



IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES

FEBRUARY 1971

VOLUME MTT-19

NUMBER 2

Published Monthly

EDITORIAL BOARD

Editor

G. I. Haddad

D. K. Adams
D. B. Anderson
F. Arams
J. R. Ashley
K. Ayaki
A. J. Bahr
R. H. T. Bates
R. W. Beatty
H. Beneking
P. Bernardi
M. M. Brady
F. Brand
M. Brodwin
H. Bussey
C. J. Carter
K. S. Champlin
A. Clavin
S. B. Cohn
E. Cristal
J. B. Davies
L. E. Davis
B. C. DeLoach
L. B. Felsen
F. E. Gardiol
R. V. Garver
J. W. Gewartowski
P. Goodman
A. Gopinath
A. I. Grayzel
S. Hagelin
R. D. Hall
M. A. K. Hamid
W. Harth
J. Helszajn
B. Hershenov
M. C. Horton
D. D. King
W. Kotyczka
R. Levy
L. Lewin
N. Lipetz
W. E. Little
T. Makimoto
G. L. Matthaei
S. E. Miller
R. Mittra
W. W. Mumford
B. R. Nag
L. S. Nag
E. Dragø Nielsen
H. Okean
D. Parker
J. D. Rhodes
K. R. Richter
E. Rivier
G. P. Rodrique
F. J. Rosenbaum
R. Sato
G. E. Schafer
E. Schlömann
R. F. Schwartz
R. Steven
H. Sobol
P. I. Somlo
W. Steenaart
W. H. Steier
D. Steinbrecher
F. Sterzer
D. Stinson
D. J. R. Stock
W. Streifer
C. T. Tai
T. Tamir
J. Taub
F. J. Tischer
H.-G. Unger
A. C. van Nie
C. Veronda
R. J. Wenzel
A. Wexler
E. Yamashita
L. Young

SPECIAL ISSUE ON BIOLOGICAL EFFECTS OF MICROWAVES

EDITOR'S NOTE.....G. I. Haddad 128

GUEST EDITORIAL.....J. M. Osepchuk 128

INTRODUCTORY REMARKS.....W. W. Mumford 130

PAPERS

Biological Experiments and Biophysical Mechanisms

- The Tri-Service Program—A Tribute to George M. Knauf, USAF (MC) (*Invited Paper*).....S. M. Michaelson 131
- Interaction of Microwave and Radio Frequency Radiation with Biological Systems (*Invited Paper*).....H. P. Schwan 146
- Biological Function as Influenced by Low-Power Modulated RF Energy (*Invited Paper*).....A. H. Frey 153
- Microwave Radiation Safety Standards in Eastern Europe (*Invited Paper*).....K. Marha 165
- Absence of Heart-Rate Effects in Rabbits During Low-Level Microwave Irradiation.....I. T. Kaplan, W. Metlay, M. M. Zaret, L. Birenbaum, and S. W. Rosenthal 168
- Evidence for Nonthermal Effects of Microwave Radiation: Abnormal Development of Irradiated Insect Pupae.....R. L. Carpenter and E. M. Livstone 173

Analysis and Measurement of Microwave Fields in Biological Systems

- Quantifying Hazardous Electromagnetic Fields: Scientific Basis and Practical Considerations (*Invited Paper*).....P. F. Wacker and R. R. Bowman 178
- Induced Fields and Heating Within a Cranial Structure Irradiated by an Electromagnetic Plane Wave.....A. R. Shapiro, R. F. Lutomirski, and H. T. Yura 187
- New Techniques for Implementing Microwave Biological-Exposure Systems.....H. L. Bassett, H. A. Ecker, R. C. Johnson, and A. P. Sheppard 197
- Analyses of Electromagnetic Fields Induced in Biological Tissues by Thermographic Studies on Equivalent Phantom Models.....A. W. Guy 205
- Electromagnetic Fields and Relative Heating Patterns Due to a Rectangular Aperture Source in Direct Contact with Bilayered Biological Tissue.....A. W. Guy 214
- Microwave Heating of Simulated Human Limbs by Aperture Sources.....H. S. Ho, A. W. Guy, R. A. Sigelmann, and J. F. Lehmann 224

Applications and Engineering Reports

- Determination and Elimination of Hazardous Microwave Fields Aboard Naval Ships.....Z. R. Glaser and G. M. Heimer 232
- Selective Electromagnetic Heating of Tumors in Animals in Deep Hypothermia.....R. P. Zimmer, H. A. Ecker, and V. P. Popovic 238
- Prolongation of Life During High-Intensity Microwave Exposures.....G. M. Samaras, L. R. Muroff, and G. E. Anderson 245

BOOK REVIEWS

- Electromagnetic Fields and the Life Environment by K. Marha, J. Musil, and H. Tuhá.....reviewed by C. Süsskind 248
- Electromagnetic Fields and Life by A. S. Presman.....reviewed by C. Süsskind 248

CORRESPONDENCE

- Electromagnetic Radiation Meter.....E. E. Aslan 249
- Microwave Cataract.....R. W. Neidlinger 250
- Analeptic Effect of Microwave Irradiation on Experimental Animals.....R. D. McAfee 251

CONTRIBUTORS.....253