LDA signal is generated from a VOR type facility and has no glide slope.
4- The LDA is not aligned with the runway.

OTHER

I—NOTAM Service is provided. Applicable only to airports with established instrument approach procedures, or high volume VFR activity.

AOE—Airport of Entry—A customs Airport of Entry where permission from U.S. Customs is not required, however, at least one hour advance notice of arrival must be furnished.

AVASI—Abbreviated Visual Approach Slope Indicator—2 boxes.

FSS—The name of the associated FSS is shown in all instances. When the FSS is located on the named airport, "on fld" is shown following the FSS name. When the FSS can be called through the local telephone exchange, (Foreign Exchange) at the cost of a local call, it is indicated by "(LC)" (local call) with the phone number immediately following the name of the FSS, i.e., "FSS: WICHITA (LC481-5867)." When an Interphone line exists between the field and the FSS, it is indicated by "(DL)" (direct line) immediately following the name of the FSS, i.e., "FSS: OTTO (DL)."

IFR—Airport with approved FAA Standard Instrument Approach Procedure.

LRA—Landing Rights Airport—Application for permission to land must be submitted in advance to U.S. Customs. At least one hour advance notice of arrival must also be furnished.

REIL—Runway end identifier lights (threshold strobe).

RVV—Runway Visibility Values, applicable runway provided.

RVR—Runway Visual Range, applicable runway provided.

VASI—Visual Approach Slope Indicator, applicable runway provided.

AIRPORT REMARKS

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

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

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

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

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

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

TPA—Traffic Pattern Altitude—This information is provided for only those airports without a 24-hour operating control tower or FSS.

TRI-VAS—Tri-Color Visual Approach Slope Aid.

OBSTRUCTIONS—The information on obstructions is taken from reports submitted to the FAA. It has not been verified in all cases. Pilots are cautioned that objects not indicated in the AIM (or on charts) may exist which can create a hazard to flight operation.

FLIGHT SERVICE STATIONS

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

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

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

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

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

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

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

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

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

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

e. Some FSSs are assigned 50KHz channels for simplex operation in the 122-123 MHz band (e.g. 122.35).

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

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

COMMUNICATIONS

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

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

AIRPORT/FACILITY DIRECTORY

The Airport Directory in this publication is limited to airports with control towers and/or instrument landing systems. See Part 2 for a complete listing of all public use airports.
NOTE: All times are local time unless otherwise indicated.

LOCATION

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

ELEVATION

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

RUNWAYS

The runway surface length, and weight bearing capacity are listed for the longest instrument runway or sealane, or the longest active landing portion of the runway or strip, given to the nearest hundred feet, using 70 feet as the division point, i.e., 1469 feet would be shown as "14"; 1470 feet would be shown as "15". Runway lengths prefixed by the letter "H" indicates that runways are hard surfaced (concrete; asphalt; bitumen, or macadam with a seal coat). If the runway length is not prefixed, the surface is sod, clay, etc. The total number of runways available is shown in parenthesis. (However, only hard surfaced runways are counted at airfields with both hard surfaced and sod runways.)

RUNWAY WEIGHT BEARING CAPACITY

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

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

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

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

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

DDT-Runway weight bearing capacity for aircraft with double dual-tandem type landing gear (747), etc.

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

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

LIGHTING

An asterisk (*) preceding a "B" (Rotating Beacon-Green and white, split-beam and other types) or "L4, 5 or 6" (Runway Lights) indicates lights operate on prior request (phone or radio request). Where the asterisk is not shown, the beacon or runway lights are in operation dusk to dawn or available as indicated in remarks.

4—Low Intensity Runway
5—Medium Intensity Runway
6—High Intensity Runway
7—Instrument Approach (neon)
7A—Medium Intensity Approach Lights (MALS)
8—High Intensity Instrument Approach (ALS)
10—Visual Approach Slope Indicator (VASI)
11—Runway end identifier lights (threshold strobe) (REIL)
12—Short approach light systems (SALS)
13—Runway alignment lights (RAIL)
14—Runway centerline
15—Touchdown zone

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

PILOT CONTROLLED AIRPORT LIGHTING

Pilot controlled lighting will be shown in clear text in the Remarks Section for each airport.

SERVICING

S2: Minor airframe repairs.
S3: Minor airframe and minor powerplant repairs.
S4: Major airframe and minor powerplant repairs.
S5: Major airframe and major powerplant repairs.

FUEL

(Fuel data includes each grade available.)

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

OXYGEN

Ox1	High Pressure
Ox2	Low Pressure
Ox3	High Pressure—Replacement Bottles
Ox4	Low Pressure—Replacement Bottles

by the tower. (When the tower is operated by someone other than the U.S. Government, two-way radio communication is required if the aircraft has the necessary equipment.

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

COMMUNICATIONS REMARKS

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

VOICE CALL

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

SERVICES AVAILABLE

TOWER

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

RADIO NAVIGATION AIDS

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

All VOR, VORTAC and ILS equipment in the National Airspace System have an automatic monitoring and shutdown feature in the event of malfunction. Unmonitored as used in the publication means that FSS or tower personnel cannot observe the malfunction or shutdown signal.

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS)

ATIS—Is a recording of non-control information in selected high activity terminal areas, which is available on continuous broadcast or by telephone call.

FLIGHT SERVICE STATION (FSS)

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

UNICOM

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

U-1—122.8 MHz for Landing Areas (except heliports) without an ATC Tower or FSS;
U-2—123.0 MHz for Landing Areas (except heliports with an ATC Tower or FSS;
U-3—123.05 MHz for heliports with or without ATC Tower or FSS;
U-4—122.85 MHz for landing areas not open to the public;
U-5—122.95 MHz for landing areas not open to the public.

RADIO CLASS DESIGNATIONS

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

Normal Usable Altitudes and Radius Distances

Class	Altitudes	Distance (miles)
T	12,000′ and below	25
L	Below 18,000′	40
H	Below 18,000′	40
H	Within the conterminous 48 states only, between 14,500′ and 17,999′	100
H	18,000′ -- FL 450	130
H	Above FL 450	100

