## IN THIS ISSUE . . .

President's Message	1
George Forbes: Carbon Brush Inventor	2
Regulatory Compliance: The Real World	8
Modular Stores Management System	11
EM Transient Protection for LRU's	17
Cellular Mobile Telephone Environment	27
EASCON '86	18
Inside AESS	32
WINCON BOG Meeting Summary	34
Book Review	36
From Our Mailbox	36

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

Professor Forbes, the subject of our lead article, received patent No. 1288 for "Improved Means for Establishing Electric Connection between Surfaces in Relative Motion Applicable to the Collectors of Dynamo Machines" on January 29th, 1885.



## 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.

EDITOR-IN-CHIEF	Lee D. Dickey	1615 White Way Drive, Arlington, TX 76013, (817) 277-9992
ASSISTANT EDITOR—AESS Affairs	Joseph F. Kasper	TASC, 8301 Greensboro Dr., Ste 1000, McLean, VA 22102, (703) 734-4100 x262
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. Weinschel, 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 Carleton A. Bayess, vice President, Professional Activit 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

Eric Herz, Executive Director and General Manager Elwood K. Gannett, Deputy General Manager Thomas W. Bartlett, Controller Donald Christiansen, Editor of IEEE Spectrum Thomas C. White, Public Information

HEADQUARTERS STAFF

Charles F. Stewart, Jr., Staff Director, Administration Services

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 I. Sherr, Staff Director, Standards Services Irving Engelson, Staff Director, Technical Activities

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) 785-24929. 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 e. 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 Ilaw 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 In 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