

033

**FLIGHT PLANNING
& MONITORING**

**COMMERCIAL PILOT LICENCE
(FLIGHT PERFORMANCE AND PLANNING)**

JAR-FCL REF NO	LEARNING OBJECTIVES	REMARKS
033 00 00 00	<u>FLIGHT PLANNING AND FLIGHT MONITORING</u>	Use: Student Pilot Route Manuals
033 01 00 00	<u>FLIGHT PLANS FOR CROSS-COUNTRY FLIGHTS FOR VFR FLIGHTS</u>	
033 01 01 00	<u>Completing a navigation plan</u>	
033 01 01 01	Selection of routes, speeds, heights (altitudes) and alternate airfield <ul style="list-style-type: none"> – Select a route and altitude taking the following criteria into account: <ul style="list-style-type: none"> – Classification of airspace A – G <ul style="list-style-type: none"> – Controlled airspace – Uncontrolled airspace – Prescribed outbound and inbound routes – Restricted areas – Weather situation – Minimum safe altitudes – Interpret, before every flight, the air traffic control information from AIP and NOTAMS obtained from AIS, for: <ul style="list-style-type: none"> – Departure – En route – Destination – Possible alternative fields – Select and/or calculate the route, true air speeds, heights and alternate fields, taking into account: 	

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033 01 01 02	<ul style="list-style-type: none"> - Prescribed outbound and inbound routes - Restricted areas - Weather situation - Minimum safe altitudes - Nav. Aids - Conspicuous points - Semi circular rules - Calculate the minimum pressure altitude from MOCA, OAT and QNH - Calculate how many feet to climb after take off from an aerodrome to a given level - Find the frequency and identifier of a radio navigation aid from the chart <p>Measurement of tracks and distances</p> <ul style="list-style-type: none"> - Define the checkpoints - Calculate, or obtain from the chart, courses (tracks) and distances to fly - Draw the intended route in the navigation chart considering: <ul style="list-style-type: none"> - Restricted areas - Danger areas - Prohibited areas - Other airspace restrictions - Find the highest obstacle within a given distance either side of the track - Derive the following data from the chart and transfer to the navigation plan form: 	<p>Use protractor and ruler</p> <p>Use Aeronautical Information Publication (AIP)</p>

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033 01 01 03	<ul style="list-style-type: none"> - Check points and/or turning points - Distances in NM (using minutes of latitude along a meridian) - True magnetic courses (tracks) <p>Obtaining wind velocity forecast for each leg</p> <ul style="list-style-type: none"> - Wind <ul style="list-style-type: none"> - At aerodromes - At cruising levels - Visibility - Clouds and cloudbase - Meteorological hazards 	<p>Use TAF, METAR and Significant weatherchart (SWC)</p>
033 01 01 04	<p>Computation of headings, ground speeds, and time en-route from courses, true airspeed and wind velocities</p> <ul style="list-style-type: none"> - Apply the annual change to the charted value of the variation if applicable (not necessary if newest charts are used) - Transfer the calculated variation to the flight plan form - Calculate the true air speed at given: <ul style="list-style-type: none"> - Flight level - Temperature and instrument/position error of the airspeed indicator - Calculate the magnetic heading given: <ul style="list-style-type: none"> - The true course - TAS and wind vector 	<p>Use mechanical slide computer</p>

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033 01 02 03	<ul style="list-style-type: none"> – Obtain the fuel for flying from the destination to the alternate from the appropriate fuel table or graph <p>Reserves</p> <ul style="list-style-type: none"> – Define the unforeseen items for which contingency fuel is to be carried – State and explain the requirements for contingency fuel for small aircraft as detailed in JAR-OPS – Calculate the contingency fuel – State and/or explain the components of the reserve fuel – Explain that additional fuel is required in special circumstances when the trip fuel, contingency fuel, alternate fuel and final reserve fuel are not sufficient for: <ul style="list-style-type: none"> – Holding at 1500 ft (450 m) above the airfield in ISA conditions – An engine failure and/ or depressurisation at the critical point between alternates and/or destination – Calculate the additional fuel if necessary 	<p>According to JAR OPS 1 section 2 subpart D</p> <p>Criteria for contingency fuel will be given in exam questions</p>
033 01 02 04	<p>Total fuel requirements for flight</p> <ul style="list-style-type: none"> – Calculate the block fuel for a flight including : <ul style="list-style-type: none"> – Taxi fuel depending on <ul style="list-style-type: none"> – Aerodrome – Type of aircraft – Trip fuel – Contingency fuel – Alternate fuel – Final reserve fuel 	<p>Preflight calculations in accordance with AMC-OPS 1.255</p>

