

**CHAPTER 13**  
**PO 130 – PARTICIPATE IN AVIATION ACTIVITIES**





**ROYAL CANADIAN AIR CADETS**  
**PROFICIENCY LEVEL ONE**  
**INSTRUCTIONAL GUIDE**



**SECTION 1**

**EO M130.01 – IDENTIFY AIRCRAFT AS MILITARY, CIVILIAN AND CADET**

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-801/PG-001, *Proficiency Level One Qualification Standard and Plan*, 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.

Review all aircraft listed to determine if any have been acquired for / retired from service.



The training aids for this EO can be presented in a number of ways, depending on the resources available at the squadron. Images of the aircraft are located at Attachment A in a MS Word document. If the squadron has the means to use a computer / projector, the aircraft images can be accessed from a PowerPoint presentation located at Attachment B.

Set up equipment for visual presentation for TPs 1–3.

Create enough sets of matching cards for TP 4 from the set located at Attachment B. It is recommended that the cards be printed in colour on heavy stock (450 g/m<sup>2</sup> / 120 lb) paper. Ensure matching cards are in complete sets.

**PRE-LESSON ASSIGNMENT**

Nil.

**APPROACH**

An interactive lecture was chosen for TPs 1–3 as it orients the cadets to aircraft, generates interest and presents basic information.

A game was selected for TP4 as it is a fun and challenging way to confirm the cadets' knowledge of the material.

**INTRODUCTION**

**REVIEW**

Nil.

## **OBJECTIVES**

By the end of this lesson the cadet shall have identified military, civilian and cadet aircraft.

## **IMPORTANCE**

Basic aircraft identification creates a base of understanding for further aviation topics. It adds value to additional aviation activities such as aerodrome tours, air shows and familiarization flying. It also fosters an interest in the military and civilian aviation communities by introducing cadets to aircraft commonly found in those communities.

**Teaching Point 1****Identify Canadian military aircraft.**

Time: 15 min

Method: Interactive Lecture

**CANADIAN MILITARY AIRCRAFT**

Military aircraft are used for a wide variety of tasks. These tasks include training, transport, maritime patrol, defence and search and rescue. Most military aircraft are painted flat grey or camouflage for low visibility. These high visibility planes used for Search and Rescue (SAR) work are painted bright yellow and red.



Select at least 11 aircraft to present during TP1 with at least one aircraft from each category. Present aircraft common to the cadets' community.

**CANADIAN CARRIERS (TRANSPORT)****CC-115 Buffalo**

The CC-115 Buffalo is mainly used for SAR operations. It has short take-off and landing (STOL) capability, which is ideal for rough landing strips. It is able to fly in almost any weather. The Buffalo is painted a highly visible yellow. It has two turboprop engines, high wings and a t-tail.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=2204-CX2005-0096-393a>

Figure 1 CC-115 Buffalo

**CC-130 HERCULES**

The CC-130 Hercules is one of the most multipurpose transport planes. It is used to airlift troops, equipment and cargo. It is also used in SAR operations and in air-to-air refuelling of fighters. With its rear cargo ramp, rugged landing gear, good short-field performance and high ground clearance of engines / propellers, the C-130 is designed to operate from unimproved airstrips in active military areas. The Hercules has four turboprop engines, high wings and a distinctively large tail.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=1956-CX2005-0096-331a>

Figure 2 CC-130 Hercules

### **CC-138 TWIN OTTER**

The highly adaptable CC-138 Twin Otter is well suited for Canada's ever-changing northern climate and terrain. This STOL utility transport aircraft can land on water, land, snow and ice. Powered by twin turboprop engines, the Twin Otter is highly manoeuvrable and has a service ceiling of over 8 000 metres. It can be outfitted with wheels, skis or floats to land on virtually any surface. The CC-138 is used in SAR missions, and transport and support roles to the Canadian Forces' northern operations. It can carry up to 20 passengers or 2 999 kg of payload, and has a range of 1 427 km.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=4209-540-IMG0075>

Figure 3 CC-138 Twin Otter

### **CC-144 CHALLENGER**

The CC-144 Challenger, DND's twin-engine, long-range executive jet, offers rapid air transportation to Canadian and international VIPs. With a range of up to 5 930 km and a maximum speed of Mach 0.83, the Challenger can quickly deliver passengers almost anywhere in the world. The Air Force's Challenger fleet includes four VIP aircraft and two utility aircraft. The utility jets are used for military transport and can be configured for medical evacuations (medevacs) when troops are in need.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=4322-761-IMG0029>

Figure 4 CC-144 Challenger

### **CC-150 A310 POLARIS**

The CC-150 Polaris is the military version of a popular civilian commercial airliner, the Airbus A310-300. The main role of the Polaris is long-range transport of personnel and equipment. It can transport up to 194 passengers or 32 000 kg of cargo. The CC-150 is a wide-body, two engine turbojet with low wings.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=5687-2007-03-19-02HQ>

Figure 5 CC-150 Polaris

### **CC-177 (C-17) GLOBEMASTER III**

CC-177 Globemasters transport large amounts of passengers and equipment over long distances in response to domestic emergencies or international crises. It provides rapid strategic delivery of troops to cargo transport of oversized combat equipment from coast to coast and to anywhere in the world - including to troops in Afghanistan. The Globemaster can be flown with night vision goggles which give it tactical advantage when flying into threatening territory. Operated by a crew of three - pilot, co-pilot and loadmaster - the CC-177, with a payload of 160 000 pounds, can fly long distances and land in remote airfields, making it a premier transporter for military, humanitarian and peacekeeping missions. The CC-177 is able to take off and land on unpaved runways as short as 3 500 feet and as narrow as 90 feet wide during the day or night.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=8223-GD2008-0786-002>

Figure 6 CC-177 Globemaster III

## CANADIAN FIGHTERS (CF) (DEFENCE)

### CF-188 (CF-18) Hornet

The CF-18 Hornet is a high-performance twin-engine jet fighter that can perform air-to-air combat or ground-attack roles. The most visible difference of the CF version of this aircraft is a paint scheme incorporating a “spoof” canopy on the underside of the front fuselage. This “spoof” canopy is used to confuse an opponent in the heat of a dogfight as to “which side is up”. The distinctive angled twin vertical fins on the tail most easily identify the CF-18.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=7356-BN2008-0094-19>

Figure 7 CF-188 Hornet

## CANADIAN HELICOPTERS (CH)

### CH-124 SEA KING

A ship-borne maritime helicopter, the CH-124 Sea King's compact design boasts a fold-up rotor and tail that help it fit on the smallest warship's deck, and its amphibious hull lends it the ability to land on water. It is powered by two turboshaft engines and is equipped with subsurface acoustic detection equipment and homing torpedoes. The Sea King lifts off from destroyers and frigates to locate and destroy submarines. Capable of flying in day or night, the CH-124 is a versatile surveillance aircraft, contributing to SAR operations, disaster relief, counter-narcotic operations, and fisheries and pollution patrols. The Sea King is to be replaced by the CH-148 Cyclone.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=8197-SW2006-0343-66>

Figure 8 CH-124 Sea King

### CH-139 JET RANGER

This single-engine trainer is currently used at 3 Canadian Forces Flying Training School (3 CFFTS) in Portage la Prairie, Manitoba, where the Air Force's helicopter trainees earn their wings. Side-by-side pilot seating makes the CH-139 ideal for training. Flight controls and doors are fitted at both positions, making them easily accessible to pilot and trainer alike. The passenger / cargo compartment is located immediately behind the cockpit, providing seating for three passengers or space for cargo.



<http://www.airforce.forces.gc.ca/v2/equip/ch139/index-eng.asp>

Figure 9 CH-139 Jet Ranger

### CH-146 GRIFFON

The CH-146 Griffon is Canada's Utility Transport Tactical Helicopter (UTTH). It performs a wide variety of roles that includes airlift of equipment and personnel, command and liaison flights, surveillance and reconnaissance, casualty evacuation, logistic transport, SAR, counter-drug operations and domestic relief operations. The Griffon has a four-blade main rotor and landing skids. It has a camouflage paint scheme.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=7848-VH2007-0004-039>

Figure 10 CH-146 Griffon

### **CH-147 CHINOOK**

The CH-147 Chinook is a twin-engine medium-to-heavy-lift helicopter re-introduced as a Canadian aircraft first deployed with the Joint Task Force Afghanistan. The CH-147 Chinook is used for troop movement and transportation of equipment and supplies with a minimum range of 100 km at maximum loading in various climatic conditions. The CH-147 Chinook provides SAR support within Canada. It has the ability to provide timely response to national emergencies in both the eastern and western regions of the country assisting in emergency response to disasters such as floods, forest fires and earthquakes. The fleet will be based primarily at CFB Petawawa with CH-147 Chinook's supporting the Canadian Manoeuvre Training Center in Wainwright Alberta, being based at CFB Edmonton.



<http://www.airforce.forces.gc.ca/v2/equip/ch147d/index-eng.asp>

Figure 11 CH-147 Chinook

### **CH-148 CYCLONE**

The CH-148 Cyclone will replace the CH-124 Sea King as Canada's main ship-borne maritime helicopter. The Cyclone will conduct Surface and Subsurface Surveillance and Control, utility and SAR missions. This twin-engine helicopter is compatible with the latest high-tech naval frigates and includes several new safety features. Its aluminum and composite airframe is built with lightning-strike and high-intensity radio frequency pulse protection. The CH-148 Cyclone has a day-and-night flight capability, and can fly in most weather conditions in temperatures ranging from minus 51 to plus 49 degrees Celsius. The CH-148 Cyclone can also fly 450 km without refuelling.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=3016-PMO06-0001-B>

Figure 12 CH-148 Cyclone

### **CH-149 CORMORANT**

The CH-149 Cormorant is a SAR helicopter. It has three powerful engines that drive a five-bladed rotor. Its ice protection system allows it to operate in continuous icing conditions. It is able to withstand high winds. These features make it ideal for Canada's demanding geography and climate. The CH-149 Cormorant has rear-ramp access and a large amount of cabin space. It can carry 12 stretchers or a load of 5 000 kg. Unlike the Griffon, the CH-149 Cormorant has retractable landing gear and is painted bright yellow.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=2857-ISD01-2009>

Figure 13 CH-149 Cormorant

### **CANADIAN TRAINERS (CT)**

#### **CT-114 Tutor**

The CT-114 Tutor may be the most well known aircraft flown by the Canadian Forces (CF). It is the plane flown in the Snowbirds air demonstration squadron. The CT-114 Tutor was used as a training aircraft from 1971 until 2000. It was designed and built in Canada. The CT-114 Tutor has a single jet engine, low wings and a t-tail.



<http://www.airforce.forces.gc.ca/v2/equip/ct114/index-eng.asp>

Figure 14 CT-114 Tutor

### **CT-142 DASH-8**

Navigators from around the world come to Canada to train on the CT-142 Dash-8. At the Canadian Forces Air Navigation School (CFANS) in Winnipeg, MB, this twin turboprop aircraft is used to teach students aerial navigation and tactics. Designed and produced in Canada, the CT-142 is a conversion of the popular Dash-8 airliner. It was adapted for navigation training by manufacturer Bombardier Inc. in the late 1980s.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=2177-WG2002-0257-20a>

Figure 15 CT-142 Dash-8

### **CT-155 HAWK**

The CT-155 Hawk was selected for the North Atlantic Treaty Organization (NATO) Flying Training in Canada (NFTC) program because of its similarities to frontline fighter aircraft. Student pilots graduate from the CT-156 Harvard II to this highly advanced jet trainer. Its Rolls-Royce turbofan engine powers the jet to supersonic speeds. The Hawk's sophisticated glass cockpit features a heads-up display (HUD), hands-on throttle and stick (HOTAS) controls, and integrated navigation and targeting systems. The jet can perform a wide range of high performance training missions. NFTC students train on the Hawk during the program's final stage. Once they've logged 125 flight hours, Canada's student fighter pilots are ready to join 410 Squadron, the Operation Training Unit, which flies CF-18 Hornets.



<http://www.airforce.forces.gc.ca/v2/equip/ct155/index-eng.asp>

Figure 16 CT-155 Hawk

### **CT-156 HARVARD II**

This agile turboprop trainer is the aircraft of choice for the early stages of NFTC program. The CT-156 has an initial climb rate of about 1 km per minute. It can handle sustained 2G turns at an altitude of 7 500 metres. The aircraft is ideally suited to help new pilots move seamlessly from basic flight training to high-performance jet training. Its performance, cockpit layout and ejection protocols mimic those of the CT-155 Hawk jet trainer.



<http://www.airforce.forces.gc.ca/v2/equip/ct156/index-eng.asp>

Figure 17 CT-156 Harvard II

### **CANADIAN PATROL (CP)**

#### **CP-140 Aurora**

The CP-140 Aurora is a maritime patrol aircraft. It carries special sensing equipment so it can detect and monitor boats and submarines. The prominent tail boom is the most obvious feature of this aircraft. It has four turboprop engines and low wings.



