

**CHANGE NOTICE**

Date Prepared: 10/29/02

1. The Boeing Company Johnson Space Center Houston TX 77058		2. <input type="checkbox"/> Proposed  <input checked="" type="checkbox"/> Approved	3. Code Ident.	4. Change Notice No. DCN 002	
			5. Contract No.  NAS15-10000	6. Directive No.	
7. Document No./Rev. SSP 30312 Revision H		8. Document Title Electrical, Electronic, And Electromechanical (EEE) And Mechanical Parts Management And Implementation Plan For Space Station		9. SSCN No. SSCN 005645	
10. Related Change No.		11. Change Title Exceptions To SSP 30312 Revision H			
THIS NOTICE INFORMS RECIPIENTS THAT THE DOCUMENT IDENTIFIED BY THE NUMBER (AND REVISION LETTER) SHOWN IN BLOCK 7 HAS BEEN CHANGED. THE PAGES CHANGED BY THE CN BEING THOSE FURNISHED HERE WITH AND CARRYING THE SAME DATE AS THIS CN. THE PAGES OF THE PAGE NUMBERS AND DATES LISTED BELOW IN THE SUMMARY OF CHANGED PAGES COMBINED WITH NON-LISTED PAGES OF THE ORIGINAL ISSUE OF THE REVISION SHOWN IN BLOCK 7 CONSTITUTE THE CURRENT VERSION OF THIS SPECIFICATION.					
12. CN No.	13. Pages Changed (Indicate Deletions)		S*	A*	15. Date
DCN 002	Revision and History Page		S		10-29-02
DCN 002	Pages D-66 through D-140			A	10-29-02
14. Technical Concurrence  /s/ Kinn Roopwah _____ <u>10-29-02</u> <span style="margin-left: 250px;">Date</span>					

\* "S" indicates supersedes earlier page. "A" indicates added page.

## REVISION AND HISTORY PAGE

REV.	DESCRIPTION	PUB. DATE
	BASELINE ISSUE (REFERENCE SSCBD BB000228, EFF. 01-15-87)	01-15-87
A	REVISION A (REFERENCE THE ELECTRONIC BASELINE VERSION)	07-30-88
B	REVISION B (REFERENCE SSCBD BB000420A, EFF. 05-30-89)	07-30-89
	CHANGE B1 (REFERENCE SSCBD BK000420C, EFF. 12-30-90)	02-15-91
C	REVISION C (REFERENCE SSCBDs BB000762 EFF. 05-15-91 AND BB000727 EFF. 09-28-90)	07-91
	CHANGE C1 (REFERENCE SSCBD BB000987AR1 EFF. 09-06-91)	09-91
	CHANGE C2 (REFERENCE SSCBD BB10247 EFF. 06-04-92)	06-92
	CHANGE C3 (REFERENCE SSCBDs BB003141 EFF. 06-23-92 AND BK050042 EFF. 06-23-92)	07-92
D	REVISION D (REFERENCE SSCBDs BB003141 EFF. 06-23-92 AND BK050042 EFF. 06-23-92)	07-92
	CHANGE D1 (REFERENCE SSCBDs BB000893B EFF. 06-23-92 AND BB000893BR1 EFF. 07-30-92)	09-92
	CHANGE D2 (REFERENCE SSCBDs BB000893C EFF. 11-20-92 AND BB000893D EFF. 11-20-92)	12-92
	CHANGE D3 (REFERENCE SSCBD BB000093 DR1 EFF. 05-06-93)	05-93
E	REVISION E (Reference SSCBD: 00002 Eff. 02-07-94)	03-23-94
F	REVISION F INCORPORATES ECP 145 (REFERENCE SSCBD 000145 EFF. 10-31-95)	11-27-95
G	REVISION G INCORPORATES SSCN 001685	06-16-00
H	REVISION H INCORPORATES SSCN 002439	03-26-02
DCN 001	DCN 001 IS AUTHORIZED BY SSCN 004415 AND INCORPORATES EXCEPTIONS 093, 094 AND 095	03-29-02
DCN 002	DCN 002 IS AUTHORIZED BY SSCN 05645 AND INCORPORATES EXCEPTIONS 053 THROUGH 092 AND 096, 097, 098 AND 099	11-04-02

DCN 001  
SSCN  
004415DCN 002  
SSCN  
05645

ERU: /s/ M. Hehn 11-04-02

**Exception 053 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
2/15/00	053	-	4A	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS			EEE Parts/Boeing-Canoga Park		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>		<b>DESCRIPTION</b>	
	F015291-0006 LDC 9115	Diode, Silicon, Rectifier, High Efficiency (UES 1304, UES 1305, UES 1306)			
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	Paragraph 4.0, Data Requirements	Microsemi	Habitable: <b>X</b> Non-Habitable:		
<b>ISSUE DESCRIPTION:</b>					
<p>Tier 1 contractors are responsible for requiring data from lower tier contractors as necessary to support compliance with requirements. The Microsemi screening traveler on this lot of diodes was not properly completed.</p>					
<p><b>RATIONALE:</b> (use continuation sheets if required)                  LORAL procured these diodes, and performed the requisite Incoming Inspection when Microsemi delivered them. Although the traveler for 100% Screening are blank, there exists objective evidence that Loral had received, reviewed and approved the complete data package which includes the aforementioned data. The data in the package provided evidence that the entire 650 pc lot was properly tested, with only 0.9% fallout over burn-in, and this defect allowance is well within the 10% allowed by the 015291 component specification. Rocketdyne has in its possession a complete DPA report for the subject lot/date code.</p> <p>The complete data package was reviewed and approved by LORAL. However the screening summary provided by Microsemi was incomplete. The LORAL review and acceptance of the Microsemi data package is sufficient to support compliance with requirements.</p> <p>The lack of attribute data for 100% Screening became known to Rocketdyne after the required 5-year data retention period from the manufacturer. In addition, there exist no known GIDEP, NASA, Boeing, or supplier alerts against this manufacturer since 1990. RSOP 13.7 describes Rocketdyne's automatic notification and tracking system for such alerts.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	2/15/00	<b>X</b>		
<p><b>COMMENTS:</b> (use continuation pages if required)                  Document this exception in SSP 30312.</p>					

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**Exception 054 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
2/15/00	054	-	4A	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS			EEE Parts/Boeing-Canoga Park		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>		
	F015580-0010 LDC 9526	Diode, Temperature Compensated, Zener Reference (ref 1N4565A-1 thru 1N4574A-1)			
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	Paragraph 4.0, Data Requirements	Microsemi	Habitable: <b>X</b> Non-Habitable:		
<b>ISSUE DESCRIPTION:</b>					
Tier 1 contractors are responsible for requiring data from lower tier contractors as necessary to support compliance with requirements. The Microsemi test report indicates that the wrong sample size was selected for Solderability testing.					
<b>RATIONALE:</b> (use continuation sheets if required)					
The 015580 Specification requires Solderability to be inspected in the Group B, subgroup 2A test sequence. For this particular lot, a 6-piece sample was to be selected for test. Microsemi incorrectly selected only 3 pieces for this test, but the records show that those samples passed the Steam Age / Solderability sequence.					
The original lot size was 228 pieces, and no subsequent solderability problems were found when those parts were installed on pc boards. In addition, there exists no known GIDEP, NASA, Boeing, or supplier alerts against this manufacturer since 1990. RSOP 13.7 describes Rockeydyne's automatic notification and tracking system for such alerts.					
Due to the acceptable results on the original solderability test, and the fact that no subsequent solderability problems were detected when the parts were installed.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	2/15/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312.					

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**Exception 055 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>
2/17/00	055	-	4A and SUBQ	1 of 1
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>	
ISS	Son Hoang 818-586-0681		EEE Parts/Boeing-Canoga Park	
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>		<b>DESCRIPTION</b>
BCDU (All Configurations)	D016015-0001	Diode, Silicon, Power Rectifier, Fast Recovery		RE 1807 S/N 0003 thru 0029
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>	
SSP 30312	3.5.1	Microsemi Corp.	Habitable: Non-Habitable: <b>X</b>	

**ISSUE DESCRIPTION:**

The D016015-0001 Power Rectifier (diode) module is used in BCDU applications. The D016015-0001 completed 100% screening and qualification tests with the exceptions to Physical dimensions, Resistance to solvent, Salt atmosphere, Moisture resistance, Shock/ Vibration/ Constant acceleration, Intermittent life-2000 cycles, and Steady State Operational Life.

RATIONALE: (use continuation sheets if required)

**Physical Dimensions:** The Diodes were installed into Fault Isolator assembly with no mechanical installation problems noted.

**Resistance to Solvents:** Build records documented use of D016015-0001 with the Lot Date Code: 9516, 9543, 9719, 9830, and 9906. There were no marking rub off noticeable of diode modules.

**Salt Atmosphere:** The BCDU ORU is covered but not sealed. However, all components are conformal coated during assembly and once P6 is launched, the salt atmosphere should not be an issue.

**Shock/ Vibration/ Constant Acceleration:** This is a non-cavity device module. Similarly constructed diode modules have passed shock/ vibration/ and constant acceleration.

**Intermittent Life – 2000 Cycles:** The component was surge tested at 100A @ 500 mS for 10 surges, which exceeds the estimated number (4) of on orbit faults. Also, during the ORU ATP testing, the diodes are activated only 102 times.

**Steady State Operational Life:** The device module using in BCDU applications is not steady state application.

**DISPOSITION**

<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/3/00	<b>X</b>		

**COMMENTS:** (use continuation pages if required)

Document this exception in SSP 30312.

**Exception 056 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
2/18/00	056	-	4A and SUBQ	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	Son Hoang 818-586-0681		EEE Parts/Boeing-Canoga Park		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>		
BCSU (All Configurations)	RM3605-001	Diode, Unidirectional Voltage Suppressor	R 072610-51 S/N X830114, X830115, X650610, C253487 and C290758		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	3.5.1	Microsemi Corp.	Habitable: Non-Habitable: <b>X</b>		
<b>ISSUE DESCRIPTION:</b>					
<p>The RM3605-001 Unidirectional Voltage Suppressor module (Diode) is used in BCSU applications. The RM3605-001 completed 100% screening and qualification tests with the exceptions to Salt atmosphere and Constant Acceleration. Additionally, the qualification samples sizes were less than specified in the specification.</p>					
<b>RATIONALE:</b> (use continuation sheets if required)					
<p><b>Salt Atmosphere:</b> The BCSU ORU is covered but not sealed. However, all components are conformal coated during assembly and once P6 is launched, the salt atmosphere should not be an issue.</p> <p><b>Constant Acceleration:</b> The Constant Acceleration test was not done during qualification, but component shock and vibration qualification tests were completed. In addition, vibration test was performed on the diode module as part of DCSU qualification during acceptance test.</p> <p><b>Additional Information:</b> The application of this component is considered low stress. The component is used to suppress common mode voltage between the return line and the chassis during chassis faults.</p> <p>The component failure history was verified: No diode modules have failed in operation. The component meets derating requirements. The average power of the component specification is 12.0W Sec while the IEA/Primary power system generates .084 W Sec.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/3/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312.					

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## Exception 057 To SSP 30312 Requirements

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE
2/18/00	057	-	3A	1 of 1
SYSTEM	ORIGINATOR and PHONE NO.		ORGANIZATION / CONTRACTOR	
ISS	Son Hoang 818-586-0681		EEE Parts/Boeing-Canoga Park	
END ITEM/CONFIG. ID NO.	NEXT ASSEMBLY(s)	PART NUMBER	DESCRIPTION	
R078486-11	RM2694-002	Diode, Rectifier Module, 600 V, 50 A	R 078486-11 S/N X830282 and X830283	
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER	LOCATION	
SSP 30312	3.5.1	Microsemi Corp.	Habitable: Non-Habitable: X	

**ISSUE DESCRIPTION:**

The RM2694-002 Rectifier module (Diode) is used in IDA applications. The RM2694-002 completed 100% screening and qualification tests with the exceptions to Physical dimensions, Resistance to solvent, Salt atmosphere, Moisture resistance, and Surge. Additionally, the qualification sample sizes were less than specified in the specification

**RATIONALE:** (use continuation sheets if required)

**Physical Dimensions:** The Diodes were installed into Initialization Diode Assembly (IDA) with no mechanical installation problems noted.

**Resistance to Solvents:** Build records documented use of RM2694-002 with the Lot Date Code: 9721 and serial numbers X830282 and X830283. There were no marking rub off noticeable of diode modules.

**Salt Atmosphere:** The (IDA) is covered but not sealed. However, all components are conformal coated during assembly and once Z1 is launched, the salt atmosphere should not be an issue.

**Moisture Resistance:** Same as Salt Atmosphere.

**Surge Test:** The surge current test was not done in qualification but was completed as part of 100% screening.  $I_{F(surge)} = 800A$   $T_P = 8.3$  mSec, six surges. One surge/minute max.

**Additional Information:**

Usage of IDA is measured in days. Should the diode fail, an alternate channel can be used to charge the Batteries on the IEA. The parts meet all derating parameters. The component failure has been checked: No components have failed operation.

**DISPOSITION**

BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/3/00	X		

**COMMENTS:** (use continuation pages if required) Document this exception in SSP 30312.

**Exception 059 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
2 March, 2000	059	N/C	3A	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	Seak Lee 818-586-3960		EEE Parts/Boeing-Canoga Park		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>		
	F015992-0XXX	Capacitor, Ceramic, Fixed, CCR type	All ORU		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	3.2.1.2	AVX	Habitable: Non-Habitable: <b>X</b>		
<b>ISSUE DESCRIPTION:</b>					
Missing Group B Data.					
<b>RATIONALE:</b> (use continuation sheets if required)					
Receiving report show a one paragraph stating that Group B was done.					
These parts are built to MIL-C-20 specification, with additional QCI test as follow: IR, Low Voltage Humidity, Capacitance & DF test. There is read and record data for the additional QCI test, however, no attribute data for Group B test. Within the receiving report, there is Quality Conformance Inspection summary for each different type of MIL-C-20 capacitors built during that period, the summary includes Group A, subgroup 1 and Group B subgroups 1, 2, 3 and life					
The lots of capacitors with different values have been procured, and DPA was successfully performed on each of them, the DPA reports are as follows:					
<p>J4787 for -103F (1000pF, 100V), LDC9431                  J4805-2 for -473F (47000pF, 50V), LDC9430                  RR4J016257 for -333F (33000pF, 50V), LDC9430                  RR4J016948 for -823F (82000pF, 50V), LDC9430</p>					
AVX is an approved Class S manufacturer for MIL-C-20 devices.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/3/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312.					

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**Exception 060 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
24 February, 2000	060	N/C	4A	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	Seak Lee 818-586-3960		EEE Parts/Boeing-Canoga Park		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b><u>PART NUMBER</u></b>		<b>DESCRIPTION</b>	
	RM2658-001 LDC9632	Hybrids		RPCM	
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	4.4	Aeroflex	Habitable: X Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b>					
Missing 100% bond pull data.					
<b>RATIONALE:</b> (use continuation sheets if required)					
Data includes a summary of the bonds pulled. However, number of devices tested are not specified. The bonds that were pulled meets requirements.					
The lot did successfully pass DPA test, which included 100% bond pull on the test (qty 1) sample as documented in report J6200, and the ORU where the parts are being used has also successfully passed the qualification test.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/3/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312.					

DCN 002
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## Exception 061 To SSP 30312 Requirements

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE	
24 February, 2000	061	-	3A	1 of 1	
SYSTEM	ORIGINATOR and PHONE NO.		ORGANIZATION / CONTRACTOR		
ISS			EEE Parts/Boeing-Canoga Park		
END ITEM/CONFIG. ID NO.	NEXT ASSEMBLY(s)	PART NUMBER		DESCRIPTION	
	F015212-0XXX	Diode, Transient Suppressor (1N5907, 1N5629A – 1N5665A)		DDCU MBSU PS A/E	
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER		LOCATION	
SSP 30312	3.2.1.2b	Microsemi		Habitable: Non-Habitable: <b>X</b>	
<b>ISSUE DESCRIPTION:</b>					
Missing data for Terminal strength and missing test limit on traveler for maximum pulse current test.					
<b>RATIONALE:</b> (use continuation sheets if required)					
ORU where parts are used has been complete vibration test, which confirmed terminal strength to be acceptable.					
Since the manufacturer Microsemi is a QPL supplier for the equivalent JANTXV devices, their process are being monitored by the government on a continuing basis for compliance.					
There are also three DPA reports that confirm the lot meets the SCD requirement, the report are:					
RR4J014883 for –0038, LDC9307 J4300-1 for –0018, LDC9325 J5349-2 for –0004, LDC9324					
<b>DISPOSITION</b>					
BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/3/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312.					

