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INSTRUMENT RATING (HELICOPTER) WRITTEN TEST GUIDE

1968

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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PREFACE

The Flight Standards Service, Federal Aviation Administration, has issued this guide to assist applicants who are preparing for the helicopter instrument rating. Its purpose is to outline the scope of the written test and direct applicants to a clear understanding of the requirements, reference materials, tests, and testing procedures. A study outline, list of study materials, and sample test with answers and explanations are presented.

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CHAPTER 1. NATURE OF THE WRITTEN TEST

1. INTRODUCTION. This study guide is made available by the Flight Standards Service of the Federal Aviation Administration to applicants who are preparing for the Instrument Rating Helicopter Written Test.

   The guide is not offered as a quick and easy way to obtain the necessary knowledge for passing the written test. Rather, the intent of this guide is to define the scope and narrow the field for study to the basic knowledge required for the instrument rating.

2. ELIGIBILITY REQUIREMENTS. Federal Aviation Regulation (FAR) 61.35 sets forth the basic knowledge and experience requirements for the Instrument Rating. Skill requirements are detailed in FAR 61.37. The study outline contained in this written test guide presents in detail the knowledge requirements.

3. TYPE OF TEST. The Instrument Rating Helicopter Written Test is based on the planning and execution of a "typical" flight operation made under instrument flight rules and in instrument conditions. Test items present a progression of problems from flight planning to arrival at destination. The official test requires approximately 5 hours to complete and the result is mailed to the applicant on AC Form 8060-37. Appropriate planning materials including charts, helicopter data, weather information, and Airman's Information Manual excerpts are provided for taking the test. Similar materials, for use with the sample test in this guide, are provided in the Appendix of this guide.

   An applicant who receives a failing grade must present the AC Form 8060-37 when he appears for reexamination. The test may be retaken after 30 days, or sooner, upon presentation of a statement from an appropriately rated flight or ground instructor certifying that (a) the applicant has been given 5 hours additional instruction, and (b) he is now deemed competent to pass the test.

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

   a. The test items should be answered in accordance with the latest regulations and procedures.

   b. Read every question thoroughly. Failure in 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.

c. Do not consider a complicated problem a "trick" question; each question has a specific objective.

d. There is only one correct and complete answer for each item.

e. Do not waste too much time on problems that stump you. Go on to the questions that you can answer readily, then return to the items which are causing difficulty.

f. For a computer problem, select the answer closest to your own solution. The problem has been checked with various types of computers, and if you have solved the problem correctly, your answer will be closer to the correct answer than to any of the other choices.

g. Complete and legible entry of personal data in appropriate spaces on the test answer sheet will aid in scoring.

CHAPTER 2. STUDY OUTLINE FOR THE INSTRUMENT RATING HELICOPTER WRITTEN TEST

5. INTRODUCTION. This study outline covers areas of aeronautical knowledge and instrument flight procedures which pertain to the Instrument Rating Helicopter Written Test. Every test item can be directly related to one or more of the topics contained in this outline. The subject matter selected is based on the requirements of Federal Aviation Regulations and a realistic appraisal of a helicopter pilot's activity in preparation for, and conduct of, instrument flight.

6. FEDERAL AVIATION REGULATIONS AND AIR TRAFFIC CONTROL PROCEDURES

a. Part 61 -- Certification: Pilots and Flight Instructors

(1) Pilot certificates and ratings

(2) Pilot logs and flight requirements

(3) Recency of experience

b. Part 91 -- General Operating and Flight Rules

(1) Aircraft certificates, documents, and inspections

(2) Aircraft equipment required

(3) Aircraft equipment accuracy checks

(4) General operating rules

(5) General flight rules

(6) Visual flight rules

(a) Basic minimums

(b) Control areas

(c) Control zones

(d) Continental control area

(e) Operation outside controlled airspace

(7) Special VFR

(8) Cruising altitudes and flight levels

(9) Instrument flight rules

(a) Flight plan requirements

(b) Fuel requirements

(c) Altimeter setting

(d) Compliance with ATC clearance

(e) IFR operations outside controlled airspace

(f) Takeoff and landing

(g) Minimum altitudes

(h) Cruising altitudes/flight levels

(i) Courses to be flown

(j) Radio communications

(k) Communications failure

(l) Equipment malfunction

c. Basic Flight Information (Airman's Information Manual - Part 1, Chapter 1)

(1) Glossary of Aeronautical Terms

(2) Good Operating Practices

(3) Air Navigation Radio Aids

(4) Airport, Air Navigation Lighting, and Marking Aids

(5) Altimetry

(6) Medical Facts for Pilots

(7) Radar

(8) Radiotelephone Phraseology and Techniques

(9) Weather

(10) Safety in Flight

d. Air Traffic Control Procedures (Airman's Information Manual - Part 1, Chapter 2)

(1) Preflight

(a) Briefing

(b) Flight plans

(c) VFR operations on IFR flight plan

(2) Departure

(a) Communications

(b) Light signals

(c) Clearance

(d) Departure Control

(3) Enroute

(a) Airways/route systems

(b) Continental Control Area

(c) Positive Control Area

(d) Holding

(e) ATCRBS/transponders

(f) Surveillance radar

(g) Changeover points

(h) Climbing/descending

(i) Communications

(j) Cruising altitudes

(4) Arrival

(a) Airport advisory service

(b) ATIS

(c) Radar traffic information

(d) Terminal radar service

(e) Approach control

(f) Instrument approach

(g) Radar monitoring of instrument approaches

(h) Speed adjustment

(5) Landing

(6) General

(a) SCATANA procedures

(b) ADIZ procedures

(7) Emergency procedures

e. IFR Exam-O-Grams

7. FLIGHT PLANNING AND AIRCRAFT PERFORMANCE

a. Preflight Log for IFR Flight (charts, aircraft flight manual data, appropriate weather information, and Airman's Information Manual excerpts will be furnished with the written test. Applicants should be familiar with these materials and should know how to use them in planning an IFR flight.)

b. Flight Log Calculations

(1) Conversion of directions - true, magnetic, and compass

(2) Density altitude

(3) True airspeed

(4) Wind correction angle

(5) Groundspeed

(6) Estimated time enroute

(7) Fuel required

c. Helicopter Performance (use of performance charts in flight manual or owner's handbook)

(1) Hovering

(2) Take-off

(3) Climb

(4) Enroute

(5) Landing

(6) Rate of fuel consumption

(7) Weight and balance

(8) Effect of changes in density altitude

8. AVIATION WEATHER AND PREFLIGHT WEATHER BRIEFING

a. Weather Elements

(1) Wind (pressure gradient, general circulation, surface friction, etc.)

(2) Air masses (general characteristics)

(3) Pressure systems and associated weather

(4) Cloud types and characteristics

(5) Frontal systems and characteristic weather

(6) Stability

(7) Icing conditions

(8) Factors affecting visibility

(9) Fog

(10) Turbulence

(11) Thunderstorms

b. Weather in Flight

(1) Structural icing

(2) Carburetor icing

(3) Turbulence

c. Weather Information In Flight

(1) Automatic transcribed weather broadcasts

(2) Scheduled weather broadcasts

(3) Special requests for weather information

(4) Automatic Terminal Information Service (ATIS)

(5) AIRMETS and SIGMETS

d. Preflight Weather Briefing

(1) Interpreting weather charts

(a) Weather depiction

(b) Low level prognostic - 12 and 24 hour

(c) Constant pressure - 850 and 700 mb

(2) Interpreting weather charts and forecasts

(a) Hourly surface reports

(b) Area forecasts

(c) Terminal forecasts

(d) Winds aloft forecasts

(e) Radar reports

9. INTERPRETATION AND USE OF FLIGHT INSTRUMENTS

a. Altimeter

(1) Altitude terms (density, pressure, and indicated)

(2) Errors

(3) Altimeter setting

(4) Effect of changes in temperature and pressure

b. Airspeed Indicator

(1) Limitations and markings

(2) Errors

(3) Use of pitot heat

c. Magnetic Compass

(1) Variation and deviation

(2) Acceleration and deceleration errors

(3) Turning errors

d. Turn-and-Bank Indicator

(1) Interpretation of needle and ball (2-min and 4-min)

(2) Relationship of TAS and angle of bank to rate and radius of turn

e. Gyro Instruments (operating characteristics and limitations)

f. Determining Aircraft Attitude From Instrument Indications

10. AIR NAVIGATION: FACILITIES, CHARTS, AND PROCEDURES

a. Operating Limitations And Characteristics Of Ground And Airborne Equipment

(1) VOR and VORTAC

(2) Homing facilities (radio beacons, compass locators, and broadcast stations)

(3) Primary radar (ASR, ARSR, and PAR)

(4) Radar beacon system

(5) DME (Distance Measuring Equipment)

(6) ILS

b. Charts (read and interpret all features and symbols)

(1) Enroute Low Altitude Chart

(2) Low Altitude Area Chart

(3) Standard Instrument Departure (SID) Chart

(4) Instrument Approach (A/L) Chart

c. Air Navigation Procedures

(1) Dead reckoning

(a) Pre-determining the compass heading

(b) Determining the actual track from observed data during flight

(2) VOR navigation

(a) Identifying ranges

(b) Orientation

(c) Interception of radials and tracking

(d) Position fixing

(e) Airway navigation

(3) ADF navigation

(a) Determining magnetic bearings

(b) Intercepting magnetic bearings

(c) Determining relative bearings

(d) Tracking

(4) Radar vectors

(a) Availability and normal use

(b) Use of transponders

(5) Instrument approach procedures (understand and apply information on Instrument Approach Charts)

(a) ILS

(b) VOR

(c) VOR/DME

(d) ADF

(e) Surveillance radar

(f) Precision approach radar

APPENDIX 1. RECOMMENDED STUDY MATERIALS

The applicant for an Instrument Rating will find the publications listed below helpful to him in his preparation for the test.

