Study and Reference Guide

Pilot Permit

Gyroplane

First Edition
April 2004
GENERAL

KNOWLEDGE REQUIREMENTS

All subjects in this guide are considered to be important to applicants for the Gyroplane Pilot Permit and may appear on the exam. Subject areas identified by a diamond (♦) are essential knowledge areas that will be emphasized on the written examination. A list of knowledge subjects may be found in the Canadian Aviation Regulation {401.20 (3) / 421.20(3)} Gyroplane Requirements.

EXAMINATIONS

Applicants for the Gyroplane Pilot Permit shall demonstrate their knowledge by writing a Transport Canada multiple choice examination on subjects contained in this guide. Applicants must be able to read the examination questions in either English or French without assistance.

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<td>50</td>
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EXAMINATION FEEDBACK

Feedback statement on the results letter will inform the candidate where questions were answered incorrectly.

Example of Feedback Statement

Identify the atmospheric conditions favorable to thunderstorm formation.
SECTION 1: AIR LAW AND PROCEDURES

CANADIAN AVIATION REGULATIONS (CARs)

PART I – GENERAL PROVISIONS

101 – INTERPRETATION

101.01 Definitions

103 – ADMINISTRATION AND COMPLIANCE

103.02 Inspection of Aircraft, Requests for Production of Documents and Prohibitions
103.03 Return of Canadian Aviation Documents
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PART III – AERODROMES AND AIRPORTS

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300.01 Definitions

301 – AERODROMES

301.01 Application
301.04 Markers and Markings
301.06 Wind Direction Indicator
301.07 Lighting
301.08 Prohibitions
301.09 Fire Prevention

302 – AIRPORTS

302.10 Prohibitions
302.11 Fire Prevention

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400 – GENERAL

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401.02 Application
401.03 Requirements to Hold a Flight Crew Permit, Licence or Rating
401.05 Recency Requirements
401.08 Personal Logs
401.20 Gyroplane - Privileges
404 - MEDICAL REQUIREMENTS

404.03 Requirement to Hold a Medical Certificate (MC)
404.04 Issuance, Renewal and Validity Period of MC
404.06 Prohibitions Regarding Exercise of Privileges
404.18 Permission to Continue to Exercise the Privileges of a Permit, Licence or Rating

Subsection (1)

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600 - INTERPRETATION

600.01 Definitions

601 - AIRSPACE

601.01 Airspace Structure
601.02 Airspace Classification
601.03 Transponder Airspace
601.05 VFR Flight in Class A Airspace
601.06 VFR Flight in Class B Airspace
601.07 VFR Flight in Class C Airspace
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601.15 Flight Restrictions
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602.02 Fitness of Flight Crew Members
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602.06 Smoking
602.07 Aircraft Operating Limitations
602.10 Starting and Ground Running of Aircraft Engines
602.11 Aircraft Icing
602.12 Overflight of Built-up Areas or Open-Air Assemblies of Persons during Take-offs, Approaches and Landings
602.13 Take-offs, Approaches and Landings within Built-up Areas of Cities and Towns
602.14 Minimum Altitudes and Distances
602.15 Permissible Low Altitude Flight
602.19 Right-of-Way – General
602.20 Right-of-Way – Aircraft Manoeuvring on Water
602.21 Avoidance of Collision
602.23 Dropping of Objects
602.24 Formation Flight
602.31 Compliance with Air Traffic Control Instructions and Clearances
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602.35 Altimeter Setting and Operating Procedures in the Altimeter-setting Region
602.36 Altimeter Setting and Operating Procedures in the Standard Pressure Region
602.37 Altimeter Setting and Operating Procedures in Transition Between Regions
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602.59 Equipment Standards
602.60 Requirements for Power-driven Aircraft
602.61 Survival Equipment – Flights over Land
602.62 Life Preservers and Personal Flotation Devices

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602.144 Interception Signals, Interception of Aircraft and Instructions to Land
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605.04 Availability of Aircraft Flight Manual
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4. Radar Service – Clock Position System
5. ATC Clearances, Instructions and Mandatory Readback Procedures
6. Wake Turbulence Separation
7. Airport/Aerodrome Operations - Controlled
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10. VFR En Route Procedures
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12. VFR/IFR Traffic Mix at Uncontrolled Airports and Aerodromes

