



Elements

Daniel A. Martinec

ARINC

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The basic elements of the avionics suite on aircraft typically relate to the communications, navigation, and surveillance (CNS) functions. The term *CNS* is used widely throughout the aviation industry to address those functions addressed later in this handbook. The elements described in this section constitute the most fundamental “backbones” of the overall avionics suite performing the CNS functions.

Digital data buses provide the necessary onboard digital communications among the avionics elements comprising the overall airborne system. The avionics use digital data buses with (mostly) standardized physical and electrical interfaces to send their internal data to other avionics. The data may comprise sensor information, the results of internal calculations, system commands, information from internal storage, relayed data, or any information that may be generated by a computational device. The overall avionics suite, through the use of these interconnected digital data buses, operates similarly to ground-based networks. A primary difference is the amount of certification required to ensure that the very high level of integrity and safety required for aviation is maintained. Three widely used buses are examined: AS 15531/MIL-STD-1553B Digital Time Division Command/Response Multiplex Data Bus; ARINC 429 Digital Information Transfer System – Mark 33; and the Commercial Standard Digital Bus.

Batteries are an essential element to provide engine starting power and back up, sustaining power for avionics, especially flight critical avionics.

Avionics performing the basic CNS functions are not the only critical elements of aircraft. Crew interfaces play an important role in assuring that the crew can interact with these avionics and that the aircraft can be flown effectively and safely. This section provides a description of some advanced and evolving technologies that can provide the crew situational awareness of the aircraft and the environment in which the aircraft flies. Included are various display technologies and speech recognition along with retinal scanning displays. Guidance is also given on proven techniques for flight deck design, a task often approached in an *ad hoc*, undisciplined manner.