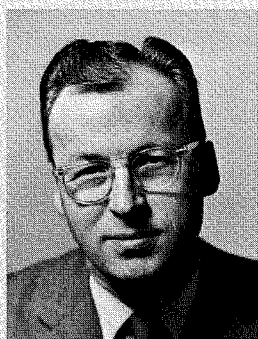


# The David Sarnoff

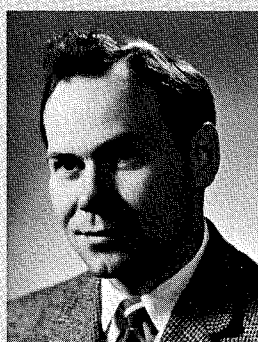


## The 1963 Individual Awards for Science and Engineering

The 1963



Dr. Paul K. Weimer



Dr. Morrel P. Bachynski

### ... About the Awards

RCA's highest technical honors are the four annual David Sarnoff Outstanding Achievement Awards. The awards, formally announced by Dr. Elmer W. Engstrom, President of RCA, consist of a gold medal, a bronze replica citation, and a cash prize for each man.

The Awards for individual accomplishment in science and in engineering were established in 1956 to commemorate the fiftieth anniversary in radio, television, and electronics of Brigadier General David Sarnoff, RCA Board Chairman. These have been made annually since to one scientist and one engineer. The two awards for team performance were initiated in 1961.

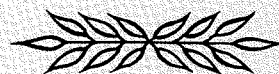
All engineering activities of RCA divisions and subsidiary companies are eligible for the Engineering Awards. The Chief Engineers in each location may present nominations annually. Similarly, members of the research staff of the RCA Laboratories are eligible for the Science Awards. Nominations are made by the Research Directors. Final selections are made by a committee of RCA executives, of which the Vice President, Research and Engineering, serves as Chairman.

**DR. PAUL K. WEIMER**, Member of the Technical Staff, Electronics Research Laboratory, RCA Laboratories, Princeton, N.J., recipient of the 1963 David Sarnoff Outstanding Achievement Award in Science . . . *"for basic and practical contributions leading to the successful and widely diversified application of evaporated thin films."*

**DR. WEIMER** is well known for his basic contributions to the development of the image orthicon and vidicon camera tubes used in television, and for his recent pioneering work in thin-film electronic devices and circuits. He has been on the staff of RCA Laboratories since 1942. Dr. Weimer contributed importantly to RCA's development of color television picture tubes during the early 1950's. During 1959-60, he undertook studies at the University of Paris under RCA sponsorship, concentrating upon new aspects of solid-state physics. Upon his return to RCA Laboratories, he turned to the development of new thin-film electronics devices and circuits. In 1961, he was responsible for the achievement of the thin-film transistor, the first practical amplifying device to be made entirely by evaporation techniques.

**DR. MORREL P. BACHYNSKI**, Director of the Microwave and Plasma Physics Research Laboratory, RCA Victor Company, Ltd., Montreal, Canada, recipient of the 1963 David Sarnoff Outstanding Achievement Award in Engineering . . . *"for outstanding and widely recognized achievements in the fields of microwaves and plasma physics."*

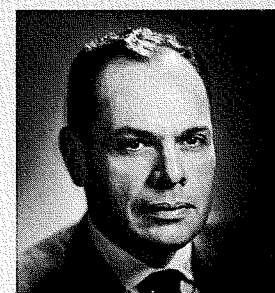
**DR. BACHYNSKI** has been widely recognized for his contributions to the understanding of electromagnetic wave propagation and his theoretical and experimental studies of aberrations in microwave lens systems. Since 1955, as a member of the staff of the RCA Victor Company, Ltd., Research Laboratories in Montreal, and later in charge of its Microwave and Plasma Physics Research Laboratories, he has been primarily concerned with short-wave propagation and plasma physics. In the latter area, Dr. Bachynski has made important contributions to the theory of electromagnetic wave interactions with plasmas confined in a magnetic field. He has also developed significant new microwave techniques for analyzing plasma. More recently, Dr. Bachynski has been responsible for the organization and supervision of an outstanding research group in microwave and plasma physics, which has received international recognition.



