

# JOURNAL of the SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS

PUBLICATION OFFICE, TWENTIETH AND NORTHAMPTON STREETS, EASTON, PA.

## Officers

### President, 1969-70

DEANE R. WHITE, E. I. du Pont de Nemours & Co., Inc., Photo Products Department, Parlin, N.J. 08859

### Executive Vice-President, 1969-70

WILTON R. HOLM, Association of Motion Picture & Television Producers, Inc., 8480 Beverly Blvd., Hollywood, Calif. 90048

### Past President, 1969-70

G. CARLETON HUNT, DeLuxe General, Inc., 850 Tenth Ave., New York, N.Y. 10019

### Engineering Vice-President, 1970-71

WILLIAM T. WINTRINGHAM, Consultant, 56 Elmwood Ave., Chatham, N.J. 07928

### Editorial Vice-President, 1969-70

RODGER J. ROSS, Canadian Broadcasting Corp., P.O. Box 500, Terminal "A", Toronto 2, Ontario, Canada

### Financial Vice-President, 1970-71

KENNETH M. MASON, Eastman Kodak Co., 6706 Santa Monica Blvd., Hollywood, Calif. 90038

### Conference Vice-President, 1969-70

E. B. MCGREAL, Producers Service Corp., 1200 Grand Central Ave., Glendale, Calif. 91201

### Sections Vice-President, 1970-71

WILLIAM D. HEDDEN, Calvin Communications, Inc., 1105 Truman Rd., Kansas City, Mo. 64106

### Vice-President for Educational Affairs, 1970-71

HERBERT E. FARMER, University of Southern California, Division of Cinema, University Park, Los Angeles, Calif. 90007

### Vice-President for Photo-Instrumentation Affairs, 1970-71

CARLOS H. ELMER, 6620 E. Cholla St., P.O. Box 875, Scottsdale, Ariz. 85252

### Vice-President for Motion-Picture Affairs, 1970-71

EDWARD H. REICHARD, Consolidated Film Ind., 959 Seward St., Hollywood, Calif. 90038

### Vice-President for Photo-Science Affairs, 1970-71

RODERICK T. RYAN, 2636 Stoner, Los Angeles, Calif. 90064

### Vice-President for Television Affairs, 1970-71

K. BLAIR BENSON, CBS Television Network, 51 West 52nd St., New York, N.Y. 10019

### Secretary, 1969-70

H. THEODORE HARDING, E. I. du Pont de Nemours & Co., Inc., Photo Products Dept. N11444, Wilmington, Del. 19898

### Treasurer, 1970-71

BYRON S. ROUDABUSH, Byron Motion Pictures, Inc., 65 K St., N.E., Washington, D.C. 20002

### Governors, 1969-70

CHARLES E. ANDERSON, Ampex Corp., 401 Broadway, MS3-59, Redwood City, Calif. 94063

ROGER J. BEAUDRY, 47 Hampshire Heights, Islington, Ontario, Canada

FRANK P. BRACKETT, JR., Technicolor Inc., 6311 Romaine St., Hollywood, Calif. 90038

ALLEN F. HILLIARD, Geo. W. Colburn Laboratory, Inc., 164 N. Wacker Drive, Chicago, Ill. 60606

NEAL KEEHN, DeLuxe General, Inc., 1546 N. Argyle St., Hollywood, Calif. 90028

WILLIAM A. KOCH, Eastman Kodak Co., 1901 West 22nd St., Oak Brook, Ill. 60521

ARTHUR J. MILLER, Horizon Towers North—Apt. 203, Horizon Rd., Fort Lee, N.J. 07024

RICHARD E. PUTMAN, 205 Wynnfield Dr., Syracuse, N.Y. 13219

### Governors, 1970-71

D. MAX BEARD, 10703 E. Nolcrest Dr., Silver Spring, Md. 20903

ROBERT A. COLBURN, Geo. W. Colburn Lab., Inc., 164 N. Wacker Dr., Chicago, Ill. 60606

JACK P. HALL, Producers Service Corp., 1200 Grand Central Ave., Glendale, Calif. 91201

JOHN J. KOWALAK, MovieLab, Inc., 619 W. 54th St., New York, N.Y. 10019

HENRY N. KOZANOWSKI, RCA Corp., Camden, N.J. 08102

JOHN R. SULLIVAN, Eastman Kodak Co., 6706 Santa Monica Blvd., Hollywood, Calif. 90038

EDWARD M. WARNECKE, Eastman Kodak Co., P.O. Box 4778-Federal Annex, Atlanta, Ga. 30318

### Section Chairmen

ROBERT L. BELL, ABC News Bureau, 1124 Connecticut Ave., N.W., Washington, D.C. 20036

CHARLES R. CANNON, JR., Southern Film Labs., 2381 John Glenn Dr., Suite 105, Chamblee, Ga. 30341

