

Payload Powerdown

STS-127

**Mission Operations Directorate
Operations Division**

**Final
May 20, 2009**

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas




MISSION OPERATIONS DIRECTORATE

**PAYLOAD POWERDOWN
STS-127**

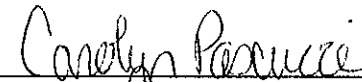
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PREPARED BY:



Yvette L. Dillard
Publication Manager

APPROVED BY:



Manager,
Flight Procedures

ACCEPTED BY:



Michael T. Hurst
FDF Manager

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NOTES

1. Section 1 of this book is inserted at the back of the Ascent Pocket Checklist.
2. Sections 2 and 3 of this book are inserted at the back of the Orbit Pocket Checklist.
3. Section 4 of this book is inserted at the back of the Entry Pocket Checklist.

PAYLOAD POWERDOWN
STS-127

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* – Omit from flight book

PL iii

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**PL PWRDN
ASC**

PL PWRDN MATRIX

**PL PWRDN
ASC**

PROCEDURE	ACTION
PWRDN FOR LOSS OF:	
2 CAB FANS	A
CAB PRESS	
(MINOR PWRDN; from step 3)	A
(MAJOR PWRDN; from step 4)	A
AV BAY COOLING/AV BAY FIRE	A (AV BAY 1 or 3 only)
2 H2O LOOPS [PLT PWRDN, SYS AOA, <u>2 H2O LOOPS (AOA);</u> (CDR/PLT PWRDNS)]	A
(POST OMS-2)	A
1 FREON LOOP	N/A
2 FREON LOOPS [PLT PWRDN, SYS AOA, <u>2 FREON LOOPS (AOA);</u> (CDR/PLT PWRDNS)]	A
(POST OMS-2)	A
HI LOAD EVAP	N/A
FES /1 FC	N/A
2nd FC	A
MN BUS UNDERVOLTS/FC VOLTS	
(from step 6; permanent loss of PL PRI)	N/A
(from step 14; temporary loss of PL PRI)	N/A

ACTION

A	PWRDN	PWRUP
N/A		N/A

P & I

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PL PWRDN – ORBIT

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PL PWRDN
ORB

PL PWRDN MATRIX

**PL PWRDN
ORB**

PROCEDURE	ACTION
PWRDN FOR LOSS OF: HI LOAD EVAP 1 FREON LOOP	N/A PP3A*,PP3B** (on MCC call) as required
AV BAY COOLING (from MAL GPC FRP-7)/ AV BAY FIRE 1 FC	C (if AV BAY 1 or 3) PP3A*,PP3B** (on MCC call) as required until ORB kW < 17
FES (ON ORBIT) (DEORBIT PREP)	PP3A*,PP3B** (on MCC call) as required A
MN BUS UNDERVOLTS/FC VOLTS (from step 6; permanent loss of PL PRI)	B
(from step 17; temporary loss of PL PRI)	B
PRIORITY PWRDN GROUP 3	PP3A*,PP3B** (on MCC call) as required

*PRIORITY PWRDN 3A (PP3A) contains recoverable Payload operations powerdown steps

**PRIORITY PWRDN 3B (PP3B) is a total Payload powerdown that may cause Payload operations to be nonrecoverable

ACTION

PP3A	PRIORITY PWRDN (Recoverable) (On MCC call only)	PWRUP
JLE L12L (SSP2)	<ol style="list-style-type: none"> 1. KEEL 2 PWR JLE – OFF ILL PWR JLE – OFF 2. JLE HTR #1 – OFF (tb-bp) 3. ICS-EF HTR #2 – OFF (tb-bp) JLE MAXI HTR #4 – OFF (tb-bp) 4. HTR 1-2 – DSBL (tb-bp) 3-4 – DSBL (tb-bp) 5. PPSU 1/2 HTR A – DSBL B – DSBL 	√MCC

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PP3A (Cont)	PRIORITY PWRDN (Recoverable) (On MCC call only)	PWRUP
<u>JEF</u> A15	6. APCU 1,2 CONV (two) – OFF OUTPUT (two) – OFF	
<u>ICC</u> L12L (SSP2)	7. KEEL 1 PWR ICC – OFF ILL PWR ICC – OFF 8. ICC PFRAM HTRS – OFF (tb-bp) BATT HTRS – OFF (tb-bp)	
<u>PCS</u> L12 (PDIP1)	9. Exit programs, power off PCS 10. DC PWR 2 – OFF	
<u>OIU</u> L12U (SSP1)	11. OIU PWR – OFF (tb-bp)	
	If additional powerdown required: 12. Go to PRIORITY PWRDN 3B (PP3B)	

