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CHAPTER 9 – DEPARTURE PROCEDURES

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DEPARTURE PROCEDURES

9.1 Departures into IMC

An aircraft shall not take off from an aerodrome unless the weather conditions at the time are equal to or better than the prescribed meteorological take-off minima. It is pilot responsibility to determining whether or not the weather is suitable to take-off. The pilot should consider before take-off what action will be necessary to ensure sufficient terrain clearance during the climb after take-off until lowest safe altitude has been reached.

9.2 Departures from Controlled Aerodromes

A detailed description of the departure procedures for civil control zone aerodromes is provided in *JEPPS ATC AU 701 DEPARTURE, APPROACH AND LANDING PROCEDURES.* Additionally, a summary of radio reporting procedures for use in Class C and D control zones is provided in *JEPPS ATC-COMMUNICATIONS*.

9.2.1 Airways Clearance

Where a clearance delivery frequency is available, the pilot shall request airways clearance preferably immediately prior to engine start.

A pilot shall read back the following items of an airways clearance *(ATC AU802)*:

- Aircraft identification
- Destination, area of operation, position or clearance limit
- Route of flight
- Assigned level, except when this element is included in the SID description
- For IFR flights, departure type
- SSR code
- Frequency requirements.

9.2.2 Start Approval

The pilot of an aircraft departing from an aerodrome within a civil control zone shall request a start approval whenever the requirement is notified:

- On the ATIS broadcast
- In NOTAM
- In the ERSA.

9.2.3 Taxi Clearance

A clearance to taxi is required at all Class C and D controlled aerodromes.

9.2.4 Runway Entry

A pilot in command must not enter an active runway unless a specific clearance to:

- Take-off
- Line-up
- Backtrack, has been received, or a clearance to enter for other purposes has been received from ATC.

An ATC clearance to line-up does **not** authorise the pilot in command to backtrack on the runway.

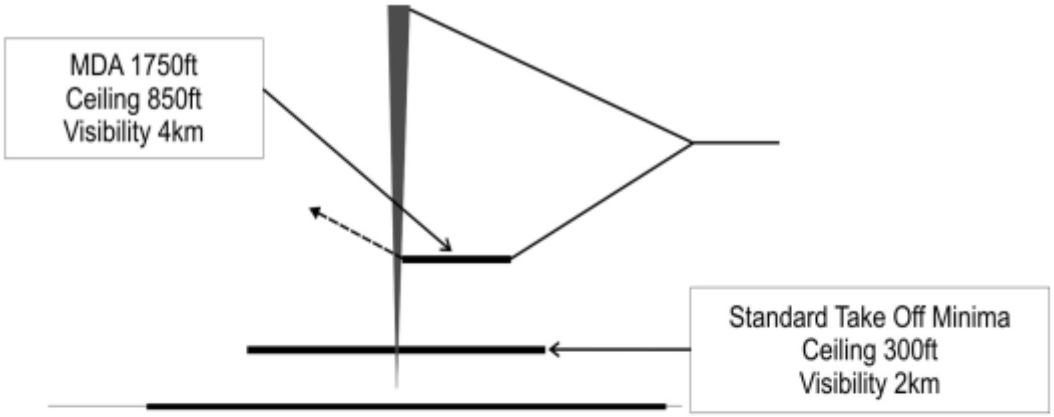
9.2.5 Take Off

Before take-off the pilot must ensure that the conditions at the time of departure are equal to or better than the prescribed take-off minima. A multi-crew operation, multi-engine aircraft, fitted with an auto-feather (**a qualifying multi-engine aeroplane)** may adopt a take-off minima lower than the Standard of ceiling 300 feet and visibility 2KM. (See *JEPPS IAL charts*). If the operation cannot comply with the above requirement then the take-off minima is the standard of 300 FT ceiling and 2 KM *(TERMINAL AU27).* This also applies to single-engine IFR aircraft. So when taking off from aerodromes such as Parafield, Adelaide, Renmark, Waikerie, etc, the take-off minima for most college aircraft is 300 FT ceiling, visibility 2 KM. An exception to this rule is a multi-engine aircraft which, due to LSALT considerations, would have to return to the departure aerodrome in the event of an engine failure. In this case the Standard take-off minima do not apply and the crew should adopt, as the take-off minima, the applicable landing (circling) minima for that aerodrome.

