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Limitations and Deviations for ACD G3 Test-stand #4

CHANGE HISTORY LOG

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1. **SCOPE**

This document lists

- the environmental limitations and
- the differences of the test-stand shipped compared to the released test-stand drawings

2. **ENVIRONMENTAL AND OPERATING CONDITION**

- The test-stand temperature must be held between 10°C and 40°C, so no thermal cycling is allowed.
- The test-stand was only tested at room-temperature.
- No vibration tests are allowed.
- The test-stand can not be operated in a vacuum chamber.
- Do not short out the power output (3.3 or 28V) for more than 10 sec to ground. If the output circuit on the GASU is in current-limiting mode, and at the same time most of the total voltage is dropped across the GASU circuit, the GASU output transistors may overheat and burn out. The GASU power-output circuit for the flight module will be on the main board and this restriction is removed, however for the G3 it is on a daughter-card and the thermal impedance to the enclosure is much higher.

3. **DIFFERENCES TO RELEASE DRAWINGS**

3.1 **GASU-DAQ Power Section**

The power-section of the GASU DAQ board switching the ACD 28V and 3.3V was modified. The as-built drawings are supplied on the LAT Electronics EGSE ACD web-page, under G3 test-stand #3. The resistor values in the circuit setting the current limit are still in review and will be optimized for the flight version.

3.2 **GASU Partslst**

Two GLTC ASICs (U28/U29) are not loaded per GASU DAQ board. The G3 test-stand does not
need/use those components.

AEM FPGA changed to version 52

3.3 GASU Assembly

Not all the GASU connectors with associated internal harness are installed in the G3 test-stand, since only 4 FREE cards per GASU primary/redundant side are supported. (ref LAT-DS-01611)

Installed are

- FREE connectors: JL172, JL176, JL174, JL178, JL173, JL177, JL175, JL179
- Power connectors: JL40, JL41
- Spacecraft connectors: JL42, JL132 (not used for G3)
- TEM connectors: JL42, JL132, JL43, JL135 (not used for G3)
- SIU connectors: JL45
- Test connector: JL153

Metal plates are installed on the connector plates in place of the missing connectors.

No cable support of the harness within the enclosures of the GASU box. (no railings/guides/support installed).

No stacking of components

No conformal coating

The enclosure is not fabricated as per drawings from aluminum, but it is a sheet-metal box.

3.4 GASU Power Supply

The 2.5V and 3.3V on the GASU DAQ board are normally supplied by two sets of converters from the GASU power-supply. In this non-flight version a single set of 3.3V and 2.5V converters powers
the entire GASU DAQ Board. (Note that this has nothing to do with the power supplied to the ACD FREE cards, since those are supplied by separate converters).

3.5 GASU Current Monitoring

The current monitoring circuit was changed. See EGSE web-site, G3 test-stand #3 for the schematic and for performance measurement. The resistor values in the circuit are still in review and will be optimized for the flight version.

4. TEST

4.1 Notes

The break-out box has a LED diode connected from the 3.3V and the 28V to ground to indicate power-on state. In other words there are a few mA flowing from each GASU power output to ground even with the BOB contacts open.

4.2 28V Tests

For the tests which used the break-out box, a diode was connected from the 28V to ground to indicate the power-on state. That circuit used about 6 mA. No additional loads were connected to the 28V outputs to the FREE in the present procedure.

Please note that if there is no load on the 28V or 3.3V, the voltage reading may be 28V or 3.3V even so the FREE power is turned off via the GASU power switches. Since the switch is a current source, leakage will show the voltage on. In other words a load of at least 1 mA should be connected to check the power-on/off state.

4.3 Changes from Test-Procedure

The test-procedure identifies the ACD-FREE connectors via the ref-des connector numbers on the GASU enclosure (4RB-A, etc). Disregard the JL180-JL189 designators as they relate to the LAT.
Interface to the flight-assembly (via the LAT shield). There is no LAT-shield included in the test-stand as the FREE’s are connected directly to the GASU.

Test 13.5.2.8: system clock low-f at turn-on was not tested on all connectors (common circuit on GASU).

Test 13.5.2.3: NDATA_P and NDATA_M Expected Voltage changed to 0V<V<0.2V

Test 13.6.2.4: NCMD_P and NCMD_M Expected Voltage changed to 0V<V<3.3V

Test 13.6.2.4: TEMP_MON_P and TEMP_MON_M Expected Voltage changed to 0V<V<2V

Test 13.6.3.4: NCMD_P and NCMD_M Expected Voltage changed to 0V<V<3.3V

4.4 Additional Tests

In addition to the tests listed in the test-procedure, 2 FREE cards were connected to the GASU simultaneously and register/event/trigger scripts were executed and passed.