

VFR OPS

1 SARWATCH refers to SAR alerting based on:

- (a) only full position reporting
- (b) only SARTIME
- (c) full or scheduled (SKEDS) position reporting as distinct from the nomination of a SARTIME
- (d) either full position reporting procedures, scheduled reporting times or SARTIME.

2 A SARTIME for departure nominated by radio when arriving at an intermediate aerodrome on a multi-stage flight, has the advantage that:

- (a) SARTIME is provided for the intermediate landing as well as the subsequent takeoff
- (b) it is additional SAR coverage to the SARTIME nominated for the final destination in the original flight notification
- (c) the SARTIME can always be cancelled or extended by radio
- (d) the airways charges are lower due to the shorter SARWATCH duration.

3 For SARTIME flights, aircraft equipped with only a single VHF radio must cancel SARTIME:

- (a) only by radio after landing
- (b) only by telephone after landing
- (c) by radio when arriving in the circuit
- (d) either after landing or at or before the MBZ or CTAF area boundary.

4 You are planning a day VFR flight to an aerodrome with an elevation of 950 ft located 115 nm from the point of departure and your ETA is 0635Z. The destination forecast includes "18015KT 9999 ... FM 07 ... BKN020". A forecast level of cloud that would be above the alternate minimum would be:

- (a) BKN015 which is 1500 ft above the aerodrome reference
- (b) BKN020 which is 2000 ft above the aerodrome reference
- (c) BKN025 which is 1550 ft above the aerodrome reference

(d) BKN020 which is 1050 ft above the aerodrome reference.

5 Climbing at a constant IAS will result in:

- (a) an increase in TAS with increasing altitude
- (b) a decrease in TAS with increasing altitude
- (c) constant ground speed
- (d) an eventual high speed stall.

6 When closing the door of a typical light aircraft you notice that the VSI shows a momentary descent indication. This could be a sign that:

- (a) there is a leak in the static system
- (b) the alternate static source has been selected and this source is in the cockpit
- (c) there is a pitot system leak
- (d) the pitot-static system is operating normally
- (e) (a) and (b) are correct.

7 When planning a VFR flight at 2500 ft AGL in G airspace close to a control zone boundary, the navigational tolerance that

must be applied to the intended track to avoid controlled airspace is:

- (a) 1 nm by day or night
- (b) 1 nm by day and 2 nm by night
- (c) 2 nm by day or night
- (d) 2 nm by day and 3 nm by night.

8 The ceiling is the height above the ground or water of:

- (a) the lowest layer of cloud below 10,000 ft covering more than one-half of the sky
- (b) the lowest layer of cloud below 20,000 ft covering more than one-half of the sky
- (c) the lowest layer of cloud covering more than one-half of the sky
- (d) the lowest layer of cloud.

9 The correct format for entering a true airspeed of 120 kt and an endurance of 250 minutes in a NAIPS flight notification is:

- (a) K120 and 0250
- (b) K0120K and 250
- (c) N0120 and 0410
- (d) 0120N and 250.



James Ostinga

IFR equipment requirements

GRADIENTS

Questions 1 to 3 refer to Canberra RWY North (non jet) SID – Bindook One (dated 25/11/04). Your aircraft has an asymmetric climbing TAS of 100 kt and you ascertain an average headwind of 15 kt. Before departure you assess the rate of climb that would be needed to meet the climb gradient on each runway for obstacle clearance.

1 What is the rate of climb required to meet the initial climb gradient for a departure from RWY 35?

- (a) 320 ft/min
- (b) 680 ft/min
- (c) 590 ft/min
- (d) 295 ft/min.

2 What minimum rate of climb must be achieved once the aircraft has passed 3400 ft on climb on the RWY 35 SID ?

- (a) 295 ft/min
- (b) 590 ft/min
- (c) 680 ft/min
- (d) 320 ft/min.

3 What is the initial climb gradient required from RWY 17 and what minimum rate of climb is needed to meet that gradient?

- (a) 3.3 per cent; 320 ft/min
- (b) 4.0 per cent; 400 ft/min
- (c) 3.3 per cent; 295 ft/min
- (d) 4.0 per cent; 360 ft/min.