The list identifies source material essential to preparing for the test but does not include all available material on the subjects. Other excellent text books, audiovisual training aids, and instruction materials useful in preparing for the test may be available at bookstores and libraries.

It is the responsibility of each applicant to obtain the study materials appropriate to his needs.

NOTE: References listed were available at the time this publication went to press.

SECTION 1. LIST OF STUDY MATERIALS

1. BASIC HELICOPTER HANDBOOK, AC 61-13 ($0.75), provides detailed information on helicopter aerodynamics, performance, and flight maneuvers to applicants preparing for private, commercial, and flight instructor pilot certificates with helicopter ratings. It is also useful to flight instructors in training students.

2. FEDERAL AVIATION REGULATIONS:

   a. Part 61 - Certification: Pilots and Flight Instructors ($0.70)

   b. Part 91 - General Operating and Flight Rules ($0.70)

3. AVIATION WEATHER, AC 00-6 ($2.25). Provides a background for understanding the meteorological principles important to aviation. This publication shows how weather conditions affect flying and how weather knowledge can be used for safer and more efficient flight.

4. INSTRUMENT FLYING HANDBOOK, AC 61-27 ($1.75). A basic text for instrument pilots. It deals, in logical sequence, with training considerations, aerodynamic factors, physiological factors, flight instruments and their use, air navigation aids, communications, the air traffic system, and flight planning. Sections on Federal Aviation Regulations and aviation weather are omitted to avoid duplication.

5. AIRMAN'S INFORMATION MANUAL. This publication presents, in three Parts, information necessary for the planning and conduct of flights in the U.S. airway system. Besides providing frequently updated airport and navaid data, the AIM includes instructional and procedural information, and is designed for use in the cockpit. Each part is available as a separate annual subscription at the prices shown below. Add 25 percent for foreign mailing.

   a. Part 1, Basic Flight Manual and ATC Procedures. (Issued quarterly)---------- $2.00

   b. Part 2, Airport Directory. (Issued semiannually) --------- $2.00

   c. Part 3, Operational Data and Notices to Airmen. (Operational data issued every 28 days; Notices to Airmen issued every 14 days)---------- $9.00

6. Using the Instrument Approach Procedure Charts, AC 90-1 (Free). This Advisory Circular clarifies the symbols and abbreviations used on Instrument Approach Procedure Charts.

7. 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.

   a. VFR Pilot Exam-O-Grams (Free).

   b. Instrument Pilot Exam-O-Grams (Free).

8. CHARTS

   a. Instrument Approach Procedure Charts (10¢ per airport set). Individual charts give detailed information on procedures for specific airports. They are available for ADF, VOR, VOR/DME, ILS, and Parallel ILS.

   b. Enroute Charts (35¢ each). These charts provide the necessary aeronautical information for enroute instrument navigation. They are available for low altitude or high altitude.

   c. Low Altitude Area Charts (35¢ per set). These charts supplement the Enroute Charts by providing an enlargement of certain high density areas.

SECTION 2. HOW TO OBTAIN STUDY MATERIALS

9. Study Manuals. The study manuals listed, except Exam-O-Grams, charts, and advisory circulars, may be obtained by forwarding a request and check or money order to:

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

10. Advisory Circular (AC 90-1) Available free from:

Distribution Unit, HQ-438
Department of Transportation
Federal Aviation Administration
Washington, D. C. 20590

11. Exam-O-Grams. May be obtained free, in limited quantities, and names may be added to the mailing list by writing to:

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

12. Charts. May be procured at local airports or by sending a request and check or money order to:

Distribution Division, C-44
Coast and Geodetic Survey
Rockville, Maryland 20852

APPENDIX 2. SAMPLE TEST

The following sample test is similar to the Instrument Rating Helicopter Written Test. Knowledge in all areas presented in the study outline--not just the ability to answer sample test items--should be the goal in preparing for the written examination. For example, applicants should expect to encounter many test items dealing with detailed ATC procedures, and may prepare themselves for such test items by careful study of Part I of the Airman's Information Manual.

Correct answers, references, and detailed explanations for the sample test items are included at the end of the examination.

This test is based on an instrument flight from Wichita Municipal Airport, Wichita, Kansas, to Mid-Continent International Airport, Kansas City, Missouri, to be made on the morning of April 3. You will be flying a single engine, single rotor helicopter owned by your company and you will be accompanied by three members of your firm.

NOTE: The sample items, answers, and analyses are based on procedures and regulations in effect at the time of preparation of this publication. Regulatory and procedural changes subsequent to the date of this publication should be checked for their effect on the applicable item.

SECTION 1. SAMPLE TEST ITEMS

1. You review weather conditions along the proposed route between Wichita and Kansas City as shown on the Weather Depiction Chart (Appendix 3, page 9). Which of the responses listed below is correct?

    1- Ceilings are progressively higher along the route.
    2- Sky is obscured at MKC.
    3- IFR weather conditions exist over the entire route.
    4- VFR weather conditions exist at ICT.

2. Review the MKC Area Forecast (FA) shown in Appendix 3, page 12. Which statement is correct?

    1- Ceilings in eastern Kansas are expected to improve during the day to 800 to 2000 feet broken to overcast.
    2- Rain showers in Kansas and Nebraska are expected to intensify before noon.
    3- Freezing level is at 400 feet over Kansas.
    4- Moderate turbulence is forecast at all levels over Kansas.

3. You plan to arrive in Kansas City (MKC) at approximately 1800 GMT (1200 CST). What weather conditions should you anticipate at this arrival time as shown in the Terminal Forecast (FT1) on page 13 in Appendix 3?

    1- Occasional light rain, visibility 3 miles in heavy fog.
    2- Visibility 7 miles in rain showers.
    3- Sky obscured, visibility 3 miles in fog and drizzle.
    4- Visibility 3 miles in fog and light drizzle.

4. Comparison of the 1400Z and 1500Z hourly surface weather reports for MCI on page 11, Appendix 3, indicates that the

    1- temperature/dewpoint spread has decreased.
    2- altimeter setting has increased.
    3- ceiling has lifted.
    4- visibility has improved.

5. Which of the following are necessary for the development of a thunderstorm?

    A. Stable air
    B. Unstable air
    C. High moisture content
    D. A lifting force
    E. A front

        1- B and E only
        2- B, C, and D
        3- A, C, and D
        4- B and D only

6. Refer to the Enroute Chart Segment in Appendix 3, page 14. Which altitude will provide obstruction clearance and navigation signal reception on Victor 12 between ICT and BONNER SPRINGS intersection?

    1- 2400 feet MSL
    2- 2500 feet MSL
    3- 2900 feet MSL
    4- 3100 feet MSL

7. Review the Mid-Continent International Airport listing in the Airport/Facility Directory on page 7, Appendix 3. Which of the items listed below is correct?

    1- Ground Control frequency is 121.7 MHz
    2- Transcribed Weather Broadcasts are available on 359 kHz
    3- A VOR test facility is available.
    4- Contact Kansas City Approach Control on 118.9 MHz approaching from the west.

* *

Test items 8 through 12 involve preflight calculations. Refer to the partially completed Flight Time Analysis form on page 17, Appendix 3. Perform the necessary computations.

* *

8. The preflight estimate for the enroute time between the Wichita Municipal Airport and Mid-Continent International Airport is

    1- 1 hour, 21 minutes.
    2- 1 hour, 11 minutes.
    3- 1 hour, 17 minutes.
    4- 1 hour, 14 minutes.

9. Average fuel consumption is 180 pounds/hour. Fuel burn-off for the enroute time calculated in test item 8 is

    1- 202 pounds.
    2- 222 pounds.
    3- 210 pounds.
    4- 237 pounds.

10. Total usable fuel capacity by volume for this helicopter is 76 gallons. Assuming a fuel weight of 6.5 pounds/gallon, what is the weight of fuel remaining which could be utilized for alternate and reserve requirements?

    1- 284 pounds
    2- 257 pounds
    3- 272 pounds
    4- 292 pounds

11. Refer to the Center of Gravity chart on page 19, Appendix 3. Assume that your helicopter is loaded so that the C.G. is exactly at the aft limit of 113.75. For this C.G. location, the corresponding gross weight is

    1- 2,450 pounds.
    2- 2,400 pounds.
    3- 2,500 pounds.
    4- 2,550 pounds.

12. The total moment corresponding to the gross weight and C.G. location in test item 11 is 278,687.5 inch/pounds. Compute the amount and direction of C.G. movement resulting from the in-flight fuel burn outlined below:

    Fuel tank centroid--fuselage station 145.0
    Fuel burn: 1.25 hours @ 180 pounds/hour

    The amount and direction of C.G. movement under these conditions is

    1- 1.5 inches aft.
    2- 2.25 inches forward.
    3- 3.15 inches forward.
    4- 0.25 inches aft.

13. Prior to operating in controlled airspace under IFR, you are required to file an IFR flight plan and receive an appropriate ATC clearance. The ATC clearance issued to you provides

    1- adequate separation from all traffic.
    2- priority over all other traffic.
    3- authorization to proceed under specified traffic conditions in controlled airspace.
    4- assurance that your flight will be conducted in keeping with Federal Aviation Regulations.

