

	Presenter:
	Organization/Date: Orbiter / 11-12-08

**STS-126  
MMT L-2 DAY REVIEW  
ORBITER PROJECT (MV)  
Multifunctional Display Unit Error**

**November 12, 2008**

# OV-105 CRT2 MEDS 1553 Bus Error

Presenter:  
Glen Finneman

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Orbiter / 11-12-08



126STMDU 11/18/2008 12:00 pm

<b>OV-105 CRT2 MEDS 1553 Bus Error</b>	<b>Presenter:</b> Glen Finneman
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**Observation:**

- Multifunction display unit (MDU) CRT2 annunciated to integrated display processor 2 (IDP) minor error message “CRT2 MEDS 1553 bus error” on numerous power ups starting on 10/31/08
  - Error message indicates a transient, self-clearing loss of communication with its IDP during power up when using the ground processing technique
  - IDP error log indicates error due to “busy bit” in MDU status response and not the result of a 1553 bus transmission error
  - Function of IDP and CRT unaffected by the message

**Concern:**

- Progression of observed signature to a condition that results in loss of MDU functionality

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## Background:

- MEDS hardware installed in OV-105 has been installed and successfully flown for 2 flights (18 total for fleet)
- MEDS IDP software recently upgraded to VI 6.00
  - Significant SAIL runtime has not encountered this bus error problem
  - OV-103 software upgraded in mid Sept 08
    - No problems have been noted to date
  - OV-105 software upgraded in mid Oct 08
- On 10/31/08, bus error messages began to be issued only on CRT2/IDP 2
- CRT 2 MDU S/N 523 replaced with S/N 531 on 11/07/08
- Same error messages have continued to be issued at power up and during troubleshooting approximately 50% of the time following R&R

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## Risk Assessment:

- MEDS PRT highly confident that the source of the errors is not resident in the IDP
- Integrated review with EPDC PRT has identified other potential causes of the errors
  - Dedicated remote power controller (RPC) located in forward power control assembly 2 (FPCA)
    - Transient voltage drop during power up would explain the signature
    - No transients during steady state operations have been observed
    - Only function of this RPC is to provide power to MDU CRT 2
  - IDP2/CRT 2 Switch
    - Error only occurs when power is applied via this switch
    - Observed failure mode is not typical for this component
- The anomaly has only occurred during IDP2/CRT2 power-up and has never occurred during steady state operation
- The anomaly as seen to date would not affect flight operations and would be transparent to the crew
- No other problems noted with the FPCA 2 bus, MDU/CRT 2, or the wire paths

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## Risk Assessment:

- Effect of observed signature is benign
- Redundancy for CRT 2 is provided through CRT 1 & 3
  - 4 other non-CRT MDUs could be reconfigured to pick up CRT 2 functionality
- Criticality of the CRT MDU is 1R3 for loss of function
- LCC requires scrub for loss of CRT
- LCC for recurrence of error message requires:
  - Single event – continue
  - Multiple events - scrub
- Flight rule impact for first failure on-orbit is NEOM
- IFM available to replace CRT 2 with CRT 4 or AFD 1 in event of hard fail

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### Flight Rationale:

- Error only occurs during a particular power on sequence that is used exclusively during ground processing
- Error message is nuisance only, transient / self-clearing, is transparent to the crew, and does not impact hardware functionality
- Adequate redundancy exists for worst case failure causing complete loss of this CRT MDU slot

### Recommendation

- Accept observed signature for STS-126 and defer further troubleshooting to STS-127 flow