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   ◆ 2. Reporting an Aviation Occurrence
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1 Types of Construction

LANDING GEAR

1 Types

ENGINES-RECIPROCATING

1 Types
2 Four Stroke Cycle
3 Methods of Cooling
4 Principles of the Magneto
5 Dual Ignition
6 Exhaust System
7 Ancillary Controls
8 Turbo-charging
9 Effect of Density Altitude/Humidity
10 Limitations and Operation
11 Instruments

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1 Theory of Operation
2 Fuel-Air Mixture
3 Mixture Controls
4 Carburettor Icing
5 Use of Carburettor Heat and Its Effect on Mixture

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1 Principle of Operation
2 Icing
3 Alternate Air

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1 Battery/Starter
2 Generator/Alternator
3 Lighting
4 Ammeter, Load Meter and Warning/Caution Systems
5 Bus Bars
6 Circuit Breakers/Fuses
7 Grounding/Bonding

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1 Types/Viscosity/Grades and Seasonal Use
2 Purposes
3 Methods of Lubrication
4 Venting
5 Filters
6 Pressure Relief
7 Oil Cooler

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1 Types/Colour/Properties
2 Additives
3 Contamination and Deterioration
4 Venting and Baffling
5 Fuel Pumps, Lines, Filters and Drains
6 Induction Manifold
7 Detonation/Pre-ignition Causes and Effects
8 Vapour Lock
9 Primers, Choke
10 Fuel Management -Ground and Air
11 Fuel Handling Fuelling Aircraft
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1 Bernoulli’s Theorem
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6 Weight
7 Drag
8 Thrust
9 Pitch Angle/Angle of Incidence
10 Rotor Disc
11 Tip Path Plane
12 Coning
13 Feathering
14 Flapping
15 Blade Drag, Lead and Lag
16 Phase Lag/Advance Lag
17 Coriolis Effect
18 Induced Flow
19 Dissymmetry of Lift

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1 Four Basic Forces
2 Blade Design
3 Pressure Distribution about an Aerofoil
4 Rotor Systems
5 Velocities Affecting Rotor Systems
6 Translational Lift/Flight Transitions
7 Theory of Autorotation and Flare
8 Reverse Flow
9 Retreating Blade Stall
10 Pilot Induced Oscillation (PIO)

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♦ 2 Static
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1 Principles of Operation
2 Errors
3 Lag

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1 Principles of Operation
2 Errors

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1 The Earth's Magnetism
2 Magnetic Dip
3 Variation

DIRECT READING MAGNETIC COMPASS
1 Principles of Operation
2 Factors Adversely Affecting
  Compass Operation
♦ 3 Reading the Compass
  4 Deviation
  5 Compass Correction Card
♦ 6 Turning and Acceleration/
  Deceleration Errors
7 Compass Serviceability Checks
8 Compass Swinging
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  Ground and in Flight

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2 Inertia
3 Precession
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3 The Standard Atmosphere
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2 Pressure Measurements
3 Station Pressure
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2 Horizontal Differences
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3 Sublimation and Condensation
4 Cloud Formation
5 Precipitation
6 Saturated and Dry Adiabatic Lapse Rates

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1 Lapse Rate and Stability
2 Modification of Stability
♦ 3 Characteristics of Stable and Unstable Air
4 Surface Heating and Cooling
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1 Classification
2 Formation and Structure
♦ 3 Types and Recognition
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2 Mechanical
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♦ 4 Wind Shear
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♦ 2 Pressure Gradient
3 Deflection caused by the Earth's Rotation
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1 Requirements for Development Structure and Development
2 Types – Air Mass, Frontal
3 Hazards – Updrafts, Downdrafts, Gust Fronts, Downbursts, Microbursts, Hall and Lightning

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HURRICANES AND TORNADOES

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1 Fog Formation
2 Fog Types (Including Mist)
3 Haze and Smoke
4 Blowing Obstructions to Vision