14. To serve as pilot-in-command of this IFR flight, you must have acquired 6 hours of instrument time within the preceding 6 months. How much of this requirement must have been accomplished in flight in a helicopter?

    1- 3 hours
    2- none
    3- 6 hours
    4- 2 hours

15. During an IFR flight, you may log as instrument time all flight time conducted

    1- in low forward visibility.
    2- between well-defined cloud layers.
    3- solely by reference to instruments.
    4- on top of a well-defined cloud layer.

16. You check the accuracy of your VOR equipment using a designated ground check point on the airport surface. In this situation, the maximum permissible bearing error is

    1- 3 degrees.
    2- 4 degrees.
    3- 6 degrees.
    4- 8 degrees.

17. The air temperature at ICT is +20°C. Assuming a pressure altitude of 1,400 feet, what is the approximate density altitude (Appendix 3, page 18)?

    1- 3,000 feet
    2- 2,600 feet
    3- 2,000 feet
    4- 2,300 feet

18. Which of the following factors act to <u>improve</u> helicopter performance?

    1- High gross weight
    2- No wind condition
    3- High density altitude
    4- Moderate to strong winds

19. Refer now to the Height/Velocity Diagram on page 19, Appendix 3. From which of the following height and indicated airspeed conditions could you normally expect to make a safe autorotative landing in the event of sudden power failure?

    1- 20 feet/10 knots
    2- 10 feet/60 knots
    3- 90 feet/35 knots
    4- 30 feet/40 knots

20. Determine the hovering ceiling, out of ground effect, of this helicopter under the conditions stated below.

Reference: Appendix 3, page 20
Takeoff power
Anti-ice off
Engine RPM 100%
Gross Weight: 2,200 pounds
Temperature (OAT): +45°C

The hovering ceiling, out of ground effect, is

1- 3,500 feet.
2- 3,800 feet.
3- 4,200 feet.
4- 4,400 feet.

21. Determine the maximum rate of climb under the conditions stated below:

Reference: Appendix 3, page 22
Takeoff power
Anti-ice: off
Gross Weight: 2900 pounds
Climb Speed (V_{CAL}): 47 knots
Engine RPM: 100%
Altitude: 6,000 feet
Temperature (OAT): +15°C

The maximum rate of climb is

1- 800 feet/minute.
2- 900 feet/minute.
3- 1,000 feet/minute.
4- 1,200 feet/minute.

22. ATC has cleared you to the Mid-Continent International Airport via flight planned route, to maintain 5000 feet. As pilot-in-command, you should be aware that this clearance

1- must be accepted as received.
2- may not be amended.
3- provides standard separation between IFR flights.
4- provides standard separation between IFR and VFR traffic.

23. You are approaching EUDORA intersection on V10 (Appendix 3, page 15). Which VOR radials will you utilize to identify the intersection?

    1- TOP/091; MKC/043
    2- TOP/108; EMP/042
    3- TOP/108; MKC/223
    4- TOP/101; MKC/223

24. Refer to the instrument approach procedure chart for Mid-Continent International Airport in Appendix 3, page 16. Which statement is correct regarding certain features on this chart?

    1- Glide slope projection angle is 4°.
    2- Distance from BONNER SPRINGS to OM is 13 miles.
    3- Distance from MM to airport is 3.8 miles.
    4- Localizer frequency is 112.6 MHz.

25. The rate of descent required to remain on the glide path during an ILS approach or a Precision Radar approach will

    1- increase if the groundspeed is increased.
    2- remain the same regardless of true airspeed.
    3- remain the same regardless of groundspeed.
    4- increase if the groundspeed is decreased.

SECTION 2. ANSWERS AND EXPLANATIONS FOR THE SAMPLE TEST

TEST ITEM 1 (Ans. 3). As shown on the Weather Depiction Chart, the route between ICT and MKC is completely within the area bounded by solid lines where IFR weather conditions exist.

TEST ITEM 2 (Ans. 1). Rain showers over eastern Kansas are expected to diminish during the day; the freezing level is at 4,000 feet over Iowa; and occasional moderate turbulence is expected in the vicinity of the jetstream.

TEST ITEM 3 (Ans. 4). The complete terminal forecast for the period during which you plan to arrive is--Ceiling 800 feet overcast, visibility 3 miles in fog, wind 110°/12 kts., occasional light drizzle.

TEST ITEM 4 (Ans. 3). The ceiling has lifted from measured 400 feet overcast to measured 500 feet overcast.

TEST ITEM 5 (Ans. 2). See Aviation Weather.

TEST ITEM 6 (Ans. 4). The highest Minimum Enroute Altitude (MEA) on the route is 3100 feet between CASSODAY intersection and EMP. This altitude, therefore, satisfies obstruction clearance and navigation signal reception requirements over the entire route.

TEST ITEM 7 (Ans. 2). See Appendix 3, page 5, for identification of various items in the listing.

TEST ITEM 8 (Ans. 4). Times for the legs are 4, 28, 37, and 5 minutes, respectively. Total time is, therefore, 1 hour, 14 minutes.

TEST ITEM 9 (Ans. 2). Average fuel consumption is 180 pounds/hour or 3 pounds/minute. Total fuel burn-off is 222 pounds.

TEST ITEM 10 (Ans. 3). Total weight of usable fuel is 494 pounds with full tanks. The fuel remaining, based on the previous burn-off calculation is 272 pounds.

TEST ITEM 11 (Ans. 1). Note that the aft C.G. limit is critical, or variable, between 2,350 pounds and full gross weight of 2,900 pounds.

TEST ITEM 12 (Ans. 3). The fuel burn of 225 pounds at fuselage station 145.0 decreases the total moment by 32,625 inch/pounds. The decreased total moment of 246,062.5 inch/pounds, when divided by the new gross weight of 2,225 pounds, yields a new C.G. location of 110.6. The resultant C.G. movement produced by the fuel burn is apparent when the previous C.G. of 113.75 is compared with the new C.G.

TEST ITEM 13 (Ans. 3). This definition of an ATC clearance may be found in the Glossary of Aeronautical Terms in Part 1 of the Airman's Information Manual.

TEST ITEM 14 (Ans. 1). The reference is FAR 61.47.

TEST ITEM 15 (Ans. 3). The reference is FAR 61.39.

TEST ITEM 16 (Ans. 2). The reference is FAR 91.25.

TEST ITEM 17 (Ans. 4). The problem can also be solved using the density altitude scale now provided on most computers.

TEST ITEM 18 (Ans. 4). The first three factors act to increase power requirements, therefore, reducing helicopter performance. The effect of wind is to increase translational lift, thereby improving helicopter performance.

TEST ITEM 19 (Ans. 4). The shaded areas represent altitude and airspeed flight combinations which should be avoided.

TEST ITEM 20 (Ans. 2). Correct as shown on referenced chart.

TEST ITEM 21 (Ans. 2). Correct as shown on referenced chart.

TEST ITEM 22 (Ans. 3). The reference is Part 1, Chapter 2 of the Airman's Information Manual.

TEST ITEM 23 (Ans. 3). Correct as shown on the referenced chart.

TEST ITEM 24 (Ans. 2). Instrument approach procedure charts are being revised to reflect criteria associated with the new U.S. standard for Terminal Instrument Procedures (TERPS). It is estimated that approximately two years will be required to reissue each individual approach procedure under the new criteria.

TEST ITEM 24 (Ans. 1). Rate of descent on the glide path will, of course, vary directly with groundspeed.

APPENDIX 3. SUPPLEMENTAL MATERIALS

SECTION 1. HELICOPTER DATA

WEIGHT LIMITATIONS

Maximum approved gross weight ---------- 2,900 pounds
Empty weight ---------- 1,285 pounds

AIRSPEED LIMITATIONS

V_{NE} 130 knots, sea level to 3000 feet
Decrease V_{NE} 3.5 knots per 1000 feet above 3000 feet

ALTITUDE LIMITATIONS

Maximum operating ---------- 20,000 feet

FUEL CAPACITY

sable fuel ---------- 76 gallons

WEIGHT AND BALANCE

Front seat (pilot/passenger) ---------- 400 pounds maximum
Rear seat (3 passengers) ---------- 510 pounds maximum
Baggage allowance ---------- 250 pounds maximum

COMPASS CORRECTION CARD:

FOR (MH)	0	30	60	90	120	150	180	210	240	270	300	330
STEER (CH)	0	30	62	94	125	152	180	208	235	266	298	328

SECTION 2. RESTRICTIONS AND NOTAMS

RESTRICTIONS TO ENROUTE NAVIGATION AIDS

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

MISSOURI

JEFFERSON CITY VOR: VOR unusable beyond 20 NM 040–105° and 140–285°; unusable below 4000′ beyond 20 mi 285–040° and 105–140°; unusable below 4000′ 0–20 mi 040–105° and 140–285°.

MARYLAND HEIGHTS VORTAC: VOR unusable 150–210° beyond 35 mi below 3,500′ MSL. DME unusable 150–215° beyond 30 mi below 3,500′ MSL.

RIVERSIDE VOR: VOR unusable in following areas: 125–170°, 252–260° and 300–310° all distances and altitudes; all other azimuths beyond 15 mi below 2,400′ MSL.

Part 3–A—NOTICES TO AIRMEN

This part is issued every 14 days and is primarily designed to supplement Part 3 of the AI[illegible] It contains appropriate notices from the daily NOTAM Summary, Airmen Advisories, new or revised Oil Burner Routes and other items considered essential to flight safety.

