



TP 13975E



04/2004

# Study and Reference Guide

Pilot Permit

## Gyroplane

First Edition  
April 2004



Transport  
Canada

Transports  
Canada

Canada 

You may reproduce this guide as required and it can be found at  
<http://www.tc.gc.ca/CivilAviation/General/Exams/Guides.htm>

## **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.

<b>Examination</b>	<b>Questions</b>	<b>Time Limit</b>	<b>Pass Mark</b>
Gyroplane Pilot Permit (GYROP)	50	2 hours	60%

### **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

103.04 Record Keeping

**PART III – AERODROMES AND AIRPORTS**

## 300 – INTERPRETATION

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

**PART IV – PERSONNEL LICENSING AND TRAINING**

## 400 – GENERAL

400.01 Definitions

## 401 – FLIGHT CREW PERMITS, LICENSES AND RATINGS

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)

## PART VI – GENERAL OPERATING AND FLIGHT RULES

### 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
- 601.08 VFR Flight in Class D Airspace

#### FOREST FIRE RESTRICTIONS

- 601.15 Flight Restrictions
- 601.16 Issuance of NOTAM
- 601.17 Exceptions

### 602 - OPERATING AND FLIGHT RULES

#### GENERAL

- 602.01 Reckless or Negligent Operation of Aircraft
- 602.02 Fitness of Flight Crew Members
- 602.03 Alcohol or Drugs-Crewmember
- 602.04 Alcohol or Drugs – Passengers
- 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
- 602.34 Cruising Altitudes and Cruising Flight Levels
- 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
- 602.40 Landing at or Take-off from an Aerodrome at Night

#### OPERATIONAL AND EMERGENCY EQUIPMENT REQUIREMENTS

- 602.58 Prohibition
- 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

#### FLIGHT PREPARATION, FLIGHT PLANS AND FLIGHT ITINERARIES

- 602.70 Definitions
- 602.71 Pre-flight Information
- 602.72 Weather Information
- 602.73 Requirements to file a Flight Plan or a Flight Itinerary
- 602.74 Contents of a Flight Plan or Flight Itinerary
- 602.75 Filing of a Flight Plan or Flight Itinerary
- 602.76 Changes in the Flight Plan – Subsections (3) and (4)
- 602.77 Requirement to File an Arrival Report
- 602.78 Contents of an Arrival Report
- 602.79 Overdue Aircraft Report

#### PRE-FLIGHT AND FUEL REQUIREMENTS

- 602.86 Carry-on Baggage, Equipment and Cargo
- 602.87 Crew Member Instructions
- 602.88 Fuel Requirements – Subsections (1), (2), (3) and (5)
- 602.89 Passenger Briefing

#### OPERATIONS AT OR IN THE VICINITY OF AN AERODROME

- 602.96 General
- 602.97 VFR and IFR Aircraft Operations at Uncontrolled Aerodromes within an MF Area
- 602.98 General MF Reporting Requirements
- 602.99 MF Reporting Procedures before Entering Manoeuvring Area
- 602.100 MF Reporting Procedures on Departure
- 602.101 MF Reporting Procedures on Arrival
- 602.102 MF Reporting Procedures when Flying Continuous Circuits
- 602.103 Reporting Procedures when Flying through an MF Area

## VISUAL FLIGHT RULES

- 602.114 Minimum Visual Meteorological Conditions for VFR Flight in Controlled Airspace
- 602.115 Minimum Visual Meteorological Conditions for VFR Flight in Uncontrolled Airspace
- 602.117 Special VFR Flight

## RADIOCOMMUNICATIONS

- 602.136 Continuous Listening Watch
- 602.138 Two-way Radio Communication Failure in VFR Flight

## EMERGENCY COMMUNICATIONS AND SECURITY

- 602.143 Emergency Radio Frequency Capability
- 602.144 Interception Signals, Interception of Aircraft and Instructions to Land
- 602.145 ADIZ
- 602.146 ESCAT Plan

## 605 – AIRCRAFT REQUIREMENTS

### GENERAL

- 605.03 Flight Authority
- 605.04 Availability of Aircraft Flight Manual
- 605.08 Unserviceable and Removed Equipment – General
- 605.10 Unserviceable and Removed Equipment – Aircraft without a Minimum Equipment List