(H)=High (L)=Low (T)=Terminal

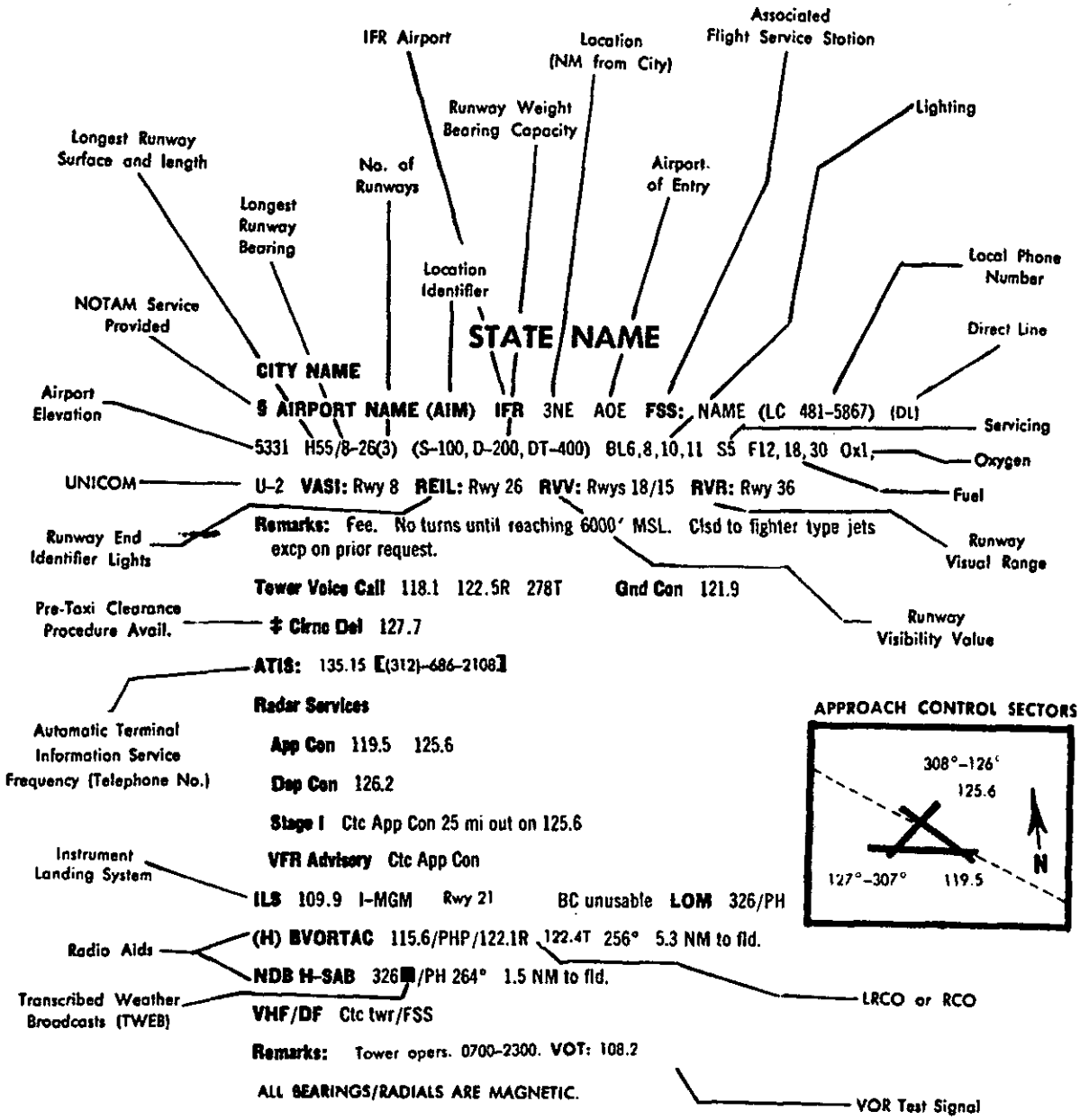
NOTE: An H facility is capable of providing L and T service volume and an L facility additionally provides T service volume.

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

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

AIRPORT/FACILITY DIRECTORY

SAMPLE



ABBREVIATIONS

Note: "s" may be added for plural, or as appropriate.

A

AAS..... Airport Advisory Service
A/C..... Approach Control
acft..... *aircraft*
ADCUS.. Advise Customs
ADF..... Automatic Direction Finder
AGL..... above ground level
AID..... Airport Information Desk
AIM..... Airman's Information Manual
ALS..... Approach light system
apch..... approach
apchg... approaching
aprx..... approximate
arpt..... airport
ARSR.... Air Route Surveillance Radar
ARTCC... Air Route Traffic Control Center
ASDE.... airport surface detection equipment
ASR..... Arpt Surveillance Radar
ATC..... air traffic control
ATCT.... *air traffic control* tower
ATIS..... Automatic Terminal Information Service
avbl..... available
awy..... airway

B

BC..... back course
bcn..... beacon
bcst..... broadcast
bldg..... building
brg..... bearing
btn..... between

C

CFR..... crash fire rescue
CIFFR... common IFR room
clsd..... closed
cmsnd... commissioned
cntr..... center
cntrln.... centerline
Comlo... Compass locator
const.... construction
crcg..... circling
CS/T.... combined station/tower
ctc..... contact
CTLZ.... Control Zone

D

dalgt.... daylight
dcmsnd.. decommissioned
degs..... degrees
DF..... direction finder
DME..... UHF standard (TACAN compatible) distance measuring equipment
dsplcd... displaced
durg..... during
DVFR.... Defense Visual Flight Rule

E

E..... east
elev..... elevation
emerg... emergency
equip.... equipment

F

FL..... Flight Level
FM..... fan marker
freq..... frequency
FSS..... *Flight Service* Station

G

GS..... glide slope
GWT.... gross weight

H

HIRL.... High intensity Runway Lights
hwy..... highway

I

ident.... identification
IFR..... Instrument Flight Rules
IFSS..... International Flight Service Station
ILS..... instrument landing system
info..... information
intl..... international
ISMLS... Interim Standard Microwave Landing System

J

J-bar.... jet runway barrier

K

kHz..... kilohertz

L

lat..... latitude
lctd..... located
LDA..... Localizer type directional aid
lgts..... lights
lgtd..... lighted
LMM.... compass locator at middle marker ILS
lndg..... landing
loc..... localizer
LOM.... compass locator at outer marker ILS
long..... longitude
LRCO.... Limited Remote Communications Outlet

M

MAA.... maximum authorized altitude
mag..... magnetic
maint.... maintain, maintenance
MALS... Medium Intensity *Approach Light System*
MALSR.. Medium Intensity Simplified Short Approach Light System with Rail
max..... maximum
MCA.... minimum crossing altitude
MEA.... minimum enroute IFR altitude
MHz..... megahertz
min..... minimum or minute
MIRL.... Medium Intensity Runway Edge Lights
MLS..... Microwave Landing System
MM..... middle marker ILS
MOCA... minimum obstruction clearance altitude
MRA..... *minimum reception* altitude
MSL..... mean sea level
muni.... municipal

N

N..... north
NA..... not authorized
natl..... national
navaid... navigational aid
NDB..... Non-directional *Radio Beacon*
ngt..... night
NM..... nautical mile(s)
Nr..... number

O

obstn.... *obstruction*
OM..... outer marker ILS
oper..... operate
opn..... operation
OTS..... Out of Service
ovrn..... *overrun*

P

PAR..... Precision Apch Radar
permly... permanently

Q

quad.... quadrant

R

RAIL.... Runway Alignment Indicator Lights
RAPCON. radar approach control (USAF)
RATCF... radar air traffic control facility (USN)
RCAG... Remote Center air/ground
RCLS.... Runway Centerline Lights System
RCO..... Remote Communications Outlet
rcv..... receive
rcvg..... receiving
rcvr..... receiver
REIL..... Runway End Identifier Lights
req..... request
rqrd..... required
rgt..... right
RRP..... Runway Reference Point
ruf..... rough
RTS..... returned to service
RVR..... runway visual range
RVRC.... Runway Visual Range Center
RVRT.... Runway Visual Range Touchdown
RVRR.... Runway Visual Range Rollout
RVV..... runway visibility values
RWY.... Runway

