CHAPTER 15

PO 160 – PARTICIPATE IN AERODROME OPERATIONS ACTIVITIES

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL ONE

INSTRUCTIONAL GUIDE

SECTION 1

EO M160.01 – IDENTIFY MAJOR AERODROME COMPONENTS

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-801/PG-001, *Proficiency Level One Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instruction guide within the TP for which they are required.

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

Photocopy and cut the game pieces located at Attachment B.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1–3 as it allows the instructor to introduce basic information to the cadets.

An in-class activity was selected for TP 4 as it is an interactive way to confirm the cadets' comprehension of the material.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall identified the major components of an aerodrome.

IMPORTANCE

Knowing the various components of an aerodrome will assist cadets in identifying them during aviation and aerodrome operations activities.

Teaching Point 1 **Define the terms aerodrome and airport.**

Time: 5 min Method: Interactive Lecture

AERODROME

Around the world there is an intricate system of aeronautical facilities designed to facilitate the efficient movement of air traffic, called aerodrome. Many aerodromes vary widely in the facilities and the services they offer. However, there are certain standard features that apply to every aerodrome.

“An aerodrome is any area of land or water designed for the arrival, departure and movement of aircraft” (Macdonald, 2000).

AIRPORT

“An airport is a licensed aerodrome, which possesses a certificate stating it has met all airport safety standards” (Macdonald, 2000).

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What is the definition of an aerodrome?

Q2. What makes an airport different from an aerodrome?

ANTICIPATED ANSWERS:

A1. An aerodrome is any area of land or water, designed for the arrival, departure and movement of aircraft.

A2. An airport possesses a certificate stating it has met all airport safety standards.

Teaching Point 2 **Explain components of the airside of an aerodrome.**

Time: 5 min Method: Interactive Lecture

Images of the various parts of an aerodrome are located at Attachment A.

This section refers to runway, taxiway and apron.

RUNWAY

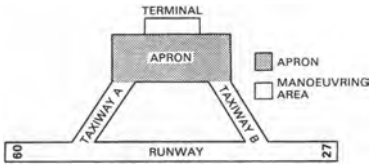
The runway is the area where aircraft take off and land. A runway may be made of pavement, grass, gravel, dirt or snow among other materials. Runways are identified by numbers and by the white lights that run along each side.

TAXIWAY

The taxiway is the area used by an aircraft to manoeuvre around the aerodrome between aprons and runways. Letters normally designates taxiways. At aerodromes with lighting, taxiways are defined by blue lights along each side.

APRON

The apron, also known as the tarmac or ramp area, is the part of an aerodrome intended to accommodate the loading and unloading of passengers and cargo. It is also the area used for refuelling, servicing and parking of aircraft.



Note. From Royal Canadian Air Cadet Manual, Proficiency Level One Handbook, Cadets Canada, 1998.

Figure 1 Aerodrome Movement Areas

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What colour lights identify the sides of the runway?

Q2. What is the purpose of a taxiway?

Q3. What other names are used to refer to the apron?

ANTICIPATED ANSWERS:

A1. White lights.

A2. The taxiway is the area used by an aircraft to move from the apron to the runway.

A3. The apron can be referred to as the tarmac or the ramp area.

Teaching Point 3 **Explain components of an aerodrome.**

Time: 10 min Method: Interactive Lecture

Images of the various parts of the aerodrome are located at Attachment A.

This section refers to control tower, terminal buildings, windsock, flying school and hangars.

CONTROL TOWER

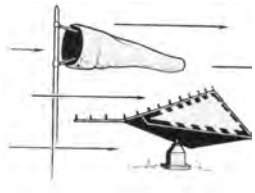
Some aerodromes have a control tower to ensure the safe and efficient movement of aircraft. The air traffic controllers in the tower are responsible for a number of procedures. These include take off and landing procedures, circuit procedures and ground manoeuvring of aircraft.

TERMINAL BUILDINGS

Terminal buildings are used for passengers arriving and departing. They are also used for baggage and cargo handling. Terminal buildings are located on the apron.

WINDSOCK

All aerodromes have at least one windsock or wind-t. The windsock is used by pilots to determine wind direction and speed. The approximate wind speed is indicated by the amount the windsock is extended. The wind-t is designed like an arrow whose small end points into the wind. They are found on the airfield, beside the runway.



Note. From The Ground Up: Millennium Edition, A.F. MacDonald, 2000.

Figure 2 Windsock and Wind-T

FLYING SCHOOL

Flying schools are used as training facilities for current pilots and those that want to learn how to fly.

HANGARS

Hangars are used to store aircraft to protect them from weather conditions that might damage their components. Hangars are also used to facilitate work while conducting maintenance tasks on the aircrafts.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What is the purpose of the control tower?

Q2. What does a windsock indicate?

Q3. What is the importance of flying schools?

ANTICIPATED ANSWERS:

A1. The purpose of the control tower is ensuring the safe and efficient movement of aircraft, through use of the air traffic controllers working within the tower.

A2. A windsock indicates wind direction and speed.

A3. Flying schools are used as training facilities for current pilots and those that wish to learn how to fly.

Teaching Point 4 **Have the cadets identify components of an aerodrome.**

Time: 5 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to confirm that the cadets are able to correctly identify various components of an aerodrome.

RESOURCES

Nil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into groups of four.
2. Distribute to the cadets the games pieces located at Attachment B.
3. Have the cadets match the different components of the aerodrome with their names and short definition.
4. Supervise the cadets as they are completing the activity.
5. Once the cadets have completed the activity, confirm the matches made by the cadets using the answer key located at Attachment C.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 4

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

END OF LESSON CONFIRMATION

The cadets' participation in the activity will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

The various areas of an aerodrome serve different purposes. As cadets, knowing the various components of an aerodrome will assist in identifying the components during aviation and airport operations activities.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A3-001 A-CR-CCP-263/PT-001*From the ground up: Millennium edition* (2000). Ottawa, ON: Aviation Publishers Co. Limited.

C3-022 ISBN 0-19-541731-3 *The Canadian Oxford dictionary* (2001). Don Mills, ON: Oxford University Press.