<http://www.airforce.forces.gc.ca/v2/netpub/index-eng.asp?rid=4412-824-IMG0001>

Figure 18 CP-140 Aurora

## CP-140A ARCTURUS

The CP-140A Arcturus is the sister aircraft to the CP-140 Aurora. The CP-140A Arcturus is used to monitor Canada's East Coast. This long-range patrol aircraft protects our coastlines from foreign threats and illegal activity. This aircraft also fulfills many of the same roles as the CP-140 Aurora: maritime surveillance, SAR operations, drug trafficking interdiction and territorial and sovereignty patrols. It is also used for pilot and crew training.



<http://www.airforce.forces.gc.ca/v2/equip/resrc/images/hst/l-g/arcturus.jpg>

Figure 19 CP-140A Arcturus

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### CONFIRMATION OF TEACHING POINT 1

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Amend the questions and answers to include the aircraft discussed in TP1

#### QUESTIONS:

- Q1. What aircraft is this? (Show CC-130 Hercules)
- Q2. What aircraft is this? (Show CT-114 Tutor)
- Q3. What aircraft is this? (Show CH-146 Griffon)

#### ANTICIPATED ANSWERS:

- A1. Military, CC-130 Hercules.
- A2. Military, CT-114 Tutor.
- A3. Military, CH-146 Griffon.

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#### Teaching Point 2

**Identify civilian aircraft.**

Time: 10 min

Method: Interactive Lecture

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#### CIVILIAN AIRCRAFT

Civilian aircraft are used in a wide variety of roles including recreational, training, and transportation of people and cargo. Civilian aircraft have a wide range of paint schemes and use more colors than military aircraft. These aircraft are seen at civilian aerodromes.

### Cessna 172

The Cessna 172 is commonly used for primary flight training and familiarization flying. It is a four seat aircraft that has high wings, tricycle landing gear and a single propeller.



<http://www.airliners.net/search/photo.search?id=277285>

Figure 20 Cessna 172

### Piper PA-28 Cherokee

Another popular recreational and training aircraft is the Piper PA-28 Cherokee. This aircraft has low wings, tricycle landing gear and a single propeller.



<http://www.airliners.net/search/photo.search?id=246912>

Figure 21 Piper PA-28

### Boeing 737

The Boeing 737 is one of the world's most popular commercial jet transport aircraft. It is a short- to medium-range airplane. They can carry 85 to 189 passengers, depending on the model. The Boeing 737 is flown by airlines including WestJet and Sunwing. The Boeing 737 has a low-wing configuration and tricycle landing gear, like most commercial transport planes. It has two turbofan jet engines mounted under the wings.



<http://www.airliners.net>

Figure 22 Boeing 737

### **Airbus A320**

The Airbus A320 is a very popular commercial jet transport aircraft. They can carry 100 to 220 passengers, depending on the model. The Airbus 320 also has a low-wing configuration, nose gear, and two turbofan jet engines mounted under the wings. The biggest difference between the Airbus and the Boeing 737 is the technology in the cockpit. Airbus uses computer technology to a greater extent than Boeing. Air Canada flies the Airbus A320, and several other Airbus models.



<http://www.airliners.net/search/photo.search?id=313545>

Figure 23 Airbus A320

### **Bombardier 415**

The Bombardier 415 amphibious aircraft is the backbone of firefighting missions around the world. Launched in 1994, this high-wing, all-metal amphibian remains the only aircraft specifically designed for aerial firefighting. Its proven technology and fire-extinguishing power make it an effective machine for the job. This aircraft may also be configured for humanitarian relief, maritime SAR, surveillance and personnel transport.



[http://www.aircraftinformation.info/Images/Bombardier\\_415\\_02.jpg](http://www.aircraftinformation.info/Images/Bombardier_415_02.jpg)

Figure 24 Bombardier 415

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## **CONFIRMATION OF TEACHING POINT 2**

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### **QUESTIONS:**

- Q1. What aircraft is this? (Show Piper PA-28)
- Q2. What aircraft is this? (Show Boeing 737)
- Q3. What aircraft is this? (Show Cessna 172)

**ANTICIPATED ANSWERS:**

- A1. Civilian, Piper PA-28.  
 A2. Civilian, Boeing 737.  
 A3. Civilian, Cessna 172.

**Teaching Point 3****Identify cadet aircraft**

Time: 5 min

Method: Interactive Lecture

**CADET AIRCRAFT**

Cadet aircraft are used for training and familiarization flying. They are usually painted bright yellow and blue. (The term “cadet aircraft” is intended to mean aircraft currently owned by the cadet program and does not include other aircraft cadets may use on Power Flying Scholarships (other model Cessnas, Katanas, etc.).

**GLIDER****Schweitzer - SGS 2-33a Glider**

The Schweitzer SGS 233A is the glider used by the Air Cadet Gliding Program for training and familiarization flying. It is a sturdy, two-place tandem (front and back seating, instead of side by side) glider, with high wings. They can be launched by auto-tow, winch or tow-plane.



<http://www.aircadetleague.com/manitoba/Gliding.html>

Figure 25 SGS 233A Glider

**TOW AIRCRAFT****Bellanca Scout – 8GCBC**

The Bellanca Scout is one of the types of tow-planes used in the Air Cadet Gliding Program. It is a two-place tandem, high wing, tail-dragger aircraft.



<http://www.aircadetleague.com/manitoba/Gliding.html>

Figure 26 Bellanca Scout

### **L19 BIRD DOG – CESSNA 305 (C305)**

The L19 Bird Dog is another tow-plane used in the Air Cadet Gliding Program. Like the Scout, the Bird Dog is a two-place tandem, high wing, tail-dragger aircraft. The L19 has a rear window, and more of a bend to the fuselage than the Scout.



<http://www.aircadetleague.com/manitoba/Gliding.html>

Figure 27 L19 Bird Dog

### **Cessna 182P**

The Cessna 182P is another tow plane used in the Air Cadet Gliding Program. Like the Bird Dog, it has a rear window but has four seats instead of two. Unlike either the Scout or the Bird Dog, which are both tail-draggers, it has a tricycle landing gear.



<http://www.cadets.ca/regions/pac/air-aviation.aspx?id=95360&terms=cadet+tow+plane>

Figure 28 Cessna 182P

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## **CONFIRMATION OF TEACHING POINT 3**

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### **QUESTIONS:**

- Q1. What aircraft is this? (Show L19 Bird Dog)
- Q2. What aircraft is this? (Show Schweizer SGS 233A)
- Q3. What aircraft is this? (Show Bellanca Scout)

### **ANTICIPATED ANSWERS:**

- A1. Cadet, L19 Bird Dog.
- A2. Cadet, Schweizer SGS 233A.
- A3. Cadet, Bellanca Scout.

**Teaching Point 4****Conduct an aircraft identification game.**

Time: 25 min

Method: Game

**OBJECTIVE**

The objective of this activity is to have the cadets practice identifying military, civilian and cadet aircraft by participating in a memory matching game.

**RESOURCES**

- One set of aircraft identification matching cards located at Attachment B per group.

**ACTIVITY LAYOUT**

Set up the classroom with large flat areas, one for each group, to play the game.

**ACTIVITY INSTRUCTIONS**

1. Divide cadets into groups of four or less.
2. Issue each group one set of aircraft identification matching cards. The cards should be laid out in a five by four grid, face down (as illustrated in Figure 30).



*Note. Created by Director Cadets 3, 2009 Ottawa, ON: Department of National Defence.*

Figure 29 Five by Four Card Grid

3. Have the first cadet turn two cards over:
  - (a) if it is not a match, the cards are turned back face down and the turn passes to the next cadet.
  - (b) if it is a match:
    - (1) but the cadet is unable to identify the aircraft; the cards are turned back over and the turn passes to the next cadet; or
    - (2) and the cadet identifies the aircraft; the cadet keeps the two cards, and takes another turn.
4. The game can be repeated as time allows, mixing up the cards.



Circulate among the groups to supervise and assist as necessary.

Answer questions the cadets have about the game.

Ensure cadets are able to correctly identify the matching pairs before removing them from the grid.

**SAFETY**

Nil.

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**CONFIRMATION OF TEACHING POINT 4**

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

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**END OF LESSON CONFIRMATION**

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

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**CONCLUSION**

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**HOMEWORK/READING/PRACTICE**

Nil.

**METHOD OF EVALUATION**

Nil.

**CLOSING STATEMENT**

Aircraft identification is a fun way of getting involved in aviation. Cadets can apply this knowledge during aviation field trips, familiarization flying and any time they see aircraft.

**INSTRUCTOR NOTES / REMARKS**

Nil.

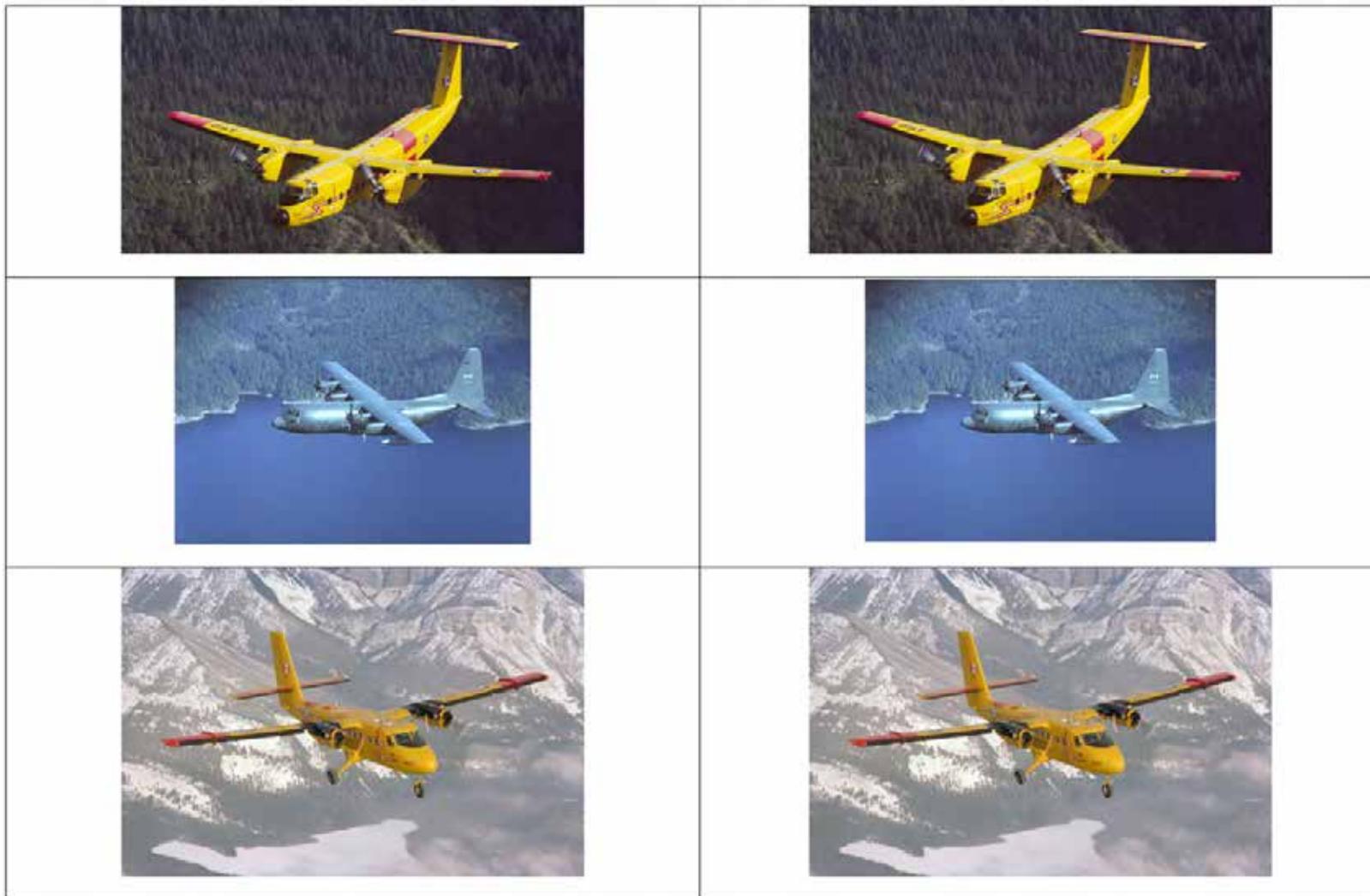
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**REFERENCES**

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A3-007 Canadian Forces. (2009). Retrieved 24 Jul 2009, from <http://www.airforces.forces.gc.ca/v2/equip/index-eng.asp>

