Part 2> Ground Briefing

Introduction

Part II - Ground Briefing prepares you to answer the questions normally asked by your examiner during the ground portion of your flight test, prior to that time during the test wherein you and your examiner move on to the aircraft to be used for the examination.

Questions relating to a particular subject have been grouped together in a logical fashion to facilitate the learning process. Of course, in this phase of the overall test, you will not be required to answer all of the questions included here in Part II, but you should nevertheless be ready to answer any questions that may be asked by your examiner.

The oral questions will be of a practical nature, based upon the aircraft performance and the trip assigned for the flight test.

This Ground Briefing part of the book is divided into four main sections, each corresponding to specific exercises as described in the Flight Test Guides. It includes:

Section 1. Documents and Airworthiness

Section 2. Aeroplane Performance

Section 3. Weight and Balance, Loading

Section 4. Pre-flight Planning Procedures

Each of the above four sections contains the following subsections:

> **Exercise Number** and description corresponding to the Flight Test Guides.

> **Performance Criteria** reproduced from the Flight Test Guides.

> **What You Should Know** in order to meet the criteria outlined in Performance Criteria.

> **Typical Questions** asked by the examiner.

> **Answers** to the questions.

To be best prepared to pass the ground briefing, ensure the following:

> Know your Pilot's Operating Handbook (POH) well.
> Be familiar with the Aircraft Documents and Flight Plan form.
> Know how to use your Canada Flight Supplement efficiently.
> Be familiar with the symbols on your VTA/VNC charts.
> Have all your planning, or as much as possible, done in advance.
> When you finish your cross-country planning, take some time to go over it.
> A large portion of the questions the examiner asks will be based on your flight planning.
> When asked a question, take the time to pause and think before giving your answer.
> Rehearse your answers (use proper terminology).

If you know your material on the ground, things will go much smoother in the air. Most flight test failures occur while in the air. However, a weak performance in the oral portion of the examination may leave you flustered, diminish your confidence and not help your mindset for your flight portion. Be prepared!

Section 1 – Documents and Airworthiness

Flight Test Guide Reference:

Ex. 2 Aeroplane Familiarization and Preparation for Flight

A. Document and Airworthiness

Performance Criteria

The candidate shall be knowledgeable regarding the location, purpose, and significance of each item, and shall demonstrate that the documents and certifications indicate that the Certificate of Airworthiness is in force.

What You Should Know

> Name all required documents to be carried on board.
> Determine the validity of all documents.
> Determine the required maintenance has been done.
> Determine the number of flying hours remaining before required service or maintenance.
> Ensure that compliance with any conditions or limitations on the maintenance release can be achieved.
> Determine the impact of deferred defects on aeroplane operations for the proposed flight.
> Explain the process for dealing with aircraft unserviceabilities arising during a flight.

Typical Questions

The answers to the following questions are located at the end of this section, starting on page 19.

1.1 With respect to the Air Regulations, what documents are required to be on board for every flight?

Certificate of Registration

(See sample Certificate of Registration in Part IV - Annex, p. 123)

1.2 What does the Certificate of Registration tell you?

1.3 How long is the Certificate of Registration valid? What invalidates it?

1.4 How long does the owner of an aircraft have to notify the Minister of Transport of a change of address?

1.5 What is the procedure with respect to the Certificate of Registration when the aircraft is sold?

Certificate of Airworthiness

(See sample Certificate of Airworthiness in Part IV - Annex, p. 123)

1.6 For how long is the original Certificate of Airworthiness valid?

1.7 What temporarily invalidates the Certificate of Airworthiness?

1.8 How often must the Certificate of Airworthiness be re-validated?

1.9 How is it re-validated?

1.10 Is a Certificate of Airworthiness issued for amateur-built aircraft?

Several additional factors will affect the airworthiness status of the aircraft, notably in connection with the Weight and Balance as well as the Journey Logbook. Therefore, many more questions and answers on the subject of airworthiness will follow under these headings, as well as under Additional Questions on page 18.

Weight and Balance Report

(See sample Weight and Balance Report in Part IV - Annex, p. 125)

1.11 Define Basic Empty Weight (BEW).

1.12 Define maximum takeoff weight.

1.13 How does the maximum takeoff weight differ from the maximum ramp weight?

1.14 Who prepares the Weight and Balance document that must be carried on board?

1.15 Show the actual Basic Empty Weight and Gross Weight for the test aircraft.

1.16 What is the difference between normal and utility categories?

1.17 Where can the pilot learn of the category(ies) for which the aircraft is approved as well as any related limitations?

1.18 Is an aircraft considered airworthy if overloaded? Why?

1.19 How often does an aircraft have to be re-weighed?

1.20 What important information is found on the original Weight and Balance Report that will not be found elsewhere?

Journey Logbook

1.21 Does the Journey Logbook have to be carried on board for each flight?

1.22 What is the difference between air time and flight time?

1.23 Are aircraft inspections based on air time or flight time?

1.24 What type of inspection schedule is the aircraft on?

1.25 When was the last inspection done and which one was it?

1.26 When is the next inspection due?

1.27 If the inspection was due at 1,050 hours, can you fly the aircraft beyond that time? If yes, under what circumstances?

1.28 How do you know that an annual inspection has been carried out?

1.29 If a snag is reported in the Remarks section of the Journey Logbook, can you fly the aircraft? Is it airworthy?

1.30 How do you correct an error in the Journey Logbook?

1.31 How often must the compass be swung?

1.32 How do you verify that the compass has been swung?

1.33 When do you require an ELT?

1.34 How often and by whom must the ELT be certified? Is an entry required in the Journey Logbook?

1.35 For how long is an ELT battery good?

1.36 At what time can you check if the ELT is operational?

1.37 With respect to the Journey Logbook, what should you check before departing on a cross-country?

1.38 When was the last inspection of the pitot-static system performed? How often should it be done?

1.39 Once a Journey Logbook has been completely filled, how long must it be retained?

1.40 Using the Journey Logbook, demonstrate that the aircraft is airworthy.

Pilot's Operating Handbook

1.41 What type of information can be found in the Pilot's Operating Handbook (POH)? Why do you think it is important to have it on board?

1.42 How does the Weight and Balance information found in the POH differ from the Weight and Balance Report for a particular aircraft?

Crew Licences and Medical Certificates

1.43 List the documents any flight crew member must carry on board while operating an aircraft.

1.44 What document tells you that a pilot licence is valid?

1.45 What class of medical is required for a private pilot licence and for how long is it valid?

1.46 What class of medical is required for a commercial pilot licence and for how long is it valid?

1.47 When does your medical expire?

1.48 How does one obtain a Radiotelephone Operator's Certificate?

1.49 For how long is the Radiotelephone Operator's Certificate valid?

Interception Procedure

1.50 What, in general terms, are the interception procedures? Where can you find them?

Proof of Insurance

1.51 Does proof of insurance for the aircraft have to be on board for each flight?

Additional questions

1.52 Which document lists the owner and the purpose of the aircraft?

1.53 A fireproof plate bearing the aircraft registration must be affixed to the aircraft. Where is this plate located?

1.54 The serial number of the aircraft is attached to the body of the aircraft. Where?

1.55 Name the four sections of the Technical Logbook.

1.56 May the Technical Logbook be carried on board the aircraft?

1.57 How long must Technical Logbooks be kept once they are full?

1.58 Should a Radio Station Licence be carried on board during flight?

1.59 What is the minimum instrumentation for day VFR flight?

1.60 What is the minimum instrumentation for night VFR flight?

1.61 How many minutes does 0.1 equal?

Answers

1.1 Certificate of Registration; Certificate of Airworthiness or Flight Permit, Weight and Balance Report; Aircraft Journey Logbook; Pilot's Operating Handbook; Crew licences (permit or licence, including Radiotelephone Operator's Restricted Certificate) and medical validation certificates; Proof of Insurance; Recommended items include: Annual Airworthiness Information Report; Interception Procedures; Aircraft Technical Log; Pilot Logbook.

Certificate of Registration

1.2 The Certificate of Registration gives the nationality and registration mark, aircraft manufacturer, model and serial number, the purpose, name and address of the owner, owner registration date, certificate issue date, and signature for the Minister of Transport.

1.3 The Certificate of Registration remains valid as long as the ownership does not change, or the owner's address does not change.

The Certificate of Registration becomes invalid when the aircraft is destroyed or taken out of service permanently.

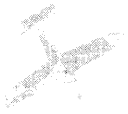
Note: The registration of the airplane (ex. C-GFAS) does not change following a change of ownership.

1.4 The owner has 7 days to complete the change of address information on the Certificate of Registration and mail it in.

1.5 To effect a change of ownership, the reverse side of the Certificate of Registration must be filled out and mailed to the Minister of Transport within 7 days.

The pink copy remains with the aircraft and is valid for a maximum of 60 days or until the new Certificate of Registration is received, whichever comes first. (If a new certificate is not received within 60 days, the aircraft is no longer considered registered.)

Certificate of Airworthiness



1.6 Indefinitely, if the aircraft continues to meet the conditions under which it was issued; that is, as long as the aircraft is maintained in accordance with the requirements of the controlling agency.

Note: A Certificate of Airworthiness is issued to a specific aircraft, not to a person/owner. Therefore, a change of address or ownership does not invalidate it.

1.7 Temporary invalidation of the Certificate of Airworthiness is caused by:

a. Failure to comply with Airworthiness Directives (AD).*
b. Failure to do required maintenance inspections at required intervals, unless on an extension.
c. An action that contradicts the Pilot's Operating Handbook.**
d. Any minor or major accident.

e. Any unscheduled maintenance report (snag) written in the Journey Logbook.

* Airworthiness Directives (AD) are notices issued by aircraft or engine manufacturers informing of a defect or problem that include corrective measures. Once an AD has been complied with, the AME (Aircraft Maintenance Engineer) must make the necessary entry in the Technical Logbook.

** A good example is the Weight and Balance. If a pilot takes off with a weight greater than that allowed, the Certificate of Airworthiness is invalid.

1.8 Once a year.

1.9 By submitting an Annual Airworthiness Information Report (see sample in Part IV - Annex, p. **124**)

1.10 No. Amateur-built aircraft are issued a Flight Permit.

Weight and Balance Report

1.11 The Basic Empty Weight includes:

a. Weight of the standard airplane (ie. airframe, engine, standard equipment, unusable fuel)
b. All optional equipment.
c. Full oil.

1.12 Maximum takeoff weight is the maximum weight approved for the start of the takeoff run.

1.13 The maximum ramp weight includes the fuel that will be used for start, taxi and run-up. Therefore, as a result of the fuel already burned, maximum takeoff weight will be less than maximum ramp weight.

Note: Maximum ramp weight is usually not used for small aircraft.

1.14 The Weight and Balance document is prepared by the manufacturer of the aircraft.

1.15 Produce, for inspection, the Weight and Balance Report for the aircraft actually used for the flight test. Make sure it is the latest amendment.

1.16 The utility category is solely for the purpose of training pilots in certain flight manoeuvres and, therefore, is usually subject to some restrictions.

In the normal category, maximum gross weight operations are permitted, but certain manoeuvres, such as spins and steep turns, are prohibited.

1.17 This information is found in the Pilot's Operating Handbook.

1.18 No. Compliance with weight limitations is part of the airworthiness validity.

1.19 Aircraft must be re-weighed and an amended Weight and Balance Report produced if a change in weight of more than 2% of the empty weight has occurred, or if the weight change cannot be measured (for example, as may occur if an aeroplane is re-painted).

Note: If the weight of the aircraft exceeds 12,500 lbs, it must be re-weighed every 5 years.

1.20 The following are found in the original Weight and Balance Report, and not found elsewhere:

a. The date of manufacture of the aircraft.
b. The actual unusable fuel.
c. The amount of full oil.

Journey Logbook

1.21 The answer is yes, but with one notable exception: if the pilot does not plan to land and shut down at a location other than the departure base, the Journey Logbook need not be carried on board.

1.22 Air time = wheels up to wheels down.

Flight time* = when wheels start moving to when wheels stop moving.

* Flight time is also referred as "pilot in control" time.

1.23 Aircraft inspections are based on air time.

1.24 Refer to the Journey Logbook or consult an AME. However, most aircraft require inspections every 100 hours of air time. Cessnas are often on the Progressive Care Maintenance Program where inspections are completed at 50 hour intervals, with a complete inspection every 200 hours.

1.25 Refer to the Journey Logbook.

1.26 Refer to the Journey Logbook.

1.27 Yes, you can fly the aircraft, by a maximum of 10 hours, if an AME has given written confirmation of an extension in the Journey Logbook.

1.28 The appropriate entry has been made in the Journey Logbook and an Annual Airworthiness Information Report has been completed.

1.29 Under no circumstances is the aircraft legal to fly if any type of problem is written in the Remarks, unless an AME has checked it and signed it off.

1.30 All errors should be corrected with a single line through them. The correct information should then be entered. Errors must never be erased or masked with "liquid paper".

Note: All entries should be made in ink.

1.31 The compass must be swung annually.

1.32 Check for the appropriate entry in the Journey Logbook.

1.33 An ELT is required on board at all times unless the aircraft is operated within 25 nautical miles of the departure aerodrome.

Note: For a complete list of the exceptions, please refer to CAR 605.38.

1.34 An ELT must be certified once per year, by an avionics shop. An entry must be made in the Journey Logbook.

1.35 ELT batteries are good for two years from the date of manufacture.

1.36 ELT operation can be checked during first five minutes past each hour for no more than five seconds.

1.37 When checking the Journey Logbook before departing on a cross-country flight, you should check if the aircraft is airworthy (refer to question 1.40). Pay special attention to how much time is left on the aircraft until the next inspection and make sure that you will not exceed this time on your flight.

1.38 Check in the Journey Logbook. The pitot-static system must be certified once every two years if the aircraft flies IFR or VFR in Class B airspace.

1.39 For a period of not less than three years.

1.40 When using the Journey Logbook to demonstrate that the aircraft is airworthy:

a. Check if the maintenance inspections have been done.
b. Check the last air time entry against the next "inspection due" air time.
c. Check if the last compass swing was done within the past year.
d. Check if the ELT was certified within the past year.
e. Check to ensure that no "snags" are recorded in the Remarks section (for the aircraft to be airworthy, any snag must have been signed off by an AME).
f. Check if the pitot-static system has been certified within the past two years (required if the aircraft is to be flown IFR or VFR in Class B airspace).

Note: Be ready to answer the examiner by locating the above entries in advance. Write down the page numbers or use "post-it" type stickers.

Pilot's Operating Handbook

1.41 The Pilot's Operating Handbook (POH), sometimes called the Aircraft Flight Manual (AFM), has all the pertinent information for the make and model of the aircraft. It allows you to research any information that might be needed while you are in the aircraft (power settings, emergency procedures, takeoff, cruise and landing performance tables, etc.). It also provides an equipment list detailing all the equipment available for a particular model of aircraft and specifies whether each item of equipment is required, optional, etc.

1.42 The weight and balance information found in the POH is usually a generic example of that particular make and model. Each aircraft is issued specific weight and balance information when it is released by the factory. Due to manufacturing techniques, all aircraft of the same model do not weigh exactly the same. Also, each aircraft has optional equipment. Furthermore, subsequent amendments may be made to the Weight and Balance Report (for instance when new equipment is added).

Crew Licences and Medical Certificates

1.43 There are three documents that any flight crew member must carry on board while operating an aircraft:

a. Licence or permit.
b. Valid medical.
c. Radiotelephone Operator's Certificate (if operating a radio).

1.44 The medical certificate tells you that a pilot licence is valid.

1.45 A Category III medical is required. It is valid for 2 years up to 40 years of age. Over age 40, it is valid for 1 year.

1.46 A Category I medical is required. It is valid for 1 year up to 40 years of age. Over age 40, it is valid for 6 months.

1.47 The medical expires on the first day of the month following the anniversary date.

Examples:

a. 25 years old
Category I Medical Certificate issued October 3, 2007
Expiry date is November 1, 2008
b. 41 years old
Category I Medical Certificate issued April 14, 2007
Expiry date is November 1, 2007

1.48 Before the first solo, the candidate must successfully write an exam, following which a Radiotelephone Operator's Certificate is issued by an approved representative of Industry Canada.

1.49 A Radiotelephone Operator's Certificate is valid for life.

Interception Order

1.50 The interception procedures are a list of visual signals given by an intercepting aircraft to which an intercepted aircraft must respond in a precise manner. A copy of the interception procedures can be found within the Canada Flight Supplement, in the CARs, and in the TC AIM.

Proof of Insurance

1.51 Yes. Proof of insurance must be carried on board for all flights except for commercial aircraft.

Additional questions

1.52 The Certificate of Registration lists the owner and the purpose of the aircraft.

Note: In addition to the owner, it also gives the Registration, Make and Model of the aircraft. The purpose can be Private or Commercial (also State or Military).

1.53 It is attached to the structure of the aircraft in a place where it is visible to a person on the ground or to a person at the main entrance or rearmost entrance door.

1.54 It is on the floor, under the pilot's seat. (This area is not fireproof.)

1.55 The Technical Logbook consists of four separate booklets:

a. Airframe Log.
b. Propeller Log.
c. Engine Log.
d. Aircraft Modifications and AD's Log.

Note: All maintenance done on the aircraft is entered both in the Technical Logbook and Journey Logbook.

1.56 The Technical Logbook must not be carried on board aircraft at the same time as the Journey Logbook.

1.57 They must be kept until such time as the aircraft is no longer registered.

1.58 No. It is no longer required for flights in Canada However, a valid radio station licence issued by Industry Canada is required for international flights.

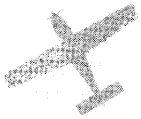
1.59 To facilitate memorization of the various elements, you might find the following useful:

M	>	Manifold Pressure Gauge
O	>	Oil Temperature Gauge
O	>	Oil Pressure Gauge
F	>	Fuel Quantity Indicator
A	>	Airspeed Indicator
C	>	Compass
T	>	Tachometer
A	>	Altimeter
R	>	Radiocommunication and/or radionavigation where applicable

Note: For more detailed information, consult CAR 605.14.

1.60 In addition to MOOFACTAR:

F	>	Spare fuses for required electrical system
A	>	Attitude Indicator
T	>	Turn Coordinator
D	>	Directional Gyro
A	>	Sensitive Pressure Altimeter
P	>	Pitot Heat
P	>	Position Lights and Anti-collision Lights*
I	>	Instrument Lights
L	>	Landing Light (if carrying passengers)
O	>	Outside Air Temperature Gauge
V	>	Vertical Speed Indicator



Note: For more detailed information, consult CAR 605.16.

In the interest of safety, anti-collision lights may be turned off (CAR 605.17).

1.61 0.1 hour = 6 minutes. Also: 0.3 hour = 18 minutes;
0.6 hour = 36 minutes;
0.9 hour = 54 minutes.

Section 2. Aeroplane Performance

Flight Test Guide Reference:

Ex. 2 Aeroplane Familiarization and Preparation for Flight

B. Aeroplane Performance

Performance Criteria

The candidate must quote from memory certain performance speeds and readily determine from the Pilot's Operating Handbook any other operational data for the aeroplane being used for the flight test.

What You Should Know

The candidate must know and do the following:

> Be thoroughly familiar with the Pilot's Operating Handbook and how to find information in it.
> Memorize essential performance airspeeds:

a. V_X (best angle of climb speed)
b. V_Y (best rate of climb speed)
c. V_S (stall speed)
d. V_{SO} (stall speed in the landing configuration)
e. V_A (manoeuvring speed)

> Explain the significance of V_A, V_{NO}, V_{NE}, V_{FE}.
> Know where to find other non-memory speeds in the POH.
> Explain the use of the various performance charts.
> Calculate takeoff and landing distances over 50 foot obstacles.
> Determine maximum crosswind component.
> Determine power setting and cruise speed for the planned en route cruising flight.

> Demonstrate your familiarity with aircraft systems and operating limitations, in particular:

a. fuel system.
b. electrical system.
c. pitot-static system.

> Determine fuel and oil information:

a. fuel capacity (usable, unusable) and grade.
b. fuel consumption.
c. oil capacity (minimum, maximum).

> (For Commercial only) Calculate the final approach speed corrected for the predicted landing weight using available charts or tables for weights that are less than maximum takeoff weight or, in their absence, using the formula:

1.3 V_{so} KCAS (max. gross wt.) x sqrt of (landing wt. ÷ gross wt.)
= 1.3 V_{so} KCAS (predicted landing wt.)

Typical Questions

To facilitate your finding of information in the Pilot's Operating Handbook, it is useful to memorize what type of information is contained in each section of the book. A detailed index can be found at the beginning of each section of the POH. Use it.

Many of the following questions require that you refer to the Pilot's Operating Handbook of the particular aircraft that you fly and/or will use for the flight test. To better illustrate the types of answers expected, sample data pertaining to various training aircraft is included where appropriate. Occasionally, extra space is provided so you may enter data concerning your own aircraft for future reference.

The answers to the following questions are located at the end of this section, starting on page 29.

Descriptive Data and Operating Limitations

2.1 What type of engine does your aircraft have? Describe it.

2.2 What type of fuel and oil does it require?

2.3 What is the minimum and maximum oil capacity?

2.4 What is the total usable and unusable fuel?

2.5 Describe (or draw) the fuel system of your aircraft.

2.6 Does the aircraft have a fuel pump?

2.7 If the fuel vent became blocked, what could happen?

2.8 What type of fluid does the nose oleo require?

2.9 What are the recommended tire pressures?

2.10 What type of flaps does your aircraft have?

2.11 What type of ailerons does your aircraft have?

2.12 Is your aircraft equipped with an elevator, or a stabilator?

2.13 Does the trim tab move in the same direction as the elevator, the stabilator or the anti-servo tab?

2.14 How does the cockpit heater system work?

2.15 Of what does the winterization kit usually found on a small aircraft consist? When should it be used?

2.16 What are the minimum/maximum engine temperatures for takeoff?

2.17 What are the maximum load factors for the test aircraft?

2.18 What does "maximum crosswind component" refer to?

2.19 Determine the following for the flight test aircraft:

a. voltage of the electrical system.
b. voltage of the battery.
c. ampere strength of the alternator.
d. ampere hours of the battery.

2.20 How does the ammeter work?

2.21 In the event of the ammeter showing a complete deflection to the right (an excessive rate of charge) and the voltage light illuminating, how would you handle this situation in flight?

2.22 If the ammeter was deflected to the left (an insufficient rate of charge) and the voltage light illuminated, how would you handle this situation in flight?

2.23 How can you determine a high/low, or over-voltage, situation?

2.24 In the event of a total electrical failure, how will it affect the magnetos?

Instruments and Related Systems

Pitot-Static

2.25 Name the pitot-static instruments.

2.26 Which pitot-static instrument(s) utilize the pitot tube? The static port?

2.27 If the pitot tube gets blocked, which instrument(s) will be affected? What about a static port blockage?

2.28 How will the airspeed indicator react to pitot tube blockage?

2.29 How will the airspeed indicator react to static port blockage?

2.30 How will the altimeter and vertical speed indicator react to a pitot tube blockage? How will they react to a static port blockage?

Gyroscopic

2.31 Name the gyroscopic instruments.

2.32 How are they powered?

2.33 How do you know if the information from the gyro instruments is reliable?

2.34 Name the major sources of error on the heading indicator.

2.35 How often must you reset the heading indicator? Under what conditions can you set it?

2.36 Does the turn coordinator indicate the amount of bank?

2.37 What is the inclinometer? How does it work?

Engines

2.38 How do you lean the mixture for best economy cruise? For best power?

2.39 What is the danger of running the engine too lean?

2.40 When you apply carburetor heat, why do you get a decrease in performance?

2.41 How do you determine if carburetor icing is present?

2.42 In flight, you notice a drop in oil pressure and a rise in oil temperature. What can you expect?

2.43 During the engine run-up, you discover that the oil pressure gauge is inoperative. Can you depart anyway?

Airspeeds and Airspeed Limitations

2.44 Quote from memory the following speeds: V_X, V_Y, V_S, V_{SO}, V_A, best glide.

2.45 In relation to the best rate of climb speed (V_Y) and the best angle of climb speed (V_X), what is the normal climb speed?

2.46 Define V_S.

2.47 What is the designation for the power off stalling speed with flaps up? How is it depicted on the airspeed indicator?

2.48 How does weight affect the stall speed?

2.49 How does bank affect the stall speed?

2.50 What is the designation for the power off stalling speed of the aircraft with flaps (and gear if applicable) down? Is it possible to see it on the airspeed indicator?

2.51 Define V_A.

2.52 What happens to V_A with an increase in weight?

2.53 Define V_{FE}. Can you read it on the airspeed indicator?

2.54 What is the significance of the yellow arc on the airspeed indicator?

2.55 What does V_{NO} stand for? How is it indicated on the airspeed indicator?

2.56 What is the V_{NO} for your test aircraft?

2.57 Define V_{NE}. Is it indicated on the airspeed indicator?

2.58 What is the V_{NE} for your test aircraft?

2.59 What is the precautionary approach speed for your test aircraft?

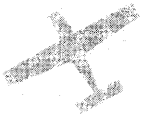
2.60 What do you call the speed that provides the best lift to drag ratio?

Performance Charts

2.61 Using the Takeoff Distance chart provided in the annex (page 126), calculate the total distance to clear a 50 ft obstacle given the following conditions:

a. sea level.
b. temperature +15°C.
c. dry grass runway.
d. no wind.

2.62 How would an increase in temperature and/or altitude affect the takeoff run?



2.63 Using the Cruise Performance chart provided in the annex (page 128), determine the hourly fuel consumption and the true airspeed of the aircraft given the following conditions:

a. 2,200 RPM.
b. temperature +5°C.
c. altitude 5,000 feet.
d. no wheel fairings.

2.64 Using the same Cruise Performance chart, determine the fuel consumption at 65% power given the following:

a. altitude 5,000 feet.
b. temperature +15°C.

2.65 Using the Landing Distance chart provided in the annex (page 127), calculate the landing distance required given the following conditions:

a. temperature +20°C.
b. pressure altitude 3,000 feet.
c. dry grass runway.
d. 4 kt tailwind.

Manoeuvres and Emergency Procedures

Emergency procedures may be assessed during different phases of the test, on the ground, in the air, or both, at the discretion of the examiner.

Sideslip

2.66 What is the difference between a sideslip and a forward slip?

2.67 In a sideslip, does the airspeed indicator over-read or under-read?

Short field landing

2.68 When executing a short field landing, why do you retract the flaps during the ground roll?

Stall

2.69 In a climbing turn, which wing should stall first?

2.70 In a descending turn, which wing will stall first?

2.71 In a level turn, which wing should stall first?

2.72 Why is aileron not used to control a wing drop when a stall is imminent?

Spin

2.73 How do you recover from a spin?

2.74 Can you spin the aircraft if it is in the normal category?

2.75 Why is it dangerous to have the flaps down during a spin?

2.76 According to the POH, at what altitude must recovery from a spin be completed?

Spiral dive

2.77 How do you recover from a spiral dive? What is the main difference between a spin and a spiral dive?

Fire

2.78 What would you do if you had an engine fire during start-up?

2.79 What would you do if you had an engine fire during flight?

2.80 What would you do in the case of an electrical fire during flight?

2.81 What would you do if you had a cabin fire during flight?

2.82 What would you do if you had a wing fire during flight?

Engine failure

2.83 What would you do should you experience an engine failure during the takeoff roll?

2.84 What would you do should you experience an engine failure just after takeoff?

Communication failure

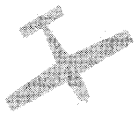
2.85 What would you do if you had a total communication failure in flight?

Icing

2.86 What would you do if you inadvertently flew into icing conditions?

Answers

Descriptive Data and Operating Limitations

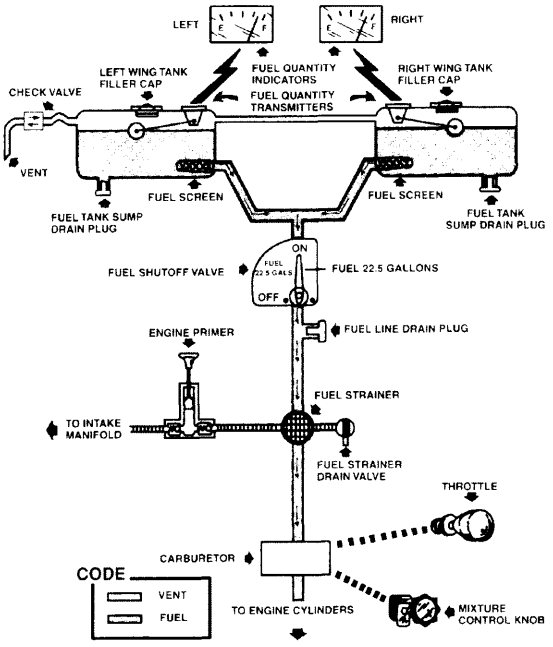


2.1 For a complete answer, please refer to your POH. Among other things, be prepared to supply the following information:

	Example:	Cessna 152	Your aircraft
	Configuration:	4-cylinder horizontally opposed	_____
	Horsepower:	110 rated BHP	_____
	Displacement:	233.3 cu. in.	_____
	Type of cooling:	air cooled	_____
2.2	Fuel:	100LL, 100	_____

	Oil:	MIL-L-22851	_____
		Ashless dispersant oil	_____
2.3	Minimum oil:	4 US quarts	_____
	Maximum oil:	6 US quarts (standard)	_____
2.4	Usable fuel:	24.5 US gallons	_____
	Unusable fuel:	1.5 US gallons	_____

2.5 Refer to the POH. You may want to practice drawing a simple diagram of the fuel system as it will facilitate retention of all the critical elements.



2.6 Refer to the POH.

Note: All low-wing aircraft have fuel pumps. Some high-wing aircraft have pumps as well, but most of the smaller ones are gravity-fed.

2.7 Fuel starvation could occur. With no fuel, the engine will stop.

Note: Think of a can of juice; two holes are required for the liquid to flow freely.

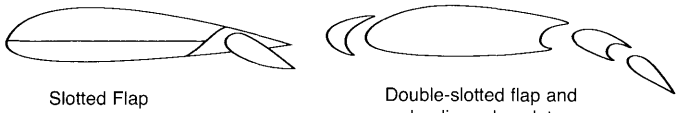
2.8	**Example:**	Cessna 152	Your aircraft
	Nose oleo:	MIL-H5606 Hydraulic fluid	_____

Note: If the answer cannot be found in the Pilot's Operating Handbook, consult the Technical Logbook - Airframe section or an AME.

2.9	Main wheels:	21 psi	_____
	Nose wheel:	30 psi	_____

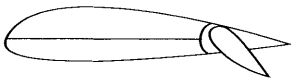
2.10 Refer to the POH (Airplane and Systems Descriptions section).

Examples:



Slotted Flap

Double-slotted flap and leading-edge slat



Plain Flap

2.11 Refer to the POH.

Examples:

Frise Ailerons

Down-going aileron streamlined into wing – reduced drag

Up-going aileron nose projects into airflow – increasing drag

Differential Ailerons

Down-going aileron moves through small angle – less drag

Up-going aileron moves through large angle – more drag

2.12 Refer to the POH.

Examples:

Cessnas 150, 152 and 172 have elevators.

2.13 No. It does not move in the same direction as the elevator.
No. It does not move in the same direction as the stabilator.
Yes. It moves in the same direction of the anti-servo tab. (Ex. Diamond Katana)

2.14 A shroud installed around the exhaust muffler allows the air to be warmed before it is channelled into the cockpit.

Note: It is absolutely critical that the exhaust system be free of any defect (ex. perforations); otherwise, deadly carbon monoxide may enter the cockpit.

2.15 The winterization kit normally consists of two plates to partially cover the cowl nose cap opening, insulation for the engine crankcase breather line and a few placards.

The equipment should be installed when the temperatures are consistently below -7°C.

2.16 Refer to the POH.

Example:	Cessna 152	Your aircraft
Minimum oil temperature:	100°F.	_____
Maximum oil temperature:	245°F.	_____

2.17 Refer to the POH.

Example:	Cessna 172	Your aircraft
Category	Normal	_____
Flaps up:	+3.8g and -1.52g	_____
Flaps down:	+3.0g	_____
Category	Utility	_____
Flaps up:	+4.4g and -1.76 g	_____
Flaps down:	+3.0g	_____

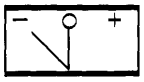
2.18 The maximum crosswind component is the maximum crosswind for which adequate control of the aircraft has been demonstrated during takeoff and landing as part of the certification process. It is not considered to be limiting.

2.19 Refer to the POH.

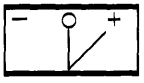
Example:	Cessna 152	Your aircraft
Voltage - electrical system:	28-volt	_____
Voltage - battery:	24-volt	_____
Ampere strength - altern:	60-amp	_____
Ampere hours - battery:	14-amp hour	_____

2.20 The ammeter indicates the flow of current from the alternator to the battery or from the battery to the airplane electrical system.

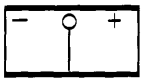
Note: The alternator is driven by a belt via the crankshaft. If the belt snaps, the alternator can no longer supply electrical power, so all the electrical power will come from the battery which, no longer being recharged by the alternator, will eventually be empty.



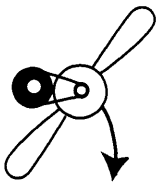
Indicates discharge of the battery. Load may be too great for battery and alternator combined or you may have an alternator failure.



Indicates the battery is being charged up by the alternator. If full deflection persists, you may have an over-voltage problem, battery being overcharged.



Battery is fully charged.
Alternator is not charging battery.



*Alternator being driven by belt via crankshaft.
*If belt snaps, the only power will be from the battery.

2.21 Refer to the POH (Emergency Procedures) for the required actions.

Example:

In the case of the C-152, the POH says that continuous charging of the battery could lead to its overheating. To prevent this, an over-voltage sensor will automatically shut down the alternator. If applying the proper procedures fails to solve the problem, then the flight should be terminated.

