

**SECTION 15****PO 337 – DEMONSTRATE AIR NAVIGATION SKILLS**

1. **Performance.** Demonstrate Air Navigation Skills.
2. **Conditions**
  - a. Given:
    - (1) Visual Flight Rules (VFR) Navigation Chart (VNC),
    - (2) Supervision, and
    - (3) Assistance as required.
  - b. Denied: N/A.
  - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard.** The cadet will demonstrate air navigation skills by:
  - a. defining air navigation terms;
  - b. identifying types of air navigation;
  - c. measuring distances along a route; and
  - d. determining position on a VNC.
4. **Remarks.** N/A.
5. **Complementary Material**
  - a. Complementary material associated with PO 337 is designed to enhance the cadet's knowledge of the air navigation through a number of activities:
    - (1) EO C337.01 (Operate a Radio for Aviation Transmission), and
    - (2) EO C337.02 (Practice Air Navigation Skills).
  - b. EO C331.05 (Participate in a Presentation Given by a Guest Speaker From the Local Aviation Community, Section 13) may be used to cover topics in both PO 331 (Describe Principles of Flight, [Section 13](#)) and PO 337 (Demonstrate Air Navigation Skills).

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**EO M337.01 – MEASURE DISTANCE ALONG A ROUTE**

1. **Performance.** Measure Distance Along a Route.
2. **Conditions**
  - a. Given:
    - (1) Visual Flight Rules (VFR) Navigation Chart (VNC),
    - (2) International Civil Aviation Organization (ICAO) ruler,
    - (3) Supervision, and
    - (4) Assistance as required.
  - b. Denied: N/A.
  - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard.** The cadet shall measure distance along a route, to include:
  - a. defining air navigation terms;
  - b. identifying types of air navigation; and
  - c. determining the distance between two points.
4. **Teaching Points**

TP	Description	Method	Time	Ref
TP1	Define air navigation terms, to include: <ol style="list-style-type: none"> <li>a. graticule,</li> <li>b. latitude,</li> <li>c. longitude,</li> <li>d. nautical miles,</li> <li>e. statute miles,</li> <li>f. scale, and</li> <li>g. VNC.</li> </ol>	Interactive Lecture	5 min	C3-116 (p. 175, p.186, p. 188)
TP2	Identify and describe types of navigation, to include: <ol style="list-style-type: none"> <li>a. pilotage,</li> <li>b. dead reckoning,</li> <li>c. inertial navigation, and</li> <li>d. satellite navigation.</li> </ol>	Interactive Lecture	5 min	C3-116 (p. 175)
TP3	Demonstrate and have the cadet determine the distance between two predetermined points along a route.	Demonstration and Performance	15 min	C3-139

5. **Time**

a. Introduction/Conclusion:	5 min
b. Interactive Lecture:	10 min
c. Demonstration and Performance:	15 min
d. Total:	30 min

6. **Substantiation**

- a. An interactive lecture was chosen for TPs 1 and 2 to introduce basic air navigation terms and types of air navigation.
- b. Demonstration and performance was chosen for TP 3 as it allows the instructor to explain and demonstrate measuring distances while providing an opportunity for the cadet to practice this skill under supervision.

7. **References**

- a. C3-116 (ISBN 0-9680390-5-7) MacDonald, A. F., & Pepler, I. L. (2000). *From the Ground Up: Millennium Edition*. Ottawa, ON: Aviation Publishers Co. Limited.
- b. C3-139 (ISBN 0-7715511-5-0) Transport Canada. (1999). *Flight Training Manual: 4<sup>th</sup> Edition Revised*. Ottawa, ON: Transport Canada.

8. **Training Aids**

- a. VNC, and
- b. ICAO ruler.

9. **Learning Aids**

- a. VNC, and
- b. ICAO ruler.

10. **Test Details.** This EO is assessed IAW Chapter 3, [Annex B](#), [Appendix 5](#) (Aviation Subjects – Combined Assessment PC).

