ROYAL CANADIAN ARMY CADETS

RED STAR

INSTRUCTIONAL GUIDE

SECTION 1

EO M222.01 – REVIEW GREEN STAR NAVIGATION

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-702/PG-001, Chapter 4. Specific uses for said resources are identified throughout the Instructional Guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Using a topographical map of the local area, to identify the objects, land features with grid references (GR) to be used during the activity.

Set up stations for the activity in TP2.

Copy the map folding activity sheet located at Annex A for each cadet.

PRE-LESSON ASSIGNMENT

N/A.

APPROACH

An interactive lecture was chosen for TP1 to present background material.

A practical activity was chosen for TP2 as it is an interactive way to allow cadets to experience navigation in a safe, controlled environment. This activity contributes to the development of navigation skills and knowledge in a fun and challenging setting.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson, the cadet shall have reviewed Green Star navigation skills to include:

- maintaining and folding a map;
- identifying marginal information;
- identifying conventional signs;

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.

- identifying types of slopes;
- determining four and six-figure GR; and
- orienting a map by inspection.

IMPORTANCE

It is important for cadets to participate in a review of Green Star navigation training as it provides the building blocks for advanced navigation. This training must be mastered before cadets are taught new navigation skills in Red Star.

Teaching point 1 **Conduct a Review of Green Star Navigation**

Time: 10 min Method: Interactive Lecture



Do not spend too much time on any one point. Briefly review Green Star navigation. The activity will be used to confirm this lesson.

MAINTAINING AND FOLDING OF A MAP

Although there are waterproof maps of some areas, most maps are printed on regular paper. Paper maps are expensive and easily damaged. Therefore, precautions must be taken to protect them from water, dirt and wind damage.

Waterproofing a Map. When exposed to water, maps become soggy causing them to deteriorate and tear. Preparing a map for the elements is a vital step in prolonging the life of the map. The easiest and cheapest way to protect a map is to put it in a plastic sealable bag.

Drying a Map. If a map gets wet, let it dry completely on a clean flat surface.

Opening a Map. When a map is opened fully in a strong wind, not only is it impossible to read, but it could tear, get dirty, or even blow away. The map should only be opened to the area you are using, and refolded along the original fold lines.

Writing on a Map. Writing on a map should be done only when necessary. Always use pencil to mark your maps and when finished, gently erase all markings. Maps that are protected by plastic can be marked with grease pencils or erasable markers.

Storing a Map. Maps are to be stored in a dry place and should be rolled, folded, or laid flat.



Arrange the cadets so they can see the demonstration and hear the explanation of folding a map as listed below, prior to the cadets practicing this procedure.

Folding a Map. To fold a map:

1. lay the map face up;
2. fold the map in half by bringing the top (north) of the map sheet down to the bottom (south);
3. crease where the bend in the map has occurred, this is the centre of the map;

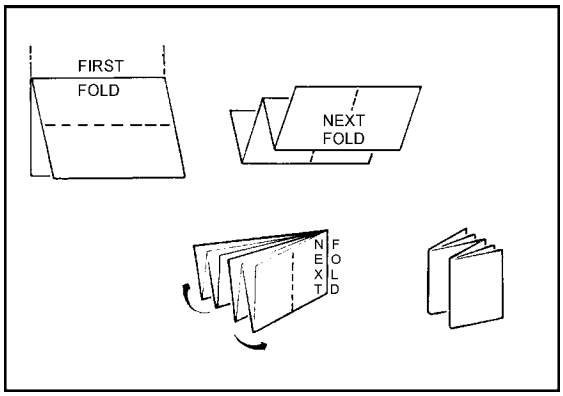
Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.

4. fold back the top half of the map sheet;

5. turn the map sheet over and fold the bottom half to match the top half;

6. fold the ends of the map in half from left to right; and

7. fold the ends back in half again so that the map name and index appear on the outside (the map should look like the letter M).



A-CR-CCP-121/PT-001 (p. 5-5)

Figure 1 Folding a Map

IDENTIFYING MARGINAL INFORMATION



Do not spend too much time on any one point. Briefly review Green Star navigation. The activity will be used to confirm this lesson.