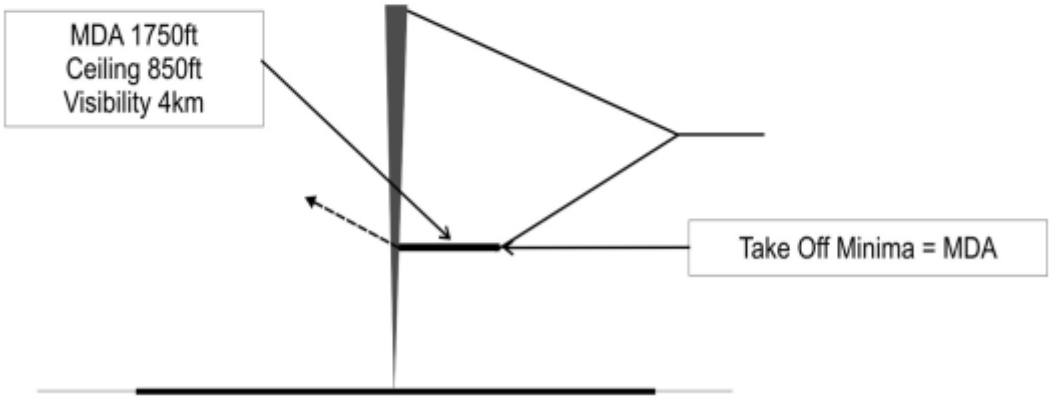
Example:

A twin engine aircraft is departing from an aerodrome called ‘A’. The take-off minima for ‘A’ in a BE76 or DA42 is 300 FT/2 KM and, unless the crew status changes, it will always be 300 FT/2 KM. Before departure from ‘A’, in the take-off safety brief, the pilot determines that in the event of an engine failure he or she would return to land at A. The cloud is at 300 FT and visibility is 2 KM but the pilot still elects to take-off. At 50 NM from A, an engine fails and so return for a landing at A is necessary. On arrival at ‘A’ the pilot carries out an instrument approach. On reaching the MDA, the aircraft is still in cloud so at the missed approach point the pilot must carry out a missed approach **on one engine with nowhere to go!** What went wrong? If it is necessary to return for a landing at the departure aerodrome the pilot must make sure their take-off minima is equal to, or better than, their landing minima (circling MDH). **So in this case the take-off minima should have been 850 FT ceiling 2.4 KM, which was the circling MDH for this aerodrome. (MDA 1750 feet)**

Note: You cannot have take-off minima less than 300 FT/2 KM unless you meet the requirements in JEPPS TERMINAL (standard take-off minima).



Example 1



Example 2

9.3 Departures from Non-towered Aerodromes

Details of the departure procedures and radio procedures to be used at non-towered aerodromes are provided in *ATC AU715.*

The pilot of an IFR aircraft departing from a non-towered aerodrome must attempt to contact ATS on VHF or HF when taxiing. If the pilot is unable to establish contact, the flight may proceed on a broadcast basis provided contact is established as soon as possible after take-off, and:

- In the case of an RPT, CHTR or AWK flight the pilot is assured of radio contact with his or her operator, or a representative of his or her operator, who has immediate access to a serviceable telephone, until contact is made with ATS.
- For flights other than RPT, a SARTIME **for departure** has been established with a maximum of 30 minutes from ETD.

> **Note**: Pilots are reminded of their obligations to see and avoid other aircraft *(CAR 163A).*

9.4 Departure Requirements

Unless otherwise instructed by ATC, or when tracking via a SID, pilot shall establish flight on the departure track as soon as practicable after take-off and at no further distance from the aerodrome than 5 miles. This 5 mile restriction also applies to departures from non-towered aerodromes. *(ATC AU717)*

9.5 Departure Time

Departure time shall be determined as follows:

- The current time minus an adjustment for the distance from the field
- When over or abeam the field.