### AIRCRAFT EQUIPMENT REQUIREMENTS

- 605.14 Power-driven Aircraft – Day VFR
- 605.16 Power-driven Aircraft – Night VFR
- 605.17 Use of Position and Anti-collision Lights
- 605.22 Seat and Safety-Belt Requirements
- 605.23 Restraint System Requirements
- 605.25 General Use of Safety Belts and Restraint Systems
- 605.26 Use of Passenger Safety Belts and Restraint Systems
- 605.27 Use of Crew Member Safety Belts
- 605.28 Child Restraint System
- 605.29 Flight Control Locks
- 605.31 Oxygen Equipment and Supply – Subsection (1)
- 605.32 Use of Oxygen
- 605.35 Transponder and Automatic Pressure Altitude Reporting Equipment
- 605.38 ELT – Subsection (3)

### AIRCRAFT MAINTENANCE REQUIREMENTS

- 605.84 General Subsection (1)

## TECHNICAL RECORDS

- 605.92 Requirements to Keep Technical Records – Subsection (1) & (2)
- 605.93 Technical Records – General
- 605.94 Journey Log Requirements
- 605.95 Journey Log – Carrying on Board
- 605.97 Transfer of Records

## 606 – MISCELLANEOUS

- 606.02 Liability Insurance – Subsection (9)

**A.I.P. CANADA**

- 1 A.I.P. Canada - VFR Information
- 2 A.I.P. Supplements
- 3 Aeronautical Information Circulars
- 4 Aviation Notices and AIRAC Canada

**AIR TRAFFIC SERVICES AND PROCEDURES (RAC 1.0)**

- 1 Air Traffic and Advisory Services
- 2 Flight Service Stations / Flight Information Centres
- 3 Communication Procedures
- 4 Radar Service – Clock Position System
- 5 ATC Clearances, Instructions and Mandatory Readback Procedures
- 6 Wake Turbulence Separation
- 7 Airport/Aerodrome Operations - Controlled
- 8 Airport/Aerodrome Operations – Uncontrolled
- 9 Mandatory and Aerodrome Traffic Frequencies
- 10 VFR En Route Procedures
- 11 VFR Holding Procedures
- 12 VFR/IFR Traffic Mix at Uncontrolled Airports and Aerodromes

**TRANSPORTATION SAFETY BOARD OF CANADA (TSB) – (A.I.P. GEN 3.0)**

- 1 Definitions
- ◆ 2 Reporting an Aviation Occurrence
- 3 Protection of Occurrence
- 4 Sites, Aircraft, Components and Document
- 5 SECURITAS Program

## SECTION 2: AIRFRAMES, ENGINES, PROPELLERS AND AIRCRAFT SYSTEMS

### AIRFRAMES

- 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

### CARBURATION

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

### FUEL INJECTION

- 1 Principle of Operation
- 2 Icing
- 3 Alternate Air

### ELECTRICAL SYSTEM

- 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

### LUBRICATING SYSTEMS AND OILS

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

### FUEL SYSTEM AND FUELS

- 1 Types/Colour/Properties Density/Weight
- 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
- ◆ 12 Grounding/Bonding

### OTHER SYSTEMS

- 1 Rotor Brakes
- 2 Engine RPM
- 3 Rotor RPM

### SECTION 3: THEORY OF FLIGHT

#### PRINCIPLES OF FLIGHT

- 1 Bernoulli's Theorem
- 2 Newton's Laws

#### DEFINITIONS

- 1 Aerofoil
- 2 Relative Airflow and Angle of Attack
- 3 Chord Line
- 4 Camber
- ◆ 5 Lift
- ◆ 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

#### AERODYNAMICS

- 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)

#### LOAD FACTOR

- 1 Centrifugal Force/Weight
- 2 Linear/Turns
- 3 Structural Limitations
- 4 Effects of gust loads
- 5 Rotor Blade Loading

- 5 Negative load factors

#### GYROPLANE CONTROLS

- 1 Cyclic
- 2 Throttle
- 3 Rudder Pedals/Nose Wheel Bar
- 4 Aids to Stability
- 5 Trimming Devices