A map, like any piece of equipment, has instructions that the user must read. It is important to know how to read these instructions. Marginal information is used to explain and describe the details found in the margins of the map. The common marginal information found on a map includes:

- name of the map sheet;
- number of the map and index of adjoining maps;
- date of map data;
- map scale;
- scale bars or graphic linear scales;
- contour interval;
- military index number (normally found at the top right corner of the map sheet which is used for ordering additional maps);
- declination diagram;
- Universal Transverse Mercator grid system (UTM); and
- legend of conventional signs.

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.

IDENTIFYING CONVENTIONAL SIGNS

A conventional sign is a symbol used to indicate an object or item of detail, such as a building or a road. The meaning of most symbols is obvious. There are tables of conventional signs located in the margins and on the back of most maps. The use of different colours is a way of showing and distinguishing detail of all types of conventional signs.

INTERPRETING CONTOUR LINES

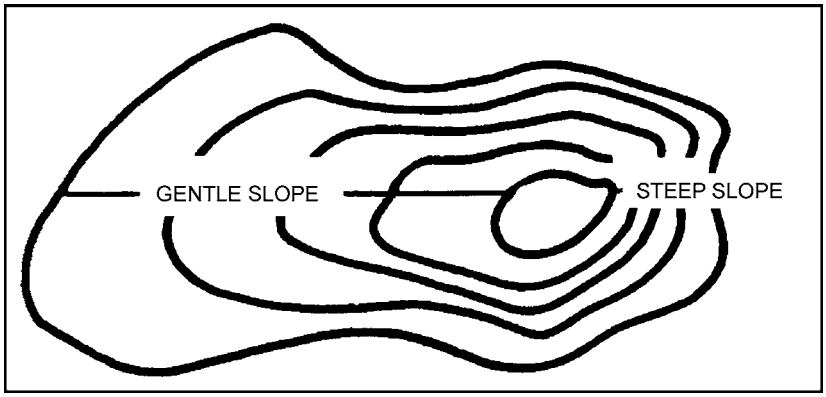
A contour line is a brown line on the map joining points of equal elevation. They are shown at regular vertical intervals. The difference in height between contours lines is called the contour interval. The contour interval is always stated in the margin of the map.

Interpreting contour lines and contour intervals provides a visualization of the shape of the ground. Correct interpretation of the shape of the ground from contour lines on the map will indicate the type of land feature on the ground. Some different types of land features are:

Steep Slope. This slope is identified when the contour lines are spaced closely together.

Gentle Slope. This slope is identified when the contour lines are further apart.

Uniform Slope. This slope is identified when the contours are an equal distance apart. The slope remains constant in its decline, whether steep or gentle.



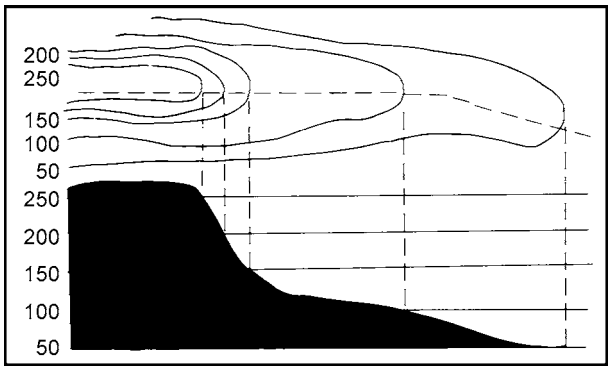
D Cdts, Royal Canadian Army Cadets Basic Map Using, Department of National Defence (p. 1-44)

Figure 2 Slopes

Concave Slope. This slope is identified when the spacing of the contours gets further apart at the bottom. The middle of the slope seems to depress inward – appearing concave.

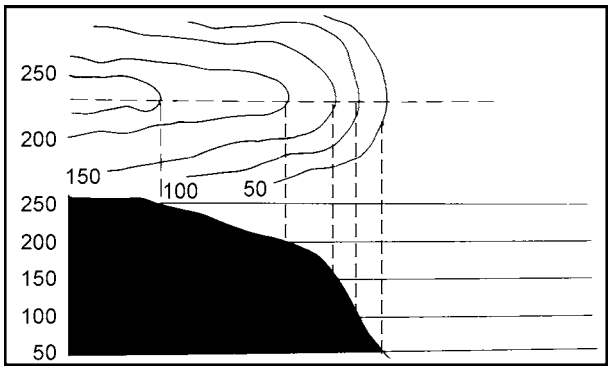
Convex Slope. This slope is identified when the spacing of contours down a slope gets close together at the bottom. The middle of the slope seems to bulge outward – appearing convex.