9.6 Standard Instrument Departures

9.6.1 General

Standard Instrument Departures *(TERMINAL AU7)* are pre-planned IFR departure routes printed for pilot use in a diagrammatic and narrative form. SIDs have been produced for selected aerodromes to satisfy the requirements of:

- Noise abatement procedure tracks
- Airspace segregation for ATC purposes
- Obstacle clearance requirements
- Maximum traffic flexibility.

Note: SIDs do not account for engine failures or other emergencies involving loss of aircraft performance.

SIDs may be procedural or radar based. The procedures are to be followed until the aircraft reaches the LSALT for intercepting the route segment.

A SID specifies in both diagrammatic and narrative form the direction of turn, tracks, and, in some cases, altitude requirements and standard departure points. When tracking to or from a navigation aid is not possible, nominal tracks are shown.

The flight planned route should be intercepted as closely as possible to the specified DME distance, where given.

Radar based SIDs specify in diagrammatic and narrative form the initial track and minimum altitude at which a turn may be initiated on to the ATC assigned heading.

Note: SID procedures assume that pilots will not compensate for wind effects when being radar vectored, but will compensate for known or estimated wind effects when flying departure routes which are expressed as tracks.

Each procedure indicates the minimum design climb gradient that ensures obstacle clearance. Where the initial required climb gradient exceeds 3.3%, the altitude at which a 3.3% climb gradient may be flown is also shown. (See CANBERRA SID)

Diagrams also show minimum sector altitudes within 25 NM of the nominated azimuth aid.

Note: SID diagrams are not drawn to scale, bearings are magnetic and altitude requirements are referenced to QNH.

Procedural SIDs are identified by the name of the first en-route waypoint; e.g. 'MALIM THREE DEPARTURE', whereas radar SIDs are identified by the name of the departure aerodrome, e.g. CANBERRA THREE DEPARTURE.

Note 1: SIDs are not identified in terms of take-off runway designators, but separate SID instructions are listed and must be followed for each runway served by the SID.

Note 2: Brackets encompass limitations on the use of the procedures by some aircraft (located in procedure title block and SID identifier) and abbreviations, e.g. 'STRATHBOGIE (SBG) FOUR (NON-JET) DEPARTURE'

Unless specifically designated otherwise, SIDs are for use by all aircraft types.

9.6.2 ATC Procedures/Requirements

ATC will nominate a requirement to operate in accordance with a SID procedure in the departure instructions of an airways clearance.

The pilot in command must advise ATC if cleared via a SID which requires the use of navigation aids not available to the aircraft. A SID may be cancelled by ATC, either before or after take-off, by the use of the phrase:

- "**CANCEL SID**" or "**ON REACHING**... (level or distance) **CANCEL SID**... (Alternative ATC instructions)".

When a SID is cancelled before take-off, ATC may require the pilot in command to depart in accordance to ATC instructions or, in VMC by day, the pilot may request, or ATC may offer, a visual departure.

When a SID is cancelled airborne, the cancellation will not be effected below the MVA (radar environment) or MSA/LSALT (non-radar environment) unless the cloud base is such as to permit flight in VMC by day up to the MVA/MSA/LSALT as appropriate. When a departure report is required during a SID, the SID identifier must be included in the report. If being radar vectored, the direction of turn and assigned heading must be advised in the airborne report.

9.6.3 Aircraft Performance

SIDs provide specific aircraft performance parameters. The design climb gradients shown are provided to assist the pilot in maintaining obstacle clearance. A pilot not meeting the published gradients, for any reason, accepts responsibility for obstacle clearance. If alternative procedures are necessary, e.g. after engine failure, the pilot in command must advise ATC.

Procedures are designed to PANS-OPS obstacle clearance criteria which consist of:

- 2.5% gradient of obstacle identification surfaces, or a gradient based on the most critical obstacle, penetrating those surfaces, whichever is the higher gradient.
- 0.8% increasing obstacle clearance from ‘screen height’ at the departure end of the runway.

Any supplementary gradient given for altitude requirements imposed for other than obstacle clearance purposes does not include the 0.8% clearance. Where the initial required climb gradient exceeds 3.3%, the altitude at which a 3.3% climb gradient may be flown will be shown.

Unless otherwise specified, when carrying out a SID flight parameters are as follows:

- Bank angle—15° average achieved
- Maximum speed for turning departures—15290 KT.