4 What is the normal descent gradient on final of a non-precision approach and what rate of descent would be required at a ground speed of 120 kts?

- (a) 4.0 per cent; 490 ft/min
- (b) 5.0 per cent; 600 ft/min
- (c) 5.2 per cent; 630 ft/min
- (d) 6.5 per cent; 800 ft/min.

5 Where possible, instrument approach descent profiles are based on 320 ft per nm to a touch down point 300 m past the threshold on a runway approach. This statement is:

- (a) true
- (b) false.

Refer to the Melbourne RWY 16 ILS approach plate (dated 17/03/05)

6 You have just crossed the Bolinda locator (NDB) at 4000 ft and the glideslope (GS) failure flag appears. You continue the approach as a localiser. Which of the following methods could be used to ensure a stable descent profile during the approach?

- (a) The approach must be discontinued when the GS fails
- (b) Crosscheck descent altitudes against successive DME distances from the approach plate
- (c) Use the "rule of thumb" of "DME x 3 + aerodrome elevation = crossing altitude"
- (d) Both (b) and (c) are correct.

7 You are about to depart from an aerodrome using standard takeoff minima in a Beechcraft Kingair 200 (MTOW below 5700 kg),

crewed by a single pilot with operative auto feather. What minimum climb gradient is required and what rate of climb would achieve this gradient at an asymmetric ground speed of 120 kt?

- (a) 2.5 per cent; 300 ft/min
- (b) 3.3 per cent; 400 ft/min
- (c) 1.9 per cent; 230 ft/min
- (d) 1.9 per cent; 460 ft/min.

8 What is the minimum climb gradient required when conducting an instrument missed-approach procedure?

- (a) 3.3 per cent or 200 ft/nm
- (b) 2.5 per cent or 152 ft/nm
- (c) 2.5 per cent or 300 ft/nm.

9 What rate of climb would be required to meet the missed approach gradient at an asymmetric ground speed of 90 kt?

- (a) 300 ft/min
- (b) 152 ft/min
- (c) 250 ft/min
- (d) 220 ft/min.



Greg Spencer

MAINTENANCE

1 When carrying out a cylinder compression check on a piston engine using a differential pressure gauge, a reading of 70/80 compared to 60/80 means that the latter:

- (a) has less leakage than the former and the input pressure is 80 psig
- (b) causes a 20 psi pressure drop across the restrictor orifice due to a higher flow rate than the former
- (c) causes a 20 psi pressure drop across the restrictor opening due to a lower flow rate than the former.

2 The main reason for taking extreme cleanliness precautions in maintaining oxygen systems is:

- (a) unpleasant odours in the breathing oxygen
- (b) possible freezing of the pipe work
- (c) deterioration of flexible seals
- (d) the risk of explosion if any oil or grease contaminants come into contact with oxygen under pressure.

3 Forged metal components are often stronger in a particular

direction than castings or items machined from a solid because:

- (a) forging breaks up the crystal sizes of the metal
- (b) a tough skin is formed on the outer surface during the forging process
- (c) the metal grain boundaries tend to be aligned in specific directions in the forging process
- (d) carbon precipitates out of the grain during the forging process.

4 A tendency for an aerodynamic control surface to flutter is usually reduced by moving the centre of gravity of the surface:

- (a) forward
- (b) backward.

5 An aircraft wire designated MIL-W-22759/16-10-9 has a gauge of:

- (a) 16 AWG
- (b) 10 AWG
- (c) 9 AWG
- (d) 10-9 AWG.

6 With reference to aircraft weight and balance, the datum is the:

- (a) position of the centre of

gravity of the empty aircraft

- (b) furthest limit of the position of the centre of gravity when fully loaded
- (c) the longitudinal position from which the arms are measured
- (d) the lateral position from which the arms are measured.

7 On some engines an oil-damped or "squeeze film" bearing is used where a film of pressure oil is directed:

- (a) between the inner race and shaft to reduce the dynamic loads transmitted from the rotating assemblies to the bearing
- (b) between the bearing outer race and bearing housing to reduce the dynamic loads transmitted from the rotating assemblies to the bearing housing
- (c) to a groove in the track to dampen the rotating elements of the bearing
- (d) to the bearing to damp the resonant frequency.

