of no upper ground plane, set $R=0.0$); DIEK is the relative dielectric permittivity K of the substrate; SH1 is the value of S/H_1; AIR takes one of the two values 0.0 (single strip) or 1.0 (coupled strips). Thus in the example the output table will refer to the even and odd modes of coupled strips with spacing $S/H_1=0.4$ on a substrate of permittivity $K=9.6$, no upper ground plane, and will list 20 lines, from $W/H_1=0.1$ through $W/H_1=2.0$ in steps of 0.2.

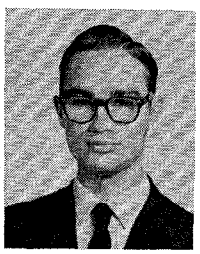
A sample of the output format is illustrated in Fig. 2 showing five lines of output data for coupled strips.

Accuracy of the resulting calculations depends largely on the value of M, the number of substrips used. Large values of M allow a closer approximation to the actual charge distribution while increasing the execution time. Small values of M have the opposite effect. It should be noted that the capacitance and the parameters which depend on it are not sensitive functions of the charge distribution. Instructions for modifying the program to utilize different values of M are included as part of the comment heading of the program list.

References

[1] J. A. Weiss and T. G. Bryant, "Parameters of microstrip," *Electron. Lett.*, vol. 5, Oct. 16, 1969, p. 517.
——, *ibid.*, vol. 6, July 23, 1970, p. 462. See also Erratum, *ibid.*, vol. 6, Aug. 20, 1970, p. 560.
[2] T. G. Bryant and J. A. Weiss, "Parameters of microstrip transmission lines and of coupled paris of microstrip lines," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-16, Dec. 1968, pp. 1021–1027.

Contributors



Leon W. Couch (S'64–M'68) was born in Durham, N. C., on July 6, 1941. He received the B.S.E.E. degree from Duke University, College of Engineering, Durham, N. C., in 1963. In 1964 and 1968, respectively, he received the M.E. and Ph.D. degrees in electrical engineering from the University of Florida, Gainesville.

He was a Graduate Teaching Assistant at the University of Florida from 1963 until 1967, and then was appointed Research Associate. Since 1968 he has been an Assistant Professor at the University of Florida where he is teaching and conducting research in various aspects of communication theory and technology.

Dr. Couch is a member of the American Society of Engineering Education, Eta Kappa Nu, Tau Beta Pi, and Sigma Xi.

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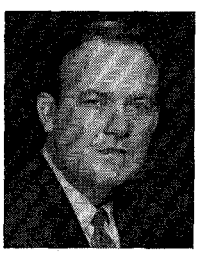
W. Alan Davis (S'60–M'69) was born in Evanston, Ill., on July 1, 1941. He received the B.S.E. degrees in engineering mathematics and electrical engineering, both in 1963, and the M.S.E. degree in electrical engineering in 1964, all from the University of Michigan, Ann Arbor.

In 1964 and 1965 he was a Teaching Fellow in the Department of Electrical Engineering of the University of Michigan, and in 1967 he joined the Cooley Electronics Laboratory of the University, where he is now completing the requirements for the Ph.D. degree. His areas of interest include microwave filters, microwave solid-state devices, and parametric amplifiers.

Mr. Davis is a member of Eta Kappa Nu and Tau Beta Pi.



Russell A. Gilson (M'70) was born in Red River, Wis., on February 13, 1937. He received the B.S.E.E. degree in 1960 from the University of Wisconsin, Madison, and the M.S.E.E. degree in 1965 from New York University, New York, N. Y.

Since 1961 he has been with USAECOM and has been involved in the development of linear and digital integrated circuits. Since 1969 he has been engaged in the design and development of power integrated circuits.

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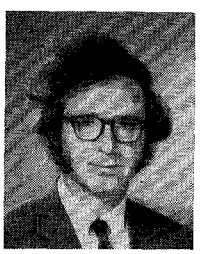

William J. Ince was born in London, England, in 1933. He received the B.Sc. degree with honors in physics from the University of Manchester, Manchester, England, in 1955, and the S.M. and Ph.D. degrees in electrical engineering in 1965 and 1969, respectively, from the Massachusetts Institute of Technology, Cambridge.

From 1955 to 1959 he was employed by E.M.I. Electronics Ltd., Hayes, England, where he worked on infrared homing devices for guided weapons and on airborne radar display systems. From 1959 to 1960 he was with the Raytheon Company, Maynard, Mass., where he worked on transistor circuit design. Since 1960 he has been with the Array Radars Group, M.I.T. Lincoln Laboratory, Lexington, Mass., where he has been concerned with the design of solid-state receivers and ferrite devices. In 1969 he was also appointed Assistant Professor of Electrical Engineering at the Massachusetts Institute of Technology.

Dr. Ince is a Fellow of the British Institute of Physics and the Physical Society.

