#### IN THIS ISSUE . . .

Aerospace High Voltage Development	2	
New Concepts in Collision Avoidance Logic		
Expert Systems in the Cockpit of the '90s		
An Assessment of the 1990 Digital/Electric Airplane		
2010: The Symbionic Cockpit		
Inside AESS—Organizational Affairs		
Message from the President		
1986 Fellows		
EASCON 86 Chairman Named		
Book Reviews		
Publications	34	
WINCON 86		

## **ABOUT THE COVER...**

The logo of the AESS symbolizes system strength through many interconnected disciplines, and is used here as this is Volume One, Number One of this magazine.



# IEEE AEROSPACE AND ELECTRONIC SYSTEMS SOCIETY



The Aerospace and Electronic Systems Society is a society, within the framework of the IEEE, of members with professional interests in the organization, design, development, integration and operation of functional systems for space, air, ocean or ground environments. These systems include, but are not limited to, navigation, avionics, spacecraft, aerospace power, radar, sonar, telemetry, defense, transportation, and command and control. All members of the IEEE are eligible for membership in the Society and will receive this Magazine and the Transactions upon payment of the annual Society membership fee. The Society Board of Governors, Organization, and its Committees will be found on cover 3.

## Information for coasideration for inclusion in this publication should be sent to either of the following:

EDITOR-IN-CHIEF	Lee D. Dickey	1615 White Way Drive, Arlington, TX 76013, (817) 277-9992
ASSISTANT EDITOR AESS Affairs	Stewart Baily	ARINC, 2551 Riva Road, Annapolis, MD 21401, (301) 266-4821
ADMINISTRATIVE EDITOR	David B. Dobson	6411 Chillum Place, NW, Washington, DC 20012, (202) 722-2246
CONTRIBUTING EDITORS Careers Patents Military Systems New Horizons Research & Publications USAB	Don C. Friedmann Ben J. Goldfarb Rick Kenefic Paul J. Nahin Steven Riter John J. Kelleher	4220 Falstaff Road, Baltimore, MD 21215, (301) 859-6007 1001 Playford Lane, Silver Spring, MD 20901 4603 Aboite Lake Drive, Ft. Wayne, IN 46804, (219) 429-5825 Dept. EE, Kingsbury Hall, Univ. NH, Durham NH 03824, (603) 862-1357 Dept. EE, Univ. Texas at El Paso, El Paso, TX 79902 3717 King Arthur Road, Annandale, VA 22003, (703) 560-4438
EDITOR EMERITUS	Ben J. Goldfarb	1001 Playford Lane, Silver Spring, MD 20901

## THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Bruno O. Weinschal, President Henry L. Bachman, President-Elect Charles A. Eldon, Past President
Emerson W. Pugh, Executive Vice President
Michiyuki Uenohara, Secretary
Edward J. Doyle, Treasurer

Cyril J. Tunis, Vice President, Educational Activities Carleton A. Bayless, Vice President, Professional Activities Charles H. House, Vice President, Publication Activities Dennis Bodson, Vice President, Regional Activities John E. May, Director, Standards Activities Merlin G. Smith, Vice President, Technical Activities

HEADQUARTERS STAFF. Eric Herz, Executive Director and General Manager Elwood K. Gannett, Deputy General Manager Thomas W. Bartlett, Controller Donald Christiansen, Editor of IEEE Spectrum

John F. Wilhelm, Staff Director, Educational Services Donald L. Suppers, Staff Director, Field Services Leo Fanning, Staff Director, Professional Activities David L. Staiger, Staff Director, Publishing Services Sava 1. Sherr, Staff Director, Standards Services Irving Engelson, Staff Director, Technical Activities

Thomas C. White, Public Information Charles F. Stewart, Jr., Staff Director, Administration Services

EIEE AEROSPACE AND ELECTRONIC SYSTEMS MAGAZINE is published monthly by The Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, NY 10017. Responsibility for the contents rests upon the authors and not upon the IEEE, the Society, or its members. IEEE Service Center (for orders, subscriptions, address changes): 445 Hoes Lane, Piscataway, N.J. 08854. Telephones: Headquarters 212-705 + extension: Information—7900, General Manager—7910, Controller—7748, Educational Services—7860, Publishing Services—7560. Region/Section Services—7571, Technical Services—7890. IEEE Service Center (201) 981-0060, Washington Office/Professional Services (202) 785-2992. Telex No. 236-411 (International messages only). This Journal is available in either microfiche or printed form. Additional copies may be purchased at \$3.00 (first copy only) by IEEE members and \$6.00 per copy by nonmembers. Annual subscription price: IEEE members, dues plus Society fee. Price for nonmembers available on request. COPYRIGHT AND REPRINT PERMISSIONS: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limits of U.S. Copyright law for private use of patrons: (1) those post-1977 articles that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 29 Congress St., Salem, MA 01970, (2) pre-1978 articles without fee. Instructors are permitted to photocopy isolated articles for noncommercial classroom use without fee. For other copying, reprint or republication permission, write to the Director of Publishing Services at IEEE Headquarters. All rights reserved. Copyright © 1986 by The Institute of Electrical and Electronics Engineers, Inc. Printed in U.S.A. Second-class postage paid at New York, N.Y., and additional mailing offices. Postmaster: Send address changes to IEEE Aerospace and Electronic Systems Society, Newsletter (USPS 212-660) which was distributed to members only. Back copies of thes