11. **Remarks**

- a. VNCs and ICAO rulers can be ordered through the Area Cadet Officer (ACO), purchased at a local flight training centre, or ordered online at NavCanada ([www.navcanada.ca](http://www.navcanada.ca)).
- b. EO C337.02 (Practice Air Navigation Skills) may be conducted to provide extra practice of the skills learned in this EO.

**EO M337.02 – DETERMINE A POSITION ON A VISUAL FLIGHT RULES (VFR) NAVIGATIONAL CHART (VNC)**

1. **Performance.** Determine a Position on a Visual Flight Rules (VFR) Navigational Chart (VNC).
2. **Conditions**
  - a. Given:
    - (1) VNC,
    - (2) Supervision, and
    - (3) Assistance as required.
  - b. Denied: N/A.
  - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard.** The cadet shall determine a position on a VNC by:
  - a. identifying the earth's graticule;
  - b. recognizing the difference between latitude and longitude; and
  - c. determining latitude and longitude.
4. **Teaching Points**

TP	Description	Method	Time	Ref
TP1	Explain that the earth is divided into sections by an imaginary grid system called a graticule, composed of: <ol style="list-style-type: none"> <li>a. parallels of latitude,</li> <li>b. meridians of longitude,</li> <li>c. the equator, and</li> <li>d. the prime meridian.</li> </ol>	Interactive Lecture	5 min	C3-116 (p. 175)
TP2	Explain geographical coordinates, to include: <ol style="list-style-type: none"> <li>a. units of measurement, and</li> <li>b. sequencing.</li> </ol>	Interactive Lecture	5 min	C3-116 (p. 175)
TP3	Given a set of coordinates, demonstrate and have the cadet determine the location of an airport by: <ol style="list-style-type: none"> <li>a. finding the latitude, and</li> <li>b. finding the longitude.</li> </ol>	Demonstration and Performance	10 min	C3-139
TP4	Demonstrate and have the cadet determine the coordinates of a given location on a map by: <ol style="list-style-type: none"> <li>a. calculating latitude; and</li> <li>b. calculating longitude.</li> </ol>	Demonstration and Performance	5 min	C3-139

5. **Time**

a. Introduction/Conclusion:	5 min
b. Interactive Lecture:	10 min
c. Demonstration and Performance:	15 min
d. Total:	30 min

6. **Substantiation**

- a. An interactive lecture was chosen for TPs 1 and 2 to introduce basic air navigation terms.
- b. Demonstration and performance was chosen for TPs 3 and 4 as it allows the instructor to explain and demonstrate determining positions and coordinates while providing an opportunity for the cadet to practice under supervision.

7. **References**

- a. C3-116 (ISBN 0-9680390-5-7) MacDonald, A. F., & Pepler, I. L. (2000). *From the Ground Up: Millennium Edition*. Ottawa, ON: Aviation Publishers Co. Limited.
- b. C3-139 (ISBN 0-7715511-5-0) Transport Canada. (1999). *Flight Training Manual 4<sup>th</sup> Edition Revised*. Ottawa, ON: Transport Canada.

8. **Training Aids.** VNC.

9. **Learning Aids.** VNC.

10. **Test Details.** This EO is assessed IAW Chapter 3, [Annex B](#), [Appendix 5](#) (Aviation Subjects – Combined Assessment PC).

11. **Remarks**

- a. VNCs can be ordered through your Area Cadet Officer (ACO), purchased at a local flight training centre, or ordered online at NavCanada.
- b. EO C337.02 (Practice Air Navigation Skills) may be conducted to provide extra practice of the skills learned in this EO.