S

S..... south
SDF..... Simplified Directional Facility
sfc..... surface
SID..... Standard Instrument Departure
SM..... statute mile(s)
SR..... sunrise
SS..... sunset
STAR.... Standard Terminal Arrival Route
STOL.... Short take-off & landing rnwy
svc..... service

T

T..... true (after a bearing)
TACAN.. UHF navigational facility—omnidirectional course and distance information
TCA..... Terminal Control Area
TCH..... Threshold Crossing Height
tfc..... traffic
thr..... threshold
tkof..... take-off
tmprly... temporarily
tmpry.... temporary
TPA..... *Traffic Pattern* Altitude
TRACON. Terminal Radar approach control
TRSA.... Terminal Radar Service Area
tsmt..... transmit
tsmtg.... transmitting
tsmtr.... transmitter
TV..... television
TWEB.... *transcribed* weather bcst
twr..... tower
twy..... taxiway

U

UHF..... Ultra high frequency
unavbl... unavailable
unctld... uncontrolled
unlgtd... unlighted

V

VASI.... Visual Approach Slope Indicator
VFR..... visual flight rules
VGS..... Visual Guidance System
VHF..... Very high frequency
VOR.... VHF Omni-Directional Radio Range
VORTAC. Combined VOR and TACAN System
VOT..... a VOR Receiver testing facility
vsby..... visibility

W

W..... west
WS..... Weather Service
wt..... weight

Z

Z..... Greenwich mean time

IFR WALL PLANNING CHART

LOW ALTITUDE – U.S.

For use up to but not including 18,000' MSL

FAA Air Traffic Service outside U. S. airspace is provided in accordance with Article 12 and Annex 11 of ICAO Convention. ICAO Convention not applicable to State aircraft but compliance with ICAO Standards and Practices is encouraged.

LEGEND

VHF/UHF Data is depicted in BLUE; LF/MF depicted in BROWN

AERODROMES

Aerodromes/Seadromes shown in BLUE have an approved Low Altitude Instrument Approach Procedure published. The DOD FLIP Terminal contains only those shown in DARK BLUE.
Aerodromes/Seadromes shown in BROWN do not have a published Instrument Approach Procedure.

LAND		SEA
◇ ◇	Civil	◇ ◇
◆ ◆	Joint Military-Civil	◆ ◆
○ ○	Military	● ●

AIRWAY AND ROUTE DATA

- V540 — VOR Airway and Identification
- B101 — LF/MF Airway and Identification
- Airways with an MEA of 10,000 ft or above (Oxygen may be necessary on extended flights above 10,000 ft MSL)
- Radial or Bearing Line
- AR 2 — VHF/UHF Atlantic Route and Identification
- AR 3 — LF/MF Atlantic Route and Identification
- PAPA ROUTE — LF/MF Oceanic Route and Identification
- BR55V — VHF/UHF Bahama Route and Identification
- BR 2L — LF/MF Bahama Route and Identification
- Military Route
- Military Advisory Route
- (200) (200) — Total Mileage between Radio Aids
- 20 20 — Mileage between Radio Aids, and/or Mileage Breakdown Points
- X X — Mileage Breakdown Point
- CSV / CSV — Facility Ident used with Centerline of Oceanic Routes and Channels

SPECIAL USE AIRSPACE

- P-Prohibited Area
- R-Restricted Area
- W-Warning Area
- A-Alert Area
- ISJTA-Intensive Student Jet Training Area
- MOA-Military Operations Area

RADIO AIDS TO NAVIGATION

- VOR
- VORTAC
- LF/MF Range with Simultaneous Voice Signal Capability
- LF/MF Range without simultaneous Voice Signal Capability
- LF/MF Non-directional Radiobeacon or Marine Radiobeacon
- Consolan Station

REPORTING POINTS

- ▲ ▲ — Compulsory Reporting Point
- △ △ — Non-Compulsory Reporting Point

BOUNDARIES

- Air Route Traffic Control Center (ARTCC)
- Flight Information Region (FIR)
- Air Defense Identification Zone (ADIZ)
- Combined FIR and ADIZ
- Intl Boundary (Omitted when coincident with FIR)
- State Boundary
- Official Time Zone
- L-8 — Index of Enroute Low Altitude Charts U.S.
- L-8 — Index of Enroute Low Altitude Charts beyond the limits of U.S. Chart Coverage

ALL MILEAGES ARE NAUTICAL

LEGEND

STANDARD INSTRUMENT DEPARTURE (SID) CHARTS

RADIO AIDS TO NAVIGATION

VOR
TACAN
VORTAC
WAYPOINT (RNAV)
NDB (Non-directional Radio Beacon)
RANGE (Simultaneous Voice)
RANGE (Non-Simultaneous Voice)
LOM (Compass Locator)
MARKER BEACONS
LOCALIZER COURSE

AERODROMES

Heliport

RUNWAYS

Hardsurface
Metal Surface
Closed
Under Construction
Other Than Hard Surface
Over-run / Hardstands/Taxiways

ROUTES

Departure Route
Transition Route

SPECIAL USE AIRSPACE

R-5
R-Restricted
P-Prohibited
W-Warning
A-Alert

MISCELLANEOUS SYMBOLS

Intersections
Compulsory Reporting Point
DME Fix
R-275 — Radial line and value
Distance Not To Scale
Arresting Gear
Jet Barrier
Displaced Threshold
Control Tower
0.8% DOWN — Take Off Gradient
Changeover Point
V-23 Airway Identification

Outer Marker (OM)-continuous dashes
Middle Marker (MM)-alternate dots and dashes.
117.6-frequency underlined indicates no voice capability.
All radials/bearings are magnetic.
All mileages are nautical.
Runway dimensions in feet.
Elevation in feet-MSL.

LEGEND

STANDARD TERMINAL ARRIVAL ROUTE (STAR) CHARTS

RADIO AIDS TO NAVIGATION

VOR
TACAN
VORTAC
WAYPOINT (RNAV)
RANGE (Simultaneous Broadcast)
NDB (Non-directional Radio Beacon)
LOM (Compass Locator)
Marker Beacons
Localizer Course
SDF Course
NAME 000.0 NAM 00 — DME or TACAN Channel
Underline indicates no voice transmitted on this frequency
R-275 — Radial line and value
Reporting Point — Non-Compulsory / Compulsory
DME Fix
15 DME Mileage (when not obvious)
VOR Changeover Point

ROUTES

4500 MEA
*3500 MOCA
270° Arrival Route
(65) Mileage
Transition Route
MCA (Minimum Crossing Altitude)
x Mileage Breakdown
Altitude change at other than Radio Aids
(65) Mileage between Radio Aids, Reporting Points and Route Breaks
V12 J80 Airway/Route Identification
Holding Pattern

SPECIAL USE AIRSPACE

R-352
R-Restricted
P-Prohibited
W-Warning
A-Alert

AERODROMES

Civil
Joint Civil-Military
Military
Heliport

Entry facility/fix identified by name and symbol only.
All radials/bearings are magnetic
All mileages are nautical
All altitudes in feet-MSL
MEA – Minimum Enroute Altitude
MOCA – Minimum Obstruction Clearance Altitude

ENROUTE LOW ALTITUDE – U. S.

