1967 G-MTT
INTERNATIONAL
MICROWAVE
SYMPOSIUM

PROGRAM &

DIGEST

MAY 8, 9, 10, 11, 1967
NEW ENGLAND LIFE HALL
STATLER HILTON HOTEL
BOSTON, MASS.

Editor: Robert A. Rivers

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TECHNICAL PROGRAM

NEW ENGLAND LIFE HALL, STATLER HILTON HOTEL

BOSTON, MASSACHUSETTS

Introductory Session **0900 - 0930, Monday, May 8**

WELCOMING REMARKS
Max Michelson, *Chairman, Steering Committee, 1967 International G-MTT Microwave Symposium.*
Saul Rosenthal, *Chairman, G-MTT National Administrative Committee.*

KEYNOTE SPEAKER – CHALLENGES FOR MICROWAVE THEORY
Professor Arthur A. Oliner, *Polytechnic Institute of Brooklyn, New York.*

Session I **Waveguides** **Monday, a.m. May 8th**

Chairman: Dr. Kiyo Tomiyasu
General Electric Company, Schenectady, New York

I-1 0930 COUPLING OF WAVEGUIDES BY RESISTIVE FILMS, Georg Epprecht, *Eidgenossische Technische Hochschule, Switzerland. (Invited)*

I-2 1000 ATTENUATING FILMS IN RECTANGULAR WAVEGUIDES, A. Wexler, *Manitoba University, Winnipeg, Canada.*

I-3 1020 A BROADBAND ABSORBING WALL FOR VHF RANGE UTILIZING THIN FERRITE TILES, K. Suetake, *Tokyo Institute of Technology. (Invited)*

1050 COFFEE BREAK

I-4 1110 A NEW CLASS OF LOW LOSS REACTIVE WALL WAVEGUIDES, R.P. Larsen, *Grumman Aircraft Engineering Corporation, and* A.A. Oliner, *Polytechnic Institute of Brooklyn.*

I-5 1130 COMPUTER SOLUTION OF WAVEGUIDE DISCONTINUITY PROBLEMS, P.J.B. Clarricoats, *Leeds University, England,* and K.R. Slinn, *Microwave Associates, Inc.*

I-6 1150 ELECTROMAGNETIC RESONANCES OF FREE DIELECTRIC SPHERES, M. Gastine, L. Courtois and J.L. Dormann, *Laboratoire de Magnetisme et de Physique du Solide, France.*

I-7 1210 RESEARCH ON MILLIMETER WAVE COMMUNICATION IN JAPAN, Ken-ichi Noda, *Nippon Telegraph & Telephone Public Corporation, Japan*

I-8 1230 OVERSIZED RECTANGULAR WAVEGUIDE COMPONENTS FOR MM WAVES, H.J. Butterweck and F.C. de Ronde, *Philips Research Laboratories, Netherlands.*

Session II **Filters and Couplers** **Monday, p.m., May 8**

Chairman: Dr. L. Young
Stanford Research Institute, Menlo Park, California

II-1 1400 THE SUPERCONDUCTING RESONATOR - A NEW MICROWAVE COMPONENT, H. Zimmer, *Philips, Zentrallaboratorium, Hamburg. (Invited)*

II-2 1430 A FREQUENCY TRANSORMATION FOR COMMENSURATE TRANSMISSION-LINE NETWORKS, E.G. Cristal, *Stanford Research Institute.*

II-3 1450 RADIAL-LINE BAND REJECTION FILTERS IN COAXIAL WAVEGUIDES, D. Varon, *Bell Telephone Laboratories, Inc.*

II-4 1510 WIDEBAND, HIGH SELECTIVITY DIPLEXERS UTILIZING DIGITAL-ELLIPTIC FILTERS, R.J. Wenzel, *The Bendix Corporation.*

1530 COFFEE BREAK

II-5 1550 A COMPUTER DESIGNED, 720 to 1 MICROWAVE COMPRESSION FILTER, Harry S. Hewitt, *Systems Techniques Laboratory, Stanford.*

