

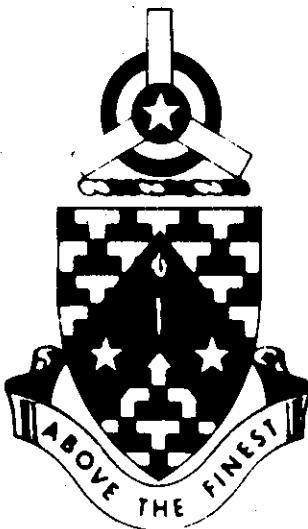
PROGRAMMED TEXT

MAP READING

Part I

MAP SYMBOLS AND MARGINAL INFORMATION

WD-36



AUGUST 1968

UNITED STATES ARMY
PRIMARY HELICOPTER SCHOOL
FORT WOLTERS, TEXAS

PROGRAMMED TEXT

PROGRAM TEXT**FILE NO:**

WD-36

PROGRAM TITLE

Map Reading
Part I
Map Symbols and
Marginal Information

POI SCOPE: Five basic colors used on a map; topographic symbols found in the map legend, and selected items found in the map margin.

INSTRUCTOR REFERENCES: FM 21-26; FM 21-30; FM 21-31

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15 August 1968

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7. 1:50,000	
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PREFACE

This self-teaching text in map reading covers those skills needed by everyone who uses military maps and map substitutes. It provides a foundation for personnel whose training program will require specialized or more advanced skills.

The instructional material in this text is Part I of an eight part course. You will be given each part in the proper sequence, especially the first three, as you will use this information over and over again in subsequent parts. The eight parts are as follows:

- Part I Map Symbols and Marginal Information
- Part II Location (Coordinates)
- Part III Distance (Map Scales)
- Part IV Terrain Features, Elevation
- Part V Direction (Azimuths, Plotter)
- Part VI Direction (Intersection, Resection, Polar Coordinates)
- Part VII Aerial Photographs
- Part VIII Military Symbols

ORGANIZATION OF TEXT

This text consists of frames, panels, and a self evaluation exercise. A frame presents a single teaching point which usually requires an answer to a specific problem. A panel is an illustration or other information needed to solve the problems in the frames. The self evaluation exercise is designed to test yourself on the material learned in the text.

The problems in some frames require you to write an answer. In others, you select a correct choice and draw a circle around it. A few frames are called INFORMATION or REVIEW frames and do not need an answer. When the frame refers you to a panel, find the correct panel (printed at the end of the text) and study it before answering the questions.

HOW TO WORK THE TEXT

1. Start with Frame 1 in Part 1. Answer it correctly by drawing a circle

around the correct choice in pencil.

2. Turn the page. The correct answer to Frame 1 is printed in parentheses above Frame 2. If you were incorrect, turn back to Frame 1 to re-study the frame and change your answer to the correct one. (Correcting wrong answers will help you remember the teaching point.)

3. Answer Frame 2 by filling in the blanks with the correct words.

4. Turn the page. Check your answer as before and then work out Frame 3 and continue in the same manner.

SELF EVALUATION EXERCISE

When you have finished all of the frames, turn to the Self Evaluation Exercise located at the end of the text. Work all of the problems then compare your answers with the answer sheet provided. To receive the full benefit of this exercise, do not read the answers before answering the questions. Should you not understand how to work a problem, refer back to the text and study the part pertaining to that question.

MATERIAL FURNISHED

You will receive considerable practice with actual map-reading materials in this course. The following materials are essential in answering the frames in Part I:

Map of LEAVENWORTH, KANSAS, 1:50,000

DEFINITION
PERFORMANCE OBJECTIVES

Upon completion of Part B you will be able to state the following:
UpOnecompletionofPart B you will be able to state the following:

