method is used. If the number of points is greater than 1000, Gaussian quadrature with cosine weights is employed. The number of points is never allowed to be less than 100.

V. Results

Table I compares the output of the original program with the modified one. One possible check for the values in this table is to decompose the microstrip capacity into the parallel plate capacity of the center and the capacity C_f of the ends. The capacity of a wide strip with width $WH1$ would be

$$C=\epsilon_0\epsilon_r(WH1-WH1P)+C_f \qquad (3)$$

where C_f is the capacity of a relatively narrow strip of width $WH1P$ from the original Bryant and Weiss program. Assuming a $WH1P$ of 33.0, (3) becomes

$$C=21.66(WH1-33.0)+751.2 \qquad (\text{pF/m}).$$

The above equation is within 0.5 percent with of values in Table I.

References

[1] T. G. Bryant and J. A. Weiss, "Parameters of microstrip transmission lines and of coupled pairs of microstrip lines," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-16, pp. 1021–1027, Dec. 1968.

[2] ——, "Dielectric Green's function for parameters of microstrip," *Electron Lett.*, vol. 6, pp. 462–464, 560, 1974.

[3] F. B. Hildebrand, *Introduction to Numerical Analysis*. New York: McGraw-Hill, 1974, 427–432.

Contributors

Peter Anders, photograph and biography not available at the time of publication.

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Fritz Arndt, photograph and biography not available at the time of publication.

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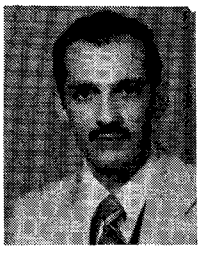

Omar Rafik Asfar was born in Jerusalem, Jordan, on November 8, 1948. He received the B.S. degree in electrical engineering at the University of Riyadh, Saudi Arabia, in 1971, and the M.S. and the Ph.D. degrees in engineering science and mechanics at Virginia Polytechnic Institute and State University, Blacksburg, in 1973 and 1975, respectively.

Since 1975, he has been an Assistant Professor of Electrical Engineering at Riyadh University, Riyadh, Saudi Arabia. He has been working on the application of perturbation methods to nonlinear problems as well as wave propagation in periodic structures.

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I. J. Bahl, (M'80) for a photograph and biography please see page 674 of the June 1980 issue of this TRANSACTIONS.

Prakash Bhartia (S'68–M'71–SM'76), for a photograph and biography please see page 674 of the June 1980 issue of this TRANSACTIONS.

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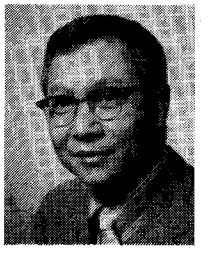


Kun-Mu Chen (SM'64–F'76) was born in Taipei, Taiwan, China, on February 3, 1933. He received the B.S.E.E. degree from the National Taiwan University, Taipei, in 1955, and the M.S. and Ph.D. degrees in applied physics from Harvard University, Cambridge, MA, in 1958 and 1960, respectively.

While at Harvard University, he held the C. T. Loo and the Gordon McKay Fellowships. From 1956 to 1957 he was a Teaching Assistant at the National Taiwan University, and from 1959 to 1960 he was a Research Assistant and Teaching Fellow at Harvard University. From 1960 to 1964 he was associated with the Radiation Laboratory, University of Michigan, Ann Arbor, where he was engaged in studies of electromagnetic theory and plasma. In 1962, while on leave from the University of Michigan, he was a Visiting Professor of Electronics at Chao-Tung University, Taiwan. Since 1964 he has been with Michigan State University, East Lansing, first as Associate Professor of Electrical Engineering, and since 1967 as Professor of Electrical Engineering. From 1968 to 1973 he was the Director of the Electrical Engineering program of the Department of Electrical Engineering and Systems Science. He has published numerous papers on electromagnetic radiation and scattering, plasmas, and the interaction of electromagnetic radiation with biological systems.

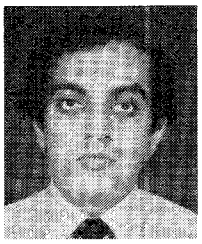
Dr. Chen is a fellow of the American Association for the Advancement of Science, a member of U.S. Commissions A, B, and C of the International Scientific Radio Union, Sigma Xi, Phi-Kappa-Phi, and Tau-Beta-Pi. He is the recipient of Distinguished Faculty Award from Michigan State University in 1976.

