



DOCUMENT
GSM-AUS-CPL.001

DOCUMENT TITLE
INSTRUMENT RATING

CHAPTER 2 – LOWEST SAFE ALTITUDES

Version 2.0
December 2017

This is a controlled document. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission, in writing, from the Chief Executive Officer of Flight Training Adelaide.

CONTENTS	PAGE
LOWEST SAFE ALTITUDES (LSALT)	3
2.1 OVERVIEW.....	3
2.1.1 LSALT Tolerance Area - Radio Aid to Radio Aid	4
2.1.2 LSALT Tolerance Area – No Radio Aid to No Radio Aid.....	5
2.1.3 LSALT Tolerance Area – Change of Direction.....	6
2.1.4 LSALT Tolerance Area - Using GNSS or Non-GNSS (RNAV).....	7
2.1.5 Calculation of LSALT during planning.....	7
2.1.6 Re-calculation of LSALT during flight.....	8
2.2 ROUTE SPECIFICATIONS.....	9
2.3 EN ROUTE CLIMB PERFORMANCE CAO 20.7.4.....	9

LOWEST SAFE ALTITUDES (LSALT)

2.1 Overview

Read and study the LSALT in JEPPEL ATC-CLIMB AND CRUISE section. (ATC AU807)

Due care must be taken whilst flying in IMC with respect to LSALT. Descent below the lowest safe altitude can only be made:

- When being assigned levels in accordance with ATS surveillance service terrain clearance procedures.
- When conducting a DME/GNSS arrival, a published instrument approach or holding procedure.
- When necessary during climb after departure from an aerodrome.
- During VMC by day (CAR 178)

Normally when planning an IFR flight you will refer to the appropriate en route chart for track, distance and LSALT. However, the situation may arise where your destination is not on a published route. In this case the Grid Minimum Off-Route Altitude (MORA) may suit your requirements; however, because of the grid size this may be much higher than the LSALT on your required track, in which case the following applies.

For routes defined by radio navigation aids or to be navigated by DR:

- The area to be considered must be within an area of 5 NM surrounding and including an area defined;
- From a radio aid splay lines 10.3 deg. each side of the nominal track.
- From a position with no radio aid splay lines at 15 deg. each side of track.

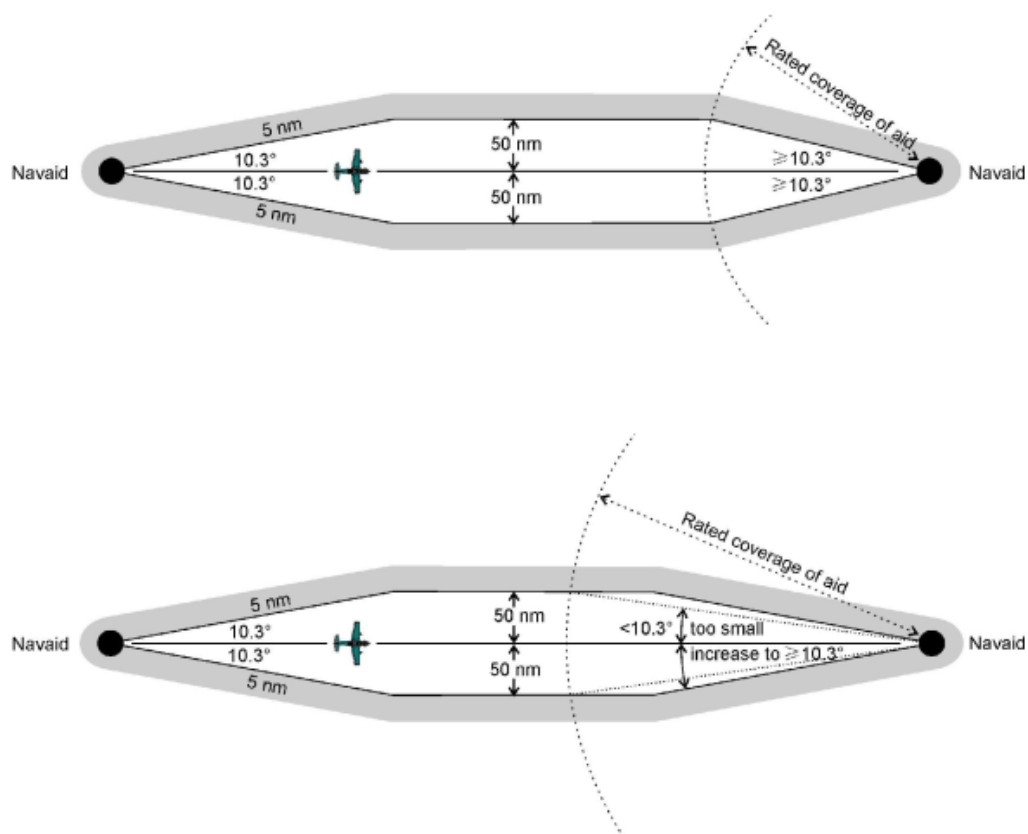
Continue splay lines until a maximum of 50 NM. either side of track, then parallel track to either a position abeam destination aerodrome, thence closing by a semi circle based on the abeam radius, or if the destination has an aid, to within the rated coverage of the aid. The minimum converging angle is to be 10.3 deg.

