

The NAVSTAR 35 and 36 Laser Retro-reflector Experiments

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The application of satellite laser ranging in navigation satellite technology was a concept explored from the beginning of development of those systems and technologies. The technology satellites developed at the start of the GPS program incorporated laser retro-reflector arrays. The objective at that time was the accurate independent measurements of the orbital positions of the satellites to aid determination of the orbits by radio frequency techniques, thereby aiding the development of passive tracking as a means of operating those systems. Partially successful at the time the concept of using laser tracking as an independent method of orbit determination for navigation satellites led to the experimental arrays installed on NAVSTAR 35 and 36. The objective of these arrays was the separation of the orbital errors from the onboard clock errors.

The activities and development of these experiments will be described and the subsequent utility they provided to the GPS and geophysical communities.