**Exception 062 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>																
March 10, 2000	062	-	3A & SUBQ	1 of 1																
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>																	
ISS	Joel Bruemmer 818-586-9346		EEE Parts/Boeing-Canoga Park																	
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>		<b>DESCRIPTION</b>																
R076500 R076522 R079903	F015212-0XXX			DDCU-I DDCU-E DDCU-HP																
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>																	
SSP 30312	4	Boeing	Habitable: X Non-Habitable: X																	
<b>ISSUE DESCRIPTION:</b>																				
The following component fails the derating criteria on the DDCU Power Supply D.																				
<table border="1"> <thead> <tr> <th>Ref Des</th> <th>Part Number</th> <th>Description</th> <th>Parameter</th> <th>Part Rating</th> <th>Derating Value</th> <th>Nominal Value (W/C)</th> <th>Stress Ratio</th> </tr> </thead> <tbody> <tr> <td>R12</td> <td>RLR07C1500FS</td> <td>Resistor, Fixed</td> <td>150 OHM</td> <td>0.25W</td> <td>0.15W</td> <td>0.150417W</td> <td>60.2%</td> </tr> </tbody> </table>					Ref Des	Part Number	Description	Parameter	Part Rating	Derating Value	Nominal Value (W/C)	Stress Ratio	R12	RLR07C1500FS	Resistor, Fixed	150 OHM	0.25W	0.15W	0.150417W	60.2%
Ref Des	Part Number	Description	Parameter	Part Rating	Derating Value	Nominal Value (W/C)	Stress Ratio													
R12	RLR07C1500FS	Resistor, Fixed	150 OHM	0.25W	0.15W	0.150417W	60.2%													
<b>RATIONALE:</b> (use continuation sheets if required)																				
Under nominal conditions R12 in PSD will dissipate 0.106 Watts. When the +15 Vdc is at its highest value (15.25V), the value of zener D3 is at its lowest value (10.45V), and R12 is at its highest value (151.5 ohm), then the power will be 0.150417 Watts which is over the derated value of 0.15 Watt. This is not likely to happen since temperature will not allow these values to vary in opposite directions.																				
<b>DISPOSITION</b>																				
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>															
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/24/00	<b>X</b>																	
<b>COMMENTS:</b> (use continuation pages if required)																				
Document this exception in SSP 30312.																				

DCN 002
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**Exception 063 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
3/11/00	063	-	ISS	1 of 3	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ARIS Rack	Gary R. De La O 256.961.1494		Boeing, Huntsville		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER</b>	<b>DESCRIPTION</b>		<b>NEXT HIGHER ASSY</b>	
683 L55A	N/A	See Attached Sheets		683-61600-001	
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	4	Boeing	Habitable: <b>X</b> Non-Habitable: <b>X</b>		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
<p>The following components did not meet the derating criteria for microcircuit supply voltages on the Active Rack Isolation System (ARIS). However, the applied voltages are below the manufacturer's recommended values.</p> <p>SEE ATTACHED PAGES.</p>					
<b>RATIONALE:</b> (use continuation sheets if required)					
<p>In all cases, the microcircuits exceeded the supply voltage (positive and negative) derating criteria by 0.04. The supply voltages are standard power supply voltages and are recommended for use by their respective manufacturers.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	5/24/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 063 To SSP 30312 Requirements (continued)****REMOTE ELECTRONICS UNIT ASSEMBLY, Part No. 683-61623-001****Printed Wiring Assembly, Accelerometer Board, Part No. 683-61622-001**

Ref Des	Part Number	Description	Parameter	Actual Stress	Rated Value	Stress Ratio	SSP 30312 Limit
U1	683-61930-003	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U5	683-61930-003	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U12	683-61930-003	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U16	683-61930-003	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U20	683-61930-003	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U23	683-61930-003	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U27	683-61930-003	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U31	683-61930-003	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U34	683-61930-003	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U48	683-62215-001	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80

**Printed Wiring Assembly, Position Sensor Board, Part No. 683-61615-001**

Ref Des	Part Number	Description	Parameter	Actual Stress	Rated Value	Stress Ratio	SSP 30312 Limit
U20	683-61930-004	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U21	683-61930-004	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U22	683-61930-004	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U23	683-61930-004	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U24	683-61930-004	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U25	683-61930-004	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U28	683-62215-001	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80

**Exception 063 To SSP 30312 Requirements (continued)****ACTUATOR DRIVER ASSEMBLY, Part No. 683-61760-001****ELECTRONICS MODULE, Part No. 683-61762-001****Printed Wiring Assembly, Amplifier Interface, Part No. 683-61560-001**

Ref Des	Part Number	Description	Parameter	Actual Stress	Rated Value	Stress Ratio	SSP 30312 Limit
U2	683-62212-022	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U3	683-61930-006	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U10	683-62212-022	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80

**CONTROLLER DRIVER ASSEMBLY, Part No. 683-61566-001****Printed Wiring Assembly, Digital Analog Converter, Part No. 683-61696-001**

Ref Des	Part Number	Description	Parameter	Actual Stress	Rated Value	Stress Ratio	SSP 30312 Limit
U2	683-61930-009	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U3	683-61930-009	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U10	683-61930-009	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80
U10	683-61930-009	Op Amp	V	- 15.1	18	0.84	0.80
				+ 15.1	18	0.84	0.80

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## Exception 064 To SSP 30312 Requirements

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE	
17March00	064	N/C	4A	1 of 3	
SYSTEM	ORIGINATOR and PHONE NO.		ORGANIZATION / CONTRACTOR		
ISS	Paul Lockwood 818-586-7155		EEE Parts/Boeing, Canoga Park		
END ITEM/CONFIG. ID NO.	WIRE HARNESS/PART NUMBER	DESCRIPTION	NEXT HIGHER ASSY		
RE1806-03	See Attached List	Field Effect Devices	SSU		
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER	LOCATION		
SSP 30312	Appendix B.3.2.4, Transistor, Field Effect, Derating Factor	Various	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
SSU Field-effect devices were derating to the requirements of SSP 30312, Revision D (0.75 derating factor), and all parts meet that requirement. Revision F of SSP 30312 requires derating to 0.60, and several parts do not meet that requirement (see attached list).					
<b>RATIONALE:</b> (use continuation sheets if required)					
Parts were selected to meet the requirements of SSP 30312 Revision D, as that was the controlling document at the time the SSU design was finalized. Reliability assessments were made with the Revision D requirements taken into consideration, and no detrimental effects were noted.					
PV Electronics Team comments regarding these MOSFET applications are attached (see page 2).					
DISPOSITION					
BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/21/00	X		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 064 To SSP 30312 Requirements (continued)****MOSFET – GATE SOURCE VOLTAGE**

Failure mechanism is a breakdown/perforation of the silicon oxide layer between the gate and source regions (see IR application note 937 A). This occurs when the gate-to-source voltage exceeds 20V.

Destruction of the MOSFET occurs when the gate-to-source voltage is high enough to arc across the gate dielectric and thus burn a microscopic hole in the gate oxide layer. International Rectifier in Application Note 955 provided this information.

There is no documentation referring to a degradation of performance at gate-to-source voltages in the range of 15 volts to 20 volts. There are just the warnings to stay below the maximum rating of 20 volts.

International Rectifier in Application Note 930A indicates that the :t20 volt absolute maximum gate voltage rating should never be exceeded or permanent damage can occur .

Both the SSU and BCDU design was completed using the guidelines of SSP 30312 revision D. This document states that the MOSFET breakdown voltage [BV(GSS)] maximum stress ratio is 0.75. At this point only a major redesign, re-fabrication ltest of new ORUs and scrapping of completed ORUs would allow Loral to conform with the requirements of SSP 30312 Revision F.

There has been no reliability data or failure analysis to support changing the BV(GSS) stress ratio from 0.75 to 0.60. The MOSFET vendors indicate that there is no degradation of parameters due to 15 volt operation just the possibility of failure if the gate-source voltage is above 20 volts. The application engineer at International Rectifier believes that the device will function above 20 volts and this requirement is conservative. What we now have is two magnitudes of safety margin built into the gate-source breakdown voltage rating. Unless data is presented relating to the effect on the reliability of the MOSFETs using a gate drive of 15 volts, we recommend using the parts as is.

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## Exception 064 To SSP 30312 Requirements (continued)

SSU – DERATING FOR FET TRANSISTOR V<sub>gs</sub>

PART NUMBER	PART TYPE	DESCRIPTION	QTY	ASSEMBLY	MODULE	Ref Des	Rated Vgs (Volts)	Actual Vgs (Volts)	Ratio 0.6 Factor (S/B <1)	Ratio 0.75 Factor (S/B <1)
F015829-A001	IRHF7130	Transistor, MOS Field Effect Semiconductor Device	3	E040034-01	Current Monitor	Q2, Q4, Q6	+/- 20	15	1.25	1.00
JANS2N3822	2N3822	Transistor, JFET Semiconductor Device	6	E040054-03	PVCE-2	Q10, Q11, Q12, Q13, Q14, Q15	50	30	1.00	0.80
JANS2N3822	2N3822	Transistor, JFET Semiconductor Device	1	E040054-03	PVCE-2	Q16	50	5	0.17	0.13
D016097-A001	IRHM7360	Transistor, MOS Field Effect Semiconductor Device, N Channel	1	E040067-03	Failsafe Assembly	Q1	+/- 20	6	0.50	0.40
D016097-A001	IRHM7360	Transistor, MOS Field Effect Semiconductor Device, N Channel	2	E040067-03	Failsafe Assembly	Q2, Q3	+/- 20	11	0.92	0.73
D016097-A001	IRHM7360	Transistor, MOS Field Effect Semiconductor Device, N Channel	3	E040067-03	Failsafe Assembly	Q4, Q5, Q8	+/- 20	8.5	0.71	0.57
D015888-0001	2N4858A	Transistor, JFET, N-Channel, Switch, Silicon	3	E040073-01	Failsafe Logic	Q1, Q3, Q7	-40	-17	0.71	0.57
F015551-A001	IRHC7360SE (Q1-Q4: Part Hybrid)	Microcircuit, Hybrid, Quad, HEXFET w/ Drivers	1	E040081-01/02	Ramp Generator	U3	+/- 20	15	1.25	1.00
F015551-A001	IRHC7360SE (Q1-Q4: Part Hybrid)	Microcircuit, Hybrid, Quad, HEXFET w/ Drivers	2	E040094-01 thru -10	8 String Module	U3, U10	+/- 20	15	1.25	1.00
D016097-A001	IRHM7360SE	Transistor, MOS Field Effect Semiconductor Device, N Channel	5	E040525-03	DC/DC Converter	Q1, Q2, Q5, Q6, Q7	+/- 20	10	0.83	0.67
D016102-A001	IRHM7450SE	Transistor, MOS Field Effect Semiconductor Device, N Channel	2	E040525-03	DC/DC Converter	Q3, Q4	+/- 20	10	0.83	0.67

## Exception 065 To SSP 30312 Requirements

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE	
17March00	065	N/C	4A	1 of 3	
SYSTEM	ORIGINATOR and PHONE NO.	ORGANIZATION / CONTRACTOR			
ISS	Paul Lockwood 818-586-7155	EEE Parts/Boeing, Canoga Park			
END ITEM/CONFIG. ID NO.	WIRE HARNESS/PART NUMBER	DESCRIPTION	NEXT HIGHER ASSY		
RE1807-03	See Attached List	Field Effect Devices	BCDU		
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER	LOCATION		
SSP 30312	Appendix B.3.2.4, Transistor, Field Effect, Derating Factor	Various	Habitable: Non-Habitable: <b>X</b>		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
BCDU Field-effect devices were derating to the requirements of SSP 30312, Revision D (0.75 derating factor), and all parts meet that requirement. Revision F of SSP 30312 requires derating to 0.60, and several parts do not meet that requirement (see attached list).					
<b>RATIONALE:</b> (use continuation sheets if required)					
Parts were selected to meet the requirements of SSP 30312 Revision D, as that was the controlling document at the time the BDCU design was finalized. Reliability assessments were made with the Revision D requirements taken into consideration, and no detrimental effects were noted.					
PV Electronics Team comments regarding these MOSFET applications are attached (see page 2).					
DISPOSITION					
BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/21/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 065 To SSP 30312 Requirements (continued)****MOSFET – GATE SOURCE VOLTAGE**

Failure mechanism is a breakdown/perforation of the silicon oxide layer between the gate and source regions (see IR application note 937 A). This occurs when the gate-to-source voltage exceeds 20V.

Destruction of the MOSFET occurs when the gate-to-source voltage is high enough to arc across the gate dielectric and thus burn a microscopic hole in the gate oxide layer. International Rectifier in Application Note 955 provided this information.

There is no documentation referring to a degradation of performance at gate-to-source voltages in the range of 15 volts to 20 volts. There are just the warnings to stay below the maximum rating of 20 volts.

International Rectifier in Application Note 930A indicates that the :t20 volt absolute maximum gate voltage rating should never be exceeded or permanent damage can occur .

Both the SSU and BCDU design was completed using the guidelines of SSP 30312 revision D. This document states that the MOSFET breakdown voltage [BV(GSS)] maximum stress ratio is 0.75. At this point only a major redesign, re-fabrication ltest of new ORUs and scrapping of completed ORUs would allow Loral to conform with the requirements of SSP 30312 Revision F.

There has been no reliability data or failure analysis to support changing the BV(GSS) stress ratio from 0.75 to 0.60. The MOSFET vendors indicate that there is no degradation of parameters due to 15 volt operation just the possibility of failure if the gate-source voltage is above 20 volts. The application engineer at International Rectifier believes that the device will function above 20 volts and this requirement is conservative. What we now have is two magnitudes of safety margin built into the gate-source breakdown voltage rating. Unless data is presented relating to the effect on the reliability of the MOSFETs using a gate drive of 15 volts, we recommend using the parts as is.

PV Electronics 3/16/00

**Exception 065 To SSP 30312 Requirements (continued)**  
BCDU – DERATING FOR FET TRANSISTOR V<sub>gs</sub>

PART NUMBER	PART TYPE	DESCRIPTION	QTY	ASSEMBLY	MODULE	Ref Des	Rated Vgs (Volts)	Actual Vgs (Volts)	Ratio 0.6 Factor (S/B <1)	Ratio 0.75 Factor (S/B <1)
D016097-A001	HRM7360SI	Transistor, MOS Field Effect Semiconductor Device, N-Channel, Silicon	2	E040090-01	Battery Heater Switch Chassis Parts	Q1, Q2	+/- 20	15	1.25	1.00
F015534-A001	IRMF7230	Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	2	E040406-02	BSCCM PS	Q10, Q15	+/- 20	15	1.25	1.00
D015987-A001	IRHM7130	Transistor, MOS Field Effect Semiconductor Device, N-Channel, Silicon	1	E040410-03	LVBC	Q3	+/- 20	15	1.25	1.00
D015988-A001	1RHM7230	Transistor, MOS Field Effect Semiconductor Device, N-Channel, Silicon	2	E040410-03	LVBC	Q1, Q2	+/- 20	15	1.25	1.00
D015987-A001	IRHM7130	Transistor, MOS Field Effect Semiconductor Device, N-Channel, Silicon	1	E040429-03	FI Lower Chassis	Q3	+/- 20	13.5	1.13	0.90
D015989-A001	1RHM9130	Transistor, Field Effect Semiconductor Device, P-Channel, Silicon	1	E040429-03	FI Lower Chassis	Q4	+/- 20	13.5	1.13	0.57
D015980-A001	SFET	OCTA Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	2	E040461-01	SuperFET	Q1, Q2	+/- 24	12	0.83	0.67
F015854-A001	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	2	E040465-01	Gate Drive Assy	U3, Q4	+/- 20	15	1.25	1.00

## Exception 065 To SSP 30312 Requirements (continued)

PART NUMBER	PART TYPE	DESCRIPTION	QTY	ASSEMBLY	MODULE	Ref Des	Rated Vgs (Volts)	Actual Vgs (Volts)	Ratio 0.6 Factor (S/B <1)	Ratio 0.75 Factor (S/B <1)
F015878-A001	SFET	Transistor, MOS Field Effect Semiconductor Device, N-Channel, Silicon	1	E0404632-02	SuperFET Assy	Q!	+/- 40	24	1.00	0.80
D015878-A001	IRHM7130	Transistor, MOS Field Effect Semiconductor Device, N-Channel, Silicon	2	E041385-02	Bilateral Converter Assy	Q1, Q3	+/- 20	6	0.50	0.40
F015989-A001	IRHM9130	Transistor, MOS Field Effect Semiconductor Device, P-Channel, Silicon	2	E041385-02	Bilateral Converter Assy	Q2, Q4	+/- 20	6	0.50	0.40
D015987-A001	IRHM7130	Transistor, MOS Field Effect Semiconductor Device, N-Channel, Silicon	3	E041407-02	Gate Drive Assy	Q1, Q4, Q11	+/- 20	13	1.08	0.87
D015988-A001	IRHM7230	Transistor, MOS Field Effect Semiconductor Device, N-Channel, Silicon	2	E041407-02	Gate Drive Assy	Q7, Q8	+/- 20	15	1.25	1.00
D015989-A001	IRHM9130	Transistor, MOS Field Effect Semiconductor Device, P-Channel, Silicon	2	E041407-02	Gate Drive Assy	Q2, Q3	+/- 20	12	1.00	0.80
F015854	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	2	E041425-03	Gate Drive CCA	Q6, Q8	+/- 20	11	0.92	0.73
D015853-A001	2N6845	Transistor, Field Effect Semiconductor Device, P-Channel, Silicon	1	E041429-02	PWM CCA	Q2	+/- 20	6	0.50	0.40
D015854-A001	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	5	E041429-02	PWM CCA	Q3, Q12, Q13, Q14, Q15	+/- 20	15	1.25	1.00

