Foreword

RECENT PROGRESS is quasi-planar millimeter-wave components and subsystems is attributed to significant advances in integrated finline technology. Innovative design techniques utilizing other forms of planar transmission lines with integrated finlines have led to the development of millimeter-wave components and subsystems with a high level of integration.

Integrated finline technology has now established itself as an appropriate technology for various military and communication systems. Due to the high level of integration provided by this technology, it is necessary to have accurate models to achieve first-pass success. Consequently, considerable effort is now being devoted to the development of accurate simulation tools for the design. This is reflected in the continued focus of research activity on the development of accurate characterization and modeling of both planar and quasi-planar transmission media, discontinuity structures, and other building blocks of the circuits. Accurate models are being developed by applying available analytical and numerical techniques or by developing newer ones, or, alternatively, by simply using empirical procedures. The main objective, in all cases, is to enhance the accuracy of the existing models so that millimeter-wave components can be accurately designed.

In view of these developments and to assess future trends, the Microwave Theory and Techniques Society Technical Committees on Microwave and Millimeter-Wave Integrated Circuits (MTT-6) and Microwave Field Theory (MTT-15) jointly sponsored a workshop on "Quasi-Planar Millimeter-Wave Components and Subsystems," which was held in conjunction with the 1987 International Microwave Symposium, in Las Vegas. The workshop program included presentations by seven speakers, who provided in-depth reviews of the technical advances made so far and focused on the problems and bottleneck issues in the design of various components using this technology. They also provided a forum for discussions on future directions. The workshop was very well attended and there was considerable audience participation. It is my pleasure to thank those active participants of the workshop who shared their experiences and concerns with the rest of us and endeavored to make this technical exchange very informative.

In keeping with the overwhelming interest of the workshop participants, it was thought that a Special Issue of the MTT TRANSACTIONS would be timely. The Technical Committees on Microwave and Millimeter-Wave Integrated Circuits and Microwave Field Theory have jointly sponsored this Special Issue. The objective is to present the background information, current state of the art, and future trends in quasi-planar millimeter-wave components and subsystems. The speakers of the workshop were invited to contribute along with open solicitation for this Special Issue. The response to the Call for Papers was very encouraging. This is evidenced by the number of papers appearing in this issue. This Special Issue has been organized in three major sections. The section on *integrated finlines* contains four papers. There are eight papers in the section on *applications*. The section on *planar transmission lines and structures* contains four papers. Four short papers are also included.

As Guest Editor, I wish to thank Dr. Tatsuo Itoh and Dr. James C. Wiltse for their guidance and constant encouragement throughout this endeavor. Also, I wish to express my appreciation to the authors for their efforts. I sincerely thank the reviewers, listed below, for their prompt and careful reviews of the manuscripts:

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ARVIND K. SHARMA
Guest Editor

Arvind K. Sharma (S'79–M'80–SM'87) received the B.E. (Hons.) degree in electronics from the Birla Institute of Technology and Science, Pilani, India, in 1973, and the M.Tech degree in electronics and communication engineering and the Ph.D. degree from the Indian Institute of Technology, Delhi, India, in 1975 and 1981, respectively.

From 1980 to 1982, he was with the Department of Electrical Engineering, University of Ottawa, Ottawa, Canada, as a Research Associate. His areas of interest included microwave and millimeter-wave integrated circuits and analytical and numerical methods in electromagnetics. From 1982 to 1987, he was with the Microwave Technology Center of RCA Laboratories, David Sarnoff Research Center, Princeton, NJ, as a Member of the Technical Staff. There he was responsible for the design and development of hybrid and monolithic millimeter-wave integrated circuits and antennas. He worked on various circuits including IMPATT oscillators and amplifiers, FET amplifiers, phase shifters, harmonic frequency multipliers, and active feed array antennas utilizing microstrip patch antennas as well as integrated fin antennas. Since June 1987, he has been with the Millimeter-Wave and Microwave Technology Center of the Electronics and Technology Division of TRW, Redondo Beach, CA, where he is responsible for the characterization and modeling of active devices and passive components at microwave and millimeter-wave frequencies. He is also involved in the design and development of monolithic circuits and subsystems, including all aspects of their producibility engineering. He has published more than 35 technical papers in the areas of microwave and millimeter-wave computer-aided design of planar transmission lines and structures. He has received three U.S. patents and has five patents pending. He has also contributed to the *Microwave Solid State Circuit Design* (John Wiley, 1988).

Dr. Sharma is active in the Microwave Theory and Techniques Society. He served as a chairman of the MTT/ED Chapter of the Princeton section in 1983 and as chairman of the Steering Committee of the Sarnoff Symposium in 1985 and 1986. He has been a member of the Technical Committee on Microwave Field Theory, the Editorial Board of the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, and the Technical Program Committee for the IEEE International Microwave Symposia since 1985. He also served as a member of the Technical Program Committee for the IEEE International Antenna Symposium in 1985 and of the Steering Committee for the 1987 IEEE International Microwave Symposium.