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033 01 02 05	<ul style="list-style-type: none"> – Extra fuel at captains discretion <p>Completion of pre-flight portion of fuel log</p> <ul style="list-style-type: none"> – Complete a fuel log which is presented with some of the elements missing, deriving those items from fuel tables and/ or graphs or other appropriate data 	
033 01 03 00	<u>Carry out flight monitoring and in-flight replanning</u>	
033 01 03 01	In-flight fuel computations	
	<ul style="list-style-type: none"> – Calculate, in flight, the fuel quantities used and remaining at navigational checkpoints 	
033 01 03 02	Calculation of actual consumption rate	
	<ul style="list-style-type: none"> – Calculate the actual consumption rate given: <ul style="list-style-type: none"> – The fuel used – The flight time – Compare the actual and the planned fuel consumption by means of calculation or flight progress chart – Compare the remaining fuel with the actual fuel to be used 	
033 01 03 03	Revision of fuel reserves estimates	
	<ul style="list-style-type: none"> – Calculate the remaining fuel at a nav checkpoint taking into account the actual fuel flow and the fuel used 	
033 01 03 04	In-flight replanning in case of problems	
	<ul style="list-style-type: none"> – Perform in flight revision of the fuel plan, if necessary, by: <ul style="list-style-type: none"> – Selecting a new destination – Selection of power settings to the old or a new destination – Calculating a new time to a new destination with a new ground speed to be calculated with given 	

Use pilots operating handbook

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	<p>wind, TAS (true air speed) and course</p> <ul style="list-style-type: none"> – Check the current fuel state, fuel requirements and fuel reserves – Explain that, in the case of a flight revision, the commander has to check the traffic and the condition of the new destination airfield and its designated alternate. The commander must also check the meteorological conditions at new destination and designated alternate airfield before the decision to continue the flight to the new destination or alternate. The aircraft must be able to land with the final reserve fuel 	
033 01 04 00	<u>Radio communication and navigation aids</u>	Use Student Pilot Route Manual or AIP
	<ul style="list-style-type: none"> – State the frequencies of the various means of Communication and Navigational aids 	
033 01 04 01	Communication frequencies and call signs for appropriate control agencies and in-flight service facilities such as weather stations	
	<ul style="list-style-type: none"> – Find communication frequencies and call signs for appropriate control agencies and in-flight service facilities, flight information services, weather information stations, Automatic Terminal Information Service stations 	
033 01 04 02	Radio navigation and approach aids	
	<ul style="list-style-type: none"> – On a route facility chart, locate the radio navigation aids and , from the symbols and other data shown, determine: <ul style="list-style-type: none"> – The type of facility/ service provided – Frequency – Identification – Modulation (as appropriate) 	
033 02 00 00	<u>ICAO ATC FLIGHT PLAN</u>	
033 02 01 00	<u>Types of flight plan</u>	

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033 02 01 01	<ul style="list-style-type: none"> – Indicate the difference between the types of Flight Plan <ul style="list-style-type: none"> – Individual flight plan – Repetitive flight plan (RPL) ICAO flight plan <ul style="list-style-type: none"> – Interpret the fixed format of an ICAO flight plan – State the reasons for a fixed format of an ICAO flightplan – Interpret the information to be given on the flight plan: <ul style="list-style-type: none"> – Aircraft identification <ul style="list-style-type: none"> – ICAO airline ident plus flight number – Aircraft registration – Flight rules – Type of flight – Number of aircraft ; wake turbulence category – Communication- and nav equipment on board – Departure aerodrome with 4 letter ident or ZZZZ and name in „other information“ – Estimate Off Block Time (EOBT) – Cruising speed – Cruising level VFR or flight level – Route with checkpoints, ATS routes, coordinates and/or bearing and range of a nav.aid and FIR boundary crossing points 	<p>Use ICAO flight plan form According DOC 4444</p>