JACKSON R. CRAVENS, 1624 Iroquois Rd., Pueblo, Colo. 81001

KENNETH P. DAVIES, 45 St. John's Rd., Pointe Claire, Quebec, Canada

JAMES B. DEWITT, 65 Page Rd., Needham, Mass. 02192

FRANK J. EBERHARDT, 102 Pineapple Lane, Atlamonte Springs, Fla. 32701

DENIS H. G. HOWE, 681 Lombardy Lane, Deerfield, Ill. 60015

RALPH L. HUCABY, 945 Caldwell Lane, Nashville, Tenn. 37204

JOHN M. McDONOUGH, 608 Shadyglen Circle, Webster, N.Y. 14580

GEOFFREY R. OLIVER, 18 Torrington Dr., Etobicoke, Ontario, Canada

RICHARD O. PAINTER, Box 73, Milford, Mich. 48042

THOMAS F. PETERSON, JR., 3060 Lander Rd., Cleveland, Ohio 44124

HERBERT R. PILZER, Motion Picture Enterprises, Tarrytown, N.Y. 10591

WERNER H. RUHL, 415 Molimo Dr., San Francisco, Calif. 92417

HOWARD F. STUCKER, California State College at Los Angeles, 5151 State College Dr., Los Angeles, Calif. 90032

## Editorial Office

9 East 41st St., N. Y. 10017

Editor—VICTOR H. ALLEN

Advertising & Conference Manager

JEFFREY B. FRIEDMAN

## BOARD OF EDITORS

Chairman—PIERRE MERTZ

66 Leamington St., Lido, Long Beach, N.Y. 11561

C. J. BARTLESON

HARLAN L. BAUMBACH

GERALD M. BEST

ELMER A. BOWEN, JR.

BERLYN BRIXNER

J. S. COURTNEY-PRATT

BERNARD E. DRIMMER

CARLOS H. ELMER

HERBERT E. FARMER

CHARLES R. FORDYCE

JOHN L. FORREST

JOHN G. FRAYNE

A. M. GUNDELINGER

CHARLES W. HANDLEY

CLYDE R. KEITH

DON V. KLOEPFEL

GLENN E. MATTHEWS

HERBERT W. PANGBORN

BERNARD D. PLAKUN

WALDEMAR J. POCH

STANLEY F. QUINN

ROXANNE O'MALLEY RAY

RICHARD W. RODGERS

SIDNEY P. SOLOW

ALLAN L. SOREM

R. T. VAN NIMAN

PETRO VLAHOS

RICHARD A. WALKER

PABLO WEINSCHENK-

TABERNERO

DEANE R. WHITE

A. D. WILLIAMS

W. T. WINTRINGHAM

HAROLD WRIGHT

CHARLES W. WYCKOFF

EMERSON YORKE

Papers Committee Chairman—ALLAN L. WILLIAMS, Eastman Kodak Co., 343 State St., Rochester, N.Y. 14650

THE SOCIETY today is the result of nearly fifty-four years of achievement and leadership. Its members are engineers, scientists and technicians skilled in every branch of motion pictures, television, instrumentation and high-speed photography. Through the Society they are able to keep abreast of current technology and contribute continuously to the technological advancements and education in these fields.

Membership is open to any interested person according to his qualifications. The Society's Headquarters welcomes inquiries from individuals who may apply for these grades: Active (annual dues, \$25.00), Associate (annual dues, \$25.00), Jr. Associate (annual dues, \$20.00) and Student (annual dues, \$5.00). All members receive the Journal.

Subscriptions to the Journal are available to non-members at \$26.00 a year (outside continental United States, add \$1.00 for postage). Single copies are \$2.50 for one-part issues; \$3.00 for special two-part issues. Journal subscription price to students is \$7.50. A 10% discount is allowed to individual members and accredited agencies on orders for subscription and single copies. Residents in countries that participate in UNESCO may use UNESCO coupons for payment in the event other means for remitting are not available.

NOTE: The costs given above for dues and subscription rates are effective January, 1971.

In addition to information about membership, subscriptions, technical activities, standards and test films, a list of priced and gratis publications is available from the Society's Headquarters Office, 9 East 41st St., New York, N.Y. 10017

# SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS, INC.

Headquarters Office: 9 East 41st St., N.Y. 10017

Cables: Somopict

Telephone: (Area 212) 867-5410

Executive Secretary: DENIS A. COURTNEY

Published monthly by the Society of Motion Picture and Television Engineers, Inc. Publication office 20th and Northampton Sts., Easton, Pa. Second-class postage paid at Easton, Pa. © Copyright 1970, by the Society of Motion Picture and Television Engineers, Inc. Permission to republish Journal text material must be obtained in writing from the Society's Headquarters Office, 9 East 41st St., New York 10017. The Society is not responsible for statements of contributors. Printed by Mack Printing Company, Easton, Pa.