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| **ECR Title: 5-Channel Filter for ESD** | DCC No: E1500164-v1 |
| Date: 6 March 2015 |
| **Requester: Richard Abbott,**  | **Impacted Subsystem(s): ISC SUS**  |  |
| **Description of Proposed Change(s):** A circuit board (D1500113) has been designed to provide filtering to the high voltage drive signals sent to the Electrostatic Drive actuation points in order to provide the following enhanced functionality:1. Single stage filtration of each quadrant signal consisting of a pole-zero RC filter to enhance dynamic range while providing sufficient filtration2. A rescaling of the RC ratio such that the filters present a higher impedance to the ESD amplifier in order to reduce the transient current flow that has caused trips in the ESD amplifier voltage monitoring function.3. Inclusion of the 10k series resistor presently used for current limiting in the event of an in-vacuum discharge. This permits better packaging.This filter would be installed in the cable tray up by the vacuum feedthrough presently used for ESD. The existing 10k resistor box would be replaced with this new design. |
| **Reason for Change(s):** Excess noise on the existing ESD high voltage amplifiers is too high. The bias path can be heavily filtered as this path is not part of a closed loop feedback system. The individual quadrant paths still require filtration, but would benefit from preservation of dynamic range by inclusion of a zero in the filter function. The proposed design would supply these functions |
| **Estimated Cost:** A total of 5 units are to be built. The estimated cost per unit is $500 |
| **Schedule Impact Estimate:** There is no predicted impact to schedule other than freeing individuals from other tasks to participate in this change. |
| **Nature of Change (check all that apply):****[ ]** **Safety****[ ]  Correct Hardware****[ ]  Correct Documentation** | **[x]  Improve Hardware****[ ]  Improve/Clarify Documentation****[ ]  Change Interface****[ ]  Change Requirement** |
| **Importance:****[ ]  Desirable for ease of use, maintenance, safety****[x]  Desirable for improved performance, reliability****[ ]  Essential for performance, reliability****[ ]  Essential for function****[ ]  Essential for safety** | **Urgency:****[ ]  No urgency****[ ]  Desirable by date/event: \_before final acceptance****[ ]  Essential by date/event: \_\_\_\_\_\_\_\_\_\_\_\_****[x]  Immediately (ASAP)** |
| **Impacted Hardware (select all that apply):****[ ]  Repair/Modify. List part & SNs: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****[ ]  Scrap & Replace. List part & SNs:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****[ ]  Installed units? List IFO, part & SNs: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****[ ]  Future units to be built** | **Impacted Documentation** D1400177-v2 will have to be updated |
| **Disposition of the proposed change(s):**The disposition of this proposed engineering change request is to be completed by Systems Engineering and indicated in the “Notes and Changes” metadata field in the DCC entry for this ECR. The typical dispositions are as follows:* **Additional Information Required**: in which case the additional information requested is defined. The ECR requester then re-submits the ECR with the new information using the same DCC number for the ECR but with the next version number.
* **Rejected**: in which case the reason(s) for the rejection are to be given
* **Approved**
* **Approved with Caveat(s)**: in which case the caveat(s) are listed
* **TRB**: the ECR is referred to an ad-hoc Technical Review Board for further evaluation and recommendation. It is the System Engineer’s (or designee’s) responsibility to organize the TRB. The System Engineer (or designee) then makes a technical decision based on the TRB’s recommendation. Links to the TRB’s documentation (charge, memos, final report, etc.) are to be added to the “Related Documents” field for this ECR.
* **CCB**: a change request for approval of additional funds or schedule impact is to be submitted to the Configuration Control Board. Links to the CCB’s documentation (CR, etc.) are to be added to the “Related Documents” field for this ECR.

**Concurrence by Project Management:** Acknowledgement/acceptance/approval of the disposition is to be indicated by the electronic “signature” feature in the DCC entry for this ECR, by one the following personnel:* Systems Scientist
* Systems Engineer
* Deputy Systems Engineer
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