Peter J. Khan (S'58–M'61) was born in Bowral, Australia, on November 12, 1936. He received the B.S. degree in mathematics and physics in 1957, and the B.E. and Ph.D. degrees in 1959 and 1963, respectively, all from the University of Sydney, Australia.

From 1953 to 1959 he was a Cadet Engineer with the Weapons Research Establishment at Salisbury, South Australia, carrying out research and developmental work in electronic circuit design. After completion of his doctoral studies in parametric amplification, he came to the United States in 1963 as a Fulbright Postdoctoral Fellow. Since that time he has been at the University of Michigan, Ann Arbor, where he was appointed as a Lecturer in 1965 and an Assistant Professor in 1967. He is head of the Microwave Solid-State Circuits Group at the Cooley Electronics Laboratory where his research interests include varactor circuits, solid-state oscillators, antenna tuning networks, and electromagnetic field analysis of microwave structures.

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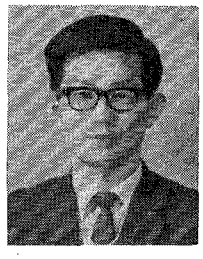

Yoshiyuki Naito (M'70) was born in Oita prefecture, Japan, on November 22, 1936. He graduated from the electricity course of Tokyo Institute of Technology, Tokyo, Japan, in 1959, and received the Dr.Eng. degree in 1964 from the same Institute.

He became an Assistant, advancing to Associate Professor in the department of Physical Electronics. Faculty of Engineering, Tokyo Institute of Technology, in November 1967. He studied at the Polytechnic Institute of Brooklyn as a Postdoctoral Fellow from September 1965 to October 1966.

At present, he is engaged in research chiefly on broad-banding of microwave circuit elements, properties of magnetic materials, and circuit elements using varactors.

Dr. Naito received an Inada Award and Treatise Award. He is a member of the Institution of Electronic and Communication Engineers of Japan, the Institute of Electrical Engineers of Japan, and the Japan Society of Applied Physics.

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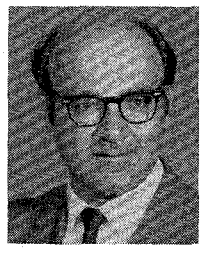
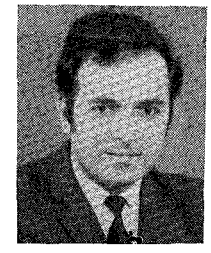


Octavius Pitzalis, Jr., (S'65–M'67) received the B.S.E.E. degree from Missouri University, Columbia, Mo., in 1959.

He has been at USAECOM since 1959. For the past four years he has been involved in the design of solid state RF power amplifiers. He is presently responsible for the development of microwave integrated power amplifiers.



Nizar Badih Sultan was born in Damascus, Syria, on May 6, 1936. He received a B.Sc. (Hons.) degree in electrical engineering in 1969, from the University of London, London, England, and the M.Sc. degree in microwaves and quantum electrons from the University College, London.

In 1960, he joined the Syrian General Posts and Telecommunication Establishment as a Microwave System Engineer. From 1965 to 1968 he was engaged in research in ferrite devices particularly circulators and phase shifters, in the Microwave Division, Standard Telecommunication Laboratories, Harlow, Essex, England, as a Senior Research Engineer. Since 1968 he has been a Research Associate at the University of Birmingham, Birmingham, England, working on microwave transit time effects in solid-state devices for the Ph.D. degree.

Mr. Sultan is a member of the Institution of Electrical Engineers (London).

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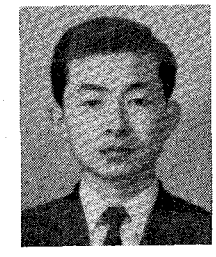

Nobuyoshi Tanaka was born in Nagano, Japan, on December 23, 1945. He received the B.S.E.E. and M.S. degrees in electrical engineering in 1968 and in 1970, respectively, both from Tokyo Institute of Technology, Tokyo, Japan. In his masters course he studied circulators.

Since April 1970 he has been employed by Cannon Inc., Tokyo, and is working on the application of holography.

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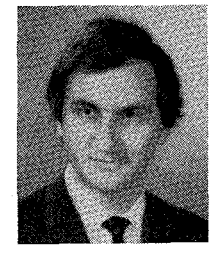

G. N. Tsandoulas (S'65–M'67) was born in Preveza, Greece, on August 14, 1939. He received the B.A. and B.S.E.E. degrees from Harvard University, Cambridge, Mass., in 1961 and 1963, respectively, and the Ph.D. degree from the University of Pennsylvania, Philadelphia, Pa., in 1967.

From 1963 to 1964 he was with KEL Corporation, Belmont, Mass., working on the implementation of a color television scheme. In 1967, he joined the Array Radars Group, M.I.T. Lincoln Laboratory. His interests are in the areas of antennas and arrays, diffraction theory, propagation, and electrodynamics.

Dr. Tsandoulas is a member of AAAS.