## Exception 065 To SSP 30312 Requirements (continued)

PART NUMBER	PART TYPE	DESCRIPTION	QTY	ASSEMBLY	MODULE	Ref Des	Rated Vgs (Volts)	Actual Vgs (Volts)	Ratio 0.6 Factor (S/B <1)	Ratio 0.75 Factor (S/B <1)
D015888-0001	2N4858A	Transistor, JFET, N-Channel Switch, Silicon	8	E041429-02	PWM CCA	Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11	- 40	- 12.5	0.52	0.42
D016027-A001	2N7278R	Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	1	E041505-01	Interface CCA	Q4	+/- 20	15	1.25	1.00
F015854-A001	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	2	E041515-02	Logic CCA	Q13, Q14	+/- 20	15	1.25	1.00
JANTXV2N666 1RS	2N6661	Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	4	E041515-02	Logic CCA	Q11, Q12, Q16, Q17	+/- 20	12.5	1.04	0.83
D016097-A001	HRM7360SI	Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	7	E041685-03	DC/DC PS	Q1, Q2, Q3, Q4, Q5, Q6, Q7	+/- 20	15	1.25	1.00
F015854-A001	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	6	E041709-02	Main Control CCA	Q7, Q8, Q9, Q10, Q11, Q12	+/- 20	15	1.25	1.00
F015854-A001	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	2	E041715-02	Isoconverter / Feedback CCA	Q7, Q8	+/- 20	15	1.25	1.00

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Exception 065 To SSP 30312 Requirements (continued)

PART NUMBER	PART TYPE	DESCRIPTION	QTY	ASSEMBLY	MODULE	Ref Des	Rated Vgs (Volts)	Actual Vgs (Volts)	Ratio 0.6 Factor (S/B <1)	Ratio 0.75 Factor (S/B <1)
D015854-0001	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	28	E041796-01	Phased Control CCA	Q2, Q3, Q4, Q5, Q10, Q11, Q13, Q14, Q15, Q16, Q21, Q22, Q24, Q25, Q26, Q27, Q32, Q33, Q35, Q36, Q37, Q38, Q43, Q44, Q45, Q46, Q47, Q48	+/- 20	15	1.25	1.00
D015888-0001	2N4858A	Transistor, JFET, N-Channel Switch, Silicon	16	E041796-01	Phased Control CCA	Q6, Q7, Q8, Q9, Q17, Q18, Q19, Q20, Q28, Q29, Q30, Q31, Q39, Q40, Q41, Q42	- 40	- 12.5	0.52	0.42
JANTXV2N666 1RS	2N6661	Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	4	E041796-01	Phased Control CCA	Q1, Q12, Q23, Q34	+/- 20	15	1.25	1.00
D016097-A001	HRM7360SI	Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	7	E041823-03	Diode/FET Assy	Q1, Q2	+/- 20	12	1.00	0.80
D015888-0001	2N4858A	Transistor, JFET, N-Channel Switch, Silicon	4	E041947-01	Controller CCA	Q3, Q4, Q5, Q6	- 40	- 12.5	0.52	0.42
F015854-A001	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	3	E041947-02	Controller CCA	Q1, Q2, Q11	+/- 20	14	1.17	0.93

## Exception 065 To SSP 30312 Requirements (continued)

PART NUMBER	PART TYPE	DESCRIPTION	QTY	ASSEMBLY	MODULE	Ref Des	Rated Vgs (Volts)	Actual Vgs (Volts)	Ratio 0.6 Factor (S/B <1)	Ratio 0.75 Factor (S/B <1)
JANTXV2N666 1RS	2N6661	Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	2	E041947-01	Controller CCA	Q10, Q12	+/- 20	15	1.25	1.00
D015854-0001	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	2	E041985-01	Controller CCA	Q1, Q3	+/- 20	14	1.17	0.93
D015888-0001	2N4858A	Transistor, JFET, N-Channel Switch, Silicon	4	E041985-01	Controller CCA	Q3, Q4, Q5, Q6	- 40	- 12.5	0.52	0.42
JANTXV2N666 1RS	2N6661	Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	1	E041985-01	Controller CCA	Q7	+/- 20	15	1.25	1.00
D015854-0001	IRHF7110	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	2	E041989-01	Gate Drive CCA	Q3, Q4	+/- 20	15	1.25	1.00
D015987-0001	IRHF7130	Transistor, MOS HEX Field Effect Semiconductor Device, N-Channel, Silicon	1	E042000-02	RBI Assy	Q6	+/- 20	14	1.17	0.93
D015989-0001	IRHF9130	Transistor, MOS HEX Field Effect Semiconductor Device, P-Channel, Silicon	1	E042000-02	RBI Assy	Q5	+/- 20	14	1.17	0.93
D016097-A001	HRM7360SI	Transistor, Field Effect Semiconductor Device, N-Channel, Silicon	4	E042000-02	RBI Assy	Q1, Q2, Q3, Q4	+/- 20	14	1.17	0.93



**Exception 066 To SSP 30312 Requirements**

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE	
March 16, 2000	066	-	All Flights	1 of 2	
SYSTEM	ORIGINATOR and PHONE NO.	ORGANIZATION / CONTRACTOR			
ISS	S. Lee 818-586-3960	EEE Parts/Boeing-Canoga Park			
END ITEM/CONFIG. ID NO.	NEXT ASSEMBLY(s)	PART NUMBER	DESCRIPTION		
See Page 2	RM2667-001 LDC 9624, 9716, 9741, and 9742	Microcircuit, EEPROM	All ORUs		
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER	LOCATION		
RM2667	Table VIII 100% Device Screening	Elmo	Habitable: <b>X</b> Non-Habitable: <b>X</b>		
<b>ISSUE DESCRIPTION:</b>					
<p>PIND failures exceeded 1% for lot date code 9624 on three runs, PIND failures exceeded 1% on lot date codes 9716, 9742, and 9741 on 1 run. However, PIND were not conducted on any of the lots until the failures were less than 1% for a run up to 5 runs as required. Therefore, the parts did not meet PIND test PDA requirement IAW MIL-STD-883, Method 2020, Condition A.</p>					
<b>RATIONALE:</b> (use continuation sheets if required)					
<p>ORU's where the parts are used has completed vibration testing and showed no failures that can attributed to loose particles.</p> <p>Five failures have been associated with these components. The system failures were analyzed and are due to weak write/read condition, and not related to loose particles.</p> <p>Three are also two DPA reports that confirmed the lot meets the SCD requirement, the reports are:</p> <p>J6677-2, LDC9716 J6325-7, LDC9624</p> <p>No GIDEP alerts exist against these components.</p>					
<b>DISPOSITION</b>					
BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Curtis G. Tallman	/s/ W. David Beverly	3/24/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312.					

## Exception 066 To SSP 30312 Requirements (continued)

Part Number	ORU	Next Assembly
RM2667-001	PVM-P6A	R076006-1
RM2667-001	PVM-P6A	R076006-1
RM2667-001	RPC4IA	R072702-41
RM2667-001	RPC4IA	R072702-41
RM2667-001	105PG2	R079903-1
RM2667-001	105PG2	R079903-1
RM2667-001	RPC3EA	R077418-21
RM2667-001	RPC3EA	R077418-21
RM2667-001	RPC1IA	R077416-31
RM2667-001	RPC5EA	R077419-21
RM2667-001	RPC6EA	R077420-21
RM2667-001	RPC4IA	R072702-41
RM2667-001	DDCU-I	R076500-01
RM2667-001	RPC4IA	R072702-41
RM2667-001	RPC5EA	R077419-21
RM2667-001	RPC6EA	R077420-21
RM2667-001	DDCU-I	R076500-101
RM2667-001	370PG2	R072610-31
RM2667-001	370PG2	R072610-31
RM2667-001	RPC2IA	R077417-31
RM2667-001	RPC2IA	R077417-31
RM2667-001	RPC4EA	R072702-31
RM2667-001	230PG2	R075300-1
RM2667-001	RPC3IA	R077418-31
RM2667-001	RPC4EA	R072702-31
RM2667-001	RPC3IA	R077418-31
RM2667-001	RPC5IA	R077419-51
RM2667-001	230PG2	R075300-1
RM2667-001	RPC6IA	R077420-31
RM2667-001	RPC6IA	R077420-31
RM2667-001	RPC5IA	R077419-51
RM2667-001	DDCU-EA	R076522-11
RM2667-001	DDCU-IA	R076500-1
RM2667-001	270PG2	R078480-1
RM2667-001	DDCU-IA	R076500-1
RM2667-001	270PG2	R078480-1
RM2667-001	DDCU-EA	R076522-11
RM2667-001	MBSUA	R072591-11
RM2667-001	MBSUA	R072591-11
RM2667-001	RPC2EA	R077417-21
RM2667-001	RPC2EA	R077417-21
RM2667-001	RPC1IA	R077416-31
RM2667-001	320PG2	R072341-1
RM2667-001	320PG2	R072341-1
RM2667-001	Z1TRSA	R080850-1
RM2667-001	Z1TRSA	R080850-1

DCN  
002

**Exception 068 To SSP 30312 Requirements**

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE
3/16/00	068	-	ISS	1 of 1
SYSTEM	ORIGINATOR and PHONE NO.		ORGANIZATION / CONTRACTOR	
ARIS Rack	Gary R. De La O 256.961.1494		Boeing, Huntsville	
END ITEM/CONFIG. ID NO.	WIRE HARNESS/PART NUMBER(s)	DESCRIPTION	DESCRIPTION	
683 L55A	N/A	Digital / Analog Converter Card Assembly	683-61566-001	
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER	LOCATION	
SSP30312	4	Boeing	Habitable: <b>X</b> Non-Habitable: <b>X</b>	

**ISSUE DESCRIPTION:** (use continuation pages if required)

The following components did not meet the derating criteria for capacitor, tantalum solid supply voltages on the Active Rack Isolation System (ARIS).

**CONTROLLER ASSEMBLY, Part No. 683-61566-001**

Digital / Analog Converter Card Assembly, Part No. 683-61696-001

Ref Des	Part Number	Description	Parameter	Actual Stress	Rated Value	Stress Ratio	SSP30312 limit
C1	CWR06HC336KC	Capacitor,	V	+5.1	10	0.51	0.50
				Tantalum, Solid			
C2	CWR06HC336KC	Capacitor,	V	+5.1	10	0.51	0.50
				Tantalum, Solid			

**RATIONALE:** (use continuation sheets if required)

In all cases, the capacitor exceeded the supply voltage derating criteria by 0.01 in a worst case scenario with a 5.1 volt supply maximum rating. However, for normal operation the applied voltage is 5 volt and within the manufacturer's recommended range.

**DISPOSITION**

BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Curtis G. Tallman	/s/ W. David Beverly	5/24/00	<b>X</b>		

**COMMENTS:** (use continuation pages if required)

**Exception 068 To SSP 30312 Requirements (continued)**

DRAWING NUMBER: 683-61696, PL683-61696 REV. D 9/15/99	NEXT ASSEMBLY: 683-61566	DATE:
ASSEMBLY NAME: DIGITAL / ANALOG CONVERTER CARD ASSEMBLY DE LA O		ANALYST: G.R.
DE-RATING STANDARD: NASA SSP 30312 REV. F 4/25/00		UPDATE:

Ref Des	Device Description	Device Part Number	Parameter	Rated Stress	Applied Stress	Units	Stress Ratio	De-rating Factor	Configuration
C86	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C87	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C136	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C151	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C152	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C153	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C154	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C157	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C158	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C159	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C160	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C162	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING

DCN 002
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**Exception 068 To SSP 30312 Requirements (continued)**

DRAWING NUMBER: 683-61565 REV.A, PL683-61565 REV. D  
 9/20/99  
 ASSEMBLY NAME: CONTROLLER CARD ASSEMBLY  
 DE LA O  
 DE-RATING STANDARD: NASA SSP 30312 REV. F  
 4/25/00

NEXT ASSEMBLY: 683-61566

DATE:

ANALYST: G.R.

UPDATE:

Ref Des	Device Description	Device Part Number	Parameter	Rated Stress	Applied Stress	Units	Stress Ratio	De-rating Factor	Configuration
C1	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C2	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C3	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C4	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C5	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C6	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C7	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C8	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C9	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C10	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C11	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C12	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C13	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C14	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C15	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C16	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C17	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C18	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C19	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C20	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C21	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C22	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C23	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C24	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C25	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C26	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C27	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING

**Exception 068 To SSP 30312 Requirements (continued)**

DRAWING NUMBER: 683-61565 REV.A, PL683-61565 REV. D  
 9/20/99  
 ASSEMBLY NAME: CONTROLLER CARD ASSEMBLY  
 DE LA O  
 DE-RATING STANDARD: NASA SSP 30312 REV. F  
 4/25/00

NEXT ASSEMBLY: 683-61566

DATE:

ANALYST: G.R.

UPDATE:

Ref Des	Device Description	Device Part Number	Parameter	Rated Stress	Applied Stress	Units	Stress Ratio	De-rating Factor	Configuration
C28	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C29	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C30	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C31	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C32	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C33	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C34	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C35	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C36	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C37	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C38	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C39	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C40	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C41	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C42	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C43	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C44	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C45	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C46	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C47	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C48	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C49	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C50	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C51	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C52	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C53	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C54	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING

**Exception 068 To SSP 30312 Requirements (continued)**

DRAWING NUMBER: 683-61565 REV.A, PL683-61565 REV. D  
 9/20/99  
 ASSEMBLY NAME: CONTROLLER CARD ASSEMBLY  
 DE LA O  
 DE-RATING STANDARD: NASA SSP 30312 REV. F  
 4/25/00

NEXT ASSEMBLY: 683-61566

DATE:

ANALYST: G.R.

UPDATE:

Ref Des	Device Description	Device Part Number	Parameter	Rated Stress	Applied Stress	Units	Stress Ratio	De-rating Factor	Configuration
C55	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C56	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C57	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C58	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C59	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C60	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C61	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C62	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C63	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C64	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C65	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C66	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C67	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C68	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C69	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C70	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C71	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C72	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C73	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C74	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C75	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C76	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C77	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C78	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C79	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C80	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C81	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING

**Exception 068 To SSP 30312 Requirements (continued)**

DRAWING NUMBER: 683-61565 REV.A, PL683-61565 REV. D  
9/20/99

NEXT ASSEMBLY: 683-61566

DATE:

ASSEMBLY NAME: CONTROLLER CARD ASSEMBLY  
DE LA O

ANALYST: G.R.

DE-RATING STANDARD: NASA SSP 30312 REV. F  
4/25/00

UPDATE:

Ref Des	Device Description	Device Part Number	Parameter	Rated Stress	Applied Stress	Units	Stress Ratio	De-rating Factor	Configuration
C82	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C82	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C84	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C85	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C86	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C87	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C88	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C89	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C90	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C304	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C350	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C351	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C352	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C353	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C354	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C400	CAPACITOR CERAMIC	683-61914-002 (NOVA CAP)	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C401	CAPACITOR CERAMIC	683-61914-002 (NOVA CAP)	VOLTAGE	50	5.1	VOLTS	0.10	0.60	CHARGE PUMP
C402	CAPACITOR CERAMIC	683-61914-002 (NOVA CAP)	VOLTAGE	50	5.1	VOLTS	0.10	0.60	CHARGE PUMP
C403	CAPACITOR CERAMIC	683-61914-002 (NOVA CAP)	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C404	CAPACITOR CERAMIC	683-61914-002 (NOVA CAP)	VOLTAGE	50	5.1	VOLTS	0.10	0.60	CAPACITOR GROUND
C804	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C850	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C851	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C852	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C853	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C854	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING



**Exception 068 To SSP 30312 Requirements (continued)**

DRAWING NUMBER: 683-61715 REV.A, PL683-61715 REV. D  
9/28/99

NEXT ASSEMBLY: 683-61623

DATE:

ASSEMBLY NAME: POSITION SENSOR ASSEMBLY (REMOTE ELECTRONICS, SERIAL INTERFACE)  
DE LA O

ANALYST: G.R.