**AIRCRAFT IDENTIFICATION MATCHING GAME CARDS**





















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|   |   |   |  |   |
|---|---|---|--|---|
| <p>CC-115 Buffalo</p>      | <p>CC-130 Hercules</p>   | <p>CC-138 Twin Otter</p>  | <p>CC-144 Challenger</p>  | <p>CC-150 Polaris</p>  |
| <p>CC-177 Globemaster</p>  | <p>CF-188 Hornet</p>     | <p>CH-124 Sea King</p>    | <p>CH-139 Jet Ranger</p>  | <p>CH-146 Griffon</p>  |
| <p>CH-147 Chinook</p>    | <p>CH-148 Cyclone</p>  | <p>CH-149 Cormorant</p>  | <p>CT-114 Tutor</p>      | <p>CT-142 Dash-8</p>  |

|   |  |   |   |   |
|---|--|---|---|---|
| <p>CT-155 Hawk</p>           | <p>CT-156 Harvard II</p>  | <p>CP-140 Aurora</p>                          | <p>CP-140A Arcturus</p>  | <p>Cessna 172</p>            |
| <p>Piper PA-28 Cherokee</p>  | <p>Boeing 737</p>         | <p>Airbus A320</p>                            | <p>Bombardier 415</p>    | <p>Schweitzer SGS 2-33A</p>  |
|   | <p>Bellanca Scout</p>   | <p>L19 Bird Dog –<br/>Cessna 305 (C305)</p>  | <p>Cessna 182P</p>      |   |

Time: 25 min

# EO M130.01

## IDENTIFY AIRCRAFT AS MILITARY, CIVILIAN AND CADET



# Military Aircraft Categories

- Carriers – CC (Transport)
- Fighters - CF
- Helicopters - CH
- Trainers - CT
- Patrol – CP

M130.01 – Identify Aircraft as Military, Civilian and Cadet



## Carrier (Transport) Aircraft

- CC-115 Buffalo
- CC-130 Hercules
- CC-138 Twin Otter
- CC-144 Challenger
- CC-150 A320 Polaris
- CC-177 (C-17) Globemaster III

M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CC-115 BUFFALO



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CC-130 HERCULES



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CC-138 TWIN OTTER



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CC-144 CHALLENGER



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CC-150 A320 POLARIS



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CC-177 (C-17) GLOBEMASTER III



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# Fighter Aircraft

- CF-188 (CF-18) Hornet



# CF-188 (CF-18) HORNET



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# Helicopters

- CH-124 Sea King
- CH-139 Jet Ranger
- CH-146 Griffon
- CH-147 Chinook
- CH-148 Cyclone
- CH-149 Cormorant

M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CH-124 SEA KING



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CH-139 JET RANGER



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CH-146 GRIFFON



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CH-147 CHINOOK



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CH-148 CYCLONE



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CH-149 CORMORANT



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# Patrol Aircraft

- CP-140 Aurora
- CP-140A Arcturus

M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CP-140 AURORA



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CP-140A ARCTURUS



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# Training Aircraft

- CT-114 Tutor
- CT-142 Dash-8
- CT-155 Hawk
- CT-156 Harvard II

M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CT-114 TUTOR



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CT-142 DASH-8



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CT-155 HAWK



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CT-156 HARVARD II



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# WHAT KIND OF AIRCRAFT ARE THESE?

M130.01 – Identify Aircraft as Military, Civilian and Cadet





M130.01 – Identify Aircraft as Military, Civilian and Cadet





M130.01 – Identify Aircraft as Military, Civilian and Cadet





M130.01 – Identify Aircraft as Military, Civilian and Cadet



## Civilian Aircraft

- Cessna 172
- Piper PA-28 Cherokee
- Boeing 737
- Airbus A320
- Bombardier 415

M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CESSNA 172



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# PIPER PA-28 CHEROKEE



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M130.01 – Identify Aircraft as Military, Civilian and Cadet



# BOEING 737



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# AIRBUS A320



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# BOMBARDIER 415



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# WHAT KIND OF AIRCRAFT ARE THESE?

M130.01 – Identify Aircraft as Military, Civilian and Cadet





M130.01 – Identify Aircraft as Military, Civilian and Cadet





M130.01 – Identify Aircraft as Military, Civilian and Cadet





M130.01 – Identify Aircraft as Military, Civilian and Cadet



## Cadet Aircraft

- Schweitzer SCG 2-33A
- Bellanca Scout 8 GCBC
- L19 Bird Dog – Cessna 305 (C305)
- Cessna 182P

M130.01 – Identify Aircraft as Military, Civilian and Cadet



# SCHWEITZER SCG 2-33A



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# BELLANCA SCOUT 8 GCBC



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# L19 BIRD DOG – CESSNA 305



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# CESSNA 182P



M130.01 – Identify Aircraft as Military, Civilian and Cadet



# WHAT KIND OF AIRCRAFT ARE THESE?

M130.01 – Identify Aircraft as Military, Civilian and Cadet





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M130.01 – Identify Aircraft as Military, Civilian and Cadet



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**ROYAL CANADIAN AIR CADETS**  
**PROFICIENCY LEVEL ONE**  
**INSTRUCTIONAL GUIDE**



**SECTION 2**

**EO M130.02 – DESCRIBE THE MAIN COMPONENTS OF AN AIRPLANE**

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Total Time:

30 min

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**PREPARATION**

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**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 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.

Create enough puzzle envelopes for each group with puzzle pieces as outlined at Attachments A to D. It is recommended that the cards be printed on heavy stock (450 g/m<sup>2</sup> / 120 lb) paper.

**PRE-LESSON ASSIGNMENT**

Nil.

**APPROACH**

An interactive lecture was chosen for this lesson as it allows the cadets to identify and describe the major components of an airplane and it generates interest in the subject.

---

**INTRODUCTION**

---

**REVIEW**

Nil.

**OBJECTIVES**

By the end of this lesson the cadet shall have described the main components of an airplane.

**IMPORTANCE**

A basic understanding of the components of an airplane provides a foundation for further aviation learning. It creates a familiarity that contributes to the cadets' appreciation of the familiarization flying and aviation tour experiences.



Before starting the class, split the cadets into groups as described in the activities. This allows for the class to be conducted within time limits.

---

**Teaching Point 1****Define aircraft and airplane. Describe the fuselage.**

Time: 5 min

Method: Interactive Lecture

---

**DEFINITIONS****Aircraft**

“An aircraft is a device that is used or intended to be used for flight in the air. Some examples of aircraft are hot air balloons, blimps, gliders, planes, helicopters, and hang-gliders.”

Aviation Safety Board, 2007.

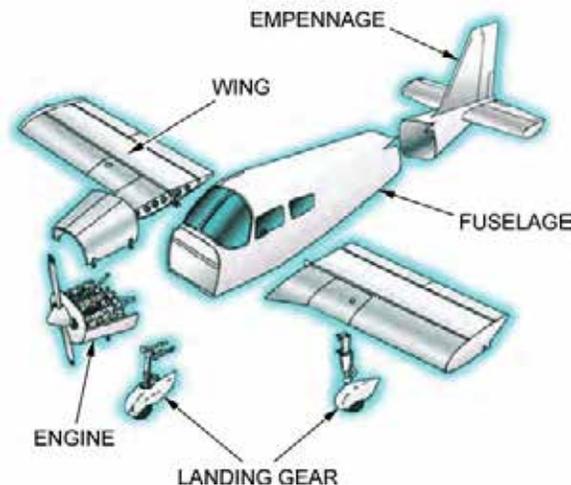
**Airplane**

“An airplane is a power-driven, heavier-than-air aircraft deriving its lift in flight from aerodynamic reactions (lift) on surfaces that remain fixed under given conditions of flight (wings).”

MacDonald, 2006.

**FUSELAGE**

The fuselage is the body of the aircraft, designed to accommodate the crew, passengers and cargo. The cockpit or crew flight deck is the part of the fuselage where the pilot and flight crew operate the aircraft. The fuselage is the structural body to which the wings, the tail section, landing gear and (in most small aircraft) the engine are attached.



*Note: From Free Online Private Pilot Ground School. (2007). Private Pilot Ground School. Retrieved December 14, 2011 from <http://www.free-online-private-pilot-ground-school.com/aircraft-structure.html>*

Figure 1 Airplane Components

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**ACTIVITY**Time: 1 min

---

**OBJECTIVE**

This objective of this activity is to familiarize the cadet with the five components of an airplane.

## RESOURCES

Basic Airplane Component Puzzle Pieces, one set per group.

## ACTIVITY LAYOUT

Divide the class into groups of four or less. Cadets will work in the same groups for all the puzzle activities.

## ACTIVITY INSTRUCTIONS

1. Provide each group with an envelope of puzzle pieces.
2. Give the groups one minute to put together the puzzle.

## SAFETY

Nil.

## INSTRUCTOR GUIDELINES

- Confirm the puzzles are assembled correctly.
- Assist cadets experiencing difficulty with the activity.

---

### CONFIRMATION OF TEACHING POINT 1

---

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

---

### Teaching Point 2

**Describe the wings.**

Time: 5 min

Method: Interactive Lecture

---



See Figure 1 – Airplane components to reference the location of these parts.

## WINGS

The fuselage is fitted with a wing on each side. The primary purpose of the wings is to support the aircraft in flight by producing lift.

The **wing root** is where the wing meets the fuselage.

The **wing tip** is the part farthest from the fuselage.

The **leading edge** is the front edge of the wing running from wing root to wing tip. The trailing edge is the back edge of the wing running from wing root to wing tip.

**Ailerons** are moveable surfaces that are hinged to the trailing edge of each wing, close to the wingtip. The ailerons control roll. Roll is the banking of the aircraft to the left and the right. The ailerons move in opposite directions to each other.

**Flaps** are moveable surface that are hinged to the trailing edge of each wing, closer to the wing root than the ailerons. They can be used during landing and take-off to provide more controlled flight at slower airspeeds. Flaps are operated with a lever or hand-wheel in the cockpit.

---

## ACTIVITY

Time: 1 min

---

### OBJECTIVE

The objective of this activity is to familiarize the cadet with the fuselage and wings.

### RESOURCES

Fuselage and Wing Puzzle Pieces, one set per group.

### ACTIVITY LAYOUT

Cadets will work in the same groups as the previous puzzle activity.

### ACTIVITY INSTRUCTIONS

1. Provide each group with an envelope of puzzle pieces.
2. Give the groups one minute to put together the puzzle.

### SAFETY

Nil.

### INSTRUCTOR GUIDELINES

- Confirm the puzzles are assembled correctly.
  - Assist cadets experiencing difficulty with the activity.
- 

## CONFIRMATION OF TEACHING POINT 2

---

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

---

### Teaching Point 3

**Describe the empennage.**

Time: 5 min

Method: Interactive Lecture

---

### EMPENNAGE

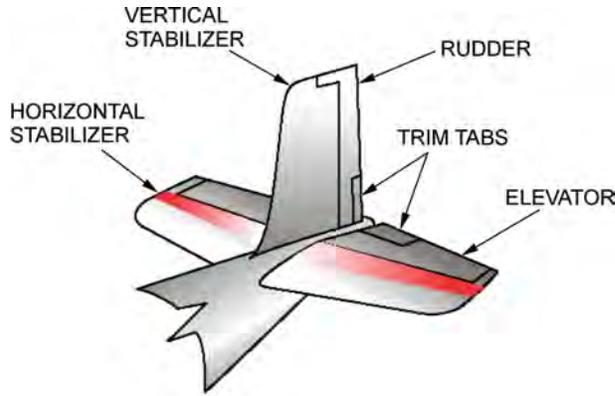
The empennage refers to the whole tail section of a plane. It includes the horizontal stabilizer, elevator, vertical stabilizer, and rudder.

The **horizontal stabilizer** is at the back of the aircraft, and helps keep the aircraft stable as it flies through the air. The horizontal stabilizer does not move.

The **elevator** is hinged to the horizontal stabilizer and is operated by moving the control column forward and backward. The elevator controls pitch. Pitch is the up and down movement of the aircraft's nose.

The **vertical stabilizer**, also called the fin, is an upright surface on the empennage. It helps keep the aircraft stable as it flies through the air. The vertical stabilizer does not move.

The **rudder** is hinged to the fin and is operated by the rudder pedals in the cockpit. The rudder controls yaw. Yaw is the side-to-side movement of the aircraft.



*Note: From Free Online Private Pilot Ground School. (2007). Private Pilot Ground School. Retrieved December 14, 2011 from <http://www.free-online-private-pilot-ground-school.com/aircraft-structure.html>*

Figure 2 Empennage Components

---

### ACTIVITY

Time: 1 min

---

#### OBJECTIVE

The objective of this activity is to familiarize the cadet with the empennage.

#### RESOURCES

Empennage Puzzle Pieces, one set per group.

#### ACTIVITY LAYOUT

Cadets will work in the same groups as the previous puzzle activity.

#### ACTIVITY INSTRUCTIONS

1. Provide each group with an envelope of puzzle pieces.
2. Give the groups one minute to put together the puzzle.

#### SAFETY

Nil.

