Award Certificate to Dr. John H. Bryant, 1970 ADCOM Chairman;

Award Placque to Dr. Harold Sobol, 1970 National Lecturer;

Microwave Prize to Dr. William J. Evans;

Student Award to Thomas A. Saponas.

Ladies Program

The ladies, with Mrs. Marie Cooper as chairman, ran a well-organized and well-received program. The three-day program was highlighted by a tour of Annapolis and the U. S. Naval Academy with up to 26 ladies participating.

Digest

Many compliments on the *Digest* have been received. Each paper in the *Digest*, text, and figures, could be fully viewed without having to continually turn pages. Each paper was complete on two $8\frac{1}{2}$- by 11-inch facing pages. The authors and the editor and his committee made a very useful and information-packed publication as a permanent record of the conference. Those in attendance strongly favored the journal size and two-page paper format. IEEE members may obtain copies of the *Digest* from IEEE Headquarters by sending $5.00 for IEEE Catalog No. 71-C25M "G-MTT Symposium Digest" to IEEE, 345 East 47th Street, New York, N. Y. 10017.

The 1971 G-MTT National Lectureship

Introduction

THE G-MTT National Lectureship was initiated in 1967 specifically to provide assistance to chapters by providing a prominent speaker on a current microwave topic. Emphasis is placed on aiding new chapters and small chapters located in areas where speakers are not readily available. The goals established for the National Lectureship are to stimulate chapter growth, provide a greater dissemination of current technical information, and establish stronger bonds between the chapters and the National Group. A budget of $2000 per year is provided to cover, or partially defray, the expenses of the National Lecturer. Typically, the National Lecturer will speak at 10–15 chapters during his one-year tenure. Past Lecturers are Harold Sobol (1970), Richard W. Damon (1969), Leo Young (1968), and Arthur A. Oliner (1967). The 1971 National Lecturer is Carl Blake, Massachusetts Institute of Technology Lincoln Laboratory, Lexington. His lecture summary follows.

Applications of Solid-State Microwave Power Sources: A Summary of the 1971 G-MTT National Lecture

Solid-state devices currently available in industrial and university laboratories are capable of generating and/or amplifying energy throughout the microwave spectrum. Early indications are that these devices can be manufactured reproducibly at costs comparable to current microwave devices such as varactors and p-i-n switching diodes. The meager data available further suggest that these devices will be capable of achieving comparable reliability to well-designed transistors and digital integrated circuits. These new devices will have a major impact on the existing microwave business. With time and ingenuity, the availability of low-cost, highly reliable, solid-state, microwave power devices will lead to new applications and a broader base for the microwave industry.

This lecture reviews the status of three generic, solid-state, microwave, power-generating devices: the transistor, the transferred-electron device (TED), and the avalanche diode. Characteristic features of each are given including operating parameters, modes of operation, efficiency, gain-bandwidth products, noise performance, etc. Cost factors are presented. Practical and fundamental performance limitations are discussed.

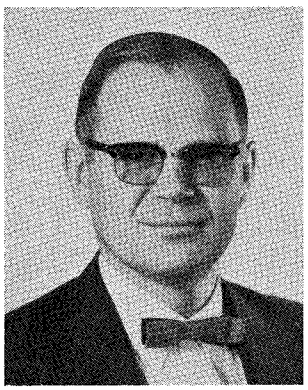
Probably the major current commercial market for solid-state microwave power devices is for Doppler radars used by state and municipal police for detecting automobile speeding violations. These devices are also used extensively in modern microwave relay links. Other applications likely in the near future include wide bandwidth waveguide communications and a variety of

monitoring and sensor functions. The extent of current applications, as well as the outlook for new ones, are discussed.

The Department of Defense has borne the major cost of developing solid-state microwave power devices with the expectation that they will prove cost effective in a variety of applications. Both ground-based and airborne phased-array radars are likely candidates for systems that would employ large numbers of these solid-state devices. The factors that bear on the applicability of these devices are described and criteria are established indicating under what conditions solid-state microwave power devices will compete favorably with vacuum tubes.

The current technological era is sometimes referred to as the second industrial revolution. The first industrial revolution is credited with having lightened the physical burden of mankind. The second, through automation, will free mankind from menial control chores. Solid-state microwave power sources will play a vital role in this process of automation by providing a reliable low-cost device for many sensor and communication applications that are vital to most forms of automation.

——CARL BLAKE



Carl Blake (A'50–M'57–SM'69) was born in Sarasota, Fla., on December 17, 1935. He received the B.S. and M.S. degrees from the Massachusetts Institute of Technology, Cambridge, in 1948 and 1949, respectively.

He worked toward his degrees as a member of a cooperative program under which he was affiliated with the Philco Corporation and obtained laboratory and industrial experience in television receiver design and production. From 1949 to 1957 he taught in the Department of Electrical Engineering, University of Maine, Orono. Under his direction, courses in solid-state physics for electrical engineers and transistor circuit design were introduced to the electrical engineering curriculum well in advance of most comparable institutions. He taught courses in pulse techniques, electro-magnetic field theory, and the theory of television. During this period he consulted extensively for radio and television stations. In 1957 he joined the Massachusetts Institute of Technology Lincoln Laboratory, Lexington, Mass. Here he became an authority on low-noise, microwave parametric amplifiers. A team under his leadership was the first to publish the successful operation of an extremely low-noise parametric amplifier cooled to 4.2°K. This work included the design and implementation of sophisticated instrumentation for the microwave characterization of various types of GaAs varactor diodes at cryogenic temperatures. In 1965 he became the leader of a group engaged in research and development of technology and system concepts for phased-array radars used for ballistic missile defense. He has pioneered in the exploration of solid-state microwave power sources for use in phased-array radars, including system configuration analyses to determine the conditions and system parameters for which solid-state sources are most competitive with vacuum tubes. He has published numerous technical articles and is frequently a speaker at technical meetings.

Mr. Blake has served on many committees and panels providing advice and consultation to the defense community. He is past chairman of the Boston Chapter of the Professional Group on Microwave Theory and Techniques. He has served on the program committees for the International Solid-State Circuits Conference, Northeast Electronics Research and Engineering Meeting, and the Professional Group on Microwave Theory and Techniques International Symposium. In 1969 he was Treasurer and Program Committee Member of the Phased Array Antenna Symposium. He is a member of the American Association for the Advancement of Science and Eta Kappa Nu. From 1949 to 1957 he was a Registered Professional Engineer in the State of Maine.