A. Write the 5 basic colors used on a topographic map and name the type of features they represent.

B. Select items that are found in the legend.

C. Select items found in the margin.

D. Label the following features on a topographic map:

E. Label the following features on a topographic map:

F. Label the following features on a topographic map:

G. Label the following features on a topographic map:

H. Label the following features on a topographic map:

I. Label the following features on a topographic map:

J. Label the following features on a topographic map:

K. Label the following features on a topographic map:

L. Label the following features on a topographic map:

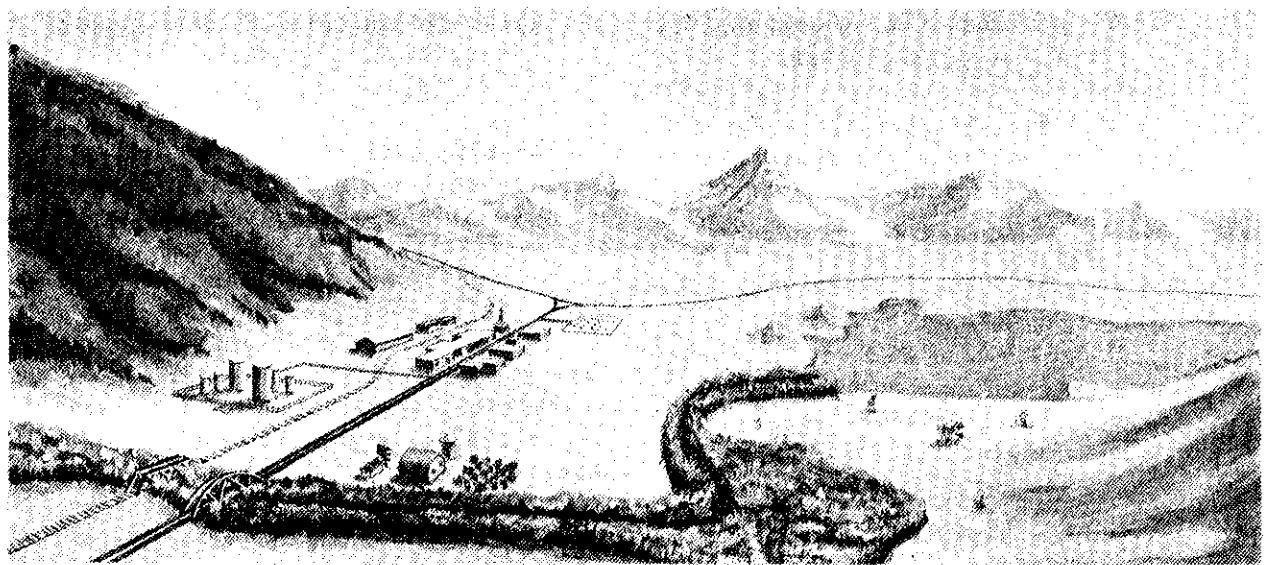
M. Label the following features on a topographic map:

