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This information was selected after 20 years of experience as the most valuable content for a single, handy reference. All installations must follow the manufacturer’s guidance, but you’ll save time and effort with the familiarization possible with this data-filled volume. For a complete list of pin connection diagrams covered, and Table of Contents, please check www.avionics.com

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Principles of Avionics - Ninth Edition

*The most up-to-date text on avionics is expanded in its Ninth Edition to cover the most recent developments.*

*The new edition has enhanced chapters on aircraft databuses, networking and GPS. Appendices cover ARINC and RTCA documents, with an expanded section on inertial guidance*

Written by an eminent professor of avionics, Dr. Albert Helfrick, this book includes every communication and navigation system, plus the latest spaced-based avionics. The text describes navcom, transponder, VOR, ADF, DME, TACAN, instruments, radar, autopilot, collision avoidance, enhanced ground proximity warning and other traditional avionics.

The book then covers all recent systems; Mode S, electronic displays, Free Flight, GPS space and earth segments, laser gyro’s, fiber optics and avionics architectures. Principles of Avionics -Ninth Edition is the most timely book on avionics now available. (For complete Table of Contents, please see: www.avionics.com)

This edition introduces a new chapter on the most important concept now affecting avionics; “Performance-Based Navigation and Required Navigation Performance.” Dr. Helfrick explains how avionics, once discussed as separate systems, are now viewed as components in a much larger infrastructure for air traffic management. He describes the technical requirements affirmed by ICAO (International Civil Aviation Organization).

The author describes the theory of each system with figures, photos, problems and solutions. Over 150 graphics illustrate basic principles. Dr. Helfrick is well-known as an avionics test equipment designer, consultant to FAA, and a frequent speaker at the Digital Avionics Systems Conference. In his teaching role at Embry-Riddle Aeronautical University, Professor Helfrick’s students are in 2- and 4-year avionics technician and engineering programs. He wrote this book to meet a long-standing need for a text and reference for anyone needing to know the latest theory and practice behind airborne electronic systems.
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Every Technician Will Have to Know Avionics Systems

This book responds to important changes facing aviation maintenance. As digital electronics spread through all aircraft, the job of “bench technician” is disappearing. New, computerized avionics must be sent back to the factory for repair. It's created a growing need for technicians who can identify a faulty black box on an airplane, remove it, then re-install and check it out after the repair.

The demand for technicians with a systems knowledge will increase as avionics expand beyond communications and navigation. Nearly every electrical and hydraulic system aboard aircraft is changing—by adding electronics. A new industry—cabin electronics (for Internet, e-mail, telephone and entertainment)—places hundreds more devices on board that fall under “avionics.”

For this reason, many airlines now require A&P mechanics to get an FCC license, which teaches general electronic theory—but no avionics of practical value.

The aviation industry is moving toward the “all-electric” airplane, where hydraulic and electromechanical components are replaced by small, smart electronic devices. Even today, electronics are over 30% the cost of an airplane.

There's a new air traffic system just now starting. It requires upgraded avionics for aircraft to receive shorter routes, favorable winds and many new services.

These trends promise a bright future for the aviation maintenance technician trained in avionics systems.

For complete Table of Contents, see next page

About the Author

Len Buckwalter started Avionics Magazine and served as Publisher and Editor for 17 years. Specializing in aviation electronics, he wrote over 2000 magazine articles and 25 books. Mr. Buckwalter started www.avionics.com in 1993 to launch Avionics Library, publisher of books, CD's and software for technicians and engineers in the avionics industry.

A graduate of New York University, he served in the U.S. Signal Corps as Communications Chief of an air-ground signal battalion, constructing communications systems. He was founder and president of Avionics Center, an FAA-certified repair station.

Mr. Buckwalter is an instrument-rated pilot with 3000 hours and attends the ARINC Avionics Maintenance Conference, Aircraft Electronics Association and Airlines Electronics Engineering Committee meetings.
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The author, Gerald Fuller, has trained over 500 FAA certification officials, corporate managers and avionics engineers in HIRF requirements. A former chief of Vulnerability Assessment, U.S. National Security Agency, he has 35 years’ experience with EMI/HIRF issues and now works with SAE, IEEE, AIAA and Lawrence Livermore National Laboratory.
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**Communications:** The FAA will transition from analog voice to digital communications in NEXCOM. Datalink will reduce voice congestion. Ground-to-ground and administrative communications will integrate into a digital telecommunications system.

**Avionics:** Aircraft will change over to satellite technology for navigation, landing and reporting position information (to the ground and other aircraft. Multifunction traffic cockpit displays will show nearby aircraft, weather, maps and data.

**Traffic Management:** ATM (Air Traffic Management) will replace ATC (Air traffic Control) to reduce congestion and delay. A system-wide network will consolidate numerous systems and enable users to share services. En route computers will receive new hardware, operating systems and controller positions. Oceanic aircraft tracking, now done manually, will be accomplished by satellite data link. Many other changes are described—for improving terminal operations, better tools for tower and airport surface operations and widespread remote monitoring for reducing delays. Hundreds of images, charts, tables, presentations and documents on the new global airspace.

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**Earth Segment:** Antennas, transmit-receive, earth stations.

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