For use up to but not including 18,000' MSL

L E G E N D

AERODROMES

Aerodromes/Seadromes shown in BLUE have an approved Low Altitude Instrument Approach Procedure published. Those shown in DARK BLUE have an approved DOD Low Altitude Instrument Approach Procedure and/or approved DOD RADAR MINIMA published in DOD FLIPS. Aerodromes/Seadromes shown in BROWN do not have a published Instrument Approach Procedure.

LAND / SEA

- Civil
- Joint Civil-Military
- Military
- Heliport

RELATED FACILITIES
Pilot to Metro Service (PMSV)

- Continuous Operation
- Less Than Continuous
- Weather Radar (WXR)
- PMSV and WXR Combined

Published ILS and/or Localizer Procedure available

Published SDF Procedure available

1. Parentheses around aerodrome name indicate military landing rights not available
2. Aerodrome elevation given in feet above or below mean sea level.
3. Length of longest runway given to nearest 100 feet with 70 feet as the dividing point (Add 00)
4. Aerodrome symbol may be offset for enroute navigation aids.
5. Pvt Privately use, not available to general public.

Night Landing Capability
Asterisk indicates lighting on request or operating part of night only

Aerodrome Elev
Name
349 *L 80
*ASR/PAR
ATIS *108.5
Radar Services Availability
Star indicates prior request only
Longest Landing Runway Length
Automatic Terminal Information Service and Frequency
Star indicates operation less than continuous or part time
(Name)
185 35
No Runway Lighting Capability
Indicates Soft Surface

RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES

RADIO AIDS TO NAVIGATION

VHF/UHF Aids are depicted in BLUE
LF/MF Aids are depicted in BROWN

COMPASS ROSE
Oriented to Magnetic North
Size of Compass Roses have no significance. Smaller sizes are used in congested areas.

VOR TACAN VORTAC

LF/MF Range with simultaneous Voice Signal Capability (Solid tip in "N" Quadrant)

LF/MF Range without simultaneous Voice Signal Capability

LF/MF Range Course
Feathered side indicates "A" Quadrant

LF/MF Non-directional Radiobeacon or Marine Radiobeacon with magnetic north indicator

UHF Non-directional Radiobeacon

Compass Locator Beacon

Consolan Station

Marker Beacon
Fan (FM) Bone (BM)

ILS Localizer Course with ATC Function. Feathered side indicates Blue Sector

RADIO AIDS TO NAVIGATION DATA BOXES

Abnormal Status Underprint for Affected Data, e.g., TO BE CMSN, SHUT DOWN, MAY BE CMSN, etc.

DME SHUT DOWN
DME Chan 000
NAME
NAM 000.0 (T)
MN 000
VOR with TACAN compatible DME

(T) Frequency protection
Usable range at 12,000' - 25 NM

* Operates less than continuous or On Request
NAME
NAM *000
Underline indicates No Voice Transmitted on this frequency

TACAN channels are without voice but are not underlined

Norfolk Weather Radio
U.S. Weather Station with Voice Communication

IDENT 000
Commercial Broadcast Station

AIR/GROUND COMMUNICATION BOXES

HEAVY LINE BOXES indicate Flight Service Station (FSS). Frequencies 255.4, 122.2, and emerg. 243.0 and 121.5 are normally available at all FSS's and are not shown above boxes. All other freqs available at FSS's are shown. Frequencies transmit and receive except those followed by R or T.
R - receive only T - transmit only

123.6 122.6
122.1R
Triangle in corner of box indicates Enroute Flight Advisory Service Frequency 122.0 Voice Call e.g., "Los Angeles Flight Watch."

Frequencies positioned above thin line NAVAID boxes are remoted to the NAVAID site
Other frequencies at the controlling FSS named are available, however, altitude and terrain may determine their reception

FAYETTEVILLE FYV
Name and identifier for FSS not associated with NAVAID

122.1R
WASHINGTON
Controlling FSS Name

Thin line box without frequencies and Controlling FSS name indicates no FSS frequencies available

Flight Service Station (FSS)
Remote Communications Outlet (RCO)
Limited Remote Communications Outlet (LRCO)

In Canada a heavy line box indicates Aeradio. All available frequencies are shown

SPECIAL USE AIRSPACE

TO $000
TP-56
W-123
A-123
REESE 1
R-1234①
TO 10,000②
0600-1800Z
MON-FRI③
IFR④
FSS⑤
Line delimits altitude separation within same Special Use Airspace Area

P - Prohibited Area
R - Restricted Area
W - Warning Area
D - Danger Area (Canada)
A - Alert Area
MOA-Military Operations Area in BROWN

SPECIAL USE AIRSPACE WILL INCLUDE

① Area Identification. In Canada area identification preceded by the letters CY (CANADA) followed by a number (PROVINCE).
② Effective Altitude ceilings are shown up to but not including 18,000'. When the airspace encompasses all altitudes in the low altitude structure, no altitude will be shown. The word "to" (an altitude) means "to and including" (that altitude).
③ Operating Time: When continuous no time is shown.
Days: Sunrise to Sunset
Nights: Sunset to Sunrise
Hours: Given in GMT, e.g., 0600-1300Z
Mon-Fri: Indicates area does not exist on Sat. or Sun.
1 Mar-15 June: Indicates area in use only through dates given.
By NOTAM: Area activated by NOTAM
Days are local

④ Weather Conditions during which the area is in operation. When continuous no weather is shown
VFR: Used only during VFR conditions.
IFR: Used only during IFR conditions
⑤ Voice Call of controlling Agency for enroute clearance through area. No A/G unless indicated

† Indicates complete information in tabulation on front panel.

A/G VOICE COMMUNICATIONS

Civil airports with terminal A/G communications are listed below, alphabetically by airport name. Airports with proper names are listed by last name. Airports located within the limits of the Area Charts are listed on the Area Chart. Frequencies transmit and receive unless otherwise noted. **An asterisk (*) follows the part-time tower freq remoted to the collocated full-time FSS for use as AAS during hours the tower is closed.** Radials defining sectors are outbound from facility. Chart panel identification letter is shown to right of listing. For additional communications data, refer to AIM.

