

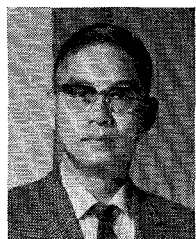
Contributors



George R. Branner (S'71-M'71) was born in Middletown, Ohio, on November 8, 1936. He received the B.S. degree (with honors) from the Ohio University, Athens, in 1959, and the M.S. degree from Ohio State University Columbus, in 1962 both in electrical engineering. From 1963 to 1965 he did advanced graduate studies in linear systems and network theory at the Polytechnic Institute of Brooklyn, Brooklyn, N. Y. In March 1973 he received the Ph.D. degree in electrical engineering from the University of Santa Clara, Santa Clara, Calif.

He was formerly employed at Wright-Patterson Air Force Base and Sylvania Electric Company. In 1969 he joined ESL Inc., Sunnyvale, Calif., where he developed computer-oriented techniques for precise analysis and design of complex microwave systems and for broad-band varactor multipliers. He has performed microwave circuit design and developed techniques for synthesis of active and distributed networks. Presently he is a Senior Member of the Technical Staff engaged in radar systems analysis. He is also an Assistant Professor (part time) in the Department of Electrical Engineering at the University of California, Davis.

Dr. Branner is a member of Tau Beta Pi, Eta Kappa Nu, and Sigma Xi.



Shu-Park Chan (S'62-M'63-SM'69) was born in Canton, China, on October 10, 1929. He received the B.S. degree in electrical engineering from the Virginia Military Institute, Lexington, in 1955, and the M.S. and Ph.D. degrees, both in electrical engineering, from the University of Illinois, Urbana-Champaign, in 1957 and 1963, respectively.

From 1957 to 1963 he taught at the Virginia Military Institute, first as Instructor in electrical engineering and mathematics and then as Assistant Professor of mathematics. On leave of absence, he was awarded a University Fellowship from 1959 to 1960 while studying toward the Ph.D. degree. From 1960 to 1961 he was an Instructor in the Department of Electrical Engineering at the University of Illinois, and from 1961 to 1963 he worked in the Coordinated Science Laboratories as Research Associate. In February 1963, he joined the faculty of the Department of Electrical Engineering at the University of Santa Clara, Santa Clara, Calif., where he is presently Professor and Department Chairman. His major interests have been in network and system theory, topological analysis and synthesis, computer-aided circuit design, and applied mathematics. He is author of *Introductory Topological Analysis of Electrical Networks* (Holt, Rinehart and Winston, 1969) and coauthor of *Analysis of Linear Networks and Systems: A Matrix-Oriented Approach with Computer Applications* (Addison-Wesley, 1972).

Dr. Chan is a member of Tau Beta Pi, Eta Kappa Nu, Pi Mu Epsilon, Phi Kappa Phi, Sigma Xi, the American Association of the Advancement of Science, and the American Society of Engineering Education. He was formerly Chairman of the Circuit Theory Group of the San Francisco Section of IEEE.



Robert P. Coats (A'55-M'60) was born in Dallas, Tex., on November 24, 1931. He received the B.S. and M.S. degrees in electrical engineering from Southern Methodist University, Dallas, Tex., in 1954 and 1961, respectively.

Since 1952 he has been a member of the Technical Staff at Texas Instruments, Incorporated, Dallas. He was initially a member of the



Microwave Circuits Group responsible for development of microwave components for antisubmarine warfare radar applications. From 1956 to 1962 he served as Project Engineer on many microwave-component development programs. Components developed during that period include frequency meters, rotary joints, frequency multipliers, and parametric amplifiers. In 1962 he became associated with the Shrike Missile Program, where he served initially as a Field Engineer at the

Naval Weapons Center, China Lake, Calif., assisting in the development of antiradiation missile guidance systems. He was subsequently responsible for development of one of the Shrike System guidance antenna configurations. From 1966 to 1969 he was engaged in the development of multioctave bandwidth-processing circuitry and antenna structures for use in advanced antiradiation missile applications. Since 1969 he has developed microwave integrated circuits for electronic warfare and satellite-communication applications.