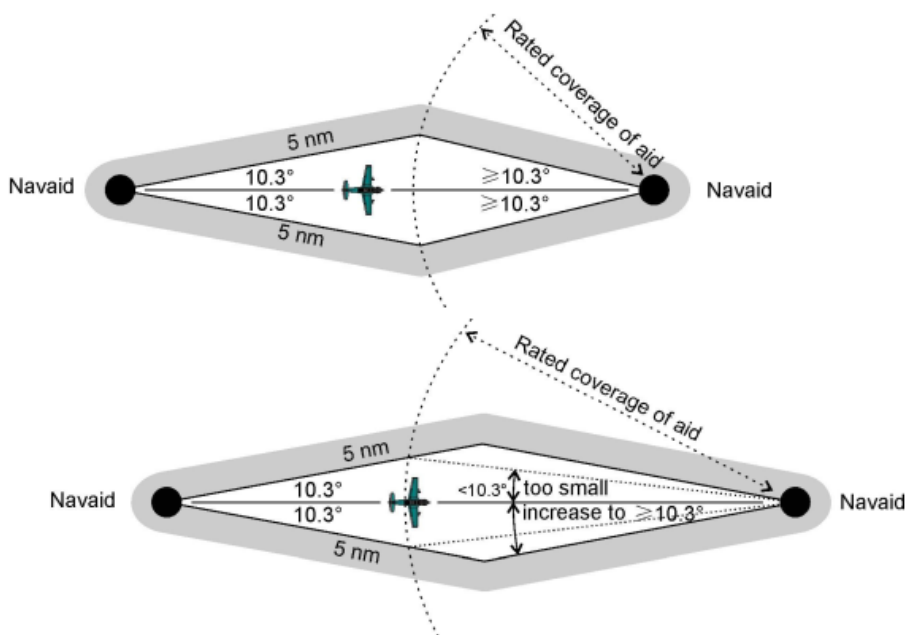
For operations with Area Navigation Systems (including GNSS):

- The area to be considered must be within an area of 5 NM surrounding and including an area defined;
- Lines drawn from departure point not less than 10.3 degrees each side of track to a maximum of 30 NM for non-GNSS (conventional RNAV systems) and 7 NM for GNSS, thence paralleling track abeam the destination and converging by a semicircle of 30 NM (non-GNSS) or 7 NM (GNSS) centred on the destination.

2.1.1 LSALT Tolerance Area - Radio Aid to Radio Aid

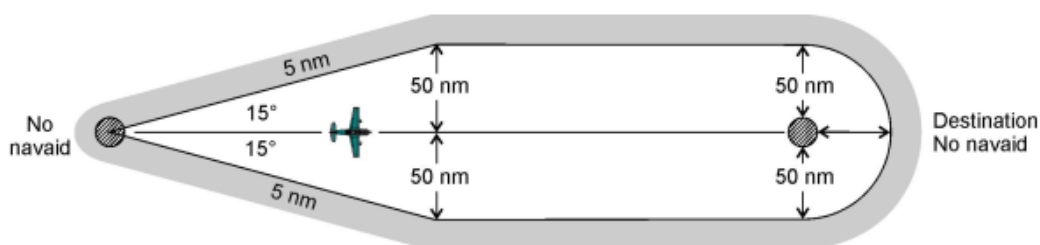
If departing from a location where track guidance is available from a navaid, the area to be considered must be within an area of 5 NM surrounding and including an area defined by lines drawn from the departure point or en route radio aid, 10.3° either side of the required track to a limit of 50 NM each side of track, then paralleling track until within the rated coverage of an on track or destination radio aid, then converging to that aid. The minimum angle of convergence is 10.3° .