PP3B	PRIORITY PWRDN (Non-Recoverable) (On MCC call only)	PWRUP
<u>DRAGONEYE</u> L12L (SSP2)	1. DRGNEYE PWR – OFF (tb-bp) cb CB2 – op	
	<u>MIDDECK PAYLOADS</u>	
	<u>NOTE</u> When orbiter power removed, science degradation or loss will occur in 120 min	
<u>GLACIER</u> MF28E/G	2. pb Left (MENU) → Press (one time) QUICK STATUS 1/5 3. pb Left (NEXT) → Press (four times) SHUTDOWN 5/5 4. pb Center (SELECT) → Press (one time) SHUTDOWN 1/2 5. pb Center (SELECT) → Press (one time) Confirm Shutdown	

PP3B (Cont)	PRIORITY PWRDN (Non-Recoverable) (On MCC call only)	PWRUP
	<p>6. pb Left (APPLY) → Press (one time) Shutting Down Please Wait</p> <p>7. √Display Shutdown Complete</p> <p>8. √sw BATTERY – ON (It on)</p> <p style="text-align: center;"><u>NOTE</u></p> <p>The Glacier power light can take up to 2 min to completely extinguish</p> <p>9. cb POWER – op</p> <p>ML86B:E 10. MNB MAR 1 – op (MAR)</p> <p style="text-align: center;"><u>NOTE</u></p> <p>When orbiter power removed, science degradation or loss will occur in 100 min</p> <p><u>PCDF-PU</u></p> <p>MA16F 11. sw POWER → OFF</p> <p>ML85E 12. DC 10 AMP MNB S4 – OFF (MUP) cb DC 10 AMP MNB CB4 – op</p> <p>If FREE DRIFT for DRAGONSAT or ANDE-2 deploy, complete deploy, then:</p> <p><u>DRAGONSAT</u></p> <p>L12L (SSP2) 13. cb PDIP2 PWR1 – op</p> <p><u>OBSS</u></p> <p>14. LCC DEACT (Cue Card, <u>LCS</u>)</p> <p>15. LCH DEACT (Cue Card, <u>LCS</u>)</p> <p>16. LDRI/ITVC DEACT (Cue Card, <u>LDRI/ITVC</u>)</p>	

PP3B (Cont)	PRIORITY PWRDN (Non-Recoverable) (On MCC call only)	PWRUP
<u>PL BUS DEACT</u>		
R1	17. PL CAB – OFF (ctr) AUX – OFF 18. PRI MNC – OFF (tb-OFF) 19. AFT MNB – OFF MNC – OFF	

A	PWRDN (to reduce internal cabin heat loads)	PWRUP
<u>ORBITER</u>		√MCC
Exit software programs, power down all non-essential PGSCs and orbiter equipment (OCAC, Ergometer, Battery Chargers, etc)		

B	PWRDN (PL PRI permanently or temporarily lost)
<u>JLE</u>	
L12L (SSP2)	<ol style="list-style-type: none"> 1. KEEL 2 PWR JLE – OFF ILL PWR JLE – OFF 2. JLE HTR #1 – OFF (tb-bp) 3. ICS-EF HTR #2 – OFF (tb-bp) JLE MAXI HTR #4 – OFF (tb-bp) 4. HTR 1-2 – DSBL (tb-bp) 3-4 – DSBL (tb-bp) 5. PPSU 1/2 HTR A – DSBL B – DSBL
<u>ICC</u>	
L12L (SSP2)	<ol style="list-style-type: none"> 6. KEEL 1 PWR ICC – OFF ILL PWR ICC – OFF 7. ICC PFRAM HTRS – OFF (tb-bp) BATT HTRS – OFF (tb-bp)
----- PWRUP (PL PRI recovered)	
On MCC GO:	
R1	<ol style="list-style-type: none"> 1. PL PRI MNC – ON (tb-ON)
<u>JLE</u>	
L12L (SSP2)	<ol style="list-style-type: none"> 2. √cb PDIP 2 PWR 2 – cl √cb CB4 – cl √cb CB2 – cl 3. KEEL 2 PWR JLE – ON ILL PWR JLE – ON 4. JLE HTR #1 – ON (tb-gray) 5. ICS-EF HTR #2 – ON (tb-gray) JLE MAXI HTR #4 – ON (tb-gray) 6. HTR 1-2 – ENA (tb-UP) 3-4 – ENA (tb-UP) 7. PPSU 1/2 HTR A – ENA B – ENA
<u>ICC</u>	
L12L (SSP2)	<ol style="list-style-type: none"> 8. KEEL 1 PWR ICC – ON ILL PWR ICC – ON 9. ICC PFRAM HTRS – ON (tb-gray) BATT HTRS – ON (tb-gray)