**DR. BENJAMIN ABELES**, **DR. JOHN P. DISMUKES**, **DR. FREDRIK EKSTROM**, and **DR. FREDERICK M. HARRIS**, Materials Research Laboratories, Princeton, N.J., recipients of the 1963 David Sarnoff Outstanding Team Award . . . *"for team performance in making advances in thermoelectric alloy structure and power."*



L. J. Caparola



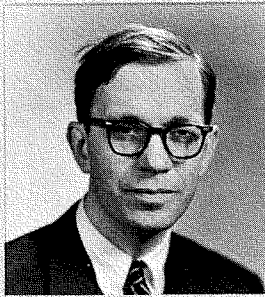
Norman S. Freedman

# Outstanding Achievement Awards

## Team Awards for Science and Engineering



Lin Abeles



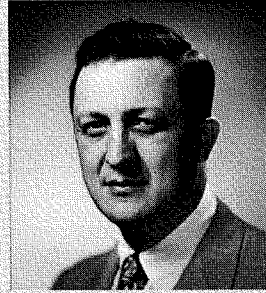
Dr. George D. Cody



Dr. John P. Dismukes



Dr. Lincoln Ekstrom



Dr. Fred D. Rosi



Carrona

**L. J. CAPRAROLA, JOHN J. CARRONA, NORMAN S. FREEDMAN, LEWIS H. GNAU, CAREL W. HORSTING, and WALTER F. LAWRENCE, JR.,** members of the engineering staff at the RCA Electron Tube Division, Harrison, N.J., recipients of the 1963 David Sarnoff Outstanding Team Award in Engineering . . . *"for team performance in developing practical structures and production methods for thermoelectric power generators."*



Carel W. Horsting



Walter F. Lawrence, Jr.



H. Gnau

Both team awards in science and engineering have been awarded for achievements in thermoelectrics. The recipients of the team award in science were cited for their part in the development of new high-temperature thermoelectric materials, while the team recipients in engineering were recognized for their contributions in the application of high-temperature thermoelectric materials to efficient power-generation for such systems as nuclear-powered earth satellites.

Approximately eighteen months ago RCA Laboratories undertook an intensive program, largely Navy-sponsored, to develop thermoelectric materials capable of converting heat to electrical energy efficiently over a broad range of temperatures from room temperature up to 1000°C.

In the first two stages of the project, the RCA Laboratories group, using telluride compounds, developed several power-generating materials which operated in the range from 25°C to 550°C with higher efficiencies than any previously reported. In the most recent phase of the program, as a result of very precise measurements of the thermal conductivity (heat flow) in various semiconductors, the RCA scientists developed new germanium-silicon alloys that operated satisfactorily in the upper temperature range from 500°C to 1000°C. With these new alloys, it should be possible to develop sandwich-type thermocouples which produce electricity directly from heat over a broad temperature range with efficiencies up to 15%.

**DR. ABELES, DR. CODY, DR. DISMUKES, DR. EKSTROM, AND DR. ROSI,** winners of the Team Award in Science, were members of the group which developed the new germanium-silicon alloys for high-temperature power generation. As part of this project, they also developed a new diffusivity method for measuring the thermal conductivity of these materials, as well as a method of preparing their alloys with suitable properties for thermoelectric generating applications, and a zone-leveling technique to provide ingots of the alloys.

**MESSRS. CAPRAROLA, CARRONA, FREEDMAN, GNAU, HORSTING, AND LAWRENCE,** winners of the Team Award in Engineering, successfully developed a practical method of utilizing these superior new thermoelectric materials for satellite applications. This group had first to evolve a method for attaching electrical and thermal contacts to the thermocouples, and then to set up pilot production facilities to produce the thermocouples in usable quantities. In addition, they translated the Laboratories zone-leveling technique into a well-controlled, highly efficient material fabrication process.

As a result of this work, the RCA Electron Tube Division has been asked to supply germanium-silicon thermocouples—the key components—for the SNAP 10A project (Systems for Nuclear Auxiliary Power) being undertaken by Atomic Energy International for the Atomic Energy Commission.

In characterizing the achievements of the two award-winning teams, Dr. Engstrom stated: *"The unprecedented success of these two research and engineering teams in moving from materials research to device development in a few short months has been instrumental in putting RCA into the field of direct energy conversion as a new area of business. We feel they have laid the foundation for a major new RCA product line."*