#### INSTRUCTOR GUIDELINES

- Confirm the puzzles are assembled correctly.
- Assist cadets experiencing difficulty with the activity.
- This puzzle will attach to the puzzle from TP2.

---

### CONFIRMATION OF TEACHING POINT 3

---

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

---

**Teaching Point 4****Describe the landing gear.**

Time: 5 min

Method: Interactive Lecture

---

**LANDING GEAR**

Landing gear on an airplane is like the tires on a car. The landing gear supports the aircraft when it is on the ground and absorbs the shock of landing. All aircraft have their landing gear under the main part of the fuselage or wings. Landing gear can be fixed or retractable. Fixed gear is attached to the airplane in a permanent position. Retractable gear can fold up into the wings or the fuselage.

There are two main landing gear configurations. Both configurations have the main wheels or main gear toward the middle of the aircraft. In a nose wheel configuration (also called tricycle) there is another wheel or gear under the nose. In a tail wheel configuration (also called conventional or tail dragger) there is another wheel or gear under the tail.



*Note: From Bush-Planes.com. Best bush planes: flying. Retrieved December 14, 2011 from <http://www.bush-planes.com/index.html>*

Figure 3 Nose Gear v. Tail Gear

---

**CONFIRMATION OF TEACHING POINT 4**

---

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

---

**Teaching Point 5****Describe the propulsion system.**

Time: 5 min

Method: Interactive Lecture

---

**PROPULSION SYSTEM**

Power is produced by an internal combustion engine (the same as a car) with a two or three bladed propeller or a gas turbine (jet) engine. A jet can be used to power a propeller – this is called a turboprop engine.

The cowling (also called the nacelle) is like the hood of a car. It encloses the engine and streamlines the airplane to reduce drag. The cowling provides cooling of the engine by ducting cool air around the engine.

---

**ACTIVITY**

---

Time: 1 min

---

**OBJECTIVE**

This objective of this activity is to familiarize the cadet with the landing gear and propulsion system.

## **RESOURCES**

Landing Gear and Propulsion System Puzzle Pieces, one set per group.

## **ACTIVITY LAYOUT**

Cadets will work in the same groups as the previous puzzle activity.

## **ACTIVITY INSTRUCTIONS**

1. Provide each group with an envelope of puzzle pieces.
2. Give the groups one minute to assemble the puzzle.

## **SAFETY**

Nil.

## **INSTRUCTOR GUIDELINES**

- Confirm the puzzles are assembled correctly.
- Assist cadets experiencing difficulty with the activity.
- This puzzle will attach to the puzzle from TP3.

---

### **CONFIRMATION OF TEACHING POINT 5**

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

---

### **END OF LESSON CONFIRMATION**

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

---

### **CONCLUSION**

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## **HOMEWORK / READING/PRACTICE**

Nil.

## **METHOD OF EVALUATION**

Nil.

## **CLOSING STATEMENT**

Being able to describe the main components of an airplane gives the cadets the knowledge needed to appreciate and successfully participate in further aviation lessons.

## **INSTRUCTOR NOTES / REMARKS**

Nil.

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**REFERENCES**

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A3-001 A-CR-CCP-263/PT-001 *From the ground up: Millennium edition (28<sup>th</sup> edition)*. (2000). Ottawa, ON: Aviation Publishers.

C3-023 *Electronic Code of Federal Regulations Title 14: Aeronautics and Space, Section 1.1 (2005)*. Retrieved 25 April 2006 from [www.ecfr.gpoaccess.gov](http://www.ecfr.gpoaccess.gov)

C3-346 Bush-Planes.com. *Best bush planes: flying*. Retrieved December 14, 2011 from <http://www.bush-planes.com/index.html>

C3-347 Free Online Private Pilot Ground School. (2007). *Private Pilot Ground School*. Retrieved December 14, 2011 from <http://www.free-online-private-pilot-ground-school.com/aircraft-structure.html>

C3-348 FAA-Aircraft-Certification.com. *Your complete guide to FAA aircraft certification*. (2007). Retrieved October 17, 2011, from <http://www.faa-aircraft-certification.com/faa-definitions.html#H>

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**ROYAL CANADIAN AIR CADETS**  
**PROFICIENCY LEVEL ONE**  
**INSTRUCTIONAL GUIDE**



**SECTION 3**

**EO M130.03 – CONSTRUCT A MODEL AIRPLANE**

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Total Time:

60 min

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**PREPARATION**

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**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 instructional guide within the TP for which they are required.

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

Prepare a completed model airplane and collect model material and tools.

Photocopy Paper Model Assembly Instruction located at Attachment A and Attachment B, one for each cadet.

**PRE-LESSON ASSIGNMENT**

Nil.

**APPROACH**

An in-class activity was chosen for TP 1 as it is an interactive way to present the content and the construction of a model airplane.

A group discussion was chosen for TP 2 as it allows the cadets to interact with their peers and share their knowledge about building a model airplane.

---

**INTRODUCTION**

---

**REVIEW**

The review for this lesson is EO M130.02.

**OBJECTIVES**

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

**IMPORTANCE**

Cadets have learned to identify the components of an airplane. This knowledge will be useful during familiarization flights, hangar visits, and other aviation activities. Being able to construct a model airplane provides cadets a method of confirming their knowledge of airplane components.

**Teaching Point 1****Construct a model airplane.**

Time: 45 min

Method: In-Class Activity

**ACTIVITY**

Time: 30 min

**OBJECTIVE**

The objective of this activity is to have the cadets construct a model airplane.



The purpose of this model is to incorporate the major components as discussed in M130.02 – NOT to build a flying model. With the propeller and landing gear attached, this model will be too heavy to fly. The assembly time provided in this lesson does not allow sufficient drying time to produce an airworthy model. Aerodynamic features of assembly have been omitted for simplicity.

**RESOURCES**

- Paper model template (one per cadet),
- Instruction sheet located at Attachment A (one per cadet),
- Thumbtack (one per cadet),
- 1" binder clip (one per cadet),
- Scissors (one pair per cadet),
- Glue stick (one stick per two cadets), and
- Markers (to be shared by all cadets).

**ACTIVITY LAYOUT**

Nil.



Supervise the cadets' work to ensure that they are following the instructions provided.

While supervising and assisting as needed, ask cadets to identify parts of the airplane.

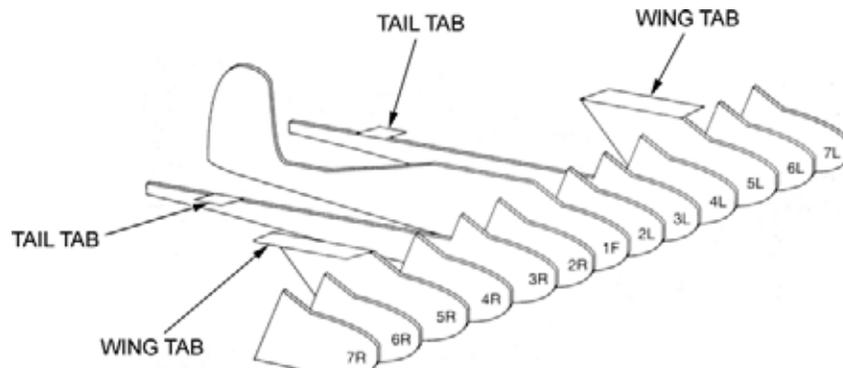
Ensure cadets identify the leading and trailing edges of the wings and attach the wings facing the correct direction

Ask other instructors to assist in supervising the activity and assisting in answering questions.

**ACTIVITY INSTRUCTIONS**

1. Provide the cadets with the instructions sheet located at Attachment A.
2. Have the cadets cut out all the airplane pieces. Cadets must be careful not to mix their pieces with others around them.

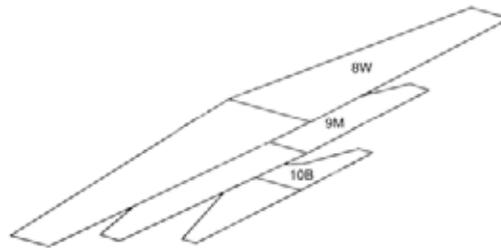
- Have the cadets assemble the fuselage by gluing pieces 1F through 7R and 7L to build up fuselage layers, carefully aligning parts. Ensure that the entire contacting surface of a smaller piece being fastened to a larger one is completely covered with glue.



*Adapted from Fabulous Paper Gliders*

Figure 1 Fuselage Assembly

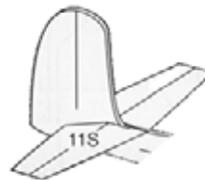
- Have the cadets assemble the wings by gluing 9M to the bottom of wing part 8W. Glue 10B to the bottom of 9M making sure the wing parts are aligned along the centreline. Fold down the wing tabs on the fuselage, and apply glue to them. Fasten the wing assembly to the fuselage.



*Adapted from Fabulous Paper Gliders*

Figure 2 Wing Assembly

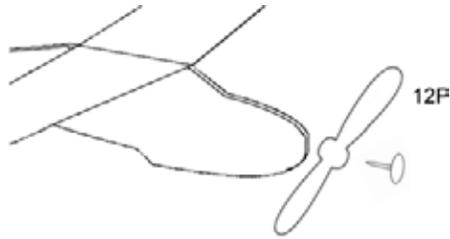
- Have the cadets assemble the tail by folding down the tail tabs on the fuselage, and applying glue to them. Fasten the horizontal stabilizer 11S to the fuselage.



*Adapted from Fabulous Paper Gliders*

Figure 3 Tail Assembly

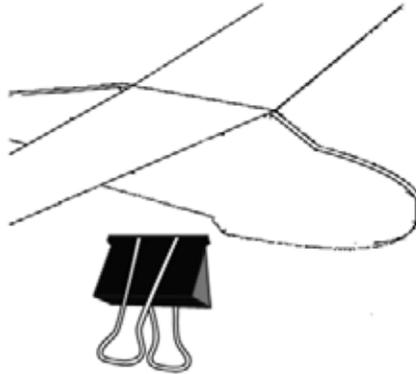
- Have the cadets attach the propeller by piercing the centre of 12P with the thumbtack, and pushing the thumbtack into the centre of the fuselage assembly.



*Adapted from Fabulous Paper Gliders*

Figure 4 Propeller Assembly

7. Have the cadets attach the landing gear by clipping the binder clip to the bottom of the fuselage, underneath the wings.



*Adapted from Fabulous Paper Gliders*

Figure 5 Landing Gear Assembly

8. Have the cadets color the model as desired.
9. Have the cadets clean up, discarding all scrap paper and return materials.



Once the activity has been completed, examine the model airplanes to ensure that all of the components are assembled correctly.

### **SAFETY**

Care should be taken when handling the thumbtacks, scissors, and glue.

### **INSTRUCTOR GUIDELINES**

Nil.

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### **CONFIRMATION OF TEACHING POINT 1**

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The cadets' participation in the assembly of an airplane will serve as the confirmation of this TP.

**Teaching Point 2****Participate in a group discussion on parts of an airplane and constructing the model airplane.**

Time: 5 min

Method: Group Discussion

**TIPS FOR ANSWERING/FACILITATING DISCUSSION:**

- Ask questions that help facilitate discussion; in other words, avoid questions with yes or no answers.
- Prepare questions ahead of time.
- Be flexible (you are not bound to only the prepared questions).
- Encourage cadets to participate by using praise such as “great idea” or “excellent response, can anyone add to that?”.
- Try to involve everyone by directing questions to non-participants.

**SUGGESTED QUESTIONS:**

- Q1. What did you learn about airplane parts from this activity?
- Q2. How did this activity help you understand airplanes better?

**CONFIRMATION OF TEACHING POINT 2**

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

**END OF LESSON CONFIRMATION**

Review the components of an airplane with the following questions, using the model created by the cadets as a training aid. Point out the various components of an airplane discussed in the previous class.

**SUGGESTED QUESTIONS:**

- Q1. What is the purpose of the landing gear?
- Q2. Where are the ailerons located?
- Q3. What movement does the rudder produce?

**SUGGESTED ANSWERS:**

- A1. The landing gear supports the aircraft when it is on the ground and absorbs the shock of landing.
- A2. Ailerons are hinged to the trailing edge of each wing, close to the wingtip. .
- A3. The rudder controls the movement called yaw. Yaw is the side-to-side movement of the aircraft.

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**CONCLUSION**

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**HOMEWORK / READING / PRACTICE**

Nil.

**METHOD OF EVALUATION**

Nil.

**CLOSING STATEMENT**

Model building is an excellent opportunity to apply theoretical knowledge. Being able to identify and describe the main components of an airplane allows the cadets to more actively participate aviation activities.

**INSTRUCTOR NOTES / REMARKS**

Nil.

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**REFERENCES**

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

C3-017 ISBN 1-895569-23-0 Schmidt, N. (1998). *Fabulous Paper Gliders*. Sterling Publishing: New York, NY.