NOTE: Data preceded by a checkmark (✓) are considered permanent and will usually be cited only once. Such information should be noted on charts and records. Temporary information is normally carried twice unless re-submitted.

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

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

MISSISSIPPI

COLUMBIA, MARION COUNTY ARPT: Clsd UFN.

MADISON, BRUCE CAMPBELL FLD: Constr on W side of rnwy 17–35 and on ramp area; rnwy 17–35 opernl.

✓MERIDIAN, KEY FLD: Only radar vectoring svc within rdr coverage lmtns now provided to Key Fld by Meridian app ctl. Radar arr/dep ctl svc and separation at low alts dscntd at Key Fld. Non-radar app/dep ctl svc still avbl.

MISSOURI

CARUTHERSVILLE MEML ARPT: Constr on rnwy 18–36 (extension on S end) until aprxly Mar 1, 1968; at present, 2400′ avbl with low int rnwy lgts operg dusk-dawn on 1000′ N end.

KANSAS CITY, MID-CONTINENT INTL ARPT: WIP until aprxly Apr 1968, rnwy and txwy constr. Rnwy 36—1000′ tmpry dspled thr apch end intmtly dalgt VFR conditions UFN. Rnwy 9-27 constr continues until aprxly Dec 1.

MOSBY ARPT: Clsd UFN.

ST JOSEPH, ROSECRANS MEML ARPT: First 500′ rnwy 22 apch clsd UFN. Usable length both directions 5600′.

SECTION 3. AIRPORT/FACILITY DIRECTORY AND LEGEND

AIRPORT/FACILITY DIRECTORY LEGEND

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., 1468 feet would be shown as "14"; 1474 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

Add 000 to figure following S, T, TT 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.

T–Runway weight bearing capacity for aircraft with twin-wheel type landing gear. (DC–6), etc.

TT–Runway weight bearing capacity for aircraft with twin-tandem type landing gear. (707), etc.

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

A blank space following the letter designation is used to indicate the runway weight bearing capacity to sustain aircraft with the same type landing gear, although definite figures are not available, e.g., (T-).

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

LIGHTING

B: Rotating Light (Rotating beacon). (Green and white, split-beam and other types.) Omission of B indicates rotating light is either not available or not operating standard hours (sunset-sunrise).

NOTE.—Code lights are not codified, and are carried in Remarks.

L: Field Lighting. An asterisk (*) preceding an element indicates that it operates on prior request only (by phone call, telegram or letter). Where the asterisk is not shown, the lights are in operation or available sunset to sunrise or by request (radio call). L by itself indicates temporary lighting, such as flares, smudge pots, lanterns.

1—Strip lights or portable runway lights (electrical)

2—Boundary

3—Runway Floods

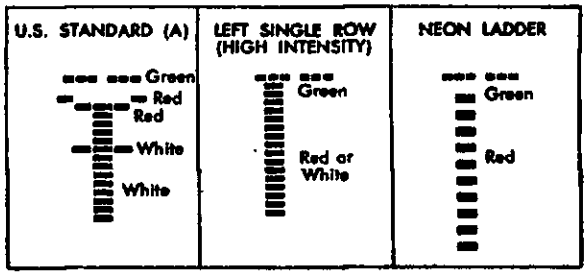
4—Low Intensity Runway

5—Medium Intensity Runway

6—High Intensity Runway

7—Instrument Approach (neon)

8A, B, or C—High Intensity Instrument Approach



9—Sequence Flashing Lights (3,000' out unless otherwise stated)

10—Visual Approach Slope Indicator (VASI)

11—Runway end identification 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.

AIRPORT/FACILITY DIRECTORY

SERVICING

S1: Storage.

S2: Storage, minor airframe repairs.

S3: Storage, minor airframe and minor powerplant repairs.

S4: Storage, major airframe and minor powerplant repairs.

S5: Storage, major airframe and major powerplant repairs.

FUEL

Code (new)	Grade	Code (old)
F12	80/87	F2
F15	91/98 and lower	F3
F18	100/130 and lower	F4
F22	115/145 and lower	F5
F30	Jet A Kerosene, freeze point −40°F	
F34	Jet A-1 Kerosene, freeze point −58°F	
F40	JP-4 Wide-cut gasoline, freeze point −60°F	
F45	Jet B Wide-cut gasoline without icing inhibitor freeze point −60°F	

DAYLIGHT SAVING TIME

Daylight Saving Time runs from the last Sunday in April to the last Sunday in October. All states in conterminous United States except Kentucky are on Daylight Saving Time.

OTHER

AOE—Airport of Entry.

VASI—Visual Approach Slope Indicator, applicable runway provided.

RVV—Runway Visibility Values, applicable runway provided.

RVR—Runway Visual Range, applicable runway provided.

FLIGHT SERVICE STATION

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)."

AIRPORT REMARKS

"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 is confined to operational items affecting the status and usability of the airport, traffic patterns and departure procedures.

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

COMMUNICATIONS

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

When operating at an airport where the control tower is operated by the U.S. Government, two-way radio communication is required unless otherwise authorized by the tower. (When the tower is operated by someone other than the U.S. Government, two-way radio 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, LF. Emergency frequency 121.5 is available at all TOWER, APPROACH CONTROL and RADAR facilities, unless indicated otherwise by a cross-out: ~~121.5~~

Radar available is listed under "RADAR SERVICES" Radar beacons are indicated by "(BCN)" after "RADAR SERVICES", when available.

COMMUNICATIONS REMARKS

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

VOICE CALL

The voice call for contact with the traffic control services listed at each airport is the airport name followed by the call of the particular service desired, i.e., "LAGUARDIA TOWER." In these instances, only the name of the service is listed. When the voice call of the facility is not the same as the airport name, the complete voice call is listed.

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) Non-Radar.
Traffic Information Service (TFC INFO) Radar.
Surveillance Radar Approach (ASR).
Precision Radar Approach (PAR).
Ground Control (GND CON).
VHF Direction Finding (VHF/DF).

AIRPORT/FACILITY DIRECTORY

RADIO NAVIGATION AIDS

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

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS)

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

RADAR APPROACH PROCEDURE MINIMA

Weather minima for precision and surveillance radar approaches (PAR/ASR) specify only the lowest straight-in authorized for the approach.

FLIGHT SERVICE STATION (FSS)

Airport Advisory Service (AAS).
Island, Mountain and Lake Reporting Service.

UNICOM

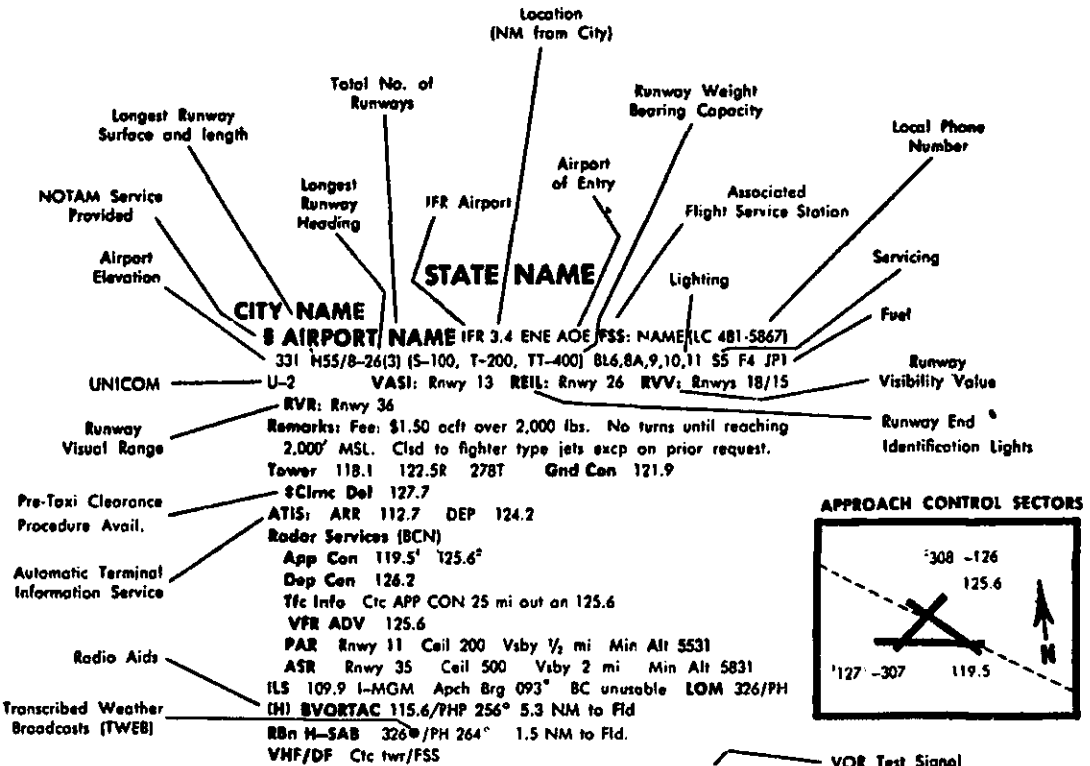
A private aeronautical advisory communications facility operated for purposes other than air traffic control, transmits and receives on one of the following frequencies:

U-1—122.8 for Landing Areas (except heliports) without an ATC Tower or FSS;

U-2—123.0 for Landing Areas (except heliports with an ATC Tower or FSS;

U-3—123.05 for heliports.

