

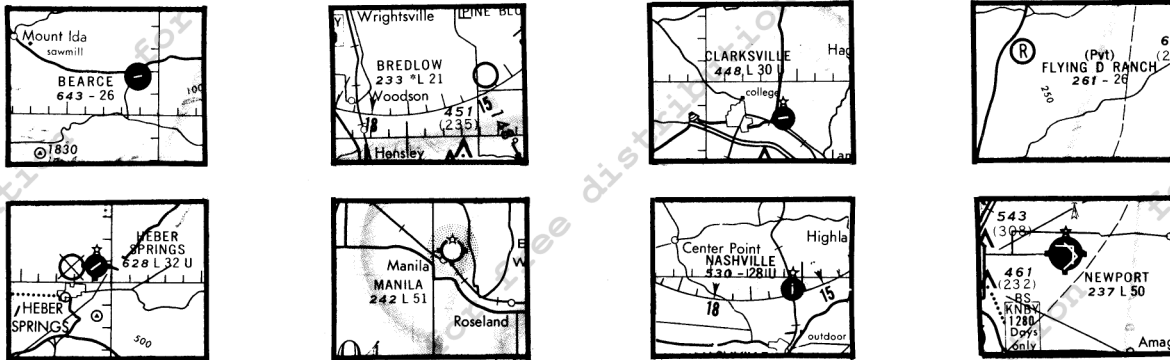
U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
VFR PILOT EXAM-O-GRAM* NO. 23

INTERPRETING SECTIONAL AERONAUTICAL CHARTS (SERIES 1)

An analysis of Pilot Written Tests indicates that applicants have difficulty interpreting and understanding symbols used on Sectional Aeronautical Charts.

This Exam-O-Gram concerns only the symbols associated with: (1) airports that are not served by a Control Tower or Flight Service Station, (2) obstruction and terrain elevation, and (3) appropriate checkpoints for VFR navigation.

Although the information in this Exam-O-Gram relates to the Memphis Sectional Aeronautical Chart only, the symbols found here are now standard for all sectional charts using the back-to-back format. Where there is no Control Tower (and therefore no Airport Traffic Area), or FSS advisory service located at an airport, the airport symbol and airport information appears on the chart in a magenta (purplish red) color.











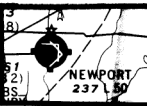
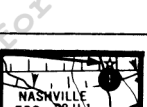
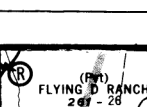




Refer to the airport symbols above and to the legend on any sectional chart that uses the back-to-back format, to check your knowledge and understanding of these chart symbols. It is suggested that you answer each of the following questions to the best of your ability, then turn to page 2 to verify your answers.

- | | |
|---|---|
| 1. Which airports have facilities for aircraft? | 11. Which airports have a rotating light? |
| 2. Which airports have emergency facilities only or no facilities at all? | 12. Which airports have lighting facilities? |
| 3. Which airports have hard surfaced runways? | 13. Which airport has lighting facilities available only upon prior request? |
| 4. Which airports have no hard surfaced runways? | 14. What is the length of the longest hard surfaced runway at the Newport Airport and which one is it? |
| 5. Which airports have hard surfaced runways at least 1,500 feet long? | 15. Which airport has no hard surfaced runways, but has a rotating light? |
| 6. Which airport is located at the highest elevation? | 16. Which airports would be the easiest to find at night? |
| 7. What is the elevation of this airport? | 17. Which airports have hard surfaced runways but have no facilities, or at best, have only emergency facilities? |
| 8. Which airport has the shortest landing area available? | 18. Which airport is restricted from public use? How is an abandoned airport symbolized? |
| 9. What is the length of this landing area? | |
| 10. Which airports have UNICOM available? | |

Rev. 1/77

* Exam-O-Grams are non-directive in nature and are issued solely as an information service to individuals interested in Airman Written Examinations.