**SECTION 4: FLIGHT INSTRUMENTS****PITOT STATIC SYSTEM**

- ◆ 1 Pitot
- ◆ 2 Static
- 3 Anti-icing

**AIRSPEED INDICATOR**

- 1 Principles of Operation
- 2 Errors
- 3 Markings
- 4 Definitions (IAS, CAS, TAS)

**VERTICAL SPEED INDICATOR**

- 1 Principles of Operation
- 2 Errors
- 3 Lag

**ALTIMETER/ENCODING ALTIMETER**

- 1 Principles of Operation
- 2 Errors

**MAGNETISM**

- 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  
(Frequency/Basic Methods)
- 9 Checking Compass Heading on  
Ground and in Flight

**GYROSCOPE**

- 1 Principles of Operation
- 2 Inertia
- 3 Precession
- 4 Power Sources

**HEADING INDICATOR**

- 1 Principles of Operation
- 2 Errors
- 3 Limitations

**ATTITUDE INDICATOR**

- 1 Principles of Operation
- 2 Errors
- 3 Limitations

**TURN AND BANK INDICATOR**

- 1 Principles of Operation
- 2 Errors
- 3 Limitations

## SECTION 5: METEOROLOGY

### THE EARTH'S ATMOSPHERE

- 1 Composition and Physical Properties
- 2 Vertical Structure
- 3 The Standard Atmosphere
- 4 Density and Pressure
- 5 Expansion and Compression

### ATMOSPHERIC PRESSURE

- 1 Definition
- 2 Pressure Measurements
- 3 Station Pressure
- 4 Sea Level Pressure
- 5 Pressure Systems and their Variations
- 6 Effects of Temperature
- 7 Isobars
- 8 Horizontal Pressure Differences

### METEOROLOGICAL ASPECTS OF ALTIMETRY

- ◆ 1 Pressure Altitude
- ◆ 2 Density Altitude
- ◆ 3 Altimeter Settings
- 4 Effects of Both Pressure and Temperature

### TEMPERATURE

- 1 Heating and Cooling of the Atmosphere – Convection/Advection/Radiation
- 2 Horizontal Differences
- ◆ 3 Temperature Variations with Altitude
- 4 Inversions
- 5 Isothermal Layers

### MOISTURE

- ◆ 1 Relative Humidity/Dewpoint
- 2 Change of State
- 3 Sublimation and Condensation
- 4 Cloud Formation
- 5 Precipitation
- 6 Saturated and Dry Adiabatic Lapse Rates

### STABILITY AND INSTABILITY

- 1 Lapse Rate and Stability
- 2 Modification of Stability
- ◆ 3 Characteristics of Stable and Unstable Air
- 4 Surface Heating and Cooling
- 5 Lifting Processes
- 6 Subsidence/Convergence

### CLOUDS

- 1 Classification
- 2 Formation and Structure
- ◆ 3 Types and Recognition
- ◆ 4 Associated Precipitation and Turbulence

### TURBULENCE

- 1 Convection
- 2 Mechanical
- 3 Orographic
- ◆ 4 Wind Shear
- 5 Clear Air Turbulence
- 6 Reporting Criteria

### WIND

- 1 Definition
- ◆ 2 Pressure Gradient
- 3 Deflection caused by the Earth's Rotation
- 4 Low Level Winds – Variation in Surface Wind
- 5 Friction
- 6 Centrifugal Force
- 7 Veer and Back
- 8 Squalls and Gusts
- 9 Diurnal Effects
- 10 Land and Sea Breezes
- 11 Katabatic/Anabatic Effects
- 12 Topographical Effects
- ◆ 13 Wind Shear – Types and Causes
- 14 Jet Stream – Low Level

**AIR MASSES**

- 1 Definition and Characteristics
- 2 Formation/Classification
- 3 Modification
- 4 Factors that Determine Weather
- 5 Seasonal and Geographic Effects
- 6 Air Masses affecting North America