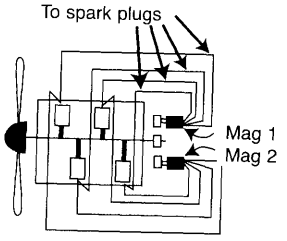
2.22 Refer to the POH (Emergency Procedures) for the required actions.

Example:

In the case of the C-152, the POH says that the continuous discharge of the battery indicates that the alternator is not supplying power to the system and should be switched off. All non-essential equipment should be turned off and the flight terminated as soon as practical.

2.23 The red voltage light may either indicate an overcharging or undercharging situation. The ammeter will indicate which situation actually exists.

2.24 It will not affect the magnetos at all. The magnetos run off the crankshaft (engine power). They are independent of the aircraft's electrical system. (Refer to diagram of the electrical system in the POH.) Therefore, if you turn the master switch off, the magnetos will not be affected, nor will the engine.



The magnetos run off the crankshaft (engine power). They are independent of the aircraft's electrical system. Total electrical failure will not affect the mags. If you turn the master switch off, it will not affect the magnetos or engine.

Instruments and Related Systems

Pitot-Static

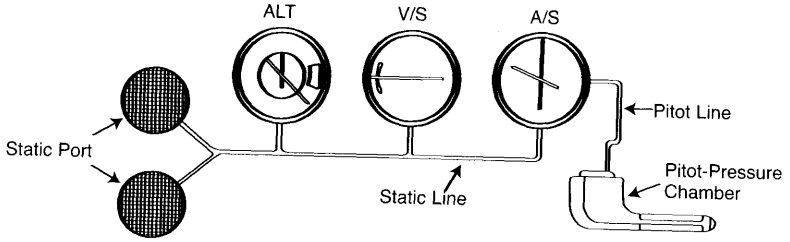
2.25 The pitot-static instruments are:

a. vertical speed indicator.
b. altimeter.
c. airspeed indicator.

Note: They do not require a power source.

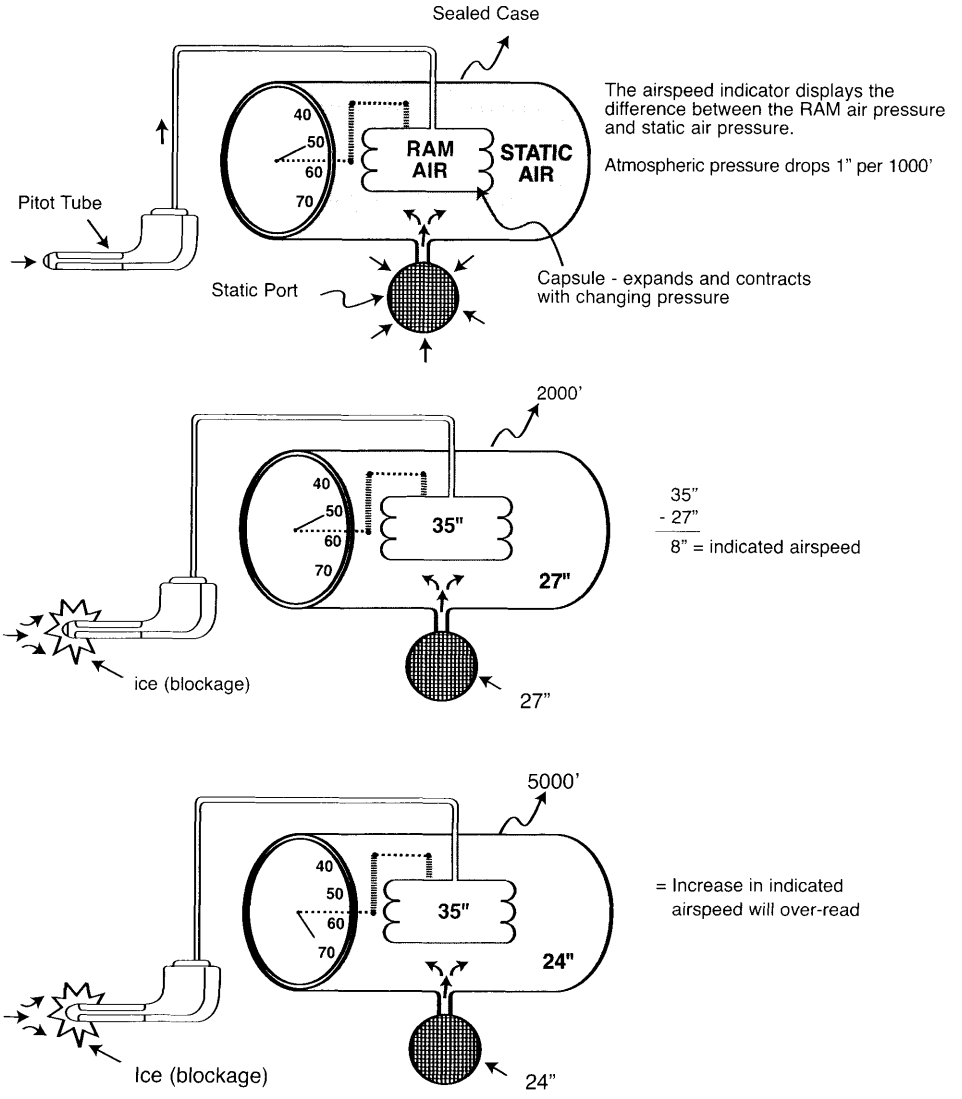
2.26 Pitot tube: airspeed indicator.
Static port: airspeed indicator, vertical speed indicator and altimeter.

2.27 Pitot tube blockage: airspeed indicator.
Static port blockage: airspeed indicator, altimeter and vertical speed indicator.

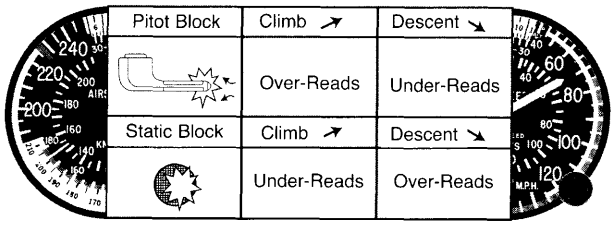


Note: In the event that the static port becomes blocked, you can use the alternate static source or break the glass case of the least important instrument - the vertical speed indicator.

2.28 In a climb, the airspeed indicator will over-read and in a descent, it will under-read.



2.29 In a climb, the airspeed indicator will under-read and in a descent, over-read.

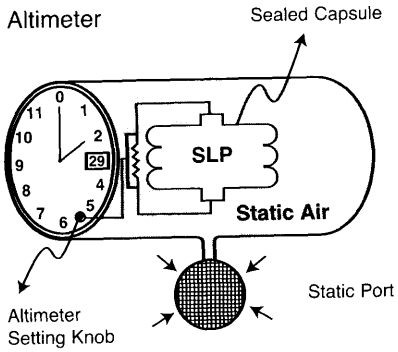


2.30 Pitot tube blockage: not affected because the altimeter and the vertical speed indicator are not connected to the pitot tube.

Static port blockage: altimeter will freeze at last reading before blockage because the static pressure is trapped in the instrument; vertical speed indicator will indicate "0" once the static air pressure has equalized in both the capsule and the case of the instrument.

Example: 29" SLP – 24" Static = 5" = 5000'

Altimeter



The Altimeter measures the difference between the pressure in the capsule and the static air pressure, based on the principle that pressure drops 1" per 1000'.

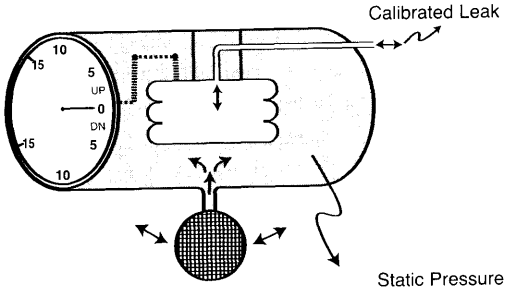
The ASL is displayed on the outside.

Altimeter setting knob sets the sea level pressure in the capsule.

The pitot tube is only utilized by the A.S.I.

Static port blockage would "freeze" the altitude.

VSI



Air cannot escape as fast as the static line.

The capsule pressure lags behind the changing static pressure.

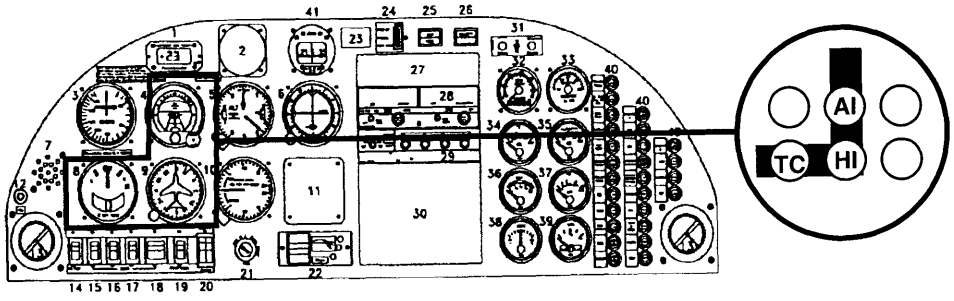
The capsule's expansion and contraction are converted into needle movement.

The calibrated leak line is vented to the static line, so if the static line is blocked, the capsule cannot expand or contract and will read "0".

Gyroscopic

2.31 The gyroscopic instruments are:

a. attitude indicator.
b. heading indicator.
c. turn coordinator (turn and bank or turn and slip indicator).



Note: These instruments are mostly found (and best scanned by the pilot) in the "Reverse L" position.

2.32 The gyroscopic instruments are powered electrically but can also be powered by a vacuum pump driven off the engine.

Example:	Cessna 150, 152, 172	Katana DV20
Attitude indicator:	vacuum	electrical
Heading indicator:	vacuum	electrical
Turn coordinator or turn and slip indicator:	electrical	electrical

Note: You find this information in the POH.

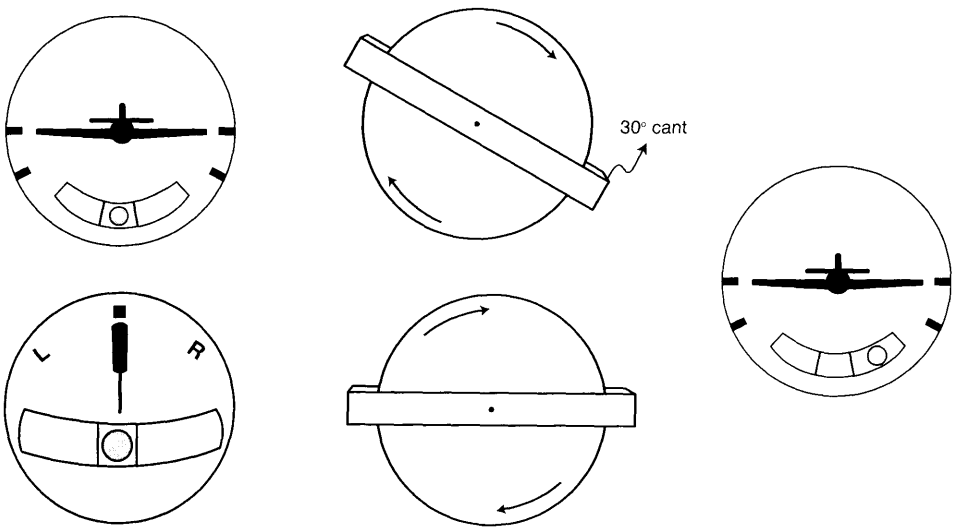
2.33 By: a. checking if the suction gauge is "in the green".
b. checking that there are no "flags".
c. performing an instrument check during taxi.

Note: The attitude indicator should be giving accurate information within 5 minutes of the start-up.

2.34 Bearing friction and the earth's rotation are the major sources of error on the heading indicator.

Note: If it precesses more than 3 degrees in 15 minutes, it is unreliable.

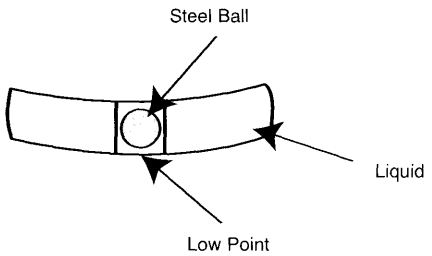
2.35 The heading indicator should be reset at least once every 15 minutes. It can only be set in straight (wings level), unaccelerated flight; also in stabilized climbs and descents.



2.36 No. The turn coordinator does not indicate the amount of bank.
> Shows rate of turn and roll.
> In the example above (far right) the A/C is flying straight with the right wing low.
> Needle indicates rate of turn and direction of turn.
> Does not show rate of roll info.
> Rate of turn = How fast the nose of the A/C is moving across the horizon.

2.37 The inclinometer is an instrument used to measure the attitude of an aircraft relative to the horizontal. It is usually made of a curved glass tube, partially filled with a clear liquid and holding a black ball made of glass, steel or agate.

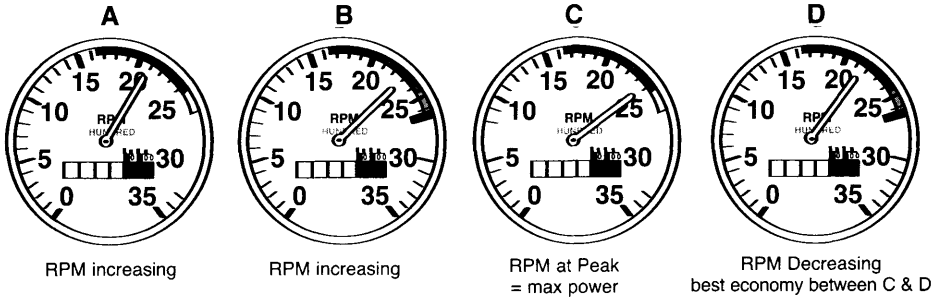
The inclinometer works on the principle of gravity.



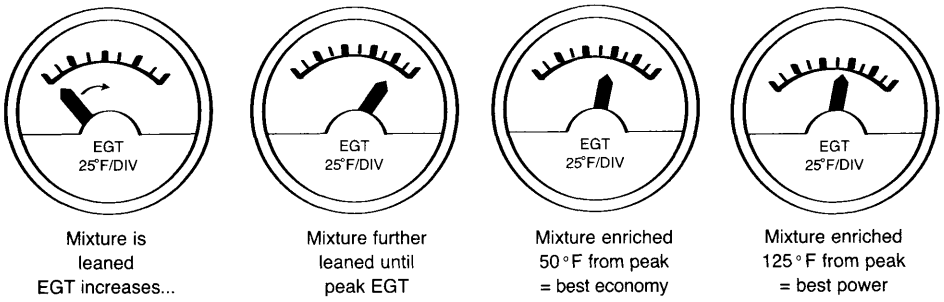
Engines

2.38 Depending on the equipment available, here are two methods to adjust the mixture to achieve the desired results.

1. Using the tachometer (example, in C-150, 152, 172)



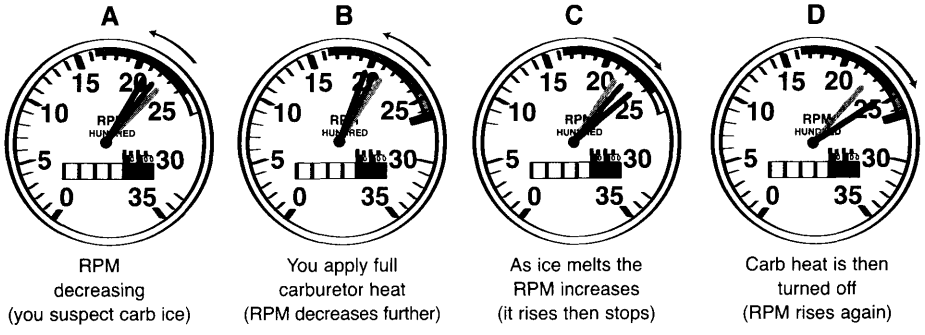
2. Using the EGT (Exhaust Gas Temperature) Gauge



2.39 Running the engine too lean may cause overheating and detonation.

2.40 When carburetor heat is applied, hot air is introduced into the mixture. As hot air is less dense than cold air, the fuel to air ratio becomes richer, too rich for best performance. Therefore, when using the carburetor heat for extended periods in cruise flight, it is a good idea to lean the mixture.

2.41 You can determine if carburetor icing is present by applying carburetor heat and watching the indications on the tachometer.



2.42 A drop in oil pressure coupled with a rise in oil temperature would indicate engine problems and possible imminent engine failure.

2.43 No. The oil pressure gauge is part of the aircraft equipment requirements for day VFR flight.

Airspeeds and Airspeed Limitations

2.44 Look for these speeds in the POH:

Example:	Cessna 152	Your aircraft
V_X:	55 KIAS	_____
V_Y:	67 KIAS	_____
V_S:	40 KIAS	_____
V_{SO}:	35 KIAS	_____
V_A:	104 KIAS	_____
Best glide:	60 KIAS	_____

2.45 The best angle of climb ensures the maximum altitude gain over a given distance; for example, when an obstacle has to be cleared on takeoff. As the angle required to clear the obstacle is greater than normal, the speed at which it can be achieved is quite low (V_X) and is meant to be used for a short time only. The best rate of climb on the other hand ensures the maximum altitude gain in a given period of time. Since this will be executed over a longer distance, the climb angle will be flatter, resulting in a greater airspeed (V_Y). However, other factors, such as engine cooling and forward visibility, may dictate that an even flatter climb be performed. The flatter the angle of climb, the higher the corresponding airspeed.

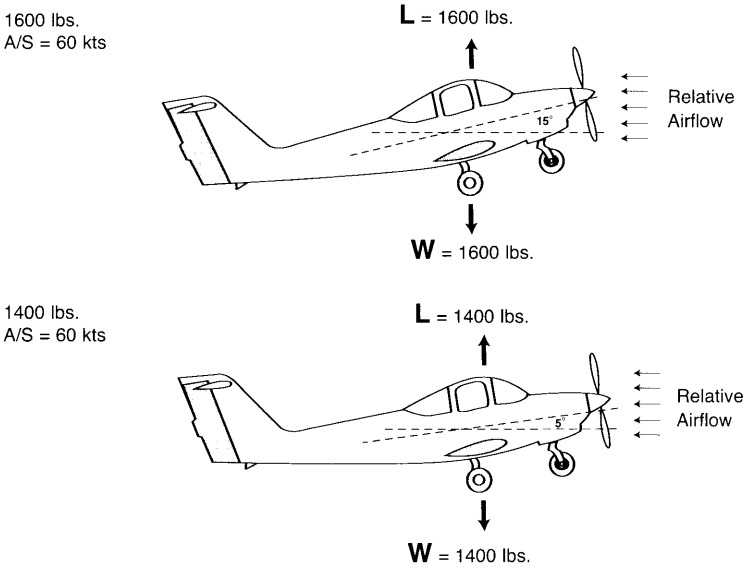
For comparison purposes, on a Cessna 152:
V_X = 55 KIAS
V_Y = 67 KIAS
Normal climb = 70-80 KIAS

2.46 V_S = stall speed. This is the minimum speed at which the aircraft is controllable in steady flight.

2.47 It is called the Vsl. It corresponds to the lower limit of the green arc.

Note: For all intents and purposes, in aircraft such as Cessna 150, 152 and 172, V_S and V_{SL} are the same.

2.48 An increase in weight translates into an increase in stall speed.



2.49 The greater the angle of bank, the higher the stall speed. Refer to the POH for complete data.

2.50 It is called the V_{SO}. It corresponds to the lower limit of the white arc.

2.51 V_A = manoeuvring speed.

It is the maximum speed at which the airplane will not be overstressed at full deflection of control surfaces.

2.52 V_A increases with an increase in weight.

2.53 V_{FE} = maximum flaps extended speed. This is the maximum speed at which the flaps can be lowered. Do not exceed this speed with flaps extended. It corresponds to the upper limitof the white arc.

Note: V_{FE} refers to the maximum speed at which any amount of flap can be lowered, not only full flaps.

2.54 The yellow arc is referred to as the "caution range". It starts at V_{NO} and terminates at V_{NE}. Manoeuvres must be conducted with caution in smooth air only.

2.55 V_{NO} = maximum structural cruising speed. This is the speed starting at which operations must be conducted with caution and only in smooth air. It corresponds to the lower limit of the yellow arc (the caution speed range).

Note: Since it is impossible to guarantee that turbulence will not be encountered and that air will be smooth, the airplane should not be operated intentionally in this range.

2.56 Refer to the POH.

Example:	Cessna 152	Your aircraft
V_{NO}:	111 KIAS	_____

2.57 V_{NE} = never exceed speed. This is the speed that must never be exceeded in any operation.

It corresponds to the red line on the airspeed indicator.

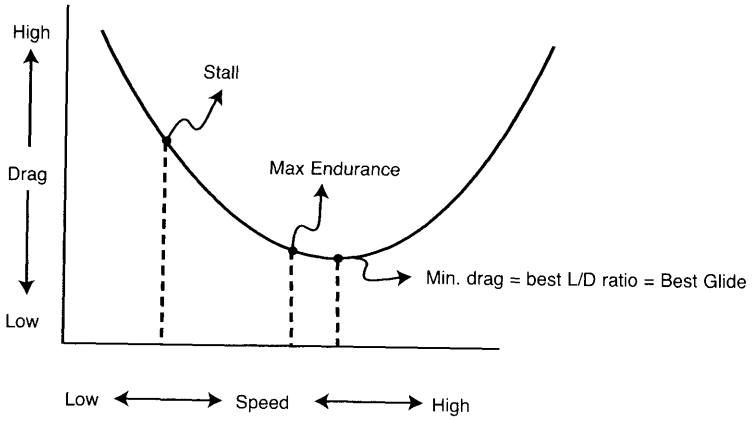
2.58 Refer to the POH.

Example:	Cessna 152	Your aircraft
V_{NE}:	149 KIAS	_____

2.59 Refer to the POH.

Example:	Cessna 152	Your aircraft
Precautionary approach speed with engine power:	55 KIAS	_____

2.60 The best glide speed.



Note: Maximum endurance (the lowest fuel burn to sustain flight) is more affected by parasite drag than by induced drag which is why the maximum endurance speed is lower than the best glide speed.

Performance Charts

2.61 1,450 feet.

2.62 An increase in temperature results in a longer takeoff run. An increase in field altitude also results in a longer takeoff run. When both factors are present, you can expect a significantly longer takeoff run than with only an increase in temperature or an increase in altitude.

2.63

Fuel consumption:	4.6 US gallons per hour
True airspeed:	88 KTAS

2.64 5.3 US gallons per hour.

2.65 891 feet.

Manoeuvres and Emergency Procedures

Sideslip

2.66 In the sideslip, the longitudinal axis is parallel to the runway. The sideslip is used for crosswind landings. In the forward slip, the longitudinal axis is not parallel to the runway centreline. The forward slip is used to lose altitude without increasing airspeed. It is often used on approach to landing.

2.67 It depends, among other things, on which side of the fuselage the static port is located. Whether the airspeed indicator over-reads or under-reads, it can be dangerous because during the approach, you are closer to the stall speed. For this reason, in performing any sideslip, you should use a slightly higher than normal speed to avoid an inadvertent stall.

Short field landing

2.68 When retracting the flaps, you are changing the camber of the wing. As a result, less lift is produced, so more weight will be transferred to the wheels for maximum braking effectiveness and less chance of skidding.

Stall

2.69 In a climbing turn, the higher wing should stall first.

2.70 In a descending turn, the lower wing will stall first.

2.71 In a level turn, the inside or lower wing normally stalls first.

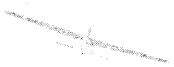
2.72 When a stall is imminent, the ailerons start losing their effectiveness. Trying to pick up a dropped wing with aileron may well precipitate a stall. Since both wings will not be stalled equally, any further use of aileron will aggravate the situation. You must use the rudder, but remember that it is also not very effective at such low speeds.

Spin

2.73 Refer to the POH for the procedure recommended for your particular aircraft, as there may be some variations on the "standard procedure" and a failure to follow immediately the proper procedure could result in delayed recovery (or worse).

For most small training aircraft approved for spins, the following procedure usually applies:

1. Power to idle - neutralize ailerons.
2. Apply and hold full rudder opposite to the direction of rotation.
3. Just after the rudder reaches the stop, move the control column briskly forward, far enough to break the stall. (Full down elevator may be required with aft centre of gravity.)
4. Hold these control inputs until rotation stops.
5. As rotation stops, neutralize the rudder, maintain the wings level and recover smoothly from the resulting drive.



2.74 No. Spins are prohibited in the normal category.

2.75 Flaps tend to induce flatter spins and, during recovery, V_{FE} will be exceeded by a wide margin. Also, flaps might reduce the effectiveness of the tail section, notably the rudder, due to deflected airflow.

2.76 Caution. The POH of many US aircraft refers to FAR 91.71 to provide the absolute minimum altitude for spin recovery, which is 1,500 feet above ground. In Canada, the minimum altitude for spin recovery is 2,000 feet above ground.

Spiral dive

2.77 Refer to the POH for the recommended procedure, particularly when the spiral dive results from inadvertent entry into clouds. However, in most cases, the recovery technique is quite straightforward.

1. Close the throttle.
2. Roll the wings level. (Attention: avoid rolling and pulling up at the same time.)
3. Ease out of the dive.
4. Apply power only after the airspeed has decreased to within the normal range.

The main difference between a spin and a spiral dive is the airspeed. In a spiral dive, the airspeed will be well above stalling speed and increasing rapidly. Also, during a spin the aircraft is stalled while during a spiral dive, it is not.

Note: A spiral dive has no practical application and it can be very hazardous, particularly at low altitude.

Fire

2.78 Refer to the POH. Commit procedure to memory.

Note: Even if the fire was of a short duration and does not appear to have caused damage, do not take off. An AME should inspect the aircraft first.

2.79 Refer to the POH. Commit procedure to memory.

2.80 Refer to the POH. Commit procedure to memory.

2.81 Refer to the POH. Commit procedure to memory.

2.82 Refer to the POH. Commit procedure to memory.

Engine failure

2.83 Refer to the POH. Commit procedure to memory.

2.84 Refer to the POH. Commit procedure to memory.

Note: Too many fatal stall/spin accidents happen because pilots attempt to return to the airport. Land as straight ahead as possible.

Communication failure

2.85 Communication failure is a fairly common occurrence. A stuck microphone can often be the cause as can the improper selection of a switch on the intercom. Also, an alternator failure leading to the slow discharge of the battery can cause your radio to gradually fail. If communication failure occurs, DON'T PANIC! Which measures will be taken depend on the circumstances. Basically, where there is a radiocommunication failure between ATC and a VFR aircraft while operating in Class B, C or D airspace, the pilot-in-command shall:

a. leave the airspace (either by the shortest route or by landing at the aerodrome for which the control zone has been established).
b. set the transponder to code 7600 (if so equipped).
c. inform ATC of actions taken as soon as possible.

If outside Class B, C or D airspace and no nearby suitable aerodrome is available:

a. pilot may enter Class B, C or D airspace.
b. continue under VFR.
c. carry remaining procedures listed above.

If outside Class B, C or D airspace and there is a suitable aerodrome nearby at which the pilot wishes to land, comply with established NORDO arrival procedure. If VFR in Class E or G airspace, pilot may follow same procedures as outlined for Class B, C or D.

When using NORDO arrival procedures, you should be alert for visual signals from the control tower. You should enter the circuit from the upwind side, overhead for the mid-downwind. You should also make adjustments in spacing, so as not to overtake traffic ahead. Before turning final, you must check for any aircraft on a straight-in approach. Expect landing clearance in the form of a light signal from the tower.

Icing

2.86 Refer to the POH.

Note: Ice buildup could be so fast that between its onset and the moment when the situation is no longer in your hands, less than 30 minutes may have elapsed. In most cases, there is no substitute for turning back or, if it is not possible, landing as soon as possible, even off airport. Increase your approach speed with ice on the wings as your wing no longer has its normal optimal-lifting shape.

Section 3. Weight and Balance, Loading

Flight Test Guide Reference:

Ex. 2 Aeroplane Familiarization and Preparation for Flight

C. Weight and Balance, Loading

Performance Criteria

The candidate must:

> determine if the takeoff and landing weights and centres of gravity are within permissible limits for the flight test aeroplane.
> demonstrate the ability to correct a situation in which the centre of gravity is out of limits or in which the gross weight has been exceeded.
> state the effect of various centre of gravity locations on aeroplane flight characteristics.

What You Should Know

The candidate must know, and do, the following:

> Know where to find all the weight and balance, and loading data pertaining to the test aircraft:

a. basic empty weight.
b. baggage compartment capacity.
c. gross weight.

> Demonstrate your knowledge of the loading graphs, envelopes and centre of gravity locations.
> Explain the effects of a forward centre of gravity and a rearward centre of gravity.
> Explain the difference between normal category and utility category.
> Know your standard weights: male, female, child, infant.
> Know where to find the weights of fuel and oil under various conditions of temperature.
> Using actual weights where possible, perform complete calculations including:

a. takeoff and landing data for all takeoffs and landings (usually 2 of each).
b. permissible fuel.
c. payload distribution.

> Explain your options should the centre of gravity be found outside limits.

Typical Questions

The answers to the following questions are located at the end of this section, starting on page 44.

3.1 Review all the questions pertaining to the Weight and Balance Report covered in Documents and Airworthiness (page 16).

3.2 Where do you find the standard weights of people?

3.3 Where do you find the weights of fuel and oil under various temperature conditions?

3.4 What does useful load refer to?

3.5 What is the payload?

3.6 What is the capacity of the baggage compartment for the test aircraft?

3.7 What is the maximum permissible gross weight of the test aircraft for takeoff and landing?

3.8 What is the datum line?

3.9 How do you determine the moment?

3.10 What does centre of gravity mean to you?

3.11 How do you calculate the centre of gravity?

3.12 What is the centre of gravity range for the test aircraft?

3.13 Where is the centre of gravity normally located on the test aircraft at the basic empty weight?

3.14 Prepare a complete weight and balance for the test aircraft, one for each takeoff and landing.

3.15 Determine the position of the centre of gravity for each takeoff and landing based on the previous question.

3.16 Is the centre of gravity within limits for each takeoff and landing?

3.17 Is the centre of gravity within limits for spins?

3.18 In which direction will the centre of gravity move as fuel is consumed?

3.19 Can you change the position of the centre of gravity by shifting your body weight?

3.20 What measures can you take if the centre of gravity is found to be outside limits?

3.21 How will an excessive aft centre of gravity affect the aircraft?

3.22 How will an excessive forward centre of gravity affect the aircraft?

3.23 With an aft centre of gravity, will the stall speed be higher or lower than normal?

3.24 With a forward centre of gravity, will the stall speed be higher or lower than normal?

3.25 How is the true airspeed (TAS) affected by centre of gravity location?

Answers

3.1 Refer to Documents and Airworthiness - Weight and Balance Report.

3.2 The standard weights are found in the TC AIM RAC 3.5.

	Summer	Winter
Male:	200 lbs	206 lbs
Female:	165 lbs	171 lbs
Child:	75 lbs	75 lbs
Infant:	30 lbs	30 lbs

3.3 Refer to TC AIM RAC 3.5.2 for complete details. They can also be found in the Canada Flight Supplement, under General.

3.4 It is the difference between takeoff weight and the basic empty weight. In other words, it is the load which is removable: usable fuel, pilot, passengers, baggage, etc.

3.5 It is the load available as passengers, baggage, etc., after the weight of the pilot, crew if any, and usable fuel has been deducted from the useful load.

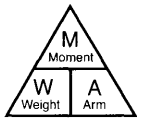
3.6 Refer to the POH. This information can be found in the Limitations section under Weight Limits.

3.7 Refer to the POH. This information is normally found in the Limitations section under Weight Limits.

3.8 The balance datum line is a line selected arbitrarily (in many small aircraft for example, it is located at the front of the firewall that separates the engine compartment and the cabin) from which horizontal distances are measured for balance purposes. The distance of any item (ex. cargo, passenger, fuel tank, etc.) from the datum line is called the arm of that item.

3.9 The formula is:

MOMENT = Weight x Arm
(M) (W) (A)



3.10 The centre of gravity is a point from which the airplane could be suspended and remain balanced.

3.11 You calculate the centre of gravity by dividing the total balance moment by the total weight. For US made aircraft, it is expressed in inches forward (-) or aft (+) of the balance datum line.

3.12 Refer to the POH. This information can be found in the Limitations section under Centre of Gravity Limits.

3.13 Refer to the Weight and Balance Report.

Note: Make sure to use the latest Weight and Balance Report.

3.14 Refer to the Weight and Balance Report and the POH.

Note: Make sure to use the latest Weight and Balance Report.

3.15 Based on your answers to the previous question, perform the appropriate calculations to determine the position of the centre of gravity in each case.

3.16 Check against the appropriate graphs.

3.17 In order to do spins, the aircraft must be within the utility category.

Example: The Cessna 172 can be flown in the normal or utility categories. For the aircraft to qualify for the utility category, certain restrictions apply (total weight, no baggage, no passengers on back seat, etc.)

Note: If spins will be part of your flight test (commercial licence), ensure that the aircraft is in the utility category.

3.18 When fuel is consumed, both the total weight of the aircraft and the distribution of the weight are changed. Use your previous calculations to verify in which direction the centre of gravity is moving. It will give you an idea of the handling characteristics to expect and also ensure that the centre of gravity remains within limits.

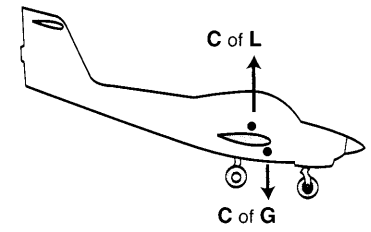
3.19 Yes. Most POH give different arm values depending on the seat adjustment.

3.20 No matter what measure is taken (less fuel, less baggage, moving passengers, shifting seat position, etc.), the most important factor here is safety. Therefore, your answer must reflect this priority.