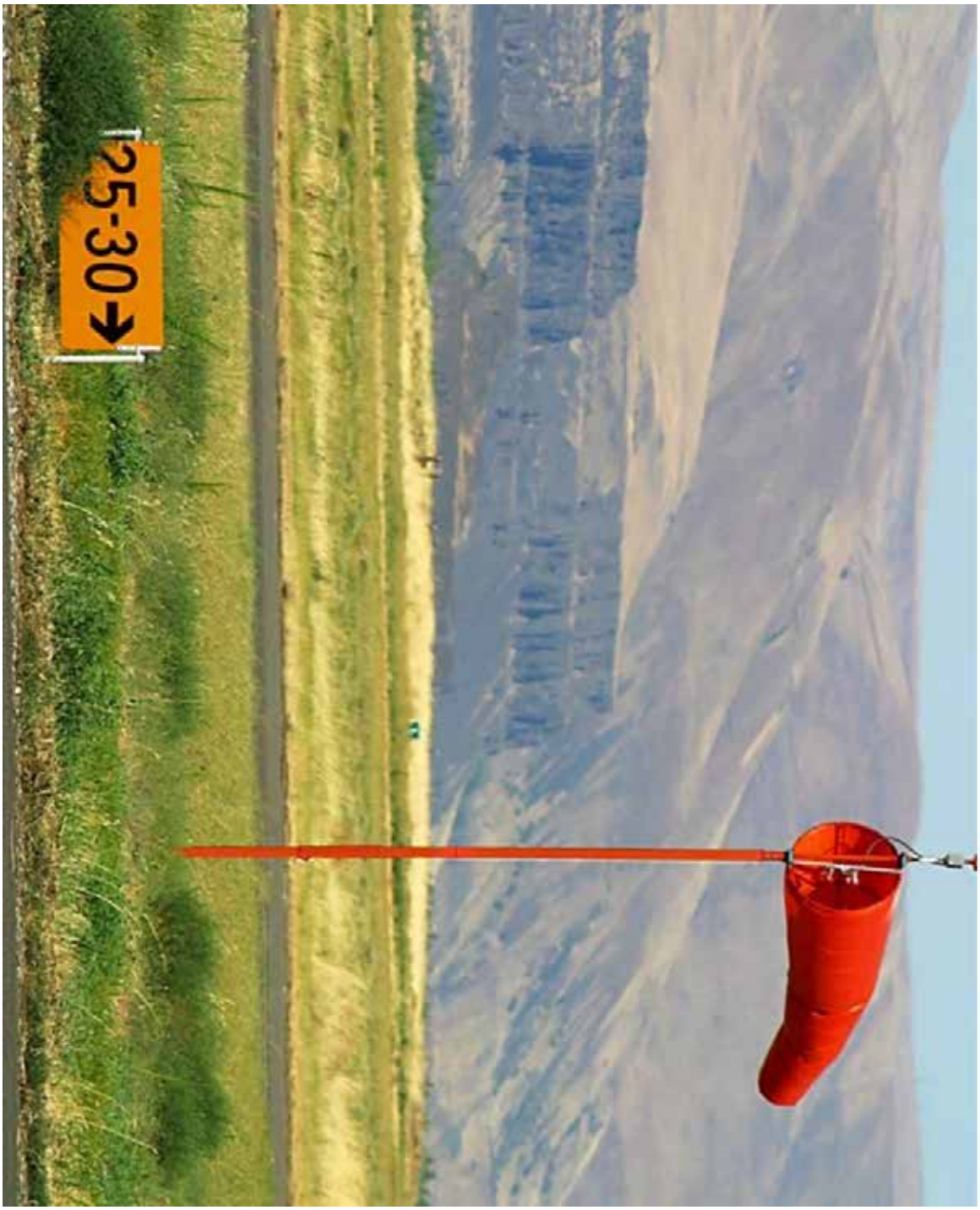

Runway

Taxiway

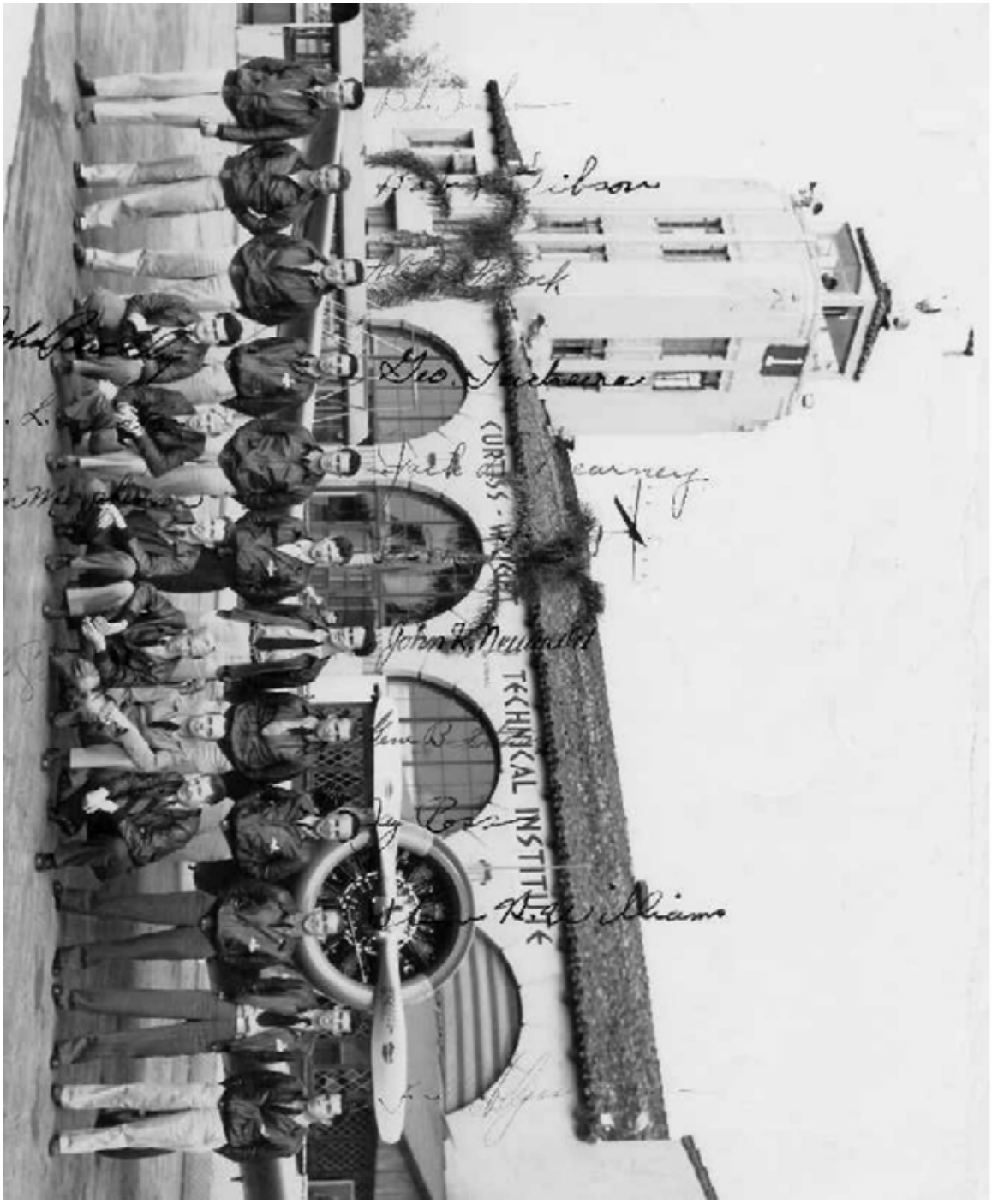
Apron

Control Tower

Terminal Building

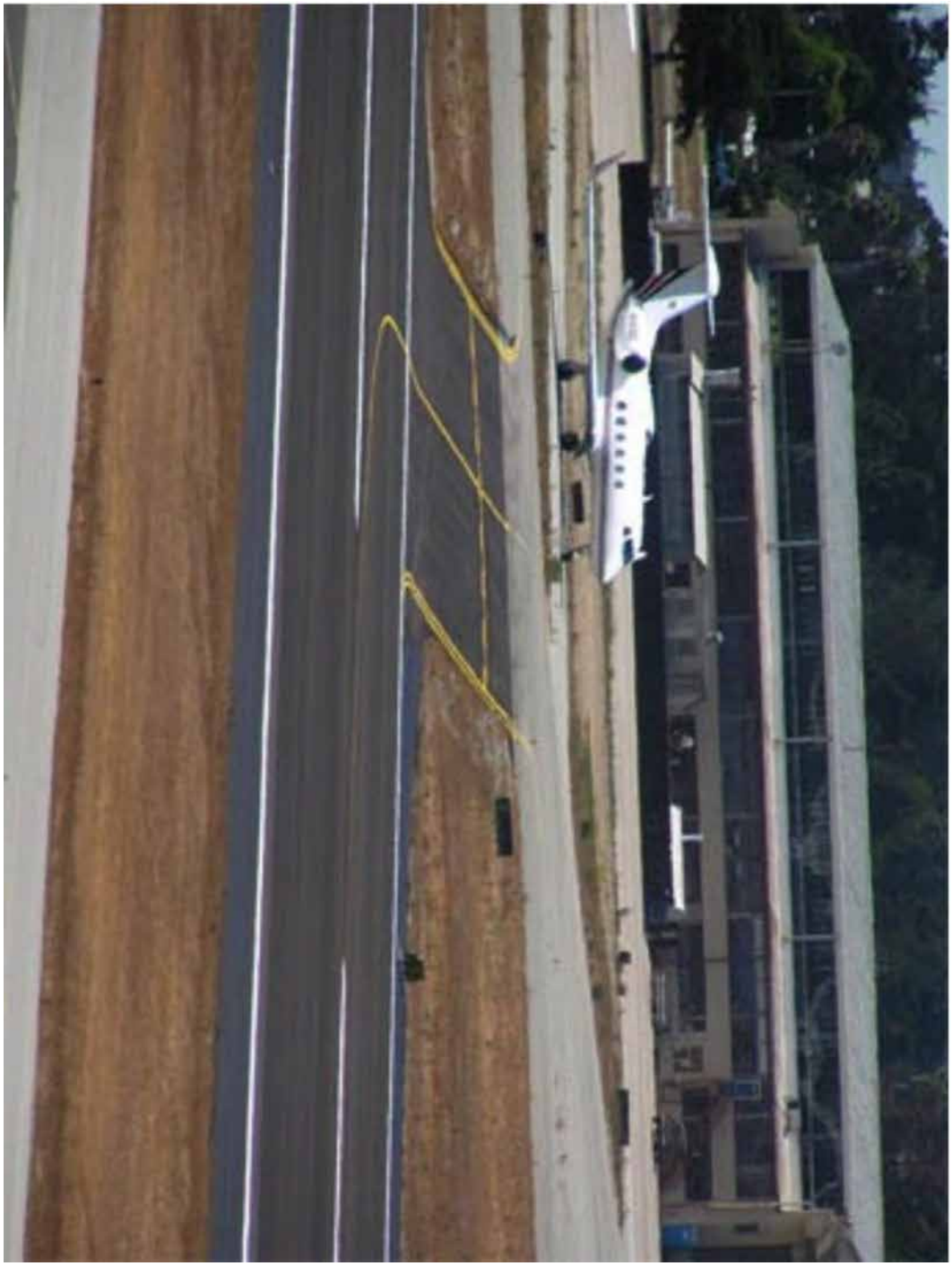


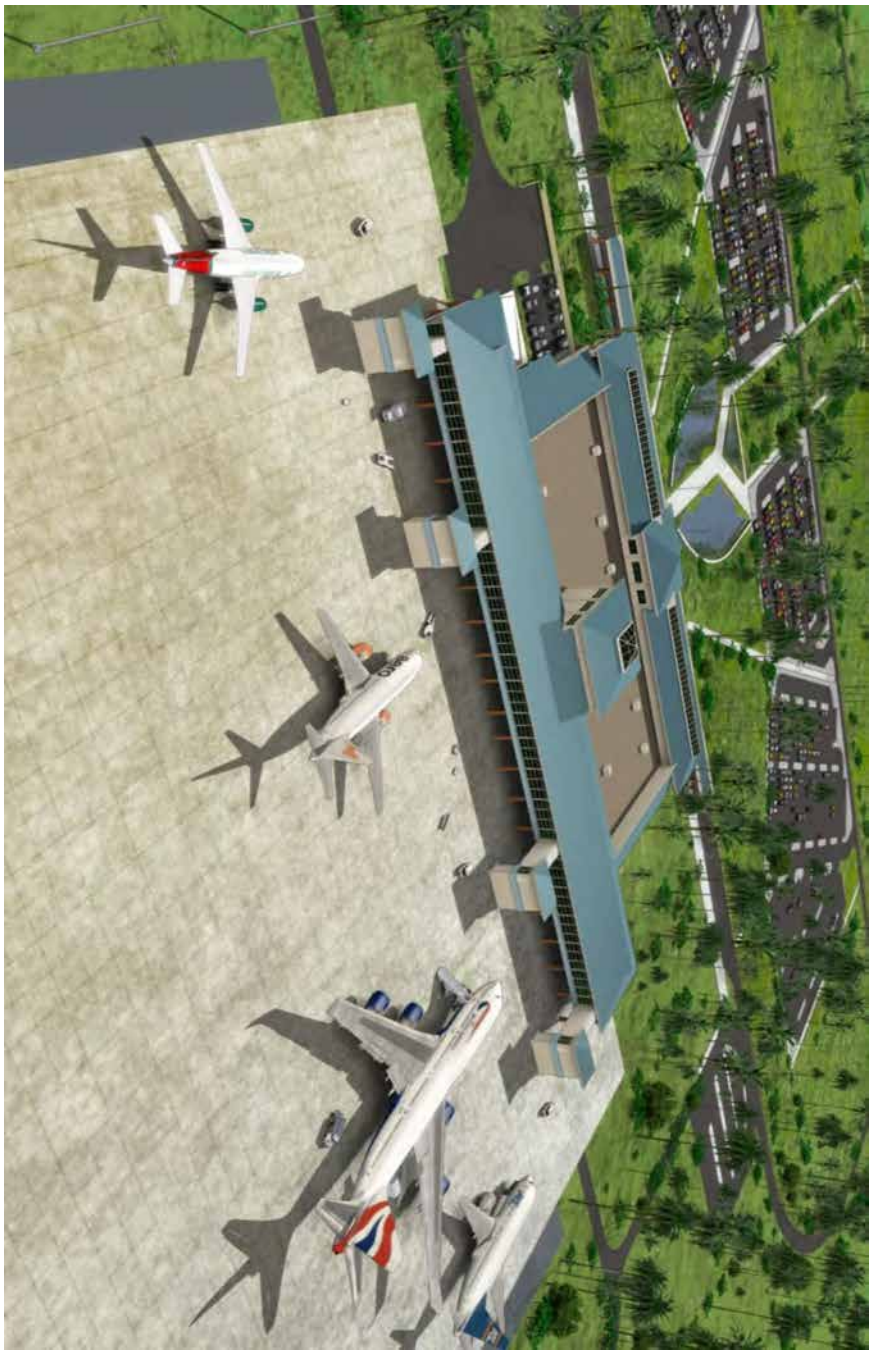
Windsock



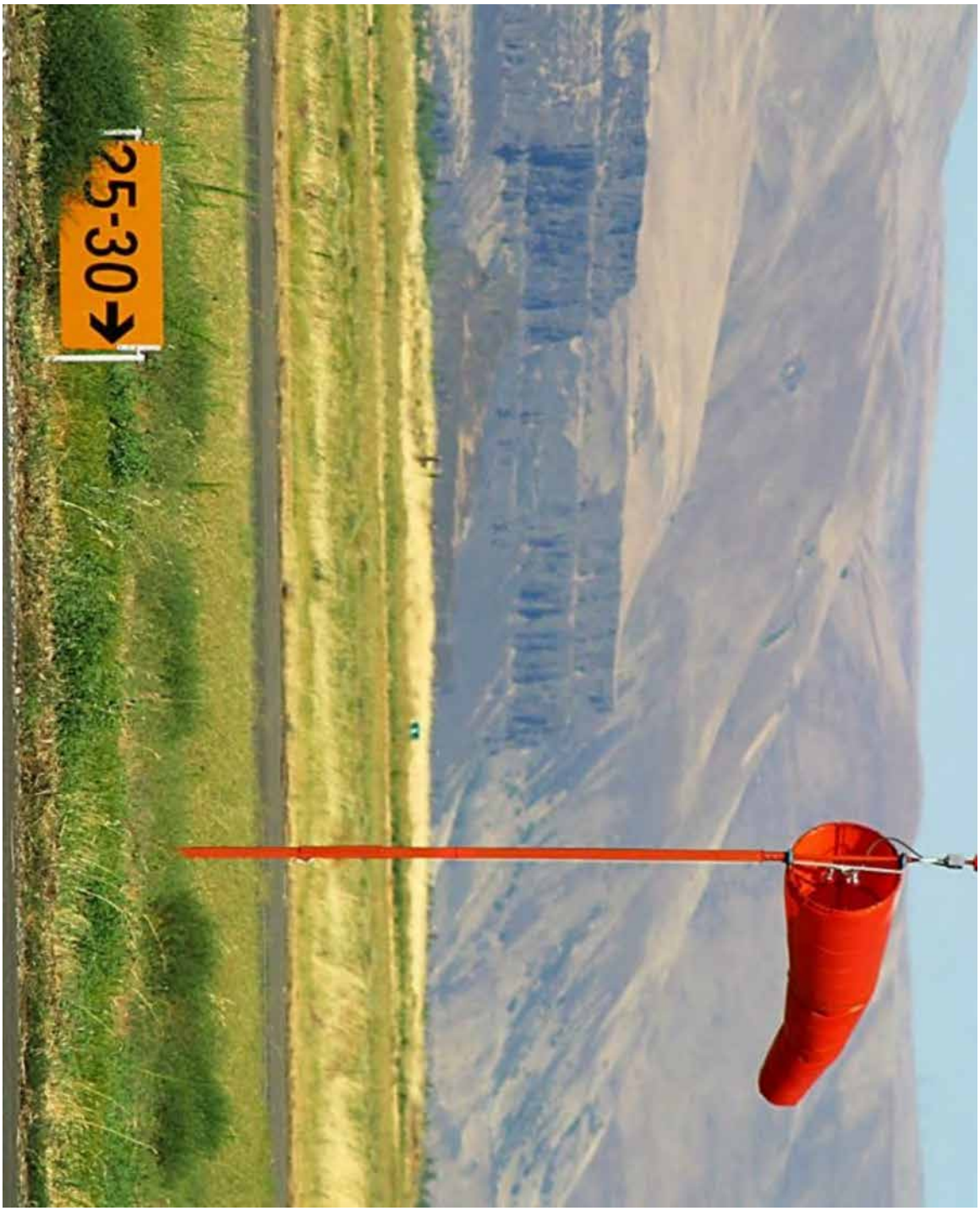
Flying School

Hangar






WORLD'S BUSIEST CONTROL TOWER
WORLD'S BUSIEST CONTROL TOWER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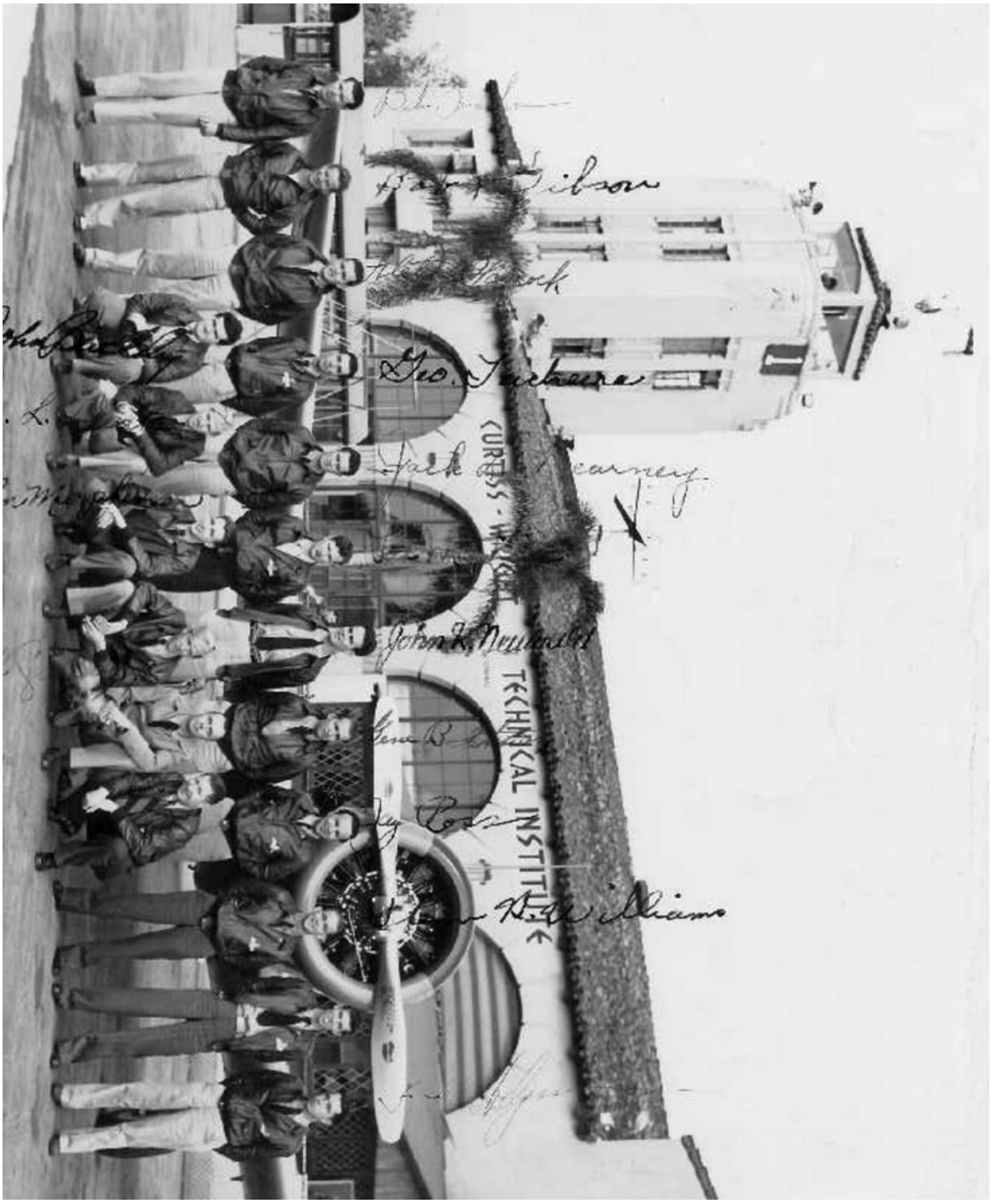

CURTISS - WRIGHT TECHNICAL INSTITUTE

RUNWAY

APRON

TAXIWAY

FLYING SCHOOL

WINDSOCK

HANGAR

TERMINAL

CONTROL TOWER