Marek T. Faber was born in Skierniewice, Poland, on March 2, 1947. He received the M.Sc. (Honors) and Ph.D. degrees in electronic engineering from the Technical University of Warsaw, Warsaw, Poland, in 1970 and 1980, respectively.

Since 1970, he has been with the Institute of Electronics Fundamentals, Technical University of Warsaw, where he is currently an Assistant Professor. While on leave during the academic year 1973–1974 he completed the postgraduate study at the University of Manitoba, Winnipeg, Man., Canada and received the M.Sc. degree from there in 1975. His current research interests are concerned with microwave circuit theory and techniques, especially with microwave receivers and mixers.

Wojciech K. Gwarek was born in Skarżysko-Kamienna, Poland, on September 13, 1947. He received the M.Sc. (Honors) and Ph.D. degrees in electronic engineering from the Technical University of Warsaw, Warsaw, Poland, in 1970 and 1977, respectively.

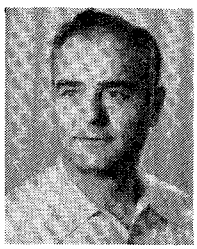
Since 1970, he has been with the Institute of Radioelectronics, Technical University of Warsaw, where he is currently an Assistant Professor. While on leave during the academic year 1973–1974 he completed the postgraduate study and received the M.Sc. degree from the Massachusetts Institute of Technology, Cambridge, MA, in 1974. His research interests are in the areas of electromagnetic field theory and microwave filters and mixers.



Khalid Karimullah (M'79) received the B.E. degree in electrical engineering from N.E.D. Engineering University, Karachi, Pakistan, and the Masters and Ph.D. degrees in electrical engineering from Michigan State University, East Lansing, in 1976 and 1979, respectively.

He was an Assistant Professor at Michigan State University until June 1980. He is currently working as a Member of the Technical Staff of COMSAT Laboratories, Clarksburg, MD. His research interests include microwave circuits and antennas.

Wei-Gan Lin, for a photograph and biography please see page 438 of the April 1980 issue of this TRANSACTIONS.



Ali Hasan Nayfeh received the B.S. with Great Distinction in Engineering Science in 1962 and the M.S. and Ph.D. degrees in aeronautics and astronautics in 1963 and 1964, respectively, all from Stanford University, Stanford, CA.

He joined Heliodyne Corporation in 1964 as a Senior Research Scientist and moved to Aerotherm Corporation in 1968 as the Manager of the Mathematical Physics Department. Then he became Professor of Engineering Science and Mechanics at Virginia Polytechnic Institute and State University, Blacksburg, in 1971. He is a University Distinguished Professor of Engineering Science and Mechanics at Virginia Polytechnic Institute and State University. He authored or co-authored over 150 refered papers on perturbation methods, hydrodynamic stability, aerodynamics, boundary nonlinear waves, aeroacoustics, nonlinear oscillations, and quantum mechanics. He is the author of *Perturbation Methods* (Wiley-Interscience and World-Publishers (in Russian)), the co-author of *Nonlinear Oscillations*, (Wiley-Interscience), and the author of *Introduction to Perturbation Techniques* (Wiley-Interscience).

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Dennis Paul Nyquist (S'63–M'67) was born in Detroit, MI, on August 18, 1939. He received the B.S.E.E. and M.S.E.E. degrees in 1961 and 1964, respectively, and the Ph.D. degree in electrical engineering from Michigan State University, East Lansing, in 1966.

Prior to obtaining the Ph.D. degree, he was a Research Engineer at the Ford Research Laboratories. He held an Engineering College Predoctoral Fellowship during his doctoral program at Michigan State University, East Lansing. He joined the Electrical Engineering Faculty at Michigan State University as an Instructor in 1966, became Assistant Professor in 1967, Associate Professor in 1970 and Professor in 1979. He has published a number of papers on electromagnetic radiation, antennas, and scattering. His current research interests include the interaction of electromagnetic fields with biological bodies.

Dr. Nyquist is a member of Commission B of the International Scientific Radio Union, the American Association for the Advancement of Science, Sigma Xi, and Phi Kappa Phi. He was the recipient of the Michigan State University Teacher–Scholar Award in 1969.

G. Lennart Nyström was born in Linköping, Sweden on September 23, 1950. He received the M.S.E.E. and Ph.D. degrees from Chalmers University of Technology, Gothenburg, Sweden, in 1973 and 1980, respectively.

From 1974 to 1980 he was employed as a Research and Teaching Assistant at the Division of Network Theory, Chalmers University of Technology. Since April 1980 he has been employed at the Telephone Company, L M Ericsson, MI-division, Mölndal, Sweden. His research interest are in the area of broadband microwave components as power dividers, couplers, filters, and also about FET amplifiers.