Q.	Answer	Explanation	
1.	Heber Springs, Manila, Newport	Those airport symbols with the 4 projections indicate airports with facilities.	
2.	Bearce, Bredlow, Clarksville, Flying D Ranch, Nashville	Those airport symbols without the 4 projections indicate airports with emergency or no facilities.	
3.	Bearce, Clarksville, Heber Springs, Nashville, Newport	Hard surfaced runways are outlined in the airport symbol.	
4.	Bredlow, Flying D Ranch, Manila	The absence of runway outlines indicates no hard surfaced runways.	
5.	Bearce, Clarksville, Heber Springs, Nashville, Newport	All hard surfaced runways 1,500' or longer are outlined within the airport symbol.	
6.	Bearce	The series of numbers on the left of the airport information block gives the elevation of the airport in feet.	
7.	643 feet		
8.	Bredlow	The series of numbers on the right side in the information block gives the length of the longest runway in hundreds of feet.	
9.	2,100 feet		
10.	Clarksville, Heber Springs, Nashville	UNICOM availability is indicated at the far right end of the airport information block.	
11.	Clarksville, Heber Springs, Manila, Nashville, Newport	A star at the top of the airport symbol indicates a rotating light.	
12.	Bredlow, Clarksville, Heber Springs, Manila, Newport	A letter L in the airport information line following the elevation indicates airport landing area lights available.	
13.	Bredlow	An asterisk preceding the letter L indicates airport lighting only on prior request. Enclosing the letter L in parentheses indicates lights available part of the night and on request.	
14.	5,000 feet	For those airports that have hard surfaced runways, the length given in the airport information line is that of the longest hard surfaced runway. However there is no symbol to indicate which one runway is the longest unless this can be determined by the relative lengths of the runway outlines.	
15.	Manila	See answers and explanations to Q4 and Q11.	
16.	Clarksville, Heber Springs, Manila, Nashville, Newport	The rotating light would point them out; however, the airport at Nashville has no airport lighting facilities.	
17.	Bearce, Clarksville, Nashville	See answers and explanations to Q1 and Q3.	
18.	Flying D Ranch	A letter R in the center of the airport symbol indicates the airport is restricted. An X indicates an abandoned airport. Pvt in the airport information block indicates a private airport.	 

Another area of difficulty in reading and interpreting sectional charts is determining obstruction and terrain elevation. It must be understood that the elevation of obstructions is referenced to both ground and sea level, while terrain and contour elevations are referenced to sea level. With reference to the two chart segments, how many of the following questions can you answer? Answers and explanations are given below.

1. What is the height, above sea level, of the group obstruction which is classed as higher than 1,000 feet above the ground (Fig. 1)?
2. What is the height, above ground level, of the single obstruction which is classed as an obstruction below 1,000 feet above ground level (Fig. 1)?
3. What is the meaning of the large numbers 29 in Figure 2?
4. At what elevation intervals are contour lines shown on sectional charts?
5. What is the highest value in feet printed on a contour line (Fig. 2)?
6. What is the significance of the contour lines being close together? Far apart?
7. What is the highest critical elevation (Fig. 2)?