Where the aircraft lands and takes off.
Designated by letters.
Used for refuelling, servicing and parking.
Used for passenger arrivals and departures.
Indicates the direction and speed of the wind.
Where to learn how to fly.
Used to protect the aircraft from the elements.
Location of those responsible for a number of procedures on the ground and in the air.

ANSWER KEY

Runway

Where the aircraft lands and takes off.

Taxiway

Designated by letters

Apron

Used for refuelling, servicing and parking.

Control Tower

Location of those responsible for a number of procedures on the ground and in the air.

Terminal

Used for passenger arrivals and departures.

Windsock

Indicates the direction and speed of the wind.

Flying school

Where to learn how to fly.

Hangar

Used to protect the aircraft from the elements.

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL ONE

INSTRUCTIONAL GUIDE

SECTION 2

EO M160.02 – IDENTIFY FEATURES OF A RUNWAY

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located at A-CR-CCP-801/PG-001, *Proficiency Level One Qualification Standard and Plan*. 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.

The training aids for this EO can be presented a number of ways, depending on the resources available at the squadron. A model runway can be constructed out of construction paper or Bristol board. If desired, Attachment A can be photocopied and distributed to the cadets.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture method was chosen for TP 1–3 as it allows the instructor to present basic information to the cadets.

An in-class activity was selected for TP4 as it is an interactive way to confirm the cadets' comprehension of the material.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have identified features of a runway.