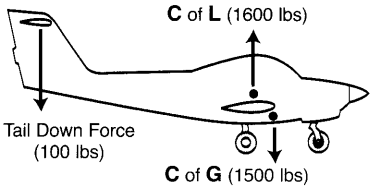
3.21 An excessive rearward (aft) centre of gravity leads to:

a. less than usual back pressure on takeoff and landing.
b. increased risk of tail strike on takeoff and landing.
c. dangerous stall and spin characteristics (recovery may even be impossible because the pilot is running out of elevator control).

In addition, an excessive aft centre of gravity will result in a lower stall speed.



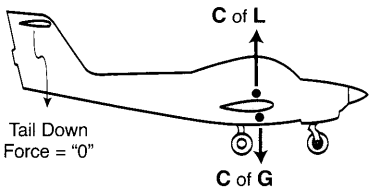
1. With no horizontal stabilizer the A/C would pitch nose down.



2. The horizontal stabilizer is an "upside down" wing, providing lift downward (negative lift).

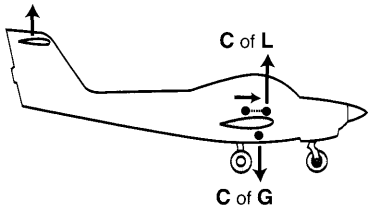
* Total force acting downward = weight of A/C + tail down force

* In order to maintain level flight C of L must equal 1600



3. With rearward C of G total force acting downward is reduced (tail down force not required).

* lower weight = lower stall speed

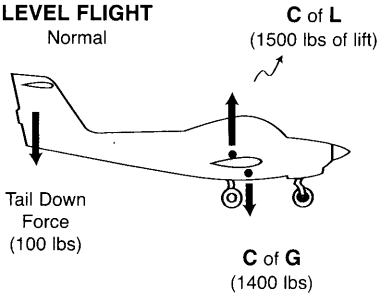


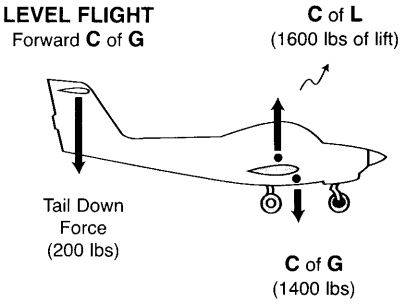
4. As you approach the critical angle of attack, C of L moves forward ahead of the C of G. At the stall tail will drop instead of nose. You may not have enough "tail up" force to push the nose over.

3.22 An excessive forward centre of gravity would require:

a. more than usual back pressure on takeoff and landing.
b. increased risk of wheelbarrowing or even propeller strike on takeoff and landing.

In addition, an excessive forward centre of gravity will result in a higher stall speed.





3.23 The stall speed is lower with an aft centre of gravity, but the stall characteristics can be dangerous. The tail may drop instead of the nose.

3.24 The stall speed will increase with a forward centre of gravity. The nose will tend to drop more than usual at stall.

3.25 The further aft the centre of gravity, the higher the true airspeed.

Section 4. Pre-Flight Planning Procedures

Flight Test Guide Reference:

Ex. 23 Pilot Navigation

A. Pre-flight Planning Procedures

Performance Criteria

Assessment will be based on the candidate's ability to:

> select a safe and efficient route.
> use appropriate and current aeronautical charts and other current flight publications to extract information pertinent to the flight.
> properly identify airspace, obstructions, terrain features and chart symbols.
> retrieve and interpret weather information, including NOTAMs appropriate for the intended flight.
> prepare a navigation chart.
> prepare contingency plans for alternate destinations.
> determine the appropriate departure procedure.
> obtain pertinent operational information about the en route and destination airports.
> determine the acceptability of the departure and destination runways under existing or forecast conditions.
> select the most favourable and appropriate altitudes.
> accurately calculate headings, estimated ground speed, fuel requirements, and time en route.
> complete a flight plan.
> make all final preparations, excluding weight and balance computations, within 45 minutes.
> where initial planning and preparation is completed in advance, complete all final preparations, including weight and balance computations, within 45 minutes.
> demonstrate practical knowledge of how to determine certain key elements of flight planning such as estimated time en route and fuel requirements.
> make a competent "Go / No-Go" decision.

What You Should Know

The Candidate must know and do the following:

> Most examiners will give the route before the flight test and supply the weights of passengers and luggage.
> The candidate will be asked to prepare a VFR cross-country flight, with one intermediate stop, to a destination at least 2 hours away.
> If the route has been provided in advance (as is usually the case), thus allowing for preliminary preparations (route selection, chart preparation, determination of tracks, distances, selection of possible alternates, initial log entries, etc.), on the day of the flight test, the candidate will be given 45 minutes for final preparations, including weight and balance calculations.
> Software-generated flight planning is acceptable provided the candidate can explain some of the key elements of flight planning such as estimated time en route, fuel requirements, contingencies, etc.

The following is based on each point to be assessed, as outlined in the Performance Criteria.

Route selection

> Types of airspace (restrictions and regulations).
> Cruising altitudes (CAR 602.34).
> Altitude versus obstacles, MOCAs and MEF's (Maximum Elevation Figure).
> Over water flight.
> Terrain difficulty.

Weather information

> Information must cover entire trip: departure, en route, destination.
> Weather forecasts and reports:

a. existing weather: METARs
b. forecast weather: TAFs, GFA, FD (Ensure to use the latest data for the intended time of the trip).

> Suitability of conditions for entire trip duration (and sometimes beyond).
> NOTAMs should be retrieved at the same time as the weather.

Navigation charts

> Validity and scale of VNC and VTA charts.
> Markings:

a. track lines.
b. ten-mile marks (starting from the destination).
c. 10 degree drift lines.
d. checkpoints.
e. halfway points.

> Drift correction procedures (before halfpoint, after halfway).

Departure procedures

> Overhead.
> Geographic point (most popular method - select easily identifiable point).
> En route climb.

Operational information and considerations (En route and Destination Airports)

> Valid Canada Flight Supplement (CFS).
> Runway information:

a. runway configuration and lengths.
b. current and expected conditions.
c. presence of surface contamination.
d. operational status and limitations (ex. displaced threshold, closed).
e. JBI/CRFI index.
f. NOTAMs.

> Services available (fuel of the grade your aircraft needs).
> Crosswind component:

a. use winds for ETA to airport.
b. caution: METARs give true winds, runways are magnetic - apply variation to the winds.

> Takeoff and landing distances:

a. refer to the POH for takeoff and landing distance charts.
b. calculate distances for each takeoff and landing (2 of each for the flight test)
c. runway length sufficient or not.
d. runway surface and other characteristics (grass, slope, etc.).

Flight planning log

> Ability to explain the provenance of basic information and the methods used to determine the required data.
> Justification behind power setting chosen.

> Suitable Flight Planning Log form (one you are comfortable with and which will ensure you do not forget anything). It should include:

a. departure and destination airports.
b. cruise altitude.
c. airspeeds: IAS, CAS, TAS.
d. calculation of pressure altitude.
e. true track.
f. wind direction and velocity (from valid FD - interpolate if necessary).
g. true heading.
h. variation.
i. magnetic heading.
j. deviation.
k. compass heading.
l. ground speed (estimated).
m. distances.
n. time en route and ETA.
o. fuel requirements (hourly consumption and total required).

Flight plans

> Options: flight plan / flight itinerary.
> When required.
> How to open and close:

a. phone FIC.
b. tower.
c. radio FIC on 126.7 MHz.
d. Confirm takeoff time = activation time (needed if you want to know at what time your flight plan or flight itinerary expires).
e. Time en route = total time including stopovers.
f. Complete Flight Plan form (see Part IV - Annex, page 129).

Typical Questions

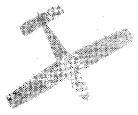
The answers to the following questions are located at the end of this section, starting on page 54.

Route selection

4.1 What are the VFR Cruising Altitudes? Are they based on true track or magnetic track?

4.2 What are the regulations for flying over open water?

4.3 What is the difference between controlled and uncontrolled airspace?



4.4 What are the VFR weather minima for controlled airspace? Uncontrolled airspace?

4.5 Name all the different classes of airspace. Which one is uncontrolled?

4.6 To what class of airspace do low-level airways belong?

4.7 What is the base of low-level airways? How wide are they?

4.8 Do VFR flights need permission to enter Class E airspace?

4.9 You intend to fly at 800 feet AGL in Class G airspace. What are the minimum weather requirements?

4.10 What is the major difference between Class E and Class G airspace?

4.11 Can you fly through Class F airspace?

4.12 Why did you choose that route?

4.13 Why did you choose that altitude?

4.14 What is the highest maximum elevation figure along your route? What is your MOCA?

4.15 Can you identify all the types of airspace you will go through on the proposed trip?

Weather information

4.16 Which weather information was used to plan for the expected runway at your destination?

4.17 What does NOTAM stand for? How did you get the NOTAMs for the proposed cross-country?

4.18 Why is it considered good practice to obtain current weather information to the west (and north-west) of the area where the cross-country flight is to take place?

Navigation charts

4.19 What is the scale of the VNC chart? VTA chart?

4.20 How do you know if your VNC and VTA charts are valid? How can you check if changes have occurred to the charts since they went into print, and if the next issue is not yet printed?

4.21 What is the purpose of 10 degree drift lines?

4.22 Name the three techniques that can be used to get back on track.

To answer questions 4.23 to 4.30, please refer to the chart segment illustrated below.

4.23 What is the elevation at Muskoka?

4.24 What is the length of the longest runway at Muskoka?

4.25 What is the variation near Muskoka?

4.26 What does the dashed box at Muskoka indicate?

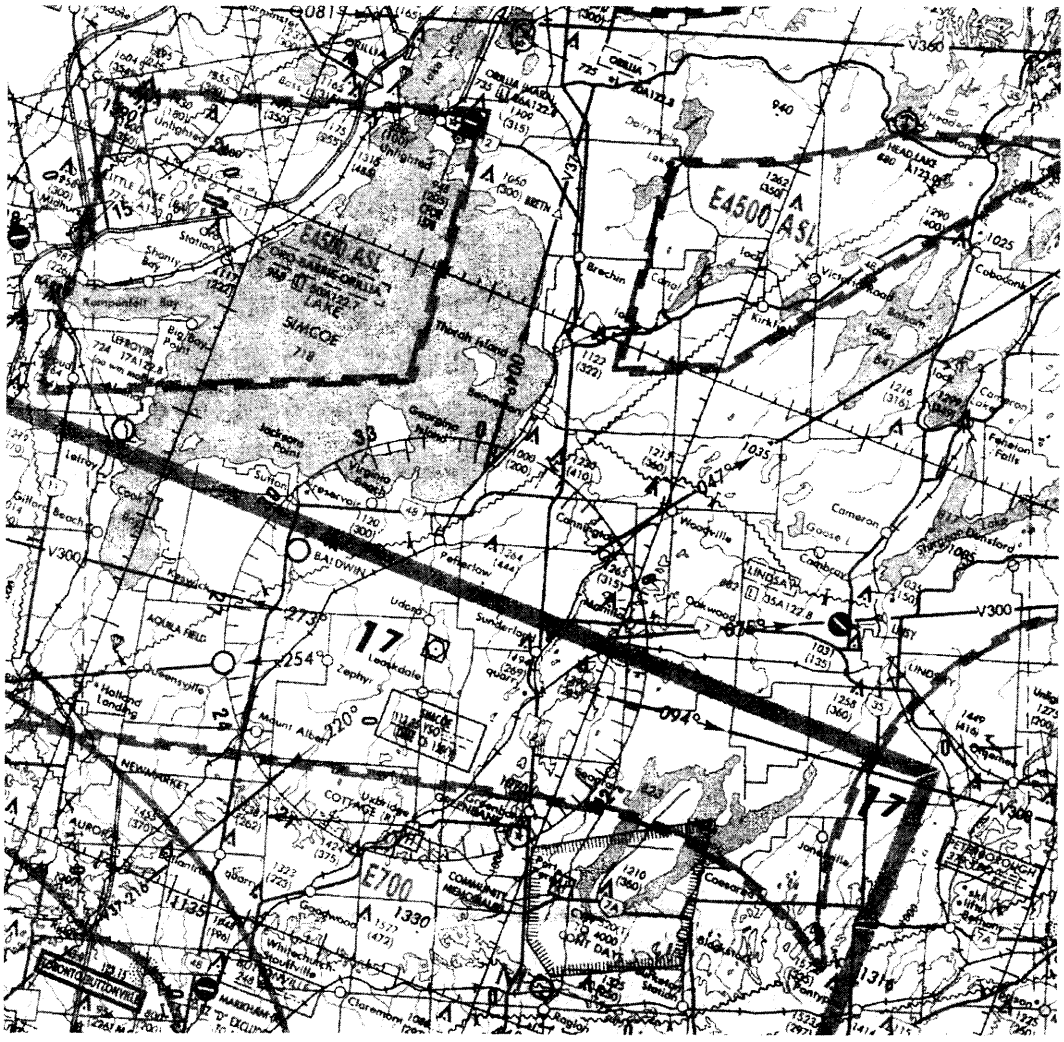
4.27 What does the E4500 ASL area below Muskoka signify?

4.28 In what class of airspace is Muskoka's control zone?

4.29 What class is the airspace above Stanhope (up to 12,000 feet ASL)?

4.30 If you draw a line from Muskoka to Stanhope, what type of airspace would you encounter?

To answer questions 4.31 to 4.39, please refer to the chart segment illustrated below.



4.31 What is the frequency and identifier for the Simcoe VOR?

4.32 What does the thick straight line running through the middle of this chart indicate?

4.33 What is the length of the longest runway at Oro-Barrie airport?

4.34 Can you get Special VFR at Toronto/Buttonville?

4.35 Can you fly through Port Perry at 2,000 feet ASL?

4.36 What is the MEF for the quadrant in which Lindsay is located?

4.37 What are the minimum visibility requirements if you are landing at Lindsay? Peterborough?

4.38 In what type of airspace is the Oro-Barrie airport located? Up to what altitude?

4.39 If you follow the 004 degree radial on V37 from the Simcoe VOR northbound, what are you on? What class of airspace are you in? Assuming there is no wind, what magnetic heading would you follow to return to the Simcoe VOR?

Departure procedures

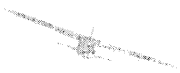
4.40 Name the three different types of "set heading" procedures and describe when you would use them.

Operational information and considerations

4.41 What is the difference between an MF and an ATF?

4.42 How do you enter an uncontrolled airport?

4.43 How do you depart an uncontrolled airport?



4.44 How do you enter a controlled airport?

4.45 What are the requirements for Special VFR?

4.46 Show your takeoff and landing distance calculations for each proposed takeoff and landing.

4.47 If you are unsure of runway conditions at your destination, what could you do?

4.48 When calculating crosswind components, why must you apply the variation to the wind?

4.49 How do you obtain a DF steer?

4.50 How do you know if your CFS is current?

To answer questions 4.51 to 4.61, please refer to the CFS excerpt reproduced on next page.

4.51 What are the shortest and longest runways at your destination?

4.52 Are there any special procedures at your destination airport?

4.53 Are there any landing fees at the Toronto/City Centre airport?

4.54 Are customs available? If yes, during what times?

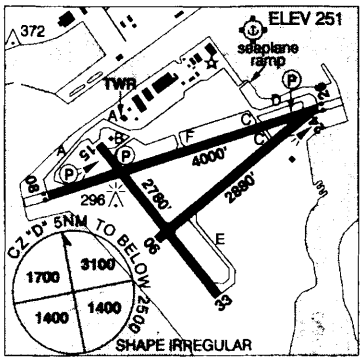
4.55 What type of fuel is available?

4.56 After taxiing onto the apron, on what frequency can you contact the Shell Aerocentre?

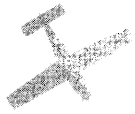
4.57 What is the width of runway 15?

4.58 Is lighting available on runway 33?

TORONTO / CITY CENTRE ON — CYTZ



REF	N43 37 39 W79 23 46 Adj S 11°W UTC-5(4) Elev 251' VTA A5000 F-21 LO6 T2 CAP
OPR	Toronto Port Authority 416-203-6942 Cert Ldg fees
PF	A-1 B-2,3,6 C-4,5
CUST	AOE/15 888-226-7277 13-01Z‡
FLT PLN	NOTAM FILE CYTZ Pilots to open/ close VFR flt plan with London rdo 123.15/126.7 or by phone.
FIC	London 866-WXBRIEF
ACC	Toronto 905-676-4590/4591/4592 or 888-217-1241
WX	METAR H24 AWOS. TAF 11-04Z‡, issue times: 11, 14, 20, 02Z (DT 10, 14, 20Z).
DUAT	Island Shell Aerocentre
SERVICES	1145-0345Z‡ dly When ferry not running no access to aprt. Hrs of ferry operation are 0615-2307 hrs (local).
FUEL	100LL, JA-1 (CON I IP JA-1, FSII)
OIL	All
S	1,3
ARFF	4 1145-0345Z‡ O/T call out chg 2 hrs PNR
PVT ADV	Esso Aviation 416-361-1100 123.2 12-23Z‡; Island Shell Aerocentre 416-203-2424 123.35 1130-0345Z‡; Esso (Toronto City Aviation) 416-361-1100 12-23Z‡ Opr Seaplane dock/ramp
MIL CON	Trans Capital Air (Imperial Oil/Esso) 416-361-1100
RWY DATA	Rwy 08(082°)/26(262°) 4000x150 asphalt Rwy 06(061°)/24(241°) 2880x150 asphalt Rwy 15(151°)/33(331°) 2780x150 asphalt
RCR	Opr 1145-0345Z‡ CRFI/RSC avbl ltd hrs. PLR/PCN
LIGHTING	08-AS(TE HI) P1, 26-AS(TE HI) AP, 15-AP 5.5° See CAUTION APAPI apch rwy 26.
COMM	
ATIS	133.6 1215-0245Z‡ dly
GND	121.7 1215-0245Z‡ dly
TWR	City 118.2 119.2 226.5 (V) 1215-0245Z‡ dly (emerg only 416-973-9240)
ATF	tfc 118.2 0245-1215Z‡ dly within CZ TO BELOW 2500 ASL
ARR	Toronto 133.4 358.1
DEP	Toronto 133.4 363.8
VDF	118.2 119.2 121.7 (V) Ltd hrs
NAV	
VOT	110.4
NDB	GIBRALTAR POINT TZ 257 (L) N43 36 46 W79 23 08 343° 1.0NM to A/D
DME	ITZ 110.15 Ch 38(Y) N43 37 38 W79 23 58 (296') at A/D. ITZ ILS, XTC localizer, ITZ DME unmonitored when twr clsd. DME not usable within 1.0 DME.
ILS	ITZ 110.15 Ch 38(Y) RVR
LOC	XTC 110.15 LOC reliable only within 20° either side of centreline
PRO	No ops outside of published hrs except MEDEVAC. Rgt hand circuits rwys 06, 08 & 15 (CAR 602.96). Noise abatement. All jet acft (exc MEDEVAC flts) and certain types of propeller acft are proh fr utilizing the aprt. Pilots should check with aprt ops prior to arr. Pilots are requested to maintain 2000 ASL or above over Metropolitan Toronto Zoo (N43 49 05 W79 11 15). Avoid overflight of noise sensitive areas, see Toronto/City Centre VTPC for east VFR routing. Tng activity btwn Toronto/Buttonville Municipal & Oshawa aprts. See Planning, Ontario, Hazards to acft operations, Claremont tng area.
CAUTION	All arr/dep acft to avoid flt over CNE/Ontario Place. For details see Toronto VTPC and Toronto/City Centre sketch. Frequent banner towing activity over CNE in fixed pattern 1500 ASL and below. Vessels up to 120' (366 ASL) in vic of final apch to all rwys. Tall vessels may penetrate PAPI apch slope rwy 08 & APAPI apch slope rwy 26. DME/glidepath antenna 296 ASL (45 AGL) at A/D, see sketch. APAPI rwy 15 apch slope 5.5°. **Do not overfly chimney** (N43 38 45 W79 19 59, 954 ASL (700 AGL) 2.6NM fr thld 26) **when using APAPI apch slope rwy 26.** Secondary ERS subject to availability of ferry ops. Flagpole 372 ASL (121 AGL) located 0.3NM N of thld rwy 15 & adj W of extended rwy centreline. Wind turbine aprx 1NM W of aprt at CNE 584 ASL (323 AGL) N43 37 52 W79 25 29. Extv bird activity on A/D.



4.59 Is DF steer available?

4.60 Are circuit patterns the same for all runways?

4.61 If you own a LearJet, can you land at YTZ?

Flight planning log

4.62 What does pressure altitude mean? On what altitude are most performance charts based?

4.63 Why did you choose this particular power setting?

4.64 Define the following: IAS, CAS, TAS.

4.65 How did you get from the TAS to the IAS?

4.66 Which winds aloft (FD) did you choose for the intended flight?

4.67 What is true track?

4.68 What is variation?

4.69 What is the difference between the magnetic track and the magnetic heading?

4.70 What is deviation?

4.71 What is compass heading?

4.72 What are the minimum fuel requirements for day VFR flight? Night VFR flight?

4.73 Explain how you determined how much fuel will be used for the entire trip.

Flight plans

4.74 What is the difference between a flight plan and a flight itinerary?

4.75 When are you required to file one of the above?

4.76 With whom do you open and close a flight plan?

4.77 Why is it important to note your takeoff time?

Answers

Route selection

4.1 VFR cruising altitudes start at 3,000 feet AGL.

EAST	(000° to 179°)	=	odd thousands + 500 feet
WEST	(180° to 359°)	=	even thousands + 500 feet

In the Southern Domestic Airspace, cruising altitudes are based on magnetic track (not magnetic heading) and in the Northern Domestic Airspace, cruising altitudes are based on true track.

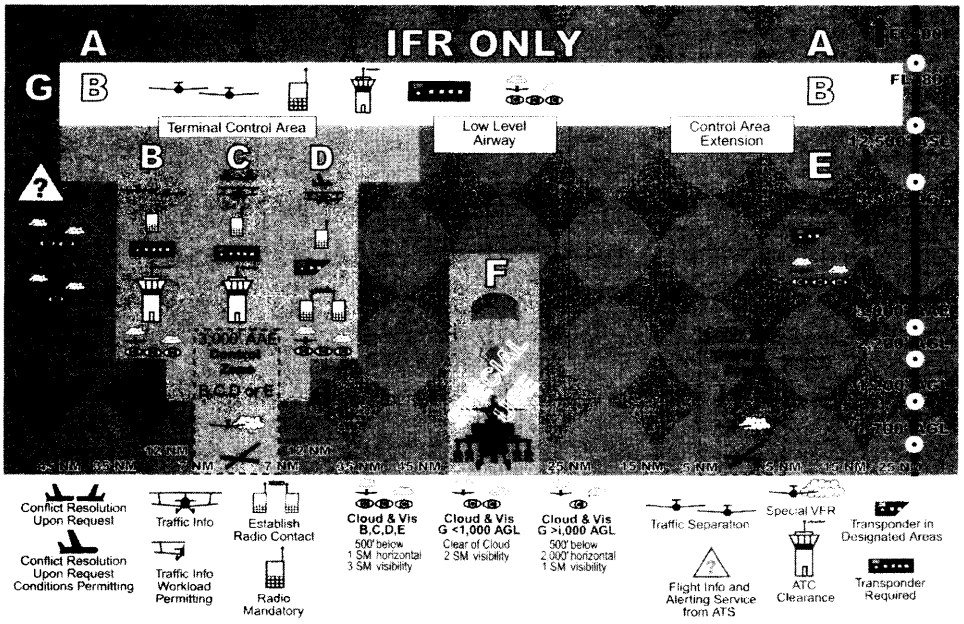
4.2 For land aeroplane: when beyond gliding distance from land, life jackets are required (CAR 602.02). For single-engine aircraft: beyond 100 nautical miles, life rafts are required (CAR 602.63).

4.3 One definition of controlled airspace is: airspace within which air traffic control service is provided and within which some, or all, aircraft may be subject to air traffic control. In uncontrolled airspace, there is no air traffic control service.

4.4 The VFR weather minima are:

Airspace		Flight Visibility	Distance From Cloud	Distance AGL
Control Zones		not less than 3 miles**	horizontally: 1 mile vertically: 500 feet	vertically: 500 feet
Other Controlled Airspace		not less than 3 miles**	horizontally: 1 mile vertically: 500 feet	
Uncon-trolled Airspace	1 000 feet AGL or above	not less than 1 mile (day) 3 miles (nght)	horizontally: 2000 feet vertically: 500 feet	
	below 1 000 feet AGL – fixed-wing	not less than 2 miles (day) 3 miles (nght) (see Note 1)	clear of cloud	
	below 1 000 feet AGL – helicopter	not less than 1 mile (day) 3 miles (nght) (see Note 2)	clear of cloud	

4.5 Class G airspace is uncontrolled. Class A airspace is the most restrictive.



4.6 Low-level airways are Class E up to 12,500 feet and Class B from 12,500 feet up to, but excluding 18,000 feet.

4.7 Low-level airways extend upward from 2,200 feet AGL. Typically, low-level airways are 8 nautical miles wide.

4.8 VFR flights do not require permission to enter Class E airspace.

4.9 Below 1,000 feet AGL in uncontrolled airspace:

a. 2 miles visibility by day, clear of cloud.
b. 3 miles visibility by night, clear of cloud.

4.10 Class E airspace is controlled: weather minima are higher and ATC may exercise some authority. Class G airspace is uncontrolled: weather minima are lower and ATC has no authority.

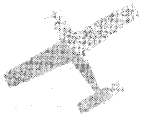
4.11 Yes, if the Class F airspace is ADVISORY (CYA on VNC and VTA charts).
No, if the Class F airspace is RESTRICTED (CYR on VNC and VTA charts).

4.12 Factors to consider when choosing a particular route are:

a. presence of large bodies of water.
b. type of airspace.
c. proximity to other airports in case of diversion.
d. visible landmarks.
e. fuel considerations.

4.13 Factors to consider when choosing a particular altitude are:

a. VFR Cruising Altitudes regulations.
b. verification of the MEFs in each quadrant along the intended route.
c. verification of the MOCA, that is the minimum ASL altitude which insures that you will clear obstructions.
d. FD.



4.14 Check the MEFs in each quadrant along your route to determine which is the highest. Locating the highest obstruction (terrain, man-made obstacles), will help you to determine your MOCA, which is the minimum altitude above sea level that will clear obstructions by 1,000 feet.

4.15 After a careful observation of your navigation chart(s), be prepared to indicate all the types of airspace through which your cross-country takes you.

Weather information

4.16 When figuring out the expected surface winds at your destination, you should use the METARs and TAFs. The METARs will indicate a trend and help to confirm that the TAFs are accurate.

4.17 NOTAM = Notice To Air Men. They contain information concerning the establishment, condition, or change in aeronautical facility, service, procedure, or hazard.

NOTAMs are issued at least 5 hours in advance and are distributed to FIC.

Always ask for NOTAMs when talking with the FIC personnel (refer to TC AIM MAP 5.0).

4.18 As weather systems generally move from west to east, there is a good chance that the weather conditions that currently exist to the west will have moved further east by the end of your flight. It is also a way to confirm if the forecasts (GFA and TAF) are accurate.

Navigation charts

4.19

VNC	=	1:500,000
VTA	=	1:250,000

4.20 TC AIM subscribers are sent a circular detailing current Canadian aeronautical charts. A current copy of the circular should be kept in the MAP section of your TC AIM.

Any changes to VFR charts are listed in the Canada Flight Supplement under Section C.

4.21 The 10 degree drift lines allow us to accurately and easily estimate how many degrees we are off track while navigating without using instruments, such as a protractor, during flight.

4.22 The three methods to get back on track are:

1. Visual alteration.
2. Double track error.
3. Opening and closing angles.

4.23 Muskoka is 925 feet ASL.

4.24 The longest runway at Muskoka is 6,000 feet.

4.25 The variation near Muskoka is 11 degrees West.

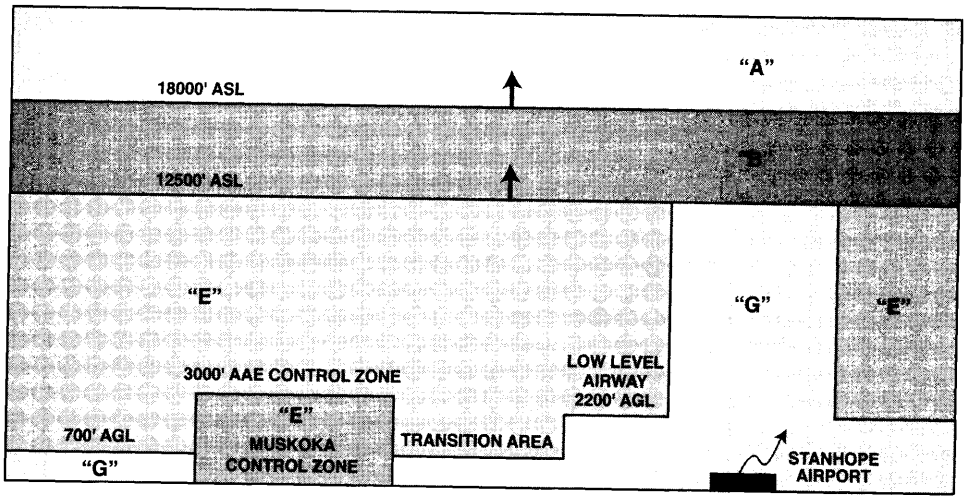
4.26 The dashed box at Muskoka indicates that customs services are available.

4.27 The E4500 ASL area signifies Class E airspace above 4,500 feet ASL; below is Class G airspace.

4.28 Muskoka's control zone is Class E airspace.

4.29 Class G airspace.

4.30 See diagram below.



4.31 The frequency for the Simcoe VOR is 117.35 MHz and its identifier is YSO.

4.32 A thick straight line indicates the boundary for a VTA chart.

4.33 The longest runway at Oro-Barrie airport is 5,000 feet.

4.34 Yes. Special VFR is only allowed in control zones, and at the pilot's request. The minimum visibility must be 1 mile.

4.35 Yes. It is a Class F - Advisory airspace (CYA).

4.36 The MEF (Maximum Elevation Figure) is 1,700 feet.

4.37 Lindsay is in Class G airspace (uncontrolled). Below 1,000 feet, the minimum visibility is 2 miles. Peterborough is in Class E airspace (controlled). The minimum visibility is 3 miles.

4.38 The Oro-Barrie airport is located in Class G airspace. From 4,500 feet ASL and up, airspace is Class E.

4.39 You are on VHF airway labelled V37, right on the centre line. Airways are in Class E airspace. Magnetic heading: 184°.

Departure procedures

4.40 The three types of "set heading" procedures are:

1. Overhead departure: The overhead departure is where you set your heading right above the airport after climbing to your cruising altitude in the vicinity. Its main advantage is to provide a known fix for starting, something particularly useful where the airport is surrounded by miles of featureless terrain or the visibility is limited.

2. Geographic point procedure: The geographic point procedure lets you set your heading at a distinct landmark a short distance away. It is often used when departing from busy airports or those with airspace restrictions.

3. En route climb: The en route climb lets you takeoff and reach a safe altitude before turning to intercept your track and climb en route. It is quick and direct, although sometimes it is difficult to determine when you are established on track.

Operational information and considerations

4.41 An Aerodrome Traffic Frequency (ATF) is normally designated for active uncontrolled aerodromes to ensure that all radio-equipped aircraft operating on the ground or within the area are listening on a common frequency and following common reporting procedures. An ATF is designated at aerodromes that do not meet the criteria listed for an MF.

A Mandatory Frequency (MF) is used at selected uncontrolled aerodromes, or aerodromes that are uncontrolled between certain hours. MF areas are established at aerodromes where the traffic volume and mix of aircraft traffic at those aerodromes are such that there would be a safety benefit derived from implementing MF procedures.

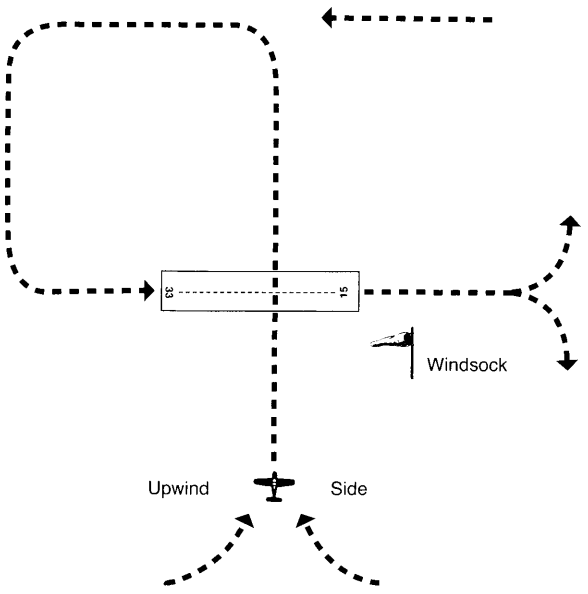
4.42 At uncontrolled aerodromes:

a. it is recommended to join the circuit from the upwind side.
b. if no possible conflict exists, it is also allowed to join straight into the downwind.

Also to be taken into consideration:

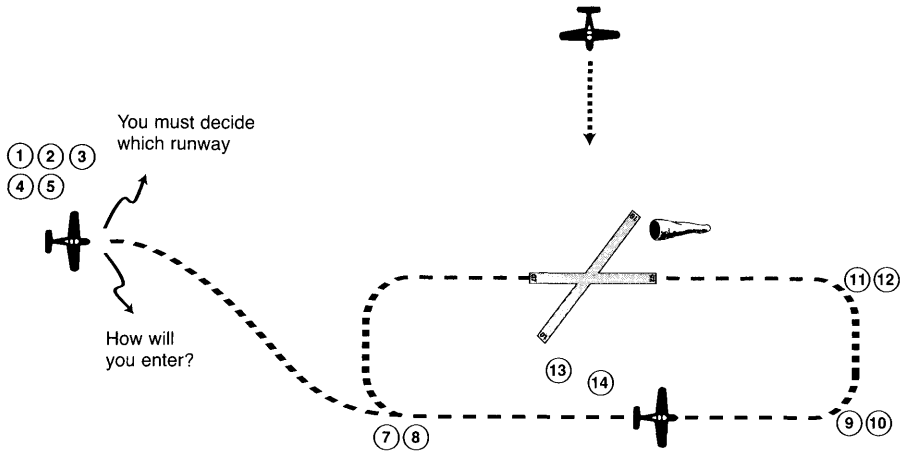
a. the circuit altitude is 1,000 feet AAE, unless otherwise specified to meet minimum distance from cloud requirements.
b. if necessary to cross over the circuit, do so at least 500 feet above the circuit altitude.
c. all descents to circuit altitude should be made on the upwind side or well clear of the circuit.
d. when joining the circuit from the upwind side, plan to cross the runway in level flight at circuit altitude.
e. MF procedures are different from ATF procedures.