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2 Aviation Weather Briefing Service (AWBS)
3 Aviation Weather Web Site (AWWS)
4 Flight Service Stations (FSS)
5 Pilot’s Automatic Telephone Weather Answering Service (PATWAS)
6 Flight Information Center (FIC)
7 Automatic Terminal Information Service (ATIS)
8 Voice Generator Module Reports

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2 Aviation Routine Weather Report (METAR)
3 SPECI
4 Automated Weather Observation Station (AWOS)
5 Pilot Reports (PIREPS and AIREP)

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1 Times Issued and Validity Periods
2 Decoding
3 Graphical Area Forecasts (GFA)
4 Aerodrome Forecasts (TAF)
5 Upper Level Wind and Temperature Forecasts (FD)
6 Airman’s Meteorological Advisory (AIRMET)
7 Significant In-flight Weather Warning Messages (SIGMET)
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### PILOT NAVIGATION

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### TIME AND LONGITUDE

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### TRIANGLE OF VELOCITIES

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NAVIGATION COMPUTERS

1. True Heading and True Airspeed
2. Applying the Wind
3. True Track and Ground Speed
4. Magnetic Heading and Magnetic Track
5. Density Altitude and True Altitude
6. Indicated, Calibrated and True Airspeed
7. Time, Ground Speed and Distance
8. Fuel Consumption and Conversions

PRE-FLIGHT PREPARATION

1. Factors Affecting Choice of Route
2. Map Preparation
3. Meteorological Information
4. NOTAM
5. Selection of Check Points
6. Fuel Requirements
7. Weight and Balance
8. Use of the Canada Flight Supplement
9. Documents to be Carried in Aircraft
10. Flight Plans and Itineraries
11. Flight Log Forms
12. Aircraft Serviceability

RADIO THEORY

1. Characteristics of Low/High and Very High Frequency Radio Wave
2. Frequency Bands Used in Navigation and Communication
3. Operational Limitations

GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS-GPS)

1. Basic Principals, Use and Limitations
SECTION 7: FLIGHT OPERATIONS

GENERAL

1 Pilot-In-Command Responsibilities
2 Winter Operations
3 Thunderstorm Avoidance
4 Mountain Flying Operations
5 Collision Avoidance – Use of Landing Lights
6 Marshalling Signals
7 Aerodrome/Heliport Marking and Lighting
8 Nose Wheel Steering/ Tail Wheel
9 Obstruction Markings/Lighting
10 Units of Measurement and Conversion
11 Use of Aircraft Flight Manual

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1 Effects of Critical Surface Contamination
2 Ground Effect
3 Weathercock Effect
4 Ground Resonance
5 Overpitching/Rotor Droop
6 Blade Sailing
7 Power Available and Required
8 Range and Endurance
9 Autorotation Speeds
10 Best Rate of Climb (Vy)
11 Mast Bumping
12 Vibrations
13 Blade Stall
14 Bank/Speed vs Rate/Radius of Turn
15 Effect of Change of Weight or Centre of Gravity (C of G) on Performance

WEIGHT AND BALANCE

♦ 1 Terms (e.g. datum, arm, moment)
2 Locating Centre of Gravity (C of G)
3 C of G Limits – Longitudinal
4 C of G Limits – Lateral
5 Weight (e.g. empty, gross)
6 Load adjustment
7 Cargo Tie Down/ Passenger Loading/ External Loading

WAKE TURBULENCE

♦ 1 Causes
2 Effects
3 Avoidance

SEARCH AND RESCUE (SAR) (A.I.P. CANADA – SAR Information)

1 Types of Service Available
2 Emergency Locator Transmitter (ELT), Exclude Categories
3 Aircraft Emergencies
4 Survival – Basic Techniques

CRITICAL SURFACE CONTAMINATION

♦ 1 Clean Aircraft Concept
2 Frozen Contaminants
3 Cold Soaking Phenomenon
4 Practices for Pilots to Ensure a Clean Aircraft
5 Pre-Take-Off Inspection