IMPORTANCE

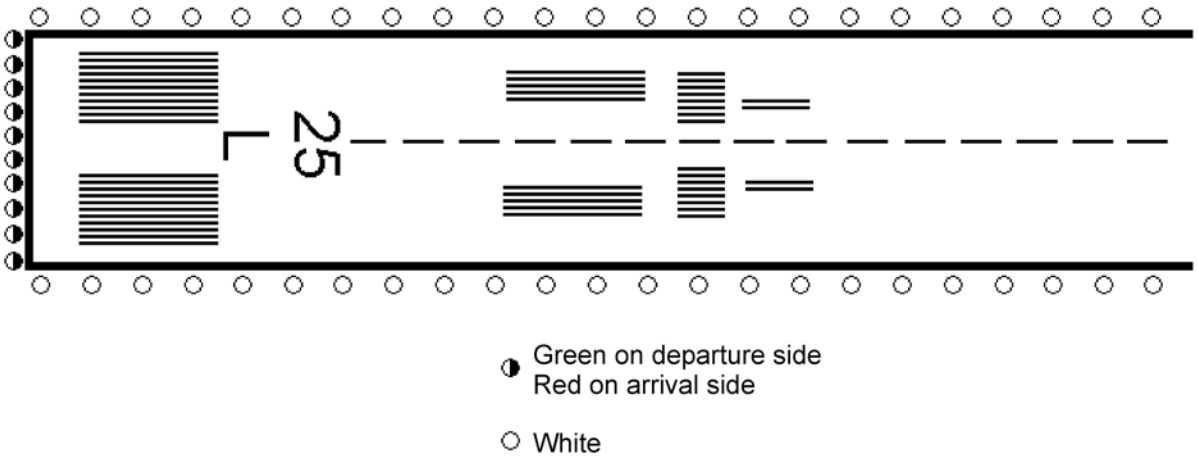
Understanding the features of a runway will be helpful during tours and familiarization flights. In the aviation industry, pilots and air traffic controllers require this information to perform their jobs.

Teaching Point 1 **Discuss runway lights.**

Time: 5 min Method: Interactive Lecture

RUNWAY LIGHTS

Both sides of a runway are marked by white lights. These lights are used to indicate the borders of the runway. They also contain red / green lights at the ends of the runway. These lights are double-sided with red on one side and green on the other. The red side of the lights faces toward the runway, or departure side, and indicates the end of the runway. The green side faces away from the runway, or arrival side, and indicates the start of the runway to aircraft that are landing.



Note. Director Cadets 3, 2011, Ottawa, ON: Department of National Defence

Figure 1 Runway Lights

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What colour lights define the runway on each side?

Q2. What is the importance of the red / green lights?

ANTICIPATED ANSWERS:

A1. White lights.

A2. They indicate the end of the runway (red side) and the start of the runway for the aircraft preparing to land (green side).

Teaching Point 2 **Discuss runway numbering.**

Time: 10 min Method: Interactive Lecture

RUNWAY NUMBERING

The runway number is indicated in large print as a two-digit number at the end of the runway. Runways are numbered according to their magnetic direction and are rounded off to the nearest ten degrees. Once rounded, the hundreds and tens digits are used to number the runway. For example, a runway that points in the direction of 266 degrees magnetic would be numbered 27. The highest runway number possible is 36 (360 degrees).

If two runways run parallel to each other they are identified as left or right by adding an L or an R next to the runway number. Two parallel runways heading north / south would be numbered 36L (left) and 36R (right).

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. How are runways numbered?

Q2. If a runway points in the direction of 176 degrees magnetic, how would it be numbered?

Q3. How are parallel runways numbered?

ANTICIPATED ANSWERS:

A1. Magnetic direction.

A2. 18 (Round 176 to 180, and use only the hundreds and tens digits).

A3. By adding L and R next to the runway number.

Teaching Point 3 **Discuss runway markings and lights.**

Time: 5 min Method: Interactive Lecture

RUNWAY MARKINGS

Runways have other important markings that have specific purposes.

Centreline. White dashed lines designate the centre of the runway. Pilots use these markings to line up the aircraft to the middle of the runway during landing.

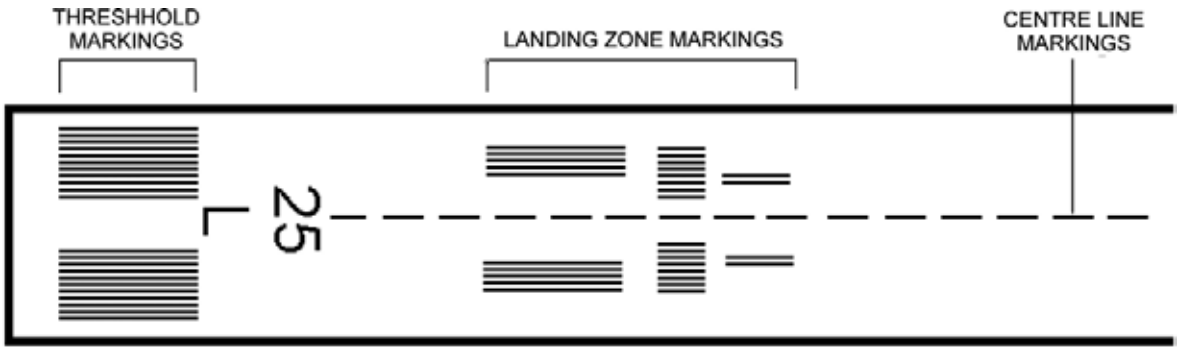
Landing zone markings. Provide the pilot with a general area where it is desirable to touch down.

Threshold markings. Indicate the beginning and the end of the runway using white lines at the threshold.

Danger Markings. Indicate areas that may be dangerous or unserviceable. These areas are signified by large white Xs on the unserviceable runways or taxiways.