For climb gradients less than 3.3%, obstacle clearance has not been assessed.

From JEPPS TERMINAL AU8 2.5% = 152 FT/nm

9.7 Standard Arrival Routes (STARs)

Refer to *TERMINAL AU11*

9.7.1 General

STARs are pre-planned IFR arrival routes which link en route airways systems to a fix at or near the destination aerodrome.

STARs satisfy the requirements of:

- Noise abatement procedures tracks
- Airspace segregation for ATC purposes
- Maximum traffic handling capacity
- Reduction in pilot/controller workload and air/ground communication requirements.

STAR charts are designed to provide pilots with primary navigational reference during the arrival phase, and specify in both diagrammatic and narrative form the route to be followed.

STARs are depicted in AIP DAP charts showing:

- A TRANSITION route where necessary to join a fix on the airway to the start of the ARRIVAL route
- An ARRIVAL route
- VERTICAL NAVIGATION REQUIREMENTS to segregate traffic
- SPEED RESTRICTIONS to assist in regulating the flow of arriving traffic
- Lowest safe altitudes for route segments, and a 25 NM MSA.

Note: STAR charts are not drawn to scale.

A profile of controlled airspace boundaries is included on each chart for pilot reference. This profile provides control area steps from the base 10,000 FT step to the CTR boundary, or, in some cases, an adjacent restricted area, e.g. R409 north of the Sydney CTR.

STARs are designed to terminate:

- At a fix for an instrument approach
- A fix for a visual approach
- By initiation of radar vectoring to the final approach course.

9.7.2 STAR Identification and Clearance Format

A STAR identifier is composed of the following items:

- A basic indicator, which is the name of the ARRIVAL FIX at which the ARRIVAL ROUTE begins
- A validity number to identify the current procedure
- The word "ARRIVAL", e.g. "ADAMS ONE ARRIVAL".

A transition is identified by:

- A basic indicator, which is the name of the TRANSITION FIX, located on an airway, where the transition commences
- The word "TRANSITION", eg. "EILDON WEIR TRANSITION".

When a STAR includes more than one arrival track, or a track terminates at a specific runway, ATC will nominate the runway to be used in the STAR clearance.

Nomination of a runway will identify the track to be flown, e.g. "CLEARED KINGLAKE ONE ARRIVAL, RUNWAY TWO SEVEN".

A level requirement depicted on a STAR chart does not authorise a pilot to descend to meet that requirement. To remove any possible ambiguity, ATC will provide a level assignment with the STAR clearance. ATC will also assign descent to permit compliance with vertical navigation requirements. Pilots must inform ATC if a level requirement cannot be met.

A STAR clearance contains the following:

- A STAR identifier
- A RUNWAY when applicable
- A TRANSITION segment when applicable
- A LEVEL assignment.

9.7.3 Star Procedures

STARs will be initiated by ATC. STARs will normally be issued prior to commencement of descent to permit pilots to plan for any vertical navigation requirements or speed restrictions. **A STAR may be commenced at any point from a TRANSITION FIX to the ARRIVAL FIX.** A pilot must read back to ATC the STAR identifier for any runway specified in the STAR clearance. The pilot in command must advise ATC if cleared via a STAR which requires the use of navigation aids not available to the aircraft.

The STAR speed requirement of 250 KT IAS maximum below 10,000 FT must be complied with unless amended by ATC. A speed restriction greater than 250 KT issued above 10,000 FT does not vary this requirement. A speed less than 250 KT IAS imposed above 10,000 FT must be complied with throughout the STAR procedure.

ATC may cancel STAR speed requirements either by individual instructions, e.g. "CANCEL SPEED RESTRICTIONS", or by general advice on the ATIS, e.g. "STAR SPEED RESTRICTIONS DO NOT APPLY".

After a STAR clearance has been issued, ATC may hold or vector aircraft prior to the ARRIVAL FIX. Unless the STAR is specifically cancelled by use of the phrase "CANCEL STAR", the speed and level requirements still apply. When cancelling holding or vectoring to rejoin the STAR, ATC will use the phrase "RESUME... (STAR identifier)". When issued with a STAR clearance and holding is required, holding must be in accordance with the published procedure on the STAR chart, or as directed by ATC.