ANSWER THE QUESTIONS ON PAGE 6 FOR PART B

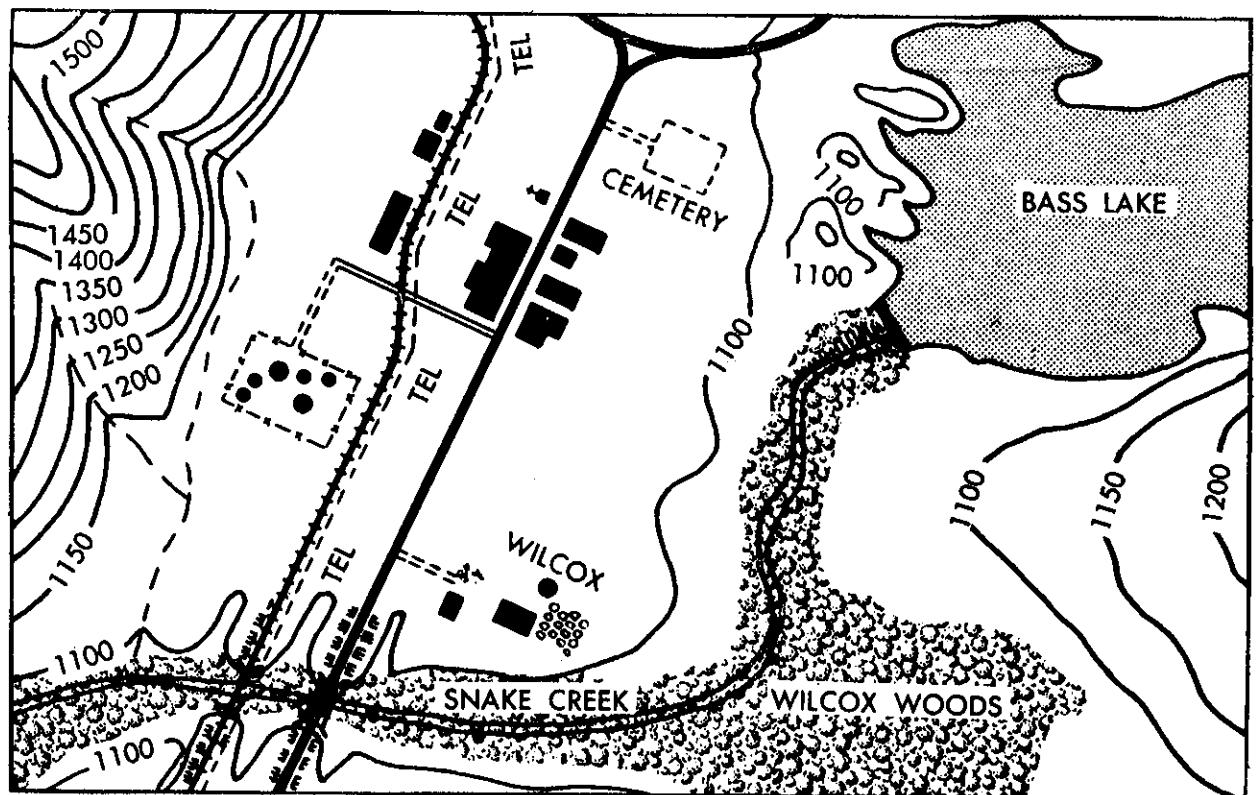
FOREWORD

What is a map? A map is a graphic representation of the earth's surface, or a part of it, drawn to scale on a plane. Manmade and natural features are depicted by symbols, lines, colors, and forms.

The purpose of a map is to permit one to visualize an area of the earth's surface with pertinent features properly positioned. Ideally, all the features within an area would appear on the map in their true proportion, position, and shape. This, however, is not practicable because many of the features would be unimportant and others would be unrecognizable because of their reduction in size. The mapmaker has been forced to use symbols and colors to represent the natural and manmade features of the earth's surface. These symbols resemble, as closely as possible, the actual features themselves but as though viewed from above. For the purpose of clarity, some of the symbols have been exaggerated. This is done, when possible, in such a manner that the center of the symbol remains in its true position. An exception to this would be some feature adjacent to a major road. If the road has been exaggerated, then the feature may have to be moved from its true position.



An area as viewed from a ground position.



Map of the same area as above



PART I

SYMBOLS AND MARGINAL INFORMATION

Set 1. TOPOGRAPHIC SYMBOLS

FRAME 1.

A topographic map is a graphic illustration of part of the earth's surface. Rivers, roads, woods, and hills are shown by lines, symbols, and colors. What is a military topographic map?

a. picture

b. drawing

TURN TO PAGE 7 FOR FRAME 2.

(b. multiple track) (6)

FRAME 7.

Refer to the Leavenworth map. Follow the Chicago, Burlington, and Quincy Railroad upwards past Horseshoe Lake and the town of Farley. Before you get to Green Cemetery, there is some swamp or marsh on the left side of the tracks. What tells you this is a swamp?

