

# Memo

To: Micah Johnson  
From: Carlton Faller  
CC:  
Date: Monday, January 12, 2004  
Re: EEE Parts Assessment of the SWAB Air Sampling Device

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In support of the E049 A *Comprehensive Characterization of Microorganisms and Allergens in Spacecraft Environment Experiment (a.k.a SWAB)* development of the Air Sampling Device, EEE parts personnel reviewed the ASD from a high level standpoint and provided suggestions for the device to be included in the final design but because of full EEE parts assessment was not required nor levied on the device. The ASD is a commercial off-the-shelf product designed and built by Sartorius Corporation of Germany that is battery powered.

Although the COTS device do not require EEE parts assessment nor have requirements that levy them, the ASD was inspected for obvious problem areas or high failure/stress components and workmanship areas. From the review of the ASD, the EEE parts engineer provided the following comments and suggestions to the payload developer:

- Semiconductor parts all found to be OK
- Other EEE parts
  - Replace fuse / fuse holder with soldered-in military fuse
  - Remove microcontroller socket (solder directly to board)
  - Inspect electrolytic capacitor soldering and reinforce if necessary
  - Inspect all solder joints on board and re-work as necessary

In addition, the only requirement levied for the ASD is a burn-in cycling requirement which includes the traditional 72 and 96 hour burn-in testing. However, because of the unique operating modes of the ASD and because it is battery operated, the traditional burn-in test could not be accomplished nor be effective for the use of this device in screening potential problem devices. Therefore, EEE parts worked with the payload developer in configuring an EEE Parts and Thermal Cycle Test Plan that would outline the acceptance (workmanship) level testing parameters and description that would best fit the device's operational nature and still provide enough screening to identify any infant mortality components or possible high failure rate components. The test plan is described further in the provided document LS-20444-2 *Electrical, Electronics, and Electromechanical Parts Screening, Burn-In, and Thermal Cycling Test Plan for the Human Research Facility (HRF) Surface, Water, and Air Biocharacterization (SWAB) Experiment Unique Equipment* which is currently in the signature cycle for baselining.