Map Reading II
Objectives

- Apply map reading skills using aspects taken from marginal information on a military map
- Interpret different terrain features based on a map’s changing topographic contour intervals
- Differentiate symbols, colors, and surrounding natural or man-made objects on a military map
- Determine hilltop elevation based on index, intermediate, and supplementary contour lines
- Plot four and six-digit grid coordinates
Marginal Information

☐ Sheet Name

☐ Sheet Number

☐ Adjoining Sheets

Tenino

SHEET 1477 IV SERIES V791 EDITION 7-DMA

ADJOINING SHEETS
Marginal Information

- Special Notes
- Declination Diagram
Marginal Information

- Scale
- Bar Scales
- Contour Interval Notes
- Grid Reference Box
### Marginal Information

- **Unit Imprint**
- **Legend**

#### Map Information

**LEGEND**

**MAP INFORMATION AS OF 1975**

**ON THIS MAP, A LANE IS GENERALLY CONSIDERED AS BEING A MINIMUM OF 2.5 METERS (8 FEET) IN WIDTH**

<table>
<thead>
<tr>
<th>ROADS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Divided highway with median strip</td>
<td></td>
</tr>
<tr>
<td>Primary all weather, hard surface, two or more lanes wide</td>
<td>3 LANEs</td>
</tr>
<tr>
<td>Secondary all weather, hard surface, two or more lanes wide</td>
<td>3 LANEs</td>
</tr>
<tr>
<td>Light duty, all weather, hard or improved surface</td>
<td></td>
</tr>
<tr>
<td>Fair or dry weather, unimproved surface</td>
<td></td>
</tr>
<tr>
<td>Trail</td>
<td></td>
</tr>
<tr>
<td>Route markers: Interstate; Federal; State</td>
<td>78 51 231</td>
</tr>
</tbody>
</table>

**RAILROADS (Standard gauge: 1.44m: 4'8.5")**

| Single track | 3 TRACKS |
| Multiple track |  |
| Multiple track, non-operating |  |
| Railroad station: Position known; Position unknown |  |
| Car line |  |

**BOUNDARIES**

- National
- State, territory
- County, parish, municipio
- Civil township, precinct, town, barrio
- Incorporated city, village, town, hamlet
- Reservations: National, state, Military
- Power transmission line

**BUILDINGS OR STRUCTURES**

- Church; School
- Watermill
- Windmill, wind pump
- Mine, vertical shaft
- Mine, horizontal shaft
- Open pit mine or quarry, inactive
- Open pit mine or quarry, active
- Horizontal control station

**BENCH MARKS**

- Bench mark, monumented: BM X 246
- Bench mark, non-monumented: X 301

**SPOT ELEVATIONS**

- Checked; Unchecked: 733 422

**WOODLAND**

- Vineyard; Orchard
- Intermittent lake
- Intermittent stream; Dam
- Marsh or swamp
- Rapids; Falls
- Large rapids; Large falls
Topographic Symbols

- Church
- School
- Tanks
- Bench Marks: BM X231 Monumented, X231 Non-Monumented
- Mine or Quarry: Inactive
- Building or Structures
- 227 Spot Elevation in Meters
- Trail
- Single Track RR
- Windmill
- Prominent Fence
- Double Track RR
- Cemetery
Military Map Colors

- **Black**: Indicates cultural (man-made) features, such as buildings and roads, surveyed spot elevations, and all labels.
- **Red-Brown**: The colors red and brown are combined to identify cultural features, all relief features, non-surveyed spot elevations, and elevation, such as contour lines on red-light readable maps.
- **Blue**: Identifies hydrograph or water features such as lakes, swamps, rivers, and drainage.
- **Green**: Identifies vegetation with military significance, such as woods, orchards, and vineyards.
- **Brown**: Identifies all relief features and elevation, such as contours on older edition maps, and cultivated land on non red-light readable maps.
- **Red**: Classifies cultural features, such as populated areas, main roads, and boundaries, on older maps.
- **Other**: Occasionally other colors may be used to show special information. These are indicated in the marginal information as a rule.
Black - Topographic Symbols

- Trail
- Single Track RR
- Prominent Fence
- Double Track RR
- Building
- School
- Church
- Mine or Quarry
- Cemetery
Red-Brown - Topographic Symbols

- **HARD SURFACE**
  - **HEAVY DUTY**
    - DIVIDED HIGHWAY
  - **MEDIUM DUTY**
    - SECONDARY ROAD

- **IMPROVED ROAD**
  - LIGHT DUTY

- **UNIMPROVED ROAD**
  - RED-LIGHT READABLE CONTOUR LINES

Revision Date: 30 November 2012
Blue - Topographic Symbols

- **STREAM**
- **INTERMITTENT STREAM**
- **LAKE OR POND**
- **INTERMITTENT LAKE OR POND**
Green - Topographic Symbols

VEGETATION

MARSH OR SWAMP

GRASSLAND

WOODS

VINEYARD/ORCHARD
Brown - Topographic Symbols

Contour Lines

Non RED-LIGHT READABLE
CONTOUR LINES
Red - Topographic Symbols

- Populated Areas (military site/urban area)
- Main Roads
Other - Topographic Symbols

- Populated Areas (shaded gray)
- Important Facilities (yellow/black icon)
Terrain Features: 10 Natural or Man-made