a. symbol and color

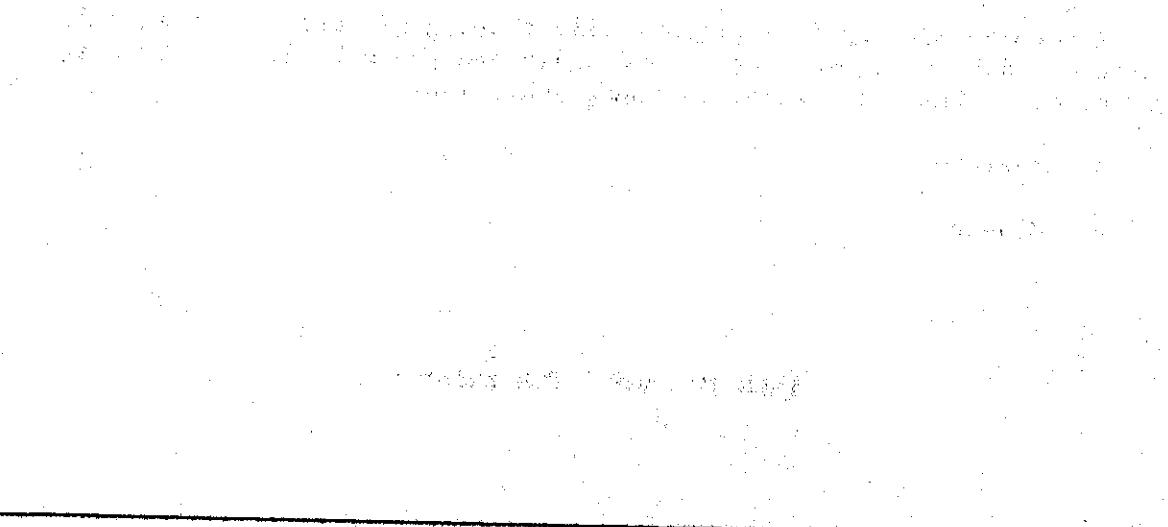
b. words

(a. topographic map) (12)

FRAME 13.

Manmade features such as roads and buildings, are extremely important in planning military operations. These features are often exaggerated on a map so the reader can distinguish them better.

locate



(Leavenworth) (18)

FRAME 19.

The series name defines the area covered by several sheets. The series name is printed in the upper left margin. Refer to the Leavenworth map. Its series name is Kansas.

(b. drawing) (1)

FRAME 2.

Study the colors on the Leavenworth map. Notice that five colors are used on it. As you would expect, blue shows water features and green shows vegetation. Brown shows elevations (hills and valleys). The colors red and black show manmade features, such as highways and buildings.

TURN TO PAGE 9 FOR FRAME 3.

(a. symbol and color) (7)

FRAME 8.

You were able to identify the symbol for a swamp area by checking the legends in the lower left margin of the Leavenworth map.

(see) (13)

FRAME 14.

FM 21-31, Topographic Symbols, defines approximately 250 symbols used by map makers. However, the map legend contains all the symbols normally required by the map reader. When you find a symbol that is neither self explanatory nor explained in the legend, you should refer to FM 21-31 if you need to know what it means.

(Kansas) (19)

FRAME 20.

To shorten the sheet name and series name identification, a sheet number is printed in the upper right corner of the map. Refer to the Leavenworth map. The sheet number for the Leavenworth, Kansas 1:50,000 map is 2043 IV.

(red, black) (2)

FRAME 3.

Bright red depicts the main roads shown on the map. What does the lighter shade of red on the Leavenworth map show?

- a. railroads
- b. churches and post offices
- c. built-up areas
- d. military reservation boundaries

(legend) (8)

FRAME 9.

Refer to the left edge of the Leavenworth map. Find where State Route 92 enters the map and trace it to the top of Pilot Knob Ridge (just before it turns right into Leavenworth). What tells you this is a State Route rather than a Federal Route?

- a. color

- b. symbol

(FM 21-31) (Memorizing all topographic symbols before you need them is impractical. You will learn them more effectively through usage.) (14)

FRAME 15.

Match the following symbols with the items they represent:

- a. school 2
- b. church 1
- c. wind pump 3

- 1. 
- 2. 
- 3. 

(7062 IV) (20)

FRAME 21.