II-6 1610 OPTIMAL 3-PORT POWER DIVIDERS DERIVED FROM HYBRID-T PROTOTYPES, S. David, *Wheeler Laboratories, Inc.*, and W.K. Kahn, *Polytechnic Institute of Brooklyn.*

II-7 1630 ELECTRICALLY SHORT 90° COUPLERS UTILIZING LUMPED CAPACITORS, C.W. Gerst, *Syracuse University Research Corporation.*

II-8 1650 A STRIPLINE DIRECTIONAL COUPLER UTILIZING A NON-HOMOGENEOUS DIELECTRIC MEDIUM, J.E. Dalley, *Bell Telephone Laboratories, Inc.*

Evening Sessions **1930 Monday, May 8th**

Parallel Sessions

PARLOR A – STATLER HILTON HOTEL

Tutorial Session On Microwave Integrated Circuits

Chairman: Roger Webster
Texas Instruments, Inc., Dallas, Texas

INVITED SPEAKERS:

Dr. Paul D. Stark, *Bell Telephone Laboratories, Inc., Murray Hill, New Jersey.*

Dr. Martin Caulton, *RCA Laboratories, Princeton, New Jersey.*

Dr. Arthur Uhlir, *Microwave Associates, Inc., Burlington, Massachusetts.*

PARLORS B and C – STATLER HILTON HOTEL

Rump and Late News Session On Microwave Sources

Chairman: Dr. Fred Sterzer
Microwave Applied Research, RCA Laboratories, Princeton, New Jersey

Session III **Ferrite Components** **Tuesday, a.m., May 9**

Chairman: P. Romanelli
Rome Air Development Center, Rome, New York

III-1 0900 A NON-RECIPROCAL FERRITE HYBRID, M. Omori, *Bell Telephone Laboratories, Inc.*

III-2 0920 HIGH POWER UHF Y JUNCTION CIRCULATOR, Y. Konishi, *Technical Research Laboratories, Nippon Hoso Kyokai, Tokyo, Japan.*

III-3 0940 S-BAND LATCHING CIRCULATOR WITH 10-NANOSECOND SWITCHING SPEED, P.C. Goodman and C.P. Tresselt, *The Bendix Corporation.*

III-4 1000 A NEW TYPE OF LATCHING, SWITCHABLE, FERRITE-JUNCTION CIRCULATOR, W.W. Sienkanowicz and W.A. Schilling, *Radio Corporation of America.*

1020 COFFEE BREAK

III-5 1040 BROADBAND LATCHING WAVEGUIDE CIRCULATOR, J.W. Simon, W.K. Alverson and J.E. Pippin, *Scientific-Atlanta, Inc.*

III-6 1100 A HIGH POWER, Y JUNCTION, E-PLANE CIRCULATOR, J.W. McGowan and W.H. Wright, Jr, *U.S. Army Electronics Command, Fort Monmouth.*

III-7 1120 LATCHING FERRITE PHASE SHIFTER FOR SCANNING DIELECTRIC LENS, P.J. Meier and B.J. Musso, *Airborne Instruments Laboratory, Division of Cutler-Hammer, Inc.*

III-8 1140 POLARIZATION INSENSITIVE PHASE SHIFTER FOR USE IN PHASED ARRAY ANTENNAS, M.C. Mohr and S.R. Monaghan, *Raytheon Company.*

Session IV Propagation In Ferrite Media Tuesday, p.m., May 9

Chairman: Dr. Peter A. Rizzi
Alpha Industries, Newton Upper Falls, Massachusetts

IV-1 A GENERAL THEORY FOR SPIN-WAVE SUPPRESSION IN FERRITES,
1400 C.D. Hannaford and M.J. Howes, *Leeds University, Department of Electrical Engineering, England. (Invited)*

IV-2 DEPENDENCE OF PEAK POWER THRESHOLD UPON ω_M/ω , J.J.
1430 Green, J.A. Hillier and J.H. Saunders, *Raytheon Research Division.*

IV-3 NON-LINEAR THRESHOLD IN REMANENT FERRITE, E. Stern, *MIT.*
1450

IV-4 OPERATING DYNAMICS AND PERFORMANCE LIMITATIONS OF
1510 FERRITE DIGITAL PHASE SHIFTERS, G.P. Rodrique, J.L. Allen, L.J. Lavedan and D.R. Taft, *Sperry Microwave Electronics Company.*