### PAPER MODEL ASSEMBLY INSTRUCTIONS

1. Cut out all the airplane pieces. Be careful not to mix your pieces with others.

2. Glue pieces 1F through 7R and 7L to build up fuselage layers, carefully aligning parts. Ensure that the entire contacting surface of a smaller piece being fastened to a larger one is completely covered with glue.

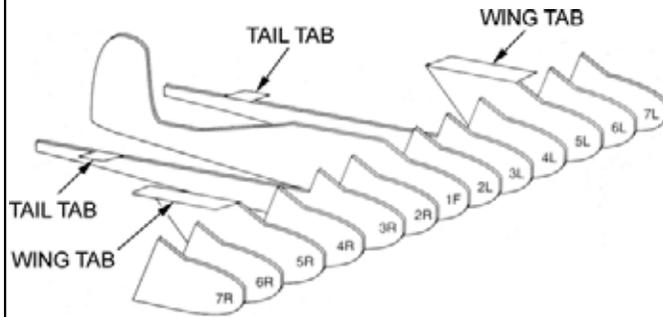


Figure A-1 Fuselage Assembly

3. To assemble the wings, glue 9M to the bottom of wing part 8W. Then glue 10B to the bottom of 9M. Make sure the wing parts are aligned along the centreline. Fold down the wing tabs on the fuselage, and apply glue to them. Fasten the wing assembly to the fuselage.

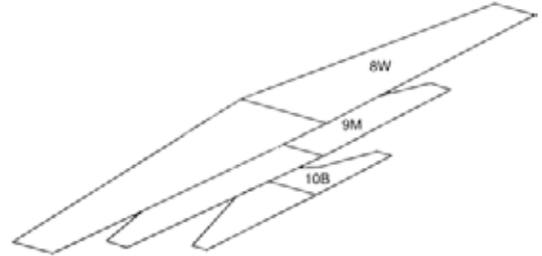


Figure A-2 Wing Assembly

4. To assemble the tail, fold down the tail tabs on the fuselage, and apply glue to them. Fasten the horizontal stabilizer 11S to the fuselage.

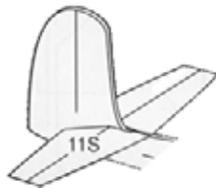


Figure A-3 Tail Assembly

5. To attach the propeller, pierce the centre of 12P with the thumbtack, and push the thumbtack into the centre of the fuselage assembly.

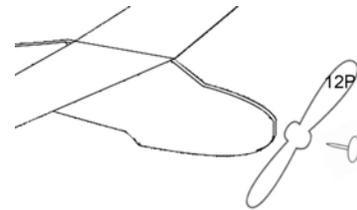


Figure A-4 Propeller Assembly

6. To attach the landing gear, clip the binder clip to the bottom of the fuselage, underneath the wings.

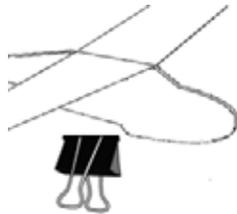
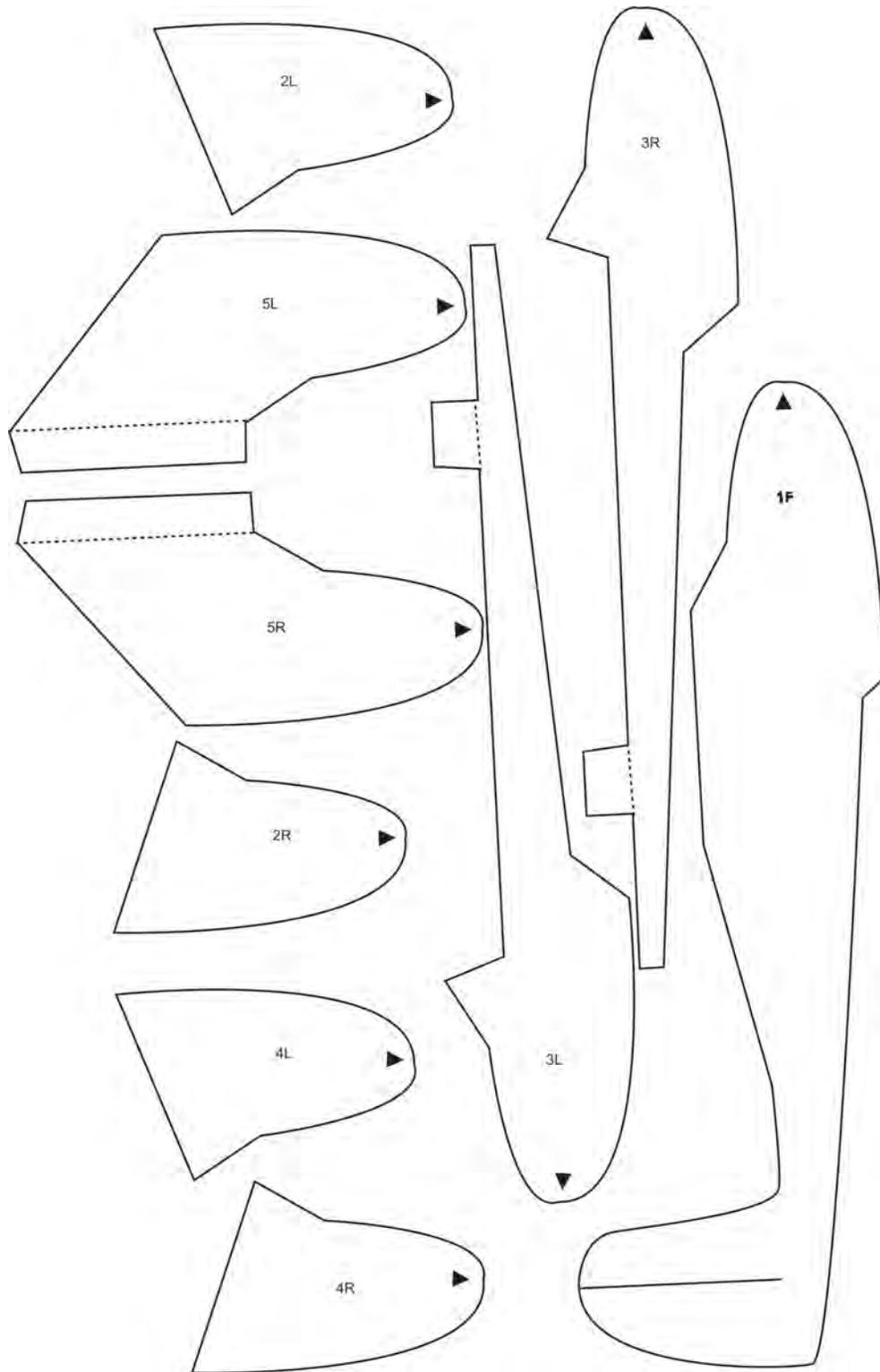
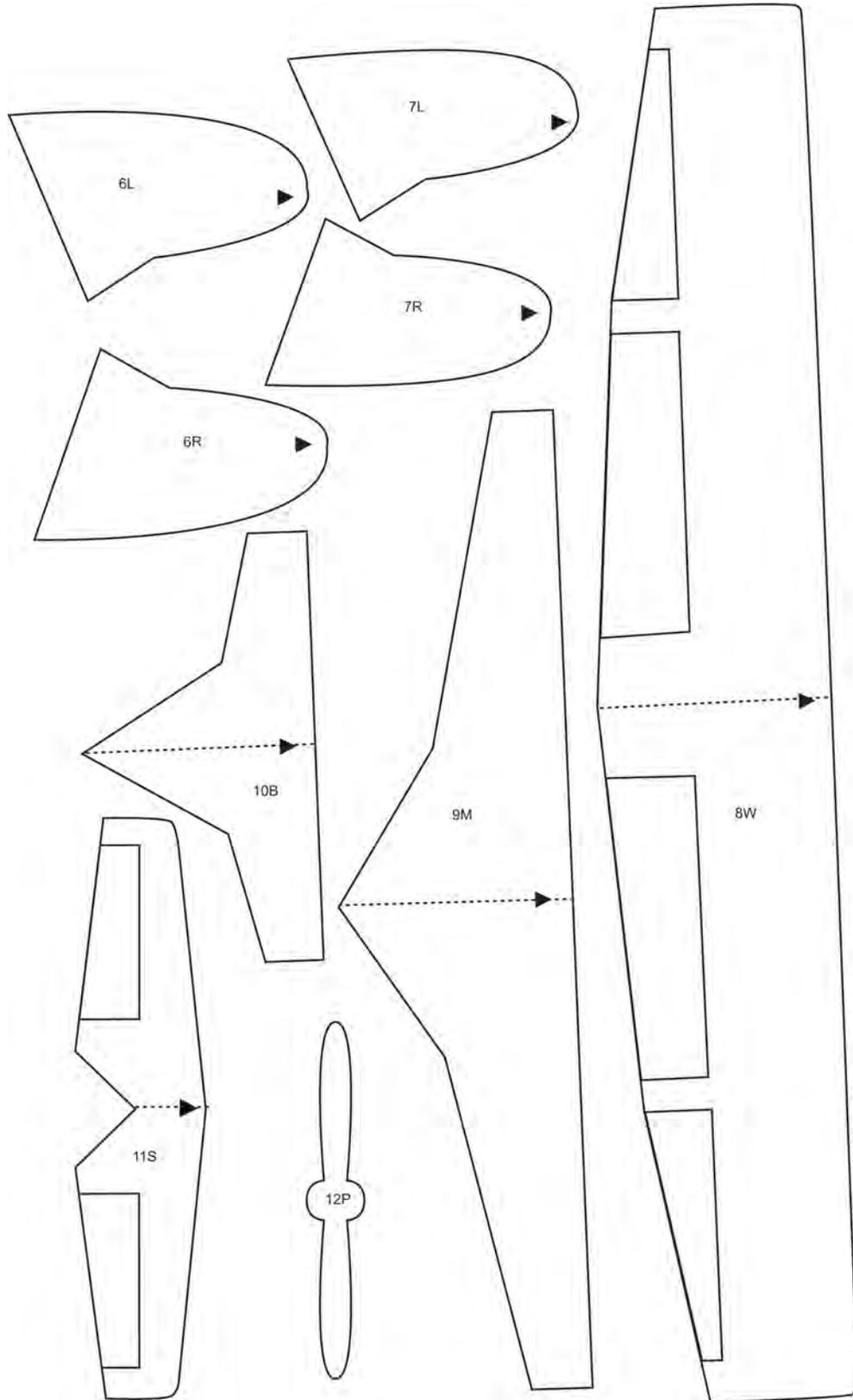


Figure A-5 Landing Gear Assembly

7. Color the model as desired.

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**ROYAL CANADIAN AIR CADETS**  
**PROFICIENCY LEVEL ONE**  
**INSTRUCTIONAL GUIDE**



**SECTION 4**

**EO M130.04 – WATCH AN *ON CANADIAN WINGS* SEGMENT**

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|             |        |
|-------------|--------|
| Total Time: | 30 min |
|-------------|--------|

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**PREPARATION**

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**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 instructional guide within the TP for which they are required.

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

Prepare a suitable classroom area with available media.

**PRE-LESSON ASSIGNMENT**

Nil.

**APPROACH**

An in-class activity was chosen as it is an interactive way to present the content.

---

**INTRODUCTION**

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**REVIEW**

Nil.

**OBJECTIVES**

By the end of this lesson the cadet shall have watched an *On Canadian Wings* segment.

**IMPORTANCE**

Discovering Canadian aviation history will give cadets a better understanding of the current role of aviation in Canada. Knowledge gained in this lesson will assist in stimulating an interest in the RCAF.

**Teaching Point 1****Watch an *On Canadian Wings* segment.**

Time: 25 min

Method: In-Class Activity

**ACTIVITY**

Time: 25 min

**OBJECTIVE**

The objective of this activity is to become familiar with Canadian aviation history through watching an episode of *On Canadian Wings*.

**RESOURCES**

Select one video segment. The video segments include the following information:

**EPISODE: CANADA'S FIRST FLIGHT**

The shaky flights of flying machines sow the seeds for military aviation. Soon hundreds of Canadian flying cadets are shown dashing around in their biplanes. Canada's first aircrews are on their way to war.

Length (00:13:26)

**EPISODE: AERIAL WARFARE**

Canadian aircrews serve in fighter squadrons at Dunkirk and go into action against German Zeppelins, seaplanes and U-boats. Canadian flying aces Major Billy Bishop, Major Raymond Collishaw and Major Billy Barker become household names.

Length (00:12:22)

**EPISODE: THE BIRTH OF A NATIONAL AIR FORCE**

With little fanfare, the RCAF comes into being on April 1, 1924. As war clouds loom over Europe, the new air force is on active service. The RCAF grows to the fourth largest air force of the allied nations.