In the lower right corner of the Leavenworth map is a diagram showing the Index to Adjoining Sheets. It identifies the sheet numbers surrounding your map. Note that the sheet number of the Leavenworth map, 7062 IV, is in the heavily outlined box. If you needed the sheet to the left of your map you would ask for sheet number 7062 I.

(c. & d. built-up areas, military reservation boundaries) (Otherwise, a city would appear in black because of the symbols for buildings and would be hard to read.) (3)

FRAME 4.

You have learned that 5 colors are used on a topographic map to show the different features on the earth's surface. Write the correct color or colors in the space after each of the following:

- a. woods and orchards green
- b. elevation brown
- c. rivers and lakes blue
- d. roads red and black
- e. built-up areas black

(b. symbol) (9)

FRAME 10.

Refer again to State Route 92 on the Leavenworth map. On the right side of the road just above the word "Knob" is an orchard. How do you know this is an orchard instead of a vineyard or a woods?

- a. color

b. symbol

(a.-2, b.-1, c.-3) (15)

Set 2. MARGINAL INFORMATION

FRAME 16.

On the Leavenworth map, you found the map symbols in the legend, which is a part of the marginal information. Later, the marginal information will help you locate points, measure distance, and find directions and elevations. The map reader needs to understand and use marginal information correctly.

(6962 I) (21)

FRAME 22.

Examine the numbering and you will see four "7062" maps in a group. The upper right one is labeled I and the others increase in a clockwise manner (II, III, and IV). To the left of 7062 IV is 6962 I. What is the sheet number of the next sheet to the left of 6962 I?

- a. 6962 III
- b. 6962 IV
- c. 6862 I
- d. 7062 IV

(a. green; b. brown; c. blue; d. red and black; e. red) (4)

FRAME 5.

The symbols and colors used on a military map are explained in the legend. Find the legend on the Leavenworth map. In what part of the map margin is the legend located?

a. top center

b lower left

(b. symbol) (10)

FRAME 11.

Refer again to the orchard near State Route 92. On the eastern (right) edge of the orchard, find the figure 1100 inserted in a brown line. This means that the hill along that particular line is 1100 feet above sea level. You can tell that the 1100 means elevation rather than something else because the number is printed in a brown color.

(marginal) (16)

FRAME 17.

In addition, marginal information enables you to identify maps so that you can requisition them properly and be sure that all users are referring to the same sheets. Specific military maps can be identified by referring to the marginal information.

(b. 6962 IV) (If you didn't select this answer, the diagram below illustrates the numbering.) (22)

6963 III	6963 II	7063 III	7063 II
6962 IV	6962 I	7062 IV	7062 I
6962 III	6962 II	7062 III	7062 II

FRAME 23.

In addition to the sheet number, a series number (assigned by the Army Map Service) denotes a particular geographical area on the earth's surface. It is printed beneath the sheet number. The series number of the Leavenworth map is V 778.

(b. lower left) (5)

FRAME 6.

Refer to the Leavenworth map. Find where the Chicago, Burlington, and Quincy Railroad enters the map from the south (bottom right). What does the symbol tell you about this railroad?

- a. single track
- b. multiple track

RETURN TO THE BOTTOM OF PAGE 5 FOR FRAME 7.

(brown) (11)

FRAME 12.

You are already "recognizing" roads, railroads, towns, swamps, and orchards. Even though the map is a drawing, it helps you "see" the ground from above. Find the same section of State Route 92 in the photomap printed on the reverse side of the map. Which view permits you to "see" State Route 92 more clearly?

- a. topographic map
- b. photomap

RETURN TO THE TOP OF PAGE 6 FOR FRAME 13.

(marginal) (17)

FRAME 18.

Each map is called a sheet by the map makers. The sheet is named after the most prominent feature shown on the map. The sheet name is printed in the top center margin. Refer to your Leavenworth map. The sheet name is Leavenworth.

RETURN TO THE BOTTOM OF PAGE 6 FOR FRAME 19.

(Series V778) (23)

END OF FRAMES FOR PART I

Now go to the bottom of page 6 and work the self evaluation exercise. You will find the answer key on page 17.