Walter R. Curtice (M'58-SM'69), for a photograph and biography please see page 434 of the June 1973 issue of this TRANSACTIONS.



Fred E. Gardiol (S'68-M'69) was born in Corsier-sur-Vecve, Switzerland, on December 2, 1935. He received the degree of physicist engineer from the Ecole Polytechnique of the University of Lausanne, Lausanne, Switzerland, in 1960, the S.M. degree in electrical engineering from the Massachusetts Institute of Technology, Cambridge, in 1965, and the Ph.D. degree in applied sciences from the Catholic University of Louvain, Louvain, Belgium, in 1969.

During 1960 and 1961 he was a Production Engineer with Transition Electronic Corp., Wakefield, Mass. From 1961 to 1966 he was employed by the Special Microwave Devices Operation, Raytheon Company, Waltham, Mass., where he specialized in the design and development of high-power microwave ferrite devices. In 1966 he joined the Microwave Laboratory of the Catholic University of Louvain, where he became Assistant Professor in 1969. Since October 1970 he has been Professor of Electromagnetism and Microwaves at the Ecole Polytechnique Fédérale, Lausanne, Switzerland.

Dr. Gardiol is a member of Sigma Xi, the International Microwave Power Institute, and the Association of Swiss Electricians. He is Vice-Chairman of the IEEE Switzerland Section for 1973.



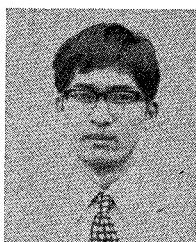
Hans L. Hartnagel (SM'72) was born in Geldern, Germany, in 1934. He received the Diplom Ingenieur degree in 1960 from the Technical University of Aachen, Aachen, Germany, and the Ph.D. degree in 1964 and the D.Eng. degree in 1971, both from the University of Sheffield, Sheffield, England.

After having worked for a short period with the Microwave Tube Laboratories of Telefunken, Ulm, Germany, he joined the Institut National des Sciences Appliquées, Vil-

leurbanne, Rhône, France. In October 1961 he was with the Department of Electronic and Electrical Engineering, University of Sheffield, first as a Senior Research Assistant, in October 1962 as a Lecturer, and in October 1968 as a Senior Lecturer. On June 12, 1970, he received the title of Reader in Electronic and Electrical Engineering, and since January 1, 1971, he has been a Professor of Electronic Engineering in the Department of Electrical and Electronic Engineering, University of Newcastle upon Tyne, Newcastle upon Tyne, England. He is the author of a book on semiconductor plasma instabilities and has written numerous papers.

Dr. Hartnagel is a Fellow of the Institute of Electronics and Radio Engineers and a member of the Institute of Electrical Engineers, London.

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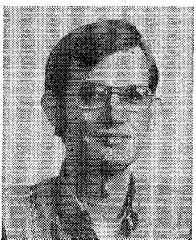
Mitsuo Kawashima was born in Kanagawa, Japan, on March 3, 1939. He received the B.E. degree in electronics from Tokyo Electrical Engineering College, Tokyo, Japan, in 1962.

Since 1962 he has been with the Solid-State Device Section, Electrotechnical Laboratory, Tanashi Branch, Tokyo, Japan, working on devices using high-field effect in Si and GaAs, except for 1971 to 1972, when he was with the University of Newcastle

upon Tyne, England. His current research interests include Gunn logic devices using optical coupling.

Mr. Kawashima is a member of the Physical Society of Japan and the Institute of Electrical Communication Engineers of Japan.

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Raymond J. Luebbbers (S'72) was born in Akron, Ohio, on September 2, 1946. He received the B.S.E.E. degree with high honors from the University of Cincinnati, Cincinnati, Ohio, in 1969, and the M.Sc. degree in electrical engineering from The Ohio State University, Columbus, in 1971, where he is currently working toward the Ph.D. degree.