SAMPLE



AIRPORT/FACILITY DIRECTORY

RADIO CLASS DESIGNATIONS

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

Class	Normally Anticipated Altitude Service	Normally Anticipated Interference-Free Distance Service
(H)	Up to 45,000 MSL	149.75 smi (130 nmi)
	Above 45,000' MSL	115.2 smi (100 nmi)
(L)	Up to 18,000' MSL	46.06 smi (40 nmi)
(T)	Up to 12,000' MSL	28.79 smi (25 nmi)

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 ---------- Continuous automatic transcribed broadcast service.

B ---------- Scheduled Broadcast Station (broadcasts weather at 15 and 45 minutes after the hour; Air Force Broadcasts, generally, 29 minutes).

DME ------- UHF standard (TACAN compatible) distance mensuring 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 on localizer channel).

LMM ------- Compass locator station when installed at middle marker site.

LOM ------- Compass locator station when installed at outer marker site.

MA ---------- Range (adcock, vertical raditors), power less than 50 watts.

MH ---------- Non-directional radio beacon (homing) power less than 50 watts.

ML ---------- Range (loop radiators), power less than 50 watts.

MRA ------- Range (adcock, vertical radiators), power 50 watts or more but less than 150 watts.

MRL ------- Range (loop radiators), power 50 watts or more, but less than 150 watts.

RA ---------- Range (adcock, vertical radiators), power 150 watts or more.

RBn -------- Non-directional rdo bcn.

RL ---------- Range (loop radiators), power 150 watts or more.

S ---------- Simultaneous range, homing signal and/or voice.

SABH ------ Non-directional radio beacon having limited navigational use. Provides automatic weather broadcasts.

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 facilities on range frequency.

Z ---------- VHF station location marker at a LF range station.

NOTES

1. All FAA MH facilities operate continuously unless otherwise cited.
2. All FAA ranges operate continuously. Those which are not manned continuously are cited in the remarks with hours of operation in parentheses, e.g., (0600–2400).
3. LMF and VHF ranges listed at the same location are controlled by the same FSS.
4. Military navigational facilities which are not part of the common system are not listed in this publication.

AIRPORT/FACILITY DIRECTORY

MISSISSIPPI—*Continued*

KEESLER RBn HW 391/BIX

KEWANEE (L) BVOR 113.8/EWA — **FSS:** MERIDIAN

LAUREL (L) BVOR 108.6/LUL — **FSS:** MERIDIAN

McCOMB (H) BVORTAC 116.7/MCB — **FSS:** McCOMB

MERIDIAN

§KEY FIELD *IFR* 3SW — **FSS:** MERIDIAN on Fld
297 H80/I-19(2) (S-45, T-120, TT-220) BL6 S3 F18, JP3
RVR: Rnwy 01
Remarks: Rnwy 1-19 lgts set on step 2 intensity 11:00 pm to 7:00 am lcl time. Servicing Fee after 7 pm. J-bar rnwys 1 and 19.
Tower[1] 118.2 126.2 122.5R 110.1T — **Gnd Con** 121.9
Radar Services: (BCN)
Meridian App Con 120.5
Meridian Dep Con 124.8
ILS 110.1 I-MEI Apch Brg 004° BC unusable **LOM:** 356/ME
Meridian (H)BVORTAC 117.0/MEI 129° 3.5NM to fld.
Remarks: [1]Twr opers 0700-2300 lcl time. Glide slope unusable below 384' MSL.

NATCHEZ (L) BVOR 110.0/HEZ — **FSS:** McCOMB

PICAYUNE (L) BVOR 112.2/PCU — **FSS:** NEW ORLEANS

TUPELO (L) BVOR 109.8/TUP — **FSS:** MUSCLE SHOALS

MISSOURI

BLUE SPRINGS (L) BVORTAC 113.6/BSP — **FSS:** KANSAS CITY

BULTER (H) VORTAC 115.9/BUM — **FSS:** KANSAS CITY

CAPE GIRARDEAU (L) BVOR 112.9/CGI — **FSS:** CAPE GIRARDEAU

COLUMBIA (L) BVOR 111.2/CBI — **FSS:** COLUMBIA

DOGWOOD (L) BVORTAC 109.4/DGD — **FSS:** SPRINGFIELD

FARMINGTON (H) BVORTAC 115.7/FAM — **FSS:** CAPE GIRARDEAU

FORNEY (L) VOR 110.0/TBN
RBn MH 391/TBN

HALLSVILLE (L) BVORTAC 115.4/HLV — **FSS:** COLUMBIA

JEFFERSON CITY (L) BVOR 110.2/JEF — **FSS:** COLUMBIA

§JOPLIN MUNI *IFR* 4NE — **FSS:** JOPLIN on Fld
980 H55(3) (S-37, T-55, TT-90) BL5,6 F18 JP4 U1 **RVV:** Rnwy 13
Remarks: Attended 6:00 am-8:30 pm, on call thereafter. 999' (2049' MSL) twr 5 NM SSW.
ILS[1] 110.3 I-JLN Apch Brg 131° **LOM:** 219/JL
Remarks: BC unusable within 1.5NM end of rnwy. Satisfactory for missed apchs. Front crs unusable below 1158' MSL.

KANSAS CITY

§MID-CONTINENT INTL *IFR* 15NW — **FSS:** KANSAS CITY
1011 H90/18-36(1) (S-100+, T-185, TT-350) BL6,8A,9
RVR: Rnwy 36
Remarks: Attended 0800-1700 daily.
Tower 120.7 ~~121.6~~ 126.5 — **Gnd Con** 121.8
Radar Services:
Kansas City App Con 118.9[1] 126.2 121.1[2] 112.6T 109.9T
Kansas City Dep Con 118.1
Tfc Info Ctc Kansas City App Con.
ILS 110.5 I-MCI Apch Brg 005° — **LOM:** 359/MC
RBn H-SAB 359°/MC 005° 4.4 to rnwy 36.
Remarks: [1]E sector. [2]W sector. Radar advisories not avbl within a 5 nmi radius of a point aprxly 5 nmi NW of arpt. LOM is H-SAB.

§KANSAS CITY MUNI *IFR* 4N — **FSS:** KANSAS CITY on Fld
758 H70/18-36(3) (S-100, T-185, TT-350) BL4,6,8A,9,11,13
S5 F18, JP1 U2 **RVV:** Rnwy 18 **REIL:** Rnwy 36
Remarks: Overrun each end rnwy 18-36. S 3270' rnwy 35 usable daylight hrs only. Rnwy 17 clsd. 1042 (2094' MSL) twr 3.5NM S and 1023' (1946' MSL) twr 4.5NM ESE. Lead-in lgts rnwy 36.
Tower 118.3 122.7R 121.1 — **Gnd Con** 121.9
‡Clrnc Del: 121.9
ATIS: 111.4
Radar Services: (BCN)
App Con 118.9[1] 121.1[2] 112.6T 109.9T
Dep Con 118.1
Tfc Info: Ctc App Con
PAR Rnwy 18 Ceil 400 Vsby 1 mi Min Alt 1158.
ILS[3] 109.9 I-MKC Apch Brg 185° BC unusable **LOM:** 219/MK
(H) BVORTAC 112.6/MKC 171° 8.7NM to fld.
Riverside (T) VOR 111.4/RIS on fld.
VHF/DF Ctc twr.
Remarks: Acft approaching from 001-180° use 118.9 and/from 179-360° 121.1. Radar advisories not avbl within a 5 nmi radius of a point aprxly 5 nmi NW of arpt. [1]E sector. [2]W sector. ASR apch not auth. [3]Glide slope unusable below 1014' MSL. Front crs unusable beyond 20 NM. Back course unusable. — **VOT:** 108.6.