Uncontrolled Arrival Procedures with an MF:



Report position, altitude, how you plan to enter, and ETA, at least 5 minutes prior to entering. If an advisory is available, you can join the circuit on the downwind, base or straight-in. Report joining the circuit. Report each leg. Report turning final. Report clear of the active.

Example:



1. Pilot: Kingston Radio C150 Golf Yankee Uniform Lima 12 miles to the west at 3,000 feet estimating Kingston in 6 minutes. Go ahead advisories.

2. Rdo: Traffic is a C172 in the circuit for runway 25, Beech 1900, 10 miles north for a straight-in runway 19. Winds are 240 at 15.

3. Pilot: (You must now decide which runway you intend to use and plan your spacing. Remember: you will only be given advisories; you are solely responsible for traffic conflicts.) C150 Yankee Uniform Lima, when is the Beech 1900 estimating the airport?

4. Rdo: Beech 1900 is estimating the airport in 3 minutes.

5. Pilot: Yankee Uniform Lima will join the left downwind for 25.

6. Rdo: Roger Yankee Uniform Lima.

7. Pilot: Yankee Uniform Lima is joining the left downwind for 25.

8. Rdo: Roger Yankee Uniform Lima.

9. Pilot: Yankee Uniform Lima is turning left base for 25.

10. Rdo: Roger Yankee Uniform Lima.

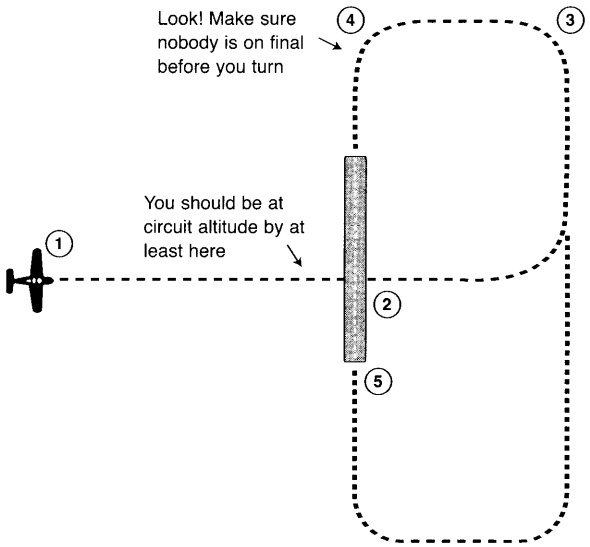
11. Pilot: Yankee Uniform Lima is turning final for 25.

12. Rdo: Roger Yankee Uniform Lima.

13. Pilot: Yankee Uniform Lima is down and clear of 25.

14. Rdo: Roger Yankee Uniform Lima.

Uncontrolled Arrival Procedures with an ATF or UNICOM:



The radio calls are essentially the same as with an MF. All your radio calls are addressed to the airport traffic. Entering the circuit pattern can be accomplished by one of two ways:

a. overhead for the mid-downwind.
b. straight into the downwind if no traffic conflict.

Example:

1. Pilot: Brampton traffic this is C150 Yankee Uniform Lima 9 miles to the northwest at 2,500 estimating the field in 5 minutes, planning to join overhead for the mid left downwind for runway 19.

2. Pilot: Brampton traffic, C150 Yankee Uniform Lima is overhead the field joining the mid left downwind for runway 19.

3. Pilot: Brampton traffic, Yankee Uniform Lima is turning left base for runway 19.

4. Pilot: Brampton traffic, Yankee Uniform Lima is turning final for runway 19.

5. Pilot: Brampton traffic, Yankee Uniform Lima is down and clear of runway 19.

Note: It is of the utmost importance to be thoroughly familiar with all aspects of the above procedures. For complete details, refer to TC AIM RAC 4.0 which also contains the procedures for controlled airports.

4.43 When departing from uncontrolled airports with an MF:

1. Request traffic advisories and active runway.

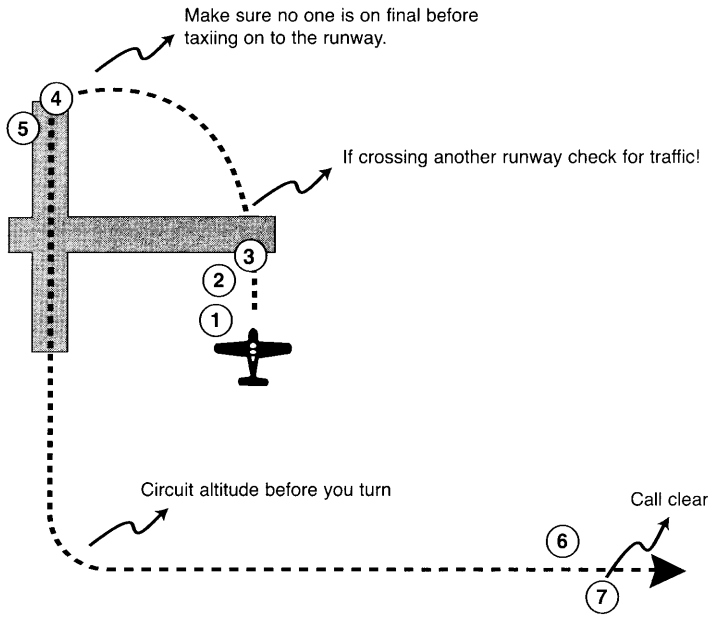
2. State your taxi intentions and your planned runway for takeoff. (Remember, the radio person with whom you are talking is not a tower controller; therefore, you choose the runway, not him. You will only be advised of traffic and be given wind and weather information.)

3. Prior to taxiing onto the runway, broadcast your intentions and look carefully for traffic, (there could be NORDO traffic).

4. On the climbout, do not turn until reaching circuit altitude.

5. Report departing from the aerodrome traffic circuit and monitor the frequency until well clear of the area.

Example:



1. Pilot: Kingston Radio this is C150 Golf Yankee Uniform Lima, at airport FBO, preparing for a VFR flight to Toronto. Go ahead advisories please.

2. Rdo: Traffic is C172 10 miles to the east inbound for a landing and a C150 in the circuit for runway 19. State your intentions.

3. Pilot: Kingston Radio, Yankee Uniform Lima is taxiing for 19. (You still have the option of using another runway for whatever reason you deem it necessary; example, crosswind, length, etc.)

4. Pilot: Kingston Radio, Yankee Uniform Lima is taxiing to position runway 19.

5. Rdo: Roger.

6. Pilot: Kingston Radio, Yankee Uniform Lima is clear to the east at 3,000 feet.

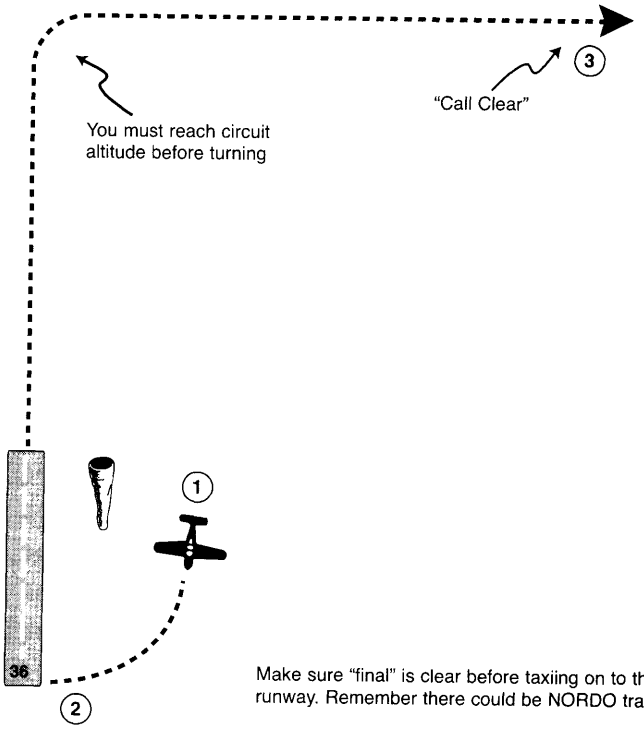
7. Rdo: Roger.

When departing from uncontrolled airports with an ATF or UNICOM:

Unlike an MF, you are transmitting your intentions to anybody who may be listening. Be aware that there may be NORDO aircraft operating at the airport; therefore, you must always ensure visually that you are clear.

The departure procedure is essentially the same as an MF, except the calls are addressed to "traffic" instead of "radio". No turns are allowed until you reach circuit altitude. If you intend to turn back overhead the airport, then you must be at least 500 feet above circuit altitude.

Example:



1. Pilot: Burlington traffic C150 Gold Yankee Uniform Lima taxiing for runway 36.

2. Pilot: Burlington traffic C150 Yankee Uniform Lima taxiing onto runway 36, right turn out.

3. Pilot: Burlington traffic C150 Yankee Uniform Lima clear to the east 3,000 feet

4.44 Arrival procedures at a controlled airport:

1. Initial contact must be made prior to operating in any control zone. If the control zone is Class B or Class C, you must receive a clearance prior to entry.

2. If ATIS is available, you should get it prior to calling the tower. If you are time constrained, you may have to "skip" it. Remember your order of operations – Aviate, Navigate, Communicate.

3. On initial contact, give your full call sign only; i.e. "City Tower this is Golf, Alpha, India Quebec."

4. When the controller replies, you then give all your information. Ensure your position report is correct as it will determine how the controller will sequence you with other aircraft and bring you in; i.e. left base, right downwind, straight in, etc.

Example:

Identification: C-GAIQ; Type: C-150; Position: over the race track; Altitude: 3,000 feet; Intentions: landing; Information: zulu (latest); Details.

"Golf Alpha India Quebec, C150, 7 miles northwest. 3,000 feet, landing, with information zulu"

5. The controller will then tell you how to enter the circuit pattern. If you're not sure or if they are talking too fast, have them repeat the instructions. If you have a bad memory, then write down the instructions that they have given to you.

6. Ensure you get a landing clearance: "Cleared to land."

4.45 Special VFR requirements:

a. one mile visibility.
b. clear of cloud.

Note: The pilot must request a Special VFR clearance. ATC will not issue it without an express request from the pilot.

4.46 Using the tables provided by the manufacturer in the Pilot's Operating Handbook for the aircraft used for the flight test, make all necessary calculations, including the correction factors for various conditions (ex. temperature, headwind or tailwind, dry grass runway, obstacles, etc.). Crosswind limitations must also be taken into consideration.

4.47 When unsure of runway conditions, check for any NOTAMs that may have been issued and contact the airport operator. (Telephone numbers for airports can be found in the CFS.)

4.48 Runways in the Southern Domestic Airspace are magnetic but winds in METARs are true. Therefore, it is necessary to apply the local variation to the winds if using METARs for your calculations.

Note: Only control towers and the ATIS give winds in magnetic degrees.

4.49 First, check in the CFS or the aerodrome data box on your chart to see if DF steers are available. Then contact the appropriate agency to request DF steers.

4.50 The front cover displays the validity dates.

4.51 Check your CFS for runway lengths.

4.52 Check your CFS. The PRO section of the airport data describes any special procedures (ex. right-hand circuits, non-standard circuits, etc.)

4.53 Yes. They are outlined in the OPR section.

4.54 Yes, customs are available. Hours are from 1200Z to 0400Z. This information is found under CUST.

4.55 100LL and JA-1. Refer to the SERVICES section.

4.56 122.72 MHz or 123.35. Refer to the SERVICES section.

4.57 Runway 15 is 150 feet wide. Refer to the RWY DATA section.

4.58 No. Refer to the LIGHTING section.

4.59 Yes. Refer to the COMM section.

4.60 No. Refer to the PRO section.

4.61 No. No jets are allowed except for MEDEVAC. Refer to the PRO section.

Flight planning log

4.62 Pressure altitude is the altitude corrected for non-standard pressure. Most performance charts are based on the pressure altitude.

A. 1" = 1000 feet

1. 29.92"
   − 29.32" (current setting)
   0.60"

2. 0.6" x 1000 = +600 feet

3. Add +600' to airport elevation or cruise altitude to get the pressure altitude.

Ex. airport elevation = 250'
+600

850' pressure altitude

B. 1" = 1000 feet

1. 29.92"
   − 30.42" (current setting)
   0.50"

2. 0.5" x 1000 = +500 feet

3. Subtract –500' from airport elevation or cruise altitude to get the pressure altitude.

Ex. airport elevation = 250'
− 500

250' pressure altitude

4.63 Be prepared to justify the chosen power setting for the intended flight. Among the factors to be considered: altitude chosen, air temperature at that altitude, cruise performance chart.

4.64 IAS (indicated airspeed) is what you read on the instrument.
CAS (corrected airspeed) is IAS corrected for instrument and position error.
TAS (true airspeed) is CAS corrected for non-standard pressure and temperature.
To convert IAS to CAS and vice versa, consult the Performance section of the Pilot's Operating Handbook. To go from CAS to TAS and vice versa, use your flight computer (ex. E6B).

4.65 Use your numbers, your flight computer and the POH.

4.66 From the wind information you have collected, make sure you use the winds for the proper period of time (check the validity period of the FD).

4.67 True track is the track that the pilot intends to follow over the ground, as drawn on the chart. It is measured in degrees true.

Note: The track really followed over the ground is called the "track made good". If all calculations are right and everything goes well, the true track and the track made good will be the same.

4.68 Variation is the angle between the true meridian and the magnetic meridian.

4.69 The magnetic track is the true track plus (if westerly) or minus (if easterly) variation.
The magnetic heading is the magnetic track with the wind correction.

4.70 Deviation is the angle through which the compass needle is deflected from the magnetic meridian. The major cause of deviation error is the magnetic fields generated by the metal in airframes and engines. The amount of error is entered on the compass deviation card affixed to the compass in the aircraft.

4.71 Compass heading is the magnetic heading corrected for the deviation. It is the heading that the pilot will follow in flight.

4.72 Day VFR: to destination + 30 minutes at normal cruising speed.
Night VFR: to destination + 45 minutes at normal cruising speed.

Note: Refer to CAR 602.88.

4.73 Use your calculations, supported by the Pilot's Operating Handbook (Performance section).

Flight plans

4.74 Flight plans are filed with ATC, FIC, FSS, over the internet at navcanada.ca, or Community Aerodrome Radio Stations. One important requirement is that they be closed as soon as possible after landing but not later than the search and rescue action initiation time specified in the flight plan or, in the absence of such, one hour after the last reported estimated time of arrival.

In addition to the above, flight itineraries can also be filed with a responsible person. An arrival report shall be given as soon as possible after landing, but not later than the search and rescue action initiation time specified in the flight itinerary or, in the absence of such, 24 hours after the last reported estimated time of arrival.

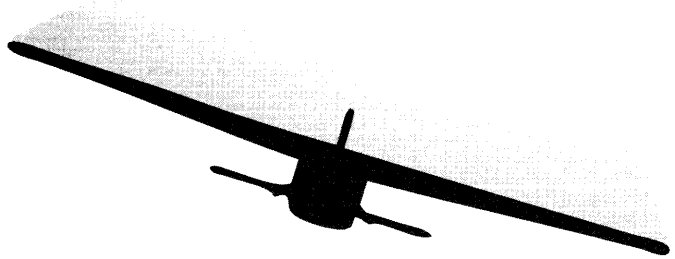
Note: Flight notifications are no longer in use.

4.75 A flight plan or a flight itinerary must be filed if the flight exceeds 25 nautical miles from the departure aerodrome.

4.76 Be prepared to tell the examiner with whom you plan to open and close the flight plan on the proposed cross-country.

4.77 Without your takeoff time, you have no way of knowing when your flight plan expires. Also, if you get lost, you will not be able to accurately calculate the total fuel burned.

Part 3 > Flight Test



Part 3 > Flight Test

Introduction

Part III - Flight Test includes all the activities, divided into sections for easy reference, that follow the examination's Ground Briefing, starting with the Pre-Flight Inspection.

The flight test exercises are introduced in the most probable sequence that you will have to execute them. Indeed, they are scheduled to occur at what would be a logical moment during a typical cross-country flight, the idea being to present a realistic environment to you and to maximize time spent in the air.

Airmanship is not assessed independently. It is included in the mark awarded to each exercise and reflects in great part the "safety" aspect of the flight test. A breach of airmanship, such as failure to maintain proper lookout, will be disqualifying even if the mechanics of the exercise are executed to perfection.

In addition, some exercises are either not tested during the flight test (for example Ex. 19 - First Solo) or are tested in conjunction with other exercises (for example Ex. 6 - Straight and Level Flight).

Each exercise is subdivided as follows:

> Exercise number and description as per the Flight Test Guides

> Performance Criteria reproduced integrally from the Flight Test Guide. It outlines the criteria that apply to the performance of each exercise

> What You Should Know and Do to meet the Performance Criteria

> Common Mistakes describes what often goes wrong in the execution of the exercise, sometimes resulting in a fail or a low assessment

> Review provides the essential background knowledge pertaining to the exercise

To be best prepared to pass the flight portion of your test, insure the following:

> Review the Flight Test Guides thoroughly. Be familiar with the requirements and tolerances.

> Think before you act!

> Don't rush anything. Stay focussed.

> Think of the examiner as a passenger. Remember, you are the pilot-in-command unless the examiner tells you otherwise.

> Keep the examiner informed about your upcoming actions.

> Most people tend to think their mistakes are worse than they really are. Don't get fazed or frazzled!

> Don't be worried by a quiet, non-emotional examiner who may just be bored.

> Ask questions if unsure of the aim of the exercise.

SAFETY FIRST!

Section 1. Pre-Flight Inspection

Flight Test Guide Reference:

Ex. 2 Aeroplane Familiarization and Preparation for Flight

D. Pre-Flight Inspection

Performance Criteria

The candidate must:

> use an orderly procedure in conducting a thorough pre-flight check of the aeroplane including at least those items listed by the manufacturer or aeroplane owner.
> describe the appropriate action to take for any unsatisfactory item detected or described by the examiner.
> confirm that there is sufficient fuel for the intended flight.
> identify and verify switches, circuit breakers/fuses, and spare fuses.
> identify and verify the location and security of baggage and required equipment.
> organize the cockpit in an efficient manner.
> perform an effective passenger safety briefing.

What You Should Know and Do

> Determine that the airplane is ready for safe flight.
> Check visually for sufficient fuel (also grade and contamination) and oil.
> Check for the presence of all required equipment and documents.
> Follow pre-flight inspection procedures specified in the Pilot's Operating Handbook.
> Conduct a passenger briefing.

Common Mistakes

> Rushing the walkaround.
> Failing to visually check the quantity of fuel. This constitutes a major error.
> Rushing the passenger briefing or omitting an item.

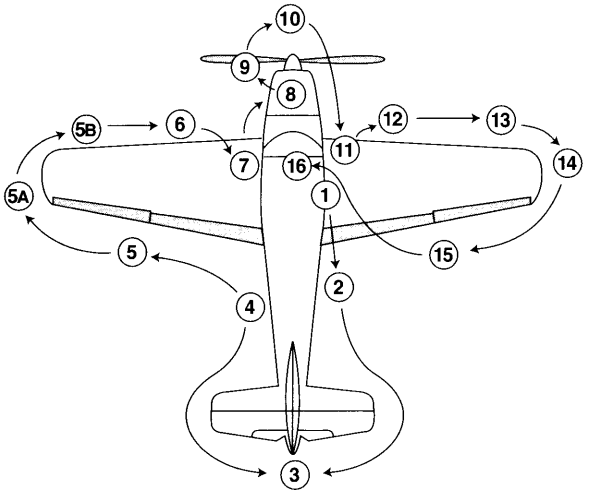
Review

When conducting the walkaround:

> Take your time! The walkaround is an important part of every flight, no matter which aircraft you fly.
> Consult your Pilot's Operating Handbook for the recommended walkaround procedure.

Note: Before the flight test, go through the walkaround with an instructor or an AME.

Example:



> Fuel check: make sure a dipstick is available for the aircraft - checking fuel gauges only is not acceptable.

When performing the passenger brief:

> Passenger briefing: be thorough and go slowly. Items to be covered and demonstrated:

S Seat belts
L Landing emergency
E Exits
E Extinguisher
T Tobacco

> Example of a typical briefing:

S> "This is how you buckle your seat belt ... This is how you unbuckle your seat belt ... Keep your seat belt on at all times while the engine is running."

L> "In the event of an emergency landing ... seat belts fastened ... sharp objects stowed in the back ... unlatch the door prior to touchdown ... there is an Emergency Locator Transmitter on board located ..."

E> "There are a total of _____ exits on board ... This is how you open and close the exit doors."

E> "The fire extinguisher is located ..."

T> "There is no smoking on board ..."

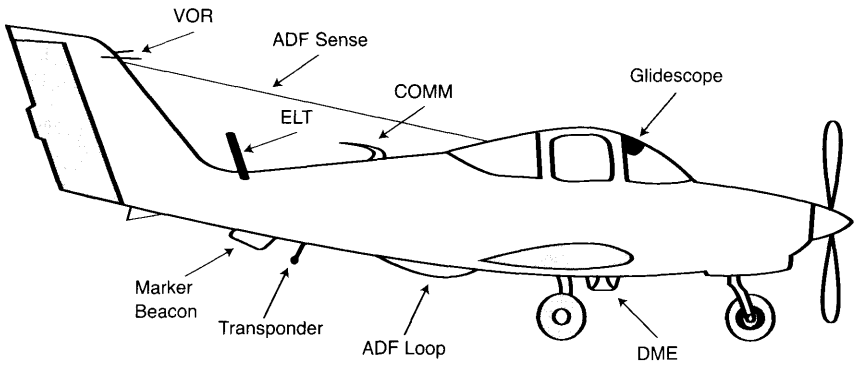
"Any Questions?" Ascertain that everything is clear and understood.

Note: Refer to CAR 602.89 Passenger Briefings

Typical questions

As asked by the examiner during the walkaround:

1. Do you know what each antenna is for on the test aircraft?



2. What control surface pitches the nose up and down?
3. How does the trim work?
4. If the elevator cable snaps, how can you control pitch?
5. Why are the ailerons and the flaps corrugated?
6. How do the ailerons work? Where is the mass balance located?
7. Where is the air intake? The carburetor heat intake?
8. If the carburetor air intake becomes blocked, how can you get air to the engine?
9. Where is the static port located?
10. What are the recommended tire pressures?
11. What type of oil does the engine take?
12. What are the minimum and maximum oil capacities?
13. What colour is the brake fluid?
14. Can you start the aircraft with the master switch off?
15. Why should you be careful whenever you are touching the propeller?
16. How are the magnetos powered?
17. How is the alternator driven?
18. Does the stall warning require a power source?

Section 2. Engine Start, Run-Up, Use of Checklists

Flight Test Guide Reference:

Ex. 2 Aeroplane Familiarization and Preparation for Flight

E. Engine Starting and Run-up, Use of Check Lists

Performance Criteria

Assessment will be based on the:

> accuracy of the procedures used.
> thoroughness of the engine and aeroplane systems checks.
> thoroughness of the checks for flight controls' freedom of operation and correct movement.
> appropriateness of the action to take with respect to unsatisfactory conditions.

> ability to use appropriate check list provided by the manufacturer or aeroplane owner.
> demonstration of sound judgement and operating practices in those instances where specific instructions or checklist items are not published.
> determination that radio navigation aids to be used on the flight test are serviceable (Commercial only).
> demonstrated awareness of other persons and property before and during engine start.

Failure to use an appropriate check list provided by the manufacturer or aeroplane owner shall constitute a fail of this exercise.

What You Should Know and Do

> Use the checklists provided by manufacturer or owner for:

a. engine starting.
b. warm-up.

> Describe or demonstrate how to correct any unsatisfactory condition, real or specified by examiner.
> Show vigilance towards people and property when starting and running the engine.

Common Mistakes

> Over-revving the engine during start-up.
> Missing a checklist item.
> Not looking outside during the propeller start.

Review

> Before starting the engine, make sure:

a. all seat belts are fastened.
b. doors are closed.
c. area in front of the propeller is clear – yell: "Clear!".

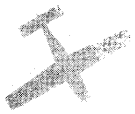
> Engine start: do not over-rev.
> Write down ATIS information and taxi instructions if at a controlled airport. If unsure of instructions, call back: "Say again taxi clearance (please)".
> Suggestion: dial in the surface winds on your VOR for reference.

Section 3. Operation of Aircraft Systems

Flight Test Guide Reference:

Ex. 2 Aeroplane Familiarization and Preparation for Flight

F. Operation of Aircraft Systems



Performance Criteria

Assessment will be based on the candidate's adherence to the procedures specified in the Pilot's Operating Handbook with respect to:

> carburetor heat.
> mixture control.
> primary flight controls and trim.
> propeller.
> fuel, oil and hydraulics.

> electrical.
> flaps.
> landing gear.
> brakes.
> avionics.
> heating and defrosting system.
> ventilators.
> any other ancillary controls.

What You Should Know and Do

> Know how to use the carburetor heat, mixture control and any other ancillary controls installed in the airplane.
> Use all ancillary controls properly **throughout the flight test**, on the ground as well as in the air.

Common Mistakes

> Failing to recognize conditions favourable to carburetor icing.
> Not applying carburetor heat when appropriate.

Review

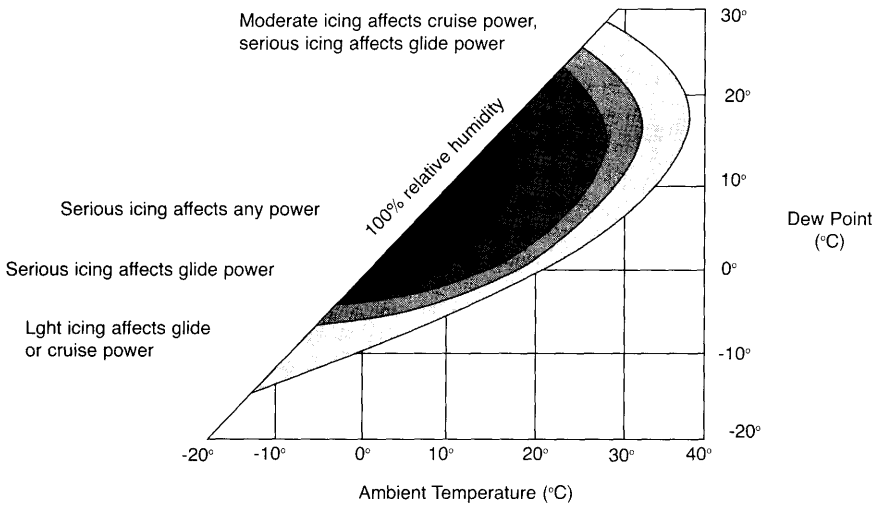
> Carburetor icing: conditions of temperature and relative humidity conducive to its formation.

> Carburetor heat control:

a. consult POH for recommended procedure.
b. improper use of carburetor heat may actually cause icing.
c. point of no return: amount of heat available insufficient to remove the ice. Early detection is critical.
d. when carburetor heat is applied, the air is not filtered (use of carb heat during taxiing is discouraged).

> Mixture control:

a. necessary for optimum engine performance (affected by temperature, density and humidity) during takeoff, climb, cruise and descent.
b. effect of carburetor heat on fuel/air mixture (heated air is less dense = richer mixture).



> Other controls: Thoroughly understand the use of any other ancillary control found on the flight test aircraft, such as windshield defogger, heating system, ventilation system, etc.

Section 4 Taxiing

Flight Test Guide Reference:

Ex. 4 Taxiing

Performance Criteria

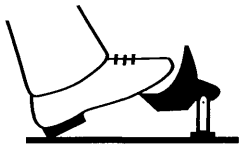
Assessment will be based on the candidate's ability to:

> safely manoeuvre the aeroplane, considering other traffic on aprons and manoeuvring areas.
> use appropriate taxiing speeds.
> maintain proper spacing from other aeroplanes, obstructions and persons.
> perform a brake check.
> adhere to local taxi rules, procedures and Air Traffic Control clearances and instructions.
> use flight controls and brakes under actual or specified strong wind conditions.
> confirm the proper functioning of the flight instruments.
> identify and correctly interpret airport, taxiway and runway signs, markings and lighting.
> after landing, clear the runway and taxi to an appropriate parking area.
> park the aeroplane properly, considering the safety of nearby persons and property.

What You Should Know and Do

> Taxi along the centreline whenever and wherever possible.
> Position the flight controls appropriately for wind conditions.
> Check for the proper functioning of the flight instruments.
> Know runway and taxiway signs.

Common Mistakes



Riding the brakes: Don't do it!

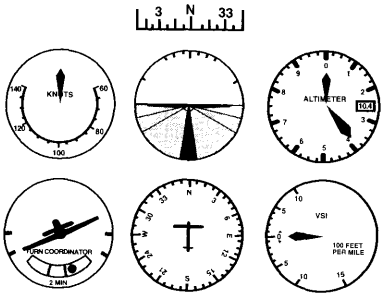
> Not applying proper wind correction.
> Taxiing too fast.
> Leaving power on when braking.
> "Riding" the brakes.
> Forgetting instrument checks during taxi.

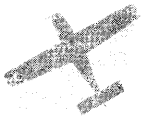
Review

> Review taxi clearance. If unsure, call ground control: "Say again taxi instructions for C-GLIS".
> If given a "hold short" clearance, you must repeat it back to the ground or tower controller.
> As soon as you start rolling, check the brakes lightly.
> Power back first, then apply brakes.
> Keep your heels on the floor to prevent "riding" the brakes.
> Do not taxi faster than jogging speed.
> Stay on the centreline as much as possible.
> Apply wind correction, even if the winds are light. Use the VOR for wind reference in case you forget the direction.
> While taxiing, check the instruments (see diagram below).
> When doing checks, call them out so the examiner knows you've done them.

LEFT TURN

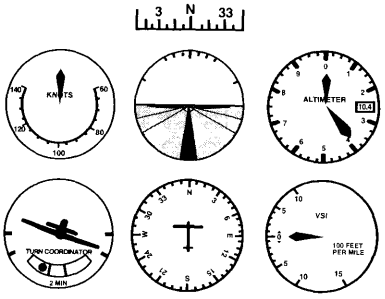
T.C. > Needle left, ball right
H.I. > Decreasing
A.I. > Steady
C. > Free and Floating





RIGHT TURN

T.C. > Needle right, ball left
H.I. > Increasing
A.I. > Steady
C. > Free and Floating



Note: It's proven that if you say the information out loud, you tend to retain it longer. Therefore, say your checks out loud.

Section 5. Run-Up and Pre-Takeoff Checks

Flight Test Guide Reference:

Ex. 2 Aeroplane Familiarization and Preparation for Flight

E. Engine Starting and Run-up, Use of Check Lists

Performance Criteria

(Since this is the continuation of Passenger Briefing and Engine Starting, the Performance Criteria is the same.)

Assessment will be based on the:

> accuracy of the procedures used.
> thoroughness of the engine and aeroplane systems checks.
> appropriateness of the action to take with respect to unsatisfactory conditions.
> effectiveness of passenger pre-takeoff briefing.
> ability to use the appropriate check list provided by the manufacturer or aeroplane owner.

Failure to use the appropriate check list provided by the manufacturer or aeroplane owner shall constitute failure of this exercise.

What You Should Know and Do

> Use the checklists provided by the manufacturer or owner for:

a. run-up.
b. checking systems and equipment.

> Check the flight controls for freedom of movement and correct sense.

> Describe or demonstrate how to correct any unsatisfactory condition, real or specified by examiner.
> Conduct pre-takeoff briefing including intended departure procedure, and procedure to be used in case of engine failure.

Common Mistakes

> Rushing the checklists.
> Forgetting to write the takeoff time.
> Forgetting to put the transponder on.

Review

> When performing your pre-takeoff checks:

a. don't rush! Be thorough in all your checks.
b. finger each item on the checklist, so you have less chance of skipping something.
c. call the items out loud.
d. the last item should be your Takeoff Time. Write it down.

> Do the emergency briefing for takeoff.
> The examiner will usually request a performance takeoff: short field or soft field. Take a moment to review the procedure.
> Clearance for takeoff:

a. switch to tower frequency as you turn to face traffic.
b. request takeoff clearance only if the approach path is clear.
c. when conducting a short field takeoff, ask the tower for a "static" or "short delay" takeoff.
d. as soon as the takeoff clearance is given, start moving and at the same time acknowledge the clearance.

> When taxiing onto the runway:

Lights = Landing light
Camera = Transponder
Action = Engine gauges "in the green"

Section 6. Takeoff and Climb Out

Flight Test Guide Reference:

Ex. 16 Takeoff

Performance Criteria

Assessment will be based on the candidate's use of correct pilot techniques to obtain maximum aeroplane performance for the conditions specified. Consideration will be given to:

Normal Takeoff

> perform an effective passenger safety brief.
> positioning of flight controls and configuration of the aeroplane for the existing or simulated conditions.
> check for traffic, taxiing into takeoff position, and aligning aeroplane with runway centreline.
> smooth advancement of throttle to takeoff power and confirmation of takeoff power.
> maintenance of directional control during takeoff roll (nosewheel within 15 feet of centreline).

> rotation at recommended airspeed (+10/-5 knots).
> acceleration to, and maintenance of, recommended climb speed (+10/-5 knots).
> height of retraction of landing gear (if applicable).
> transition from takeoff power to climb power, if applicable.
> elimination of drift, and proper track, along runway extended centreline.
> compliance with any noise abatement procedures in effect.

