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OPERATION MOONWATCH IN AUSTRALIA

Abstract

When the United States decided to launch a satellite during the International Geophysical Year, it also needed tracking stations to monitor the satellite in orbit. The Smithsonian Astrophysical Observatory (SAO) developed an optical tracking network using Baker-Nunn telescope cameras to photograph the satellite against the fixed star background, to obtain a precise determination of its orbit. Because it was calculated that the first satellites would have a visual magnitude of around 5 to 7, just at the limit of naked eye visibility, it was a challenge for optical tracking to determine the initial location of their high-altitude targets.

Anticipating this problem, the SAO conceived of a unique solution – recruiting a world-wide cadre of volunteer observers, particularly amateur astronomers, who would scan the skies at dawn and dusk reporting any satellite sightings to the SAO. These sightings would provide approximate locations for the Baker-Nunn observatories to begin their precision tracking. This global volunteer program, known as Operation Moonwatch, was an example of what today would be termed ‘citizen science’. Despite initial scepticism about this aspect of the optical tracking program, Moonwatch volunteers world-wide made significant contributions to early satellite tracking.

Operation Moonwatch groups in Australia made important contributions to the satellite tracking program, including a number of satellite spotting ‘firsts’. This paper will outline the history of the Moonwatch program in Australia, with a focus on the initial groups that were established to participate in the International Geophysical Year. It will look at their operations and the challenges they faced as volunteer organisations operating on limited funding, as well as their significant successes in satellite tracking and the observation of satellite re-entries.