**FRONTS**

- 1 Structure
- ◆ 2 Types
- 3 Formation
- 4 Cross-sections

**FRONTAL WEATHER**

- 1 Cold Front
- 2 Warm Front
- 3 TROWAL and Upper Fronts

**AIRCRAFT ICING**

- 1 Formation
- 2 In Flight-Freezing Rain
- 3 Hoar Frost

**THUNDERSTORMS**

- ◆ 1 Requirements for Development Structure and Development
- ◆ 2 Types – Air Mass, Frontal
- 3 Hazards – Updrafts, Downdrafts, Gust Fronts, Downbursts, Microbursts, Hail and Lightning

**SQUALL LINES****HURRICANES AND TORNADOES****SURFACE BASED LAYERS**

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

**METEOROLOGICAL SERVICES AVAILABLE TO PILOTS**

- 1 Aviation Weather Information Service (AWIS)
- 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

**AVIATION WEATHER REPORTS**

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

**AVIATION FORECASTS**

- 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)

**SECTION 6: NAVIGATION AND RADIO AIDS****DEFINITIONS**

- 1 Meridian
- 2 Prime Meridian
- 3 Longitude
- 4 Equator
- 5 Latitude
- 6 Great Circle
- 7 Rhumb Line
- 8 Variation
- 9 Isogonal
- 10 Agonic Line
- 11 Deviation
- 12 Track
- 13 Heading
- 14 Airspeed
- 15 Ground Speed
- 16 Air Position
- 17 Ground Position
- 18 Bearing
- 19 Wind Velocity
- 20 Drift

**MAPS AND CHARTS**

- 1 Characteristics of Projections VTA – Transverse Mercator Projection
- 2 VNC – Lambert Conformal Conic Projection
- 3 Topographical Symbols
- 4 Elevation and Contours (Relief)
- 5 Aeronautical Information
- 6 Scale and Units of Measurement
- 7 Locating Position by Latitude and Longitude
- 8 Navigational Aids

**TIME AND LONGITUDE**

- 1 24 Hour System
- 2 Time Zones and Relation to Longitude
- 3 Conversion of UTC to Local and Vice Versa

**PILOT NAVIGATION**

- 1 Use of Aeronautical Charts
- 2 Measurement of Track & Distance
- 3 Map Reading
- 4 Setting Heading – Visual Angle of Departure
- 5 Check Points and Pin-Points
- 6 Use of Position Lines to Obtain a Fix
- 7 Ground Speed Checks and E.T.A. Revisions
- 8 Track Made Good
- 9 Determining Drift by 10° Lines
- 10 Double Track Error Method to Regain Track
- 11 Sum of Opening and Closing Angles to Destination
- 12 Visual Alteration Method of Correcting to Track
- 13 Diversion to Alternate
- 14 Return to Departure Point (Reciprocal Track)
- 15 Low Level Navigation
- 16 Deduced (Dead) Reckoning (DR Navigation)
- 17 In-flight Log and Mental Calculations
- ◆ 18 Procedures When Lost
- 19 Air and Ground Position
- 20 Variation and Deviation
- 21 True Track, Magnetic Track
- 22 True, Magnetic and Compass Headings
- 23 Indicated and Calibrated Airspeed (IAS, CAS)
- 24 True Airspeed, Ground Speed (TAS, G/S)
- 25 Compass Errors
- 26 Radio Communications (as per Section 1)

**TRIANGLE OF VELOCITIES**

- 1 True Airspeed and Heading
- 2 Wind Velocity
- 3 Ground Speed and Track

**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

### PERFORMANCE

- 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 ( $V_y$ )
- 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

### USE OF PERFORMANCE CHARTS

- 1 Rate of Climb
- 2 Critical Wind Azimuth
- 3 Performance (V) Speed –  $V_y$ ,  $V_{ne}$

### 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

## SECTION 8: HUMAN FACTORS

### AVIATION PHYSIOLOGY

- 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)

### AVIATION PSYCHOLOGY

- 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](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://cgp-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

The Study Guide for the Radiotelephone Operator's Restricted Certificate (Aeronautical) is available free of charge from district offices of Industry Canada – Examination and Radio Licensing.

### **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.

A variety of publications used in pilot training in the United States are available through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. (internet address: <http://www.access.gpo.gov/index.html>).

### **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>