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INSTRUMENT RATING

CHAPTER 7 – AIRCRAFT REQUIREMENTS

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AIRCRAFT REQUIREMENTS

7.1 Overview

In this section we will be studying Jeppesen and CAO. 20.18. Your knowledge of aircraft equipment requirements will be checked on an instrument rating flight test.

7.2 Instrumentation

The basic instrumentation requirements for flight under the instrument flight rules are set out in CAO 20.18 *appendices 3–5*. It must be understood that the minimum required instrumentation changes with class of operation (PVT/AWK & CHTR).

Instrumentation for PVT/AWK & Freight Charter (IFR):

- An Airspeed Indicator
- A Sensitive Pressure Altimeter
- A Direct Reading Magnetic Compass
- A Rate of Climb and Descent Indicator
- A Heading Indicator (Directional Gyroscope)
- An Attitude Indicator (Artificial Horizon)
- A Turn and Slip Indicator
- An Outside Air Temperature Indicator
- An Accurate Time Piece
- Power Supply Indicator(s) to Gyroscopic Instruments
- A Pitot Anti-Ice System (Pitot Heat).

The pitot: static instruments shall be connected to either a normal or an alternate static source, but not both sources simultaneously. Alternatively, they may be connected to a balanced pair of static ports.

Ref C.A.O. 20.18 *Appendix iv*

Instrumentation for Passenger Charter:

- Instrumentation as for PVT and AWK
- Two Attitude Indicators (Artificial Horizons)
- Two Pressure Sensitive Altimeters.

The gyroscopic instruments shall be connected to duplicated sources of power.

Ref CAO. 2.18 *Appendix iii*

Note: Must be twin. Exception – turbine powered and approved by CASA.

7.3 Additional Instrumentation

In addition to the instruments and equipment required by CAO. 20.18, the instrumentation requirements of the aircraft's flight manual section 5 shall be complied with for all operations.

7.4 Assigned Altitude Indicator

Unless equipped with an altitude alerting system, an aircraft operating under the instrument flight rules in controlled airspace shall be equipped with an assigned altitude indicator.

(Ref. C.A.O. 20.18 para 7.3)

7.5 Automatic Pilot

An automatic pilot must be fitted and serviceable and approved by CASA, for all RPT, charter, aerial work as an air ambulance or for a flying doctor that has the following capabilities:

- A capability of operating the flight controls to maintain flight and manoeuvre the aeroplane about the roll and pitch axis
- An automatic heading hold capability
- An altitude holding capability
- Or a co-pilot with a minimum of a co-pilot instrument rating, endorsed on the aircraft type with dual functional flight controls fitted and must occupy the second control seat. *(Ref. CAO. 20.18 Para 4.1A and 4.1B)*

7.6 Lighting Requirements

For operations at night, an aircraft shall be equipped with the following lighting:

- Instrument lighting for all instruments and equipment, used by the flight crew that are essential for the safe operation of the aircraft.
The power supply to this lighting shall be so arranged that in the event of the failure of the normal source of power, an alternative source of power is immediately available.
- A means of controlling the intensity of the instrument lighting
- Landing light:
 - 2 for charter operations
 - 1 for private or airwork operations.
- A light in each passenger compartment

- A light in the pilot's compartment to provide adequate illumination for the study of maps and flight documents
- Anti-collision and position lighting required by *C.A.R. 196*
- A shock-proof electric torch in each crew member station.

(Ref. *C.A.O. 20.18 Appendix v*)

7.7 Aircraft Documentation

Aircraft are individually approved for flight under the instrument flight rules by the inclusion in the flight manual of:

- A radio systems approval page
- An IFR operations supplement.

The radio systems approval page(s) can be found in Section 7 of the aircraft's flight manual. The table of figures provided specify the maximum operating altitude of each piece of equipment under various flight procedures.

7.8 Radio Communications Systems

REFER JEPPS ATC COMMUNICATIONS, AU 900 section

Aircraft must be equipped with radio communications systems capable of continuous communication according to the flight classification and airspace category. The systems specified in the following table at the minimum required for the particular operation and except where otherwise indicated must be of a type approved by the CASA, properly installed in the aircraft and serviceable on the departure of the flight.

7.9 Serviceability

All instruments and equipment fitted to an aircraft shall be serviceable prior to take-off, unless the operation is one that is approved under the provisions of *C.A.O. 20.18 paragraph 10.1 (a), (b) or (c)*. (Ref. *C.A.O. 20.18 Paragraph 101*)

C.A.O. 20.18 paragraph 10.2 allows unserviceable equipment to remain fitted only if it is prominently placarded "UNSERVICEABLE" and the operation is permitted under the provisions of *C.A.O. 20.18 paragraph 10.1 (a), (b) or (c)*

Note: Flight under IFR with unserviceable equipment is not normally permitted.

7.10 Operation of Aircraft Radar on the Ground

CAO 20.9, Para 6 details the requirements for the ground operation of aircraft radar. This applies only to aircraft radar units having a nominal peak power output rating in excess of 25 KW. Most light aircraft have Weather Radar units which operate at nominal power output ratings well below 25 KW.

It is important for pilots (and engineers) the restrictions in place for the ground operation of aircraft radar. In general terms, the limitations relate to how the radar unit is being operated. In the normal mode (antenna rotating) the sector being scanned by the radar beam must be clear of persons, equipment, fuel tankers and other aircraft by at least 37 metres (120 feet). If the radar unit antenna is not rotating (stationary) then the distance is increased to greater than 60 metres (200 feet). If an approved beam attenuating device (Lead shield) is used then the distances can be reduced by 75%. That is approximately 10 metres (30 feet) in the rotating mode or approximately greater than 15 metres (50 feet) in the stationary mode. This shield must always be used if the radar unit is being energised in side a building or hangar.

Under no circumstances may a radar unit be operated in an aircraft being refuelled.

