is supplied with fuel from the aircraft tanks. The APU compartment is equipped with a fire detection and extinguishing system.

12.16 AVIONIC SYSTEMS

Avionic systems are dealt with in Section 11 of this handbook. For the sake of completeness, definitions of the avionic system are given here in the same way as above for the nonavionic systems. Introductory information can also be obtained from the related literature given in Further Reading.

Auto Flight (ATA 22)

Details of the auto flight system are covered in Section 11. The auto flight as defined by ATA 100:

> Those units and components which furnish a means of automatically controlling the flight of the aircraft. Includes those units and components which control direction, heading, attitude, altitude and speed.

The most important parts of the auto flight system are the autopilot and the auto throttle (auto thrust) system.

The autopilot is (ATA 100):

> that portion of the system that uses radio/radar signals, directional and vertical references, air data (pitot-static), computed flight path data, or manually induced inputs to the system to automatically control the flight path of the aircraft through adjustment to the pitch/roll/yaw axis or wing lift characteristics and provide visual cues for flight path guidance, i.e.: Integrated Flight Director. This includes power source devices, interlocking devices and amplifying, computing, integrating, controlling, actuating, indicating and warning devices such as computers, servos, control panels, indicators, warning lights, etc.

and the auto throttle is

> that portion of the system that automatically controls the position of the throttles to properly manage engine power during all phases of flight/attitude. This includes engaging, sensing, computing, amplifying, controlling, actuating and warning devices such as amplifiers, computers, servos, limit switches, clutches, gear boxes, warning lights, etc.

Communication (ATA 23)

Details of the communication system are covered in Section 11. Communication systems as defined by ATA 100:

> Those units and components which furnish a means of communicating from one part of the aircraft to another and between the aircraft or ground stations, includes voice, data, C-W communicating components, PA [Passenger Address] system, intercom and tape reproducer-record player.

The communication system includes (ATA 100):

- Speech communication: Radio communication air-to-air, air to ground. HF, VHF, UHF radio communication, in-flight telephone, and satellite receiver
- Data transmission and automatic calling: Selcal (Selected Call) and ACARS (Aircraft Communicating Addressing and Reporting System)
- Passenger address and entertainment system:[15]
  - Entertainment: Audio, overhead video, in-seat video, interactive video, in-seat telephone, video on demand, Internet systems, and seat power supply system for passenger laptops
  - Passenger address system: The system to address the passengers from the cockpit or the cabin crew station, playback of automatic recordings, boarding music, or acoustic signs.
- Audio integrating: Controls the output of the communications and navigation receivers into the flight crew headphones and speakers and the output of the flight crew microphones into the communications transmitters; also includes the interphone, used by flight and ground personnel to communicate between areas on the aircraft
- Integrated automatic tuning of navigation transmitters and receivers
- Cockpit voice recorder

Indicating/Recording Systems (ATA 31)

The indicating/recording system deals primarily with the instrument panels and controls. This aspect is covered in Section 11 of this handbook. Indicating/recording systems as defined by ATA 100:

> coverage of all instruments, instrument panels and controls... Includes systems/units which integrate indicating instruments into a central display system and instruments not related to any specific system.

The indicating/recording system includes (ATA 100):

- The instrument and control panels (Figure 12.65)
- Independent instruments (not related to any other aircraft system)
- Flight data recorder, recorders for performance or maintenance data
- Central computers, central warning and display systems

[15] In ATA 2200 the passenger address and entertainment system has become the "cabin systems (ATA 44)" in its own right. Definition: "Those units and components which furnish a means of entertaining the passengers and providing communication within the aircraft and between the aircraft cabin and ground stations. Includes voice, data, music and video transmissions."

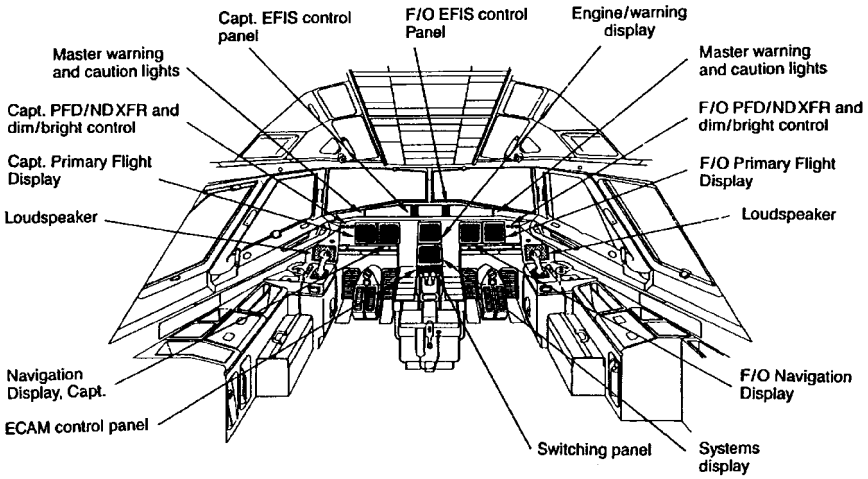

FIGURE 12.65 A321 general cockpit arrangement and instrument layout.

Navigation (ATA 34)

Details of the navigation system are covered in Section 11. The navigation system as defined by ATA 100:

> Those units and components which provide aircraft navigational information. Includes VOR, pitot, static, ILS, ... compasses, indicator, etc.

Data handling of the navigation system includes (ATA 100):

- Flight environment data (pitot/static system, rate of climb, airspeed, etc.)
- Magnetic data (magnetic compass)
- Independent data (inertia guidance systems, weather radar, Doppler, proximity warning, collision avoidance)
- Dependent data (DME, transponder, radio compass, LORAN, VOR, ADF, OMEGA, GPS)
- Data from landing and taxiing aids (ILS, marker)

ACKNOWLEDGMENT

All figures named "A321" are by courtesy of Airbus. They are taken from the *Aircraft Maintenance Manual* (AMM), the *Flight Crew Operations Manual* (FCOM), or other material prepared or used for flight maintenance training. *At no time should the information given be used for actual aircraft operation or maintenance. The information given is intended for familiarization and training purposes only.*