AIR TRAFFIC SERVICES AND AIRSPACE INFORMATION

AIRWAY AND ROUTE DATA

VHF/UHF Data is depicted in BLUE; LF/MF depicted in BROWN

- V8 — VOR Airway and Identification
- G9 — Airway and Identification
- A RTE 10 — Uncontrolled Airway
- BR 57V — Bahama Route and Identification
- BR 70L — Bahama Route and Identification
- AR 1 — Atlantic Route Identification
- A15 ROUTE — Oceanic Route and Identification
- Military IFR Route
- Flight Planning Route
- Substitute Route Structure (See NOTAMS for facility outages)
- Alt relative and supporting data shown in brown
- Unusable or closed segment
- V5 — Preferred Single Direction Airway
- NME 000.0 — Facility Locator used with Radial Line in the formation of a Reporting Point
- AME 000 — Facility Locator used with Bearing Line in the formation of a Reporting Point

REPORTING POINTS

- Compulsory Reporting Point
- Non-Compulsory Reporting Point
- Offset Arrows indicate Facility Forming a Reporting Point Toward LF/MF, Away from VHF/UHF

BOUNDARIES

- Altimeter Setting Change
- Altimeter Setting Change when not otherwise defined
- Air Route Traffic Control Center (ARTCC)
- NAME / Nome / 134.3 269.5 — ARTCC Remoted Sites with Discrete VHF and UHF Freqs.
- Flight Information Region (FIR)
- Air Defense Identification Zone (ADIZ)
- Combined FIR and ADIZ
- Control Area (CTA)
- Control Zone
- Canadian Positive Control Zone
- Control Zones within which fixed-wing special VFR flight is prohibited
- Intl Boundary (Omitted when coincident with ARTCC or FIR)
- Area of Enlargement (Contains only data for through flights). See Area Charts for complete data
- Official Time Zone

038 — Radial Outbound from a UHF/VHF Radio Aid
036 — Bearing Inbound to a LF/MF Radio Aid
123 / (123) — Total Mileage between Compulsory Reporting Points and/or Radio Aids
23 / 23 — Mileage between other Reporting Points, Radio Aids, and/or Mileage Breakdown
42 / 26 — VOR Changeover Point Giving mileage to Radio Aids (Not shown at mid-point locations)
X X — Mileage breakdown
Denotes DME fix (Distance same as route mileage)
(18) — Denotes DME fix (Encircled mileage shown when not otherwise obvious)
MAA-15500 — MAA (Maximum Authorized Altitude)
3500 / 3500 — MEA (Minimum Enroute Altitude)
*3000 / *3000 — MOCA (Minimum Obstruction Clearance Altitude)
EVEN — Canada only-Direction of Flight indicator. (Shown when exception to Cruising Alt Diagram.
MEA, MAA and/or MOCA Change at other than Radio Aids to Navigation
MRA (Minimum Reception Altitude)
MCA (Minimum Crossing Altitude)

AIRSPACE INFORMATION

Open area (white) indicates controlled airspace. Shaded area (brown) indicates uncontrolled airspace up to 14,500'. THE BASE OF THE CONTINENTAL CONTROL AREA IS 14,500 FT MSL EXCLUDING THE AIRSPACE LESS THAN 1,500 FT ABOVE THE TERRAIN AND CERTAIN SPECIAL USE AIRSPACE AREAS.

MISCELLANEOUS

1975 Isogonic Line and Value

ALL MILEAGES ARE NAUTICAL EXCEPT AS NOTED

ALL RADIALS AND BEARINGS ARE MAGNETIC

ALL ALTITUDES ARE MSL UNLESS OTHERWISE STATED.

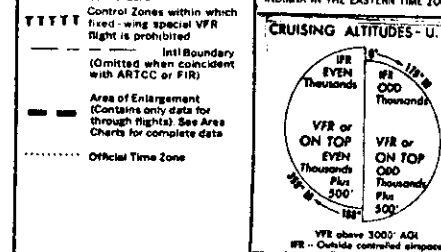
ALL TIME IS GREENWICH MEAN (STANDARD) TIME (GMT)

DAYS ARE LOCAL

‡DURING PERIODS OF DAYLIGHT SAVING TIME (DT) EFFECTIVE HOURS WILL BE ONE HOUR EARLIER THAN SHOWN

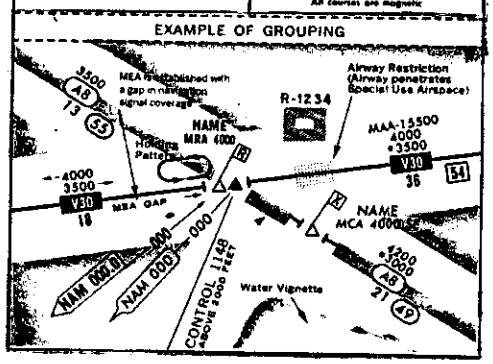
ALL CONTERMINOUS STATES ON DT EXCEPT ARIZONA AND THAT PORTION OF INDIANA IN THE EASTERN TIME ZONE

CRUISING ALTITUDES - U. S.



VFR above 3000' AGL
IFR - Outside controlled airspace
IFR - within controlled airspace as assigned by ATC
All courses are magnetic

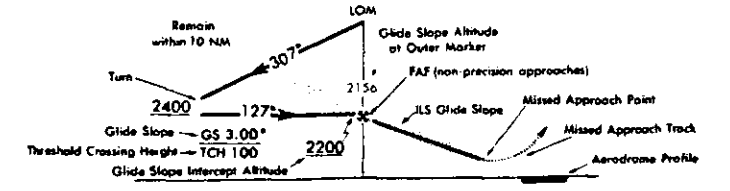
EXAMPLE OF GROUPING



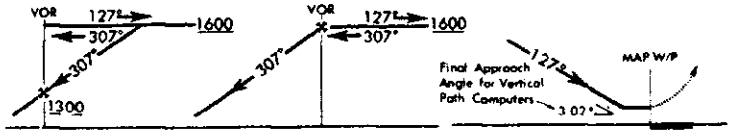
LEGEND

INSTRUMENT APPROACH PROCEDURES (CHARTS)

PROFILE



DESCENT FROM HOLDING PATTERN



RNAV DESCENT

FACILITIES/FIXES

Z	
FM	
NDB (RBn)	
VOR	
VORTAC	
TACAN	FIX
WAYPOINT	INT

ALTITUDES

5500	2300	4800	2200
Mandatory Altitude	Minimum Altitude	Maximum Altitude	Recommended Altitude

Altitudes precede fix or are arrowed to show where they apply.

Glide Slope intercept altitude is the same as the minimum altitude over LOM for localizer only approach, except as otherwise noted.

Final Approach Fix (FAF) (for non-precision approaches)

Glide Slope Intercept

Visual Flight Path

AERODROME SKETCH

Runways

Hard Surface — Other Than Hard Surface — Hardstands/Taxiways

Closed Runways and Taxiways — Under Construction — Metal Surface

Over-run — Displaced Threshold

Arresting Gear

uni-directional — bi-directional — Jet Barrier

- Control Tower
  When Control Tower and Rotating Beacon are co-located, Beacon symbol will be used and further identified as TWR.
- ☆ Rotating Aerodrome Beacon.
- U.S. Navy Optical Landing System (OLS) "OLS" location is shown because of its height of approximately 7 feet and proximity to edge of runway may create an obstruction for some types of aircraft.

Approach light symbols are shown on a separate legend.

Helicopter Alighting Areas

Negative Symbols used to identify Copter Procedure landing point.

Note: The prop type symbol is being phased out.

TDZE 123 — Runway TDZ elevation

0.8% — up — Total Runway Gradient (shown when runway gradient exceeds 0.3%)

MINIMA DATA

△ Indicates other than standard Alternate Minimums apply for U.S. Army and Civil, refer to tabulation.

△NA Indicates IFR minimums are Not Authorized for alternate use due to unmonitored facility or absence of weather reporting service.

▽ Indicates other than standard Take-off Minimums or departure procedures apply for Civil users. DOD users refer to Service Directives.