Length (00:11:58)

**EPISODE: THE AERODROME OF DEMOCRACY**

Canadian squadrons see sustained combat in the Battle of Britain and help to keep the sea lanes from Canada to England open. RCAF schools across Canada train more than 150,000 Commonwealth air and groundcrews.

Length (00:12:48)

**EPISODE: SOME OF THE FEW**

Flying aces F/L Buzz Beurling, Wing Commander Johnnie Johnson and Flight Lt. D.E. Hornell are immortalized with a string of spectacular wartime successes.

Length (00:12:22)

**EPISODE: BOMBS OVER EUROPE**

The famous No. 6 Bomber Group is formed as the bomber offensive heats up over Europe. Squadron Leader Ian Bazalgette and Pilot Officer Andrew Mynarski each earned a Victoria Crosses (VC).

Length (00:12:55)

**EPISODE: FAST TIMES FOR THE GOLDEN JETS**

Canadian aircrews are again involved in combat over Korea. The Golden Hawks formation flying team of F86 Sabres – the Spitfires of the jet age, dazzle audiences around the world.

Length (00:12:37)

**EPISODE: A TIME OF TRANSITION**

Canada develops the Avro Arrow – a supersonic jet fighter that could out fly anything in the world. The Diefenbaker government mysteriously cancels the project and destroys all drawing and prototypes.

Length (00:11:57)

**EPISODE: THERE SHALL BE WINGS**

Canada's air force support North Atlantic Treaty Organization (NATO) and United Nations (UN) operations in the Balkans, the Middle East, Africa, Central America and Haiti, and humanitarian relief worldwide.

Length (00:13:00)

**ACTIVITY LAYOUT**

Arrange the room to ensure all cadets are able to see and hear the video segment.

**ACTIVITY INSTRUCTIONS**

1. Introduce the video segment to be shown.
2. Show the complete video segment.
3. Following the segment, have the cadets answer questions specific to the chosen segment.

**SAFETY**

Nil.

**INSTRUCTOR GUIDELINES**

Choose one of the following sets of questions to pose, based on the segment selected.

---

**CONFIRMATION OF TEACHING POINT 1**

---

**SUGGESTED QUESTIONS:**

***Canada's First Flight***

- Q1. Who were the founding members of the Aerial Experimental Association?
- Q2. What was the name of the aircraft they initially used?
- Q3. In which year did the first aviation policy appear?
- Q4. How many people were members of the Canadian aviation corps?

- A1. Alexander Graham Bell, J.A.D. McCurdy, Casey Bothman.
- A2. The Silver Dart.
- A3. 1907.
- A4. Three People.

***Aerial Warfare***

- Q1. How long did the strategic bombing campaign last?
- Q2. How many zeppelins were destroyed during World War 1 (WW 1)? How many by Canadians?
- Q3. Who was Billy Bishop and what did he do?

- A1. One Year.
- A2. 12 destroyed, 6 of them by Canadians.
- A3. Billy Bishop was one of the first Canadian aviation aces. He had 72 confirmed victories and was decorated with the Victoria Cross.

***The Birth of a National Air Force***

- Q1. What major event occurred in 1920?
- Q2. What was the goal of military aviation at that time?
- Q3. Where was the largest pilot training camp situated?
- Q4. In 1937 the RCAF was given a very precise mandate, what was that mandate?

- A1. The CAF was dismantled.
- A2. Cartography, medical evacuations, ice patrols, surveillance and fighting forest fires.
- A3. Borden, Ontario.
- A4. To defend Canadian airspace.

***The Aerodrome of Democracy***

- Q1. What was Canada's role at the beginning of WW 2?
- Q2. Most of the pilots were trained on which aircraft?

Q3. How many Squadrons were initially based in Halifax?

Q4. How many U-boats did the RCAF sink?

A1. Canada was an immense centre of pilot training for the Commonwealth nations.

A2. Tiger Moth.

A3. Five.

A4. Twenty-seven.

### ***Some of the Few***

Q1. Name the ace of Canadian aces during WW II?

Q2. Which Canadian squadron was victorious over the most enemy aircraft in 1944 and how many aircraft did they shoot down?

Q3. Name the two new types of aircraft used by Canada as the end of the war approached.

A1. Buzz Beurling.

A2. 418 Sqn with 103 confirmed victories.

A3. Mustang, Typhoon, and Mosquito.

### ***Bombs over Europe***

Q1. What was the first Canadian bomber Squadron and when was it created?

Q2. Which bombers did Canadians use?

Q3. Who was the commander of the first all-Canadian Squadron in Great Britain?

A1. 405 Sqn was formed in April 1941.

A2. Wellington, Halifax, Lancaster, Liberator, and Mosquito.

A3. Johnny Fauquier.

### ***Fast times for the Golden Jets***

Q1. In 1948, Canada acquired numerous aircraft. What were they and how many were acquired?

Q2. Canada was divided, due to resources, into several search and rescue regions. How many regions and how many aircraft were assigned to this task?

Q3. What was the name of the aircraft and the training base used in the formation of the first military aviation demonstration team?

Q4. Canada began the construction of its own all-Canadian aircraft. What was its name?

A1. Eighty-five Vampires.

A2. Five regions and 34 aircraft.

A3. Blue Devils flew Vampires at St-Hubert, Quebec (QC).

A4. CF-100 Canuck.

***A Time of Transition***

- Q1. What aircraft was supposed to replace the CF-100?
- Q2. Following the failure of the Avro Arrow, which aircraft did Canada buy?
- Q3. What major event occurred in 1968?
- Q4. New aircraft appeared during this period. Name at least 3 of them.

- A1. The Avro Arrow.
- A2. F-101 Voodoo.
- A3. The unification of the three branches of the Canadian Forces.
- A4. Caribou, Buffalo, Hercules, Tutor, Dassault Falcon, Sea King, and CF 5 Freedom Fighter.

***There Shall be Wings***

- Q1. In which year was the aerial command group formed?
- Q2. In which year did the first CF-18 (CF-188 Hornet) arrive in Canada?
- Q3. How many Canadian CF-18s were sent to serve during the Gulf War?

- A1. 1975.
- A2. 1981.
- A3. Twenty-four.

---

**END OF LESSON CONFIRMATION**

---

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

---

**CONCLUSION**

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**HOMEWORK / READING / PRACTICE**

Nil.

**METHOD OF EVALUATION**

Nil.

**CLOSING STATEMENT**

Discovering Canadian aviation history will give cadets a better understanding of the current role of aviation in Canada. Knowledge gained in this lesson will assist in stimulating an interest in the RCAF.

**INSTRUCTOR NOTES / REMARKS**

The instructor shall choose only one segment to watch for the mandatory period.

The instructor may choose to view and discuss additional segments as part of complementary training, C130.03 (Watch an *On Canadian Wings* Segment).

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**REFERENCES**

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C3-039 Squires, C. (1999). *On Canadian wings* [Series]. Winnipeg, MB: PWGSC.

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**ROYAL CANADIAN AIR CADETS**  
**PROFICIENCY LEVEL ONE**  
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**SECTION 5**

**EO C130.01 – PARTICIPATE IN A WALK-AROUND AIRCRAFT INSPECTION**

---

|             |        |
|-------------|--------|
| 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 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.

Ensure access to single engine, non-high performance airplane.

Arrange for 1 qualified pilot per 10 cadets (maximum group size) to conduct the inspection.

**PRE-LESSON ASSIGNMENT**

Nil.

**APPROACH**

An in-class activity was chosen for TP 1 as it is an interactive way to present a walk-around aircraft inspection.

A group discussion was chosen for TP 2 as it allows the cadets to interact with their peers and share their knowledge about and experience with walk-around aircraft inspection.

---

**INTRODUCTION**

---

**REVIEW**

Nil.

**OBJECTIVES**

By the end of this lesson the cadet shall have participated in a walk-around aircraft inspection.

**IMPORTANCE**

Carefully inspecting an airplane before flight is one way the pilot ensures that the airplane is operational and safe. The walk-around inspection is an opportunity to apply knowledge of major airplane components. It is an introduction to the culture of safety that surrounds aviation.

**Teaching Point 1****Supervise a walk-around aircraft inspection.**

Time: 20 min

Method: In-Class Activity

**BACKGROUND KNOWLEDGE**

This information is representative only. Always refer to and follow the recommendations of the manufacturer in carrying out any inspections and procedures. Individual models of airplane may have special procedures and inspection guidelines that may vary from the information given in this guide.

**GENERAL**

Flight safety includes the possession of knowledge, using common sense, and self-discipline. Thorough inspections and following established procedures allows a pilot to ensure that important safety considerations are not overlooked. One of these practices is conducting a walk-around inspection of the aircraft before a flight. The purpose of the walk-around is to notice any damage or condition that may pose a safety hazard to the flight. A walk-around can identify problems early in the flight preparation process, so that changes can be made if necessary (eg, minor repairs, changing aircraft, etc.). If any damage is noticed, it should be brought to the attention of an aircraft maintenance engineer, and noted in the aircraft's technical logbook. It is ultimately the pilot's decision whether an aircraft is in condition to fly. It is always better to make a decision on the side of safety, than to be caught in a potentially dangerous situation while flying.

**CABIN**

Before beginning the external inspection of the airplane, there are some preparatory things to be done inside the cabin.

Control locks should be removed. The control lock is a device that makes the control column / yolk immobile, so that the control surfaces (ailerons and elevators) do not move in the wind.

The pilot should ensure that the ignition is off, to avoid an unintended engine start.

The master switch controls power to the electrical systems in the airplane. The master switch should be turned on to supply power to the fuel gauges and the flaps. The fuel level indicated on the fuel gauges should be noted. This indicated level is cross-checked with a visual check of the actual fuel levels. The flaps should be fully lowered. The master switch should then be turned off to avoid draining the battery.

**WINGS**

Aircraft that are parked outside overnight are usually tied down to anchors beneath the wings and tail. The wing tie-downs should be removed from the airplane. There may be external control locks placed over the ailerons to prevent movement. These should be removed.

The flap sliders should be inspected to ensure secure attachment and minimal "play" or unwanted freedom of movement.

The aileron attachment points should be inspected to ensure security. The ailerons should be moved through their full range of motion to confirm correct and free movement.

All wing surfaces, the leading edge, and the trailing edge should be checked for dents, tears, cracks, wrinkles, bulges or missing rivets.

A small amount of fuel should be drained from the fuel tank drain valve and visually checked to see if there is any water or sediment in the fuel. Water appears as bubbles at the bottom of the cup as water is heavier than fuel. The fuel should also be checked to see that it is the correct fuel grade. Different grades of fuel are different colours. One hundred low lead is the fuel grade most commonly used in light aircraft, and is coloured blue.

The fuel levels should be visually confirmed by removing the fuel cap and using a dipstick. The fuel cap must be properly secured after checking the fuel.

The pitot tube is connected to the instruments in the cockpit. In order for it to work properly, it must be clear of obstructions.

## **FUSELAGE**

The baggage compartment should be checked to see if there is anything stored there that may be required for the flight, such as a survival kit. Knowing what is on board the airplane is important for calculating the weight and balance.

All fuselage surfaces should be checked for dents, tears, cracks, wrinkles, bulges or missing rivets.

The static port is connected to the instruments in the cockpit. In order for it to work properly, it must be clear of obstructions.

## **EMPENNAGE**

If the aircraft is tied down, the tie-downs from the tail must be removed. External control locks should be removed.

All empennage surfaces should be checked for dents, tears, cracks, wrinkles, bulges or missing rivets.

The rudder and elevator attachment points should be inspected to ensure security. The rudder and elevator should be moved through their full ranges of motion to confirm correct and free movement.

## **LANDING GEAR**

Wheel chocks are used to keep the airplane from rolling while parked. They should be removed.

The wheels and brakes should be checked to ensure there is no excessive wear or fluid leaks.

The tires should be checked to ensure they are properly inflated and there are no signs of excessive wear or damage.

## **ENGINE**

Extra caution should always be exercised around the propeller arc. The propeller should be checked for damage or evidence of a propeller strike. This could indicate damage to the engine.

The openings to the cowling should be checked for obstructions, particularly bird or animal nests.

The oil level is checked with a dipstick, and should be within the prescribed limits. The cap and dipstick must be secured after checking the oil.

A small amount of fuel should be drained from the main fuel strainer to clear any water or sediment that may have accumulated.

---

## ACTIVITY

Time: 20 min

---



The cadets should be guided through a complete walk-around inspection. The instructor / pilot should cover all of the relevant information provided in the background information section of this guide.

### OBJECTIVE

The objective of this activity is designed to familiarize the cadet with the procedures of a walk-around aircraft inspection.

### RESOURCES

- Single engine, non-high performance airplane,
- Operator's manual inspection checklist for the aircraft type,
- Fuel dipstick, and
- Fuel drain cup.

### ACTIVITY LAYOUT

Nil.