KIRKSVILLE (H) BVORTAC 114.6/IRK — **FSS:** KIRKSVILLE

LAKE RBn HW 385/LAQ — **FSS:** ST. LOUIS

MACON (L) BVOR 112.9/MCM — **FSS:** KIRKSVILLE

MALDEN (L) BVOR 111.2/MAW — **FSS:** CAPE GIRARDEAU

MAPLES (L) BVORTAC 113.4/MAP — **FSS:** VICHY

MARYLAND HEIGHTS (L) BVORTAC 110.8/MTS — **FSS:** ST. LOUIS

NEOSHO (L) BVOR 116.6/EOS — **FSS:** JOPLIN

RICHARDS-GEBAUR (L) VOR 111.0/GVW — **FSS:** KANSAS CITY

RICHWOODS (L) BVOR 109.2/RCW — **FSS:** ST. LOUIS

ST JOSEPH

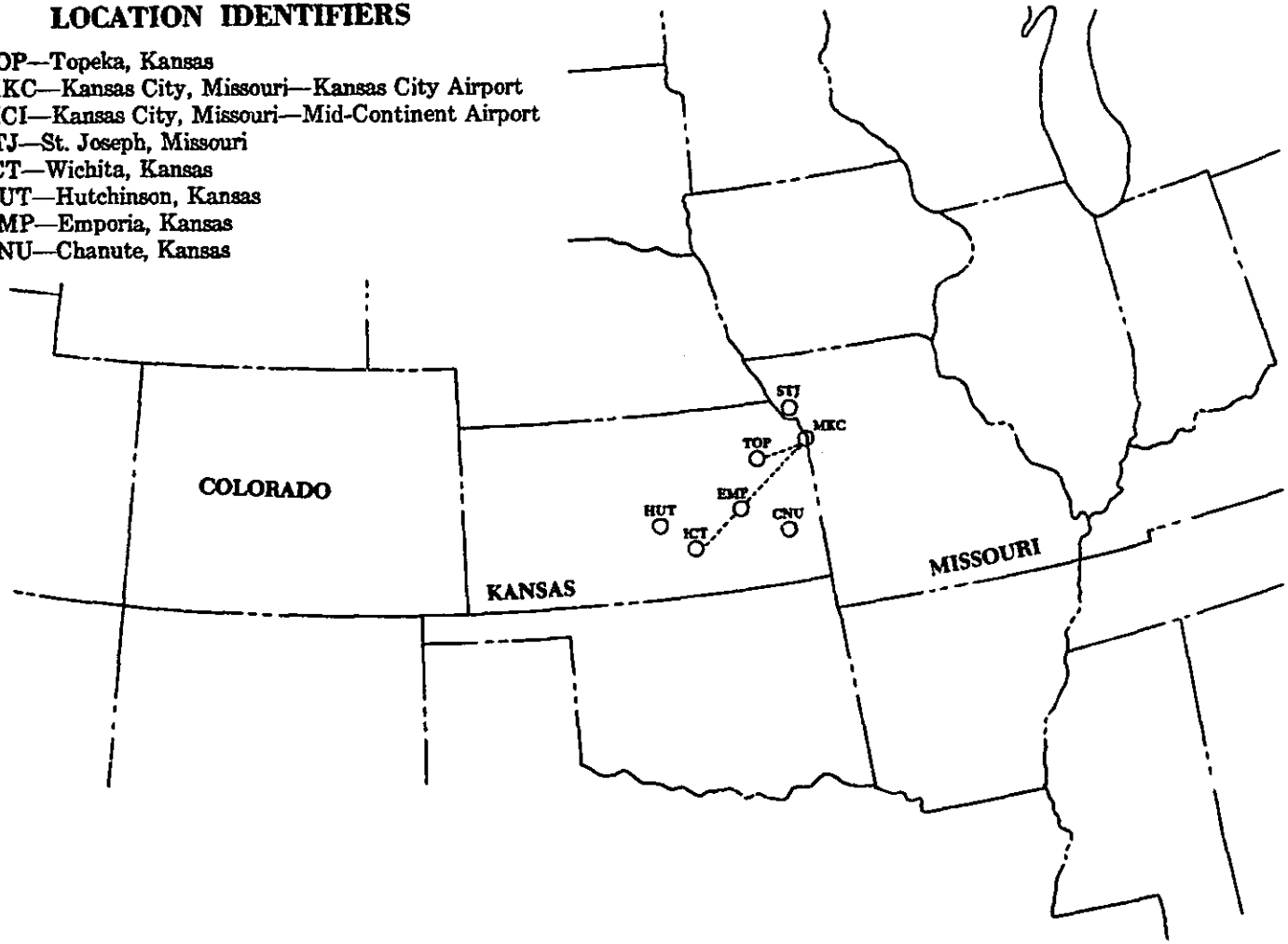
§ROSECRANS MEMORIAL *IFR* 3WNW — **FSS:** KANSAS CITY (DL)
826 H80/17-35(3) (S-60, T-160, TT-250) BL5,6,8 S5 F12,18,30 U2
RVV: Rnwy 35
Tower 119.9 122.5R — **Gnd Con** 121.9
App Con: 119.9 121.2 122.5R 110.3T
ILS 110.3 I-STJ Apch Brg 352° **LOM:** 260/ST
(L) BVORTAC 108.2/STJ 167° 10.7NM to fld.

ST. LOUIS

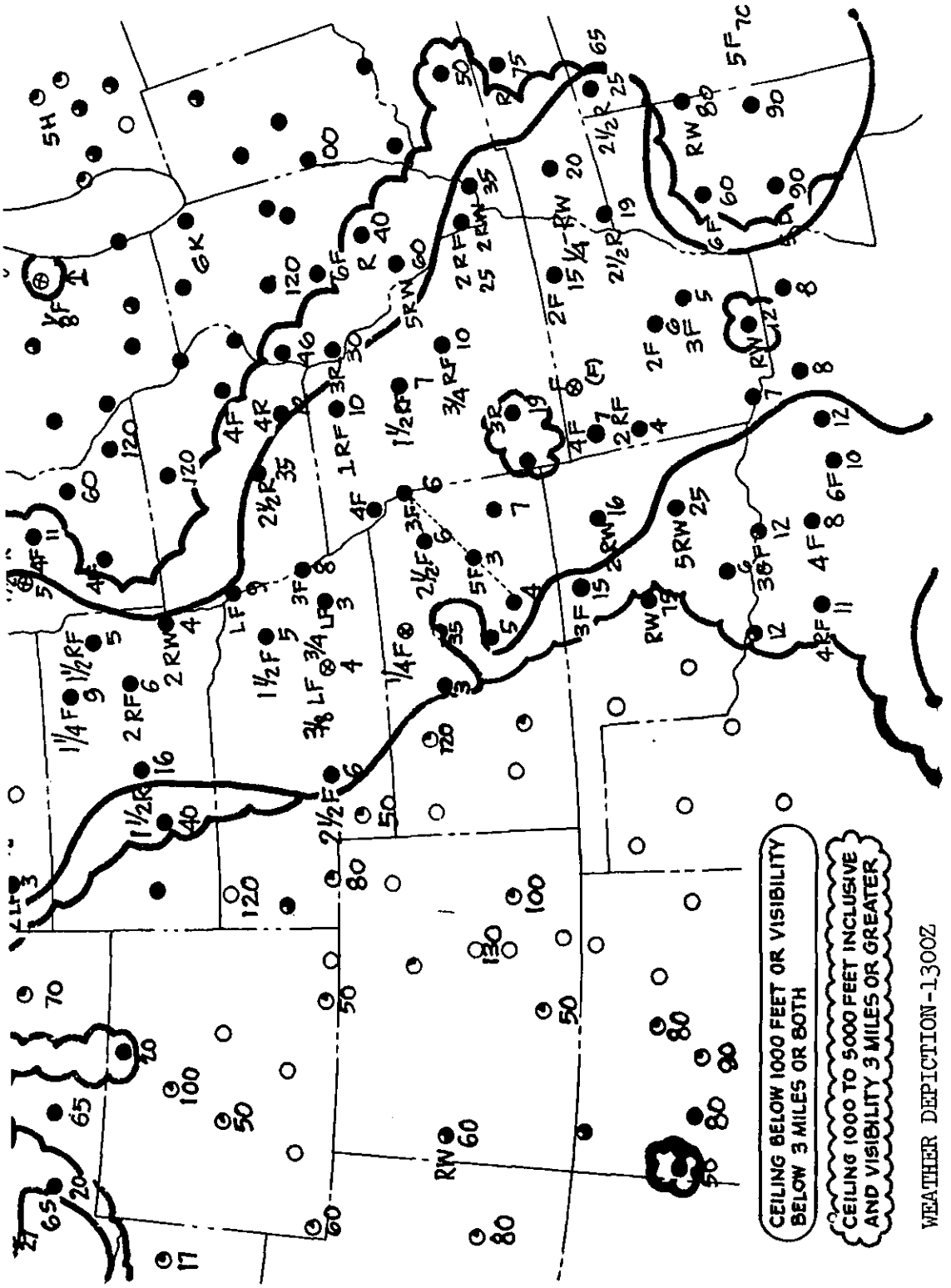
§LAMBERT-ST LOUIS *IFR* 10NW — **FSS:** ST. LOUIS on Fld
571 H100/12R-30L(4) (S-100, T-200, TT-400) BL5,6,8A,9,12 S5 F22, JP1, JP5 U2 **RVR:** Rnwy 24
Remarks: U.S. Customs lndg rgts arpt (3 hr advance notice rqrd). 476' displaced threshold rnwy 12R, 9542' avbl lndg day/ngt. Full length 10,018' abl lndg/tkof day/ngt rnwy 30L and tkof day/ngt rnwy 12R. A-gear all rnwys except 12L-30R. Fee. No solo student flying.
St. Louis Tower 118.5 118.95 126.2 122.7R — **Gnd Con** 121.9
‡Clrnc Del 119.5
ATIS[4]: 110.3 109.7
Radar Services: (BCN)
St. Louis App Con 126.5[1] 123.7 118.1[2]
St. Louis Dep Con 119.9
Tfc Info Ctc St. Louis App Con.
PAR[3] Rnwy 24 Ceil 200 Vsby ½ mi Min Alt 771.
ASR Rnwys 6, 17, 24, 30L, 35 Ceil 500 Vsby 1 Min Alt 1071.
Rnwys 12L, 30R Ceil 500 Vsby 1½ mi Min Alt 1071.
Rnwy 12R Ceil 400 Vsby 1 mi Min Alt 971.
ILS 110.3 I-STL Apch Brg 238° **LOM:** 404/ST
109.7 I-LMR Apch Brg 117° **LOM:** 338/LM
St. Louis (H) BVORTAC 117.4/STL 138° 8.0NM to fld.
St. Louis RBn H-SAB 338°/LM 117° 5.3 NM to fld.