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.



B-GL-382-005/PT-001, Maps, Field Sketching, Compasses and the Global Positioning System (p. 32)

Figure 3 Concave Slope

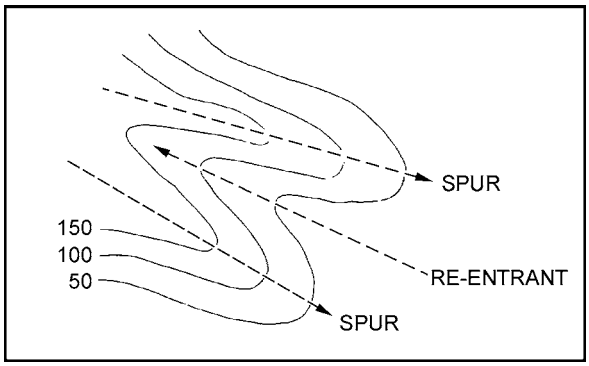


B-GL-382-005/PT-001 (p. 32)

Figure 4 Convex Slope

Spurs. A spur is a contour feature that extends out from a slope.

Re-entrants. A re-entrant is a contour feature that cuts back into a slope.



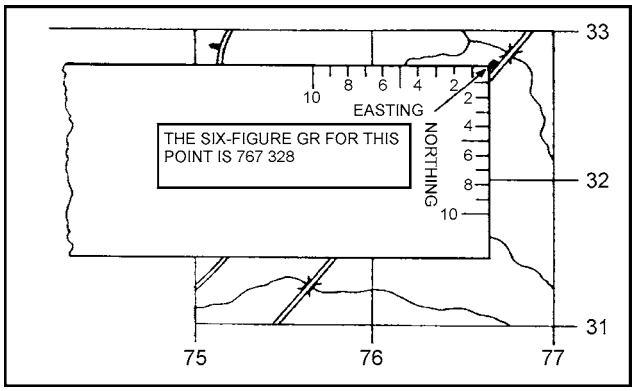
B-GL-382-005/PT-001 (p. 32)

Figure 5 Spur/Re-entrant

DETERMINING A GRID REFERENCE (GR)

Using the grid system, a grid reference (GR) identifies a location on a map. When determining a GR to a square, the reference is always to the southwest (bottom left) corner of the square. GRs are always given with the easting value first, followed by the northing value. A four-figure GR is used to identify a specific 1000 m by 1000 m grid square. A six-figure GR is used to determine a more accurate location within a specific 100 m by 100 m grid square.

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.



A-CR-CCP-121/PT-001 (p. 5-20)

Figure 6 Determine a GR

ORIENTING A MAP BY INSPECTION

Orienting a map by inspection means to visually pinpoint a location on the ground so that the cardinal directions on the map match directions on the ground. Orienting a map by inspection makes it easier to relate information on the map to features on the ground. To pinpoint a position more accurately, these steps must be followed:

1. Identify one's approximate position on the map.

2. Identify two or three prominent landmarks in different directions on the ground and find them on the map.

3. Rotate the map until all identified objects on the map line up with the direction in which objects are located on the ground. If near a straight stretch of road, orient the map by using the road. Line up the road on the map parallel with the road on the ground.

4. Check all around to verify that the terrain features to the front are in front of the position on the map, and so on. The top of the map now points north.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the navigation round robin activity will serve as the confirmation of this TP.

Teaching point 2 **Conduct a Navigation Activity**

Time: 40 min Method: Practical Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to confirm navigation training taught during Green Star.

RESOURCES

- 6 foot table (one per station);
- Romer (one per station);
- Topographical map (one per station);
- Map folding activity sheet located at Annex A;

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.

- Land feature sheet located at Annex B; and
- Assistant instructor (one per group).