DE-RATING STANDARD: NASA SSP 30312 REV. F  
4/25/00

UPDATE:

Ref Des	Device Description	Device Part Number	Parameter	Rated Stress	Applied Stress	Units	Stress Ratio	De-rating Factor	Configuration
C4	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	POWER SUPPLY FILTERING
C5	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	POWER SUPPLY FILTERING
C19	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C43	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C44	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C20	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C49	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C50	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C61	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C62	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C63	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C64	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C65	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C66	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C67	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C68	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C69	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C70	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C71	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C76	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	CAPACITOR GROUND
C77	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C79	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C120	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C200	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	FIRST ORDER INTEGRATOR

Exception 068 To SSP 30312 Requirements (continued)

DRAWING NUMBER: 683-61622 REV.A, PL683-61622 REV. E  
11/5/99

NEXT ASSEMBLY: 683-61623

DATE:

ASSEMBLY NAME: PRINTED WIRING ASSEMBLY, ACCELEROMETER BOARD

ANALYST: G.R. DE LA O

DE-RATING STANDARD: NASA SSP 30312 REV. F  
4/25/00

UPDATE:

Ref Des	Device Description	Device Part Number	Parameter	Rated Stress	Applied Stress	Units	Stress Ratio	De-rating Factor	Configuration
C5	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C12	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C29	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C36	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C41	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C53	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C60	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C65	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C96	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C102	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	POWER SUPPLY FILTERING
C117	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C118	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C119	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C120	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C121	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING
C122	CAPACITOR CERAMIC	CDR04BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING

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**Exception 068 To SSP 30312 Requirements (continued)**

DRAWING NUMBER:	683-61609 REV.D, PL683-61609 REV. H 9/21/99	NEXT ASSEMBLY: 683-61762	DATE:
ASSEMBLY NAME:	CONTROLLER CARD ASSEMBLY DE LA O		ANALYST: G.R.
DE-RATING STANDARD:	NASA SSP 30312 REV. F 4/25/00		UPDATE:

Ref Des	Device Description	Device Part Number	Parameter	Rated Stress	Applied Stress	Units	Stress Ratio	De-rating Factor	Configuration
C9	CAPACITOR CERAMIC	CDR33BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	POWER SUPPLY FILTERING
C10	CAPACITOR CERAMIC	CDR33BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	POWER SUPPLY FILTERING
C11	CAPACITOR CERAMIC	CDR33BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	POWER SUPPLY FILTERING
C12	CAPACITOR CERAMIC	CDR33BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	POWER SUPPLY FILTERING
C13	CAPACITOR CERAMIC	CDR33BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	POWER SUPPLY FILTERING
C14	CAPACITOR CERAMIC	CDR33BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	POWER SUPPLY FILTERING
C70	CAPACITOR CERAMIC	CDR33BX104AKUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	VOLTAGE DECOUPLING

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**Exception 068 To SSP 30312 Requirements (continued)**

DRAWING NUMBER: 683-61560 REV.D, PL683-61560 REV. E  
 10/25/99  
 ASSEMBLY NAME: CONTROLLER CARD ASSEMBLY  
 DE LA O  
 DE-RATING STANDARD: NASA SSP 30312 REV. F  
 4/25/00

NEXT ASSEMBLY: 683-61762

DATE:

ANALYST: G.R.

UPDATE:

Ref Des	Device Description	Device Part Number	Parameter	Rated Stress	Applied Stress	Units	Stress Ratio	De-rating Factor	Configuration
C7	CAPACITOR CERAMIC	CDR34BP103AJUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	CAPACITOR GROUND
C15	CAPACITOR CERAMIC	CDR34BP103AJUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	FIRST ORDER INTEGRATOR
C16	CAPACITOR CERAMIC	CDR34BP103AJUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	FIRST ORDER INTEGRATOR
C19	CAPACITOR CERAMIC	CDR34BP103AJUS	VOLTAGE	50	5.1	VOLTS	0.10	0.60	FIRST ORDER INTEGRATOR

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**Exception 070 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE1 of 1</b>	
06/13/00	070		4A		
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
SAW	Seak Lee 818-586-3960		Boeing – Canoga Park		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
RE1801-01	N/A	DIDOE, BYPASS	PV Array		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
5838050-503	SSP 30312, Paragraph B.3.2.2.2	Microsemi SSDI	Habitable: <input type="checkbox"/> Non-Habitable: <input checked="" type="checkbox"/>		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
<p>1. Forward current for Microsemi is rated for 5A, the de-rated value should be 2.5A, and the actual apply current is 3.1A maximum worst case.</p> <p>2. Junction temperature for both Microsemi and SSDI parts are rated at 150<sup>o</sup>C, derated value should be 125<sup>o</sup>C, and the actual temperature the junction experienced is 141<sup>o</sup>C.</p>					
<b>RATIONALE:</b> (use continuation pages if required)					
<p>Qualification Life test at diode level were performed on both parts successfully, the test conditions were as follow:</p> <p>a) Temp Cycle – 20,000 cycles, -115<sup>o</sup>C to + 150<sup>o</sup>C with ramp rate 30<sup>o</sup>C / minute</p> <p>b) Power Cycle – 20,000 cycles, 50<sup>o</sup>C ± 5<sup>o</sup>C to 150<sup>o</sup>C ± 50<sup>o</sup>C at IF = 3.0A</p> <p>A separate life test for both parts were also successfully tested at 275<sup>o</sup>C and 300<sup>o</sup>C for 5000 hours.</p> <p>Successful Qualification and Life test at extreme temperatures justified the parts used in flight that exceeded the de-rating requirement.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Kinn Roopwah for Curtis G. Tallman	/s/ Madhu Rao for David Beverly	06/13/00	X		
<b>COMMENTS:</b> (use continuation pages if required)					
<p>The bypass diodes are installed in the Solar Array Wing (SAW), normally the diodes are in reverse bias when the SAW is conducting, and switched to forward bias when the SAW is not conducting</p>					

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**Exception 071 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE 1 of 1</b>	
6/13/00	071	-	4A		
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	Paul Lockwood 818-586-7155		EEE Parts/Boeing-Canoga Park		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
SAW	MD1047	Cable			
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	Appendix B, para B.3.5.2	Lockheed	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
In several SAW locations, bundled 16AWG wires are carrying 6.2 amps in worst-case conditions. SSP30312 requires derating of bundled wires of this size to 6.0 amps, maximum.					
<b>RATIONALE:</b> (use continuation pages if required)					
In the Solar Array Wing, the 6.2 amps is a worst-case condition, and is intermittent based upon orbit position and solar exposure. The true average current carried by the 16AWG wires is 5.4 amps.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Thomas M. Orton for Curtis G. Tallman	/s/ Madhu Rao for David Beverly	6/13/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 072 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>		
June20th 2000	072	N/C	8A	PAGE 1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
Rate Gyro Assembly	Mohamed Moolji ex 70242		EEE Parts/Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>		<b>DESCRIPTION</b>	
222044A	ISS	34096982 Honeywell NSPAR No:HIF-0147B LDC9250		Connector Rect.Min. Rck & Panel	
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	Paragraph 3.3	Positronics	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b>					
<p>In NSPAR HIF-0147 B dated 01/08/99, "yes" in box "a" of section 11 was checked, indicating that the part is qualified, but qualification data (boxes "h" and "l" ) were not filled in. Honeywell which uses this part can not locate QCI (Quality Conformance Inspection) data package.</p>					
<b>RATIONALE:</b>					
<p>This part was evaluated as part of Boeing- Huntington Beach Flight 8A RGA technical assessment. The conclusion of the study was that there is no impact. The rest of the RGA nonstandard parts had QCI data packages, which indicates that Space Station requirements were complied with as a matter of policy, and QCI data packages in question was simply misplaced. We have completed a GIDEP search on Reynolds connectors dating back to 1990 and found no alerts having any impact to connectors on this NSPAR. Also RGA has passed qualification and acceptance testing. This data is more than 5yrs (LDC 9250) old therefore it exceeds the data retention requirements.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	6/23/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312					

**Exception 073 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>		
June20th 2000	073	N/C	8A	PAGE 1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
Rate Gyro Assembly	Mohamed Moolji ex 70242		EEE Parts/Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>		<b>DESCRIPTION</b>	
222044A	ISS	34091620 Honeywell NSPAR No:HIF-0084 A LDC 9303		Connector & CA Assy, PL RPC	
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	Paragraph 3.3	Reynolds	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b>					
<p>In NSPAR HIF-0084A dated 01/08/99, "yes" in box "a" of section 11 was checked, indicating that the part is qualified, but qualification data (boxes "h" and "l" ) were not filled in. Honeywell which uses this part can not locate QCI (Quality Conformance Inspection) data package.</p>					
<b>RATIONALE:</b>					
<p>This part was evaluated as part of Boeing- Huntington Beach Flight 8A RGA technical assessment. The conclusion of the study was that there is no impact. The rest of the RGA nonstandard parts had QCI data packages, which indicates that Space Station requirements were complied with as a matter of policy, and QCI data packages in question was simply misplaced. We have completed a GIDEP search on Reynolds connectors dating back to 1990 and found no alerts having any impact to connectors on this NSPAR. Also RGA has passed qualification and acceptance testing. This data is more than 5yrs( LDC9303 ) old therefore it exceeds the data retention requirements.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	6/23/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312					

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**Exception 074 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>		
June20th 2000	074	N/C	8A	PAGE 1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
Rate Gyro Assembly	Mohamed Moolji ex 70242		EEE Parts/Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>		<b>DESCRIPTION</b>	
222044A	ISS	34091619 Honeywell NSPAR No:HIF-082B LDC 9303		Connector And Cable Assembly, High Voltage	
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	Paragraph 3.3	Reynolds	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b>					
In NSPAR HIF-082 B dated 01/08/99, "yes" in box "a" of section 11 was checked, indicating that the part is qualified, but qualification data (boxes "h" and "l" ) were not filled in. Honeywell which uses this part can not locate QCI (Quality Conformance Inspection) data package.					
<b>RATIONALE:</b>					
This part was evaluated as part of Boeing- Huntington Beach Flight 8A RGA technical assessment. The conclusion of the study was that there is no impact. The rest of the RGA nonstandard parts had QCI data packages, which indicates that Space Station requirements were complied with as a matter of policy, and QCI data packages in question was simply misplaced. We have completed a GIDEP search on Reynolds connectors dating back to 1990 and found no alerts having any impact to connectors on this NSPAR. Also RGA has passed qualification and acceptance testing. This data is more than 5yrs( LDC9303 ) old therefore it exceeds the data retention requirements.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	6/23/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required) Document this exception in SSP 30312					

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## Exception 075 To SSP 30312 Requirements

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE	
6/07/00	075	--	ISS	1 of 1	
SYSTEM	ORIGINATOR and PHONE NO.	ORGANIZATION / CONTRACTOR			
Video Tape Recorder	Micheal Delmas 256.461.2884	Boeing-Huntsville			
END ITEM/CONFIG. ID NO.	NEXT ASSEMBLY(s)	PART NUMBER	DESCRIPTION		
CI 683138A	N/A	Interface Circuit Card Assembly	683-51020-001		
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER	LOCATION		
SSP 30312	3.2.3.1	Boeing	Habitable: X Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b>					
<p>The Video Tape Recorder (VTR) assembly part number 683-51020-001 contains an integrated circuit, where it cannot be proven that the PIND test was performed. The integrated circuit is part number 5962-8764601EX and is located on the Interface Circuit Card Assembly Part Number 683-51036-004.</p> <p>This DESC part number 5962-8764601EX was going to have the PIND screening test performed to meet D683-50990-1. The part was kitted in February, 1996 and the drawing was changed to require PIND screening but no evidence can be found that the PIND test was actually performed.</p> <p>The recommendation is to use the part as is for the VTR.</p>					
<b>RATIONALE: (use continuation pages if required)</b>					
<p>In all cases, integrated circuits procured by Boeing for use in the VTR have had no PIND test performed with the exception of 5962-8764601EX. The risk of use of this part is low since the part has good reliability, the VTR is a criticality 3 item, and two VTRs are being flown on the International Space Station. Furthermore, the VTR contains a TEAC commercial, off-the-shelf, video recorder that is designed for military aircraft applications. This recorder contains electro-mechanical mechanisms that basically establish the reliability of the VTR. Integrated circuits within the TEAC assembly were not subjected to PIND tests. During card level testing, the card is vibrated at levels of 6.1 gRMS with power applied.</p> <p>The recommendation is to approve the use of this part without PIND testing for the reasons described above. The circuit card assemblies that contain this part are part number 683-51036-004, serial numbers 001001, 001002, 001003 and 001004. A Boeing non-conformance (NC00640) was prepared to document this discrepancy. Also, the remaining parts in stock will be sent out for PIND screening.</p>					
<b>DISPOSITION</b>					
BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Kinn Roopwah for Curtis G. Tallman	/s/ W. David Beverly	6/29/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312					

**Exception 076 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE 1 of 1</b>	
7/17/00	076	C	ALL Flights		
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	Roger W. Parks 256-961-0372		Boeing, Huntsville		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
220F03000	220F03082-1,-3,-5,-7,-9,-11	Power Filter Inductor			
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
220F0382		Datatronics	Habitable: Non-Habitable:		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required) .Disapproved NSPAR SSI-TBE-0010					
<b>RATIONALE:</b> (use continuation pages if required) <b>Qualification Test Results:</b> (100% screening complete) Datatronics Power Filter Inductor P/N 220F03082 Datatronics has completed the Qualification testing dtd 4/12/96 Qty 6 parts completed their testing Qty 2 Subgroup III tests completed without any anomaly.					
<b>1 Problem:</b> Corroded lead that completely severed the lead. Datatronics could not reproduce the conditions that caused the corrosion. First Article Test Moisture Resistance test. Pin 4 broke off all, others met requirements. Qty 6 samples broke out of 24 tested. PC mount, round with 4 leads out of the bottom.					
<b>2. Problem:</b> The Qualification by similarity per MIL-PRF-27F Appendix A para A4.1 <ul style="list-style-type: none"> <li>• Similar products (yes)</li> <li>• MFG using same or similar</li> <li>• Materials (yes)</li> <li>• Process (yes)</li> </ul>					
<b>3. Problem:</b> Resistance to Solder heat. Qty 4 used should be Qty 8					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	7/27/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

**Exception 077 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE 1 of 2</b>	
7/17/00	077	B-	ALL Flights		
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	Roger W. Parks 256-961-0372		Boeing, Huntsville		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
220F03000	220F03090-1	IC, Adj. Lin. Reg.			
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
220F03090C		QPL	Habitable: Non-Habitable:		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required) .Disapproved NSPAR SSI-TBE-0062B					
<b>RATIONALE:</b> (use continuation pages if required) <b>Requirements:</b> <ul style="list-style-type: none"> <li>• SCD 220F03090 is up-screened from 5962-7703405UX /883 B level part.</li> <li>• Additional screening beyond the 100% 883 method 5004 screening: <ul style="list-style-type: none"> <li>• Initial DPA Qty 3</li> <li>• Temp Cycling 48 hours</li> <li>• Constant Acceleration</li> <li>• Seal</li> <li>• Particle Impact Noise Detection</li> <li>• Electrical Performance</li> <li>• Burn-in for 160 hours @ 125°C</li> <li>• Electrical Performance</li> <li>• Percent Defective Allowable = 5%</li> <li>• X-ray</li> </ul> </li> </ul>					
<b>Results:</b> Qty: 10 and 15 (2 test lots, both LDC 9519) D/C: 9519 Mfg: Omnirel Tested by Pentest. No Failures.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	7/27/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 077 To SSP 30312 Requirement (continued)**

**Qualification by generic data**

Mfg: Omnirel

Qty: 15

D/C: 4D9501

Generic P/N: 7703406UA

Tested from 5962-8855301TA

Tests 100% screening

Group A, B, and C

Plus 500 hrs Steady State Life @ 135°C & 18V Qty 45 with zero defects.

The above qualification was not performed on the flight parts bought and tested, but was done on the generic part type as shown above.

The Load Control Assembly is Criticality III hardware and authorized to use Grade B parts.

