

1993b

“Coarse Attitude Determination from Earth Albedo Measurements,” H. L. Fisher, K. L. Musser, and M. D. Shuster, *IEEE Transactions on Aerospace and Electronics Systems*, Vol. 29, No. 1, January 1993, pp. 22–26.

The SDIO Thrusted Vector Mission (also known as Delta-181, after the launch vehicle) would determine attitude inflight from gyros alone with an occasional Sun-sensor update. It was decided a few months before launch that it would be nice to have a separate attitude determination system on the ground to check the gyro attitudes. Launch would take place only two-and-a-half months following the task assignment. Since the only specific attitude sensor on board was the Sun sensor, this attitude determination system also made use of output from one of the payloads, a very coarse Earth Albedo sensor, it was decided to use this as a second sensor in a deterministic attitude determination system using the TRIAD algorithm. As an attitude sensor, the Earth Albedo sensor was found to have an accuracy of only 6 deg. The software was generated in the APL programming language. At launch, the Thrusted-Vector spacecraft went into flat spin due to unanticipated outgassing from one of the cryogenic coolers., which made three-axis attitude estimation an unimportant task.

Superseded 1989e.