ACTIVITY LAYOUT

- This round robin activity will have four different stations spaced apart.
- Set up one 6 foot table per station.
- Place a map and a romer at each station.

ACTIVITY INSTRUCTIONS

In teams of no more than five cadets, the group will move through a series of stations to confirm Green Star Navigation material. This is to be conducted as group work, not individual work, meaning the whole group must agree on the final answer given. Groups will have eight minutes to complete the activity at each station and two minutes for debriefing.

- **Station 1 – Conventional Signs and Marginal Information.** Cadets will be asked to select five conventional signs from the legend and identify them on the map sheet. Then identify five items of marginal information and locate them on the map, which may include:
  - name of the map sheet;
  - number of the map sheet and index;
  - map scale and bar;
  - contour intervals; and
  - declination diagram.
- **Station 2 – Contour Lines and Features.** Cadets will identify two land features from the sheet located at Annex B and locate similar features on the map sheet.
- **Station 3 – Grid References (GR)**
  - Cadets will be given one four-figure GR and one six-figure GR and identify what is located at each GR.
  - Cadets will be given two distinct conventional signs on the map sheet. They must locate the object and give the six-figure GR of that object.
- **Station 4 – Orient a Map by Inspection and Fold a Map.** The cadets will be given a six-figure GR of their location and must orient the map by inspection. If this activity is being conducted indoors, draw symbols for some prominent objects, then place them on the walls for the cadets to use as a reference. Then cadets must complete the map folding activity so that the map index is seen.

SAFETY

N/A.

CONFIRMATION OF TEACHING POINT 2

The cadets' participation in the navigation round robin activity will serve as the confirmation of this TP.

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.

END OF LESSON CONFIRMATION

QUESTIONS

Q1. Why is it important to maintain and fold a map?

Q2. What corner of the grid square is used when determining a GR?

Q3. How many prominent objects should be used when orienting a map by inspection?

ANTICIPATED ANSWERS

A1. Maintenance is important to prolong the life of the map sheet.

A2. The GR is always to the southwest (bottom left) corner of the square.

A3. When orienting a map by inspection, two or three prominent objects in different directions should be used.

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

N/A.

CLOSING STATEMENT

Map reading is a skill, and true proficiency will only be mastered by practice in the outdoors. The skills you have learned during Green Star are the building blocks required before moving on to more complex navigation training. Remember, practice makes perfect!