Five Major
- Ridge
- Hill
- Saddle
- Valley
- Depression

Three Minor
- Spur
- Draw
- Cliff

Two Supplementary
- Cut
- Fill

Terrain features are derived from a complex landmass known as a mountain or ridgeline.
Actual Terrain

Five Major

- Ridge
- Hill
- Saddle
- Valley
- Depression
5 Major Terrain Features

Land Navigation

Hill

Hills are represented by contour lines forming concentric circles. You can use your fist to help remember and visualize terrain features. A hill looks like one of the knuckles of your fist. A hill is a major terrain feature.
Valley

Valleys usually have maneuver room and contain a stream or river. Valleys are depicted as contour lines forming a U. The lines tend to parallel a stream before crossing. The contour line crossing a stream always points upstream. You can visualize a valley as your open hand. A valley is a major terrain feature.
Ridge

Ridges are depicted as contour lines forming a U or V; the closed end of the contour points away from high ground. A ridge is a series of connected hills. You can visualize it as the four knuckle of your fist. A ridge is a major terrain feature.
Saddle

A saddle can be either lower ground between two hills or a break in a level crest. A saddle is depicted as an hourglass. You can visualize saddles as the spaces between the knuckles or your fist. A saddle is a major terrain feature.
Depression

Land Navigation

Depression
A depression is depicted by closed contour lines that have tick marks pointing towards low ground. You can visualize a depression as your open hand with your palm cupped slightly. A depression is a major terrain feature.
3 Minor Terrain Features

**Draws**
Draws are depicted as contour lines shaped like a V with the point of the V toward the head (high ground) of the draw. You can visualize draws as the spaces between your fingers running down from the spaces between the knuckles of your fist. A draw is a minor terrain feature.

**Spurs**
Spurs are often formed by parallel streams cutting draws down a ridge. Spurs are depicted by U or V shaped contour lines with the U or V pointing away from high ground. You can visualize spurs as the slopes of your fingers running downhill from the knuckles of your fist. A spur is a minor terrain feature.

**Cliff**
Cliffs are depicted by contour lines drawn close together or by ticked or carrying contour lines (ticks point to lower ground). You can visualize a cliff as the outside edge of your fist. A cliff is a minor terrain feature.
2 Secondary Terrain Features

Land Navigation

Supplementary Terrain Features

**Cut** - A cut is a man-made feature resulting from cutting through raised ground, usually to form a level bed for a road or railroad track. Cuts are drawn with a contour line along the cut line. This contour line extends the length of the cut and has tick marks that extend from the cut line to the roadbed, if the map scale permits this level of detail.

**Fill** - A fill is a man-made feature resulting from filling a low area, usually to form a level bed for a road or railroad track. Fills are drawn with a contour line along the fill line. This contour line extends the length of the filled area and has tick marks that point toward lower ground. If the map scale permits, the length of the fill tick marks are drawn to scale and extend from the base line of the fill symbol.

[Diagram of cut and fill features]
Contour Lines Show 10 Terrain Features

1. HILL
2. VALLEY
3. RIDGE
4. SADDLE
5. DEPRESSION
6. DRAW
7. SPUR
8. CLIFF
9. CUT
10. FILL
Sand Run
Describe Map Features
Map Symbols and Surroundings

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
Determine Hilltop Elevation

To determine the elevation to a hilltop, add one-half the contour interval to the elevation of the last contour line.
Protractor (GTA 5-2-12, 1981)

1:50,000 Scale
360 Degrees
6400 Mils
Four-Digit Grid Coordinate

- The cardinal rule of map reading:
  - Read **RIGHT**, then
  - Read **UP**

- Remember to always orient each grid square from the lower left-hand corner
Orient Protractor with “0 Mark” on Map

☐ Select the correct scale on the protractor.

☐ Put horizontal scale on the grid line with “0 mark” at the lower left-hand corner of the grid square.
Determine Six-Digit Grid Coordinate

1. Place your protractor scale on the Zero-Mark (+)
2. Slide the protractor scale along the horizontal axis
3. Stop as the vertical axis intersects the plot point
4. Read **RIGHT** along the horizontal axis
5. Round to the nearest whole number: **6**
6. Read **UP** along the vertical axis
7. Round to the nearest whole number: **3**

The 6 digit grid coordinate is **786 003**
100,000 Meter Square Identification

WASHINGTON 1:50,000

EH 03 00

EG 03 99
Practical Exercise:
Determine Six-Digit Grid Coordinates

- Identify the following major terrain feature or object at each of the following coordinates:

1. EH 107031  Terrain/Object: __________
2. EG 145859  Terrain/Object: __________
3. EH 074017  Terrain/Object: __________
4. EG 097827  Terrain/Object: __________
Closing

- Summary
- Questions
- Next Lesson: MSL 102, Lesson 03, Introduction to Land Nav.
- Read Student Textbook, MSL I, Introduction to Leadership: Tactics & Techniques Section, *Introduction to Land Navigation* and answer “Critical Thinking” questions; prepare to discuss in class
- Review FM 3-25.26 Map Reading and Land Navigation; 18 January 2005 (C1/dated 30 August 2006); (Ch 6, par 6-2 thru 6-9), Ch 10, pp 10-4 and 10-5
- Download and review from Blackboard any additional materials such as; Student Handouts, ppt. slides, and/or charts/graphs, etc for the next class