Short Field Takeoff

> perform an effective passenger safety brief.
> specification of a "Go/No Go" point to the examiner.
> positioning of flight controls and flaps for the existing or simulated conditions.
> check for traffic, taxiing into position that maximizes takeoff distance.
> smooth advancement of throttle to takeoff power while holding brakes.
> confirmation that static takeoff power has been reached.
> maintenance of directional control during takeoff roll.
> rotation at recommended airspeed (+10/-5 knots), liftoff and acceleration to the recommended obstacle clearance airspeed or Vx, whichever is greater.
> establishment of pitch attitude for the recommended obstacle clearance airspeed or Vx, and maintenance of that speed (+10/-5 knots) until any obstacle is cleared or until 50 feet AGL.
> (For Commercial only) maintenance of takeoff power to a safe height then, where applicable, setting of climb power (+/- 0.5" MP, +/- 50 RPM).
> height of retraction of landing gear (if applicable).
> retraction of flaps (where applicable) at a safe height.
> transition from takeoff power to climb power, if applicable.
> elimination of drift, and proper track, along runway extended centreline.

Soft Field Takeoff

> perform an effective passenger safety brief.
> specification of a "Go/No Go" point to the examiner.
> positioning of flight controls and flaps for the existing or simulated conditions.
> check for traffic.
> taxiing onto takeoff surface at a safe speed, alignment of aeroplane and, without stopping, advancement of throttle to takeoff power.
> confirmation that takeoff power has been achieved.
> establishment and maintenance of pitch attitude that will effectively transfer weight of the aeroplane from wheels to wings.
> maintenance of directional control during takeoff roll.
> liftoff at the slowest safe airspeed appropriate for the conditions (real or simulated).
> remaining in ground effect after takeoff while accelerating to recommended climb speed.
> establishment of pitch attitude for the recommended climb speed and maintenance of that speed (+10/-5 knots).
> (For Commercial only) maintenance of takeoff power to a safe height then, where applicable, setting of climb power (+/- 0.5" MP, +/- 50 RPM).
> height of retraction of landing gear (if applicable).
> retraction of flaps (where applicable) at a safe height.
> transition from takeoff power to climb power, if applicable.
> elimination of drift, and proper track, along runway extended centreline.

The candidate must explain the operational necessity for any variation from specified speed; for example, gusty or crosswind conditions.

What You Should Know and Do

> The candidate will be required to demonstrate:

a. normal takeoff.
b. short field takeoff and/or soft field takeoff.

> Crosswind conditions (real or simulated) will apply for one of the takeoffs. Other simulated conditions (runway surface, runway length, obstacles, etc.) might also be included.
> Use airspeeds and configurations specified in the Pilot's Operating Handbook and/or placards.
> Follow proper procedure to leave the airport area.

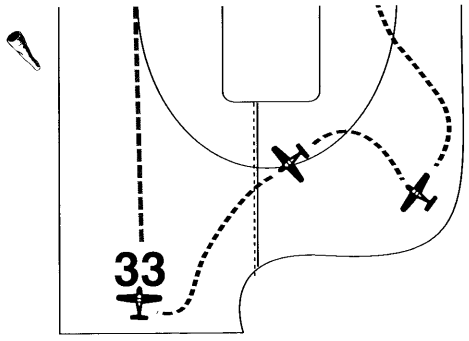
Common Mistakes

> Using brakes on soft field takeoff.
> Not verifying full power on the gauges during initial takeoff roll.
> Not applying crosswind correction.
> Not maintaining the runway centreline during the takeoff roll and the climb.
> Failing to lower nose after liftoff to achieve appropriate climb speed.
> Taking hand off the throttle before first 200 feet of climb.
> Raising flaps too early or forgetting to bring the flaps up.
> Turning too early on climb out.
> During the level off, not waiting for the aircraft to accelerate to cruise before powering back.
> Forgetting to do a cruise check upon level off.

Review

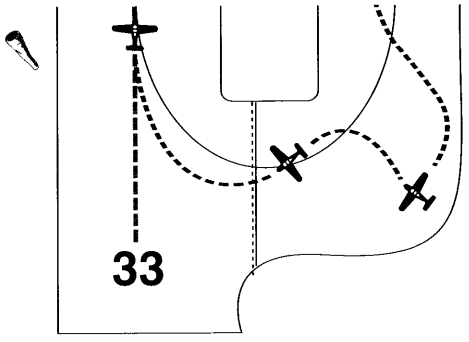
Performance takeoffs

Short field

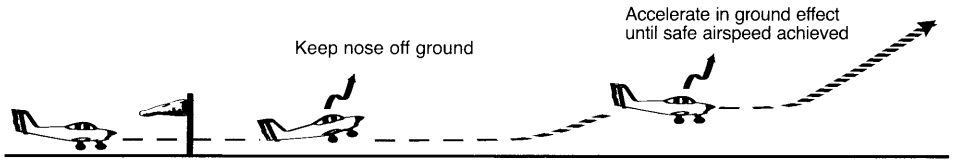


1. Taxi to the end of the runway facing the centreline.
2. Verify flap position by visually checking both flaps.
3. Brakes on - Full power - Ailerons into the wind.
4. Confirm full power with RPM gauge (as per POH).
5. Release brakes.
6. Takeoff roll, normal attitude, a little back pressure – this attitude provides the least amount of drag.
7. Rotate at the recommended liftoff speed (as per POH).
8. Lower the nose after liftoff to accelerate to appropriate climb speed.
9. Pitch for normal climb attitude if no obstacle. If there is an obstacle, pitch for Vx attitude.

Soft field

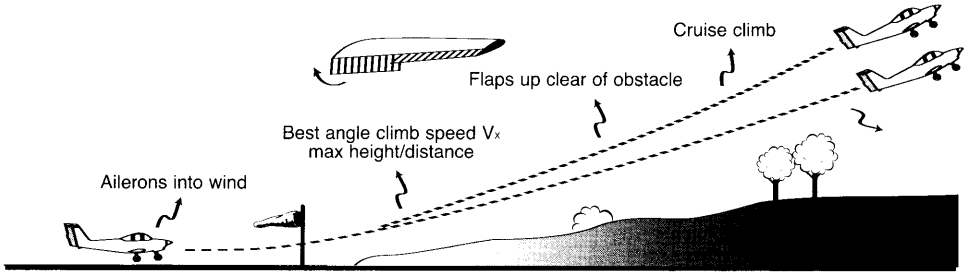


1. Taxi onto centreline: no brakes, no sharp turns, elevator full back, ailerons into wind.
2. When approaching centreline, gradually add full power.
3. Use the heading indicator for reference.
4. As the nosewheel lifts off, release back pressure to obtain desired climb attitude.
5. When the aircraft rotates, lower the nose to cruise attitude.
6. Accelerate in ground effect, crab into wind, maintain centreline.
7. Climb attitude at safe airspeed.



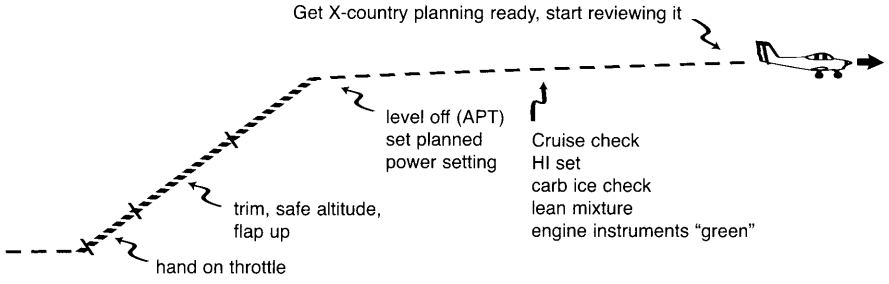
Takeoff and Climb Out Sequence of Events

Takeoff rolls and initial climb



1. Crosswind: for a strong crosswind takeoff, cleanly leave the runway, slightly above the normal speed of rotation (VR), with 0° flap setting.
2. Obstacle: the use of flaps reduces the distance to get off the ground; however, for many light aircraft (such as Cessna) a 0° flap setting is recommended for an obstacle takeoff.

Climb out



1. Crab into wind to maintain runway centreline projection. Look back to confirm; if no rear window, pick a reference point ahead.
2. Keep your hand on the throttle for at least the first 200 feet after takeoff (or the last 200 feet prior to touchdown).
3. At a safe altitude, retract the flaps.
4. Climb check at a safe altitude, not less than 500 feet AGL.
5. Do not start turns until:

    a. 500 feet AGL in a control zone.
    b. 1,000 feet AGL at an uncontrolled aerodrome.

6. Lower the nose every 500 feet of climb to check for traffic.
7. Level off: A = attitude P = power T = trim
8. Call when clearing the zone. Switch frequency to 126.7 MHz unless required to use another frequency.

Section 7. Cross-Country

Flight Test Guide Reference:

Ex. 23 Pilot Navigation

B. Departure Procedure C. En Route Procedure

Performance Criteria

Assessment will be based on the candidate's ability to:

Departure Procedure

> note takeoff time.
> use an organized procedure (overhead, geographic point, or en route climb) to set heading.
> comply with all departure clearances and instructions.
> activate the flight plan with ATS (or simulate activation).
> set the heading indicator by reference to the magnetic compass or other acceptable means.
> note set heading time.
> estimate the time of arrival for the first turning point or destination.

En Route Procedure

> maintain the pre-calculated airspeed, the planned cruising altitude (within +/- 200 feet for Private, +/- 100 feet forCommercial), and headings within +/- 10°.
> identify landmarks by relating the chart symbols to surface features.
> navigate by applying systematic navigation techniques.
> maintain accurate records that reflect the progress of the flight.
> provide, within 15 minutes from the time of setting heading, the position of the aircraft, and then

a. demonstrate an organized method which would correct any existing track error (to within 1 nautical mile of the route for Commercial candidates); then,
b. confirm or revise as appropriate, the estimated time of arrival for the first turning point or destination(to within 3 minutes for Commercial candidates).
c. confirm fuel requirements.

What You Should Know and Do

> Perform a cruise check.
> Review your cross-country planning.
> Execute the set heading procedure.
> Confirm the heading and time to first turning point or destination.

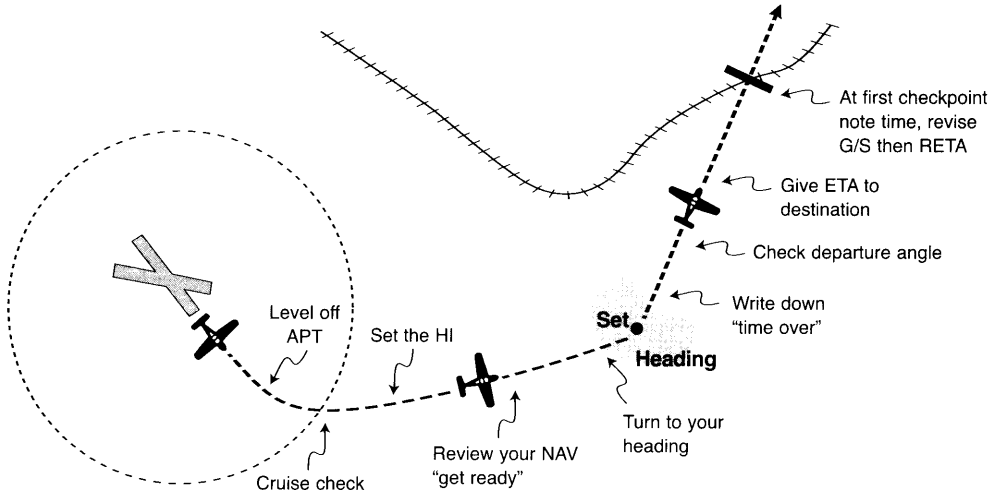
Common Mistakes

> Failure to set the heading indicator prior to turning at set heading point.
> Failure to maintain the planned heading.
> Failure to check for carb ice en route.
> Failure to monitor engine instruments.
> Altitude deviation.

> Trouble calculating ETA, and revised ETA (RETA).
> Not knowing how to use your flight computer quickly and efficiently.
> Changing planned magnetic (compass) heading without first checking carefully if the change is warranted. Be sure.

Review

Cross-country departure and en route procedures



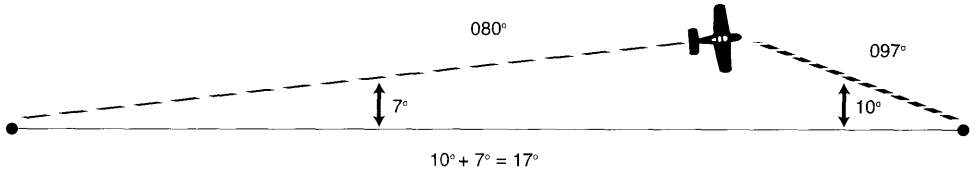
1. Cruise check:

Power	=	set
Carburetor heat	=	check for ice
Mixture	=	lean
Engine instruments	=	"in the green"
Heading indicator	=	set

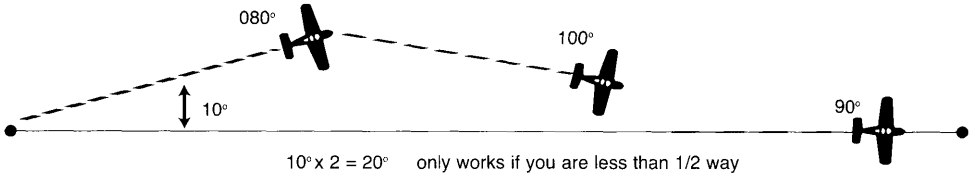
2. Review carefully your cross-country planning prior to arriving at the set heading point.
3. At set heading point, turn to your heading.
4. Once on heading, write down the "time over".
5. Check your departure angle with the chart.
6. Give your ETA to the first destination.
7. At the first checkpoint, write down "time over"; then revise and give your groundspeed and revised ETA, (RETA).

Three off-track procedures to get back on track

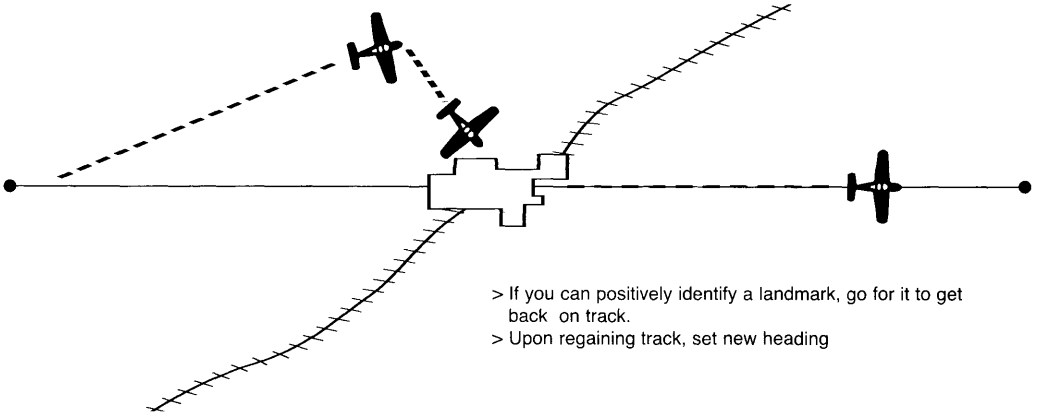
Opening and closing angles method



Double track error method



Visual alteration method



Note: Adjust the heading indicator any chance you get. Read CHART to GROUND.

Remarks

Although it is up to each examiner to decide the order in which the flight test exercises will be performed, it is normally at this point that the cross-country exercise is interrupted and that the upper level airwork, also know as the "S" manoeuvres, starts:

Steep turns	
Slow flight	
Stalls	
Spins	(Commercial only)
Spiral dives	(entry performed by the examiner)

All "S" manoeuvres require the HASEL check, with the exception of steep turns which require clearing turns only.

Height	=	minimum 2,000 feet AGL for slow flight, stalls and spin recovery.
Area	=	over unpopulated area.
Security	=	all loose objects stowed (maps, pencils, etc.).
Engine	=	pre-landing check (adjust seats, belts and harnesses - mixture rich - carburetor heat ON)
Lookout	=	clearing turns - 90° to the left, then 90° to the right or vice versa OR a 180° turn to the left or the right.

Section 8. Steep Turn

Flight Test Guide Reference:

Ex. 9 Steep Turns

Performance Criteria

The candidate must complete a steep turn:

> after completing an appropriate safety lookout before entering the steep turn.
> rolling into and out of turns, using smooth and coordinated pitch, bank, yaw and power.
> rolling into a coordinated turn with an angle of bank of 45°.
> reversing the direction of turn and repeating the manoeuvre in the opposite direction.
> rolling out of the turn at the same rate as used to roll into the turn.
> maintaining coordinated flight.
> maintaining altitude within +/- 100 feet.
> maintaining airspeed within +/- 10 knots.
> maintaining angle of bank within +/- 10° (+/- 5° for Commercial) of that assigned.
> maintaining an effective lookout.
> visually recovering from the turn within +/- 10° ° of the pre-selected recovery reference point.
> dividing attention appropriately between outside visual references and instrument indications.

What You Should Know and Do

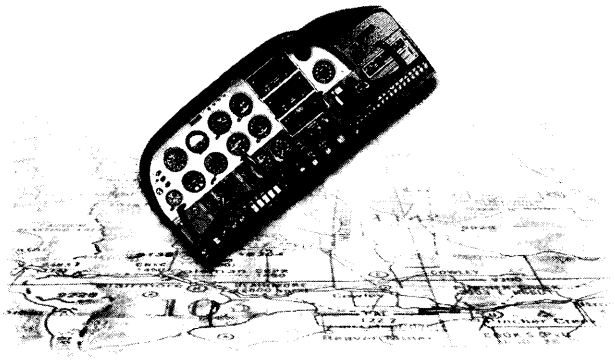
> Execute a steep turn through 360°, starting and ending at a prominent geographic point.
> Required bank angle is 45°.
> Airspeed and altitude are assigned by the examiner.

Common Mistakes

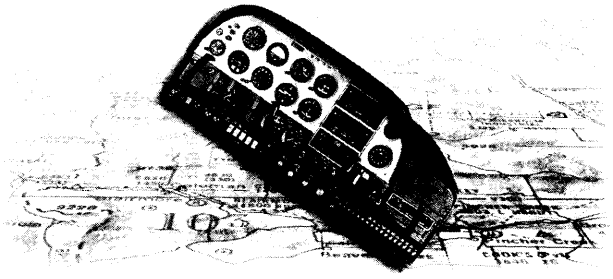
> Not checking for conflicting traffic during the turn.
> Fixating on the altimeter.
> Not maintaining altitude throughout the turn.
> Altitude deviation more than +/- 100 feet.
> Not returning to cruise configuration on roll out.

Review

> Clearing turns.
> Note heading and select reference point.



> Steep turn to the left
> Pick a point on the nose cowling and hold it.



> Steep turn to the right
> Notice how the steep turn to the left differs from the steep turn to the right.

> As you roll through 30 degrees, move control column back and increase throttle. Coordination is essential.
> Once established, maintain attitude and perform quick instrument check:

Attitude indicator	=	check 45° bank
Altimeter	=	check for assigned altitude
Vertical Speed Indicator	=	shows instant trend information

> If losing altitude, pitch up slightly, reduce bank by 5 degrees (you'll get more vertical lift).
> If gaining altitude, pitch down slightly or increase bank by 5 degrees.
> Start to roll out 20 degrees before desired heading.
> As you pass through 30 degrees, nose down and power back.

Note: If you maintain the proper attitude, your altitude should remain constant.

Section 9. Slow Flight

Flight Test Guide Reference:

Ex. 11 Slow Flight

Performance Criteria

Assessment will be based on the candidate's ability to:

> complete appropriate safety precautions before entering slow flight.
> establish and maintain an airspeed that is 5 knots above the stall speed indicated by the appropriate arc or as specified in the POH.
> demonstrate coordinated straight and level flight and gentle turns in level flight.
> maintain specified altitude (+/- 100 feet), headings (+/- 15° for Private, +/- 10° for Commercial), and bank angles (+/- 5°).
> roll out on specified headings (+/- 15° for Private, +/- 10° for Commercial).
> maintain an effective lookout.
> prevent a stall.
> promptly accomplish a coordinated return to normal airspeeds with minimum loss of altitude.

What You Should Know and Do

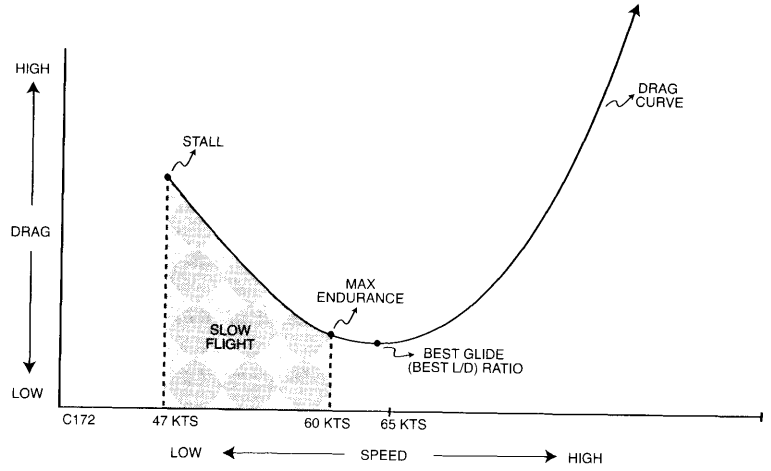
> HASEL check.
> Perform the manoeuvre at an operationally safe altitude not below 2,000 feet AGL.
> Identify when the aircraft is in the slow flight speed range.
> Execute manoeuvres requested by the examiner while maintaining control at all times.
> Return promptly to normal flight speeds when requested.

Common Mistakes

> Not maintaining altitude.
> Not maintaining constant airspeed.
> Not using full power when asked to climb while in slow flight.
> Not maintaining heading during the recovery.
> Forgetting to bring up the flaps during recovery or retracting flaps too quickly.

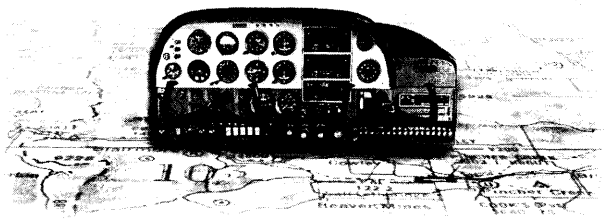
Review

> Slow flight is the range in airspeed from maximum endurance to stall. Select one of these airspeeds and maintain it during the slow flight exercise.

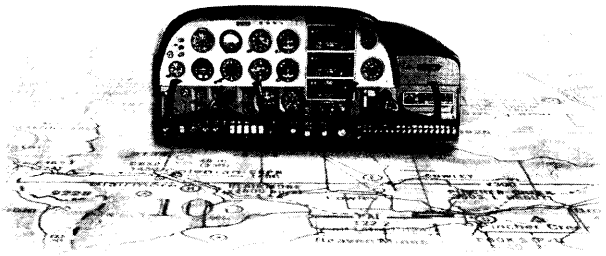


> Don't worry if you hear the stall warning horn; you are not stalled. The stall warning horn usually goes off 5 to 10 knots before an actual stall.
> Quite often, the examiner will make you stall the aircraft while in slow flight. In this case, call out the HASEL check.
> Proper procedure to enter and recover from slow flight:

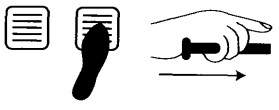
Entry

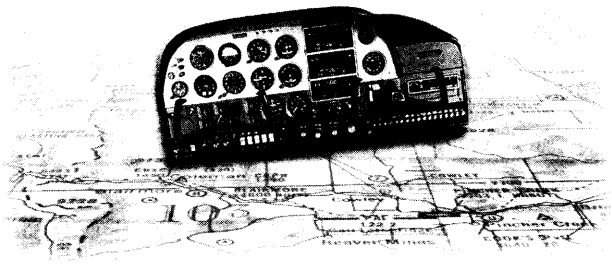


Reduce Power at white arc.
Drop flaps, pitch/trim to maintain altitude.



At desired A/S, add power and right rudder. Notice attitude similar to climb attitude. Pitch controls A/S.
Power controls altitude.





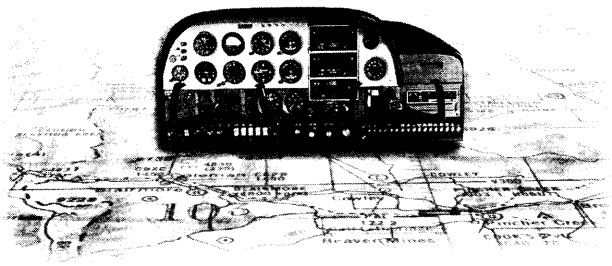
Add power during turns, avoid large bank angles.

1. HASEL check.
2. Reduce power.
3. Once airspeed is within the white arc range, extend the flaps.
4. When proper pitch attitude is established, trim to maintain altitude.
5. Choose airspeed in slow flight range.
6. At desired airspeed, add power and right rudder.

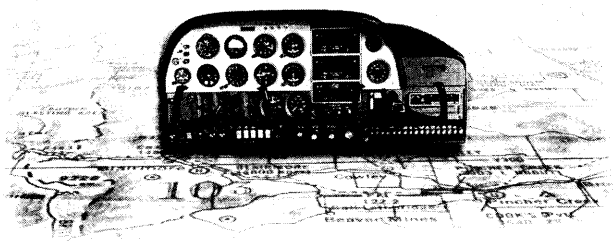
Note: Important reminder – pitch controls airspeed, power controls altitude.

7. Add power in turns and avoid large bank angles: the aircraft is very close to stall speed.
8. Use full power for climbs.
9. Maintain altitude and airspeed.

Recovery



Full power/carb cold/right rudder.
Lower nose slightly, avoid altitude loss, but enough for A/S to increase.
Flaps up in stages.



Maintain heading and altitude.
Gradually lower nose to cruise attitude while accelerating through slow flight range.

1. Full power / Carburetor heat OFF / Right rudder (to keep wings level).
2. Lower nose slightly, enough to allow airspeed to increase but not to lose altitude.
3. Flaps – from full extension to 20 degrees (or half the flap range).
4. Maintain heading and altitude.
5. When rate is positive, reduce flap setting to zero in stages.
6. Gradually lower nose to cruise attitude while accelerating through slow flight range.

Typical questions:

1. Define slow flight.
2. Why is slow flight taught?
3. How do you know you are in slow flight?

Section 10. Stall

Flight Test Guide Reference:

Ex. 12 Stall

Performance Criteria

Assessment will be based on the candidate's ability to:

> complete appropriate safety precautions before entering the stall.
> establish the configuration and power setting (for a power on stall) as specified by the examiner.
> transition smoothly to pitch that will induce a stall.
> recognize the onset of the stall by identifying the first aerodynamic buffeting or decay of control effectiveness.
> stall the aeroplane.
> maintain directional control.
> use immediate and correct recovery procedures in the proper sequence.
> retract flaps to the recommended setting and retract landing gear (where applicable) after a positive rate of climb is established, or as recommended by the manufacturer.
> accelerate to at least Vx or the speed recommended by the manufacturer, whichever is higher, before a final flap retraction (for Commercial only).
> avoid secondary stall, excessive airspeed, or excessive altitude loss.
> return to the altitude, heading and airspeed specified by the examiner.

What You Should Know and Do

> Types of stalls required:

a. Private Pilot Licence: The candidate will be required to perform BOTH a power on and a power off stall.
b. Commercial Pilot Licence: The candidate will be required to perform a power on stall and a spin.

> Altitude must be sufficient to allow recovery at a minimum of 2,000 feet AGL or higher if the manufacturer recommends it.
> Stalls will be entered from practical flight situations at the choice of the examiner.

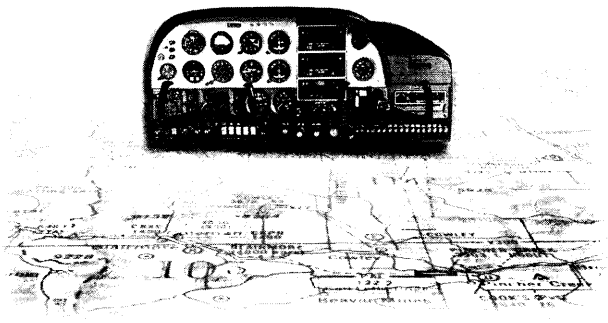
Common Mistakes

> Not applying enough right rudder, as required, with full power.
> When applying full power, forgetting carburetor heat OFF and flaps to 20 degrees (or half).
> Initiating recovery too early.
> Using excessive nose down on stall recovery, resulting in excessive loss of altitude.

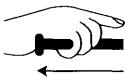
Review

> Before executing any stall, perform HASEL check.
> Avoid excessive loss of altitude.
> If a wing drops during the stall, use opposite rudder to bring it up. Using ailerons would aggravate the wing drop.
> In a climbing turn, the high wing will stall first, resulting in a roll in the direction opposite to the turn. Use the rudder to level the wings during recovery.

Entry to Power-off Stall



Keep the wings level.
Pitch to maintain altitude.
Pick a reference point outside to keep straight.

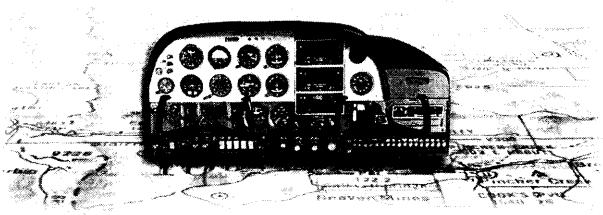


1. Power to idle.
2. Keep wings level.
3. Pick a reference point outside to keep straight.
4. Pitch to maintain altitude.
5. Extend flaps if requested (airspeed in white arc).
6. Wait for symptoms:

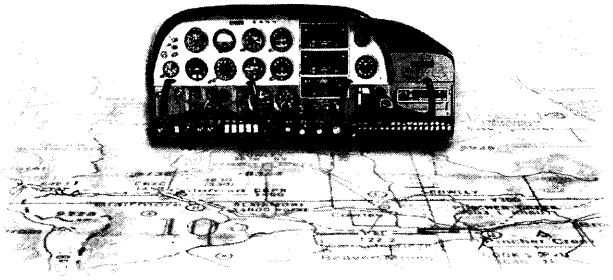
    a. loss of control effectiveness.
    b. stall warning horn (5 to 10 knots before actual stall).
    c. buffeting (not on all aircraft).
    d. loss of altitude.

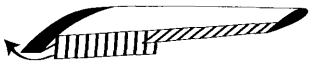
Note: When aircraft stalls, keep wings level with rudders.

Recovery from Power-off Stall



When aircraft stalls keep the wings level with rudders, add full power, right rudder, as required.

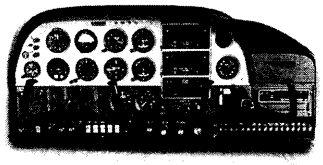




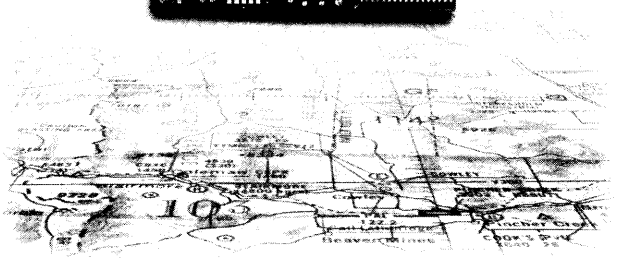
Pitch up to the climb attitude, positive rate, flaps up, in stages. If you have full flap bring them up 1/2 way after adding power and pitching up to the climb attitude.

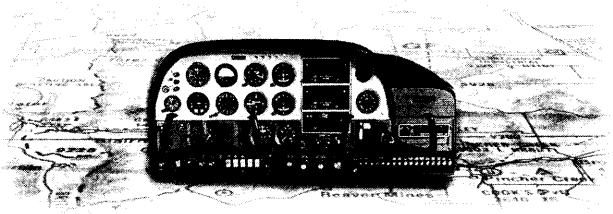
1. Reduce angle of attack (control column forward enough).
2. Add full power / Carburetor heat OFF / Right rudder as required.
3. Pitch up to climb attitude. If flaps fully extended, bring them up halfway (ex. from 40° to 20°).
4. Positive rate, remaining flaps up in 10° stages.

Power on Stall

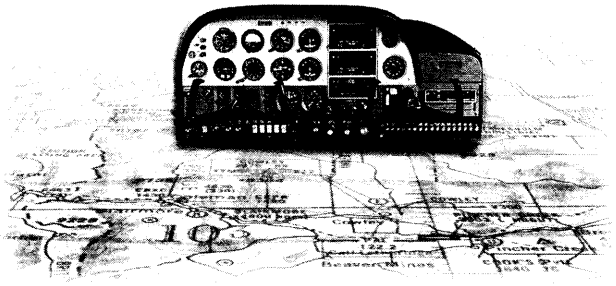


Use a power setting that will give about 50% power. Lower "typical" landing flap. The aircraft will stall at a much higher "nose up" attitude compared to a "power off stall."



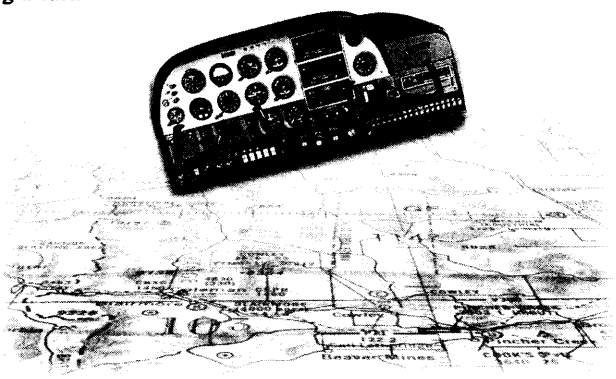


The stall will be sudden and the "nose drops" quite a lot compared with the "power off" stall.

