



Accession Number : AD0738841

Title : The Trapped Radiation Handbook

Descriptive Note : Rept. for Jan 1968-Jun 1970

Corporate Author : LOCKHEED MISSILES AND SPACE CO
INC PALO ALTO CA PALO ALTO RESEARCH LAB

[Defense Technical Information Center](#)

Personal Author(s) : Cladis, John B. ; Davidson, Gerald T. ; Newkirk, Lester L.

Handle / proxy Url : <http://handle.dtic.mil/100.2/AD738841>

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Report Date : DEC 1971

Pagination or Media Count : 746

Abstract : The Trapped Radiation Handbook provides useful information and design data for scientists and engineers engaged in the design of spacecraft systems that must operate in the trapped radiation environment. These subjects are discussed: The Magnetosphere; Features and Mathematical Models of the Earth's Magnetic Field; The Motion of Charged Particles in the Field; The Properties of the Particles in the Natural Radiation Belts; Source and Loss Mechanisms; The Artificial Radiation BELTS THAT HAVE RESULTED FROM TESTS OF NUCLEAR DEVICES CONDUCTED AT HIGH ALTITUDES; The Phenomenology of Nuclear Detonations and Beta Injection Processes; The Effects of Trapped Particles--Both Natural and Fission Betas--on Materials and Devices: The Irradiation of Circular Orbit Satellites by Trapped Particles of (1) the natural environment, (2) environments produced by weapon tests at various L-values, and (3) an estimated wartime environment; The Synchrotron Radiation Emitted by the Trapped Electrons; and the Vulnerability of Operational Systems in the Environments (1), (2), and (3) mentioned previously.

Descriptors : *SPACECRAFT, *MAGNETOSPHERE, NUCLEAR EXPLOSIONS, DAMAGE, CHARGED PARTICLES, FISSION PRODUCTS, VAN ALLEN RADIATION BELT, RADIATION EFFECTS, NUCLEAR RADIATION, SPACE ENVIRONMENTS, GEOMAGNETISM

Subject Categories : ATMOSPHERIC PHYSICS
RADIOACTIVITY, RADIOACTIVE WASTES & FISSION PROD
UNMANNED SPACECRAFT

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