LOCATION IDENTIFIERS

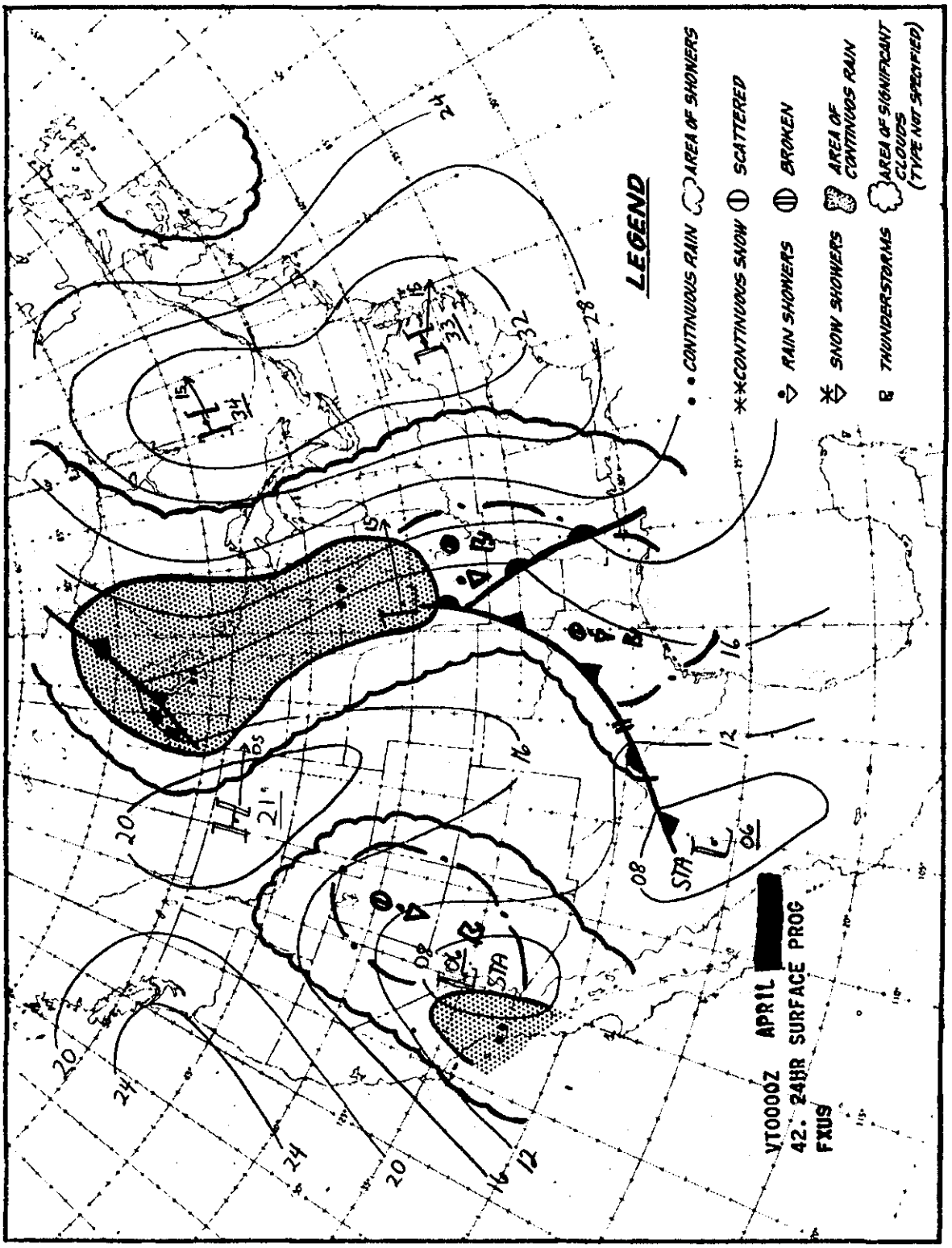
TOP—Topeka, Kansas
MKC—Kansas City, Missouri—Kansas City Airport
MCI—Kansas City, Missouri—Mid-Continent Airport
STJ—St. Joseph, Missouri
ICT—Wichita, Kansas
HUT—Hutchinson, Kansas
EMP—Emporia, Kansas
CNU—Chanute, Kansas



SECTION 5. WEATHER CHARTS AND DATA



WEATHER DEPICTION-1300Z


LEGEND
CONTINUOUS RAIN
AREA OF SHOWERS
CONTINUOUS SNOW
SCATTERED
RAIN SHOWERS
BROKEN
SNOW SHOWERS
AREA OF CONTINUOUS RAIN
THUNDERSTORMS
AREA OF SIGNIFICANT CLOUDS (TYPE NOT SPECIFIED)
VT00002 APRIL
42. 24HR SURFACE PROG
FXUS

030 SA30031400

DEN /-Φ60 115/41/27/2003/994/SC TPG HIR MTNS W-NW
COS →COS↘4/2UR
GLD S B4Φ12 109/52/43/3015/989
HLC O10 081/51/45/2411/978
[redacted] S W1X3/4F 072/56/55/2018/976
SLN E35Φ/Φ15 098/54/52/1417/981/LOW SCUD N-S→SLN↘2/8XX
CNK W1X1/4F 102/48/48/1112/981
TOP M5⊕21/2F 136/46/44/1209/992/CIG RGD
MKC M7⊕3F 149/44/41/1013/995→MKC↘2/100A 3/150A 4/30A
MCI M4⊕2F 43/41/1120G28/995
STJ A7⊕3F 41/40/1110G17/996/ ⊕28V36/LGT TURBC 23 DC3
ICT S M5Φ9⊕8 102/56/55/1314/983/RE44→ICT↘11/1810 3/23AN
HUT E3⊕7 55/52/1312/982
EMP E3⊕2F 129/48/46/1414/990
CNU S B6⊕4L-F 124/49/49/1212/989/TE40 RWE 45 T MOVD SE

030 SA30031500

DEN /Φ60 113/49/25/2409/996/SC OBSCG HIR MTNS W-NW/ 115 1501
COS →COS↘4/2UR
GLD 6Φ/Φ15 113/48/42/2917/990/ 224 1601
HLC O10 081/51/45/2411/978
RSL B3⊕2F 078/58/57/2215/997/ 303 OCNL SML BINOVC
SLN S 4ΦE35Φ/Φ12 101/55/53/1610/982/ 210 →SLN↘2/8XX
CNK S WOX1/8F 100/49/49/0810/981/ 103
TOP M6⊕3F 130/48/45/1210/990/CIG RGD
MKC M8⊕3F 141/45/42/1110/993/ B17 16//→MKC↘2/100A 3/150A 4/30A
MCI M5⊖2F 44/41/1118/994
STJ M7⊕3F 44/41/1210G16/996
ICT S 6ΦM9⊕8 103/58/56/1414/984/ 000 16//→ICT↘11/1810 3/23AN 4/210
HUT E5Φ3F 56/54/1514/982
EMP W1X1/4F 116/49/49/1410/986/ 002
CNU S B2⊕3F 124/51/51/1513/989/LE03RWB03E42/ 805

FA MKC 031245
13Z SAT-01Z SUN
NEB EXCP PNHDL IA KANS MO CLDS AND WX. HGTS ASL UNLESS NOTED. LOW CIG AND POOR VSBY C5-12⊕1-3R-F WITH OCNL RW- ERN AND CNTRL NEB CNTRL AND ERN KANS WRN MO IPVG DURG DAY TO C8-20⊕ TO ⊕. RW WL DMSH THIS FRNN KANS AND NEB. CIGS IA AND MO LWRG THIS AFTN AND EVE TO C10-30⊕ TO ⊕ AND VSBY LESS THAN 2 MI THIS FRNN IPVG TO 3-5 MI AFTN. TOPS OF CLDS 120-180. CLRG SLOLY FM WRN NEB AND WRN KANS TDA.

ICG. MDT TO LCLY HVY ICGICIP ABV FRZG LVL. FRZG LVL 40 NERN IA TO 110 SRN KANS WL LFT TO 80 IN IA DURG DAY.

TURBC. OCNL MDT CAT LKLY VCNTY JTSTR SERN KANS SRN MO 350-420.

OTLK. 01Z-13Z SUN. RW CONTG SERN KANS DURG NGT BUT DMSHG FM W. CLRG FM W IN KANS AND NEB. GND FOG FRMG DURG NGT IN CLRG SECS CNTRL AND ERN NEB AND CN TRL AND ERN KANS.

END JRM

FD-1 WBC 021150
1800Z

LVL	3000	5000FT	7000	10000FT	14000FT	18000FT	24000FT
GLD		2414+12	2417	2321+03	2328-08	2337-20	2347-33
DEN			2612	2415+01	2311-09	2231-21	2240-35
MKC	2026	2126+13	2228	2228+04	2331-07	2438-18	2547-31
ICT	2122	2224+13	2227	2330+04	2437-06	2446-18	2456-31

FT1 031045
11Z-23Z SAT

STJ C8⊕3F 1210 OCNL L-. 2000Z C10⊖20⊕7 1615 OCNL RW-
0200Z 15⊖C25⊖ 2010
TOP C8⊕3F 1210 OCNL L-. 2000Z C10⊖20⊖7 1615 OCNL RW-
0000Z 20⊖C25⊖ 2010
MKC C8⊕3F 1112 OCNL L-. 2100Z C10⊖20⊕7 1612 OCNL RW-
0200Z 15⊖C20⊖7 1810
ICT 5⊖C10⊕ 1415 OCNL C5⊖ TIL 1700Z. 2000Z C10⊖20⊕ 1815
0000Z 20⊖C50⊖ 2012
DDC 200⊖ 2712
CNU C3⊕3L-F 1212. 2000Z C8⊖15⊕7 1615 OCNL RW-. 0200Z C25⊖ 2015
GCK 200⊖ 2712
HUT 3⊖C10⊕ 1412 OCNL C5⊖ TIL 1700Z. 2100Z C10⊖20⊕ 1815
0200Z 20⊖C50⊖ 2012
SLN 4⊖C15⊕ 1415 OCNL C4⊖. 0200Z 15⊖C40⊖ 2012
GLD 200⊖ 2915 BRF 6⊖ TIL 1900Z