ON PAGE 17

SELF EVALUATION EXERCISE

PART I

This exercise will test what you have learned from this programmed text. Read each question carefully and select the correct answer or answers.

1. Match the following colors with the items they represent on a topographic map.

a. Brown	<u>1</u>	1. Elevation
b. Green	<u>4</u>	2. Railroad
c. Black	<u>2</u>	3. Lake
d. Blue	<u>3</u>	4. Woods

2. Circle the letters for those symbols that would be found in the ~~Legend~~ of a map.

a  unimproved dirt road

b  railroad, single track

c.  declination diagram

d.  statute miles

 meters

Bar Scale

 yards

3. What map sheet joins the Leavenworth map at the top? 7063 III

4. The sheet number of a map is found in the ~~Legend~~ ~~margin~~ (margin) (Cross out the incorrect answer.)

5. Where would you first look if you saw a topographic symbol on a tactical map and did not know what it meant?

- a. Grid reference box
- b. Legend
- c. Declination diagram
- d. Back of map sheet

6. Which symbol depicts a light house on your Leavenworth map?

- a. 
- b. 
- c. 
- d. 

ANSWERS TO SELF EVALUATION EXERCISE - PART I

TABLE OF CONTENTS

1. a - 1, b - 4, c - 2, d - 3

2. a, b

PROGRAMMED TEXT

3. 7063 III
WI-16

PROGRAM TIME

Map Reading - Part I

4. Margin

CONTENTS

PAGE NUMBER

5. b. Legend

3. PERFORMANCE OBJECTIVES

6. b. PROGRAM

1. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

2. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

3. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

4. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

5. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

6. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

7. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

8. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

9. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

10. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

11. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

12. LEAVENWORTH, KAN. - POP. 10,000
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13. LEAVENWORTH, KAN. - POP. 10,000
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14. LEAVENWORTH, KAN. - POP. 10,000
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15. LEAVENWORTH, KAN. - POP. 10,000
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16. LEAVENWORTH, KAN. - POP. 10,000
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17. LEAVENWORTH, KAN. - POP. 10,000
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18. LEAVENWORTH, KAN. - POP. 10,000
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19. LEAVENWORTH, KAN. - POP. 10,000
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20. LEAVENWORTH, KAN. - POP. 10,000
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21. LEAVENWORTH, KAN. - POP. 10,000
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22. LEAVENWORTH, KAN. - POP. 10,000
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23. LEAVENWORTH, KAN. - POP. 10,000
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24. LEAVENWORTH, KAN. - POP. 10,000
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25. LEAVENWORTH, KAN. - POP. 10,000
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26. LEAVENWORTH, KAN. - POP. 10,000
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27. LEAVENWORTH, KAN. - POP. 10,000
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28. LEAVENWORTH, KAN. - POP. 10,000
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29. LEAVENWORTH, KAN. - POP. 10,000
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30. LEAVENWORTH, KAN. - POP. 10,000
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31. LEAVENWORTH, KAN. - POP. 10,000
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32. LEAVENWORTH, KAN. - POP. 10,000
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33. LEAVENWORTH, KAN. - POP. 10,000
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34. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

35. LEAVENWORTH, KAN. - POP. 10,000
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36. LEAVENWORTH, KAN. - POP. 10,000
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37. LEAVENWORTH, KAN. - POP. 10,000
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38. LEAVENWORTH, KAN. - POP. 10,000
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39. LEAVENWORTH, KAN. - POP. 10,000
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40. LEAVENWORTH, KAN. - POP. 10,000
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41. LEAVENWORTH, KAN. - POP. 10,000
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42. LEAVENWORTH, KAN. - POP. 10,000
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44. LEAVENWORTH, KAN. - POP. 10,000
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45. LEAVENWORTH, KAN. - POP. 10,000
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46. LEAVENWORTH, KAN. - POP. 10,000
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47. LEAVENWORTH, KAN. - POP. 10,000
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48. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

49. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

50. LEAVENWORTH, KAN. - POP. 10,000
1:50,000

L1818 Army-Ft. Sill, Okla.