

Subject No 54 Flight Navigation - IFR

Each subject has been given a subject number and each topic within that subject a topic number. These reference numbers will be used on 'knowledge deficiency reports' and will provide valuable feed back to the examination candidate.

Sub Topic Syllabus Item**54.2 Maps and Charts**

54.2.2 List the aeronautical charts used in New Zealand for operations under IFR and VFR.

54.2.4 Identify the information published in the legends of aeronautical charts and in the CHART Symbols section of the AIPNZ Vol 2 & 3.

54.2.6 Explain the meaning of abbreviations and codes used in Operational Data for aerodromes in the AIPNZ.

54.2.8 Interpret information published on aerodrome Instrument Approach charts.

54.2.10 Demonstrate proficiency in determining distances on IFR enroute charts using the linear scales printed separately on the charts, and using the latitude scale along meridians.

54.2.12 Describe how magnetic tracks are presented on enroute charts.

54.2.14 Explain what is meant by:

- (a) ADEP;
- (b) ADES;
- (c) RNAV;
- (d) Waypoint;
- (e) SID.

54.2.16 Define the following terms presented on enroute charts:

- (a) Minimum enroute altitude (MEA);
- (b) Minimum reception altitude (MRA);
- (c) Minimum safe altitude (MSA);
- (d) Route operating limitations (ROL);
- (e) Minimum flight altitude (MFA);
- (f) Compulsory reporting point;
- (g) Non-compulsory reporting point;
- (h) Exact reporting point;
- (i) Non-exact reporting point;
- (j) VOR change-over point.

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| 54.2.18 | With regard to Standard Routes, describe in detail the: <ul style="list-style-type: none">(a) function of the routes;(b) associated standard route clearance system;(c) manner in which standard routes are highlighted on enroute charts;(d) meaning of codes allocated to individual standard routes;(e) documents where standard routes are published. |
| 54.2.20 | With regard to uncharted routes, state the: <ul style="list-style-type: none">(a) document, and section, where the routes are published;(b) code allocated to the routes;(c) meaning of symbols (e.g. asterisks). |
| 54.2.22 | Using a protractor, describe how non-published magnetic tracks can be drawn on enroute charts. |
| 54.2.24 | Describe how different classes and types of airspace can be identified on enroute charts. |
| 54.2.26 | With regard to the World Geodetic System 1984 datum, state: <ul style="list-style-type: none">(a) where this datum is published;(b) the symbol used to denote the datum. |
| 54.2.28 | Describe the information contained in the following charts, tables and diagrams published in the AIPNZ VOL 2 & 3, and explain compliance procedures associated with: <ul style="list-style-type: none">(a) VOR/DME MRA Sector charts;(b) 25 DME Minimum Sector Altitude diagrams;(c) Standard Instrument Departure (SID) diagrams;(d) Visual arrival charts;(e) Standard Arrival Route (STAR) charts;(f) Ground movements charts;(g) Instrument T/O procedure chart – rate of climb table;(h) IFR alternate aerodrome minima table. |
| 54.4 | Flight Planning |
| 54.4.2 | For the preparation of a flight plan, determine: <ul style="list-style-type: none">(a) route details, including reporting points and turning points;(b) climb performance data including minimum climb gradients associated with |