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	<ul style="list-style-type: none"> - Destination aerodrome, EET, alternate aerodromes - Other information REG/, SEL/, OPR/, STS/, TYP/, PER/, COM/, NAV/., DEP/, DEST/, ALTN/ and RMK/ DAT - Endurance - Persons on board - Emergency equipment - Aircraft colour and markings - Define the concept of the repetitive flight plan 	
033 02 02 00	<u>Completing the flight plan</u>	
033 02 02 01	Information for flight plan <ul style="list-style-type: none"> - Complete the Flight Plan using information from: <ul style="list-style-type: none"> - Navigation plan - Fuel plan - Operator's records for basic aircraft information - Mass and balance records 	<p>According to PANS RAC (DOC 4444) forms to be used as information for the flight plan should contain all relevant information</p>
033 02 03 00	<u>Filing the flight plan</u>	
033 02 03 01	Procedures for filing <ul style="list-style-type: none"> - State the earliest and the latest time, prior to the estimated off block time , that a flight plan should be filed with ATC for onward transmission on the Aeronautical Fixed Telecommunications Network (AFTN) - State the procedure, regarding the flight plan, if take-off is delayed 	<p>According ICAO DOC 4444</p>

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033 02 03 02	<p>Agency responsible for processing the flight plan</p> <ul style="list-style-type: none"> – Name which ATC unit is responsible for: – Checking compliance with the format and data conventions – Checking for completeness and accuracy – Taking action, if necessary, to make it acceptable for ATC – Indicate acceptance and/or changes to the operator 	
033 02 03 03	<p>Requirements of the state concerning when a flight plan must be filed</p> <ul style="list-style-type: none"> – State and explain that there are circumstances in which the flight plan must be filed earlier 	
033 02 04 00	<p><u>Closing the flight plan</u></p>	
033 02 04 01	<p>Responsibilities and procedures</p> <ul style="list-style-type: none"> – Define the responsibility in respect to closing the flight plan – Indicate the time limit within which the flight plan should be closed 	
033 02 04 02	<p>Processing agency</p> <ul style="list-style-type: none"> – Name the agency responsible for processing the flight plan 	
033 02 04 03	<p>Checking slot time</p> <ul style="list-style-type: none"> – Define the concept slot time/ calculated take off time delivered by the Central Flow Management Unit (CFMU) 	
033 02 05 00	<p><u>Adherence to flight plan</u></p>	
033 02 05 01	<p>Tolerances allowed by the State for various types of flight plans</p> <ul style="list-style-type: none"> – State that there are differences between national regulations and practices and the international standards for rules of the air (candidates are not expected to know these differences) 	

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033 02 05 02	<ul style="list-style-type: none"> – List the publications where the differences can be found – List the subjects on which differences can occur <p>In-flight amendment of flight plan</p> <ul style="list-style-type: none"> – List the items of the flight plan which, if necessary, can be changed or amended in the air: <ul style="list-style-type: none"> – State who is responsible for filing an amendment – State to which ATC unit that amendment should be communicated – Name the maximum divergence of time and/or speed from those given in the filed flight plan before an in-flight amendment should be made 	
033 03 00 00	<u>PRACTICAL FLIGHT PLANNING VFR</u>	Use Student Pilot Route Manual, ruler and protractor
033 03 01 00	<u>Chart preparation</u>	
033 03 01 01	<p>Plot courses and measure directions and distances</p> <ul style="list-style-type: none"> – Find the checkpoints – Draw the intended route in the navigation chart taking into account: <ul style="list-style-type: none"> – Restricted areas – Danger areas – Prohibited areas – Other airspace restrictions – Find the highest obstacle for 5 NM either side of the track – Derive the following data from the chart and transfer to the navigation plan form: 	Use Aeronautical Information Publication

