

JOURNAL of the SMPTE

PUBLICATION OFFICE, NINE EAST FORTY-FIRST STREET, NEW YORK, NY 10017

Officers

President 1971-72

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

Executive Vice-President, 1971-72

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

Past President, 1971-72

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

Engineering Vice-President, 1972-73

WILLIAM T. WINTRINGHAM, Consultant, 56 Elmwood Ave., Chatham, NJ 07928

Editorial Vice-President, 1971-72

RICHARD E. PUTMAN, General Electric Co., Command Performance Network, Electronics Park, Syracuse, NY 13201

Financial Vice-President, 1972-73

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

Conference Vice-President, 1971-72

HARRY TEITELBAUM, Hollywood Film Co., 956 Seward St., Hollywood, CA 90038

Sections Vice-President, 1972-73

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

Vice-President for Educational Affairs, 1972-73

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

Vice-President for Photo-Instrumentation Affairs, 1972-73

A. EARL QUINN, Eastman Kodak Co., Bldg. 35, Kodak Park Works, Rochester, NY 14650

Vice-President for Motion-Picture Affairs, 1972-73

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

Vice-President for Photo-Science Affairs, 1972-73

RODERICK T. RYAN, 4501 Hayvenhurst Ave., Encino, CA 91316

Vice-President for Television Affairs, 1972-73

K. BLAIR BENSON, CBS-TV, 51 West 52nd St., New York, NY 10019

Secretary, 1971-72

E. B. MCGREAL, 111 Via Koron, Lido Isle, Newport Beach, CA 92660

Treasurer, 1972-73

JOSEPH T. DOUGHERTY, 472 Vassar Pl., Brick Town, NJ 08723

Governors, 1971-72

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

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

TED FOGELMAN, Consolidated Film Industries, 959 Seward St., Hollywood, CA 90038

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

SHELDON NEMEYER, NBC News, 30 Rockefeller Plaza, New York, NY 10020

RICHARD S. O'BRIEN, CBS Television Network, 51 West 52nd St., New York, NY 10019

GEOFFREY R. OLIVER, 78 Waterford Dr., Weston, Ont., Canada

FREDERICK M. REMLEY, JR., University of Michigan, 310 Maynard Ave., Ann Arbor, MI 48108

ALLAN L. WILLIAMS, Eastman Kodak Co., 343 State St., Rochester, N.Y. 14560

Governors, 1972-73

ANTHONY D. BRUNO, Eastman Kodak Co., 6706 Santa Monica Blvd., Hollywood, CA 90038

ROBERT A. COLBURN, Geo. W. Colburn Labs., Inc., 164 N. Wacker Dr., Chicago, IL 60606

JOSEPH A. FLAHERTY, JR., CBS Television Network, 51 W. 52nd St., New York, NY 10019

NEAL KEEHN, DeLuxe General, Inc., 1546 N. Argyle St., Hollywood, CA 90028 (1972)

JOHN H. MAYNARD, Eastman Kodak Co., 1133 Ave. of the Americas, New York, NY 10036

GARLAND C. MISENER, Capital Film Labs., Inc., 11000 Powder Horn Dr., Potomac, MD 20854

HERBERT R. PILZER, Motion Picture Enterprises, Inc., Tarrytown, NY 10591 (1972)

FRED J. SCOBAY, DeLuxe General, Inc., 1546 N. Argyle Ave., Hollywood, CA 90028

EDWARD M. WARNECKE, Eastman Kodak Co., P.O. Box 4778 Federal Annex, Atlanta, GA 30302

Section Chairmen

J. OSCAR BARBER, 1998 N. E. 150th St., North Miami, FL 33161

HUGO A. BONDY, WAGA-TV, P.O. Box 4207, Atlanta, GA 30302

ANTHONY D. BRUNO, Eastman Kodak Co., 6706 Santa Monica Blvd., Hollywood, CA 90038

DONALD R. COLLINS, Tele-Cine Inc., 294 E. Shore Drive, Massapequa, NY 11758

LESTER DUNN, 2199 E. Field Way, Lakewood, CO 80227

STEPHEN A. KALLIS, JR., 112 Central Street, W. Acton, MA 01720

WILLIAM LITTLE, 2379 Panorama Drive, Deep Cove, North Vancouver, B.C., Canada

ALEXANDER R. MACGREGOR, 1670 Bayview Ave., Toronto, Ont., Canada

W. RUSSELL MCCOWN, 6660 Upton Lane, Nashville, TN 37209

JAMES W. PARKER, 4311 Black Locust Dr., Houston, TX 77088

RAYMOND W. PAYNE, National Film Board of Canada, Box 6100, Montreal 3, P.Q., Canada

FRANKLIN R. REINKING, Eastman Kodak Co., 6300 Cedar Springs Rd., Dallas, TX 75235

FREDERICK M. REMLEY, JR., University of Michigan, 310 Maynard Ave., Ann Arbor, MI 48108

DAVID W. RIDGWAY, 1735 Highland Pl., Berkeley, CA 94709

RICHARD K. SCHAFFER, 315 Highland Ave., Rochester, NY 14620

THOMAS SPENCE, Ohio Bell Telephone Co., 100 Erieview Pl., 2 fl. CCTV Ctr., Cleveland, OH 44114

MURRAY H. STEVENSON, 95 Merrivale La., Turramurra, N. S. W., Australia 2074

EDWARD A. WINKLER, 4340 Willow Woods Dr., Annandale, VA 22003

CORNELIUS L. ZICHTERMAN, 8429 Morton Ave., Morton Grove, IL 60053

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	BERNARD D. PLAKUN
HARLAN L. BAUMBACH	WALDEMAR J. POCH
LEO BEISER	STANLEY F. QUINN
GERALD M. BEST	ROXANNE O'MALLEY RAY
ELMER A. BOWEN, JR.	RODGER J. ROSS
BERLYN BRIXNER	SIDNEY P. SOLOW
J. S. COURTNEY-PRATT	WOODLIEF THOMAS, JR.
BERNARD E. DRIMMER	R. T. VAN NIMAN
CARLOS H. ELMER	PETRO VLAHOS
HERBERT E. FARMER	RICHARD A. WALKER
CHARLES R. FORDYCE	PABLO WEINSCHENK-TABERNERO
JOHN L. FORREST	DEANE R. WHITE
JOHN G. FRAYNE	RALPH D. WHITMORE, JR.
A. M. GUNDELFINGER	A. D. WILLIAMS
CLYDE R. KEITH	W. T. WINTRINGHAM
DON V. KLOEPFEL	HAROLD WRIGHT
GLENN E. MATTHEWS	CHARLES W. WYCKOFF
LESLIE J. MURCH	
HERBERT W. PANGBORN	

THE SOCIETY today is the result of over fifty-five 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.

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: 9 East 41st Street, New York, N.Y. Second-class postage paid at New York, N.Y. and at additional mailing office. © Copyright 1972, 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.