Sub Topic	Syllabus Item
	published departure procedures;
	(c) descent performance data including rate of descent required to arrive at a position at a stipulated altitude, or to comply with published arrival procedures;
	(d) fuel consumption details during climb, cruise, descent, and during diversion (if different);
	(e) cruising level(s) considering topography and meteorological considerations;
	(f) ATC and Noise Abatement requirements;
	(g) speed limitations, if applicable;
	(h) requirement for, and availability of, alternate(s);
54.4.4	Through calculation or determination, prepare an IFR flight plan which contains the following details: <ul style="list-style-type: none">(a) point of departure including minimum departure altitude or departure instructions, if applicable;(b) rate of climb required to comply with published climb gradient;(c) location and altitude of top of climb and top of descent;(d) each sector of the flight identified as From/To;(e) point of arrival including minimum procedure commencement altitude, if applicable;(f) the altitude of each sector including mean climb and mean descent altitude;(g) each sector distance;(h) outside air temperatures for the calculation of TAS during climb, cruise and descent;(i) the wind velocity used for climb, cruise and descent, including split climb and split descent;(j) TAS for each sector;(k) Track (in °M) of each sector;(l) Heading (°M), groundspeed and time for each sector;(m) climb, cruise and descent details of a diversion;(n) total fuel load required including provision for diversion, reserve and contingency fuel.
54.6	Navigation
54.6.2	Define: <ul style="list-style-type: none">(a) drift, drift angle, drift allowance (aka drift correction);

Sub Topic	Syllabus Item
	<ul style="list-style-type: none">(b) track error, closing angle, total correction;(c) magnetic and true bearing;(d) radial;(e) position line;(f) fix;(g) area of probability (“cocked hat”).
54.6.4	Through the use of the navigation computer and mathematical means, solve problems involving: <ul style="list-style-type: none">(a) the triangle of velocity;(b) the 1 in 60 rule;(c) time/speed/distance;(d) time/fuel used/fuel consumption rate;(e) height/time/distance/rate of climb/rate of descent.
54.6.6	Interpret meteorological information for IFR take-off minima.
54.6.8	Based on information derived from currently used ADF, VOR and DME displays, and from GPS instrumentation if approved, determine or calculate: <ul style="list-style-type: none">(a) navigation aspects associated with published departure procedures;(b) magnetic headings required to maintain, or regain, required magnetic tracks;(c) determination of magnetic tracks to specified point(s);(d) CAS/TAS, drift and groundspeed;(e) estimated times of arrival at destination or intermediate positions;(f) requirements with respect TOC/TOD and rate of climb/rate of descent;(g) wind velocity;(h) position in terms of a radial, magnetic or true bearing and distance to or from a navigation aid;(i) alteration in magnetic heading to make good a position or track;(j) fuel consumption, and operational details or requirements resulting from fuel flow information;(k) navigation aspects associated with published arrival procedures;(l) holding time over a navigation aid before diversion flight must be commenced.
54.6.10	Describe the principles involved in obtaining an accurate fix.

Sub Topic	Syllabus Item
54.6.12	<p>Describe the information that should be displayed by ADF/ VOR/ DME instrumentation to confirm position in relation to:</p> <ul style="list-style-type: none">(a) a navigation aid or aids; or(b) a magnetic track.
54.6.14	<p>Using the transfer of position lines procedure (in °M), determine a new position, given:</p> <ul style="list-style-type: none">(a) an initial position;(b) a track required from that position;(c) a magnetic heading, or information to determine a magnetic heading;(d) a TAS, or information to determine TAS;(e) distance(s), or information to determine distance(s);(f) ADF, VOR and/or DME information at specific times to calculate and plot position lines. <p>NOTE: The new position may be required to be expressed in terms of lat/long, or as a bearing and distance from or to a navigation aid.</p>
54.6.16	<p>Having established a new position using the transfer of position line procedure, calculate or determine any or all of the following:</p> <ul style="list-style-type: none">(a) drift;(b) track error;(c) wind velocity;(d) correction to heading to make good a point or a track;(e) estimated time of arrival at a point of a track.
54.6.18	<p>Determine:</p> <ul style="list-style-type: none">(a) the type or class of airspace in which an IFR flight is operating;(b) ATC aspects when operating IFR in controlled and uncontrolled airspace.
54.6.20	<p>Interpret meteorological information for IFR approach minima.</p>
54.6.22	<p>Interpret, describe and explain the procedures involved during precision and non-precision instrument approaches.</p>
54.6.24	<p>Describe the procedures associated with published missed approaches.</p>