### ACTIVITY INSTRUCTIONS

1. Divide the cadets into groups of ten or less. Brief all cadets on the safety guidelines before beginning the inspection.
2. If there is more than one group inspecting one plane, they should start at opposite points (eg, opposite wings, or nose and tail).
3. Have the groups walk around and conduct an aircraft inspection.

### SAFETY

- Caution should always be exercised around the propeller arc.
- Identify boundaries.
- Only the aircraft involved in the lesson can be touched.

---

### CONFIRMATION OF TEACHING POINT 1

---

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

**Teaching Point 2****Lead a group discussion about what the cadets learned and found interesting.**

Time: 5 min

Method: Group Discussion

**BACKGROUND INFORMATION****Background Information**

You have had the opportunity to participate in a walk-around aircraft inspection during which you saw the process to inspect various parts of the aircraft. The walk-around aircraft inspection can identify problems that require minor repairs or changing the aircraft that is not serviceable.

**DISCUSSION QUESTIONS****TIPS FOR ANSWERING / FACILITATING DISCUSSION:**

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions. Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.



Cadets can be divided into more than one group to conduct the group discussion. This enables all cadets the opportunity to participate in the discussion if the initial group is too large. Assistant instructors will be needed to conduct this activity.

**SUGGESTED QUESTIONS:**

Q1. Why is it important to conduct a walk-around aircraft inspection?

Q2. What would a pilot do if damage to the airplane is noticed?

Q3. How would a pilot change the walk-around procedure if the pilot was in a hurry to go flying?

(The pilot wouldn't! Procedures, checklists, and inspections are too important!)



Other questions and answers will develop throughout the discussion stage. The group discussion should not be limited to the suggested questions.



Reinforce those answers given and comments made during the group discussion, ensuring the teaching point is covered. Cadets should be given time to share information, experiences and feelings about the aircraft inspection.

---

### CONCLUSION

---

#### HOMEWORK / READING / PRACTICE

Nil.

#### METHOD OF EVALUATION

Nil.

#### CLOSING STATEMENT

The walk-around inspection is one of the procedures followed to ensure the safety of a flight. Carefully following procedures on every flight is very important to ensure nothing is overlooked. Safety is paramount in aviation.

#### INSTRUCTOR NOTES / REMARKS

This lesson should be conducted by a qualified pilot / in conjunction with familiarization flying.

---

### REFERENCES

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A3-001 A-CR-CCP-263/PT-001 *From the ground up: Millennium edition (28<sup>th</sup> edition)*. (2000). Ottawa, ON: Aviation Publishers.



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**SECTION 6**

**EO C130.02 – IDENTIFY INTERNATIONAL AIRCRAFT**

---

|             |        |
|-------------|--------|
| 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 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.

Prepare PowerPoint presentation or a slideshow with pictures located at Attachment A.

**PRE-LESSON ASSIGNMENT**

Nil.

**APPROACH**

An interactive lecture was chosen for this lesson to orient the cadets to identifying international aircraft and generate interest.

---

**INTRODUCTION**

---

**REVIEW**

Nil.

**OBJECTIVES**

By the end of this lesson the cadet shall have identified international aircraft.

**IMPORTANCE**

Being able to identify international aircraft supports the aim of stimulating an interest in the aviation community. Cadets can use this knowledge when visiting an aerodrome, at a local air show, or while attending a CSTC.

---

**Teaching Point 1****Describe American aircraft.**

Time: 15 min

Method: Interactive Lecture

---

**F/A-22A RAPTOR**

The F/A-22A Raptor is the United States Air Force's (USAF) newest fighter aircraft. Its combination of stealth, supercruise, manoeuvrability and integrated avionics represents an exceptional leap in war fighting capabilities. Its primary role is air dominance. The Raptor performs both air-to-air and air-to-ground missions. Also, it produces more thrust than any current fighter. The combination of the increased thrust and its unique aerodynamic design allows the aircraft to cruise at supersonic speeds without using afterburner. The Raptor is manufactured by Lockheed-Martin and is powered by two Pratt & Whitney F119-PW-100 turbofan engines with afterburners.



United States Air Force website, <http://www.af.mil>

Figure 1 F/A-22A Raptor



United States Air Force website, <http://www.af.mil>

Figure 2 F/A-22A Raptor

**A-10 THUNDERBOLT II**

The A-10 Thunderbolt II is the first USAF aircraft specially designed for close air support of ground forces. The A-10 can be used against all ground targets including tanks and other armoured vehicles. Its wide combat

radius and short takeoff and landing capability permit operations in and out of locations near front lines. The Thunderbolt is distinguished by its 30mm GAU-8/A Gatling gun. This weapon is mounted on the nose, can fire 3 900 rounds per minute and can defeat an array of armoured vehicles. The A-10 is manufactured by Fairchild Republic Company and is powered by two General Electric TF34-GE-100 turbofans mounted high on the rear of the aircraft.



*United States Air Force website, <http://www.af.mil>*

Figure 3 A-10 Thunderbolt II



*United States Air Force website, <http://www.af.mil>*

Figure 4 A-10 Thunderbolt II

## F-117A NIGHTHAWK

The F-117A Nighthawk is the world's first operational aircraft designed to use low observable stealth technology. This technology allows the aircraft to not be easily detected by radar. This precision strike aircraft penetrates high threat airspace and uses laser-guided weapons systems against critical targets. The Nighthawk created a revolution in military warfare by incorporating low observable technology into operational aircraft. It has a sleek design that allows for its stealth technology to be very effective. The F-117A is manufactured by Lockheed-Martin and is powered by two GE F404 non-afterburning engines.



*United States Air Force website, <http://www.af.mil>*

Figure 5 F-117A Nighthawk



*United States Air Force website, <http://www.af.mil>*

Figure 6 F-117A Nighthawk

## B-52 STRATOFORTRESS

The B-52 is a long-range heavy bomber that can perform a variety of missions. The bomber is capable of flying at high subsonic speeds at altitudes up to 50 000 feet. It can carry nuclear or precision-guided weapons. The B-52 is a large aircraft with a length of 159 feet 4 inches and a wingspan that measures 185 feet. The Stratofortress is manufactured by Boeing Military Airplane Company and is powered by eight Pratt & Whitney TF33-P-3/103 turbofan engines.



*United States Air Force website, <http://www.af.mil>*

Figure 7 B-52 Stratofortress



*United States Air Force website, <http://www.af.mil>*

Figure 8 B-52 Stratofortress

---

## CONFIRMATION OF TEACHING POINT 1

---

### QUESTIONS:

- Q1. What is distinctive about the A-10 Thunderbolt II?
- Q2. What type of weapons systems does the F-117A Nighthawk use against critical targets?
- Q3. How long is the wingspan of the B-52 Stratofortress?

### ANTICIPATED ANSWERS:

- A1. The nose mounted 30mm Gatling gun.
- A2. Laser guided.
- A3. One hundred and eighty-five feet.

---

### Teaching Point 2

**Describe British aircraft.**

Time: 5 min

Method: Interactive Lecture

---

### EF-2000 TYPHOON

The Typhoon is an agile, single seat, multi-role aircraft optimized for high altitude supersonic air combat. It is also capable of operating at lower levels in an air-to-ground role. Its low weight and high thrust means it can reach 36 000 feet in less than two minutes from a standing start. The engine intake is mounted on the bottom of the fuselage. A tall sharply swept tail is at the rear of the fuselage with twin-engine pipes directly below. The Typhoon is manufactured by Eurofighter and is powered by two Eurojet EJ200 turbofan engines.



Royal Air Force image website, <http://www.defenceimages.mod.uk>

Figure 9 EF-2000 Typhoon



Royal Air Force image website, <http://www.defenceimages.mod.uk>

Figure 10 EF-2000 Typhoon



Royal Air Force image website, <http://www.defenceimages.mod.uk>

Figure 11 EF-2000 Typhoon

### **JAGUAR GR3**

The Jaguar is a dual-role advanced operational trainer and tactical support aircraft. It is a fighter-bomber that is capable of using 1 000 lb general-purpose bombs that are guided to their targets by lasers. The Jaguar has a long sleek fuselage with a large swept tail fin and rudder. It has short-span swept wings that are mounted on top of the fuselage. The internal jet engines have intakes on either side of the fuselage behind the cockpit. The raised bubble canopy is set above the sharply pointed nose. The Jaguar is manufactured by Sepecat and is powered by two Rolls-Royce Adour turbofan engines.



*Airliners.net, <http://www.airliners.net>*

Figure 12 Jaguar GR3



*Airliners.net, <http://www.airliners.net>*

Figure 13 Jaguar G3

---

## CONFIRMATION OF TEACHING POINT 2

---

### QUESTIONS:

- Q1. Where is the Typhoon's sharply swept tail located?
- Q2. Where is the engine intake mounted on the Typhoon?
- Q3. Where is the canopy located on the GR3 Jaguar?

**ANTICIPATED ANSWERS:**

- A1. At the rear of the upper fuselage.
- A2. On the underside of the fuselage.
- A3. Above the sharply pointed nose.

---

**Teaching Point 3**

Time: 5 min

**Describe Russian aircraft.**Method: Interactive Lecture

---

**MIG-29 FULCRUM**

The MiG-29 Fulcrum is an all weather, single seat fighter interceptor flown by the Russian Air Force. The MiG-29's wings are swept back and tapered with square tips. It is equipped with twin jet engines mounted low and to the sides of the fuselage. Diagonal shaped air intakes give the aircraft a box like appearance. The fuselage is made of a long, thin, slender body. The MiG-29 is manufactured by the Moscow Air Production Organization and is powered by two Klimov / Sarkisov RD-33 turbofans.



*Airliners.net, <http://www.airliners.net>*

Figure 14 MiG-29 Fulcrum



*Airliners.net, <http://www.airliners.net>*

Figure 15 MiG-29 Fulcrum

### **ANTONOV AN-124-100**

The Antonov AN-124-100 is a civil certified long-range commercial freighter. It is widely used for the carriage of outsize and very heavy pieces of air cargo that other aircraft cannot accommodate. Pieces of cargo have included the space launcher, satellites, helicopters, large wheeled vehicles and a 109 tonne locomotive. The AN-124 has the largest payload and the largest interior of any airplane in the world. It features a double deck fuselage layout with the upper deck containing the cockpit and personnel compartments. The lower deck is a massive pressurized cargo compartment. The AN-124 is manufactured by O.K. Antonov and is powered by four D-18T series 3 engines.



*Airliners.net, <http://www.airliners.net>*

Figure 16 Antonov AN-124-100



*Airliners.net, <http://www.airliners.net>*

Figure 17 Antonov AN-124-100

---

### CONFIRMATION OF TEACHING POINT 3

---

#### QUESTIONS:

- Q1. How are the MiG-29 Fulcrum's wings shaped?
- Q2. What is the MiG-29's fuselage made of?
- Q3. Name one of the large pieces of cargo the AN-124 has carried.

#### ANTICIPATED ANSWERS:

- A1. Swept back and tapered with square tips.
- A2. A long, thin, slender body.
- A3. The space launcher, satellites, helicopters, large wheeled vehicles and a 109 tonne locomotive.

---

### CONCLUSION

---

#### HOMEWORK / READING / PRACTICE

Nil.

#### METHOD OF EVALUATION

Nil.

#### CLOSING STATEMENT

Cadets have identified American, British and Russian aircraft. Being able to identify these aircraft supports the aim of stimulating an interest in the aviation community. Cadets can use this knowledge when visiting an aerodrome, when at a local air show, or while attending CSTC training.

#### INSTRUCTOR NOTES / REMARKS

Nil.