Night minimums shown in negative form being phased out.
Charts converted to TERPs criteria will show night minimum when different than day by an asterisk and note.

PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

LEGEND

INSTRUMENT APPROACH PROCEDURES (CHARTS)

PLANVIEW SYMBOLS

Procedural Track

Procedure Turn
(45° off course bearing for select users–degree and point of turn is left to discretion of pilot)

Missed Approach — Visual Flight Path

HOLDING PATTERNS

270° / 090° — In lieu of Procedure Turn

270° / 090° — Arrival Holding Pattern

Limits will only be specified when they deviate from the standard. DME fixes may be shown.

Helicopter Alighting Area

(IAF) — 20 DME — 6 DME — Name

TACAN Fix — TACAN/DME Fix — RNAV Fix

TERMINAL ROUTINGS

2000 Minimum Altitude
155
(15.1) Mileage
Penetrates Special Use Airspace

3100 NoPT 5.6 NM to GS Intcpt
045°
(14.2 to LOM)

R-198 — Radial line and value

R-198 — Lead Radial

1400 — Minimum Sector Altitude within 25 NM (Emergency Use Only)

(Arrows on distance circle identify Sectors)

123° — 125°

International Boundary

Distance not to scale

VOR Changeover Point

OBSTRUCTIONS

• Spot Elevation — ⊛ Highest Spot Elevation

△ Unlighted — ☆ Lighted — ▲ Group Unlighted

Group Lighted — Highest Obstruction

± Doubtful Accuracy

SPECIAL USE AIRSPACE

R-352 — R-Restricted, P-Prohibited, W-Warning

RADIO AIDS TO NAVIGATION

110.1 Underline indicates No Voice transmitted on this frequency

VOR — TACAN — VORTAC

NDB (Non-directional Radio Beacon)

LOM (Compass Locator)

Marker Beacons

Localizer Course

Localizer Transmitter
(shown when localizer installation is offset from its normal position off the end of the runway)

SDF Course

WAYPOINT (RNAV)

Waypoint Data

PRAYS
38°58.3'N 89°51.5'W
112.7 CAP 187.1° – 56.2
590

Waypoint Name, Coordinates, Frequency, Identifier, Radial/Distance (Facility to Waypoint) Reference Facility Elevation.

Reporting Point — ▲ Name (Compulsory) — △ Name (Non-Compulsory)

Fix or Intersection

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LEGEND

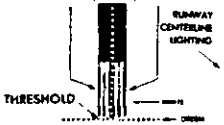
INSTRU APPROACH PROCEDU (CHARTS)

APPROACH LIGHTING SYSTEMS – UNITED STATES

Each approach lighting system indicated on Airport Diagrams will bear system identification letter (A, B, etc.) indicated in legend.

A dot "•" portrayed with approach lighting letter identifier indicates sequenced flashers (F) installed with the approach lights e.g. (A1)

TOUCHDOWN ZONE LIGHTING (TDZL)



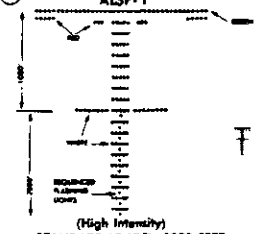
AVAILABILITY of TDZL will be shown by NOTE in SKETCH e.g. "TDZL Rwy 15"

(A) U.S. STANDARD ALSF-2

(High Intensity)

STANDARD LENGTH 3000 FEET

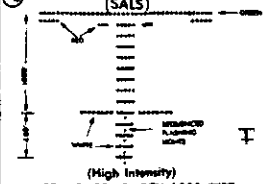
(A1) U.S. STANDARD ALSF-1



(High Intensity)

STANDARD LENGTH 3000 FEET

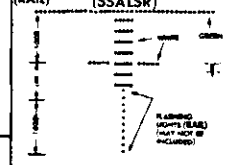
(A2) SHORT APPROACH LIGHT SYSTEM (SALS)



(High Intensity)

STANDARD LENGTH 1500 FEET

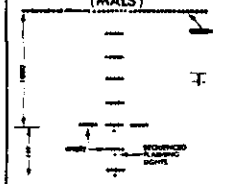
(A3) SIMPLIFIED SHORT APPROACH LIGHT SYSTEM with Runway Alignment Indicator Lights (RAIL) (SSALSR)



(High Intensity)

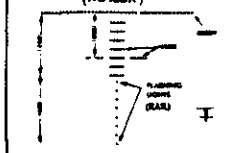
STANDARD LENGTH 3000 FEET

(A4) Medium Intensity Approach Light System (MALS)



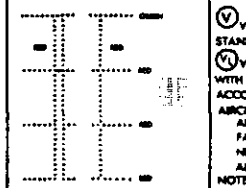
STANDARD LENGTH 1400 FEET

(A5) Medium Intensity Approach Light System with Runway Alignment Indicator Lights (RAIL) (MALSR)



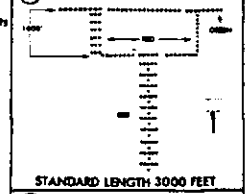
STANDARD LENGTH 3000 FEET

(D) NAVY PARALLEL ROW AND CROSSBAR



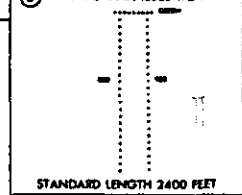
STANDARD LENGTH 1500 FEET

(B) U.S. CONFIGURATION (B)



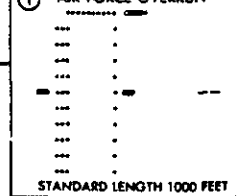
STANDARD LENGTH 3000 FEET

(E) TWO PARALLEL ROW



STANDARD LENGTH 2400 FEET

(I) AIR FORCE OVERRUN



STANDARD LENGTH 1000 FEET

(VASI) VISUAL APPROACH SLOPE INDICATOR

(V) VISUAL APPROACH SLOPE INDICATOR WITH STANDARD THRESHOLD CLEARANCE PROVIDED.

(V1) VISUAL APPROACH SLOPE INDICATOR WITH A THRESHOLD CROSSING HEIGHT TO ACCOMODATE LONG BODIED OR JUMBO AIRCRAFT.

ALL LIGHTS WHITE – TOO HIGH
FAR LIGHTS RED, NEAR LIGHTS WHITE } ON GLIDE SLOPE
ALL LIGHTS RED – TOO LOW

NOTE: VASI CONFIGURATION WILL VARY FROM A 2 BOX 2 BAR SYSTEM TO A 16 BOX 3 BAR SYSTEM.

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LEGEND

INSTRUMENT APPROACH PROCEDURES (CHARTS)

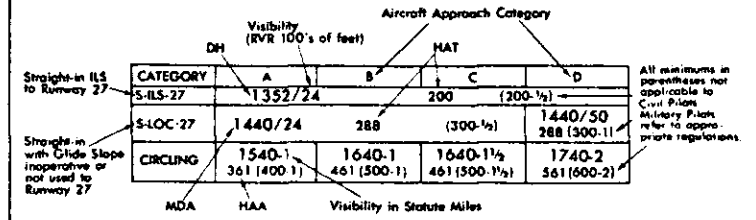
GENERAL INFORMATION & ABBREVIATIONS

* Indicates control tower operates non-continuously.
All distances in nautical miles (except Visibility Data which is in statute miles and Runway Visual Range which is in hundreds of feet).
Runway dimensions in feet.
Elevations in feet Mean Sea Level.
All radials/bearings are Magnetic.