8 As the specific gravity of a turbine fuel increases, the calorific value per unit of weight

tends to:

- (a) decrease and the calorific value by volume increases
- (b) decrease and the calorific value by volume decreases
- (c) increase and the calorific value by volume decreases
- (d) increase and the calorific value by volume increases.

9 A battery and generator system provide direct current. To produce alternating current requires:

- (a) a commutator
- (b) a rectifier
- (c) a transformer and rectifier unit (TRU)
- (d) an inverter.

10 A constant speed drive (CSD) unit drives an AC generator using:

- (a) a synchronous motor
- (b) a hydraulic pump and motor augmented in some applications with a differential unit
- (c) an epicyclic gearbox
- (d) a wild frequency generator and rectifier.



LAME working on piston engine



LAME working on turbine engine

WHAT'S THE MESSAGE



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Last issue's winning caption: "Stop ... stop, not that bay – eBay!
When I said to sell it I'll put it in eBay, I was referring to the internet!"
Peter Blair-Hickman, Northmead, NSW

QUIZ ANSWERS

VFR

- (d)** GEN 2.2-19 definitions. It is the generic term for all forms of SAR alerting.
- (a)** ENR 67.3.2; VFG page 212. *(Note that before nominating a SARTIME for departure, SARTIME for arrival must be cancelled.)*
- (d)** ENR 67.2.4; VFG page 212; cancelling by radio in the circuit would involve interruption of radio watch on the CTAF or MBZ.
- (b)** *Note (a) is actually the alternate minimum. TAF cloud heights are referenced to the aerodrome reference point.*
- (a)** As air density reduces, IAS reduces for a given TAS.
- (a & b)** The closing of the door can momentarily raise the cockpit pressure and this is transferred to the VSI, ASI and altimeter.
- (d)** VFG page 240; (b) applies up to 2000 ft AGL.

- (b)** GEN 2.2-5 definitions; VFG page 346.
- (c)** Instructions are on the Airservices website at www.airservicesaustralia.com.

IFR

- (c)** DAP 2-1. TAS 100 kt – 15 kt (headwind) = 85 kts (G/S) 6.6 per cent gradient.
- (a)** DAP 2-1. G/S 85 kts as above 3.3 per cent gradient.
- (d)** DAP 2-1. G/S 85 kt as above 4.0 per cent gradient.
- (c)** AIP ENR 1.5-12, para 1.19. DAP 2-1.
- (a)** DAP 1-1, para 1.4.
- (d)** Note: for the "rule of thumb" to work, the DME must be suitably located. That is, you are losing 300 ft per nm. Check each approach plate before adopting.
- (c)** AIP ENR 1.5 – 26 para 4.3.2. DAP 2-1. Note: since the table does not go down to

1.9 per cent, a tip is to work 3.8 per cent and halve the result. i.e. 3.8 per cent is 460 ft/min so 1.9 per cent is 230 ft/min.

- (b)** AIP ENR 1.5-7, para 1.10.1.
- (d)** DAP 2-1.

MAINTENANCE

- (a)** The input pressure is set to 80 psig and connected to the cylinder via a restrictor orifice; the greater the leakage the greater will be the drop across the restrictor.
- (d)** It could be argued that the other answers are also applicable; however, the overwhelming risk is an explosion could occur, even in the presence of only minute traces of oil or grease.
- (c)** The forging is stronger as a result of the alignment of the grain boundaries, particularly because of bending at right angles to the direction of grain flow.
- (a)** Stability of the surface increases as the centre of gravity of the surface is moved further forward.
- (b)** The first dash number represents the gauge. The /16 designates tin plated copper conductors and the -9 indicates a white outer jacket.
- (c)** The datum is a point defined by the manufacturer for particular weight and balance system.
- (b)** See *The Jet Engine*, Rolls Royce Limited, part 12.
- (a)** As the specific gravity increases, a greater weight of fuel and therefore calorific value occurs in a given volume.
- (d)** A TRU changes AC to DC.
- (b)** Most larger units employ a differential gearbox arrangement in addition to the hydraulic pump and motor.