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**Exception 078 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE 1 of 2</b>	
7/17/00	078	B	ALL Flights		
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	Roger W. Parks 256-961-0372		Boeing, Huntsville		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
220F01101-001 Positive Pressure Transducer Assembly	126430 (LM725H/883, LDC 9150)	IC Operational Amplifier			
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
126430		National Semi	Habitable: Non-Habitable:		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required) .Disapproved NSPAR SSI-TBE-0076					
<b>RATIONALE:</b> (use continuation pages if required) <b>The EEE Part type listed below is used in the Positive Pressure Transducer Assembly.</b>					
<p><b>1. Issue</b>  <b>Screening Test Results:</b>  <b>P/N 126430</b>  <b>NSPAR SS1-TBE-0076</b>            Generic P/N LM725H/883            National            Operational Amplifier            Qty 110 lot size, Qty passed 90, Qty failed 20            Date Code H109150A            Screening done Visual, Serialization, PIND, Radiographic Insp., Temperature Cycling, Pre-electrical, Dynamic Burn-in (240 hrs @ 125°C) Post Electrical, Hermetic Seal (Fine and gross) and DPA (6 pcs).</p> <p><b>Problems:</b>            Qty 7 devices failed PIND test per MIL-STD-883 Method 2020 condition            Qty 4 devices failed Radiographic Inspection            Qty 1 failed Power Burn-in (due to operator error)            Qty 9 devices failed Delta Computation            PDA computation was calculated and the maximum allowable limit of 5% was exceeded.</p> <p>"Taber Industries was notified and per their fax dated 4/6/93 the PDA requirements was waived and ATC was to continue and complete the screening process." .            ** S/N 210 failed both PIND and radiograph inspection (for voids).</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	7/27/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

**Exception 078 To SSP 30312 Requirements****Next Assembly Testing in the Positive Pressure Transducer (PPT)**

P/N: 220F01101-001

Qualification Test report # SS-TS-183B dtd 11/16/98

**Test Requirements**

- Proof Pressure: 3 times, internal pressure
- Leakage Tests: internal to external
- Output Signal Test: tested to verify signal meets required range, accuracy & output voltage.
- Isolation / Insulation Resistance: 50 Mega Ohms minimum, using 50 V dc source.
- Response Time Test: after cycled from low to high pressure. Response time shall be less than 100 milliseconds.
- Power Consumption Test: power consumption less than 0.6 watts steady state with 20psia.
- Random Vibration: per SSP41172, 20 Hz to 200 Hz, level 0.8g<sup>2</sup>/Hz, X, Y, & Z axis.
- Electrical Bonding Test: verify low resistance bond exists between PPT & Vacuum System tubing.
- Burn-in: minimum of 300 hrs.
- EMI / EMC: verify compliance with emissions & susceptibility requirements of SSP30327.
- Acoustic Noise Generation:
- Resonant Frequency Test: no resonant of 50 Hz and below.
- Thermal Cycle Test: minimum 24 thermal cycles over +9°F to +150°F.
- Output Signal Short Circuit Test:
- Input Voltage Surge Test: no damage when 40 to 50 Volts surges.
- Input Voltage Reverse Polarity Test: verify no damage when 28 Volt dc input applied with reverse polarity.
- Depressurization / Re-pressurization: verify no damage or performance impaired when depressurization from 14 psia to 1E<sup>-2</sup> torr, for 24 hrs.



**Exception 079 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE 1 of 1</b>	
7/17/00	079	-	ALL Flights		
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	Roger W. Parks 256-961-0372		Boeing, Huntsville		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
220F01012-003 Vacuum System Assembly (TBE)	220F01087 – 1" Valve 220F01082 - 2½" Valve	Vacuum System Valve EEE Parts Application Analysis			
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
220ANL1142 – Application Analysis		Marotta	Habitable: X Non-Habitable:		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required) .Disapproved Application Analysis for 220ANL1142					
<b>RATIONALE:</b> (use continuation pages if required)  The Application Analysis (AA) submitted on 7/5/00 includes part derating but does not include an assembly schematic or temperature / environments. The AA submitted on 4/1/96 that was disapproved did have an assembly schematic and part temperature info, but still did not include assembly environments. The two AA listed above are attached.  Between the 2 application analyses (attached), there is sufficient electrical and environmental data to provide assurance that none of the EEE parts are being used in excess of their derating requirements.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	7/28/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 080 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
7/17/00	080	-A	All Flights	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	Roger W. Parks 818-586-1914		Boeing-Huntsville		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
1360AE7010 Sync & Control	1360PD1133-001	Microcircuit, EEPROM			
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
1360PD1133-001		Atmel	Habitable: X Non-Habitable:		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
Disapproved NSPAR SS1-LFS-0212.					
<b>RATIONALE:</b> (use continuation pages if required)					
<b>Qualification Test Results:</b>					
Atmel EEPROM					
Problem:					
100% PIND test per MIL-STD-883, Method 2020, Condition A requires that not more than 1% of the lot fail. The failed parts may be removed from the lot and the remaining parts retested with not more than 1% failures. The lot may be retested up to five times to achieve the 1% failure rate.					
Qty tested: 96 Qty Passed: 94 Qty failed: 2					
The issue is the lot was not retested as allowed by the MIL STD. DPA was done, however, on three samples and all passed.					
The Sync and Control circuit is Criticality III hardware. The 2 %failure rate is not excessive for the upscreen of a commercial part. Since the failed parts were removed from the lot, these EEPROMs are considered acceptable for use-as-is in the Sync and Control Unit.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	7/28/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

**Exception 081 To SSP 30312 Requirement**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>
7/17/00	081	-	All Flights	1 of 2
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>	
ISS	Roger W. Parks 818-586-1914		Boeing-Huntsville	
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>	
	220RPT0652	U.S. Laboratory Outfitting Load Control Assembly EEE Parts		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>	
220RPT0652		Teledyne Brown	Habitable: X Non-Habitable:	

**ISSUE DESCRIPTION:** (use continuation pages if required)  
Disapproved Application Analysis 220RPT0652.

**RATIONALE:** (use continuation pages if required)

The Application Analysis (AA) submitted on 7/18/00 includes:

- Power Supply Module (220F03044)
- DC Control Module (220F03024)
- Stepper Motor Control Module (220F03038)
- 1553 Interface Module (220F03019)
- 28VDC Converter Module
- Motherboard Assembly (220F3015)
- EEE Parts Failure Rate Summary

Problem Areas:

- Power Supply Module (220F03044)

The derating analysis for the LCA Power Supply was performed under a worst case environment of 70°C ambient and 70°C board temperature in order to keep results general for use in all applications of the LCA. Reference detailed thermal analysis reports generated for each LCA application for verification that thermal conditions are below the worst case assumptions made for this analysis. U19 and U20 exceeded the input output voltage differential. Transformer T1 exceeded temperature derating.

		Temp °C									
Des	Desc	Derate	Oper	Parameter	Units	Rated	Derate	Oper	Ratio	Comments	
T1	Transformer	90	92	DWV	Vrms	740	370	260	.7	Max rated temp for mtl 130°C	
U19	IC, Pos Reg	100	87	input volt	V	35	28	19	.68	Output 15V exceeds by .25V	
U20	IC, Neg Reg	100	87	input volt	V	35	28	19	.68	Output 15V exceeds by .25V	

**DISPOSITION**

<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	7/27/00	X		

**COMMENTS:** (use continuation pages if required)

**Exception 081To SSP 30312 Requirement (continued)**

Problem Areas: (cont)

- 1553 Interface Module (220F03019)

A table summarizing derating analysis results for the 1553 Interface Module is included in Appendix A. This analysis was performed using applicable SSP30312 Rev F derating criteria. Supply voltage exceeded the derated value on U65 and U74.

Des	Desc	Temp °C		Parameter	Units	Rated	Derate	Oper	Ratio
		Derate	Oper						
U65, U74	IC, Multiplexer	100	69.95	Supply Voltage	V	32	28.8	30	1.04
Comments Supply voltage is Between V+ and V-									

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**Exception 082 To SSP 30312 Requirement**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
22 August 2000	082	A	8A/11A	1 of 2	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	W. Dykes (714)896-3311 7-0062		EEE Parts/Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
222033A/222032A	See below	SARJ/TRRJ	All		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312 See also SSP 41173	3.14 3.3 and 3.5	LMMS	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required) LMMS has reported that some traceability data was not recorded in the as-built records. The data could only be partially reconstructed from existing data. Two lower tier subcontractors recorded incoming lot and serial numbers but did not record data at next assembly. LMMS had some loss of data due to missing shop orders for TRRJ and SRRJ #1 and #2 only. Summary details are noted on the following page. More details are available in the LMMS letters.					
<b>RATIONALE:</b> (use continuation pages if required) LMMS has examined the risks associated with flying with limited traceability for the parts noted and determined that there is little risk. Parts have completed qualification and acceptance testing with no failures and there is no trend data indicating that there might be lot related defects. Some traceability data can be recovered during future rework/ repair of affected next assemblies as serial numbers for switch and connectors can be recorded from the next assembly when access is available. Boeing feels that costs associated with traceability recovery are not warranted due to the low risk of needing this data at some future time. Some data is available from procurement records.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	8/22/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 082 To SSP 30312 Requirement (continued)**

<b>End Item</b>	<b>ORU</b>	<b>Responsible subcontractor</b>	<b>Notes</b>
SARJ #1 and #2	UTA	HSSO	NZGL00T connectors. (6 types, 8 connectors total)
SARJ, all	Trundle	Able Engineering	Limit switch (6 per including spares, 72 pieces total) A number of lot date codes are included in this material
TRRJ #1 & #2	DLA 1003 thru 1006 y	LMMS	Limit switches, missing shop order records
TRRJ #1 & #2	TDLA	LMMS	Missing shop orders for Network resistors.

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**Exception 083 To SSP 30312 Requirement**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
8 June 2000	083	N/C	8A	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	William Floyd (714) 896-1465		EEE Parts/Boeing-Huntington Beach		
<b>CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
222XXXA	M39016/13-056P	Relay	ISS		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	Paragraph 3.8.1	Boeing-Huntington Beach	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
<p>SSP 30312 requires use of Grade 1 parts derated per appendix B. No grade 1 relays exist. No military relays per the only approved specification (MIL-R-30916) listed in SSP 30423 are rated for the 120 Vdc used on the Space Station bus. Attempts to have relays specially built to source control drawing were no bid by the QPL vendor.</p>					
<b>RATIONALE:</b> (use continuation pages if required)					
<p>Relay P/N M39016/13-056P is used in the BBC (Bolt Bus Controller) to provide open circuit isolation of the redundant BBC ground connection. These devices are single use, only run for approximately 0.5 hours to mate truss segments together. In this application, maximum open circuit during a fault condition is 120 Vdc and the relay is rated for a minimum dielectric voltage of 350 Vrms at altitude. During BBC operation, the relay is closed before current flows and is used as a carry only device when current is flowing. The maximum current flow under normal operating condition is 750 mA. The minimum overload resistive switched current rating is 4 amperes at 28 volts. There is no minimum rating for carry-only in the military specification. The maximum carry only is a function of the contact resistance which is 0.15 ohms resulting in a worst case power loss of only 2.4 watts at final torque of the Bolt Motor Actuator. This worst case current occurs only during the last 1-2 minutes of mission operation, and is therefore not expected to cause significant temperature rise.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	8/25/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					
Document this exception in SSP 30312					

DCN  
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**Exception 084 To SSP 30312 Requirement**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
11 September, 2000	084	N/C	8A	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
Bolt Bus Controller Signal Conditioning Unit	Ali Lakhani (714) 896-3311 x7-1419		EEE Parts/Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
222064A 222082A	ISS (S0)	301R18W103KV4H 301S49W184KV4H H2010CPX0R75G UC1842AL/883B	Capacitor, 0.1 uF 300V Capacitor, 0.18 uF 300V Resistor, 0.75 ohm Microcircuit, PWM		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP30312	Para. 3.5	BBC, SCU (Boeing-HB) DC/DC CONV-(APACE) Capacitor – (Johanson) Resistor – (State of Art) Microcircuit – (Unitrode)	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
<p>The BBC and SCU use a DC/DC Converter built by APACE. APACE will not provide qualification data for four parts (listed above) which are used in DC/DC Converter, without significant cost impact. Boeing-HB buyers and engineering personnel have tried various times to obtain this data without any success. Per APACE transmittal, obtaining this data would be a major cost impact to the program.</p>					
<b>RATIONALE:</b> (use continuation pages if required)					
<p>All parts used in the DC/DC Converter meet the electrical and thermal derating requirements of SSP30312. The electrical parts in the DC/DC Converter have also successfully passed qualification testing at both the power supply level and the ORU level. There have been no GIDEP ALERTs for these parts.</p> <p>Per written documentation from APACE, the qualification data does reside with the part manufacturers, however obtaining this data would be a major cost impact to the program. There is evidence that the parts did undergo qualification/acceptance testing at the parts level. There is also additional acceptance tests performed at the DC/DC Converter and ORU levels. These parts do not, therefore, present any significant risk to the reliability of the BBC and SCU.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	9/11/00	X		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 085 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
10/3/00	085		7A	1 of 2	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
GFE	Paul Meier/281-244-1761		NX22/SAIC		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
See comments for End Item	N/A	SPCE Equipment	N/A		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
See comments for End number	SSP30312	GFE	Habitable: X Non-Habitable:		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
<p>This hardware does not comply with all the part selection requirements of SSP30312, for level 2 programs. The parts are military screened to MIL-STD-883. To support schedule, parts listed as JANTX versions were used rather than the recommended JANTXV version. No particle impact noise detection testing was done on cavity devices. No additional electrical screening was performed except a small effort on commercial capacitors at the Receiving and Test Facility. Two commercial microcircuits received no additional electrical testing. These parts were discussed and accepted for this application at the Parts Working Group meeting September 22, 2000.</p>					
<b>RATIONALE:</b> (use continuation pages if required)					
<p>This hardware is Criticality 2R for function. Except an issue previously approved by the Parts Working Group January 21, 2000 (see an excerpt of the minutes in comments section below), no parts are applied or used above manufacturers rating. The hardware is screened at the box level to 300 hours assembly burn-in minus part level burn-in time. The design is such that a failure of the battery charger will not damage EMU batteries. The charger is divided into four redundant boards. A short in this hardware which causes a trip of the circuit protection device, a circuit breaker, between the Remote Power Control Module (RPCM) channel and each battery charger will not propagate beyond that shorted channel. The architecture causes loss of power to only SPCE equipment, since SPCE equipment has dedicated circuitry aboard the space station. No other critical or non critical equipment is incapacitated by a loss of power (a circuit protection trip) to the SPCE equipment. The parts are judged adequate for this application.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ Madhu Rao for W. David Beverly	10/4/00	X		
<b>COMMENTS:</b> (use continuation pages if required)					
<p>SEG39128212-301            Battery Charger Assembly                  SEG39128213-301/-303    Battery Stowage Assembly                  SEG39128310-303        Fluid Pumping Unit Assembly                  SEG39128211-303/-305    Power Supply Assembly                  SED39128214-303/-305/-307    Battery Charger Interface Harness Assembly</p>					

**Exception 085 To SSP 30312 Requirements (continued)****COMMENTS:** (cont)

From the excerpt from the minutes of the January 21, 2000 meeting.

PSA (Power Supply Assembly) overstressed resistors was presented by Mike Defrancis. R22, a 1/8W rated RLR carbon film type resistor in the Power Supply Assembly of the Servicing and Performance Checkout Equipment was determined to be dissipating 1/4W. The R22 resistors in all PSAs, except S/N 1002, have been changed out for higher dissipation rated units. S/N 1002 has already been installed in the Airlock racks. Additional investigation revealed that the worst case skin temperature in this application is 80°C (actual measurement) compared to the rated maximum of 125°C. The skin temperature is maintained within acceptable limits by heatsinking to the power plane. Dale, the resistor manufacturer, predicted that the worst affect of the additional power dissipation in the resistor would be the additional 0.5% resistance value drift over the life of the part. The project manager is requesting the PCB to approve the temporary use of this stressed part to prevent the need to remove the unit from flight equipment. The resistor will be replaced once the SPCE is replaced in flight. The PCB agreed that this one-time use was acceptable since the reliability of the hardware was not effected.

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**Exception 086 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
9/28/00	086	N/C	8A	1 of 2	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
PUMP CONTROL VALVE PACKAGE	Mohamed Moolji ex 70242		EEE Parts/Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>		
222044A	ISS	JANTXV2N3767 Ham-Std NSPAR No: SSI-HAM-1091 LDC9602	Transistor,NPN, Power		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	Paragraph 3.3	Silicon Transistor Corp.	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b>					
<p>In NSPAR SSI-HAM-1091 its stated that due to delivery and schedule constraints, this selection was made as specified in SSP30312, 3.2.3.1, instead of the higher order of precedence, 3.2.1.2c, a Grade 2 Standard Part upscreened in accordance with SSQ25001. This lot of parts was not screened to full requirements of SSQ25001, but only to MIL-STD -19500 JANTXV Level ( See attached chart) and PIND tested to MIL-STD-750 Method 2052 Condition A.</p>					
<p><b>RATIONALE:(For Reduced Burn-in).</b> During end item (PCVP) acceptance testing, these devices are operated for additional 300 hrs of burn-in. In addition, during acceptance testing the PCVP is thermal cycled for 7 to 9 days ( 6 cycles, ramp rate dependent). The temperature extremes are -45 deg. F to +120 deg. F. The item is powered during thermal transitions, it is de-powered while soaking at temperature extremes. After soaking, the system is re-powered for system performance measurements at each extreme.</p> <p>There are no known alerts against this lot date code and no known failures at the system level.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	10/6/00	<b>X</b>		
<p><b>COMMENTS:</b> (use continuation pages if required) Document this exception in SSP 30312</p>					

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**Exception 086 To SSP 30312 Requirements**

## COMPARISON OF SCREENING REQUIREMENTS

TEST / SCREEN	SSQ25001	JANTXV DEVICE
TEMP CYCLE	√	√
PRE-SCREEN DPA	√	NONE
POST SCREEN DPA	√	√
SURGE	√	√
PIND	√	√
SERIALIZATION	√	NONE
PRE BURN IN ELECTRICALS	√	√
REVERSE BIAS BURN IN	√	√
POWER BURN-IN	√	√ (1)
FINAL ELECTRICALS (+25°C, +125°C and -55°C)	√	√
PDA (2)	√	√
SEAL (FINE and GROSS)	√	√
LIFE (3)	√	√

**Notes (#)**

- (1). Burn in duration = 160 hrs for JANTXV, 240 hrs SSQ25001 upgrade screened device.
- (2). PDA = 5% and 2% for re-submission per 25001, 5% for JANTXV AND 3% for resubmission.
- (3). For SSQ25001 upgrades, Life testing is performed for 1000 hours upon 22 devices for each lot. For JANTXV parts life testing is same only required to be performed periodically by the manufacturer.

