Foreword

THE PURPOSE of this special issue is to bring together some of the recent technology advances that will have a significant effect on future microwave systems. To some extent, this issue is an extension of the panel discussion on Advances in Millimeter-Wave Subsystems held at the 1985 International Microwave Symposium, in St. Louis.[1] We are currently experiencing a rapid growth in the number of traditional microwave functions included in a subsystem. Subsystem designers must include signal processing, synthesizer functions, antenna control, and other related functions within the overall subsystem package. Examples of these technologies are included in the first four papers of this issue. NASA's programs in millimeter-wave monolithic integrated circuits are reviewed by K. B. Bhasin and D. J. Connolly. This work is a major thrust into high levels of integration, combining solid-state technology with microwave techniques. One of the major signal-generation devices, the microwave acoustic frequency source, is reviewed, with projections for many future applications, in our second paper, by E. A. Gerber *et al.* The third paper, by K. D. Stephan, offers a new technique of injection locking to be used in power-combining and phased-array subsystems. A good example of how these techniques can be used is presented in the fourth paper, by W. J. Wilson *et al.*, on a millimeter-wave imaging sensor. This paper clearly demonstrates the unique application of millimeter-wave technology to a practical system.

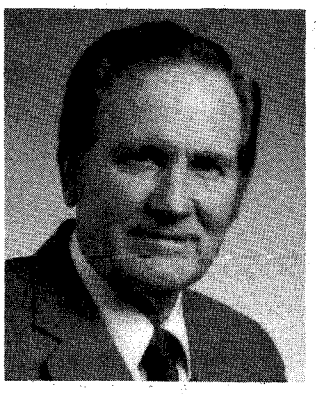
Our second four papers deal with microwave systems in a variety of applications. Z. D. Farkas' paper, on a binary power multiplier, deals with high-power problems at the megawatt level. This is an example of classic microwave techniques being applied at power levels most of us will only read about. The last three papers were received from open call, but are included here since they are very much systems-oriented. The paper by Q. F. Li *et al.*, on the gyrotron amplifier, provides us with a further look into high-power technology. The last two papers deal with special techniques applicable to systems design. The paper by W. El-Kamali *et al.* provides new information on microwave voltage-controlled oscillators and that by L. Chommeloux *et al.* provides us with a unique modeling technique for microwave imaging.

As is the case for most special issues, several of the papers planned for the issue did not make the deadline. I would like to encourage the authors involved to continue to work on these papers, with hope that we can include them in a later issue.

I would like to express my appreciation to the authors and their sponsoring organizations for the contributions to this issue. Also, my special thanks go to the paper reviewers and the members of MTT-16 technical committee for their support and encouragement.

JOHN B. HORTON
Guest Editor

[1] J. B. Horton and T. H. Oxley, "A review of the panel discussion on advances in millimeter wave subsystems," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-33, pp. 1531–1533, Dec. 1985.



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