Guest Editors' Overview

ISY 92, The International Space Year 1992, is a global event that marks the 35th anniversary of the International Geophysical Year which ushered in the Space Age. It is also the 500th anniversary of the discovery of America by Columbus. The planning for ISY 92 was initiated in the summer of 1987 by an assembly of Pacific Rim Countries that met in Hawaii, but the participation has since expanded to include all the Earth's nations that are involved in major space activities. At that time, Dr. Russell Drew, past President of the IEEE, chaired a working group composed of Professional Societies.

Of the various professional societies, the IEEE MTT-S has a particular strong interest and involvement in space. Microwaves are involved in many different ways in space activities. They are essential to information collection and transfer, be it in the form of commercial communications, as links from Earth to space vehicles exploring the planets and deep space, as radiation from objects on Earth or in space that indicates the properties of these objects, or in radar for actively sensing objects in space. In addition there is the potential for beaming power by microwaves for various space applications.

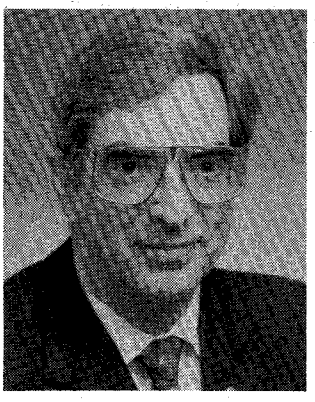
The MTT-S participation in ISY 92 by a Special Issue of the TRANSACTIONS devoted to "Microwaves in Space" was suggested by W. C. Brown, the MTT-S representative to the IEEE USA Aerospace R&D Policy Committee. The MTT-S ADCOM approved the suggestion and invited Dick Dickinson to be the Senior and Principal Editor.

A goal of this Special Issue was to document the importance of microwaves in space. A wider than normal spectrum of articles/topics was solicited and achieved as benefits the celebrations of the Voyages of Discovery of Columbus this year also. This issue brings color and significant international participation.

The membership and allied workers in the field responded with articles on generating and filtering microwaves, radiating them to and from space, synthesizing and characterizing microwave devices and components, utilizing natural and man-made microwaves for radar, communications, tracking, transportation, remote sensing including concepts and actual design theory and analysis techniques.

Thanks to the many reviewers listed below, to JPL management for their patience and to the authors. Special thanks to Judith Miller and Al Kroger for their invaluable assistance, and to Steve Maas, the regular editor for his guidance in the process.

RICHARD M. DICKINSON
WILLIAM C. BROWN
Guest Editors

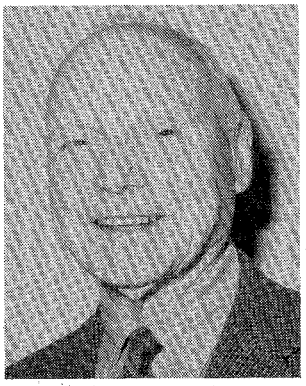


Richard M. Dickinson (S'56–M'58–SM'83) received the B.S.E.E. from Auburn University, Auburn, AL in 1958 and the M.S.E.E. from the University of Texas, Austin, in 1962.

He is currently on the Staff of the Telecommunications Science and Engineering Division at the Jet Propulsion Laboratory, California Institute of Technology and splits his time as the Pacific Rim specialist in the International Affairs office. Dickinson has been active in the development of both microwave and optical frequency deep space communications technology for planetary exploration. His work encompassed HF through 32 GHz RF and optical communication and propagation on Mars for sample return missions. He has been a member of the NASA OAST Communications Technology Working Group and was chairman of the Communications Working Group of the Space Station Technology Steering Committee. Prior activities were involved with foliated medium propagation and with investigating the technology of the Microwave Power Transmission Link of the Proposed Satellite Power System sponsored by DOE and NASA. Records for over 54% end-to-end efficiency in a link and for over 34 KW of power recovery at 1.6 km distance were established at S-band frequencies. The first X-band transmitter on the Mariner-Venus 1973 spacecraft for use in S/X-band dispersive

charged particle experiments was developed in the Spacecraft Transmitter Development Group supervised by Dickinson. Dick also supervised the Ground Based 400 KW CW *S* & *X*-band Transmitter Development Group during his 29 years at JPL, aiding the exploration of the solar system at the speed of light via JPL's Planetary Radar.

He has consulted for Universal Studios, JFD Electronics Corporation, LTI Robotics Systems, A. D. Little, and SRI International. Dick has four patents in the Microwave Technology field, and is a member of Sigma Xi.



William C. Brown (A'39–M'55–SM'58–F'59–LF'82) received the B.S.E.E. from Iowa State University in 1937 and the M.S.E.E. from M.I.T. in 1941.

He joined the Raytheon Co. in 1940. His early contributions were in microwave tube development that resulted in super power tubes which led him to the development of systems and components to beam power by microwaves. He led a team that developed the microwave powered helicopter system which was exhibited on national TV in 1964. In 1975 he participated as principal engineer in the JPL-Raytheon team that demonstrated the beamed microwave power transmission of over 30 kilowatts of power over a distance of one mile in the Mojave Desert. He participated in the study of the Solar Power Satellite in the 1975 to 1982 period.

Mr. Brown retired from Raytheon in 1984 but has since been active as a consultant, and as a spokesperson for beamed microwave power applications. Among his activities, under the sponsorship of IBM at Northeastern University in Boston, was a series of video taped lectures on the subject of "Beamed Microwave Power Transmission Systems Interconnecting Earth and Space". Recently he has proposed that power beamed by microwaves from the Earth be used to supply power to electric thrusters on orbital transfer vehicles and therewith create a better space transportation system from low-Earth orbit to geosynchronous orbit.

REVIEWERS FOR THIS SPECIAL ISSUE

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Dan Bathker
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David J. Bell
John J. Blandino
William C. Brown
Leopold Cantafio
Bruce Conroy
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Harry Detweiler
Robert C. Detweiler
Richard M. Dickinson
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Philip W. Garrison
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