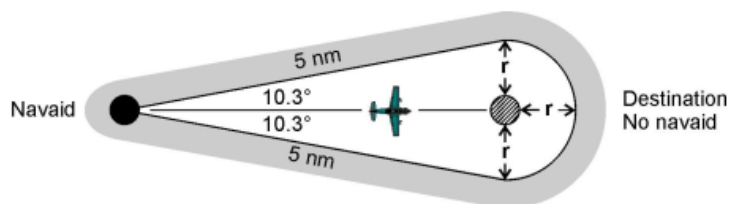
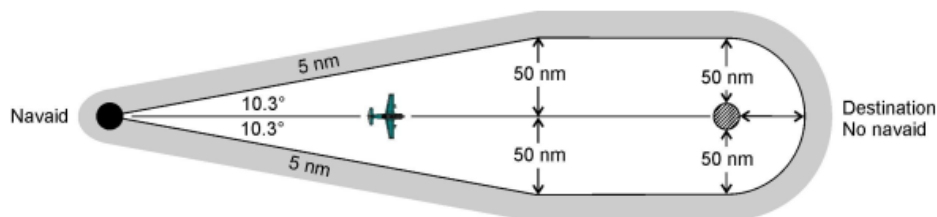




2.1.2 LSALT Tolerance Area – No Radio Aid to No Radio Aid

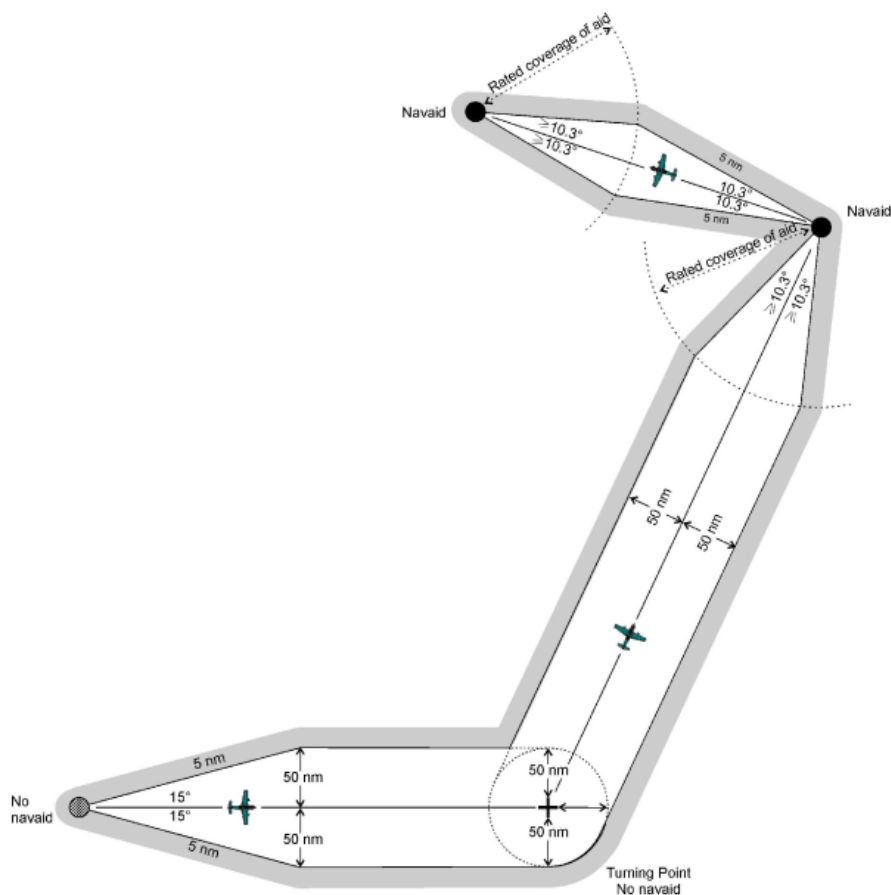
If departing from an aerodrome at which track guidance from a suitable navigation aid is not available, the area to be considered must be within an area of 5 NM surrounding and including an area defined by lines drawn from the departure point 15° either side of the required track to a limit of 50 NM each side of track, then paralleling track until abeam the destination, then converging by a semicircle of 50 NM radius centred on the destination. On shorter routes where these lines are displaced by less than 50 NM abeam the destination, they shall converge by a radius based on that lesser distance.