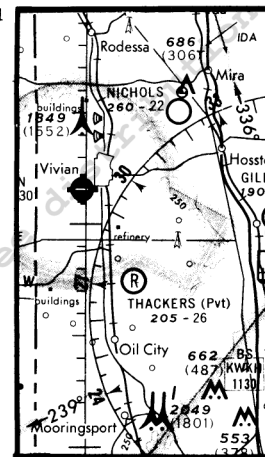


FIG. 1

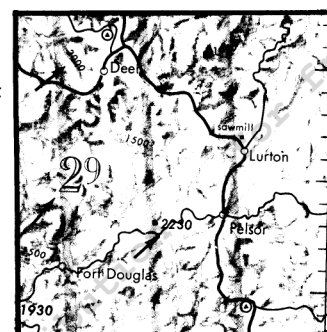


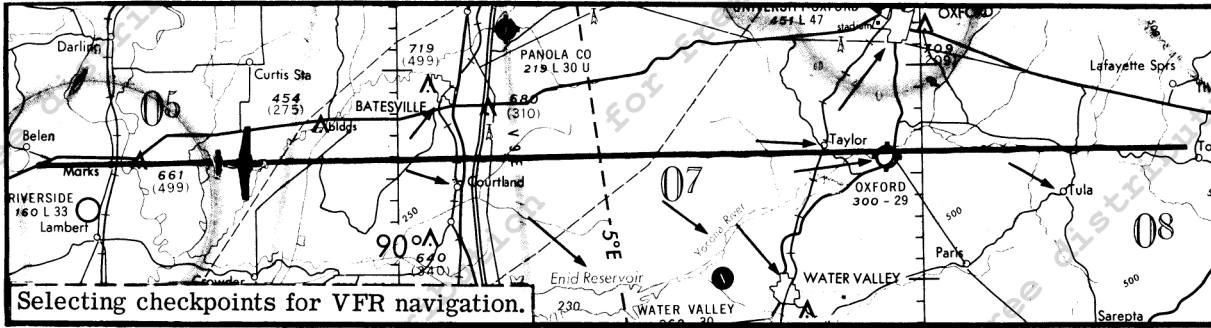
FIG. 2

ANSWERS AND EXPLANATIONS TO QUESTIONS 1 THROUGH 7.

1. The tower shaped symbol \blacktriangle indicates the top of the obstruction is 1,000 feet or higher Above Ground Level. A double symbol $\blacktriangle\blacktriangle$ indicates a group obstruction. The height (top) above sea level of this obstruction in Fig 1 is 2,049 feet as shown in bold print and without parenthesis.
2. The inverted "V" shaped symbol \blacktriangle denotes a single obstruction with the top less than 1,000 feet above ground level. The top of this obstruction is 306 feet AGL shown by the number in parenthesis below the bold faced number 686 representing the height MSL. A double symbol $\blacktriangle\blacktriangle$ indicates a group obstruction.
3. The large numbers 29 are called maximum terrain elevations. Maximum Terrain elevation figures, centered in the area bounded by ticked lines of latitude and longitude, are elevations in THOUSANDS and HUNDREDS of feet required to safely clear the terrain, BUT DO NOT INCLUDE ELEVATIONS OF VERTICAL OBSTRUCTIONS.

The value is computed by adding the safety factor (100 feet or 1/2 contour interval when interval exceeds 200 feet on source data) to the highest terrain, and raising the sum to the next 100-foot level.

2900 feet ----- 29
4. There are two intervals used; the basic contour interval which is 500 feet, and the intermediate contour interval which is 250 feet. Contour lines may extend for some distance before the elevation is indicated. Sometimes no elevation indication is found on the contour lines, but generally the elevation can be determined by comparing nearby contours.
5. The highest value printed is 2,000 feet. This is not the highest terrain in the area or on the chart. The highest terrain is determined by applying the appropriate interval to a labeled line. The colored coding for the particular chart which is found on the front of the chart must also be used to determine terrain elevation.
6. The closer the contour lines are together the steeper the slope of the terrain; the farther apart they are the more gradual the slope of the terrain.
7. The highest critical elevation is 2,230 feet MSL. The specific point is indicated by a small black dot located near the number denoting the elevation.



When flying the course shown above, which checkpoints indicated by arrows would be most appropriate for VFR navigation? (Assuming a visibility greater than 10 miles.)

- | | | |
|---------------------|--------------|----------------|
| I | II | III |
| Batesville | Batesville | Courtland |
| Enid Reservoir | Courtland | Enid Reservoir |
| Water Valley (Town) | Taylor | Oxford Airport |
| Oxford (Town) | Yocona River | Tula |

Group I represents the best checkpoints since it includes only the prominent landmarks, i. e., larger towns and bodies of water. Although the larger towns are not exactly on course, they are close enough to be easily identified. Small towns and villages usually are poor checkpoints even though they lie right on course because they are difficult to identify. Small towns may be important as checkpoints in sparsely populated areas, but care must be exercised or their use may be misleading. Bodies of water reflect light and usually can be seen even with reduced visibility. Rivers are also excellent checkpoints, especially if they have prominent loops or bends, or are used in combination with other checkpoints. In fact, using a combination of checkpoints is always an effective and desirable practice in pilotage. Also, it should be noted that the highway to the left (north) of course provides an excellent reference for VFR navigation.

FAA Aeronautical Center
 Flight Standards Technical Division, Operations Branch
 P. O. Box 25082
 Oklahoma City, Oklahoma 73125
 Exam-O-Grams available free of charge--single copy only per request. Permission is hereby granted to reproduce this material.