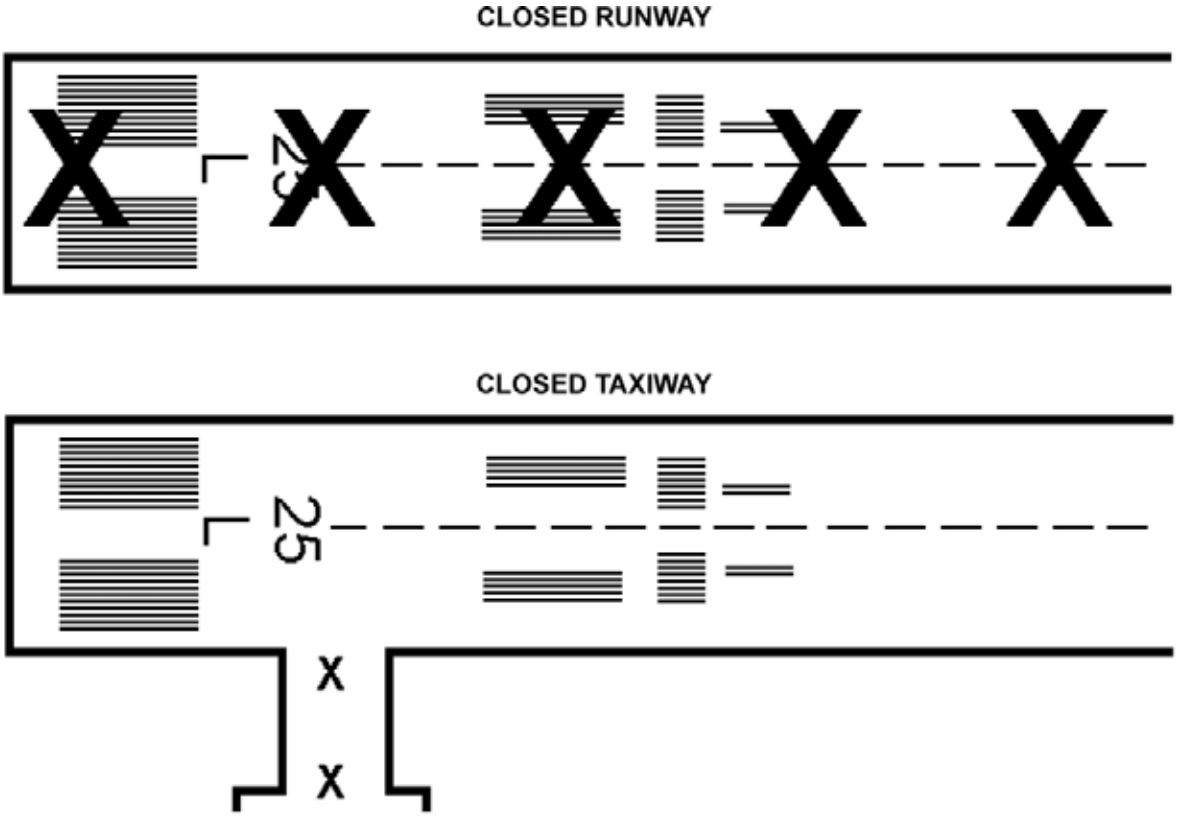
Obstruction lights. Identify possible structures that may obstruct a plane while attempting to take off / land.

Windsocks: Lit so pilots can use them at night.



Note. Director Cadets 3, 2011, Ottawa, ON: Department of National Defence

Figure 2 Runway Markings



Note. Director Cadets 3, 2011, Ottawa, ON: Department of National Defence

Figure 3 Runway Danger Markings

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What are the markings that indicate the beginning and the end of the runway?

Q2. What does a large white X signify on a runway or a taxiway?

Q3. What is the purpose of obstruction lights?

ANTICIPATED ANSWERS:

A1. Threshold markings.

A2. Areas which may be dangerous or unserviceable.

A3. Obstruction lights are used to identify structures that may obstruct a plane while attempting to take off or land.

Teaching Point 4 **Have the cadets identify various features of a runway.**

Time: 5 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of the activity is to confirm the cadets can identify the features of a runway.

RESOURCES

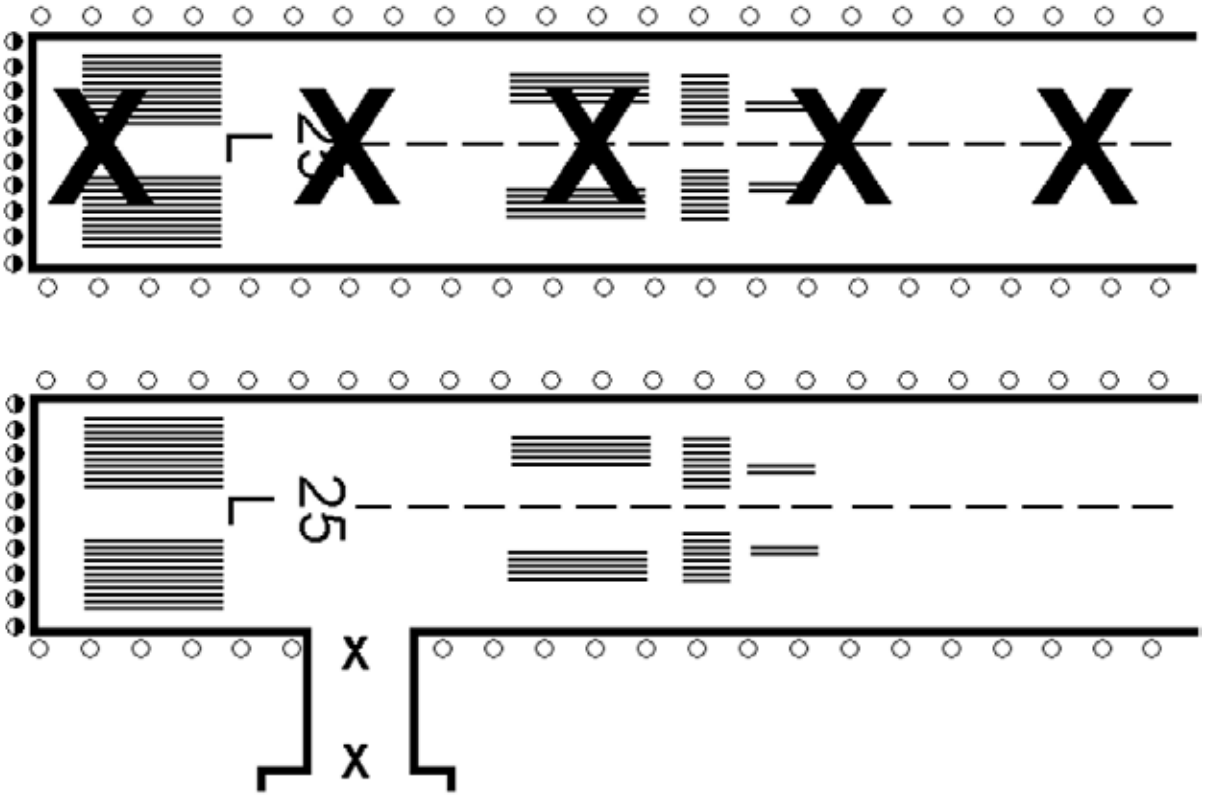
- Flipchart paper, and
- Flipchart markers.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into groups of four.
2. Give each group a sheet of flipchart paper and flipchart markers.
3. Have each group create a runway using the materials provided. The runways must include:
   (a) threshold markings,
   (b) red / green lights,
   (c) runway numbers,
   (d) centre line,
   (e) aerodrome landing markings,
   (f) danger markings, and
   (g) white lights.