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**Exception 087 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
9/28/00	087	N/C	8A	1 of 2	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
PUMP CONTROL VALVE PACKAGE	Mohamed Moolji ex 70242		EEE Parts/Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>NEXT ASSEMBLY(s)</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>		
222044A	ISS	5962-9474301MXA Ham-Std NSPAR No: SSI-HAM-1092 LDC 9703D	Microcircuit, linear, 16-bit,A to D converter		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	Paragraph 3.3	Analog Devices	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b>					
<p>In NSPAR SSI-HAM-1092 its stated that due to delivery and schedule constraints, this selection was made as specified in SSP30312, 3.2.3.1, instead of the higher order of precedence, 3.2.1.2c, a Grade 2 Standard Part upscreens in accordance with SSQ25001. This lot of parts was not screened to full requirements of SSQ25001, but only to DSC 883 level B (see attached chart) and PIND tested to MIL-STD- 883 Method 2020 Condition A.</p>					
<p><b>RATIONALE:</b> (For Reduced Burn-in). During end item (PCVP) acceptance testing, these devices are operated for additional 300 hrs of burn-in. In addition, during acceptance testing the PVCP is thermal cycled for 7 to 9 days (6 cycles, ramp rate dependent). The temperature extremes are -45 deg. F to +120 deg. F. The item is powered during thermal transitions, it is de-powered while soaking at temperature extremes. After soaking, the system is re-powered for system performance measurements at each extreme.</p> <p>There are no known alerts against this lot date code and no known failures at the system level.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	10/6/00	<b>X</b>		
<p><b>COMMENTS:</b> (use continuation pages if required) Document this exception in SSP 30312.</p>					

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**Exception 087 To SSP 30312 Requirements (continued)**

## COMPARISON OF SCREENING REQUIREMENTS

TEST / SCREEN	SSQ25001	DSCC /883 DEVICE
WAFER LOT ACCEPTANCE	NONE	NONE
PRE-SCREEN DPA	√	NONE
POST SCREEN DPA	√	NONE
TEMP CYCLE	√	√
PIND	√	√
SERIALIZATION	√	NONE
PRE BURN IN ELECTRICALS	√	√ (1)
REVERSE BIAS BURN IN	√ (3)	NONE
BURN IN	√	√ (2)
FINAL ELECTRICALS (+25°C, +125°C and -55°C)	√	√
PDA (4)	√	√
LIFE (5)	√	√

**Notes (#)**

- (1). Pre-burn-in electricals performed at 25°C for /883 devices versus 25°C, 125°C and -55°C for 25001 upscreened devices.
- (2). Burn in duration = 160 hrs for /883 device, 240 hrs SSQ25001 upgrade screened device.
- (3). Only as required by specific device specification slash sheet.
- (4). PDA = 5% and 2% for re-submission per 25001, 5% for /883.
- (5). For SSQ25001 upgrades, Life testing is performed for 1000 hours upon 22 devices for each lot. For 883B parts life testing is only required to be performed periodically by the manufacturer.

**Exception 088 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
30 October, 2000	088	N/C	8A	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
Signal Conditioning Unit	Ali Lakhani (714) 896-3311 x7-1419		EEE Parts/Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
222082A	ISS (S0)	ISSA-515-113 LDC 9850, 9904, 9905, 9912, and 9913	Inductor Assembly		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP30312	Para. 3.8	APACE	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
<p>The Signal Conditioning Unit (SCU) uses three DC/DC Converters (PS1: P/N 1F97574-503; PS2 and PS3: 1F97574-501) built by APACE. PS3 uses an Inductor Assembly (P/N ISSA-515-113) which consists of three Inductors. The hot spot temperature on these three Inductors exceeds the maximum derated hot spot temperature by 1°C. The maximum derated hot spot temperature should not exceed 105°C, the calculated worst-case hot spot temperature is 106°C.</p>					
<b>RATIONALE:</b> (use continuation pages if required)					
<p>The Inductor Assembly's hot spot temperature is well within the manufacturer's rating of 125°C. There have been no failures or derating related issues on these parts during Acceptance and Qualification tests of the Signal Conditioning Unit. Exceeding the derating limit by 1°C will not pose any significant reliability problems.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	10/30/00	X		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 089 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE 1 of 1</b>
24 October 2000	089	new	8A 9A	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>	
ISS	W. Dykes (714)896-3311 7-0062		EEE Parts/Boeing-Huntington Beach	
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>	
222201A	D60693000-1 r	Mobile Transporter	LDU or LTU Spares	
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>	
SSP 30312	3.7	Boeing	Vacuum	

**ISSUE DESCRIPTION:** (use continuation pages if required)  
 Thermostat parts to 1F97597 were previously reported as failing atmospheric leak test. Testing and analysis at the time showed that the parts were capable of operating with just an epoxy seal assuming operation below the dewpoint and vacuum operation. Refer to exception 051.  
 Corrective action was taken at the time, February 2000, by modification of the traveller at the lead potting operation to assure no damaged glass-to-metal seals. This included a visual examination of the hermetic seal prior to potting and detailed careful handling while installing leaded devices in the potting fixture. Possibly as a result of this fix interim lots have been leak free, however one of 4 pieces of LDC 0026, the DPA sample received by Boeing HB did exhibit a  $1.9 \times 10^{-5}$  sccs leak rate. Note that leak testing is possible after the leads have been removed from the DPA sample. The balance of 3 pieces are not testable with 14, six foot leads each. A check of the lot records indicated that all devices passed prepotting leak check at better than  $1 \times 10^{-7}$  sccs.  
 These parts 1F97597-525 thermostats are needed to support schedule for completion of PIO29 spares (Mobile Transporter) and loan to support RBVM flight hardware schedules.

**RATIONALE:** (use continuation pages if required)  
 The same testing, analysis and rationale of exception 051 still applies for use here as all parts are intended for vacuum operation. Earthside long term storage of completed spares are appropriately sealed from humidity and contamination.  
 The testing described and attached to the previous exception 051 consisted of placing holes in 2 thermostats and running them under voltage in the off condition for 23 hours at a point where H2O condensation occurred but just above freezing (3°C). Each day the units were allowed to stabilize at room ambient humidity (approx. 50%) for 1 hour before the next condensation exposure. This test was repeated until a total of 104 hours were reached. The part remained functional and operation setpoints remained unchanged. When the parts were opened post test they showed no evidence of corrosion or damage. This test at maximum condensation exposure and electrification would constitute a worse case condition. On-orbit the environment is vacuum and leakage presents no problem. A second test for corona partial discharge indicated no corona initiation at the worse case operating voltage. There are no voltages above 126 Vdc in the thermostats. Again this test shows no problem with the vacuum environment.

**DISPOSITION**

<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	11/17/00	<b>X</b>		

**COMMENTS:** (use continuation pages if required)



**Exception 090 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE 1 of 1</b>	
7November 2000	090	New	9A		
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
ISS	W. Dykes (714) 896-3311 7-0062		EEE Parts/Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
222073A	1F01194-1 A2 Board	Video Luminaire	All		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP 30312	3.8.1	Boeing St. Louis	External		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
<p>Thermal concerns based on earlier data measured on the Video Luminaire have largely been resolved. Higher than expected temperatures during thermal vacuum tests resulted on some circuit changes and a T1 transformer redesign. However final analysis of the modified Luminaire design indicates that there are 4 components that still do not meet SSP 30312 derating criteria at expected worst case flight conditions.</p> <p>C11 and C35 capacitors, M39006/22-0571H (CLR79), rated at 50 Volts nominal and 40 Volts at a W-C local board temperature of 113°C. The derated maximum is 24 Vdc from 30312 and the applied voltage is 28 Vdc. R51 and R173 resistors, RLR32C1000G, rated at 1.0 watts nominal and 0.55 W at a W-C local board temperature of 110.6°C. The derated maximum is 0.33 W from 30312 and applied is .36 W.</p> <p>Recommendation is to use as is based on the rationale below.</p>					
<b>RATIONALE:</b> (use continuation pages if required)					
<p>Parts are 70% and 65% of their ratings for the capacitor and resistor respectively. They should be 60% maximum. In reviewing the potential impacts, HB Thermal personnel reviewed the expected thermal profile and determined that the worst case temperature would apply; no more than 5% of the year, and less than 1/2 the orbit. It also assumed that 1 of 4 Luminaire's would be installed in the worst case of 14 locations and be powered on. Impact on reliability based on this analysis indicates that the increased risk could not be differentiated from the baseline MTBF.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	11/17/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 091 To SSP 30312 Requirements**

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE
15 January 2001	091	NEW	Spares only	1 of 2
SYSTEM	ORIGINATOR and PHONE NO.		ORGANIZATION / CONTRACTOR	
ISS	W. Dykes (714)896-3311 7-0062		EEE Parts/Boeing-Huntington Beach	
END ITEM/CONFIG. ID NO.	WIRE HARNESS/PART NUMBER(s)	DESCRIPTION	NEXT ASSEMBLY(s)	
222007A	5080097-1	Control Moment Gyro	Follow-on spares	
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER	LOCATION	
SSP 30312 SSQ21218	3.7, 4.3.1.4, 4.3.3.1, 4.3.4c	L3 Teterboro	Habitable: Non-Habitable: X	

**ISSUE DESCRIPTION:** (use continuation pages if required)  
 Last production lot of SSQ devices by Maxwell Sierra is held at the supplier's facility as there are DCMA issues with the lot, as cited by the DCMA rep. Provided herein are Maxwell's responses, the DCMA response (1/20/2000) to Maxwell's fix, and any second response by Maxwell to the DCMA:

1. Solderability: At end of Group A, subgroup 3, 3 of 5 samples exhibited 95% dewetting.  
 Maxwell's fix: (Probably due to tarnish of the lead finish from environmental tests.) Maxwell requested BFGoodrich/AlliedSignal/NASA approval to re-tin (solder-dip) terminals then re-perform solderability. NASA (Ralph Grau) approved Maxwell's re-tinning procedure (8/24/99) (so did AlliedSignal) and solderability passed.

2. CAR 99-W-01: DCMC withholds acceptance/approval of the lot for additional problems (12/99):

a. Maxwell's DPA test procedure TPS-6270 Rev E does not make reference to RS-469 which is referenced in the SSQ drawing.  
 Maxwell's fix: Add RS-469 (EIA-469) to Applicable Documents in TPS 6270.  
 DCMC response: This is form reference, not use of the procedures which are required per MIL-F-28861, para. 30.3.3.  
 Resolution: Accept these devices for use-as is and verify all applicable documents are correct prior to use in future.

b. Maxwell does not grind the samples in accordance with the RS-469, that is, grinding rpm, disk speed range and grinding pressure; in addition the grinding wheel is not calibrated.  
 Maxwell's fix: The information in RS-469 is for monolithic, non-discoidal capacitors, not axial units mounted in filters. In addition, the information is recommendations, not requirements.  
 DCMC response: Yes, RS-469 is a recommendation, but MIL-F-28861 states grinding shall conform to the RS-469 procedures [thereby RS-469 becomes a requirement].  
 Resolution: Accept devices for use-as-is and verify all applicable documents are interpreted correctly in the future.

c. Cracks were present on the first two samples that DCMC witnessed.  
 Maxwell's fix: Much time and effort was expended by Maxwell to point out and verify that the cracks were induced during DPA and not present in the basic capacitors; and all other testing of the lot passed.

d. The Xray certification states 181 pieces were Xrayed, but the serial numbers run from 001 to 185. (4) Testing failures had been pulled from the lot prior to Xray. Improper component tracking during Xray resulted in inaccurate documentation and untraceability of lot pieces.  
 Maxwell's Fix: Maxwell QA will review all POs for correctness in the future.  
 DCMC response: The lot is not traceable back to the Xray certification since the certification does not match the serialized parts.  
 Resolution: Accept devices for use-as-is. Maxwell personnel were instructed on the need to clearly call requirements on the PO for the C of C. Vendor was reminded to follow all instructions on the PO

e. SSQ states serial number should be four digit: they are three digits.  
 Cause: PO did not state leading zeros.  
 Maxwell's fix: Maxwell corrected marking procedure to be alpha-numeric four digit.  
 DCMC response: Yes, corrected for future build, not this lot.  
 Maxwell's fix: Add a zero in front of each number (resolved).

f. MIL-F-28861 states that the contractor shall implement and use statistical process control which is non-evident.  
 Maxwell's fix: The DCMC rep was shown AlliedSignal's 9/16/99 SPC approval for this lot; in addition, the DCMC rep reviewed all other SPC activity data at Maxwell (resolved).

g. The contractor does not maintain age control on chemicals used in the DPA lab.  
 Maxwell's fix: Struers (Potting compound manufacturer) and Buehler (sectioning materials manufacturer) stated that age control is not applicable to grinding pastes, polishes and grit paper. In addition, age control is not required by SSQ; RS-469 only makes recommendations, not requirements (resolved).

**Exception 091 To SSP 30312 Requirements (continued)**

**RATIONALE:** (use continuation pages if required)

(A) h. There were other concerns raised by DCMA concerning adequacy of instruction, communication and understanding of requirements at the production line level.

In addition to the DPA at the finished filter level issue which has been resolved via the earlier Exception to SSQ21218 there are other issues raised by DCMA which are holding the lot acceptance. Technical review indicates that the discrepancies do not impact part quality or reliability. Summary of evaluation:

1. Solderability re work procedures approved, parts passed. This resolution is technically acceptable.

2a. Current SSQ21218 paragraph does not make direct reference to RS-469, it is cited in data section as it relates to format only. Reference drawing apply only to the extent specified in the SSQ document. This is a technically acceptable translation of spec requirements.

2b. Rational provided is correct. Further, filter industry indicates that DPA induced failures in this product type warrant adjustment to grinding rates and times due to different forces subjected to the finished product.

2c. This was addressed directly in the earlier exception.

2d. Maxwell error in specifying number of parts to X-ray. Traceability to Xray inspection and certification of all parts submitted not in question.

2e. Maxwell error in not specifying correct number of digits in serial number. Not a technical or reliability issue. No future lots.

2f. SPC would have been audited during original ISS survey activity. Allied Signals effort may be assumed to be more recent re audit and with approval is further verification of adequacy.

2g. Agree that age controls for DPA sectioning materials not required.

(A) In response to general concerns, the following re-performance of acceptance by an independent lab is to be accomplished prior to final acceptance:

Re-perform the 100% tests of Group A which includes:

Thermal Shock- Voltage Conditioning

Dielectric withstanding

Insulation resistance

Insertion loss- verify lab capability for adequate fixtures.

DC resistance, DC voltage drop

Radiographic inspection (since serialized x-rays are available the task is to re review these for adequacy)

Seal test

Visual- mechanical inspection.

Solderability- ( re-emersion not required with an inspection of the terminals to assure adequate solder coverage is acceptable as a part of the inspection above.)

Group B sample test are to be restricted to the following critical tests only.

Small sample life test.

DPA- Use and re examine existing DPA report. Only re perform as needed.

Other tests of Group B not applicable for the following reasons:

Not applicable to on-orbit environment- Salt spray, moisture resistance, AC voltage drop, barometric pressure reduced (hard vacuum). Shock (high aspect ratio parts required reduction of shock test but meet 100 G's with no problem).

Redundant Group A tests- Thermal shock and immersion, resistance to solder heat, radiographic inspection, seal

Design related attributes already proven and low risk. Voltage- temperature limits of capacitance, Insertion loss at temperature, temperature rise, current overload, terminal strength, resistance to solvents, and vibration.

