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EXPERIENCE: Experience primarily directed toward systems requirement analysis and system design with specialized experience in antenna design, communication satellites and signal relay systems, noise and signal processing; energy, signal detection, and surveillance systems, navigation, position finding and guidance systems. Since 1963 as consultant or as member of staff at Stanford Research Institute, MITRE, Research Analysis Corp., and Computer Sciences Corp. worked on wide range of survivable strategic satellite signal relay systems for DOD. This work consisted of the system design and signal processing to relay communication, ATC, surveillance and mapping in three-dimensions, navigation, position fixing, and earth resources sensor signals. The system performance (channel capacity, security, jamming protection, survivability, position location and resolution information) as a function of ground and space system cost (antenna size, signal power, bandwidth, frequencies, and orbits) for both dedicated and multifunctional worldwide systems was determined. Also the work consisted of the design and analysis of the antenna patterns and the manufacture, deployment, and stabilization of space arrays; and the design of passive and active position keeping and attitude control systems; and the analysis of modulation techniques; and the studies of space environmental effects. Also as owner of Satellite Technology Company worked as consultant and on contracts from Dept. of Energy and the National Science Foundation on basic approaches to power conversion of energy fluctuations and signal detection. Earlier as Principal Physicist at Cornell Aeronautical Laboratories designed new technique for target location for surveillance aircraft and analyzed guidance, navigation and high resolution radar systems for drone surveillance. Earlier work at the University of Michigan included tracking and guidance systems for missile and anti-missile systems.

EDUCATION: B.A., University of Texas; M.A. (Physics), University of California, Berkeley; Completed course work for Ph.D. (Physics), University of Buffalo.

PUBLICATIONS: "Physical Basis of Energy Conversion of Power Conversion of Energy Fluctuations" (submitted for publication).

"Relation of Second Law of Thermodynamics to the Power Conversion of Energy Fluctuations" Physical Review A, October 1979.

"Rebuttal to 'Comments on Power Conversion of Energy Fluctuations'" Physical Review A, August 1979.

Publications:
(continued)

"Reversible Thermoelectric Power Conversion of Energy Fluctuations" Proceeding of the Second International Conference on Thermoelectric Energy Conversion, Arlington, Texas, March 1978.

"Power Conversion of Energy Fluctuations" Physical Review A, October 1974.

"Space Reflectors for Radar and Astronomy" Applied Optics, February 1975.

"Signal Relay System Using Large Space Arrays" IEEE Trans. on Communications, December 1972.

"The Effects of Phase Variations of Microwave Transmission on High Resolution Radar," Seventh Annual Radar Symposium, University of Michigan, 1961.

PATENTS:

Communication Satellite, U.S. Patent No. 3,427,623, issued February 11, 1979

Power Conversion of Energy Fluctuations, U.S. Patent No. 4,004,210, issued January 18, 1977.

SOCIETIES:

Member IEEE
Member American Physical Society