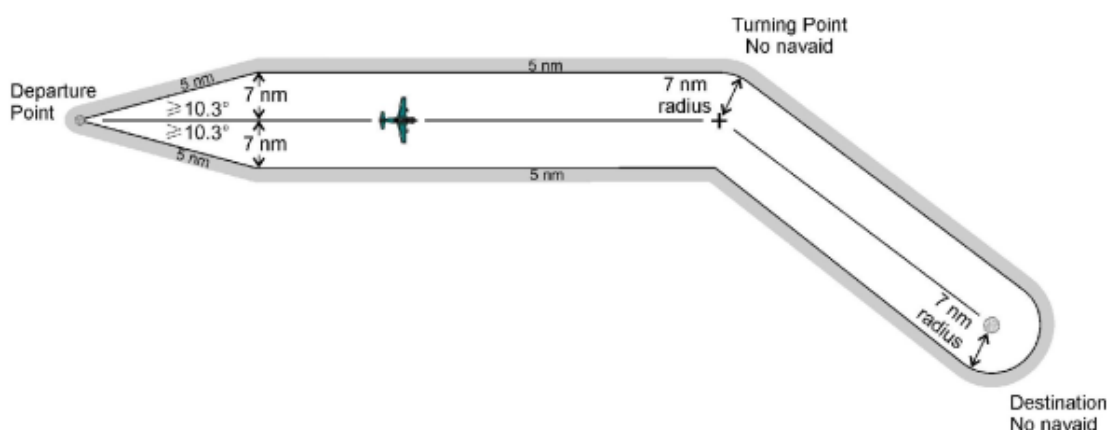
2.1.3 LSALT Tolerance Area – Change of Direction

LSALT flight planning showing multiple directions with navaid and no navaid situations



2.1.4 LSALT Tolerance Area - Using GNSS or Non-GNSS (RNAV)

The area to be considered must be within an area of 5 NM surrounding and including an area defined by lines drawn from the departure point not less than 10.3 degrees each side of track to a maximum of 7 NM for GNSS [30 NM for non-GNSS.]