**DISPOSITION**

BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Curtis G. Tallman	/s/ W. David Beverly	1/15/01	✓	---	---

**COMMENTS:** (use continuation pages if required)

**Exception 092 To SSP 30312 Requirements**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>	
11/21/00	092	N/C	N/A	1 of 1	
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
MDM	Ali Lakhani (714) 896-3311 x7-1419		Boeing-Huntington Beach		
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>	<b>NEXT ASSEMBLY(s)</b>		
8269360-901 On-Orbit Tester	ISS	56W-NW125DC-CGO	GREEN LED		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>		
SSP30312	3.5	Data Display Products	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
<p>The LED used is commercial and meets only the derating requirements of SSP30312.                  The purpose of the LED is to indicate on/off.                  The LED was not in the original design but was requested by the astronauts upon seeing the equipment. The 120VDC part required for this application is not available in the MIL-Qualified version because of the unusual supply voltage.</p>					
<b>RATIONALE:</b> (use continuation pages if required)					
<p>This is the same LED used in the Utility Power Strip, a piece of GFE.                  There are redundant LEDs at both ends of the cable, Insert adapter and Utility Power Strip both have one. Procedure dictates not plugging in test items with Utility Power Strip powered on. Three standard parts, a LED, a blocking diode and a resistor would be required to replace this part.                  This LED is not used on critical hardware and was chosen to avoid necessity for additional spares on orbit.</p>					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Kinn Roopwah for Curtis G. Tallman	/s/ W. David Beverly	11/21/00	<b>X</b>		
<b>COMMENTS:</b> (use continuation pages if required)					

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**Exception 096 To SSP 30312 Requirement**

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b>
04/09/01	096	-	6A	1 of 1
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>	
ISS	W. Dykes (714)896-3311 7-0062		EEE Parts/Boeing-Huntington Beach	
<b>END ITEM/CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>DESCRIPTION</b>		<b>NEXT ASSEMBLY(s)</b>
1F97597-517	AIRLOCK LTA Heater Assy 683-52037-001 683-52038-001	Thermostat		683-52030-001
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>MANUFACTURER</b>	<b>LOCATION</b>	
SSP 30312	3.8	Micropac Industries	Habitable: X Non-Habitable:	

**ISSUE DESCRIPTION:** (use continuation pages if required)  
 During the Lab insertion ( Flight 5A) there was an LTA heater anomaly. Investigation lead to the realization that the thermostats were dissipating more than expected power; a result of a lack of good power data to the thermal engineering personnel at HSV for the Airlock application. The thermostat module is a hybrid device with attached wire interconnects. The power switch in this device is subject to momentary thermal spikes exceeding manufacturer's published limits. The steady state junction temperature is expected to be 123°C when the hybrid case temperature is at it's maximum of 105°C (221°F), which meets ISS requirement of <125°C Tj. The concern is that the FET switch requires 10 ms to turn off, during which time the junction temperature is expected temperature rise 37°C resulting in a peak temperature of 160°C. The maximum Tj for this FET, P/N IRFC9240, is rated at 150°C by International Rectifier. Due to the 10 ms turn-off ramp, the FET Tj is calculated to exceed 150°C for 23 ms every turn-off cycle.

**RATIONALE:** (use continuation pages if required)  
 This technology has good characteristics with regard to thermal runaway or current hogging of the individual vertical MOSFET cells. The critical attributes to prevent thermal runaway include, a) technology, temperature, time, voltage and current.  
 1) This device is a HEXFET III device which provides resistance to momentary breakdown. This has been demonstrated by reliable performance while being subjected to repetitive momentary breakdowns (due to inductive voltage spikes) at high temperature.  
 2) Rds(on), channel resistance, has a positive thermal constant and therefore intrinsically shares well with adjacent cells.  
 3) The duty cycle for this transient event is very small. The 10 ms turn-off occurs only once per many minutes to many hours. As this heater system is only active as a supplemental heat source at the worse case beta angles, it is active only during certain times of the year. Thermally driven failure modes such as diffusion and ionic recombination affecting oxides and contributing to field distortion would not contribute to an increased failure rate due to the miniscule cumulative duration of the thermal spike events.  
 4) The heater load is resistive so there are no voltage spikes or sustained high voltage during current shut off which means that the voltage stays below 126 Vdc and meets it's derating requirements (rated 200 Vdc).  
 5) Due to the thermal delay, the Tj is above 150°C for the last 5 ms of the turn-off ramp where the current is down to 1.3 amperes. For 80% of the time the junction temperature is above 150°C, the FET switch is fully off.  
 6) Evaluation of the attach material, Ablebond 84-1, indicates that the material, which cures at 175°C, is capable of operation to that temperature. Reliability data for power cycling indicates that these FET's will exhibit better than .0001% cumulative failure rate for 500,000 cycles for a 37°C delta temperature.  
 7) The 37°C rise is based on a TO254 package device on a beryllia tab, which is similar to the hybrid application. Some preliminary modeling by HB indicated that the more massive alumina substrate of the hybrid device may provide a better thermal response, approximately 25°C delta T. However there is no test data or more detailed FEA analysis to back up this position therefore the more conservative position must be addressed.  
 In summary, the very short period (23 ms), low duty cycle (once per minutes to hours), small (10°C) thermal excursion above rated, and limited thermostat operating time per year will have minimal impact on the reliability of the IRFC9240 switching FET in this application. This allows the thermostats to be flown on the ISS with minimal risk.

**DISPOSITION**

<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis G. Tallman	/s/ W. David Beverly	4/13/01	X		

**COMMENTS:** (use continuation pages if required)  
 The models and analysis for the delta T and thermal response time are attached.

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## Exception 097 To SSP 30312 Requirements

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE	
5/10/01	097	N/C	N/A	1 of 1	
SYSTEM	ORIGINATOR and PHONE NO.		ORGANIZATION / CONTRACTOR		
SSMMU	Ali Lakhani, 714-896-3311 X7-1419		Boeing-Huntington Beach		
END ITEM/CONFIG. ID NO.	NEXT ASSEMBLY(s)	PART NUMBER	DESCRIPTION		
BG8259015-914	ISS	8265409-005 LDC 0019	RAD Tolerant FPGA		
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER	LOCATION		
SSP 30312	3.7	Actel	Habitable: Non-Habitable: X		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required)					
<p>The device is an FPGA, generic P/N RT54SX32-1CQ256B manufactured by Actel. One part failed Residual Gas analysis during DPA (8361ppm vs 5000ppm maximum limit).  Three other devices from the same lot date code (LDC 0019) passed RGA at the qualification testing. RGA data shows insignificant amount O<sub>2</sub>, Ar, and CO<sub>2</sub> and therefore there is no evidence of part leakage or that the origin of the H<sub>2</sub>O is from atmospheric leakage or exchange.  The ISS PCB provided conditional approval of these devices (See minutes from January 26, 2001) pending successful completion of Qualification test at the assembly level.</p>					
<b>RATIONALE:</b> (use continuation pages if required)					
<p>Qualification testing at the assembly level is complete, the unit passed all required tests. The qualification tests were witnessed by Honeywell Quality Engineer, Boeing Customer Representative and DCMC.</p> <p>Request PCB approve the results of the qualification testing at the assembly level and grant final acceptance of NCMR 007107 for P/N 8265409-005.</p> <p>* Excerpts from the 1/26/01 PCB.</p> <p>8265409-005 – Ali Lakhani and Pat Lintz: This device is an FPGA, generic P/N RT54SX32-1CQ256B manufactured by Actel. This issue is one part failed Residual Gas Analysis testing during DPA due to the package containing excess water vapor (8361 ppm vs 5000 ppm maximum limit), after 3 parts had successfully passed RGA during initial lot testing. Pat Lintz from Honeywell presented data in response to questions from the PCB of 1/12/01. Pat confirmed that the 3 DPA samples from the same LDC were tested at Pernicka. He did not get the actual RGA results from them, merely that they passed. Pat also presented the data from the RGA analysis performed on their DPA sample. The dew point (+5°C) does fall within the application temperature expected to be seen by the device (-6.7°C to +48.9°C). The RGA indicated the content and percentages of all internal gas elements were nominal with the exception of the water vapor content. No explanation was provided as to the source of the moisture. The devices do not utilize conformal coating or other environmental barrier to protect conductive components within the package. Due to time and cost constraints, it was concluded that additional devices would not be procured and DPA be performed. It was determined that the Qualification testing these devices will be subjected to at the assembly level would provide acceptable levels of stress through the dew point to provide confidence that the operation of the flight parts will not be impacted by possible excess water vapor in the packages. If the devices pass Qualification testing at the box level without failure, Ali will generate an Exception to SSP 30312. The PCB provided conditional approval to use these devices pending the successful completion of Qualification testing.</p>					
<b>DISPOSITION</b>					
BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Curtis G. Tallman	/s/ W. David Beverly	5/11/01	✓		
<b>COMMENTS:</b> (use continuation pages if required)					

## EXCEPTION 098 To SSP 30312 Requirements

<b>SUBMITTAL DATE</b>	<b>EXCEPTION NO.</b>	<b>REV.</b>	<b>FLIGHT #(s)</b>	<b>PAGE</b> 1 of 6	
30 May 2001	098	N/C	<b>Stage 7A.1 and Subsequent</b>		
<b>SYSTEM</b>	<b>ORIGINATOR and PHONE NO.</b>		<b>ORGANIZATION / CONTRACTOR</b>		
<b>ARIS equipped rack</b>	<b>Henry Hoang (281) 336-5157</b>		Utilization		
<b>CONFIG. ID NO.</b>	<b>WIRE HARNESS/PART NUMBER(s)</b>	<b>Description</b>	<b>NEXT Assembly (s)</b>		
	1J01101-1 (J1 Umbilical, looped) 1J01101-501 (J1 Umbilical, unlooped) SK683-20005-6 (J2 Umbilical, looped) SK683-20005-5 (J2 Umbilical, unlooped)	Wire Harnesses	ISS		
<b>SPECIFICATION NUMBER</b>	<b>SPEC. PARAGRAPH NO.</b>	<b>Manufacture</b>	<b>LOCATION</b>		
<b>SSP 30312</b>	<b>Paragraph 3.8.1</b>	Boeing-Houston	Habitable: X Non-Habitable:		
<b>ISSUE DESCRIPTION:</b> (use continuation pages if required) The Payload Engineering Integration (PEI) team has identified the case that 6 kW racks with Active Rack Isolation System (ARIS) may require 8-gauge power wire to carry the maximum nominal current of 50 amps. The ARIS is installed in EXPRESS Racks (Rack 2 or 3), and the nominal current of 50Amps is the maximum current allowed for 6 kW racks. The actual operating current is expected to be lower than 50 Amps, as limited by power available to payloads. The SSP 30312 derated single wire current for 8 gauge wire is 44 amps and the maximum allowable circuit breaker trip point is 57.2 amps (130% of 44 amps). See Attachment 1 & 2 for J1/J2 umbilical cables drawing assembly. A program exception is requested to allow 50 amps on a 8 gauge wire in the wire harnesses listed above.					
<b>RATIONALE:</b> (use continuation pages if required)  The use of 8-gauge wire for ARIS power supply through the J1 and J2 connectors of the Utility Interface Panel (UIP) is necessary to meet microgravity isolation requirements and safe to use in all rack locations within the US Laboratory only. The J1 and J2 power umbilicals in the ARIS umbilical set have 4-gauge supply and return wires, and an 8-gauge ground. For brevity, this umbilical wire configuration will be referred to as a 4-4-8 configuration. These umbilicals are looped to reduce their stiffness. The current umbilical configuration has a large dynamic resonance at 10 Hz. Due to this resonance ARIS isolation is predicted to be -26dB at 10 Hz. The DAC-6 analysis indicates we need -33dB to meet the system microgravity requirement onboard the ARIS rack at 10 Hz. Ground tests show that isolation performance at 10 Hz can be improved by a factor of two if the two 4-gauge wires are replaced by two 8-gauge wires (an 8-8-8 configuration). Analysis indicates that this "factor of two" improvement in isolation performance is sufficient to meet the system microgravity requirement onboard the ARIS rack at 10 Hz.  Under the provisions of the SSP 30312, Rev. F, the request for an exception to SSP 30312 requirements for this case was analyzed by the PEI engineer - see the engineering analysis with supporting calculations.					
<b>DISPOSITION</b>					
<b>BOEING PCB CHAIR</b>	<b>NASA PCB CHAIR</b>	<b>DATE</b>	<b>APPROVE</b>	<b>DEFER</b>	<b>REJECT</b>
/s/ Curtis Tallman	/s/ David Beverly	6/12/01	X		
<b>COMMENTS:</b> (use continuation pages if required) Document this exception in SSP 30312					

**Exception 098 TO SSP 30312 Requirements (Continued)**

**Subject:** Request for Parts Control Board (PCB) Approval

**Reference:** Exception 01 (65 amps through 8 gauge power wire) of SSP 30312,

**Background:** The Payload Engineering Integration (PEI) team has identified the case that 6 kW racks with Active Rack Isolation System (ARIS) ISS Characterization Experiment (ICE) may require 8 gauge power wire to carry the maximum nominal current of 50 amps. The SSP30312 limits for 8 gauge wire is 44 amps and a maximum circuit breaker trip point of 57.2 amps. Therefore, the PEI team asks the PCB to allow 50 amps on 8 gauge wire in the following wire harnesses:

Boeing, Houston	
Harness Nomenclature/Identifier	Harness Part Number
J1 Umbilical, looped	1J01101-1
J1 Umbilical, unlooped	1J01101-501
J2 Umbilical, looped	SK683-20005-6
J2 Umbilical, unlooped	SK683-20005-5

**Analysis:** The PEI analysis reached the conclusion, the 8 gauge wire can handle 50 amps for a limited (in days) amount of time.

1. The Exception is applicable to all the EXPRESS Racks with ARIS for using of 8-gauge wire power supply through J1 and J2 connectors of the UIP in the US Lab for 7A.1 and Subsequent.
2. Current rating for 8-gauge wire:
  - According to NASA Technical Memorandum 102179, Table 2

Environment	Rating (Amp)
72°F / 14.7 PSI	169.0
72°F / 10 <sup>-6</sup> TORR	88.4
200°F / 10 <sup>-6</sup> TORR	81.0

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**Exception 098 TO SSP 30312 REQUIREMENTS (Continued)**

- According to SSP 30312, Appendix B.3.5.2

Environment	Single Wire Current (I <sub>sw</sub> ) (A)	Remarks
70°C / 10 <sup>-6</sup> TORR	44.0	6. Circuit protective devices shall not allow sustained current exceeding 130% ( <b>57.2Amp</b> ) of derated single wire current without PCB AIT approval.

3. US Lab Compatibility:

The maximum nominal current flow supplied at any ISPR location is 50Amp. This value is well below the current rating defined in NASA Technical Memo 102179 for a shirt sleeve environment (72°F / 14.7 PSI). The maximum sustained current available in the USL based on RPC trip characteristic is 55Amp, which is well below the 102179 current rating 169.0 Amp.

SSP 30312 current for 8-gauge wire is 44Amp, but allows for sustained current flow of up to 130% (57.2A) of this rating without concurrence of EEE Parts Control Board. This rating is defined for a vacuum environment and the derating of this wire is more severe for vacuum than a pressurized environment. Even so, the nominal current and maximum sustained current values for the USL fall below the allowable 30312 current ratings.

The maximum temperature for the ISS is defined as 46°C (115°F) with a nominal range of 17 to 28°C (63-82°F). Based on the maximum defined temperature of 46°C and the wire insulation rated at 200°C, the maximum allowable delta T for the ARIS J1/J2 umbilical is 154°C (309°F). Based on the 102179, Figure 3 - single wire in free air, the delta T for an 8-gauge wire at 55Amp is 25°F. This value falls below the maximum allowable delta T of 309°F. In the unlikely event that the rack remains powered at same time the module is unpressurized the delta T at 55Amp would be ~ 140°F (reference 102179, Figure 5 - single wire in a vacuum at 72°F ambient). This delta T is also below the maximum allowable of 309°F.

The IVA touch temperature limit for Teflon is defined as 120°C (248°F) for incidental contact and 70°C (158°F) for intentional contact in MA2-95-048. The touch temperature of the wire under pressurized conditions at the maximum nominal ISS cabin temperature (82°F) is 107°F.

Based upon the data presented 8-gauge wire is compatible for all ISPR locations in the US Lab.

4. JEM Compatibility:

Based on SSP57001, Figure 3.2.6-3, the maximum sustained current attainable in the JEM is 65A. This value falls below both the pressurized and vacuum environment current ratings defined in 102179, but exceeds the SSP30312 current ratings. The delta T in a pressurized environment would be 35°F and 180°F in a vacuum environment. The resultant IVA touch temperature at 82°F ambient is 117°F. Based on the current ratings defined in 102179 the ARIS umbilicals are compatible with all ISPR locations in the JEM, however approval for use in the JEM must be coordinated with NASDA.