**EO C337.01 – OPERATE A RADIO FOR AVIATION TRANSMISSION**

1. **Performance.** Operate a Radio for Aviation Transmission.
2. **Conditions**
  - a. Given:
    - (1) Hand-held radio,
    - (2) Supervision, and
    - (3) Assistance as required.
  - b. Denied: N/A.
  - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard.** The cadet, simulating a pilot, shall operate a radio for aviation transmission, to include:
  - a. using the phonetic alphabet and numbers;
  - b. communicating the arrival (landing) of an aircraft; and
  - c. communicating the departure (takeoff) of an aircraft.
4. **Teaching Points**

TP	Description	Method	Time	Ref
TP1	Review the phonetic alphabet and numbers.	In-Class Activity	5 min	C3-116 (p. 218) C3-182
TP2	Explain, demonstrate and have the cadet practice operating a radio to communicate the arrival of an aircraft.	Demonstration and Performance	10 min	C3-116 (pp. 221–226) C3-182
TP3	Explain, demonstrate and have the cadet practice operating a radio to communicate the departure of an aircraft.	Demonstration and Performance	10 min	C3-116 (pp. 221–226) C3-182

5. **Time**
  - a. Introduction/Conclusion: 5 min
  - b. In-Class Activity: 5 min
  - c. Demonstration and Performance: 20 min
  - d. Total: 30 min

6. **Substantiation**
  - a. An in-class activity was chosen for TP 1 as an interactive way to review the phonetic alphabet.
  - b. Demonstration and performance was chosen for TPs 2 and 3 as it allows the instructor to explain and demonstrate operating a radio while providing an opportunity for the cadet to practice radio transmissions under supervision.

7. **References**

- a. C3-116 (ISBN 0-9680390-5-7) MacDonald, A. F., & Pepler, I. L. (2000). *From the Ground Up: Millennium Edition*. Ottawa, ON: Aviation Publishers Co. Limited.
- b. C3-182 *Study Guide for the Radiotelephone Operator's Restricted Certificate (Aeronautical)*. (1990). Retrieved October 23, 2007, from <http://www.ic.gc.ca/epic/site/smt-gst.nsf/en/sf01397e.html>.

8. **Training Aids**

- a. Presentation aids (eg, whiteboard/flip chart/OHP/multimedia projector) appropriate for the classroom/training area,
- b. Hand-held radio, and
- c. Script of phrases.

9. **Learning Aids**

- a. Hand-held radio, and
- b. Script of phrases.

10. **Test Details.** N/A.

11. **Remarks.** Depending on available resources, this EO may be conducted on the familiarization flying day in cooperation with the Technical Training Establishment (TTE).



**EO C337.02 – PRACTICE AIR NAVIGATION SKILLS**

1. **Performance.** Practice Air Navigation Skills.
2. **Conditions**
  - a. Given:
    - (1) VFR Navigational Chart (VNC),
    - (2) International Civil Aviation Organization (ICAO) ruler,
    - (3) Supervision, and
    - (4) Assistance as required.
  - b. Denied: N/A.
  - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard.** The cadet shall practice air navigation skills.
4. **Teaching Points.** The cadet shall:
  - a. practice measuring distance along a route; and
  - b. practice determining position on a VNC.
5. **Time**

a. Introduction/Conclusion:	5 min
b. Practical Activity:	25 min
c. Total:	30 min
6. **Substantiation.** A practical activity was chosen for this lesson so that the cadets may further develop skills learned in EO M337.01 (Measure a Distance Along a Route) and EO M337.02 (Determine a Position on a Visual Flight Rules [VFR] Navigational Chart [VNC]).
7. **References.** N/A.
8. **Training Aids.** N/A.
9. **Learning Aids**
  - a. Pencil,
  - b. Paper,
  - c. Tape,
  - d. VNC, and
  - e. ICAO ruler.
10. **Test Details.** N/A.
11. **Remarks.** This EO is designed to complement EO M337.01 (Measure a Distance Along a Route) and EO M337.02 (Determine a Position on a Visual Flight Rules [VFR] Navigational Chart [VNC]) as extra time to practice the skills.