1530 COFFEE BREAK

IV-5 COMPUTER-AIDED ANALYSIS AS A QUANTITATIVE DESIGN TOOL FOR
1550 FERRITE PHASE SHIFTERS AND RESONANCE ISOLATORS, J.L. Allen, *Sperry Microwave Electronics Company.*

IV-6 NON-RECIPROCAL REMANENCE PHASE SHIFTERS IN H-GUIDE,
1610 E. Stern, *MIT.*

IV-7 FERRITE MICROSTRIP PROPAGATION, D.C. Buck, *Westinghouse.*
1630

IV-8 ON WAVE PROPAGATION IN PERIODIC MEDIA CONTAINING FERRITE,
1650 J.E. Goell, *Bell Telephone Laboratories, Inc.*

Symposium Banquet – 1900-2100 Tuesday, May 9th

1966 IEEE G-MTT MICROWAVE PRIZE
Professor Arthur A. Oliner, *Polytechnic Institute of Brooklyn, New York.*

1966 MORRIS E. LEEDS AWARD
William W. Mumford, *Bell Telephone Laboratories, Inc., Whippany, New Jersey.*

BANQUET SPEAKER
Professor John C. Slater, *University of Florida, Gainesville, Florida.*

Session V **Integrated Circuits** **Wednesday, a.m., May 10th**

Chairman: Frank Brand
U.S. Army Electronics R and D Laboratory, Fort Monmouth, New Jersey

V-1 0900 HIGH DIELECTRIC SUBSTRATES FOR MICROWAVE HYBRID INTEGRATED CIRCUITRY, G.D. Vendelin, *Texas Instruments, Inc.*

V-2 0920 MICROSTRIP TRANSMISSION LINES ON HIGH DIELECTRIC CONSTANT SUBSTRATES FOR HYBRID MICROWAVE INTEGRATED CIRCUITS, K.C. Wolters, P.L. Clar, *Motorola, Inc.*

V-3 0940 MICROSTRIP CIRCUITRY FOR INTEGRATED TRANSISTOR AMPLIFIERS, R.F. Mayo, S.P. Knight and R. Ekholdt, *RCA Laboratories, Inc.*

V-4 1000 MICROSTRIP HYBRID COUPLERS AND THEIR INTEGRATION INTO BALANCED MIXERS AT X- and K- BANDS, R.E. Blight, *Microwave Associates, Inc.*

1020 COFFEE BREAK

V-5 1040 LUMPED ELEMENTS IN MICROWAVE INTEGRATED CIRCUITS, D.A. Daly, S.P. Knight, M. Caulton and R. Ekholdt, *RCA Laboratories, Inc.*

V-6 1100 ALL GARNET MICROSTRIP CIRCULATORS FOR INTEGRATED CIRCUITS, B. Hershenov, *RCA Laboratories, Inc.*

V-7 1120 A THIN FILM X-BAND VARACTOR QUADRUPLER, J.B. Horton, *Texas Instruments, Inc.*

V-8 1140 COMPUTER ANALYSIS OF MICROWAVE INTEGRATED SWITCHES, H.E. Stinehelfer, Sr, *Microwave Associates, Inc.*

Session VI **Solid State Sources** **Wednesday p.m., May 10**

Chairman: M. Hines
Microwave Associates, Burlington, Massachusetts

VI-1 1400 RECENT ADVANCES IN BULK SEMICONDUCTOR MICROWAVE DEVICES IN JAPAN, T. Okoshi, *Department of Electrical Engineering, Tokyo University, Japan. (Invited)*

VI-2 1430 STATUS AND FUTURE OF IMPATTS, Dr. B.C. deLoach, *Bell Telephone Laboratories, Inc. (Invited)*

VI-3 1500 SERIES STACKED VARACTORS FOR HIGH POWER, HIGH FREQUENCY APPLICATIONS, W. Jann, T. Miles and J. DiBona, *Philco-Ford Corp.*

