CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: FIGURE 4-2
NAME/QUANTITY: ARMING MECHANISM/2
DRAWING REFERENCE: SED39122120-303

PROJECT: INTELSAT VI-F3 REBOOST MISSION
LRU NAME/QUANTITY: MAIN BEAM ASSEMBLY/1
LRU PART NUMBER: SED39122120-303

SUBSYSTEM: CAPTURE BAR/1
EFFECTIVITY: STS-49

FAILURE MODE NUMBER Intelsat-002	CRITICALITY 2/2	FAILURE EFFECT	RETENTION RATIONALE
FUNCTION Mechanism allows crewmember to manually open and arm the latches and set the triggers		**END ITEM** Unable to arm latches	A. DESIGN: • Designed to safety factor of 2.0 per PRD, and structural analysis (report # 91-1975) per certification plan. • Materials are selected for this environment to prevent galling, binding, and any type of adverse friction. • Materials are: AL alloy 6061-T6, SST 302, SST 303, CRES, and AL bronze (Continued on next page)
FAILURE MODE AND CAUSE Mode: Mechanism jammed; unable to arm the latches Cause(s): 1. Piece part(s) failure 2. Piece part lock-up 3. Contamination 4. Quick release pin binding		**MISSION** Unable to complete capture of Intelsat; unable to meet Intelsat mission objectives **CREW/VEHICLE** None **INTERFACE** None	
REDUNDANCY SCREENS A – N/A B – N/A C – N/A	REMAINING PATHS None		
MISSION PHASE	TIME TO EFFECT	TIME TO CORRECT	
Capture	Seconds	None	

PREPARED BY: D. A. CROUCH
REVISION:
SUPERSEDING DATE:
DATE: 9/91

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: FIGURE 4-2
NAME / QUANTITY: ARMING MECHANISM / 2
DRAWING REFERENCE: SED39122120-302

PROJECT: INTELSAT VI-F3 REBOOST MISSION
LRU NAME / QUANTITY: MAIN BEAM ASSEMBLY / 1
LRU PART NUMBER: SED39122129-302

SUBSYSTEM: CAPTURE BAR / 1
EFFECTIVITY: STS-49

FAILURE MODE NUMBER	CRITICALITY	
Intelsat-002 (Continued)	2/2	

RETENTION RATIONALE (CONTINUED)

B. TEST:
- PDA
  - Functional checkout and test
- Acceptance test
  - Acceptance testing includes vibration and thermal vacuum testing. The vibration test was conducted per the table shown below.

Intelsat Capture Bar Hardware Acceptance Vibration Environment		
X-axis	20 – 80 Hz	+ 3.0 dB/oct
6.1 G_{rms}	80 – 350 Hz	.04 G^2/Hz
	350 – 2000 Hz	– 3.0 dB/oct
	20 Hz	.01 G^2/Hz
	45 Hz	.0355 G^2/Hz
Y-axis	70 Hz	.0355 G^2/Hz
6.52 G_{rms}	80 Hz	.04 G^2/Hz
	350 Hz	.04 G^2/Hz
	390 Hz	.0355 G^2/Hz
	600 Hz	.0355 G^2/Hz
	2000 Hz	.007 G^2/Hz
Z-axis	20 – 80 Hz	+ 3.0 dB/oct
6.1 G_{rms}	80 – 350 Hz	.04 G^2/Hz
	350 – 2000 Hz	– 3.0 dB/oct

- Certification
  - Manned thermal vacuum test: – 80 ± 10 °F at 10^{-5} torr; 150 °F at 10^{-10} torr certified by analysis.
  - Low temperature component test to – 110 °F.
  - Sine sweep: The resonant frequency is below 35 Hz, therefore, a modal survey will be conducted.

  Random vibration testing was conducted per the table shown on the following page.

(Concluded on next page.)

PREPARED BY: D. A. CROUCH
REVISION:
SUPERSEDING DATE
DATE 9/91

CRITICAL ITEMS LIST

REFERENCE DESIGNATOR: FIGURE 4-3
NAME/QUANTITY: ARMING MECHANISM/3
DRAWING REFERENCE: SED39122020-303

PROJECT: INTELSAT VI-F3 REBOOST MISSION
LRU NAME/QUANTITY: MAIN BEAM ASSEMBLY/1
LRU PART NUMBER: SED39122120-303

SUBSYSTEM: CAPTURE BAR/1
EFFECTIVITY: STS-49

FAILURE MODE NUMBER	CRITICALITY	
Intelsat-002 (Concluded)	2/2	

RETENTION RATIONALE (CONCLUDED)

Intelsat Capture Bar Hardware Vibration Environments		
X-axis	20 – 80 Hz	+ 3.0 dB/oct
7.84 G_{rms}	80 – 350 Hz	.067 G^2/Hz
	350 – 2000 Hz	– 3.0 dB/oct
	20 Hz	.017 G^2/Hz
	45 Hz	.060 G^2/Hz
Y-axis	70 Hz	.060 G^2/Hz
8.48 G_{rms}	80 Hz	.067 G^2/Hz
	350 Hz	.067 G^2/Hz
	390 Hz	.060 G^2/Hz
	600 Hz	.060 G^2/Hz
	2000 Hz	.012 G^2/Hz
Z-axis	20 – 80 Hz	+ 3.0 dB/oct
7.84 G_{rms}	80 – 350 Hz	.067 G^2/Hz
	350 – 2000 Hz	– 3.0 dB/oct

Hardware was functionally tested before and after vibration testing.

- Structural limit test per approved certification plan for a safety factor of 1.4 for limit loads and analysis for a safety factor of 2.0 for ultimate loads. Certification will be accomplished by testing and/or analysis. On the component level, structures will be individually tested as approved by the NSTS Structures and Mechanics working group.

The following environments will be certified by analysis per the certification plan:

1. Natural temperature
2. Pressure
3. Fungus
4. Hail
5. Humidity
6. Lightning
7. Ozone
8. Meteoroids
9. Salt spray
10. Sand/dust
11. Induced high temperature
12. Induced pressure
13. Shock
14. Life
15. Solar Radiation
16. Cycle

C. INSPECTION:
- Manufacturing
  - Inspect for damage or material degradation
- PDA
  - Inspect for damage or material degradation
  - Verify successful completion of interface test
  - Verify conformance to drawing

D. FAILURE HISTORY: None

E. OPERATIONAL USE:
- In the event of this failure, the crewmember will work the arming mechanism back and forth.
- The crew will be trained for this failure mode prior to launch.

PREPARED BY: D. A. CROUCH | REVISION: | SUPERSEDING DATE: | DATE: 9/91