ADF	Automatic Direction Finder	MALS/R	Medium Intensity Approach Light Systems /with RAIL
ALS	Approach Light System	MAP	Missed Approach Point
APP CON	Approach Control	MDA	Minimum Descent Altitude
ARR	Arrival	MIRL	Medium Intensity Runway Lights
ASR-PAR	Published Radar Minimums at this Aerodrome	NA	Not Authorized
ATIS	Automatic Terminal Information Service	NDB	Non-directional Radio Beacon
BC	Back Course	NoPT	No Procedure Turn Required (Procedure Turn shall not be executed without ATC clearance)
C	Circling	RA	Radio Altimeter Height
CAT	Category	Radar Required	Radar vectoring required for this approach
CHAN	Channel	Radar Vectoring	May be expected through any portion of the Nav Aid Approach, except final
CLNC DEL	Clearance Delivery	RAIL	Runway Alignment Indicator Lights
DH	Decision Height	REIL	Radio Beacon
DME	Distance Measuring Equipment	REIL	Runway End Identifier Lights
DR	Dead Reckoning	RCLS	Runway Centerline Light System
ELEV	Airport Elevation	RNAV	Area Navigation
FAF	Final Approach Fix	RRL	Runway Remaining Lights
FM	Fan Marker	RTB	Return To Base
GPI	Ground Point of Interception	Runway Touchdown Zone	First 3000' of Runway.
GS	Glide Slope	RVR	Runway Visual Range
HAA	Height Above Aerodrome	S	Straight-in
HAL	Height Above Landing	SALS	Short Approach Light System
HAT	Height Above Touchdown	(S) SALS/R	(Simplified) Short Approach Light System /with RAIL
HIRL	High Intensity Runway Lights	SDF	Simplified Directional Facility
IAF	Initial Approach Fix	TA	Transition Altitude
ICAO	International Civil Aviation Organization	TACAN	TACAN
Intcp	Intercept	TCH	Threshold Crossing Height (Height in feet Above Ground Level)
INT, INTXN	Intersection	TDZ	Touchdown Zone
LDA	Localizer Type Directional Aid	TDZE	Touchdown Zone Elevation
Idg	Landing	TDZL	Touchdown Zone Lights
LIRL	Low Intensity Runway Lights	TLv	Transition Level
LDIN	Lead-in Light System	W/P	Waypoint (RNAV)
LOC	Localizer		
LR	Lead Radial. Provides at least 2 NM (Center 1 NM) of lead to assist in turning onto the intermediate/final course		
MALS	Medium Intensity Approach Light System		

LANDING MINIMA FORMAT

In this example airport elevation is 1179, and runway touchdown zone elevation is 1152.



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Instrument Approach Procedures (Charts)
INOPERATIVE COMPONENTS OR VISUAL AIDS TABLE
Civil Pilots see FAR 91.117(c)

Landing minimums published on instrument approach procedure charts are based upon full operation of all components and visual aids associated with the particular instrument approach chart being used. Higher minimums are required with inoperative components or visual aids as indicated below. If more than one component is inoperative, each minimum is raised to the highest minimum required by any single component that is inoperative. ILS glide slope inoperative minimums are published on instrument approach charts as localizer minimums. This table may be amended by notes on the approach chart. Such notes apply only to the particular approach category(ies) as stated. See legend page for description of components indicated below.

(1) ILS, MLS, and PAR

Inoperative Component or Aid	Approach Category	Increase DH	Increase Visibility
MM*	ABC	50 feet	None
MM*	D	50 feet	¼ mile
ALSF 1 & 2, MALSR, & SSALR	ABCD	None	¼ mile

*Not applicable to PAR

(2) ILS with visibility minimum of 1,600 or 2,000 RVR.

MM	ABC	50 feet	To 2400 RVR
MM	D	50 feet	To 4000 RVR
ALSF 1 & 2, MALSR, & SSALR	ABCD	None	To 4000 RVR
TDZL, RCLS	ABCD	None	To 2400 RVR
RVR	ABCD	None	To ½ mile

(3) VOR, VOR/DME, VORTAC, VOR (TAC), VOR/DME (TAC), LOC, LOC/DME, LDA, LDA/DME, SDF, SDF/DME, RNAV, and ASR

Inoperative Visual Aid	Approach Category	Increase MDA	Increase Visibility
ALSF 1 & 2, MALSR, & SSALR	ABCD	None	½ mile
SSALS, MALS & ODALS	ABC	None	¼ mile

(4) NDB

ALSF 1 & 2, MALSR, & SSALR	C	None	½ mile
	ABD	None	¼ mile
MALS, SSALS, ODALS	ABC	None	¼ mile

AIRCRAFT APPROACH CATEGORIES

Minimums are specified for the various aircraft speed/weight combinations. Speeds are based upon a value 1.3 times the stalling speed of the aircraft in the landing configuration at maximum certificated gross landing weight. Thus they are COMPUTED values. See FAR 97.3 (b). An aircraft can fit into only one category, that being the highest category in which it meets either specification. For example, a 30,000 pound aircraft landing weight combined with a computed approach speed of 130 knots would place the aircraft in Category C. If it is necessary, however, to maneuver at speeds in excess of the upper limit of the speed range for each category, the minimum for the next higher approach category should be used. For example, a B-727-100 which falls in Category C, but is circling to land at a speed in excess of 140 knots, should use the approach category "D" minimum when circling to land. See following category limits.

Approach Category	Speed/Weight

A : Speed less than 91 knots; weight less than 30,001 pounds.

B : Speed 91 knots or more but less than 121 knots; weight 30,001 pounds or more but less than 60,001 pounds.

C : Speed 121 knots or more but less than 141 knots; weight 60,001 pounds or more but less than 150,001 pounds.

D : Speed 141 knots or more but less than 166 knots; weight 150,001 pounds or more.

E : Speed 166 knots or more; any weight.

RVR/Meteorological Visibility Comparable Values

The following table shall be used for converting RVR to meteorological visibility when RVR is inoperative.

RVR (feet)	Visibility (statute miles)
1600	1/4
2400	1/2
3200	5/8
4000	3/4
4500	7/8
5000	1
6000	1 1/4

SURFACE AVIATION WEATHER REPORTS

TABLE 2-1. 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.

TABLE 2-2. 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

TABLE 2-3. 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

TABLE 2-4. 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.