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033 03 02 00 033 03 02 01	<ul style="list-style-type: none"> – Check points and/or turning points – Distances in NM by measuring with meridian minutes – Courses <p><u>Navigation plan</u></p> <p>Completing the navigation plan</p> <ul style="list-style-type: none"> – Complete the flight log with the courses and distances as taken from a chart prepared with routes – Derive and calculate the headings using <ul style="list-style-type: none"> – Wind as provided – TAS – Course – Variation 	Use flight log
033 03 03 00 033 03 03 01	<p><u>Simple fuel plans</u></p> <p>Preparation of fuel logs showing planned values</p> <ul style="list-style-type: none"> – Prepare fuel log showing the planned values for: <ul style="list-style-type: none"> – Fuel used on each leg considering temperature, distance, flight level and wind – Fuel remaining at the end of a flight sector – Endurance based on fuel remaining and planned consumption rate at the end of a flight sector 	Use Flight Planing Manual or Pilots Operating Handbook
033 03 04 00 033 03 04 01	<p><u>Radio planning practice</u></p> <p>Communications</p> <ul style="list-style-type: none"> – Find the frequencies and call signs of air traffic control agencies and facilities for in-flight services such as weather information 	Use Student Pilot Route Manual and AIP

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033 03 04 02	Navigation aids <ul style="list-style-type: none"> - Find the frequencies and identifiers of en-route terminal navigation aids which can be used 	Use Student Pilot Route Manual
033 06 00 00	<u>PRACTICAL COMPLETION OF A FLIGHT PLAN (navigation plan/ flight log)</u>	
033 06 01 00	<u>Extraction of data</u>	
033 06 01 01	Extraction of navigational data <ul style="list-style-type: none"> - Obtain the following navigation data from the Navigation charts and Aerodrome charts <ul style="list-style-type: none"> - Courses - Distances - Waypoints <ul style="list-style-type: none"> - Bearings and ranges from beacons - Co-ordinates - Variation - Obstacle heights and elevations - Classification of airspace 	
033 06 01 02	Extraction of meteorological data <ul style="list-style-type: none"> - Obtain and decode the following meteorological data <ul style="list-style-type: none"> - Wind at different and appropriate levels and position of the jetstream - The presence of thunderstorms - Cloud base and thickness of cloud layers - Precipitation 	

Use
- weather analysis,
- weather depiction chart
- wind charts for different

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033 06 01 03	<ul style="list-style-type: none"> – Temperatures at different levels – Icing conditions – Areas of CAT and other turbulence <p>Extraction of performance data</p> <ul style="list-style-type: none"> – From the performance data for the aircraft, determine <ul style="list-style-type: none"> – Top of climb – Top of descent – Fuel flow – True air speed – Time/ fuel/ distance for climb and descent – Final reserve fuel – Alternate fuel – Find the short distance cruise altitude, given appropriate data 	<p>levels</p> <p>Use Flight Planning Manual or Pilots Operating Handbooks</p>
033 06 01 04	<p>Completion of navigation flight plan</p> <ul style="list-style-type: none"> – Calculate the following parameters to complete the flight plan (navigation plan) <ul style="list-style-type: none"> – The block fuel – Total ground distance – TAS given appropriate data – Identify the time system in which time entries have to be made in operational flightplan forms 	

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033 06 01 05	<ul style="list-style-type: none"> - Define the time of departure - Define the arrival time <p>Completion of fuel plan</p> <ul style="list-style-type: none"> - Obtain the following data <ul style="list-style-type: none"> - Time, distance and fuel to top of climb - Time, distance and fuel at cruise altitude - Time, distance and fuel to top of descent - Time, distance and fuel for descent - Total time, distance and fuel to destination - Fuel required from destination to alternate for missed approach, climb to en-route altitude, cruise descent, approach and landing - Final reserve fuel - Compute the TAS for en-route at a certain flight level with the aid of a graph or table - Calculate traffic load, estimated landing mass at alternate and maximum additional load 	<p>Use the fuel consumption tables and graphs of Flight Planning Manual or Pilots Operating Handbooks</p>
033 06 01 07	<p>Completion of air traffic flight plan</p> <ul style="list-style-type: none"> - Complete an air traffic flight plan for a given aircraft and flight, using the instructions contained in the latest AIC, together with the nominated airways charts. 	