Note. Director Cadets 3, 2011, Ottawa, ON: Department of National Defence

Figure 4 Complete runway markings

4. The groups have five minutes to complete the assignment.

5. Confirm that each group included all the features.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 4

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

END OF LESSON CONFIRMATION

The cadets' participation in the activity will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Being familiar with the various features of runways can assist cadets in a number of areas of training. Understanding the features of a runway enhances cadet knowledge of aerodrome components and gives further insight into the runways' role in take off and landing procedures.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A3-001 A-CR-CCP-263/PT-001*From the ground up: Millennium edition* (2000). Ottawa, ON: Aviation Publishers Co. Limited

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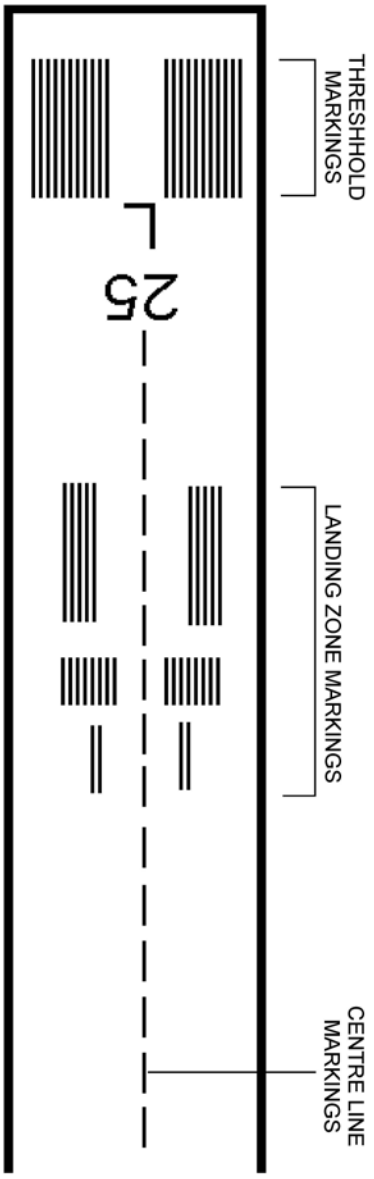
RUNWAY LIGHTS
25
Green on departure side
Red on arrival side
White

RUNWAY MARKINGS



DANGER MARKINGS
CLOSED RUNWAY
25
CLOSED TAXIWAY
25

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL ONE

INSTRUCTIONAL GUIDE

SECTION 3

EO M160.03 – CONSTRUCT A MODEL AERODROME

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located at A-CR-CCP-801/PG-001, *Proficiency Level One Qualification Standard and Plan*. 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.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An in-class activity was selected for this lesson as it is a fun and interactive way to confirm the cadets' comprehension of the material.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have constructed a model aerodrome.

IMPORTANCE

Cadets will visit aerodromes as part of participating in various aircraft and aerodrome operations activities. This lesson will help them identify the major features of the aerodrome.

Teaching Point 1 **Have the cadets construct a model aerodrome.**

Time: 50 min Method: In-Class Activity

OBJECTIVE

The objective of this activity is to confirm the information taught during the previous two lessons on aerodrome operations.

RESOURCES

The materials recommended for the construction of the model aerodromes are:

- Bristol board,
- construction paper,
- cardboard,
- small boxes (shoe box size),
- white chalk,
- stick pins,
- colour markers,
- scissors,
- glue, and
- masking tape.

Other materials may be used beyond this list if available at the squadron.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Place the cadets into groups of four to five.
2. Distribute the materials to each group.
3. Have each group start with four pieces of Bristol board (two by two taped together) to form the base of their aerodrome.
4. Show the cadets the diagram located at Attachment A for the ideal placement of the components of an aerodrome.
5. Have each group construct a model aerodrome.
6. Have each group tour each aerodrome and compare ideas on how they were constructed.

While cadets are encouraged to be creative with the materials provided, the instructor may recommend the following uses for the resources listed above:

- cardboard, poster board and small boxes – can be used for the construction of small buildings;
- white chalk – can be used for runway numbering and markings on Bristol board;
- multi-coloured markers – can be used for labelling the various components and adding specific details to them;
- construction paper – can be used with cardboard/small boxes if a specific colour for the building/component is required;
- stick pins – can be used for the lighting at an aerodrome (taxiway and runway lights); and
- glue and masking tape – can be used to hold the various components together.

SAFETY

Nil.

INSTRUCTOR GUIDELINES

- Ensure the cadets share the supplies when creating model aerodromes.
- Assist groups in getting started if they are having difficulty.
- Supervise the cadets' work to ensure that they are following the instructions listed above.
- Once the activity has been completed, the instructor should examine the model aerodromes to ensure that all of the components are labelled properly and in their proper locations.
- After this activity has been completed, the instructor should carry on with the reflection/questioning stage.

Make use of all teachable moments throughout the model construction process. Make sure to cover material from M160.01 and M160.02.

CONFIRMATION OF TEACHING POINT 1

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

END OF LESSON CONFIRMATION

The cadets' participation in the activity will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Cadets will have an opportunity to visit various aerodromes during aviation and aerodrome activities. They will now be familiar with major aerodrome components.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A3-001 A-CR-CCP-263/PT-001 *From the Ground Up: Millennium Edition* (2000). Ottawa, ON: Aviation Publishers Co. Limited.

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL ONE

INSTRUCTIONAL GUIDE

SECTION 4

EO C160.01 – TOUR A LOCAL AERODROME

Total Time:	90 min

THERE IS NO INSTRUCTIONAL GUIDE PROVIDED FOR THIS EO