Sean O. Scanlan (M'62–SM'66–F'76) was born in Dublin, Ireland, on September, 20, 1937. He received the B.E., M.E., and D.Sc., degrees from the National University of Ireland Dublin, and the Ph.D. Degree from the University of Leeds, Leeds, England.

From 1963 to 1973 he was with the University of Leeds where he was Professor of Electronic Engineering from 1968. Since 1973 he has been Professor of Electronic Engineering at University College Dublin, Ireland where his interests have been in the fields of circuit theory, communications, and solid-state devices.

Dr. Scanlan is a Fellow of the Institute of Mathematics and its Applications and a Member of the Royal Irish Academy.

Martin V. Schneider (M'56–SM'71–F'76) was born in Bern, Switzerland, on October 20, 1930. He received the Diploma in physics and the Doctorate in natural sciences from the Swiss Federal Institute of Technology, Zurich, Switzerland in 1956 and 1959, respectively.

From 1959 to 1961 he was a Research Assistant at the Swiss Federal Institute of Technology and in 1961 he joined the Radio Research Laboratory at Bell Laboratories, Inc., in Holmdel, N.J. He has worked on thin film solid-state devices and circuits, Schottky barrier photodetectors, and microwave and millimeter-wave integrated circuits. He is presently engaged in advanced work on millimeter-wave devices and circuits for use in communication receivers and for remote sensing. He is a Visiting Professor of Electrical Engineering at the University of Virginia.

Dr. Schneider is a member of the Editorial Boards of the IEEE TRANSACTIONS on Microwave Theory and Techniques and the International Journal of Infrared and Millimeter Waves. He has been actively engaged in IEEE matters by serving as MTT Group Chapter Chairman and as Section Chairman for the New Jersey Coast Section of the IEEE. He enjoys hiking in his spare time and he has gone on extended bicycle trips along the canals of Burgundy and Nivernais in France.

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Franco N. Sechi (M'70) received the degree of Doctor in Electrical Engineering in 1964 from the Polytechnic Institute of Milano, Italy.

From 1965 to 1968, he was employed by ITT in Milano, where he was concerned with the design of solid-state microwave radio-link equipment. In 1968, he joined RCA, Electronic Components, Harrison, NJ, as a design engineer in the Solid State Product Design Group. In this position he designed transferred-electron oscillators and developed a technique for measuring the impedance of transferred-electron diodes under large-signal conditions. In 1973, he transferred to the Microwave Technology Center, RCA Laboratories, Princeton, NJ, as a Member of Technical Staff. In his present position, he is involved in the development of power transistor amplifiers. He has authored papers on transferred-electron oscillators, thermal and large-signal characterization of microwave devices, and on high-power microwave transistor amplifiers. He currently holds six U.S. patents.

For his work on linear microwave power amplifiers, Dr. Sechi received the RCA Laboratories' Outstanding Achievement Award in 1976. He received a second Achievement Award in 1979 for his work on a solid-state radar system for aircraft. He is past Chairman of the IEEE Princeton Chapter on MTT/ED.

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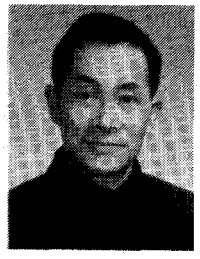

Hao-Ming Shen was born in Zhejiang, China, November 5, 1933. He graduated in physics from Peking University, Peking, China in 1958.

After graduation he taught theoretical physics and radio physics for five years. He continued his graduate program in electromagnetic theory and antennas from 1963 to 1966 at the Tangshan Chiaotung University. From 1966 to 1979 he was engaged in the research of automatic control equipment at the Harbin Civil Engineering College, Harbin, China. In 1978 he became an Associate Professor. He is currently a Visiting Scholar at the Gordon McKay Laboratory of Harvard University, Cambridge, MA. His areas of interest are in electromagnetic theory and applications.

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George P. Young (S'76–M'79) was born in Dublin, Ireland, on July 18, 1953. He received the B.E. degree in 1974 and the Ph.D. degree in 1978, both from the National University of Ireland, University College, Dublin.

From 1974 to 1977 he held a research demonstrator position at University College Dublin, undertaking research in the design of microwave transistor amplifiers. In 1977 he joined Telectron Ltd., Dublin, working initially in the design of telegraphy transmission systems. In 1979 he worked with the National Board for Science and Technology, Ireland in the area of telecommunications policy. At present he is with Telectron Ltd., leading a group designing telephone switching systems.