2.1.5 Calculation of LSALT during planning

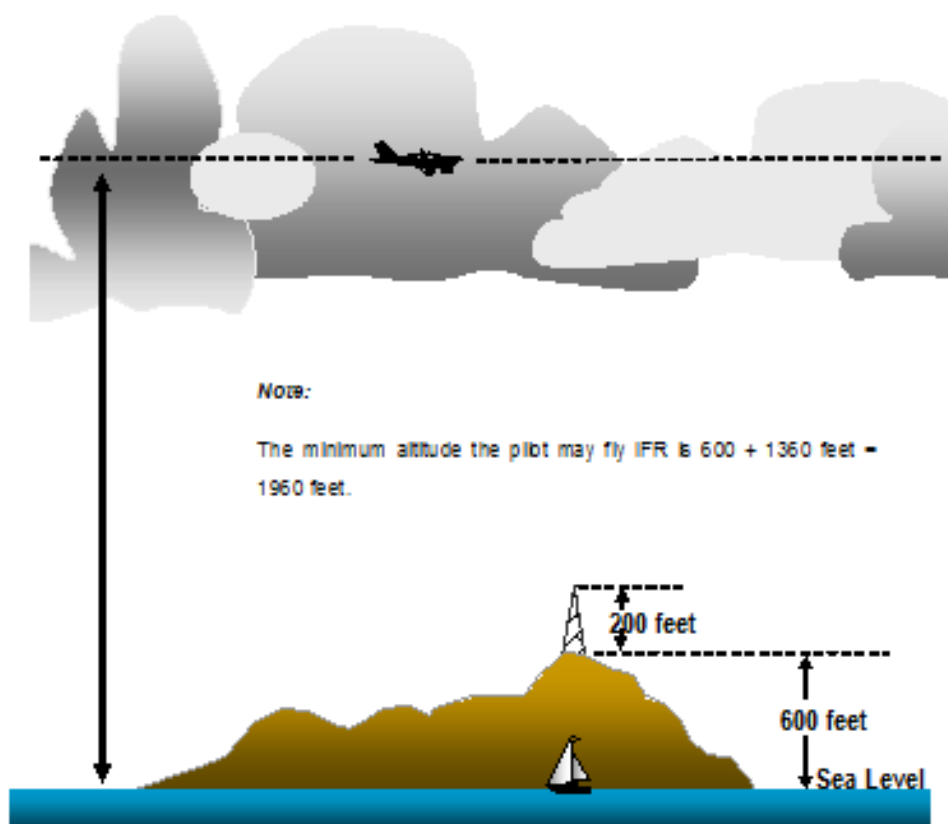
(ATC AU806)

To ensure compliance with the foregoing statement, LSALT must be calculated using the following methodology [which takes into account the obstacle reporting requirements of CAR 89Y.] After assessing obstacles and terrain, in the relevant area, either:

- Where the highest obstacle is more than 360 FT above the height determined for terrain, add 1000ft. to the highest obstacle; or
- Where the highest charted obstacle is less than 360 FT above terrain, or there is no charted obstacle, add 1360 FT to the height determined for terrain.

When operating as in (d) above, the pilot is responsible for ensuring that adequate obstacle clearance is achieved during the climb to the lowest safe altitude. If at an unfamiliar aerodrome, it is good practice, after take off and during the climb to remain in the circling area until the LSALT has been reached.

When the highest obstacle in the tolerance area is lower than 500 feet, the lowest safe altitude shall be 1500 feet. Refer *JEPPS ATC-CLIMB AND CRUISE*.



(NB: towers up to 360 ft. may be erected without licence or notification).

2.1.6 Re-calculation of LSALT during flight

If the navigation of the aircraft is inaccurate, or the aircraft is deliberately flown off-track, or where there is a failure of any radio navigation aid normally available, the area to be considered is a circle centred on the DR position, with a radius of 5 NM plus 20% of the **air distance** flown from the last positive fix. *[ATC AU807 CLIMB AND CRUISE]*

An aircraft operating under IFR flight procedure shall not be flown at an altitude lower than the lowest safe altitude except when:

- Being radar vectored
- Flown in accordance with a DME or GNSS arrival procedure
- Conducting an instrument approach or holding procedure
- Climbing after departure from an aerodrome
- Except during VMC by day (CAR 178).

2.2 Route Specifications

The pilot in command of a multi engine aircraft must take into account en route performance requirements of CAO 20.7.1B, CAO 20.7.2, or **CAO 20.7.4**, as appropriate, when planning IFR flight.

Asymmetric limitations for aircraft <5700 KG.

2.3 En Route Climb Performance CAO 20.7.4

Multi-engine aeroplanes engaged in charter or aerial work operations under the instrument flight rules must have the ability to climb with a critical engine inoperative at a gradient of 1% at all heights up to 5000 feet in the standard atmosphere in the following configuration:

- Propeller of inoperative engine stopped
- Undercarriage (if retractable) and flaps retracted
- Remaining engine(s) operating at maximum continuous power
- Airspeed not less than 1.2Vs.

Some aircraft will be weight limited in order to achieve this 1% climb requirement. In aircraft such as the Duchess and Piper Seminole the aircraft must not depart IFR at MTOW; however, may assume IFR en route when the appropriate amount of fuel burn has been achieved. The pilot in command must ensure the aircraft is maintained in VMC for terrain separation up to the LSALT prior to assuming IFR status.

A pilot must be aware of the limitations of his aircraft and have knowledge of the Pilot Operating Handbook.