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**REFERENCES**

---

C3-009 *United States Air Force*. (2006). Retrieved March 21, 2006, from <http://www.af.mil/factsheets.asp>

C3-010 *Royal Air Force*. (2006). Retrieved March 20, 2006, from <http://www.raf.mod.uk/equipment.html>

C3-011 *Federation of American Scientists*. (2006) Retrieved March 21, 2006, from <http://www.fas.org/nuke/guide/russia/airdef/mig-29.htm>

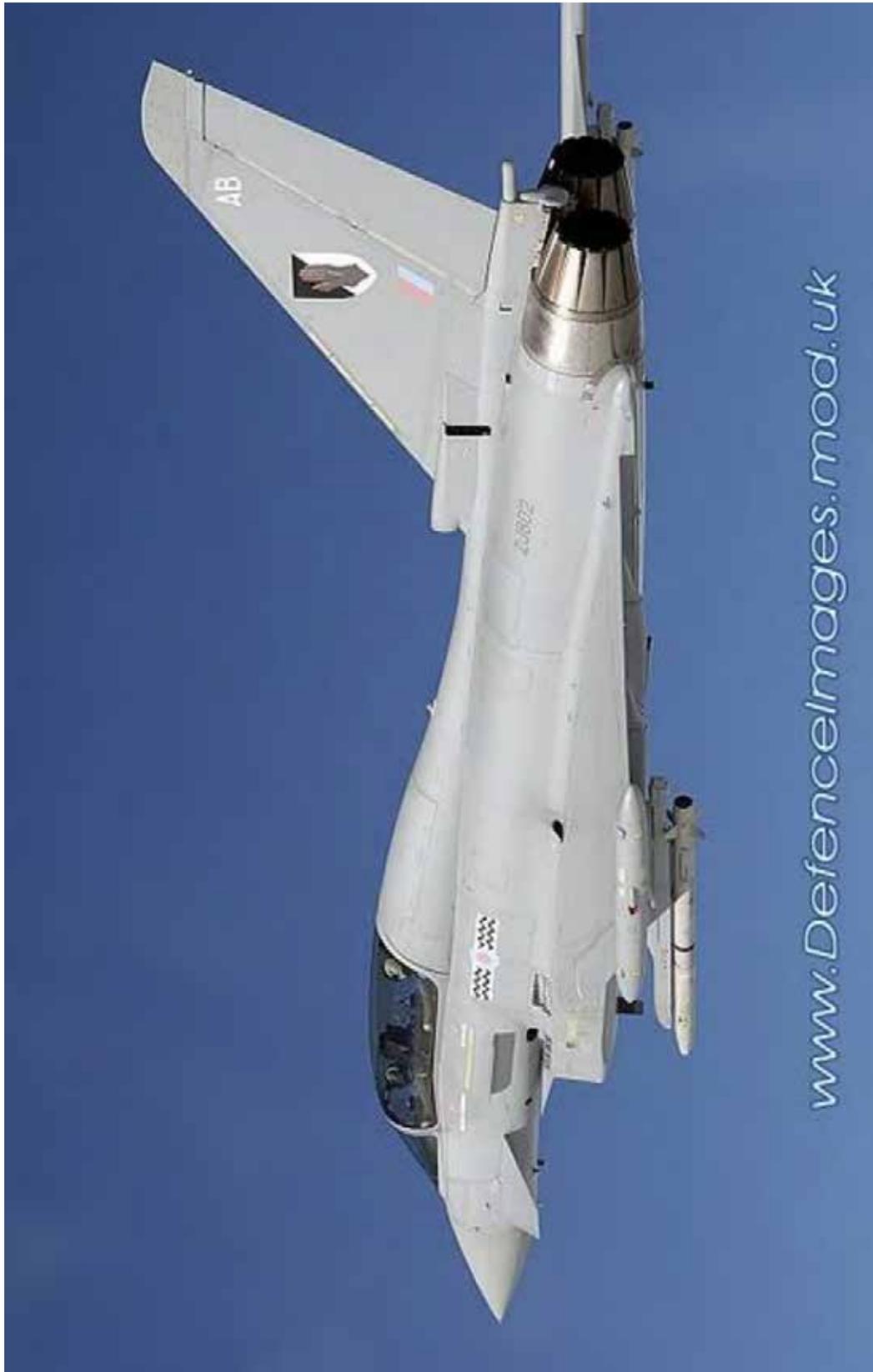
C3-012 *Antonov airlines*. (2006). Retrieved March 21, 2006, from <http://www.antonovairlines.co.uk/antonov/military-logistics/antonov-124.asp>



















**ROYAL CANADIAN AIR CADETS**  
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**SECTION 7**

**EO C130.03 – WATCH AN *ON CANADIAN WINGS* SEGMENT**

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|             |        |
|-------------|--------|
| Total Time: | 30 min |
|-------------|--------|

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**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 instructional guide within the TP for which they are required.

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

Prepare a suitable classroom area with available media.

**PRE-LESSON ASSIGNMENT**

Nil.

**APPROACH**

An in-class activity was chosen for this lesson as it is an interactive way to present the content.

---

**INTRODUCTION**

---

**REVIEW**

Nil.

**OBJECTIVES**

By the end of this lesson the cadet shall have watched an *On Canadian Wings* segment.

**IMPORTANCE**

Discovering Canadian aviation history will give cadets a better understanding of the current role of aviation in Canada. Knowledge gained in this lesson will assist in stimulating an interest in the RCAF.

**Teaching Point 1****Watch an *On Canadian Wings* segment.**

Time: 25 min

Method: In-Class Activity

**ACTIVITY**

Time: 25 min

**OBJECTIVE**

The objective of this activity is to become familiar with Canadian aviation history through watching an episode of *On Canadian Wings*.

**RESOURCES**

Select one video segment. The video segments include the following information:

**EPISODE: CANADA'S FIRST FLIGHT**

The shaky flights of flying machines sow the seeds for military aviation. Soon hundreds of Canadian flying cadets are shown dashing around in their biplanes. Canada's first aircrews are on their way to war.

Length (00:13:26)

**EPISODE: AERIAL WARFARE**

Canadian aircrews serve in fighter squadrons at Dunkirk and go into action against German Zeppelins, seaplanes and U-boats. Canadian flying aces Major Billy Bishop, Major Raymond Collishaw and Major Billy Barker become household names.

Length (00:12:22)

**EPISODE: THE BIRTH OF A NATIONAL AIR FORCE**

With little fanfare, the RCAF comes into being on April 1, 1924. As war clouds loom over Europe, the new air force is on active service. The RCAF grows to the fourth largest air force of the allied nations.

Length (00:11:58)

**EPISODE: THE AERODROME OF DEMOCRACY**

Canadian squadrons see sustained combat in the Battle of Britain and help to keep the sea lanes from Canada to England open. RCAF schools across Canada train more than 150,000 Commonwealth air and groundcrews.

Length (00:12:48)

**EPISODE: SOME OF THE FEW**

Flying aces F/L Buzz Beurling, Wing Commander Johnnie Johnson and Flight Lt. D.E. Hornell are immortalized with a string of spectacular wartime successes.

Length (00:12:22)

**EPISODE: BOMBS OVER EUROPE**

The famous No. 6 Bomber Group is formed as the bomber offensive heats up over Europe. Squadron Leader Ian Bazalgette and Pilot Officer Andrew Mynarski each earned a Victoria Crosses (VC).

Length (00:12:55)

**EPISODE: FAST TIMES FOR THE GOLDEN JETS**

Canadian aircrews are again involved in combat over Korea. The Golden Hawks formation flying team of F86 Sabres – the Spitfires of the jet age, dazzle audiences around the world.

Length (00:12:37)

**EPISODE: A TIME OF TRANSITION**

Canada develops the Avro Arrow – a supersonic jet fighter that could out fly anything in the world. The Diefenbaker government mysteriously cancels the project and destroys all drawing and prototypes.

Length (00:11:57)

**EPISODE: THERE SHALL BE WINGS**

Canada's air force support North Atlantic Treaty Organization (NATO) and United Nations (UN) operations in the Balkans, the Middle East, Africa, Central America and Haiti, and humanitarian relief worldwide.

Length (00:13:00)

**ACTIVITY LAYOUT**

Arrange the room to ensure all cadets are able to see and hear the video segment.

**ACTIVITY INSTRUCTIONS**

1. Introduce the video segment to be shown.
2. Show the complete video segment.
3. Following the session, have the cadets answer questions specific to the chosen segment.

**SAFETY**

Nil.

**INSTRUCTOR GUIDELINES**

Choose one of the following sets of questions to pose, based on the segment selected.

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**CONFIRMATION OF TEACHING POINT 1**

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**SUGGESTED QUESTIONS:**

***Canada's First Flight***

- Q1. Who were the founding members of the Aerial Experimental Association?
- Q2. What was the name of the aircraft they initially used?
- Q3. In which year did the first aviation policy appear?
- Q4. How many people were members of the Canadian aviation corps?

- A1. Alexander Graham Bell, J.A.D. McCurdy, Casey Bothman.
- A2. The Silver Dart.
- A3. 1907.
- A4. Three People.

***Aerial Warfare***

- Q1. How long did the strategic bombing campaign last?
  - Q2. How many zeppelins were destroyed during World War 1 (WW 1)? How many by Canadians?
  - Q3. Who was Billy Bishop and what did he do?
- A1. One Year.
  - A2. 12 destroyed, 6 of them by Canadians.
  - A3. Billy Bishop was one of the first Canadian aviation aces. He had 72 confirmed victories and was decorated with the Victoria Cross.

***The Birth of a National Air Force***

- Q1. What major event occurred in 1920?
  - Q2. What was the goal of military aviation at that time?
  - Q3. Where was the largest pilot training camp situated?
  - Q4. In 1937 the RCAF was given a very precise mandate, what was that mandate?
- A1. The CAF was dismantled.
  - A2. Cartography, medical evacuations, ice patrols, surveillance and fighting forest fires.
  - A3. Borden, Ontario.
  - A4. To defend Canadian airspace.

***The Aerodrome of Democracy***

- Q1. What was Canada's role at the beginning of WW 2?
- Q2. Most of the pilots were trained on which aircraft?
- Q3. How many Squadrons were initially based in Halifax?
- Q4. How many U-boats did the RCAF sink?

- A1. Canada was an immense centre of pilot training for the Commonwealth nations.
- A2. Tiger Moth.
- A3. Five.
- A4. Twenty-seven.

***Some of the Few***

- Q1. Name the ace of Canadian aces during WW II?
- Q2. Which Canadian squadron was victorious over the most enemy aircraft in 1944 and how many aircraft did they shoot down?
- Q3. Name the two new types of aircraft used by Canada as the end of the war approached.

- A1. Buzz Beurling.
- A2. 418 Sqn with 103 confirmed victories.
- A3. Mustang, Typhoon, and Mosquito.

***Bombs over Europe***

- Q1. What was the first Canadian bomber Squadron and when was it created?
- Q2. Which bombers did Canadians use?
- Q3. Who was the commander of the first all-Canadian Squadron in Great Britain?

- A1. 405 Sqn was formed in April 1941.
- A2. Wellington, Halifax, Lancaster, Liberator, and Mosquito.
- A3. Johnny Fauquier.

***Fast times for the Golden Jets***

- Q1. In 1948, Canada acquired numerous aircraft. What were they and how many were acquired?
- Q2. Canada was divided, due to resources, into several search and rescue regions. How many regions and how many aircraft were assigned to this task?
- Q3. What was the name of the aircraft and the training base used in the formation of the first military aviation demonstration team?
- Q4. Canada began the construction of its own all-Canadian aircraft. What was its name?

- A1. Eighty-five Vampires.
- A2. Five regions and 34 aircraft.
- A3. Blue Devils flew Vampires at St-Hubert, Quebec (QC).
- A4. CF-100 Canuck.

***A Time of Transition***

- Q1. What aircraft was supposed to replace the CF-100?
- Q2. Following the failure of the Avro Arrow, which aircraft did Canada buy?
- Q3. What major event occurred in 1968?
- Q4. New aircraft appeared during this period. Name at least 3 of them.

- A1. The Avro Arrow.
- A2. F-101 Voodoo.
- A3. The unification of the three branches of the Canadian Forces.
- A4. Caribou, Buffalo, Hercules, Tutor, Dassault Falcon, Sea King, and CF 5 Freedom Fighter.

***There Shall be Wings***

- Q1. In which year was the aerial command group formed?
- Q2. In which year did the first CF-18 (CF-188 Hornet) arrive in Canada?
- Q3. How many Canadian CF-18s were sent to serve during the Gulf War?

- A1. 1975.
- A2. 1981.
- A3. Twenty-four.

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**END OF LESSON CONFIRMATION**

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

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**CONCLUSION**

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**HOMEWORK / READING / PRACTICE**

Nil.

**METHOD OF EVALUATION**

Nil.

**CLOSING STATEMENT**

Discovering Canadian aviation history will give cadets a better understanding of the current role of aviation in Canada. Knowledge gained in this lesson will assist in stimulating an interest in the RCAF.

**INSTRUCTOR NOTES / REMARKS**

One segment will already have been viewed in M130.04 (Watch an *On Canadian Wings* Segment) and squadrons may choose other segments for viewing in any of the complementary periods. A thirty-minute period is required for each additional segment selected. To view all segments, eight additional periods are required. It is not necessary to watch all the segments.

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**REFERENCES**

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C3-039 Squires, C. (1999). *On Canadian wings* [Series]. Winnipeg, MB: PWGSC.

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INSTRUCTIONAL GUIDE**



**SECTION 8**

**EO C130.04 – TOUR A LOCAL AVIATION MUSEUM**

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Total Time:

90 min

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**THERE IS NO INSTRUCTIONAL GUIDE PROVIDED FOR THIS EO**

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**ROYAL CANADIAN AIR CADETS  
PROFICIENCY LEVEL ONE  
INSTRUCTIONAL GUIDE**



**SECTION 9**

**EO C130.05 – ATTEND A LOCAL AIR SHOW**

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Total Time:

180 min

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**THERE IS NO INSTRUCTIONAL GUIDE PROVIDED FOR THIS EO**

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