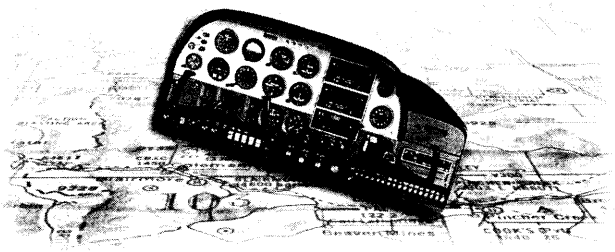


On the recovery, full power, right rudder as required, climb attitude, flap 40° - 20° keep straight, use an outside reference.

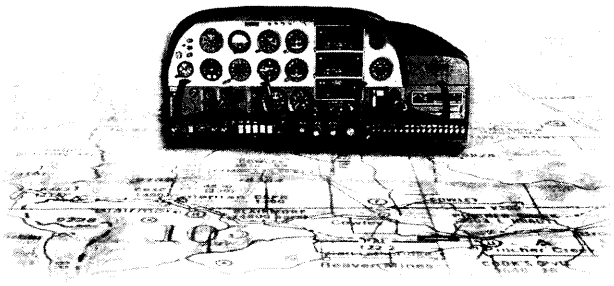
Stall During a Turn



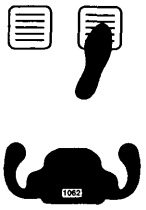
The outside wing has a greater angle of attack than the inside wing, the outside wing will stall first.



The outside wing will drop, causing a turn in the opposite direction. Trying to "pick up" the wing with a turn to the left will aggravate the stall and cause a further wing drop.



Use the rudder to "pick up" the wing.



Other types of stalls

The procedures concerning other types of stalls, such as departure stalls, stalls during descending or level turns, acceleration stalls, etc., should be reviewed carefully.

Whatever the stall, FULL POWER on recovery is essential.

Section 11. Spin

Flight Test Guide Reference:

Ex. 13 Spinning

(Commercial only)

Performance Criteria

Assessment will be made on the candidate's ability to:

> complete appropriate safety precautions before entering the spin.
> enter the spin with correct and effective control application, in the proper sequence for the type of aeroplane.
> hold the aeroplane in the spin by maintaining correct and full control application until the command to recover is given.
> recognize and announce a developing spiral dive, it if occurs.
> use immediate and correct recovery procedures in the proper sequence.
> avoid secondary stall, excessive airspeed, or excessive altitude loss.
> avoid exceeding any airframe limitations.

The recovery method used shall be in accordance with that specified in the Pilot's Operating Handbook.

What You Should Know and Do

> Spin entry and recovery are to be effected at the examiner's request.
> Altitude must be sufficient to allow full recovery at a minimum of 2,000 feet AGL or higher if the manufacturer recommends it.
> Recommended entry point is 4,000 feet AGL.
> Spin may be initiated under various conditions, including climbing or descending turns.
> Minimum rotation: one half to one full turn.
> Consult the Pilot's Operating Handbook for recommended procedure.

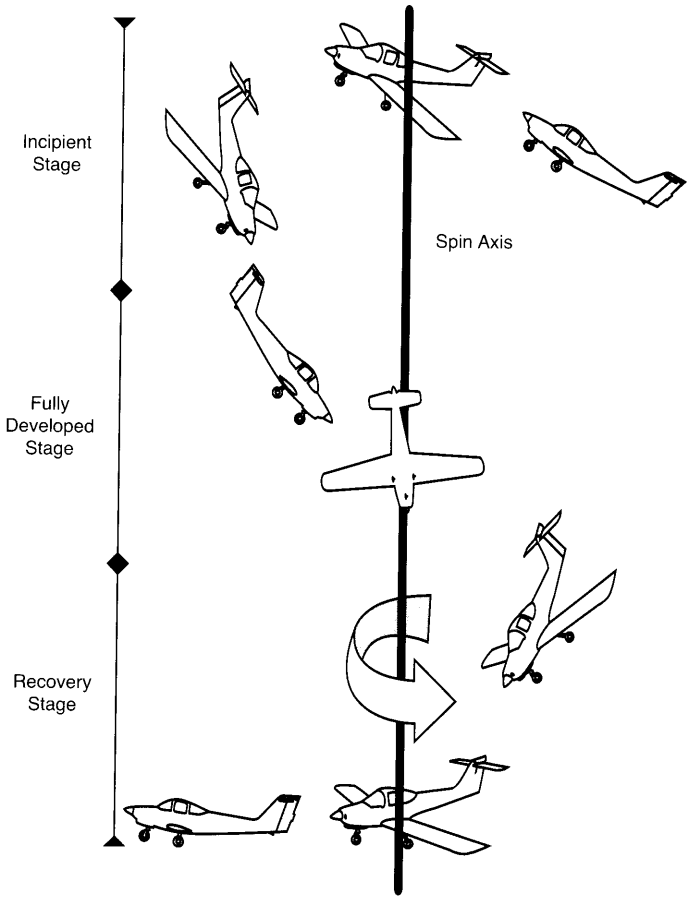
Common Mistakes

> Not applying full rudder and full back pressure for entry.
> In the recovery, once the spin stops, failing to neutralize the rudder.

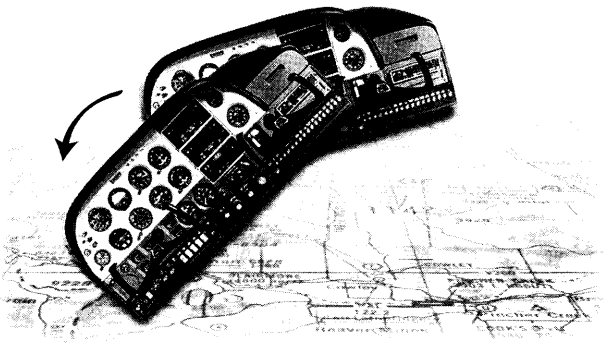
> Pulling up too fast during recovery.
> Pulling up without levelling the wings first.
> Letting the spin develop into a spiral dive.

Review

> Before executing a spin, perform HASEL check. Flaps UP!
> Stages of the spin.
> Basic spin sequence that applies to most small aircraft:



Entry



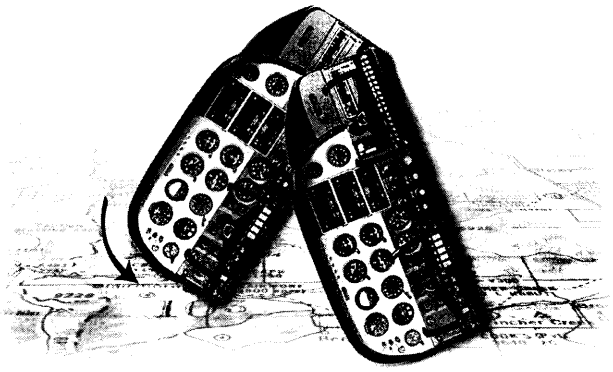
At stall horn, column full aft and full left rudder is applied. The aircraft is rolling and yawing to the left.

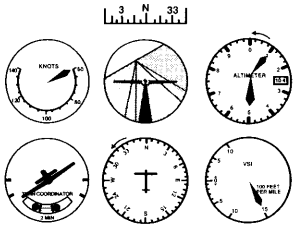
1. Power to idle (although a little power helps to get the spin started in most aircraft).
2. Pitch to maintain altitude.
3. Wings level.
4. At stall horn, simultaneously and with authority:

    a. full rudder (in this example, left rudder).
    b. full aft on control column.

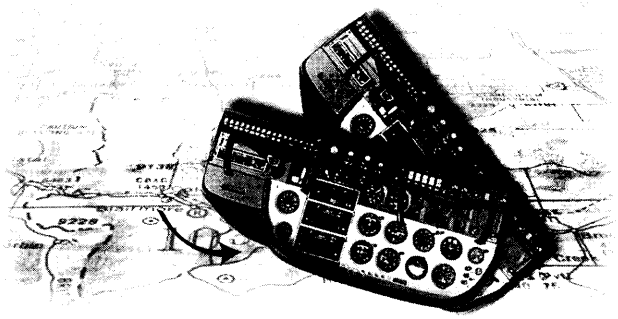
Note: "with authority" does not mean "brutally". A "snapped" entry into a spin, especially one with a little extra airspeed, will not only feel unpleasant, but may also lead to excessive G forces on the aircraft and/or structural damage.

> Hold full control inputs.



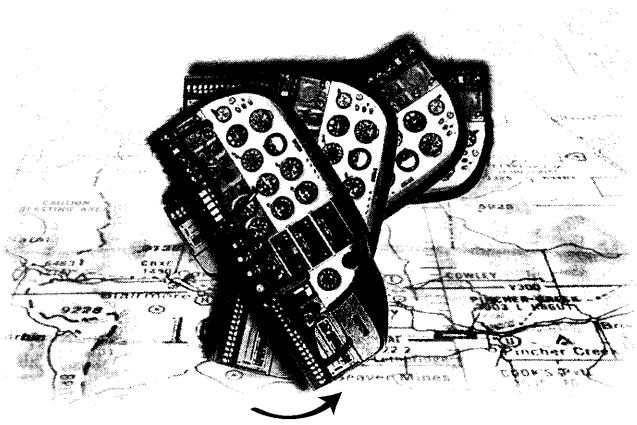


> After 90° of heading change, the aircraft is inverted.



After 90° of heading change, the aircraft is in an inverted position.

Stabilized spin

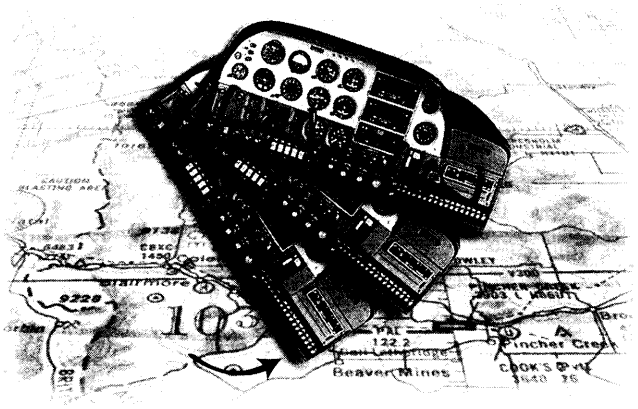


Fully developed stage. The rate of rotation increases.

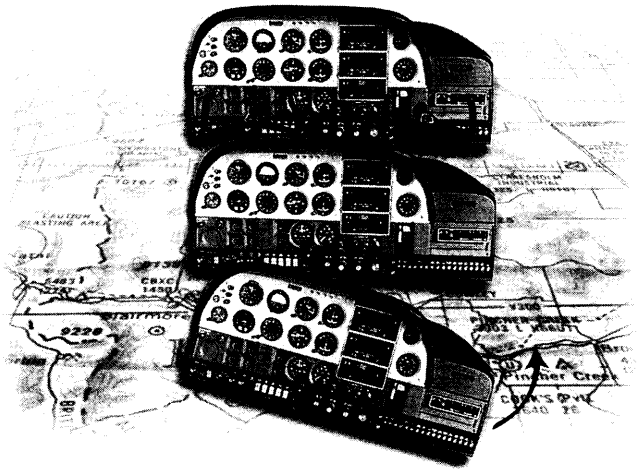
Recovery

1. Power to idle.
2. Ailerons neutral.
3. Full opposite rudder.
4. Control column forward (enough to break the stall).
5. Hold control inputs until rotation stops.
6. Neutralize rudder when rotation stops.
7. With the wings level, pull out of the dive.
8. Add power at cruise airspeed.

> Recovery is initiated



Note: Failure to neutralize rudder can lead to a spin in the other direction.



Notes: Pulling up too fast can cause excessive G forces and/or result in a secondary stall. Wings must be level (with ailerons) when the pull up is initiated because any amount of "bank" will result in increased G forces.

Section 12. Spiral Dive

Flight Test Guide Reference:

Ex. 14 Spiral

Performance Criteria

Assessment will be based on:

> prompt and proper use of power and flight controls.
> control of airspeed.
> a return to straight and level flight with minimum loss of altitude without exceeding any operating limitation of the aeroplane.

What You Should Know and Do

> The examiner will initiate the entry from an overbanked steep turn or an incorrect spin entry.
> The candidate is responsible for recovering immediately upon the examiner's request.
> Recovery should be completed at a minimum altitude of 2,000 feet AGL or higher.

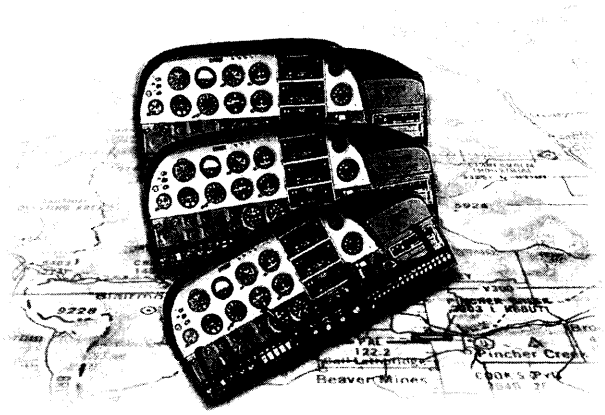
Common Mistakes

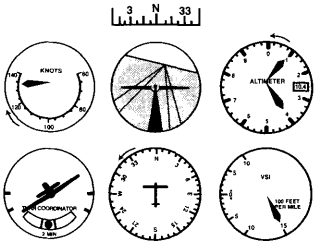
> Pulling up before levelling the wings.
> Not ensuring power is at idle.
> Uncoordinated use of ailerons and rudder, or over-use of rudder.
> Increasing power during recovery, before the desired cruise airspeed has been reached.

Review

> A spiral dive can be described as a steep turn gone bad.
> Instrument indications in a spiral dive are shown below.

Basic spiral dive recovery sequence:

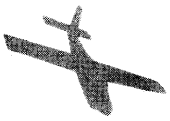




1. Power to idle.
2. Wings level first (absolutely!).
3. Pull out of dive.

Note: The pull out must be effected positively, but gently. Abrupt recovery can result in excessive G forces, possibly leading to pilot blackout, structural damage or a high-speed stall.

4. Once at cruise airspeed, increase power to cruise power.



Section 13. Forced Approach

Flight Test Guide Reference:

Ex. 22 Forced Landing

Performance Criteria

Assessment will be based on:

> selection of a suitable landing area and touchdown zone.
> control of the aeroplane and establishment of the recommended best glide speed.
> completion of an approach that would ensure a landing could have been safely accomplished in the selected touchdown zone.
> selection of landing path.
> plan of descent and any required airspeed and flight profile variations.
> general flying accuracy.
> cockpit checks and appropriate (simulated) radio calls.
> performance of an effective passenger emergency safety review.
> final descent procedure including use of flaps, sideslip, or slipping turn as required.

Descent airspeeds shall be maintained within +/- 10 knots of that specified in the Pilot's Operating Handbook. The candidate must explain the operational necessity for any variation from the specified airspeed.

The candidate will be expected to demonstrate good airmanship by clearing the engine at appropriate intervals during the descent. The practice of leaving some power on and achieving a normal descent angle and airspeed by using flaps is acceptable.

A change of field is acceptable from an altitude in the approach where a landing could still have been made on the original landing site.

What You Should Know and Do

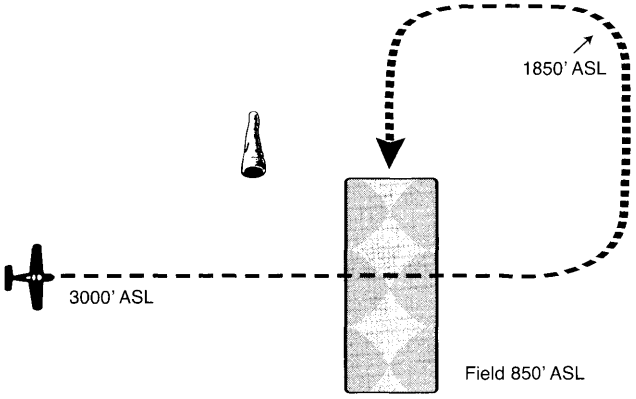
> Engine failure will be simulated without advance warning by the examiner.
> Usually initiated at 3,000 feet AGL.
> Select a suitable landing area.
> Fly a successful approach in an organized manner.
> Execute all required emergency procedures.
> Overshoot only at the examiner's request.
> Be familiar with both forced landing approach procedures: circuit pattern and 360° pattern.
> Consult the Pilot's Operating Handbook for recommended procedure and best glide speed.

Common Mistakes

> Overshooting the field (9 out of 10 failures result from this)
> Undershooting the field.
> Changing landing field. (unless there is an obstruction that was not visible from a higher altitude)
> Losing sight of the field.
> Crowding the field.
> Stretching the glide.
> Approach speed too high.
> Excessive bank angle.
> Failing to warm the engine every 500 feet.
> Not being familiar with both the circuit forced landing pattern and the 360° forced landing pattern.

Review

> Number 1 priority: make the field!
> Lower the flaps only when you've made the field.
> Know by memory the procedure recommended by the manufacturer, as found in the POH, and / or the owner of the aircraft.
> Basic procedure to be followed in the event of an engine failure in flight:

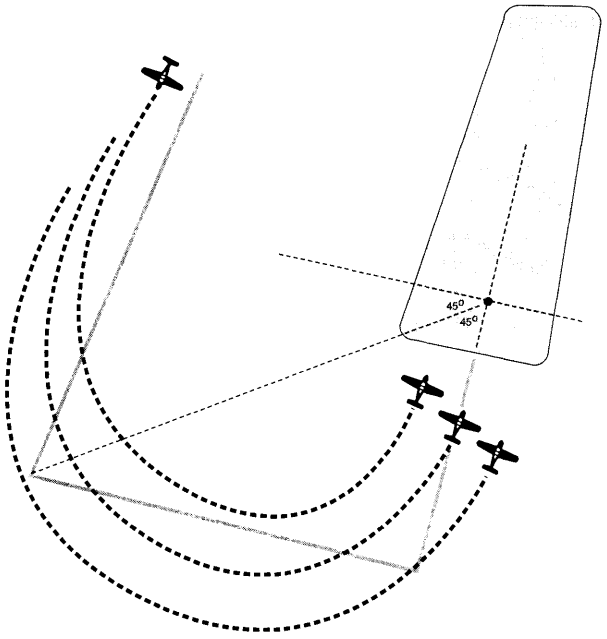


a. Best glide speed.
b. Carburetor heat ON.
c. Determine surface winds.
d. Find a place to land.
e. Plan how you will arrive at the landing point (determine key points).
f. Cause check.
g. Call Mayday.
h. Cabin check and passenger briefing.
i. Shutdown check.

Note: Try to fly the forced approach as you would a regular circuit.

> Too low? Don't go to the key point.
> Too high? Go past it.

Two methods to plan approach to the field:



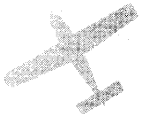
Circuit pattern

Advantages:

1. Familiar approach pattern.
2. Several occasions to adjust according to circumstances.

Important considerations:

Where to turn base is the most crucial part of the forced landing procedure. A large error in judgement may be impossible to correct on final. A minor one may be corrected by:



a. forward slip.
b. flaps (none or introduced early).
c. turning on final a little late or early.

As you approach the "base" key point, you may choose to turn before or after arriving there. Factors to consider in this decision:

a. height at base point.
b. wind direction and strength.

Examples:

Height at base point:

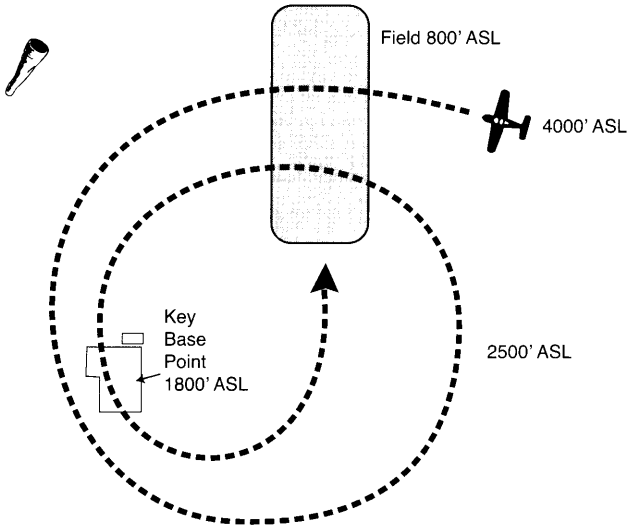
a. more than 1,000 feet AGL = extend
b. less than 1,000 feet AGL = turn early

Headwind on final approach:

a. strong = turn early
b. light = extend

You should not adjust your airspeed to arrive at the touchdown point. Pitch controls airspeed, not height. Rather, you should adjust the track to compensate if you are "high" or "low". Forward slip and flaps can also be used to fine tune your rate of descent.

360° pattern (spiral path over intended landing area)



Advantages:

1. Keeps the field always within gliding distance.
2. Good technique to utilize if you have a lot of altitude to lose and your field is close.

Important considerations:

1. Plan to arrive at the "base" key point at 1,000 feet AGL. Using the base point will help you to estimate your approach.
2. Avoid crowding the field.
3. Avoid excessive bank angles and airspeed.

Eagerness to get down is a common fault. Whatever method you use, avoid the temptation of "pushing the nose over" if you are high on approach; it will only serve to increase your airspeed. And if your airspeed is higher than it should be on approach, you will overshoot the field!

Section 14. Sideslip

Flight Test Guide Reference:

Ex. 15 Sideslip

Performance Criteria

Performance will be assessed on the entry, the sideslip and the recovery. Assessment will be based on:

> smoothness.
> attitude control.
> airspeed control.
> directional control (if applicable).
> recovery to coordinated flight.

What You Should Know and Do

> Demonstrate the use of sideslip to lose altitude, and/or demonstrate a slipping turn.

Common Mistakes

> Not using full rudder, if required, in the forward slip.
> Failure to maintain airspeed during the forward slip.
> Releasing control inputs too quickly.
> Skidding in the manoeuvre.

Review

> Slipping has two purposes:

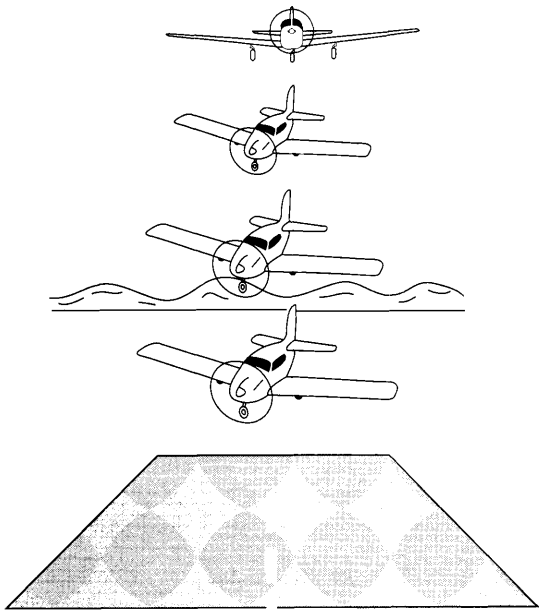
1. To increase the rate of descent without increasing airspeed.
2. To counteract the effect of drift when landing in a crosswind.

> Slipping should always be done into the wind.
> There are three slipping variations: sideslip, forward slip, slipping turn.

Sideslip

> The main purpose of the sideslip is to counteract drift when landing in a crosswind.
> The longitudinal axis is parallel to the flight path.
> During the flight test, sideslips are not demonstrated separately; they are judged when performing a crosswind landing.

Forward slip



> The main purpose of the forward slip is to lose altitude without increasing the airspeed.
> The longitudinal axis is at an angle to the flight path.
> An advantage of the forward slip over flaps is that you commit yourself when you extend flaps.
> With the forward slip, you have the option of releasing the control inputs if you "guessed wrong".

Slipping turn

> The purpose of the slipping turn is the same as a forward slip: increase the rate of descent without increasing the airspeed.
> A slipping turn is a forward slip, but instead of tracking straight, you are turning.
> Particularly useful during the turn to final approach in the case of a forced landing.

Note: Many students are not comfortable with forward slips and slipping turns. Practice is the key.

Section 15. Diversion

Flight Test Guide Reference:

Ex. 23 Pilot Navigation

D. Diversion to an Alternate

Performance Criteria

Assessment will be based on the candidate's ability to:

> identify and record present position.
> select an appropriate alternate destination and route.
> identify the highest Maximum Elevation Figure (MEF) along the selected route and determine a minimum safe altitude for that route.
> select an aircraft configuration and airspeed appropriate for the actual or simulated conditions.
> estimate initial heading, arrival time and fuel consumption to the alternate destination.

> divert toward the alternate destination.
> maintain the selected airspeed (+/- 10 knots) and selected headings (+/- 10°).
> maintain declared altitudes (+/- 100 feet).
> provide an estimated time of arrival that is sufficiently accurate to ensure that the diversion can be conducted as planned.
> establish or simulate communication with ATS to inform of intention to divert.

What You Should Know and Do

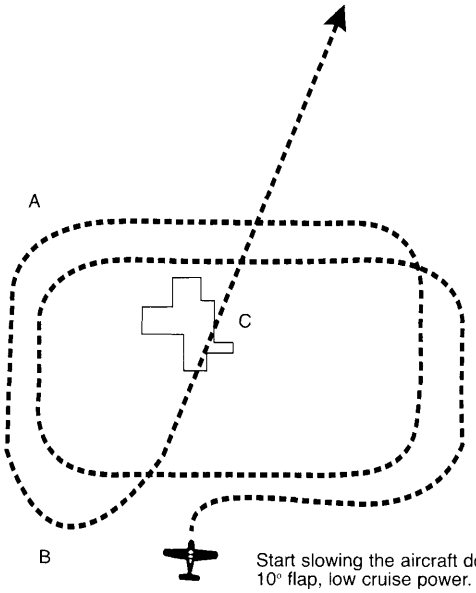
> Demonstrate your ability to carry out a diversion to an alternate destination within fuel range.
> Usually set up as a bad weather situation.
> Preferred altitude: 500 feet AGL.
> Exercise in dead reckoning.
> Use natural geographic features (ie. roads, railways, power lines, etc.).
> No computers, rules, protractors allowed.
> Arrival at the destination, or completion of a sufficient portion of the diversion to confirm a successful outcome, is assessed as a pass.
> The practice of following a geographical feature towards an alternate destination is reserved for the PPL flight test. A practical demonstration of dead-reckoning skills is required on the CPL flight test.

Common Mistakes

> Not getting to destination point or inability to ensure positive outcome.
> Not utilizing natural geographic features for navigation.
> Altitude deviation.
> Failure to realize the route takes you over a populated area and/or through a control zone where appropriate communication is required with ATC.
> Arriving at destination airport without contact or preparation.
> Arriving at destination airport below circuit height and oblivious to potential conflicts.
> Failure to advise of your change of plan.

Review

Diversion procedure:



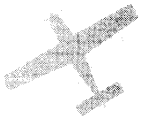
A. While holding over the known geographic point, estimate:
   • distance
   • time it will take
   • track, heading to fly
   • set the HI
   Don't forget to factor in winds aloft.
B. Avoid excessive bank angle in turns
C. When you're ready to start:
   • time (write it down)
   • track (departure angle)
   • throttle
   • time to get there – ETA
   • talk – let someone know

1. Set up:

    a. start slowing the aircraft down, 10° flap setting, low cruise power.
    b. set up a racetrack holding pattern with left hand turns over a known geographic point.

2. While flying over the known geographic point, do your planning while straight and level:

    a. circle where you are and where you want to go. Connect the circles.
    b. avoid excessive bank angles in turns (less than 30°).
    c. find the distance.
    d. estimate the track and, taking into consideration the winds aloft, the heading and the time en route.
    e. set the heading indicator.



Note: If a natural feature, such as a railroad track, can take you to your destination, use it!

3. When ready to start:

    a. write down the time over the departure point.
    b. turn to your heading.
    c. check the departure angle relative to the track.
    d. adjust the throttle.
    e. let someone know of your intentions.

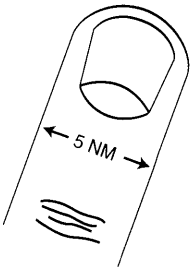
4. When en route, give an ETA.

Rules of thumb:

Distance estimates:

> 1° of latitude = 1 nautical mile
> For most people:

    a. 1 finger width = 5 NM (VNC)
    b. 2 fingers width = 10 NM (VNC)



Note: For VTA charts, halve these figures.

Time estimates

> Based on a ground speed of 90 kts *:
> Approximate time en route = 2/3 the distance

Examples:

Distance				Approx. Time En Route
12 NM	x	2/3	=	8 minutes
30 NM	x	2/3	=	20 minutes

* 90 kts = 90 NM in 60 minutes = 3 NM in 2 minutes

> Divide track into equal segments. To find the time to reach your destination, multiply the time taken to fly the first segment by the number of segments left.

Total Distance	Time to Fly First Segment		Remaining Segments	Time Left
12 NM (3 segments)	3 min.	x	2	= 6 min.
24 NM (4 segments)	4 min.	x	3	= 12 min.

Section 16. Precautionary Landing

Flight Test Guide Reference:

Ex. 21 Precautionary Landing

Performance Criteria

Assessment will be based on:

> selection of a suitable airstrip or other area on which a safe landing could be made.
> compliance with circuit procedures.
> making of appropriate radio calls.
> evaluation of the wind conditions, landing surface and obstructions.
> flying an approach that could ensure landing in the selected touchdown zone
> establishment of the circuit at an appropriate distance from the airstrip/landing area.
> correction for wind drift to maintain proper ground track.
> orientation with the airstrip/landing area.
> performance of an effective passenger brief.
> maintenance and holding circuit altitude (+/- 100 feet) and an appropriate airspeed (+/- 10 knots).
> establishment of the recommended approach configuration.
> maintenance of a stabilized approach and recommended airspeed (+/- 10 knots).
> overflying the landing area in stabilized flight and maintaining a safe obstacle clearance altitude (+/- 100 feet) and a recommended airspeed (+/- 5 knots) that will permit an effective assessment of surface conditions.
> indication of the type of landing to be used and performance of a final approach in a manner that would permit touch down within the selected touchdown zone.
> maintenance of crosswind correction and directional control throughout approach and landing.

What You Should Know and Do

> The examiner will give a scenario necessitating the use of a precautionary landing, often in conjunction with the diversion.
> An actual landing may not be required, but the approach flown must confirm that a successful landing could have been accomplished in the pre-selected touchdown zone.
> You will be marked on the overshoot. (This is really part of Ex. 18 - Landing, but the examiner may decide to grade the compulsory overshoot exercise at this point.)

Common Mistakes

> Failure to inform ATC or the FIC of the changes to your flight plan.
> Choosing an improper field, and a poor landing path and direction into that field.
> Failure to find and analyse surface winds.
> Picking key points too close together.
> Forgetting the radio work if your new destination is an airport.
> Using a higher than normal approach speed - overshooting the field.
> Omitting the "3P" check on the final circuit.
> Improper overshoot procedure (leaving carburetor heat ON, flaps down, applying partial power only).
> Taking too much time to complete the procedure.

Review

Possible scenarios:

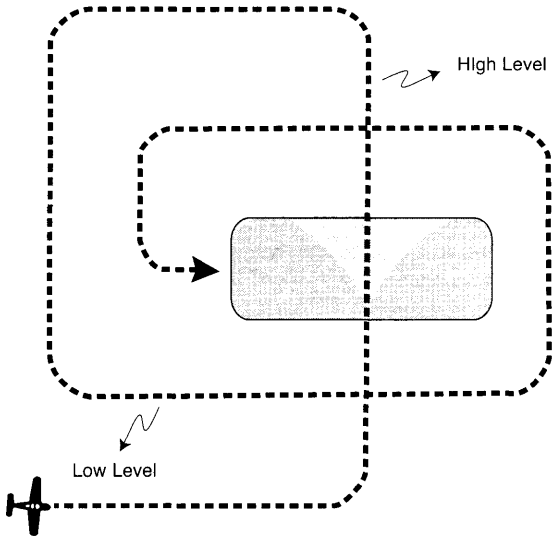
1. Unfamiliar landing strip.
2. Deteriorating weather conditions.

3. Sick person on board.
4. Partial engine failure.
5. Low fuel.
6. Approaching darkness.

Decision making factors:

> If you are not constrained by time, take every precaution. Do at least both the high level and the low level inspections.
> If time does not permit it, you may have to omit the high level inspection. A low level inspection is more important.
> If you have only partial power or experience icing, omit the low level inspection. A high level inspection helps to ensure that you will make the field should the situation deteriorate.

Simplified precautionary landing procedure:



Each precautionary landing carries its own challenges (terrain conditions, flight conditions, immediate emergency, etc.), so procedures need to be adjusted to existing conditions. Following are three such procedures:

Full precautionary landing procedure

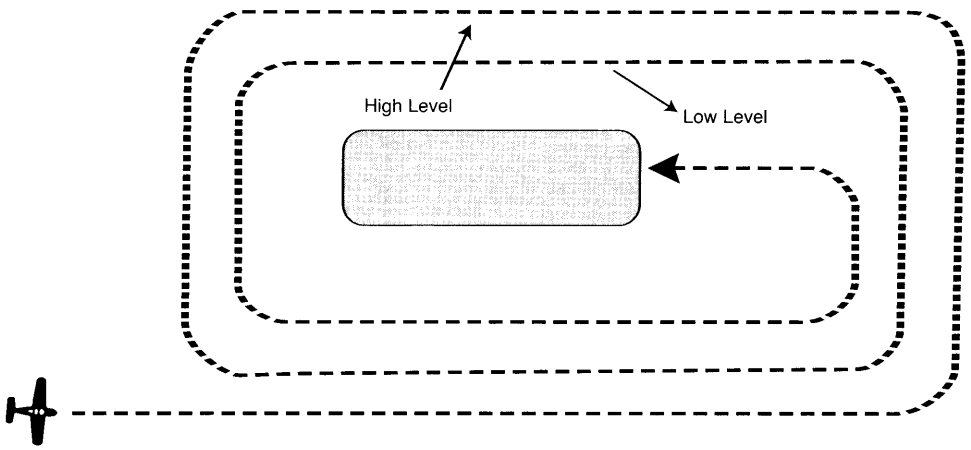
When you are not pressed for time, use as much of it as you need to select a proper landing area. In selecting your field, take into consideration:

a. length
b. winds
c. surface
d. obstacles
e. proximity to civilization

Often overlooked is the fact that a greater distance can be achieved by landing from corner to corner diagonally along the field.

