

The May 1967 great storm and radio disruption event: Extreme space weather and extraordinary responses

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The space weather storm of late May 1967 tested numerous radio and space-based technologies that had developed during the Cold War and ‘Space Race’ of the mid-20th century. McMath Region 8818, at ~30 deg east of the solar central meridian was the source of a localized white-light flare and extensive H-alpha flare emissions. The storm made its initial mark at Earth with a colossal solar radio burst causing radio interference at frequencies between 0.01 and 9.0 GHz and near-simultaneous disruptions of dayside radio communication and surveillance radars by intense fluxes of ionizing solar radiation. Substantial fast (EUV-associated) and slow (soft X-ray-associated) magnetic crochets were observed. Within hours a solar energetic particle event disrupted high-frequency communication in the polar cap. Subsequently, record-setting geomagnetic and ionospheric storms compounded the disruptions. Satellite orbits and satellite tracking were particularly impacted. This was one of the “Great Storms” of the twentieth century, despite the apparent lack of large geomagnetically induced currents. I will recount what we know about the state of the magnetosphere-ionosphere-thermosphere system as the Dst index dropped to nearly -400 nT. Further, I will explain how this storm expanded terrestrial weather monitoring-analysis-warning-prediction efforts into the realm of space weather forecasting.

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