INSTRUCTOR NOTES/REMARKS

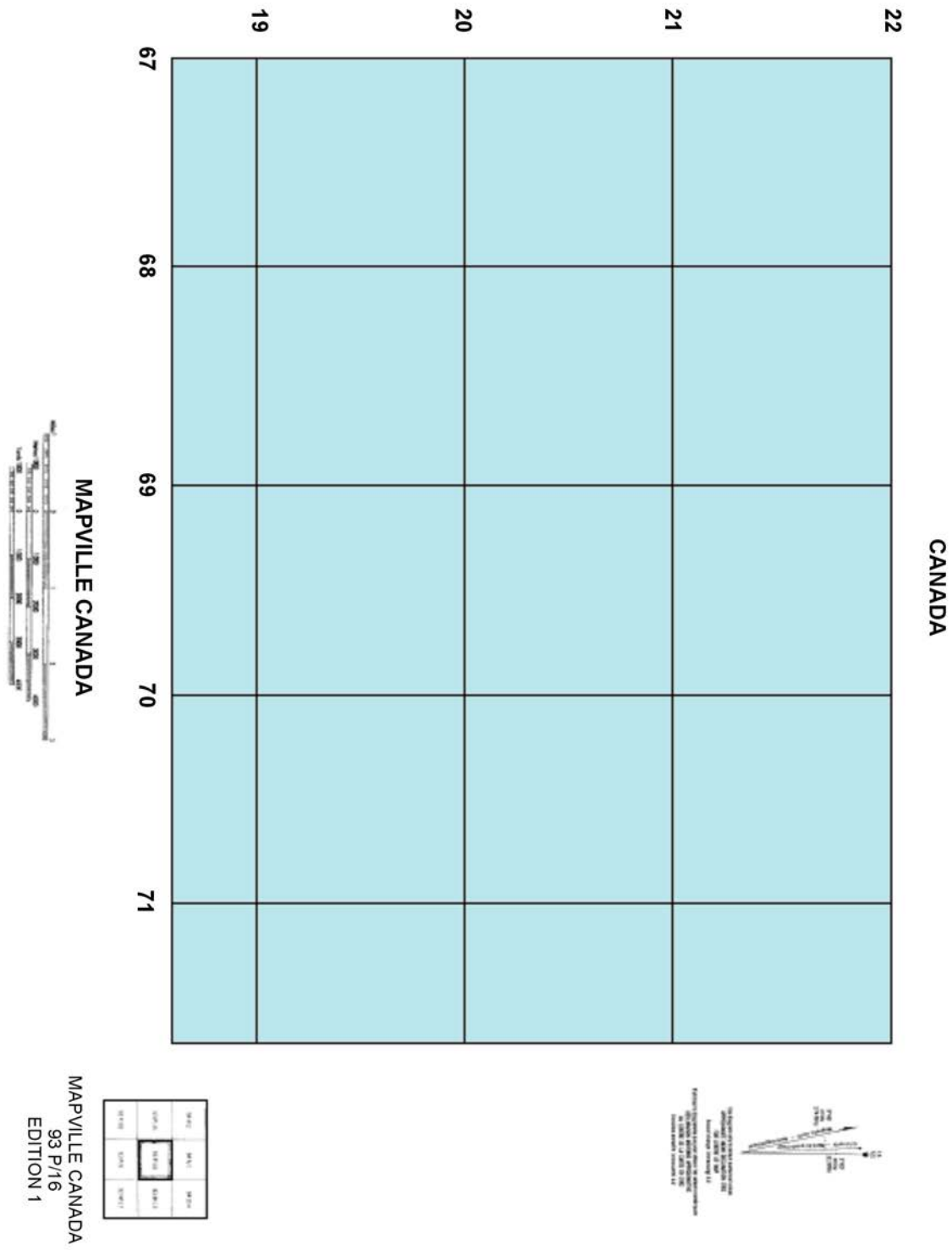
A thorough understanding of Green Star navigation training is required before cadets are taught new navigation skills in Red Star. This EO will provide an opportunity for cadets to practice skills they learned in the corps program.

REFERENCES

A2-041 B-GL-382-005/PT-001 Canadian Forces. (2006). *Maps, Field Sketching, Compasses and the Global Positioning System*. Ottawa, ON: Department of National Defence.

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.