Once you have made your choice:

a. map out the area.
b. pick key points (where to turn crosswind, downwind, base and final) to construct your own circuit.



In a real situation, do not hesitate to fly as many inspection circuits as necessary. For the purpose of the flight test, you will fly these two:

High level inspection circuit

1. Slow the aircraft down to recommended power and flap setting (consult the POH).
2. Enter the circuit as you would at an uncontrolled airport.
3. Fly at circuit altitude (1,000 feet AGL), using your key points.
4. Check approach and departure end.
5. Keep the "runway" on your left-hand side (unless unsafe to do so).

Low level inspection circuit

1. Descend for your low level circuit when turning base as if it were a normal base leg preparatory to landing.
2. Level off as low as possible (your examiner may request 500 feet AGL if near buildings).
3. Keep the "runway" on your left-hand side.
4. Give the examiner and yourself a briefing on the field conditions and the overshoot area.
5. After inspecting the field, overshoot.

The low level inspection circuit is flown to provide enough information to make a landing/no landing decision. If the answer is yes, you will then fly a final circuit.

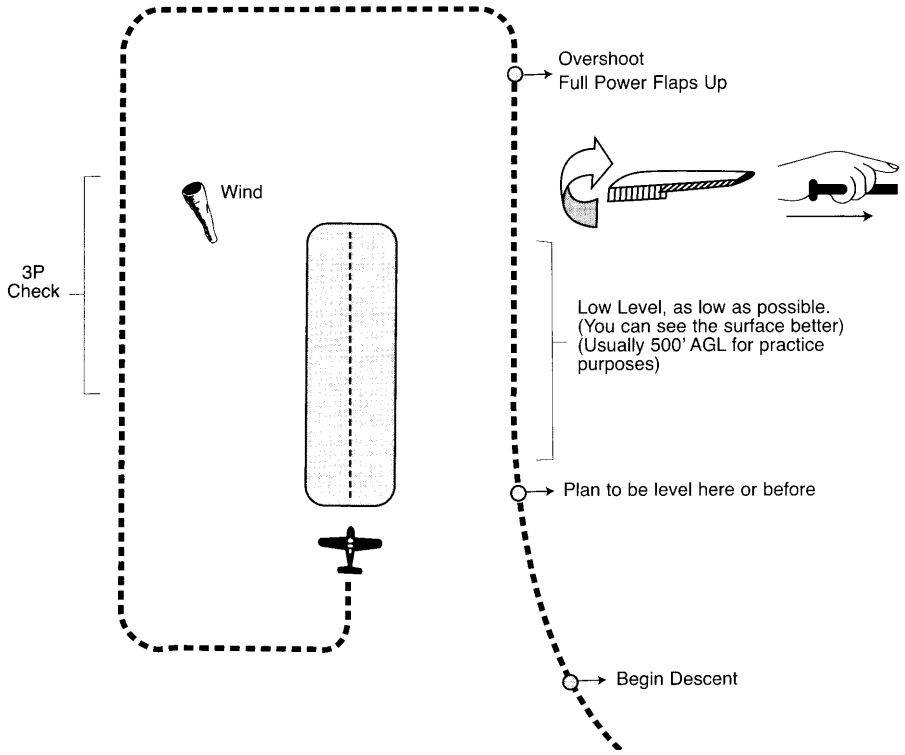
Final circuit

1. Use your key point to turn crosswind side and climb back up to normal circuit altitude.
2. In the downwind, do the 3P check:

    a. Pan-Pan call (let someone know what you are doing).
    b. Passenger briefing (calm them down).
    c. Pre-landing check.

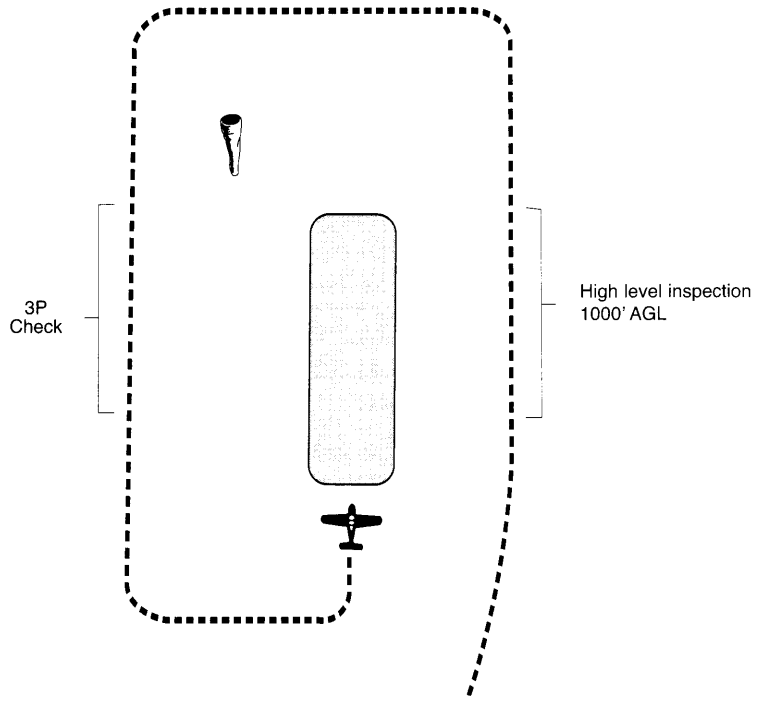
3. When turning base and final for landing (or simulated landing), it is important to maintain normal approach speed. Don't use a higher than normal approach speed or you'll overshoot the field.
4. In most situations, a soft field landing is warranted. Aim to touch down somewhere in the first third of the field.

"Time limited" procedure



When you do not have enough time for a full procedure (low fuel, approaching darkness, bad weather, sick person), or, you are familiar with the airport but unsure of runway conditions, you will omit the high level inspection circuit.

"Partial power" procedure



With partial power only, height is your best ally in case you lose power entirely. In this situation, you will omit the low level inspection circuit. This procedure is also indicated when icing has occurred.

17. Instrument Flying

Flight Test Guide Reference:

Ex. 24 Instrument Flying (Private)
Ex. 24 Instrument Flying and Use of Radio Navigation Aids (Commercial)

A. Full Panel (Private/Commercial)
B. Limited Panel (Commercial)
C. Recovery from Unusual Attitude (Private/Commercial)
D. Radio Navigation(Commercial)

A. Full Panel (Private and Commercial)

Performance Criteria

For a private pilot flight test, the candidate must control and manoeuvre the aeroplane within:

+/- 15° of the assigned heading.
+/- 200 feet of the assigned altitude.
+/- 15 knots of the assigned airspeed.
an angle of bank not to exceed the angle required to give a standard rate of turn.

For a commercial pilot flight test, the candidate must control and manoeuvre the aeroplane within:

+/- 10° of the assigned heading.
+/- 100 feet of the assigned altitude.
+/- 10 knots of the assigned airspeed.
+/- 100 feet/minute of the required rate of climb or descent when established.
+/- 10° of the specified angle of bank.

What You Should Know and Do

Private (wearing a view limiting device)

With reference to instruments only, the candidate will be asked to demonstrate:

a. coordinated straight and level flight for two minutes, followed by
b. a rate one, 180° turn, to a reciprocal compass heading immediately followed by
c. coordinated straight and level flight for two minutes.

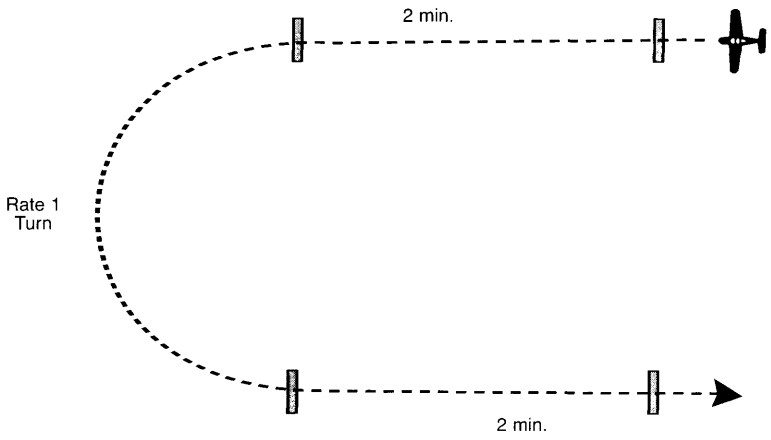
Commercial (wearing a view limiting device)

At various airspeeds, the candidate will be asked to demonstrate:

a. coordinated straight and level flight.
b. changes in airspeed in straight and level flight and level turns.
c. climbing at a constant airspeed.
d. descending at a constant airspeed.
e. climbing at a constant rate.
f. descending at a constant rate.
g. climbing, descending and level turns at various assigned angles of bank to assigned headings and altitudes.

Review

Exercise required for the private pilot flight test.



B. Limited Panel (Commercial only)

Performance Criteria

The candidate must control and manoeuvre the aeroplane within:

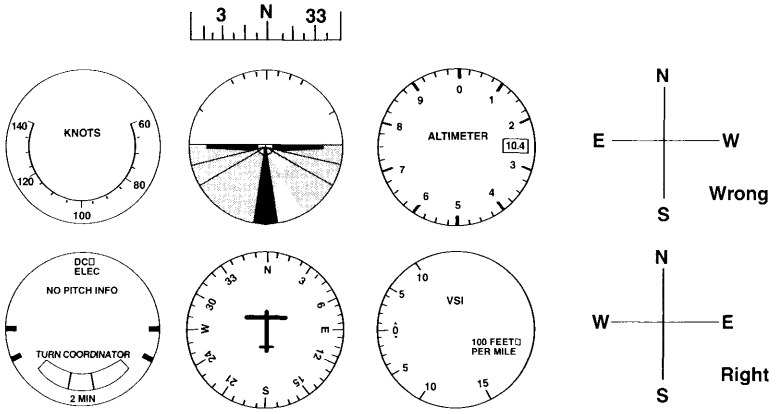
+/- 15° of assigned heading.
+/- 100 feet of assigned altitude.
+/- 10 knots of assigned airspeed.

What You Should Know and Do

Wearing a view limiting device, the candidate will be expected to:

a. maintain straight and level flight.
b. conduct a rate one timed turn in the shortest direction to a specific compass heading.

Review



> The examiner will usually cover the heading indicator and the attitude indicator to simulate a vacuum failure.
> One third of all failures on this exercise can be attributed to badly executed rate one timed turns; in particular, turning the wrong way when using the magnetic compass as a reference.

The compass card of the magnetic compass is the reverse of the heading indicator card.

C. Recovery from Unusual Attitude (Private and Commercial)

Performance Criteria

Recovery shall be assessed on the basis of:

> prompt recognition of what the aeroplane is doing by reference to the instruments.
> promptness in taking immediate and correct action.
> recovery with minimum loss of altitude and without excessive airspeed.
> smoothness.
> coordination.

What You Should Know and Do

Private (wearing a view limiting device)

Using available instruments, the candidate is expected to recover from one unusual attitude with minimum loss of altitude.

Commercial (wearing a view limiting device)

Using limited panel, the candidate is expected to recover from one unusual attitude with minimum loss of altitude.

Common Mistakes

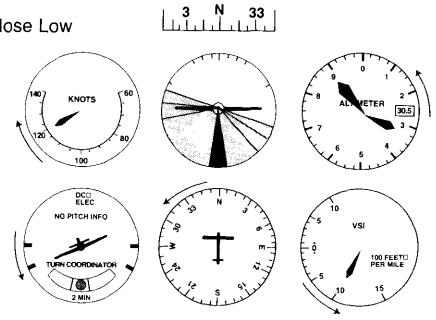
Most mistakes occur during the recovery from unusual attitude.

> In nose high situation, applying only partial power rather than full power.
> In nose low situation, not bringing power to idle.
> Overcontrolling, high G loading (may induce a high speed stall).

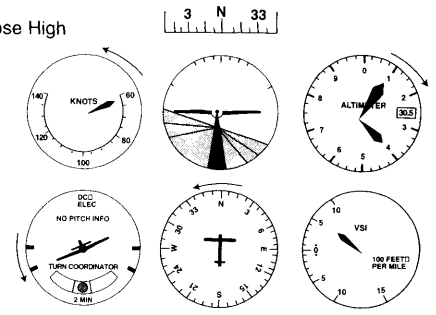
Review

Typically, you will be given a nose low or nose high attitude.

Nose Low



Nose High



For the private flight test:

1. Look at your airspeed indicator:

   a. if the airspeed is high, power to idle.
   b. if the airspeed is low, full power.

2. To determine the aircraft attitude, look at your attitude indicator, turn coordinator, altimeter, and vertical speed indicator.
3. Level the wings and bring the nose down or up.

For the commercial flight test: Since the attitude indicator will be masked, you must read the other instruments to determine the attitude of the aircraft.

D. Radio Navigation (Commercial only)

Performance Criteria

No prescribed orientation procedure will be required; however, failure of the candidate to apply a systematic method to complete successful orientation will be disqualifying.

Assessment will be based on the candidate's ability to:

> tune and identify the radio facility or, for GPS, select and identify the required waypoint.
> apply a systematic method using radio navigation aids to determine aircraft position on the VFR chart.
> expeditiously apply an orientation procedure which will establish the aeroplane on required track.
> maintain track within +/- 10°, or, for GPS, within 1 nautical mile.
> identify or describe station or waypoint passage.

What You Should Know and Do

> A view limiting device (hood) will not be used for this portion of the flight test.
> You will be required to use either VOR, ADF or GPS. The option rests with the candidate.
> The candidate will be required to:

a. determine his position relative to a navigation aid.
b. follow a track specified by the examiner until station or waypoint passage.

Review

The radio navigation procedure is relatively simple:

1. Tune and identify the chosen navigation aid.
2. Determine the position of the aircraft relative to the radio navigation aid.
3. Intercept the track specified by the examiner.
4. Maintain the required track to the navigation aid or waypoint.
5. Identify station or waypoint passage.

Section 18. Circuit

Flight Test Guide Reference:

Ex. 17 Circuit

Performance Criteria

Assessment will be based on the candidate's ability to:

> fly an accurate circuit maintaining correct position and separation from other aircraft.
> comply with actual or simulated ATC clearances or instructions.
> adhere to published circuit patterns.
> adhere to published circuit entry and departure procedures.
> adhere to other procedures in effect at the time.
> transmit required radio calls.
> correct for wind drift to maintain proper track.
> remain oriented with the runway in use.
> maintain circuit altitude (+/- 100 feet) and an appropriate airspeed (+/- 10 knots).
> complete appropriate checklists.
> apply any applicable noise abatement and wake turbulence avoidance procedures.

What You Should Know and Do

> You will be asked and expected to know circuit procedures for controlled/uncontrolled airports, including departure and joining.
> What cannot be demonstrated (for example, because of location) will be assessed through questioning.
> Compliance with ATC clearances and instructions while maintaining traffic separation will be compulsory.

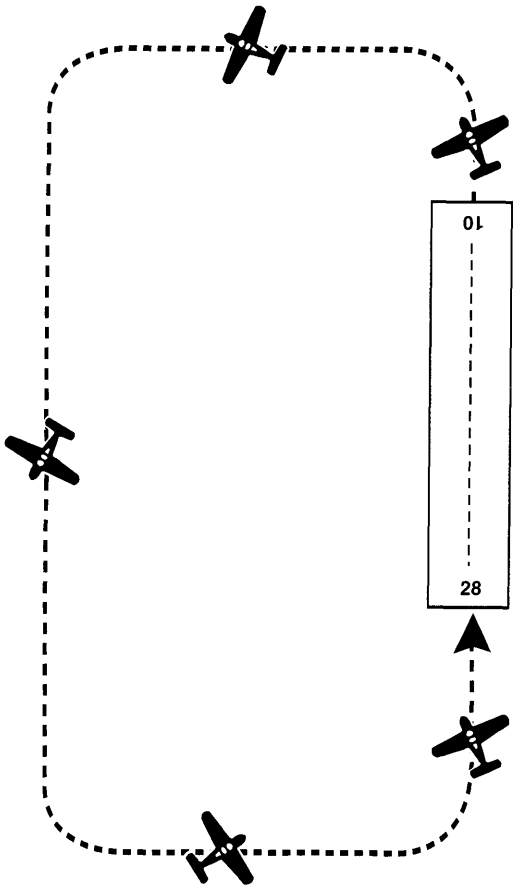
Common Mistakes

> Failing to compensate for wind during the circuit legs.
> Improper lookout.
> Missed instructions from ATC.

Review

Make sure your circuits are rectangular to the runway. Compensate for the wind.

> Control your altitude. Respect circuit height.
> Make sure you are at the proper circuit altitude prior to joining the circuit.
> When departing an uncontrolled airport, do not turn until you are at circuit altitude.



Be sure to compensate for drift, and fly the circuit in a rectangular pattern relative to the ground.

Section 19. Landing

Flight Test Guide Reference:

Ex. 18 Approach and Landing

Performance Criteria

Assessment of approaches and landings will be based on the candidate's ability to select the proper approach profile for the actual conditions, or for those specified by the examiner.

Consideration will be given to:

Normal Approach and Landing

> performance of an effective passenger brief.
> consideration of wind conditions, landing surface and obstructions.
> selection of a specific touchdown point.
> establishment of the recommended approach and landing configuration.
> maintenance of a stabilized approach at the recommended airspeed or in its absence, 1.3 Vso (+/- 10 knots).
> maintenance of crosswind correction and directional control.
> smooth, timely and correct control applications.
> smoothness of touchdown at minimum speed at the specified touchdown point (+400/-100 feet).
> touchdown with no drift and with aeroplane's longitudinal axis aligned with and within 15 feet of the centre of the landing surface.
> touchdown in accordance with the POH.
> application of braking action as necessary.
> completion of appropriate checklists.

Short Field Approach and Landing

> performance of an effective passenger brief.
> consideration of wind conditions, landing surface and obstructions.
> selection of a specific touchdown point.
> execution of initial approach using recommended airspeeds and configurations.
> a final approach profile that clears any actual or simulated obstacle and results in the appropriate configuration at a height of 50 feet with one of the following:

For Private Licence

a. the recommended final approach speed (+10/-5 knots).
b. 1.3 Vso (+10/-5 knots).
c. the minimum safe speed for existing conditions (crosswind or gusts).

For Commercial Licence

a. the recommended final approach speed, corrected for the actual landing weight in accordance with POH charts or tables (+10/-5 knots), or in the absence of charts or tables,
b. 1.3 Vso corrected for the landing weight (see Part II, Section 2. Aeroplane Performance), or,
c. the minimum safe speed for existing conditions, e.g. gusty or crosswind conditions.

> maintenance of crosswind correction and directional control.
> smooth, timely and correct control applications during landing flare and touchdown.
> touchdown at the specified touchdown point (+200/-50 feet for Private, +100/-50 feet for

Commercial) in accordance with the POH.
> touchdown with no drift and with aeroplane's longitudinal axis aligned with and within 15 feet of the centre of the landing surface.
> application of braking action as necessary.
> completion of appropriate checklists.

Soft Field Approach and Landing

> performance of an effective passenger brief.
> consideration of wind conditions, landing surface and obstructions.
> selection of a specific touchdown point.
> execution of initial approach using recommended airspeeds and configurations.
> a final approach profile that clears any actual or simulated obstacle and results in the appropriate configuration at a height of 50 feet with one of the following:

For Private
a. the recommended final approach speed (+10/-5 knots).
b. 1.3 Vso (+10/-5 knots).
c. the minimum safe speed for existing conditions (crosswind or gusts).

For Commercial Licence
a. the recommended final approach speed, corrected for the actual landing weight in accordance with POH charts or tables (+10/-5 knots), or in the absence of charts or tables,
b. 1.3 Vso corrected for the landing weight (see Part II, Section 2. Aeroplane Performance), or,
c. the minimum safe speed for existing conditions, e.g. gusty or crosswind conditions.

> maintenance of crosswind correction and directional control.
> softness of touchdown using power as necessary to achieve the landing attitude for the slowest possible touchdown on the main wheels, while preventing the nosewheel or tailcone contacting the ground.
> touchdown in the first third of the runway with no drift and with aeroplane's longitudinal axis aligned with the landing surface.
> maintenance of nose-up control during landing roll.
> completion of appropriate checklists.

Power-off 180° Accuracy Approach and Landing (for Commercial only)

> consideration of wind conditions, landing surface and obstacles.
> specification of an appropriate touchdown point.
> closing of throttle from normal circuit height.
> establishment of gliding approach at the recommended speed (+10/-5 knots).
> completion of cockpit checks.
> extension of flap and lowering of landing gear (if applicable) when landing is assured.
> a normal landing attitude at the specified touchdown point (+400/-50 feet).

Overshoot

Assessment of the overshoot will be based on the candidate's ability to promptly follow the procedures specified in the Pilot's Operating Handbook. If no procedure is specified, assessment will be based on:

> a timely decision to discontinue the approach to landing.
> prompt and smooth application of maximum power, and pitch attitude to stop descent rate.
> retraction of flaps in stages or as recommended in the POH.
> retraction of landing gear (where applicable) after a positive rate of climb is established, or as recommended in the POH.

> acceleration to, and maintenance of, the recommended climb speed (+10/-5 knots)
> maintenance of maximum allowable power to a safe manoeuvring altitude then, where applicable, set climb power (+/- 0.5" MP, +/- 50 RPM for Commercial).
> completion of appropriate checklists.

What You Should Know and Do

The candidate will be required to demonstrate:

a. a normal landing (most likely with a crosswind).
b. a short field landing or a soft field landing (surface conditions, obstacles, threshold, length of runway, etc., will be specified by the examiner).
c. an overshoot (usually judged during the precautionary landing or forced approach).
d. a power-off 180° accuracy approach and landing from circuit height (for Commercial only).

> One engine clearing is allowed before descending through 500 feet AGL for power-off accuracy approach and landings. In very cold conditions, the use of some power and flaps while maintaining the same airspeed and a normal gliding rate of descent is acceptable.
> Consult the Pilot's Operating Handbook and / or placards for procedures and limitations.

Common Mistakes

Normal crosswind landing

a. Omitting the crosswind input during the ground roll.
b. Improper approach speed.
c. Not maintaining runway centreline.
d. Quality of landing mediocre.

Short field landing

a. Failing to retract flaps on roll out (or as may be suggested in the POH). In aircraft with retractable landing gear, be careful not to accidentally retract the landing gear in the landing roll.
b. Applying brakes without pulling back on control column.
c. Missing predetermined touchdown point.

Soft field landing

a. Quality of landing mediocre.
b. Not keeping nosewheel off the ground.
c. Not applying crosswind correction.

Power-off 180° approach and landing (for Commercial only)

a. Too low, not reaching the runway / landing too short.
b. Too high, forced to overshoot / landing too long.
c. Touching down too far from specified point.
d. Forcing the aircraft onto the runway.
e. Ineffective use of flap and/or slipping.
f. Not closing throttle abeam touchdown point.
g. Not stabilizing at the recommended glide/approach speed.

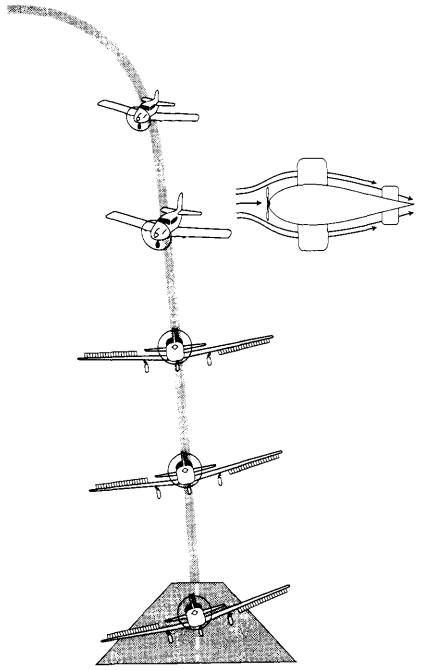
Overshoot

a. Improper control of pitch attitude with power application.
b. Failing to close carb heat control.
c. Failure to retract flaps in stages

Review

Normal crosswind landing

a. Control of airspeed.
b. Drift elimination.
c. Ability to land in predetermined touchdown zone.
d. Quality of landings.
e. Maintaining the centreline.
f. Maintaining crosswind input throughout the ground roll.



"Big" Weather Vane

Short field landing

a. Control of airspeed.
b. Use of flaps.
c. Ability to land in predetermined touchdown zone.
d. Quality of landing.
e. Maintain centreline, crosswind inputs.
f. Proper procedure during the roll out (flaps up, control column aft, brakes).

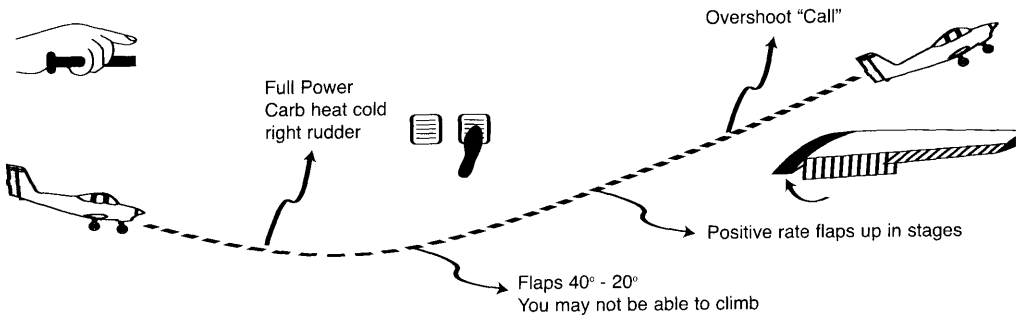
Soft field landing

a. Control of airspeed.
b. Use of flaps.
c. Quality of landing.
d. Landing on the main wheels – power will keep the nosewheel off the ground.
e. Maintaining centreline.
f. Maintaining crosswind input.

Power-off 180° approach and landing (for Commercial only)

a. Judging glide to touchdown point.
b. Visual reference points, front and side.
c. Wind direction considerations.
d. Use of flaps.

Overshoot



Important considerations:

Approach speed: maintaining the approach speed is critical since you are very close to the stall speed:

a. if you are 5 kts slow, you may fail.
b. if you are 5 kts fast, you will not fail.

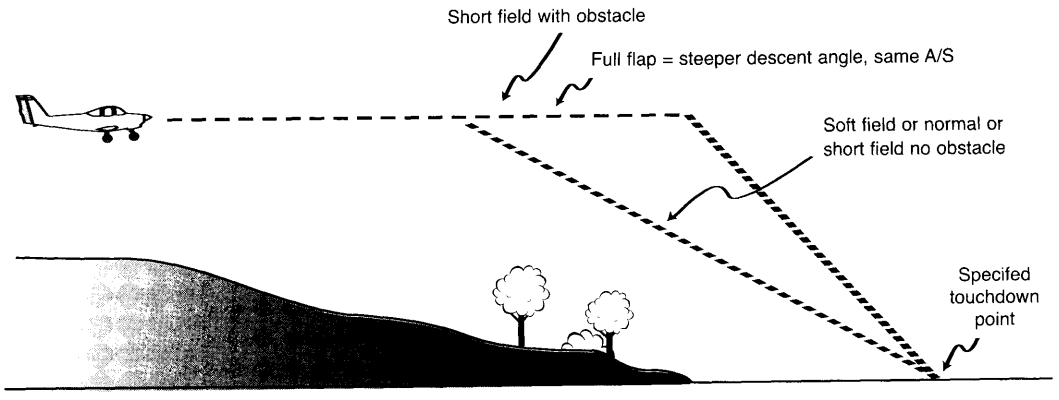
Crosswind: reduce the amount of flaps as they tend to amplify the effect of the crosswind.

Gusty conditions: increase the approach speed by half the gust factor.

Example:

Normal approach speed:	60 kts
Winds:	15 kts gusting to 25 (25 - 15 = 10 kt gust factor)
Adjusted approach speed:	65 kts (60 + ½ of 10, ie. 5 = 65 kts)

Recap



Section 20. Emergency Procedures/Malfunctions

Flight Test Guide Reference:

Ex. 29 Emergency Procedures/Malfunctions

Performance Criteria

The candidate must correctly apply procedures as specified in the Pilot's Operating Handbook and demonstrate adequate knowledge of the emergency procedures of the systems, subsystems and devices installed on the aeroplane.

Assessment will be based on the candidate's action taken to respond to:

> partial power loss.
> rough engine or overheat.
> loss of oil pressure.
> fuel starvation.
> electrical fire.
> vacuum system failure.
> pitot or static blockage
> cabin fire.
> icing.
> electrical malfunction.
> landing gear malfunction.
> brake failure or seizure.
> flap failure.
> door opening in flight.
> spin recovery.
> emergency descent.

What You Should Know and Do

Assessment of emergency procedures may be carried out in the air, on the ground before engine start or upon return to the apron. Full compliance with the procedures outlined in the POH is essential.

Common Mistakes

> Not knowing the procedures for memory.
> Just memorizing the procedures and not being able to apply them to hypothetical situations.

Review

> Many of the emergency procedures have already been outlined under Aeroplane Performance in Part II - Ground Briefing. Please review carefully the pertinent questions and answers.
> You will be expected to react to simulated conditions in accordance with the POH.
> Among the most commonly assessed procedures:

a. engine fire in flight or during start up.
b. electrical fire.
c. cabin fire.
d. wing fire.
e. electrical system malfunction (overvoltage, low voltage, alternator, generator, etc.).
f. vacuum system failure.
g. hydraulic circuit failure.
h. propeller overspeed.

i. collision avoidance.
j. steep descending turn.
k. landing with a damaged landing gear or blown tire.

> Emergency procedures should be ingrained in your brain, but if you forget a complete procedure, use your checklist.

Note: Practising repeatedly on the ground in the airplane and acquiring a thorough understanding of the aircraft systems is time extremely well spent.

Section 21. Radio Communication

Flight Test Guide Reference:

Ex. 30 Radio Communication

Performance Criteria

Assessment will be based on the candidate's ability to:

> select appropriate frequencies for facilities to be used.
> use correct radio procedures and phraseology.
> correctly interpret and respond to clearances, instructions and information provided by Air Traffic Services.
> demonstrate a practical knowledge of ATC light signals.
> use correct procedure for simulated radio communications failure.
> demonstrate or explain the correct procedure for obtaining DF steers, radar assistance and/or a Special VFR clearance.
> demonstrate how to obtain information such as weather and NOTAM from a radio facility.
> give a clear and accurate VFR position report.
> use correct emergency communication procedures.

What You Should Know and Do

> Demonstrate the correct procedures for the use of radio communication equipment.
> Know how to obtain and respond to ATC clearances and instructions (including Special VFR, DF steers, radar assistance).
> Know who to contact and how to get information (including weather, NOTAM).

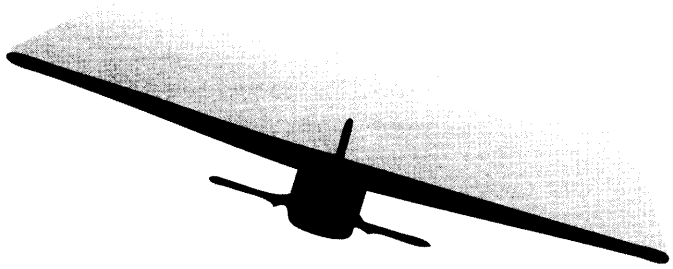
Common Mistakes

> Speaking too quickly, thus mispronouncing.
> Proceeding while unsure of ATC instruction.
> Not asking "say again" when necessary.

Review

> Speak slowly and clearly.
> Use proper terminology.
> If unsure, request "say again instructions please".
> On initial call, use full call sign of the aircraft.
> Know who to contact on the radio and how to obtain weather and NOTAMs.
> Know how to obtain a DF steer and the requirements for Special VFR.
> Repeat back all "hold short" clearances.

Part 4 > Annex



Part 4 > Annex

Introduction

Part IV - Annex contains the material referenced in Parts I, II and III; namely:

Flight Test Forms:

> Flight Test Report - Private / Commercial (form)
> Recommendation for Flight Test (suggested letter format)

Aircraft Documents:

> Certificate of Registration of Aircraft (sample only)
> Certificate of Airworthiness (sample only)
> Annual Airworthiness Information Report (sample only)
> Weight and Balance Report (sample only)

Performance Data:

> Takeoff Distance
> Landing Distance
> Cruise Performance

Flight Plan:

> Canadian Flight Plan / Itinerary - ICAO Flight Plan (form)
> How to complete a Flight Plan

Classification of Canadian Airspace

Part IV Annex also includes useful rules of thumb, graphs and regulations (CARS):

Crosswind Component

Rules of Thumb

Regulations:

> Recency Requirements (for complete details, refer to CARs 401.01 and 421.05)
> Personal Logs (for complete details, refer to CAR 401.08)

Aircraft Documents

Certificate of Registration of Aircraft

Transport Canada
Safety and Security
Civil Aviation

Transports Canada
Sécurité et sûreté
Aviation civile

CERTIFICATE OF REGISTRATION OF AIRCRAFT
CERTIFICAT D'IMMATRICULATION DE L'AÉRONEF

Nationality and Registration Marks Marques de nationalité et d'immatriculation	Aircraft or Kit Manufacturer Constructeur de l'aéronef ou du kit de l'aéronef	Manufacturer's Designation of Aircraft Désignation du constructeur de l'aéronef
C - GCIJ	DIAMOND AIRCRAFT INDUSTRIES INC.	DA 20-C1
Purpose - Objet PRIVATE/PRIVÉ		Aircraft Serial Number - Numéro de série de l'aéronef C0002

Name(s) of Owner(s) - Nom(s) du(des) propriétaire(s)

DIAMOND AIRCRAFT INDUSTRIES INC.