VI-4 1520 ITERATIVE SYNTHESIS OF VARACTOR-MULTIPLIER MICROWAVE NETWORKS AND A DOUBLER WITH 0.17 WATT OUTPUT AT 47 GHz, D.H. Steinbrecher, *MIT*, and M.E. Goff and A.H. Solomon, *Sylvania Electric.*

1540 COFFEE BREAK

VI-5 1600 YIG TUNED AND VARACTOR TUNED L-BAND TRANSISTOR OSCILLATOR, K. Hunton, *Sylvania.*

VI-6 1620 FREQUENCY MODULATION OF AVALANCHE TRANSIT TIME OSCILLATORS, J.W. Amoss and K.E. Gsteiger, *Sperry Microwave Electronics Company.*

VI-7 1640 A HIGH SPEED BINARY PULSE REGENERATOR IN MICROWAVE FREQUENCIES, M. Sugiyama, Y. Matsuo and A. Saeki, *Nippon Electric Company, Japan.*

Session VII Microwave Control Devices Thursday a.m., May 11

Chairman: Dr. K. Mortenson
Rensselaer Polytechnic Institute, Troy, New York

VII-1 0900 MICROWAVE PROPAGATION AND FARADAY EFFECT IN A SOLID STATE PLASMA WAVEGUIDE, H.J. Kuno and W.D. Hershberger, *RCA Labs and University of California.*

VII-2 0920 VARACTOR LINEAR MICROWAVE PHASE MODULATOR, R.V. Garver, *Harry Diamond Laboratories.*

VII-3 0940 A SUBNANOSECOND X-BAND PULSE MODULATOR, D.K. Adams, B.M. Schiffman and R.B. Larrick, *Stanford Research Institute.*

VII-4 1000 HIGH POWER, OCTAVE BANDWIDTH, SPDT MICROWAVE SWITCHES, J.F. White and K.E. Mortenson, *Rensselaer Polytechnic Institute.*

1020 COFFEE BREAK

VII-5 1040 HIGH POWER PIN DIODE LIMITING, P. Basken, K.E. Mortenson and N. Brown, *Microwave Associates.*

VII-6 1100 FERROELECTRIC PHASE SHIFTERS, R. Das, *Loral Electronic Systems.*

VII-7 1120 PLASMA VARACTOR X-BAND PHASE SHIFTERS, J.Y. Wada and R.C. Knechtli, *Hughes Research Laboratories,* and B.J. Forman and A. Fafarman, *Hughes Aircraft Company.*

VII-8 1140 A MULTIKILOWATT X-BAND NANOSECOND SOURCE, H. Goldie, *Westinghouse.*

Session VIII **Microwave Delay Lines** **Thursday, p.m. May 11th**

Chairman: Dr. R.W. Damon
Sperry Rand Research Center, Sudbury, Massachusetts

VIII-1 1400 REALIZATION OF MICROWAVE CIRCUIT FUNCTIONS USING ACOUSTIC WAVES, E.A. Ash, *University College, London. (Invited)*

VIII-2 1430 CURRENT STATUS OF MICROWAVE DELAY LINES, H.J. Shaw, *Stanford University. (Invited)*

VIII-3 1500 BROADBAND, FIXED TUNED, ACOUSTIC DELAY LINES AT L AND S BAND FREQUENCIES, L.R. Whicker, P.F. Carcia and G.E. Evans, *Westinghouse.*

VIII-4 1520 FREQUENCY MODULATION AND TRANSLATION WITH MAGNETO-ELASTIC WAVES IN YIG, B.A. Auld, J.H. Collins and H.R. Zapp, *Sanford University.*

1540 COFFEE BREAK

VIII-5 1600 TWO-PORT UHF PULSE COMPRESSION VIA MAGNETOSTATIC WAVES IN YIG RODS, G.E. Bennett and F.A. Olson, *Teledyne.*

VIII-6 1620 WIDEBAND PULSE COMPRESSION USING MAGNETOELASTIC WAVES IN YIG RODS, H. Van de Vaart and R.W. Damon, *Sperry Rand Research Center.*