C	PWRDN	PWRUP
<u>MIDDECK PAYLOADS</u>		N/A
IF AV BAY 1:		
	<u>NOTE</u>	
	When orbiter power removed, science degradation or loss will occur in 120 min	
<u>GLACIER</u>		
MF28E/G	1. pb Left (MENU) → Press (one time)	
	QUICK STATUS 1/5	
	2. pb Left (NEXT) → Press (four times)	
	SHUTDOWN 5/5	
	3. pb Center (SELECT) → Press (one time)	
	SHUTDOWN 1/2	
	4. pb Center (SELECT) → Press (one time)	
	Confirm Shutdown	
	5. pb Left (APPLY) → Press (one time)	
	Shutting Down	
	Please Wait	
	6. Display	
	Shutdown Complete	
	7. √sw BATTERY – ON (It on)	
	<u>NOTE</u>	
	The Glacier power light can take up to 2 min to completely extinguish	
	8. cb POWER – op	
ML86B:E	9. MNB MAR 1 – op	
(MAR)		
IF AV BAY 3:		
	<u>NOTE</u>	
	When orbiter power removed, science degradation or loss will occur in 100 min	
<u>PCDF-PU</u>		
MA16F	10. sw POWER → OFF	
ML85E	11. DC 10 AMP MNB S4 – OFF	
(MUP)	cb DC 10 AMP MNB CB4 – op	

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PL SAFING – ORBIT

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APCU.....	PL 3-3
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PL SAFING
ORB

PL SAFING MATRIX

PROCEDURE	ACTION
9.101 JOINT EXPEDITED UNDOCKING AND SEPARATION, from step 18b (SODF: JOINT OPS, <u>EMERGENCY RESPONSE</u> ; JEUS)	PL SAFING
PWRDN FOR LOSS OF:	
2 CAB FANS	PL SAFING
2 H2O LOOPS	PL SAFING
CAB PRESS	PL SAFING
2nd FC (TIG < 4 hr) (from step 5)	PL SAFING
(TIG > 4 hr) (from step 15)	PL SAFING
2 FREON LOOPS	PL SAFING

PL SAFING
ORB

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PL 3-2

PL PWR/127/O/FIN

ACTION

PL SAFING

MIDDECK TRANSFER (IF NOT ALREADY PERFORMED)

If transfer hardware in ODS:

1. Complete transfer to ISS

Else:

2. Stow in Middeck

MIDDECK PAYLOADS

GLACIER

- MF28E/G 3. $\sqrt{\text{sw}}$ BATTERY – ON (It on)

NOTE

The Glacier power light can take up to 2 min to completely extinguish

4. cb POWER – op
ML86B:E 5. MNB MAR 1 – op
(MAR)

PCDF-PU

- MA16F 6. sw POWER → OFF
ML85E 7. DC 10 AMP MNB S4 – OFF
(MUP) cb DC 10 AMP MNB CB4 – op

OIU

- L12U 8. OIU PWR – OFF (tb-bp)
(SSP1)

APCU

- A15 9. APCU 1,2 CONV (two) – OFF
10. OUTPUT (two) – OFF

DEPLOYABLES

If FREE DRIFT for DRAGONSAT or ANDE-2 deploy,
complete deploy

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PL SAFING (Cont)

PAYLOAD BUSES

- R1
11. PL PRI MNC – OFF (tb-OFF)
 √MNB,FC3 (two) – ctr (tb-OFF)
 12. AUX – OFF
 13. CAB – OFF (ctr)
 14. AFT MNB – OFF
 MNC – OFF

Once PL SAFING completed, return to calling procedure, if required

Once calling procedure completed, stow all non-essential orbiter equipment (OCAC,Cycle Ergometer,Battery Chargers, etc)

PL PWRDN – ENTRY

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GLACIER	PL 4-2
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PL PWRDN MATRIX

PROCEDURE	ACTION
PWRDN FOR LOSS OF:	
2 CAB FANS	A
2 H2O LOOPS (ENTRY)	A
CAB PRESS	A
AV BAY COOLING/AV BAY FIRE (ENTRY)	A (AV BAY 1 or 3 only)
1 FREON LOOP/HI LOAD EVAP (ENTRY)	N/A
FES	N/A
1 FC (ENTRY)	N/A
2 FREON LOOPS (ENTRY)	A
2nd FC (ENTRY)	A
MN BUS UNDERVOLTS/FC VOLTS (from step 6; permanent loss of PL PRI)	N/A
(from step 14; temporary loss of PL PRI)	N/A

ACTION

A	PWRDN	PWRUP
	<u>MIDDECK PAYLOADS</u>	N/A
	IF AV BAY 1:	
	<u>NOTE</u> When orbiter power removed, science degradation or loss will occur in 120 min	
	<u>GLACIER</u>	
	MF28E/G 1. √sw BATTERY – on (It on)	
	<u>NOTE</u> The Glacier power light can take up to 2 min to completely extinguish	
	2. cb POWER – op	
	ML86B:E (MAR) 3. MNB MAR 1 – op	
	IF AV BAY 3:	
	<u>NOTE</u> When orbiter power removed, science degradation or loss will occur in 100 min	
	<u>PCDF-PU</u>	
	MA16F 4. sw POWER → OFF	
	ML85E (MUP) 5. DC 10 AMP MNB S4 – OFF	
	cb DC 10 AMP MNB CB4 – op	

PL PWRDN
ENT

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Space Shuttle Program
FLIGHT DATA FILE

JSC-48097-127
FINAL



**PAYLOAD
POWERDOWN**

**STS
127**

Flight Cover (trim bottom to expose tabs)