Address- Adresse

1560 CRUMLIN SIDEROAD
LONDON ON N5V 1S2

Whereas it has been duly declared that the above-mentioned aircraft is not registered in any other State, it is hereby certified that it has been duly entered on the Register of Canada in accordance with the Convention on International Civil Aviation dated the 7th of December, 1944, and the *Canadian Aviation Regulations*.

Attendu que l'aéronef mentionné ci-dessus n'a pas été immatriculé dans un autre État, je certifie par la présente qu'il a été inscrit au registre du Canada, conformément à la Convention relative à l'Aviation civile internationale signée le 7 décembre 1944 et du *Règlement de l'aviation canadien*.

17 JAN/JANV 2000 Owner Registration Date Date d'immatriculation du propriétaire	17 JAN/JANV 2000 Certificate Issue Date Date de délivrance du Certificat	For the Minister of Transport / Pour le ministre des Transports

26-0478 (97-12) FF 1.1

This Certificate is not a Certificate of Title - Ce certificat n'est pas un certificat de titre

Certificate of Airworthiness

Transport Canada
Transports Canada

CERTIFICATE OF AIRWORTHINESS **CERTIFICAT DE NAVIGABILITÉ**

1. Nationality and Registration Marks Marques de nationalité et d'immatriculation	2. Aircraft Manufacturer and Model - Constructeur et modèle de l'aéronef	3. Aircraft Serial Number Numéro de série de l'aéronef	4. Category – Catégorie
C-GCIJ	DIAMOND AIRCRAFT INDUSTRIES DA 20-C1	C0002	UTILITY

5. Authority and basis for issuance

This Certificate of Airworthiness is issued pursuant to the **Aeronautics Act** and certifies that, as of the date of issuance, the aircraft to which it was issued has been inspected and found to conform to the type certificate therefor, to be in a condition for safe operation, and has been shown to meet the requirements of the comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation.

5. Autorisation et conditions de délivrance

Le présent certificat de navigabilité est délivré en vertu de la **Loi sur l'aéronautique** et certifie qu'à la date de délivrance dudit certificat, l'aéronef visé par ce certificat, a été inspecté, est conforme à son certificat de type, est apte à voler en toute sécurité et a démontré qu'il satisfait aux exigences du code de navigabilité complet et détaillé tel que décrit à l'Annexe 8 de la Convention relative à l'aviation civile internationale.

6. Terms and Conditions

Unless suspended or cancelled in accordance with the **Aeronautics Act**, this certificate shall remain in force so long as the aircraft identified above is maintained and certified in accordance with the applicable requirements of the Canadian Aviation Regulations.

6. Conditions et modalités

Conformément à la **Loi sur l'aéronautique**, à moins qu'il n'y ait suspension ou annulation, le présent certificat reste en vigueur tant que l'aéronef ci-haut mentionné est entretenu et certifié conformément aux exigences pertinentes du Règlement de l'aviation canadien.

7. In respect of Part II of Annex 16 (aircraft noise) to the Convention on International Civil Aviation and the **Aeronautics Act**, this aircraft:

☒ complies with the requirements / satisfait aux exigences
☐ does not comply with the requirements / ne satisfait pas aux exigences
☐ is not required to comply / n'est pas obligé de satisfaire aux exigences

7. En vertu de la Partie II de l'Annexe 16 (bruit des aéronefs) de la Convention relative à l'Aviation civile internationale et de la **Loi sur l'aéronautique**, l'aéronef mentionné:

MAY/mai 13, 1998
Date of Issue – Date de délivrance

For the Minister of Transport – Pour le ministre des Transports

Seal
Sceau

24-0073 (96-06)

Canada

Annual Airworthiness Information Report

Transport Canada / Transports Canada
Civil Aviation / Aviation civile

Annual Airworthiness Information Report / **Rapport annuel d'information sur la navigabilité aérienne**

DIAMOND AIRCRAFT INDUSTRIES IN C-GFHJ
1560 CRUMLIN SIDEROAD
LONDON ON
N5V 1S2

DATE OF ISSUE (DA/MO/YR) / DATE DE DÉLIVRANCE (JO/MO/AN): 12/07/2000
DUE DATE (DA/MO/YR) / DATE D'ÉCHÉANCE (JO/MO/AN): 20/08/2000

REGISTRATION MARK - IMMATRICULATION: C-GFHJ
TYPE CERTIFICATE - CERTIFICAT DE TYPE: A101
FLIGHT AUTHORITY - AUTORITÉ DE VOL: C OF A
PURPOSE - UTILISATION: PRIVATE
AIRCRAFT BASE - BASE D'EXPLOITATION: LONDON
TC REGION - RÉGION DE TC: ONTARIO

COMPLETE FORM AND SUBMIT NOT LATER THAN THE DUE DATE / ***REMPLIR ET PRÉSENTER LE FORMULAIRE AU PLUS TARD À LA DATE D'ÉCHÉANCE***

SEE REVERSE SIDE FOR INSTRUCTIONS / ***VOIR AU VERSO POUR LES INSTRUCTIONS***

REPORTING PERIOD FOR HOURS FLOWN *LAST CALENDAR YEAR* / PÉRIODE DU RAPPORT DES HEURES DE VOL, *DERNIÈRE ANNÉE CIVILE*: JAN. 1 TO DEC. 31, 1999

DATE OF THE *MOST RECENT* ANNUAL OR 100-HOUR INSPECTION / DATE DE *LA PLUS RÉCENTE* INSPECTION ANNUELLE OU DE 100 HRES: New 20 Aug 99

NAME AND NUMBER OF AME OR AMO WHO / WHICH CONDUCTED AND CERTIFIED THE ABOVE INSPECTION / NOM ET NUMÉRO DU TEA OU DE L'OMA QUI A EFFECTUÉ ET CERTIFIÉ L'INSPECTION MENTIONNÉE CI-DESSUS
NAME - NOM / No. - N°

HAS THE AIRCRAFT BEEN DAMAGED SINCE LAST REPORT? / L'AÉRONEF A-T-IL ÉTÉ ENDOMMAGÉ DEPUIS LE DERNIER RAPPORT? — ☐ YES / OUI ☑ NO / NON — DATE OF DAMAGE / DATE DES DOMMAGES

DATE OF REPAIR CERTIFICATION / DATE DE LA CERTIFICATION DES RÉPARATIONS

TOTAL HOURS FLOWN SINCE NEW / HEURES DE VOL DEPUIS LA MISE EN SERVICE: 716 HRS / HRES
HOURS FLOWN *LAST CALENDAR YEAR* / HEURES DE VOL, *DERNIÈRE ANNÉE CIVILE*: 7.6. HRS / HRES

OPTIONAL FOR AIR OPERATORS & FLIGHT TRAINING UNITS / ***FACULTATIF POUR EXPLOITANTS AÉRIENS ET UNITÉS DE FORMATION AU PILOTAGE***
SPECIALTY HOURS - HEURES D'OPÉRATIONS SPÉCIALISÉES
TRAINING - FORMATION: HRS / HRES
OTHER AERIAL WORK - AUTRES ACTIVITÉS DE TRAVAIL AÉRIEN: HRS / HRES

OPTIONAL - FACULTATIF
EMERGENCY AD FAX NUMBER / N° DE TÉLÉCOPIEUR POUR CN D'URGENCE *(SEE INSTRUCTIONS - VOIR INSTRUCTIONS)*
(INCL AREA CODE - INCL INDICATIF RÉGIONAL)

LATEST EMPTY WEIGHT / MASSE À VIDE LA PLUS RÉCENTE: 1162 LB
MAX. APPROVED TAKE-OFF WEIGHT / MASSE MAX. APPROUVÉE AU DÉCOLLAGE: 1653 LB
WITH LANDING GEAR CONFIGURATION / AVEC QUEL TRAIN D'ATTERRISSAGE
☑ WHEELS / ROUES ☐ FLOATS / FLOTTEURS ☐ SKIS

AIRCRAFT MAKE - CONSTRUCTEUR DE L'AÉRONEF	AIRCRAFT MODEL - MODÈLE DE L'AÉRONEF	AIRCRAFT SERIAL No. - N° DE SÉRIE DE L'AÉRONEF
DIAMOND	DA 20 C1	20077

ENGINE MAKE - CONSTRUCTEUR DU MOTEUR		PROPELLER MAKE - CONSTRUCTEUR D'HÉLICE
TELEDYNE CONTINENTAL		SENSENICH

	ENGINE MODEL - MODÈLE DU MOTEUR	ENGINE SERIAL No. - N° DE SÉRIE MOTEUR	PROPELLER MODEL - MODÈLE D'HÉLICE	PROP. SERIAL No. - N° DE SÉRIE D'HÉLICE
1.	IO-240-B	306142	76EM8	87993
2.				
3.				
4.				

SKI MANUFACTURER - CONSTRUCTEUR DES SKIS	SKI MODEL - MODÈLE DES SKIS
FLOAT MANUFACTURER - CONSTRUCTEUR DES FLOTTEURS	FLOAT MODEL - MODÈLE DES FLOTTEURS

AIRCRAFT OUT OF SERVICE - AÉRONEF HORS SERVICE
(SEE INSTRUCTIONS & COMPLETE ONLY IF APPLICABLE)
(VOIR LES INSTRUCTIONS ET REMPLIR SEULEMENT S'IL EST APPLICABLE)

☐ The aircraft will be out of service for *all of the current calendar year*
L'aéronef sera hors service pendant *toute l'année civile courante*

Estimated date of return to service / Date estimée de retour en service: (MO) (YR - AN)

Reason aircraft is out of service *(optional)* - Raison l'aéronef est hors service *(facultatif)*

TRANSPORT CANADA C-GFHJ
ONTARIO REGIONAL OFFICE
4900 YONGE ST, SUITE 300
WILLOWDALE ON
M2N 6A5

ENSURE THAT THIS ADDRESS APPEARS IN ENVELOPE WINDOW PRIOR TO MAILING
VÉRIFIER QUE L'ADRESSE EST VISIBLE DANS LA FENÊTRE DE L'ENVELOPPE AVANT DE POSTER

I CERTIFY THAT THE INFORMATION SUPPLIED IS CORRECT
JE CERTIFIE QUE LES RENSEIGNEMENTS DONNÉS SONT EXACTS

SIGNATURE OF OWNER OR AUTHORIZED AGENT / SIGNATURE DU PROPRIÉTAIRE OU DE L'AGENT AUTORISÉ — DATE: 25 July 00

24-0059 (98-11) DOT / DLC - 100 - 02546

3

Canada

Weight and Balance Report

Model: DA20-C1 Katana

Diamond

Aircraft Specific Weighing Report

Aircraft Serial No.:	C0127
Registration:	N827DC
Issue date:	2 November 2000

Data with reference to the Type Certificate Data Sheet and the Flight Manual.

Reference Datum: Leading edge of wing at root rib.
Horizontal reference line: Wedge 1000:55.84, 2000mm (78.7 in) aft of the step in the fuselage at the canopy edge.

Equipment list - dated: 2 November 2000 Cause for Weighing: ORIGINAL

Weight and Balance Calculations

Weight Condition:

Include brake fluid, engine oil and Unusable fuel (Type 1 system, 14.5 liters unusable, 10.2 kg (22.5 lbs))
(Type 2 system, 2 liters unusable, 1.44 kg (3.18 lbs))

Finding Empty Weight:

Finding Arm: (Measured)

Support	Gross lbs	Tare lbs	Net Weight lbs	Lever Arm m (in)
Front G			246	X = 41.75
Rear G_{LH}			456	X_{LH} = 23.00
Rear G_{RH}			469	X_{RH} = 23.00
		EMPTY WEIGHT (G)	1170	

Finding Empty - Weight Center of Gravity (X_{CG}):

Empty Weight CG Formula

$$X_{CG} = \frac{G_{LH}(X + X_{LH}) + G_{RH}(X + X_{RH})}{G + GLH + GRH} - X = 9.44$$

Finding Empty - Weight Moment

Empty-weight Moment (M) = Empty Weight (G) x Empty-weight CG (X_{CG}) = 11,045.99

(Positive results indicate, that CG is located aft of RD)

Finding Maximum Permitted Useful Load:

Maximum Weight kg (lbs)	1720 lbs
Empty Weight kg (lbs)	1170 lbs
Maximum useful Load kg (lbs)	550 lbs

Empty Weight (G): lbs	**Empty-weight Moment (M): in·lbs**
1170 lbs	**11,045.99**

Place / Date:	*Authorizing Stamp*	*Authorizing Signature*
D.A.I.C. 2 November 2000 *IDENT: CYXU*	DA Q 9	DA202-C1-ASWR-01

FILE COPY

Performance Data

Takeoff Distance

Takeoff Distance
(Short Field)

Condition:

Flaps 10°
Full throttle Prior to Brake Release
Paved, Level, Dry, Runway
Zero Wind

Notes:

1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 3,000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. Decrease distances 10% for each 9 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
4. For operation on a dry, grass runway, increase distances by 15% of the "Ground Roll" figure.

Weight (LBS)	Takeoff Speed (KIAS)		Press. Alt. (ft)	0°C		10°C		20°C		30°C		40°C	
	Lift off	At 50 ft		Ground Roll	Total to Clear 50 ft obs.	Ground Roll	Total to Clear 50 ft obs.	Ground Roll	Total to Clear 50 ft obs.	Ground Roll	Total to Clear 50 ft obs.	Ground Roll	Total to Clear 50 ft obs.
1670	50	54	S.L.	640	1190	695	1290	755	1390	810	1495	875	1605
			1000	705	1310	765	1420	825	1530	890	1645	960	1770
			2000	775	1445	840	1565	910	1690	980	1820	1055	1960
			3000	855	1600	925	1730	1000	1870	1080	2020	1165	2185
			4000	940	1775	1020	1920	1100	2080	1190	2250	1285	2440
			5000	1040	1970	1125	2140	1215	2320	1315	2525	1420	2750
			6000	1145	2200	1245	2395	1345	2610	1455	2855	1570	3125
			7000	1270	2470	1375	2705	1490	2960	1615	3255	1745	3590
			8000	1405	2800	1525	3080	1655	3395	1795	2765	1940	4195

Landing Distance

Landing Distance
(Short Field)

Condition:

Flaps 30°
Power Off
Maximum Braking
Paved, Level, Dry, Runway
Zero Wind

Notes:

1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on a dry, grass runway, increase distances by 45% of the "Ground Roll" figure.

Weight (LBS)	Speed at 50 ft (KIAS)	Press. Alt. (ft)	0°C		10°C		20°C		30°C		40°C	
			Ground Roll	Total to Clear 50 ft obs.	Ground Roll	Total to Clear 50 ft obs.	Ground Roll	Total to Clear 50 ft obs.	Ground Roll	Total to Clear 50 ft obs.	Ground Roll	Total to Clear 50 ft obs.
1670	54	S.L.	450	1160	465	1185	485	1215	500	1240	515	1265
		1000	465	1185	485	1215	500	1240	520	1270	535	1295
		2000	485	1215	500	1240	520	1270	535	1300	555	1330
		3000	500	1240	520	1275	540	1305	560	1335	575	1360
		4000	520	1275	540	1305	560	1335	580	1370	600	1400
		5000	540	1305	560	1335	580	1370	600	1400	620	1435
		6000	560	1340	580	1370	605	1410	625	1440	645	1475
		7000	585	1375	605	1410	625	1440	650	1480	670	1515
		8000	605	1410	630	1450	650	1480	675	1520	695	1555

Cruise Performance

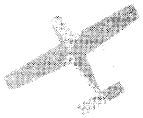
Condition:

1670 Pounds

Recommended Lean Mixture

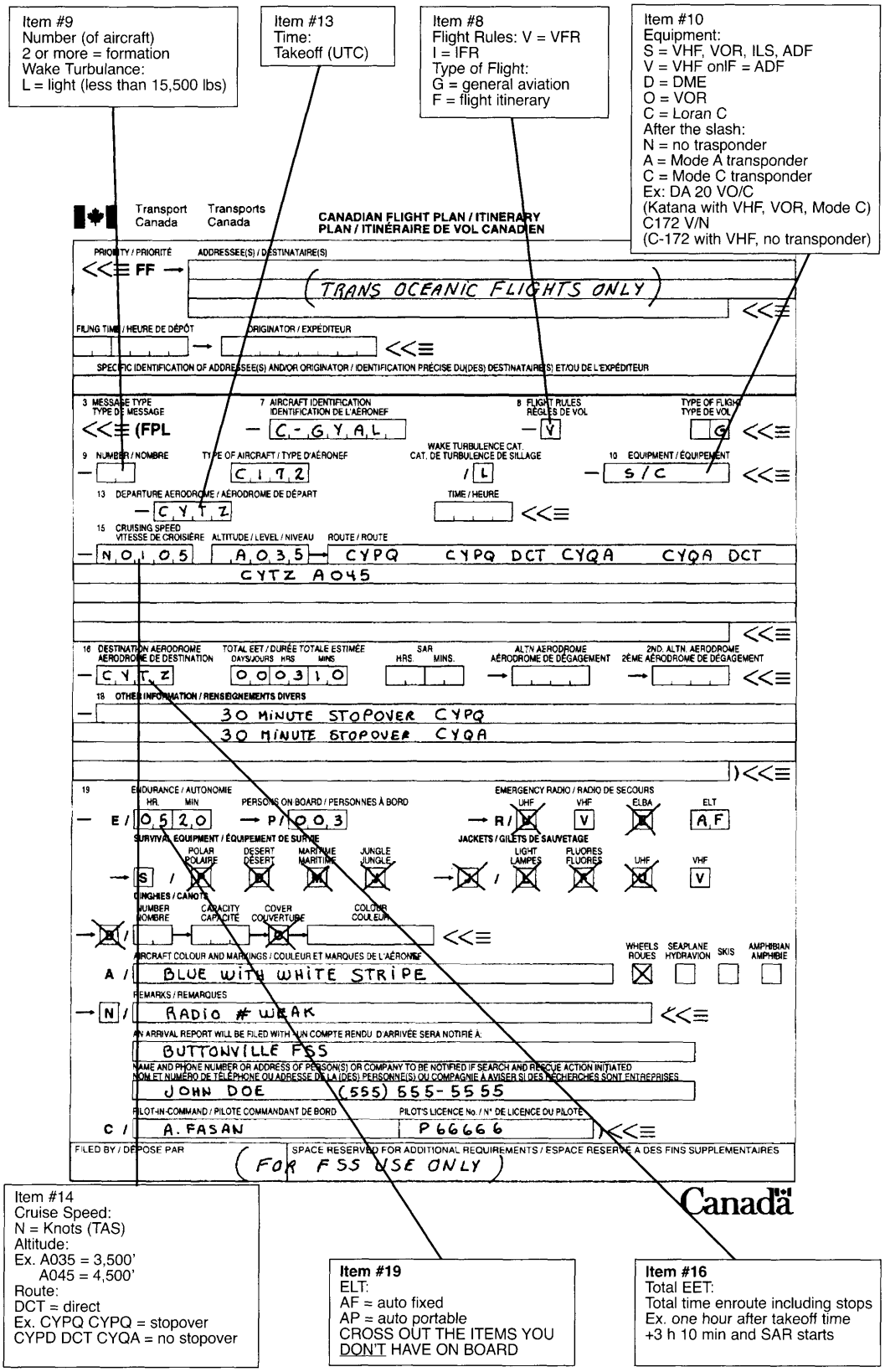
Note:

Cruise speeds are shown for an airplane equipped with speed fairings which increase the speeds by approximately 2 knots.

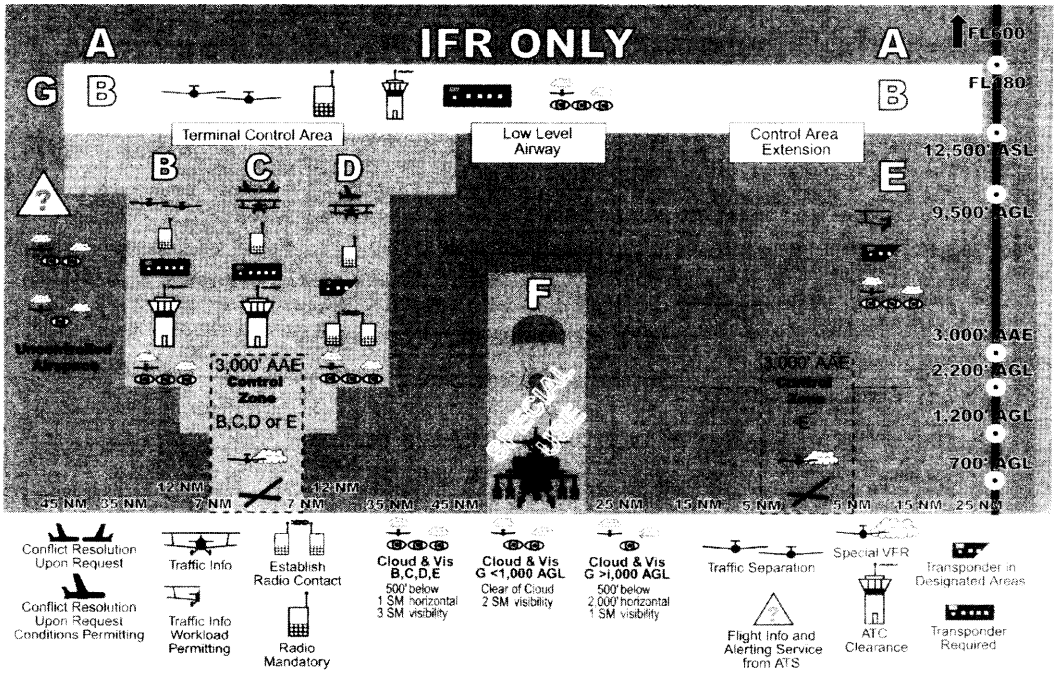


Pressure Altitude (ft)	RPM	20°C Below Standard Temperature			Standard Temperature			20°C Above Standard Temperature		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2000	2400	—	—	—	75	101	6.1	70	101	5.7
	2300	71	97	5.7	66	96	5.4	63	95	5.1
	2200	62	92	5.1	59	91	4.8	56	90	4.6
	2100	55	87	4.5	53	86	4.3	51	85	4.2
	2000	49	81	4.1	47	80	3.9	46	79	3.8
4000	2450	—	—	—	75	103	6.1	70	102	5.7
	2400	76	102	6.1	71	101	5.7	67	100	5.4
	2300	67	96	5.4	63	95	5.1	60	95	4.9
	2200	60	91	4.8	56	90	4.6	54	89	4.4
	2100	53	86	4.4	51	85	4.2	49	84	4.0
	2000	48	81	3.9	46	80	3.8	45	78	3.7
6000	2500	—	—	—	75	105	6.1	71	104	5.7
	2400	72	101	5.8	67	100	5.4	64	99	5.2
	2300	64	96	5.2	60	95	4.9	57	94	4.7
	2200	57	90	4.6	54	89	4.4	52	88	4.3
	2100	51	85	4.2	49	84	4.0	48	83	3.9
	2000	46	80	3.8	45	79	3.7	44	77	3.6
8000	2550	—	—	—	75	107	6.1	71	106	5.7
	2500	76	105	6.2	71	104	5.8	67	103	5.4
	2400	68	100	5.5	64	99	5.2	61	98	4.9
	2300	61	95	5.0	58	94	4.7	55	93	4.5
	2200	55	90	4.5	52	89	4.3	51	87	4.2
	2100	49	84	4.1	48	83	3.9	46	82	3.8
10,000	2500	72	105	5.8	68	103	5.5	64	103	5.2
	2400	65	99	5.3	61	98	5.0	58	97	4.8
	2300	58	94	4.7	56	93	4.5	53	92	4.4
	2200	53	89	4.3	51	88	4.2	49	86	4.0
	2100	48	83	4.0	46	82	3.9	45	81	3.8
12,000	2450	65	101	5.3	62	100	5.0	59	99	4.8
	2400	62	99	5.0	59	97	4.8	56	96	4.6
	2300	56	93	4.6	54	92	4.4	52	91	4.3
	2200	51	88	4.2	49	87	4.1	48	85	4.0
	2100	47	82	3.9	45	81	3.8	44	79	3.7

Flight Plan


Item #9
Number (of aircraft)
2 or more = formation
Wake Turbulance:
L = light (less than 15,500 lbs)
Item #13
Time:
Takeoff (UTC)
Item #8
Flight Rules: V = VFR
I = IFR
Type of Flight:
G = general aviation
F = flight itinerary
Item #10
Equipment:
S = VHF, VOR, ILS, ADF
V = VHF onlF = ADF
D = DME
O = VOR
C = Loran C
After the slash:
N = no trasponder
A = Mode A transponder
C = Mode C transponder
Ex: DA 20 VO/C
(Katana with VHF, VOR, Mode C)
C172 V/N
(C-172 with VHF, no transponder)
Transport Canada
Transports Canada
CANADIAN FLIGHT PLAN / ITINERARY
PLAN / ITINÉRAIRE DE VOL CANADIEN
PRIORITY / PRIORITÉ
ADDRESSEE(S) / DESTINATAIRE(S)
FF
(TRANS OCEANIC FLIGHTS ONLY)
FILING TIME / HEURE DE DÉPÔT
ORIGINATOR / EXPÉDITEUR
SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND/OR ORIGINATOR / IDENTIFICATION PRÉCISE DU(DES) DESTINATAIRE(S) ET/OU DE L'EXPÉDITEUR
3 MESSAGE TYPE / TYPE DE MESSAGE
(FPL
7 AIRCRAFT IDENTIFICATION / IDENTIFICATION DE L'AÉRONEF
C-GYAL
8 FLIGHT RULES / RÈGLES DE VOL
V
TYPE OF FLIGHT / TYPE DE VOL
G
9 NUMBER / NOMBRE
TYPE OF AIRCRAFT / TYPE D'AÉRONEF
C172
WAKE TURBULENCE CAT. / CAT. DE TURBULENCE DE SILLAGE
L
10 EQUIPMENT / ÉQUIPEMENT
S/C
13 DEPARTURE AERODROME / AÉRODROME DE DÉPART
CYTZ
TIME / HEURE
15 CRUISING SPEED / VITESSE DE CROISIÈRE
ALTITUDE / LEVEL / NIVEAU
ROUTE / ROUTE
N0105
A035
CYPQ CYPQ DCT CYQA CYQA DCT
CYTZ A045
16 DESTINATION AERODROME / AÉRODROME DE DESTINATION
TOTAL EET / DURÉE TOTALE ESTIMÉE
DAYS/JOURS HRS MINS
SAR
HRS MINS
ALTN AERODROME / AÉRODROME DE DÉGAGEMENT
2ND. ALTN. AERODROME / 2ÈME AÉRODROME DE DÉGAGEMENT
CYTZ
0 0 0 3 1 0
18 OTHER INFORMATION / RENSEIGNEMENTS DIVERS
30 MINUTE STOPOVER CYPQ
30 MINUTE STOPOVER CYQA
19
ENDURANCE / AUTONOMIE
HR. MIN
E / 0 5 2 0
PERSONS ON BOARD / PERSONNES À BORD
P / 0 0 3
EMERGENCY RADIO / RADIO DE SECOURS
UHF
VHF
ELBA
ELT
R /
V
A F
SURVIVAL EQUIPMENT / ÉQUIPEMENT DE SURVIE
POLAR POLAIRE
DESERT DÉSERT
MARITIME MARITIME
JUNGLE JUNGLE
JACKETS / GILETS DE SAUVETAGE
LIGHT LAMPES
FLUORES FLUORES
UHF
VHF
S /
V
DINGHIES / CANOTS
NUMBER NOMBRE
CAPACITY CAPACITÉ
COVER COUVERTURE
COLOUR COULEUR
WHEELS ROUES
SEAPLANE HYDRAVION
SKIS
AMPHIBIAN AMPHIBIE
AIRCRAFT COLOUR AND MARKINGS / COULEUR ET MARQUES DE L'AÉRONEF
A / BLUE WITH WHITE STRIPE
REMARKS / REMARQUES
N / RADIO # WEAK
AN ARRIVAL REPORT WILL BE FILED WITH / UN COMPTE RENDU D'ARRIVÉE SERA NOTIFIÉ À:
BUTTONVILLE FSS
NAME AND PHONE NUMBER OR ADDRESS OF PERSON(S) OR COMPANY TO BE NOTIFIED IF SEARCH AND RESCUE ACTION INITIATED
NOM ET NUMÉRO DE TÉLÉPHONE OU ADRESSE DE LA (DES) PERSONNE(S) OU COMPAGNIE À AVISER SI DES RECHERCHES SONT ENTREPRISES
JOHN DOE (555) 555-5555
PILOT-IN-COMMAND / PILOTE COMMANDANT DE BORD
PILOT'S LICENCE No. / N° DE LICENCE DU PILOTE
C / A. FASAN
P 6666 6
FILED BY / DÉPOSÉ PAR
SPACE RESERVED FOR ADDITIONAL REQUIREMENTS / ESPACE RESERVÉ À DES FINS SUPPLÉMENTAIRES
(FOR FSS USE ONLY)
Canada
Item #14
Cruise Speed:
N = Knots (TAS)
Altitude:
Ex. A035 = 3,500'
A045 = 4,500'
Route:
DCT = direct
Ex. CYPQ CYPQ = stopover
CYPD DCT CYQA = no stopover
Item #19
ELT:
AF = auto fixed
AP = auto portable
CROSS OUT THE ITEMS YOU
DON'T HAVE ON BOARD
Item #16
Total EET:
Total time enroute including stops
Ex. one hour after takeoff time
+3 h 10 min and SAR starts

Classification of Canadian Airspace

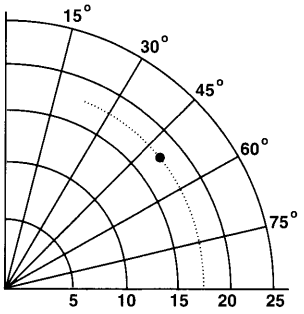


Crosswind Component

Method to calculate the crosswind component:

1. Obtain the winds. (Note: TAF/METAR winds are in degrees true.)
2. Add variation to the winds.
3. Consult the Canada Flight Supplement and choose the runway with the least crosswind.
4. Subtract the winds from the runway heading to get the number of degrees the wind is not aligned with the runway.
5. "Plug" the number of degrees the wind is off in relation to the runway along with the wind speed into the Crosswind Component Chart.

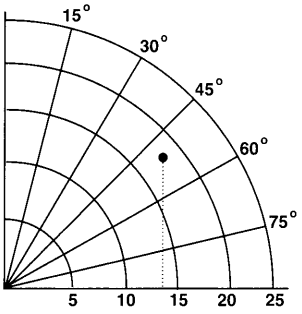
Example:



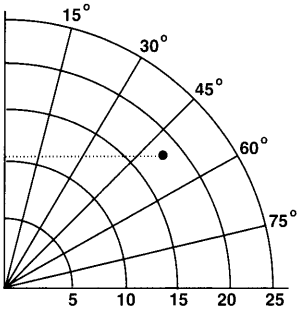
Surface Wnds: 210/18 kts
Variation: 10° W
Runway: 27

1. Draw curved line up (parallel to other curved line) from wind speed index.

2. Place dot on curved wind speed line at the amount of degrees wind is "off" runway.



3. Draw line straight down from wind dot to get x-wind component



4. Draw straight horizontal line to get head-wind component.

Answer: x-wind component: – 14 kts
headwind component: – 12 kts

Rules of Thumb

Maximum crosswind component = 20% x Vso

Minimum approach speed = 1.3 x Vso

Bank angle for standard rate turn = 10% of TAS
+ 7 (if airspeed in knots) OR
+ 5 (if airspeed in mph)

100 NM	10 NM	5 NM	
=	=	=	to estimate time for diversions
60 min.	6 min.	3 min.	

Descending (maintaining airspeed):

100 RPM reduction = 100 feet/min.

or

1" manifold pressure = 100 feet/min.

Rolling out to specific headings = **start to rollout at 1/2 the bank angle**

Example: Steep turn: 45°
Start rollout: 22° before specific heading

Course reversal

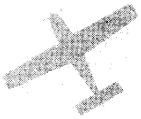
a. subtract 2 and add 2	Ex.: 327°	3 - 2 = 1 / 2 + 2 = 4 / 7	147°
b. add 2 and subtract 2	056°	0 + 2 = 2 / 5 - 2 = 3 / 6	236°

Canadian Aviation Regulations

Recency Requirements

If you have not flown as pilot-in-command in the last 5 years:

1. Medical.
2. PSTAR (pre-solo exam).
3. Flight review by a flight instructor.



If you have flown as pilot-in-command in the last 5 years, recurrent training must be done every 24 months. Following is a list of the activities that qualify as recurrent training:

1. Flight review by a flight instructor.
2. Attending a Transport Canada safety seminar.
3. Obtaining or renewing any licence, permit or rating.
4. Completion of a self-paced study program (by Transport Canada).
5. Completion of the written exam for any licence, permit or rating.
6. Participation in an approved recurring training program to update pilot knowledge.

Notes: 1. Only one of the above is required.
2. Recurrent training must be recorded in your logbook.
3. If carrying passengers:

a. during the day - 5 takeoffs and landings in the last 6 months in the same category (aeroplane, helicopter, etc.) and in the same class (single, multi, seaplane, etc.) of aircraft.

b. at night - the takeoffs and landings must be done at night.

For complete details, please refer to CAR 401.05 and CAR 421.05 Recency Requirements.

Personal Logs

Keeping a personal log is mandatory for all pilots.
For each flight, record the following information:

1. date of flight.
2. aircraft type and registration.
3. crew position (P.I.C., co-pilot).
4. day / night, VFR / IFR.
5. departure / destination.
6. all intermediate takeoffs and landings.
7. flight time.

For complete details, please refer to CAR 401.08 Personal Logs.

Other References

For information concerning the privileges attached to your licence, please refer to:

Private Pilot Licence - Privileges	CAR 401.26
Commercial Pilot Licence - Privileges	CAR 401.30