AERODYNAMIC DECELERATORS FOR MODERN VENUS PROBES/LANDERS

Allen Witkowski [(1)], Ethiraj Venkatapathy [(2)], Peter Zell [(3)], Gary Allen [(4)]

[(1)] Pioneer Aerospace Corporation, South Windsor, CT (USA), Email:Al.Witkowski@zodiacaerospace.com
[(2)] NASA Ames Research Center, Moffett Field, CA (USA), Email: ethiraj.venkatapathy-1@nasa.gov
[(3)] NASA Ames Research Center, Moffett Field, CA (USA), Email: peter.t.zell@nasa.gov
[(4)] Eloret Corporation, Sunnyvale, CA (USA), Email: gary.a.allen@nasa.gov

ABSTRACT

Any *in situ* exploration of Venus will require some form of Aerodynamic Decelerator System (ADS). NASA's typical use of "heritage" would suggest that any future mission should use the 1978 Pioneer Venus mission (P-V) as a baseline design. Unfortunately, there can be no such thing as a "build to print" P-V ADS, since the materials, subcomponents, and techniques used to create and test it are no longer readily available. This paper involves a review the archival P-V ADS data, with emphasis on determination of the validation and verification of the final ADS design. Using this data, modern equivalents are evaluated for materials and subcomponents that are no longer available. Additionally, current proposed mission requirements are examined from the perspective of the ADS and suggestions for modern parachute designs are made. Using the experience of the most recent robotic planetary *in situ* exploration, comments on expected development and qualification activities to aid in mission design/proposal activities are also included.