WEATHER CHART SYMBOLS

THE WEATHER DEPICTION CHART

TOTAL SKY COVER

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

OTHER

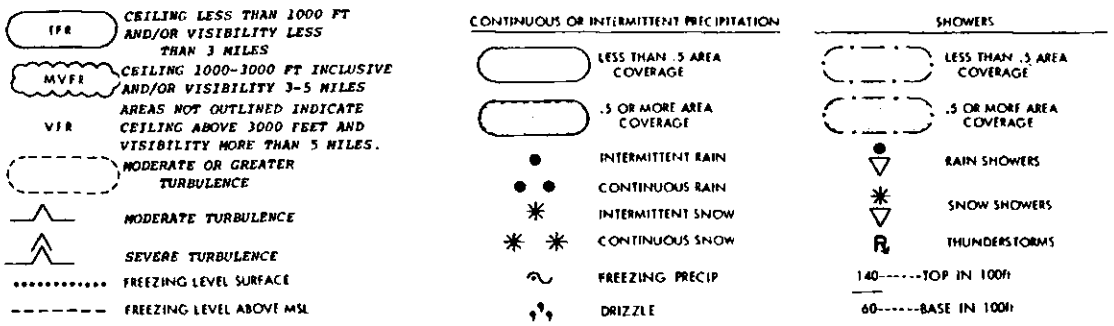
- Clouds Topping Ridges

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.

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
6 -09	−9° C, wind 260° at 50 knots
6 6 -47	−47° C, wind 360° at 115 knots
-11 99	−11° C, wind calm (light variable)

DEPARTMENT OF TRANSPORTATION – FEDERAL AVIATION ADMINISTRATION

QUESTION SELECTION SHEET

TITLE	SELECTION NO.
INSTRUMENT RATING – AIRPLANE	

NAME _____

NOTE: (1) IT IS PERMISSIBLE TO MARK ON THIS SHEET

(2) LEGEND MATERIAL IS IN QUESTION BOOK APPENDIX, PAGES 187 THROUGH 201

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	4	21	279	41	597	61	869
2	23	22	286	42	606	62	891
3	39	23	301	43	611	63	898
4	50	24	336	44	615	64	910
5	68	25	362	45	636	65	912
6	82	26	365	46	647	66	915
7	83	27	373	47	685	67	941
8	103	28	381	48	689	68	944
9	119	29	410	49	693	69	957
10	122	30	421	50	706	70	959
11	135	31	455	51	707	71	966
12	190	32	457	52	725	72	971
13	213	33	496	53	740	73	975
14	218	34	504	54	773	74	980
15	235	35	516	55	778	75	986
16	237	36	520	56	806	76	1002
17	253	37	524	57	822	77	1004
18	256	38	557	58	825	78	1007
19	266	39	577	59	840	79	1009
20	273	40	581	60	862	80	1013

BEFORE TURNING IN YOUR ANSWER SHEET, BE SURE THAT YOU HAVE COMPLIED WITH THE SPECIFIC INSTRUCTIONS ON PAGES 1 AND 4 OF THE AIRMAN WRITTEN TEST APPLICATION.

For Official Use Only

DEPARTMENT OF TRANSPORTATION – FEDERAL AVIATION ADMINISTRATION

QUESTION SELECTION SHEET

TITLE	SELECTION NO.
INSTRUMENT RATING — HELICOPTER	

NAME _____

NOTE: (1) IT IS PERMISSIBLE TO MARK ON THIS SHEET

(2) LEGEND MATERIAL IS IN QUESTION BOOK APPENDIX, PAGES 187 THROUGH 201

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	6	21	255	41	455	61	737
2	17	22	279	42	501	62	740
3	44	23	280	43	504	63	744
4	45	24	304	44	507	64	752
5	60	25	315	45	510	65	753
6	65	26	321	46	517	66	782
7	82	27	324	47	527	67	791
8	87	28	333	48	546	68	800
9	92	29	343	49	550	69	804
10	95	30	358	50	553	70	813
11	97	31	365	51	554	71	843
12	113	32	375	52	558	72	943
13	121	33	391	53	581	73	954
14	127	34	404	54	590	74	965
15	129	35	413	55	616	75	968
16	140	36	433	56	620	76	972
17	183	37	440	57	647	77	1002
18	200	38	446	58	649	78	1004
19	219	39	449	59	671	79	1008
20	248	40	451	60	736	80	1009

BEFORE TURNING IN YOUR ANSWER SHEET, BE SURE THAT YOU HAVE COMPLIED WITH THE SPECIFIC INSTRUCTIONS ON PAGES 1 AND 4 OF THE AIRMAN WRITTEN TEST APPLICATION.

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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 | MECH EXP 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.

1 ①②③④	23 ①②③④	45 ①②③④	67 ①②③④	89 ①②③④	111 ①②③④	133 ①②③④
2 ①②③④	24 ①②③④	46 ①②③④	68 ①②③④	90 ①②③④	112 ①②③④	134 ①②③④
3 ①②③④	25 ①②③④	47 ①②③④	69 ①②③④	91 ①②③④	113 ①②③④	135 ①②③④
4 ①②③④	26 ①②③④	48 ①②③④	70 ①②③④	92 ①②③④	114 ①②③④	136 ①②③④
5 ①②③④	27 ①②③④	49 ①②③④	71 ①②③④	93 ①②③④	115 ①②③④	137 ①②③④
6 ①②③④	28 ①②③④	50 ①②③④	72 ①②③④	94 ①②③④	116 ①②③④	138 ①②③④
7 ①②③④	29 ①②③④	51 ①②③④	73 ①②③④	95 ①②③④	117 ①②③④	139 ①②③④
8 ①②③④	30 ①②③④	52 ①②③④	74 ①②③④	96 ①②③④	118 ①②③④	140 ①②③④
9 ①②③④	31 ①②③④	53 ①②③④	75 ①②③④	97 ①②③④	119 ①②③④	141 ①②③④
10 ①②③④	32 ①②③④	54 ①②③④	76 ①②③④	98 ①②③④	120 ①②③④	142 ①②③④
11 ①②③④	33 ①②③④	55 ①②③④	77 ①②③④	99 ①②③④	121 ①②③④	143 ①②③④
12 ①②③④	34 ①②③④	56 ①②③④	78 ①②③④	100 ①②③④	122 ①②③④	144 ①②③④
13 ①②③④	35 ①②③④	57 ①②③④	79 ①②③④	101 ①②③④	123 ①②③④	145 ①②③④
14 ①②③④	36 ①②③④	58 ①②③④	80 ①②③④	102 ①②③④	124 ①②③④	146 ①②③④
15 ①②③④	37 ①②③④	59 ①②③④	81 ①②③④	103 ①②③④	125 ①②③④	147 ①②③④
16 ①②③④	38 ①②③④	60 ①②③④	82 ①②③④	104 ①②③④	126 ①②③④	148 ①②③④
17 ①②③④	39 ①②③④	61 ①②③④	83 ①②③④	105 ①②③④	127 ①②③④	149 ①②③④
18 ①②③④	40 ①②③④	62 ①②③④	84 ①②③④	106 ①②③④	128 ①②③④	150 ①②③④
19 ①②③④	41 ①②③④	63 ①②③④	85 ①②③④	107 ①②③④	129 ①②③④	
20 ①②③④	42 ①②③④	64 ①②③④	86 ①②③④	108 ①②③④	130 ①②③④	
21 ①②③④	43 ①②③④	65 ①②③④	87 ①②③④	109 ①②③④	131 ①②③④	
22 ①②③④	44 ①②③④	66 ①②③④	88 ①②③④	110 ①②③④	132 ①②③④	

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