IN THIS ISSUE ...

President's Message	1
NASTYGLASS Windows	2
LORAN-C in the 21st Century	8
Mid-Continent LORAN-C Expansion	11
NAVSAT	15
Microwave Landing System Area Navigation	23
Inside AESS — New Governor	29
- Annual Reports	29
- EASCON Awards	32
- Resnik Recipient	33
Foreign Technology Abstracts	Centerfold Insert
Annual Index	Follows Page 34

ABOUT THE COVER ...

Since we could not print our photograph of *NASTYGLASS*, we decided to adorn the cover with illustrations from Paul Mahin's article on page two.



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, 1700 N. Moore St., Suite 1800, Arlington, VA 22209, (703) 558-7400
ADMINISTRATIVE EDITOR	David B. Dobson	6411 Chillum Place, NW, Washington, DC 20012, (202) 722-2246
CONTRIBUTING EDITORS		
Careers	Don C. Friedmann	4220 Falstaff Road, Baltimore, MD 21215, (301) 859-6007
Foreign Technology	Joan Doerr	Westinghouse, MS 1138, P.O. Box 746, Baltimore, MD 21203, (301) 765-2858
Patents	Ben J. Goldfarb	1001 Playford Lane, Silver Spring, MD 20901
New Horizons	Paul J. Nahin	Dept. EE, Kingsbury Hall, Univ. NH, Durham, NH 03824, (603) 862-1357
Research & Publications	Steven Riter	Dept. EE, Univ. Texas at El Paso, El Paso, TX 79902
USAB	John J. Kelleher	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.

Henry L. Bachman, President	Ronald G. Hoelzeman, Vice President, Educational Activities
Russell C. Drew, President-Elect	Carleton A. Bayless, Vice President, Professional Activities
Bruno O. Weinschel, Past President	Charles H. House, Vice President, Publication Activities
Merrill W. Buckley, Executive Vice President	Robert S. Duggan, Jr., Vice President, Regional Activities
Ramiro Garcia Soza, Secretary	Donald C. Fleckenstein, Director, Standards Activities
Edward J. Doyle, Treasurer	Emerson W. Pugh, Vice President, Technical Activities
HEADQUARTERS STAFF	
Eric Herz, Executive Director and General Manager	Rudolf A. Stampfl, Staff Director, Educational Services
Elwood K. Gannett, Deputy General Manager	Donald L. Suppers, Staff Director, Field Services
Thomas W. Bartlett, Controller	Leo Fanning, Staff Director, Professional Activities
Donald Christiansen, Editor of IEEE Spectrum	David L. Staiger, Staff Director, Publishing Services
Thomas C. White, Public Information	Sava I. Sherr, Staff Director, Standards Services
Charles F. Stewart, Jr., Staff Director, Administration Services	Irving Engelson, Staff Director, Technical Activities

IEEE 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, NJ 08854. Telephones: Headquarters 212-705 + extension: Information—7900, General Manager—7910, Controller—7748, Educational Services—7860, Publishing Services—7560, Region/Section Services—7751, Technical Services—7800, IEEE Service Center (201) 981-0060. Washington Office/Professional Services (202) 785-0017. NY Telecopier No. (212) 752-4929. 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 (1970, (2) pre-1978 articles without fee. Instructors are permitted to photocopy isolated articles for noncommercial classroom use without fee. For copying, reprint or republication permission, write to the Director of Publishing Services. Postmaster: Send address changes to IEEE Aerospace and Electronic Systems Magazine, 445 Hoes Lane, Piscataway, NJ 08854. This publication was formerly known as the IEEE Aerospace and Electronic Systems Society Newsletter (USPS 212-660) which was distributed to members only. Back copies of these issues are not available.