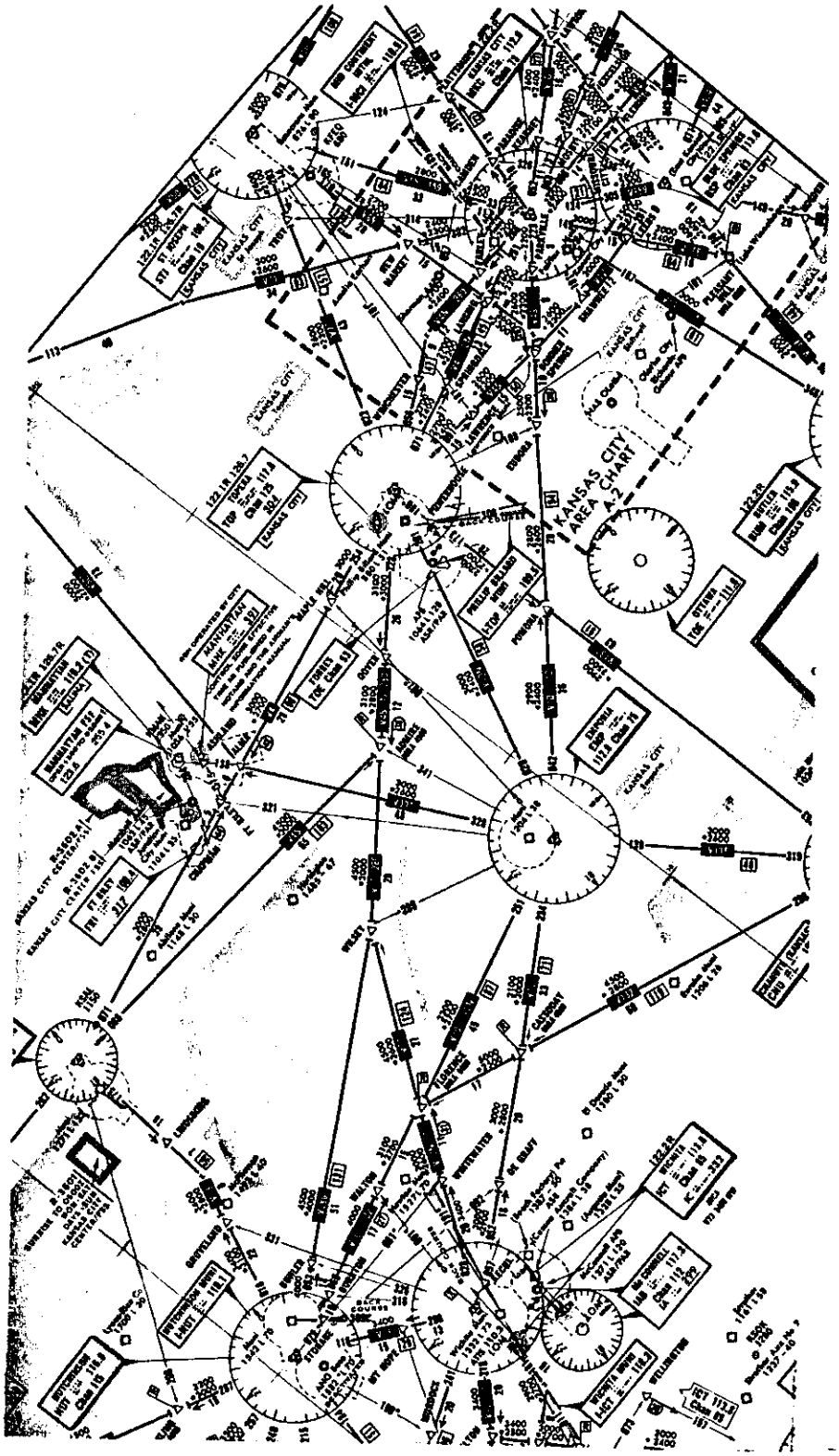
FL MKC 031500

AIRMET DELTA 11. OVR ERN NEB WRN IA CNTRL AND ERN KANS AND MO CIGS BLO 1 THSD FT AND VSBYS LESS THAN 2 MIS IN FOG AND ST WITH OCNL RAIN OR DRZL. CONDS SPRDG INTO ERN IA BY 18Z. CONDS CONTG THRU 21Z

FL MKC 031500

SIGMET ECHO 1. OVR NRN IA MDT TO LCLY HVY ICGICIP IN FRZG RAIN ABV 2 THSD FT MSL. CONDS CONTG THRU 21Z

SECTION 6. ENROUTE CHART SEGMENT

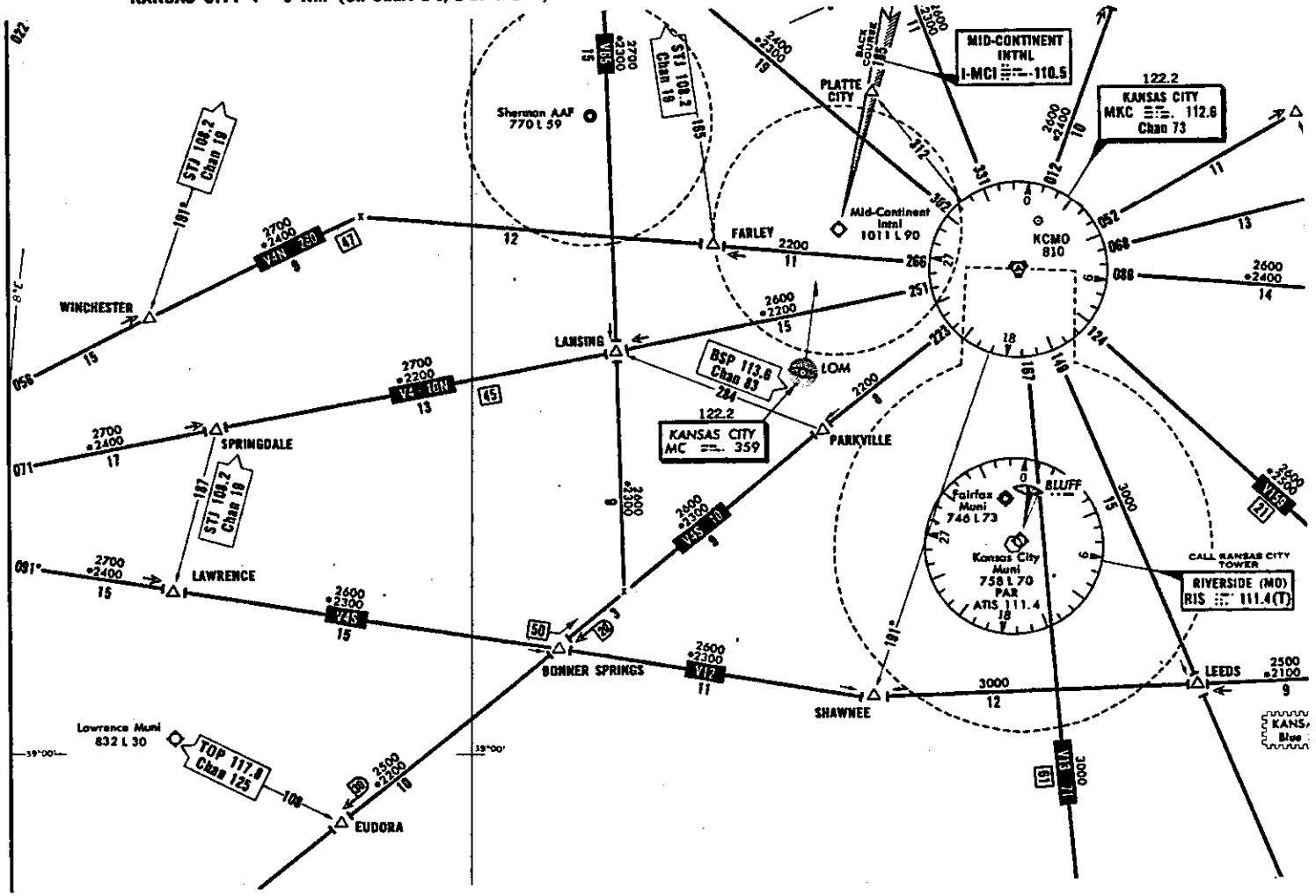


AREA CHART

A/G VOICE COMMUNICATIONS

FAIRFAX Twr—119.1 122.5R Kansas City App Con—118.9 (360°-179°) 121.1 (180°-359°) 112.6T Gnd Con—121.7 Kansas City Dep Con—118.1	LAWRENCE Kansas City Center App and Dep Con—120.5
KANSAS CITY App Con—118.9 (360°-179°) 121.1 (180°-359°) 112.6T 109.9T Twr—118.3 122.7R VOT 108.6 Gnd Con—121.9 Dep Con—118.1	MID-CONTINENT INTNL Kansas City Dep Con—118.1 Kansas City App Con—118.9 (360°-179°) 121.1 (180°-359°) 112.6T Twr—120.7 126.5 Gnd Con—121.8

KANSAS CITY 1"=5 NM (On Chart L-6, L-21 & L-11)



SECTION 8. INSTRUMENT APPROACH CHART