From 1969 to the present he has been with the ElectroScience Laboratory at The Ohio State University, where he is currently a Research Associate. His research activities have been primarily in the analysis and design of resonant periodic surfaces. He has also performed research on antennas mounted on finite length cylinders and on electromagnetic chaff.

Mr. Luebbbers is a member of Phi Eta Sigma, Eta Kappa Nu, Tau Beta Pi, and Sigma Xi.

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Kenneth D. Marx (S'60-M'62) was born in Amity, Ore., on March 13, 1940. He received the B.S. degree in electrical engineering from Oregon State University, Corvallis, in 1961, and the M.S. and Ph.D. degrees in applied science from the University of California at Davis/Livermore, in 1965 and 1968, respectively.

He has worked at Sandia Laboratories, Livermore, Calif., from 1961 to the present time, except for the period between 1965 and

1968, when he was on educational leave. Since 1969, he has also been a Lecturer at the Department of Applied Science, University of

California at Davis/Livermore. His current research interests include electromagnetic field theory, transmission lines, and plasma physics, with particular emphasis on computational methods of solving problems in these areas.

Dr. Marx is a member of the American Physical Society.

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Benedikt A. Munk (M'61) was born in Fredericia, Denmark, on December 3, 1929. He received the M.Sc.E.E. degree from the Polytechnical Institute of Denmark, Copenhagen, Denmark, in 1954, and the Ph.D. degree in electrical engineering from The Ohio State University, Columbus, in 1968.

He joined the Antenna Group of Rohde and Schwarz, Munich, Germany, in 1956, where he developed several high-power TV transmitting antenna systems. Then, in 1959,

he joined the A/S Nordisk Antenna Fabrik, Copenhagen, Denmark, where he was responsible for the development and design of commercial and special antennas. In 1961 he joined the Andrew Corporation, Chicago, Ill., where he was responsible for the hard and soft antennas for the guidance of the Titan II missiles. Later he was associated with North American Aviation, Columbus, Ohio, as a Senior Research Engineer. He is now an Assistant Professor in the Department of Electrical Engineering and an Associate Supervisor in the ElectroScience Laboratory, The Ohio State University. His interests include antennas, scattering, radomes, and absorber designs. He holds several patents.

Dr. Munk is a member of Sigma Xi.

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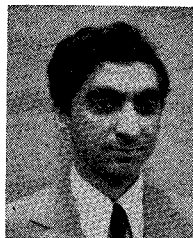


Olivier Parriaux was born in Lausanne, Switzerland, on May 17, 1943. He received the degree of physicist from the University of Lausanne, Lausanne, Switzerland, in 1970.

After completing his studies, he held a teaching position at the College of Lausanne as Professor of Physics. Since 1971 he has been a Member of the Microwaves and Electromagnetics Group of the Ecole Polytechnique Fédérale, Lausanne, Switzerland. He is currently working towards the Ph.D. degree. His

principal interest lies in the study of propagation in symmetrical circular structures.

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Ashok K. Talwar (S'67-M'72) received the M.Sc. degree in physics and M.Sc. Tech. in electronics from Rajasthan University, Jaipur, Rajasthan, India, in 1962 and 1964, respectively, and the M.S.E. and Ph.D. degrees in electrical engineering from the University of Michigan, Ann Arbor, in 1967 and 1972, respectively.

He was a Lecturer in electronics at the Birla Institute of Technology and Science, Pilani, India, for the academic year 1964-1965. He worked for Philips India, Ltd., Poona, India, during 1965-1966. From 1966 to 1971 he was a Research Assistant in the Electron Physics Laboratory of the Department of Electrical and Computer Engineering, the University of Michigan, where most of his research was on transferred-electron devices. He is presently engaged in the development of automobile radar systems at the Product Development Laboratories of Ford Motor Company, Dearborn, Mich.

Dr. Talwar is a member of Sigma Xi.

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