USE OF PERFORMANCE CHARTS

1 Rate of Climb
2 Critical Wind Azimuth
3 Performance (V) Speed – Vy, Vne
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1 Hypoxia/Hyperventilation
2 Gas Expansion Effects
3 Decompression (including SCUBA diving)
4 Vision/Visual Scanning Techniques
5 Hearing
6 Orientation/ Disorientation (including visual and vestibular illusions)
7 Positive and Negative "G"
8 Body Rhythms/Jet Lag
9 Sleep/Fatigue

THE PILOT AND THE OPERATING ENVIRONMENT

1 Personal Health
2 Diet and Nutrition
3 Medications (prescribed and over-the-counter)
4 Substance Abuse (alcohol and drugs)
5 Pregnancy
6 Heat/Cold
7 Noise/Vibrations
8 Effects of Smoking
9 Toxic Hazards (including Carbon Monoxide)

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1 The Decision-Making Process
2 Factors that Influence Decision-Making
3 Situational Awareness
4 Stress
5 Managing Risk
6 Attitudes
7 Workload (Attention and Information Processing)

PILOT – EQUIPMENT/MATERIALS RELATIONSHIP

1 Controls and Displays – Errors in Interpretation and Control
2 Standard Operating Procedures–Rationale/Benefits
3 Errors in the Interpretation and Use of Maps/Charts
4 Correct Use of Checklists and Manuals

INTERPERSONAL RELATIONS

1 Communication with – Flight Crew/Maintenance Personnel/Air Traffic Services/Passengers
2 Operating Pressures – Family Relationships/Peer Group / Employer
GOVERNMENT OF CANADA PUBLICATIONS

The following items are available free of charge from:

Civil Aviation Communications Centre (AARC)
330 Sparks Street, Place de Ville, Tower C – 5A
Ottawa, Ontario, Canada, K1A 0N8
Telephone: (613) 993-7284 or 1-800-305-2059
Facsimile: (613) 957-4208 - Attention: AARC
Internet Address: http://www.tc.gc.ca/aviation/pubs/index_e.htm

1. Sample Examination for Private Pilot Licence (TP 13014E)
2. Student Pilot Permit or Private Pilot Licence for Foreign and Military Applicants, Air Regulations (PSTAR) (TP 11919E)
3. When in Doubt… Small and Large Aircraft – Aircraft Critical Surface Contamination Training (TP10643E)
4. Aircraft Critical Surface Contamination Examination Questions (TP 10615E) – Questions that are appropriated to the licence sought may appear on written examination

The following publications may be purchased from the above address at cost plus a handling and mailing charge.

1. Helicopter Flight Training Manual (TP 9982E)
2. Air Command Weather Manual (TP 9352E)
3. Air Command Weather Manual Supplement (TP 9353E)
4. Human Factors for Aviation – Basic Handbook (TP 12863E)

The publications listed below may be purchased from:

Canadian Government Publishing
Ottawa, Ontario, Canada, K1A 0S9
General inquiries: (819) 956-4800 or 1-800-635-7943
Facsimile: (819) 954-5779 or 1-800-565-7757
Internet Address: http://cqp-egc.gc.ca/pubindex-e.html

1. Aeronautical Information Publication (A.I.P Canada) (TP 2300E)
2. Canadian Aviation Regulations (CARs)

To find the nearest distributor of the publications listed below, contact:
Canada Map Office
615 Booth Street
Ottawa, Ontario, Canada, K1A 0E9
Telephone (613) 952-7000 or 1-800-465-6277
Facsimile (613) 957-8861 or 1-800-661-6277
Internet Address: http://aero.nrcan.gc.ca

1. VFR Navigation Charts (VNC)/VFR Terminal Area Charts (VTA)
2. Canada Flight Supplement

ADDITIONAL REFERENCE MATERIAL

Information on text books and other publications produced by commercial publishers can be obtained through local flying training organization, bookstores and similar sources.


ENQUIRIES

Information concerning the location of pilot training organizations and matters pertaining to flight crew licensing can be obtained by contacting the appropriate Regional Offices. A complete listing may be found at http://www.tc.gc.ca/CivilAviation/General/Exams/Centres.htm