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**Exception 098 TO SSP 30312 REQUIREMENTS (Continued)**

## 5. APM Compatibility:

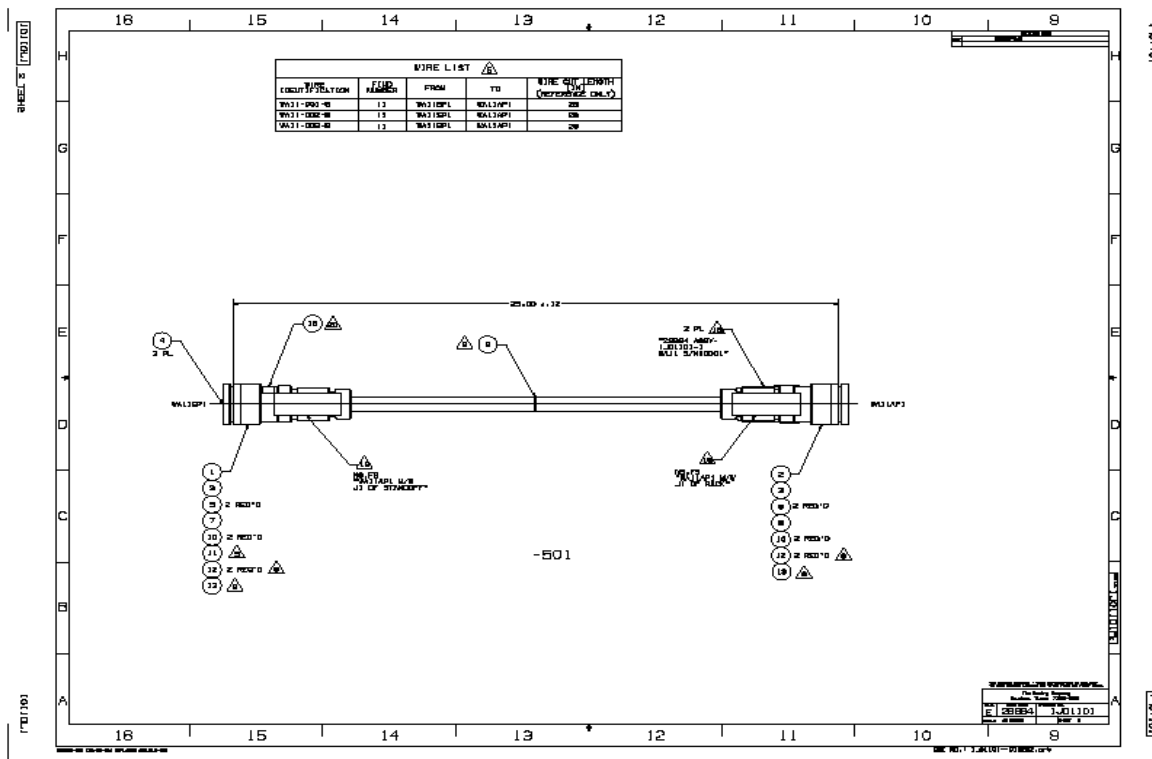
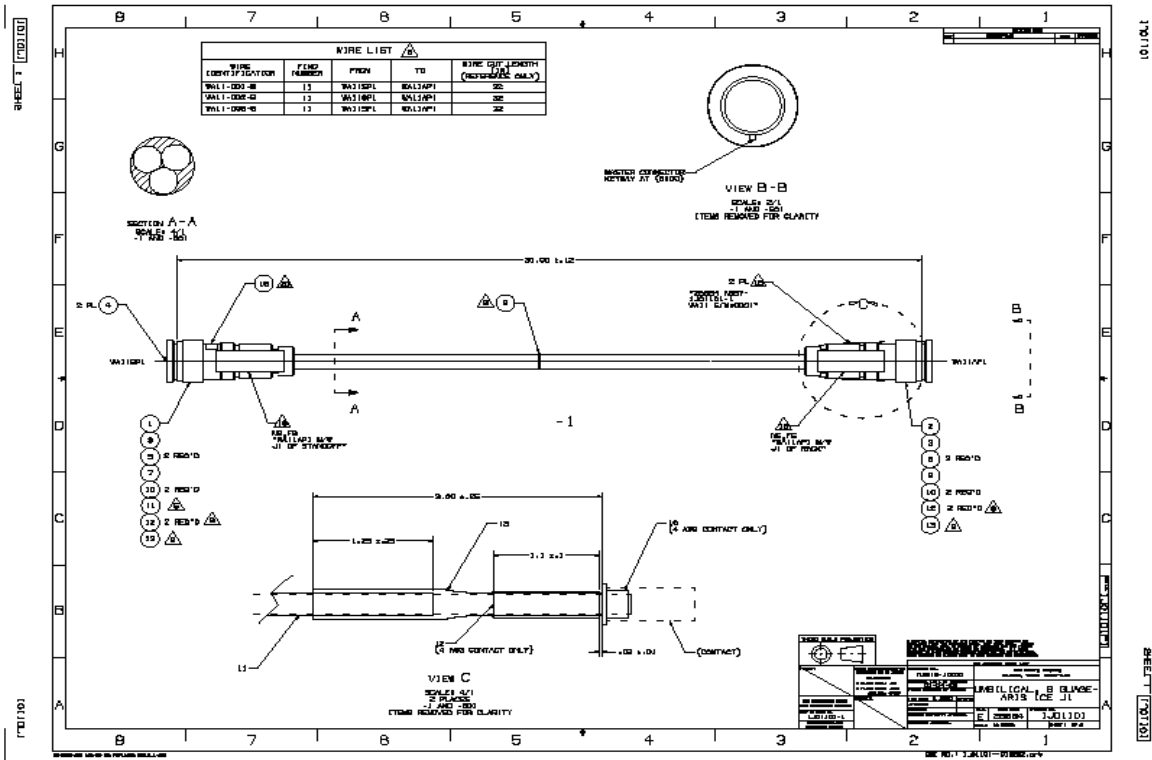
Based on SSP57001, Figure 3.2.6-1, the maximum sustained current attainable in the APM is 79.6A. This value falls below both the pressurized and vacuum environment current ratings defined in 102179, but exceeds the SSP30312 current ratings. The delta T in a pressurized is 60°F and is 250°F in a vacuum environment. Both of these values fall below the maximum allowable delta T of 390°F.

The resultant IVA touch temperature at 82°F ambient is 142°F. Based on the current ratings defined in 102179 the ARIS umbilicals are compatible with all ISPR locations in the APM, however approval for use in the APM must be coordinated with ESA.

**Note:** Using Type III RPC to protect 6 kW rack (nominal current of 50 Amps) complies with ISS EPS Architecture requirements. Type III RPC will trip between 55 Amps and 60 Amps if the overcurrent condition persists for more than 40 ms. Type III RPC allows higher transient current for shorter duration, e.g., 95 Amps for transient less than 40 ms. The duration of surge current from the racks will be limited to 10 ms. Therefore, nuisance trips are avoided.

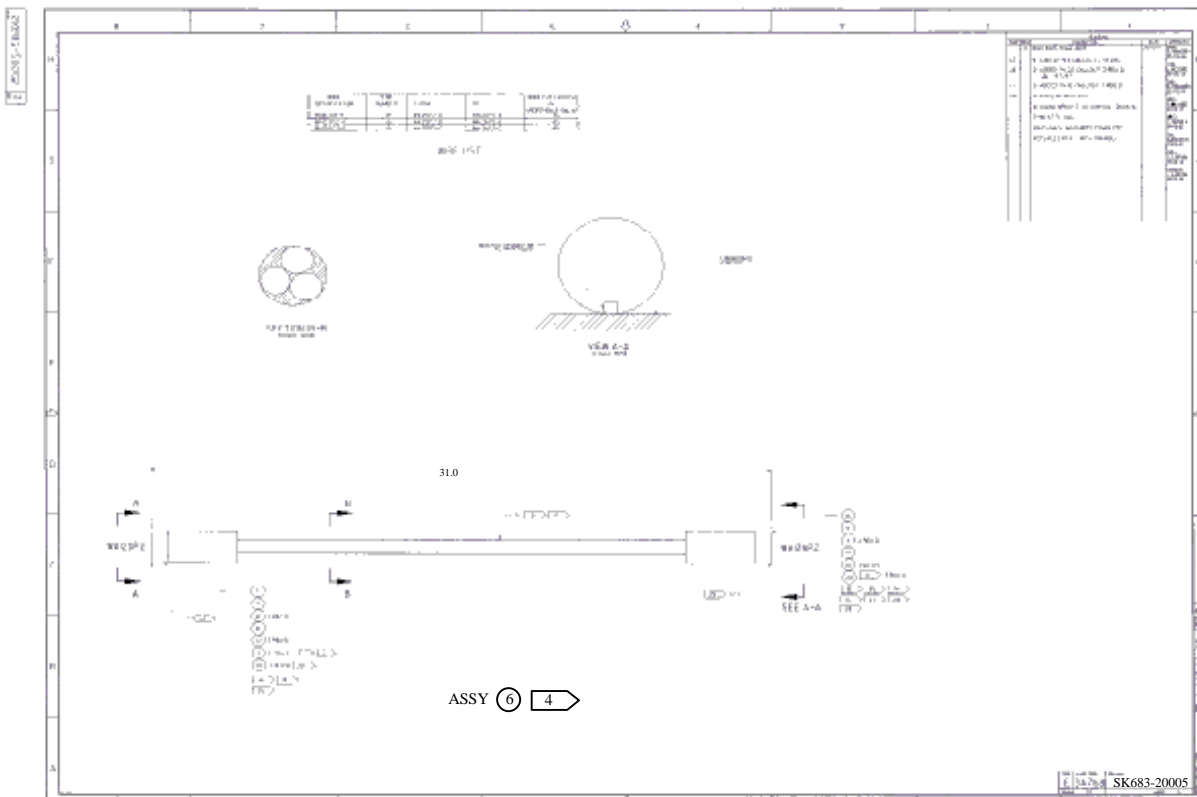
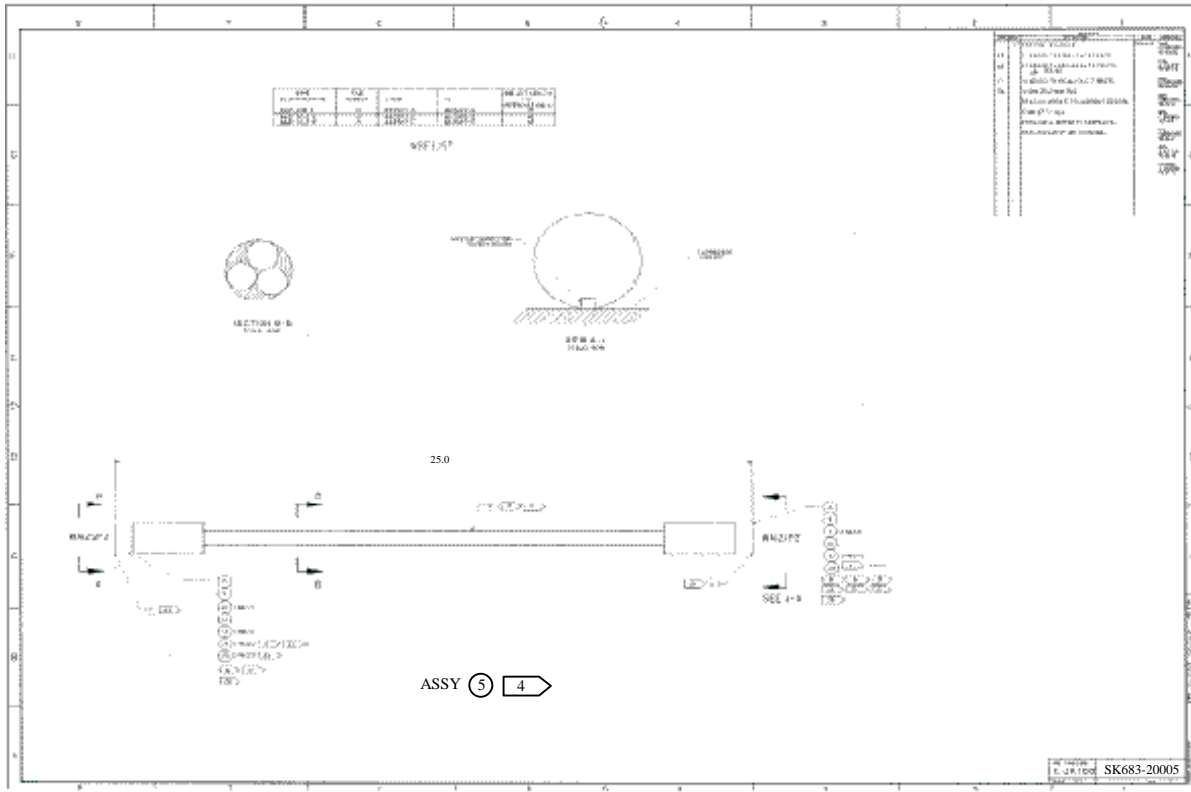
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Exception 98 To SSP 30312 Requirements (continued)  
Attachment 1 - J1 Umbilical Cables



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Exception 98 To SSP 30312 Requirements (continued)  
Attachment 2 – J2 Umbilical Cables



## Exception 099 To SSP 30312 Requirements

SUBMITTAL DATE	EXCEPTION NO.	REV.	FLIGHT #(s)	PAGE	
6-13-01	099		8A	1 of 1	
SYSTEM	ORIGINATOR and PHONE NO.	ORGANIZATION / CONTRACTOR			
ISS	W. Dykes (714) 896-3311 7-0062	EEE Parts/Boeing-Huntington Beach			
END ITEM/CONFIG. ID NO.	WIRE HARNESS/PART NUMBER(s)	DESCRIPTION	NEXT ASSEMBLY(s)		
222064A &B/ 1F45012-1 & -501 222082A/ 1F97520-1	1F67621-1 and 1F67621-501	DC-DC Converter	Bolt Bus Controller (BBC) Signal Conditioning Unit (SCU)		
SPECIFICATION NUMBER	SPEC. PARAGRAPH NO.	MANUFACTURER	LOCATION		
SSP 30312	3.7	Modular Devices Inc.(MDI) LI NY	Uninhabited		
<p><b>ISSUE DESCRIPTION:</b> (use continuation pages if required)</p> <p>A family of DC-DC Converters (+5, +/-15, +/-5V) was developed for use in the above units. Engineering units were installed in system qualification units however due to device level qualification test failures, the required subsequent redesign and rebuild, the 1F67621 schedule no longer supported the program. A second supplier (APACE Inc.) was developed who built, tested and delivered flight hardware for a drop-in replacement to a new drawing 1F97574. Due to test and failure issues with this 2<sup>nd</sup> supplier there are no longer enough converters to produce SCU spares build using 1F97574 parts. In the mean time 1F67621 parts arrived and when DPA problems were cited the parts were retained in MRB (-1 version) and receiving interim stores (-501 version) until a final disposition could be made. As the parts were not needed and the supplier's assessment was that they met the spec and not returnable, this storage has extended to 2 years prior to this resolution.</p> <p>Proposal is to use the 1F67621 parts with retest. A study was conducted to assure that the performance of the 2 suppliers was compatible with interchangeability. DPA exceptions are:</p> <ol style="list-style-type: none"> <li>1) Residue appearing to be flux was in evidence from capacitor/ magnetic soldering operations.</li> <li>2) Excess encapsulation materials used on magnetic devices.</li> <li>3) 3 of 5 parts failed RGA at 7170, 7727 and 7483 ppm.</li> <li>4) Surface mount tantalum capacitor anomaly.</li> </ol>					
<p><b>RATIONALE:</b> (use continuation pages if required)</p> <ol style="list-style-type: none"> <li>1) Solder connection of magnetics and capacitors necessitates use of flux. Cleaning processes should remove all visible traces of flux per MIL-STD-883, Method 2017. Proximity of delicate wire and die makes normal wiping processes prone to cause rejectable damage to those elements.</li> <li>2) Epoxy bonding material required to mount transformer/ inductor cores and to secure lead wires and stacked ceramic capacitors. There is no objective criteria for excessive bonding material.</li> <li>3) RGA failures are only marginally outside of expected limit of 5000 ppm and consistent with other large hybrids with organic die mounting medium reviewed by the PCB. Leak checks are 100% pass balance of gas present is N2, CO2 and only 490, 851, 801, 736 and 471 ppm of detected hydrocarbons. This indicates little re condensible contaminate to cause corrosion effects. This ameliorates the potential issues caused by anomalies 1) and 2) above.</li> <li>4) It was reported that a solid tantalum capacitor had a cracked plug. If the plug were cracked it is doubtful that the unit would operate. On re examination it was determined that the anomaly occurred when the core was packed prior to sintering where a small area like a wrinkle was present. While rare this does not present a functional problem for the capacitor.</li> </ol> <p>Screening prior to reuse.</p> <ol style="list-style-type: none"> <li>1) Open 2 units and conduct an aqueous test for chlorides and conductivity. This assures that the residue noted will not cause long term corrosion.</li> <li>2) Conduct an electrical retest of all units.</li> </ol>					
DISPOSITION					
BOEING PCB CHAIR	NASA PCB CHAIR	DATE	APPROVE	DEFER	REJECT
/s/ Alex Di Taranto for Curtis G. Tallman	/s/ W. David Beverly	6/29/01	X		
<p><b>COMMENTS:</b> (use continuation pages if required)</p>					