MAP FOLDING ACTIVITY SHEET



D Cdts 3, 2007, Ottawa, ON: Department of National Defence

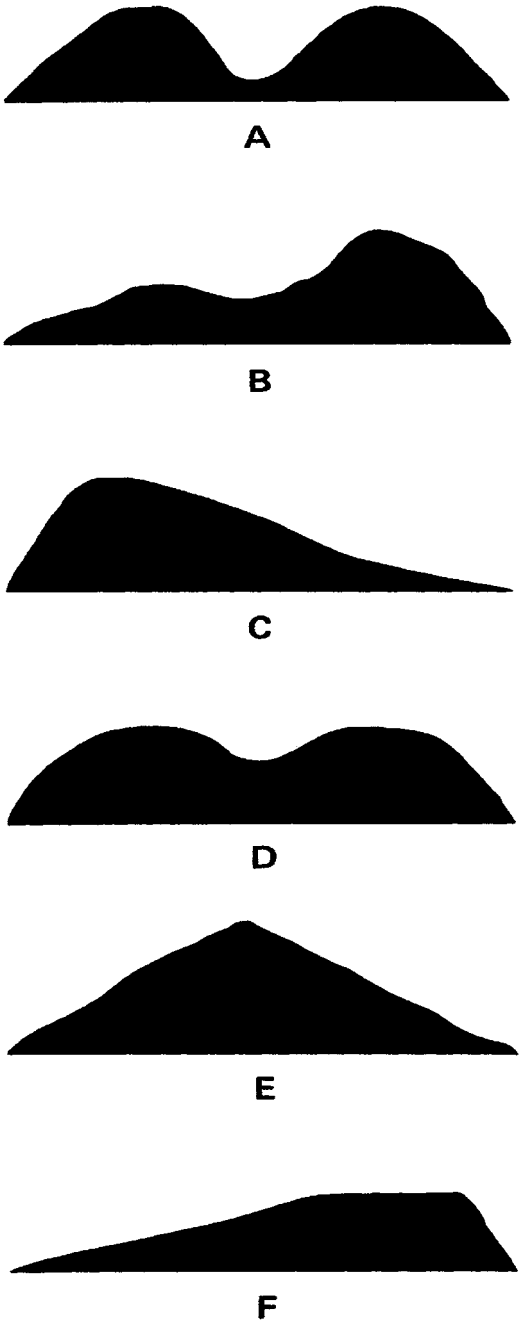
Figure A-1 Map Folding Activity Sheet

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.

THIS PAGE INTENTIONALLY LEFT BLANK

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.

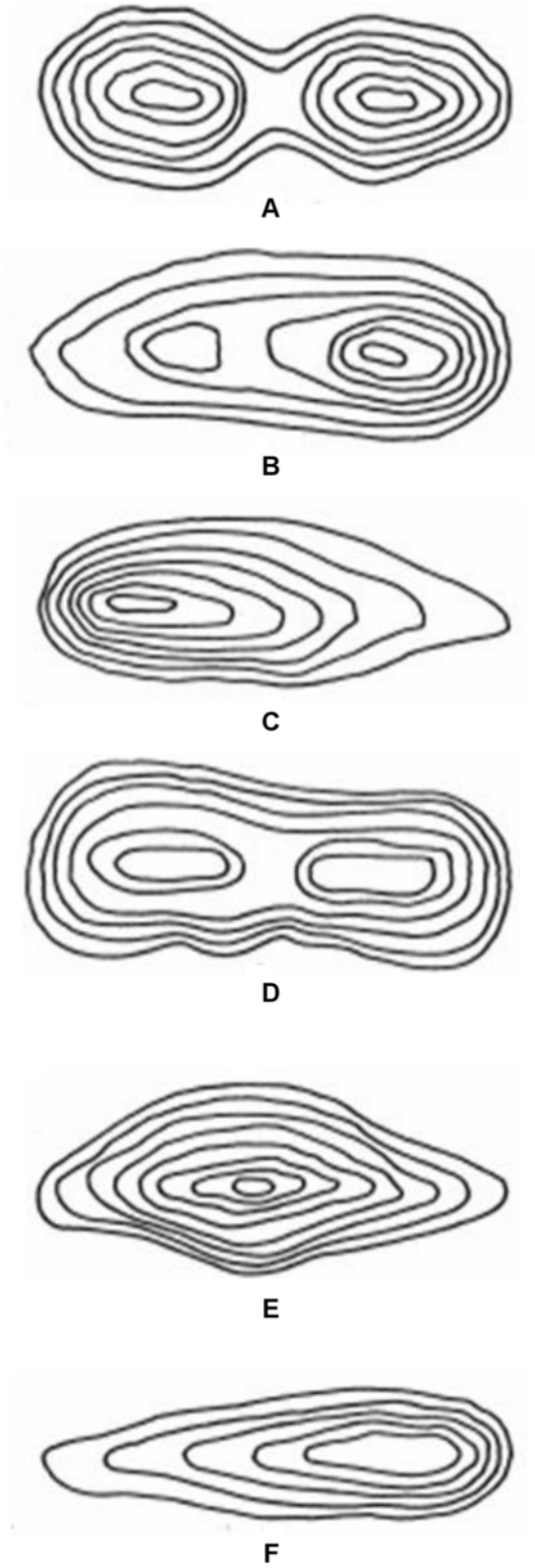
LAND FEATURES



D Cdts 3, 2007, Ottawa, ON: Department of National Defence

Figure B-1 Contour Features

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.



D Cdts 3, 2007, Ottawa, ON: Department of National Defence

Figure B-2 Contour Features Examples

Unofficial convenience copy of A-CR-CCP-702/PF-001, cached 2026-11-08 from https://app.cadets.gc.ca/cadet-publications/A-CR-CCP-702-PF-001/A-CR-CCP-702-PF-001.pdf.
Verify against the official publication.