



Space Shuttle Mission 2007

For Version: 4.10

Designed By: Michael Swannick



Mission Checklist

STS-128

Crew Members

Commander - Frederick W. Sturckow | Pilot - Kevin A. Ford

Mission Specialist

Patrick G. Forrester | Jose M. Hernandez | Christer Fuglesang | John D. Olivas | Nicole Stott (ISS)

Mission Highlights

Carried out by Discovery on August 28, 2009, STS-128 was the last Space Shuttle ISS resupply and maintenance mission. Mission Specialist Nicole Stott will remain onboard the ISS and Tim Kopra will return home. First launch attempt scrubbed due to weather concerns. The second launch attempt was called off due to an anomaly in the shuttle's fuel valve. The third launch attempt was successful and Discovery blasted off on a 13 day mission to deliver more than 7 tons of supplies, science racks and equipment, as well as additional environmental hardware to sustain six crew members on the orbital outpost.

Payload

Multi Purpose Logistics Module (MPLM) LEONARDO. The Italian built module contains about 12,700 pounds of supplies that will be transferred to the ISS.

Lightweight Multi Purpose Equipment Support Structure Carrier (LMC). The LMC will hold the new and the depleted ammonia tank. It will also hold the EuTEF experiment while traveling back to Earth.

External Airlock Androgynous Peripheral Docking System (APDS)

Flight Summary

Launchpad: Kennedy Space Center (KSC) 39A | Orbit: 122NM | Inclination: 51.6 | Orbits: 219

Duration: 13 Days, 20 Hours, 54 Minutes, 55 Seconds | Landing: Edwards Air Force Base



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PRE-LAUNCH CHECKLIST

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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	PANEL AREA & NOTES
1	T-00:01:50:00				Astronauts Enter The Shuttle
2	T-00:01:40:00	Overhead Left Panel	O5	* Set Left Audio XMIT/ICOM MODE To VOX/VOX * Set Left Audio A/G (1 & 2) To T/R * Set Left Audio A/A To T/R * Set Left Audio ICOM (A & B) To T/R * Set Left Audio (AUD) Power Switch To AUD/TONE	Activates Commander Communications
3	T-00:01:35:00	Overhead Right Panel	O9	* Set Right Audio XMIT/ICOM MODE To VOX/VOX * Set Right Audio A/G (1 & 2) To T/R * Set Right Audio A/A To T/R * Set Right Audio ICOM (A & B) To T/R * Set Right Audio (AUD) Power Switch To AUD/TONE	Activates Pilot Communications
5	T-00:01:20:00	Front Left Panel	F6	* Check ABORT Light (DIM/BRIGHT/DIM) For 8 Seconds	Abort Advisory Check
6	T-00:01:10:00				Flight Control Confirms With Commander That The Side Hatch Is Closed & Locked
7	T-00:01:05:10	Left Panel	L2	* Set CABIN VENT ISOL To CLOSE	Cabin Leak Check
		Front Left Panel	F2	* Set CABIN VENT To CLOSE * Press MASTER ALARM	Cancel Master Alarm Sound
8	T-00:00:51:00				Pilot Confirms IMU Alignment
9	T-00:00:50:00	Right Panel	R2	* Check BOILER CNTLR/HTR (1/2/3) Are On - A	Confirm Boiler Power On
		Overhead Aft Panel	O14	* Set BOILER N2 Supply (1/2/3) To ON	
		Center Panel	O16	* Set L OMS ENG VLV Is ON	
			C3	* Set R OMS ENG VLV Is ON * Set OMS ENG (LEFT & RIGHT) Are Set To ARM/PRESS	
10	T-00:00:45:00	Left Panel	L2	* Set CABIN VENT/VENT To OPEN	Open Cabin Vent
11	T-00:00:42:00	Center Panel	C3	* Set BFC CRT DISPLAY To ON	Enable Backup Flight System (BFS) And
				* Confirm BFC CRT SELECT Is At (3+1)	Execute Computer Data Transfer To BFS
			C2	* Enter ITEM 25 EXEC (Use Left Keypad)	Copy Primary Avionics SW To BFS
12	T-00:00:36:40	Left Panel	L2	* Set CABIN VENT To CLOSE	Cabin Leak Check - Continued
		Overhead Low Panel	O1	* Set CABIN VENT ISOL To OPEN * Check CABIN dP/dT Gauge For Possible Depressurization	
13	T-00:00:33:20	Left Panel	L2	* Set CABIN VENT ISOL To Close * Check CABIN VENT Is CLOSED	Cabin Pressurization Check Complete
14	T-00:00:30:00	Center Panel	C2	* Enter OPS 101 PRO (Use Right Keypad) * Enter SPEC 99 PRO (Use Right Keypad) * Press RESUME (Use Right Keypad)	Load OPS 1 - Planned 10 Minute Hold Load First Stage SW Into Primary Avionics System
15	T-00:00:29:00	Center Panel	C2	* Enter OPS 101 PRO (Use Left Keypad)	Load OPS 1 Into The BFS
16	T-00:00:26:00	Right Panel	R2	* Set He ISOLATION A (LEFT/CRT/RIGHT) To Open * Set He ISOLATION B (LEFT/CRT/RIGHT) To Open * Set PNEUMATICS He ISOL To Open * Set 6 ENGINE POWER Switches (LEFT/CTR/RIGHT) To ON	Begin The Main Propulsion System (MPS) Helium (He) Pressurization
17	T-00:00:15:00	Front Left Panel	F6	* Check ABORT Light ON/OFF For 8 Seconds	Final Test Of The ABORT System
		Center Panel	C3	* Set CAUTION/WARNING MEMORY To CLEAR	Clear C/W Memory
18	T-00:00:09:00	Center Panel	C3	* Set Timer Thumbwheels To 0900 * Set TIMER Switch To SET * Check EVENT TIMER MODE Is DOWN	Enable Countdown From Nine (9) Minutes
605	T-00:00:09:00	Center Panel	C3	* Set EVENT TIMER CONTROL To START	Start The Nine (9) Minute Countdown
		Front Center Panel	F7	* Confirm EVENT TIMER Display Continues The Countdown	
19	T-00:00:08:00	Right Panel	R1 R2	* Set ESS BUS SOURCE (MN B/C, MN C/A, MN A/B) To ON * Check APU FUEL TK VLV (1/2/3) Are CLOSED * Check APU AUTO SHUT DOWN (1/2/3) Are Enable * Check HYD MAIN PUMP PRESS (1/2/3) Are LOW * Check APU SPEED SELECT (1/2/3) Are NORM * Set HYD CIRC PUMP (1/2/3) Set To GPC * Set APU CNTLR PWR (1/2/3) To ON	Enable Fuel Cells The Crew Access Arm Is Retracting APU Prestart Check Is Underway
20	T-00:00:05:10	Right Panel	R2	* Set APU FUEL TK VLV (1/2/3) To Open * Check APU/HYD READY TO START (1/2/3) Repeaters-(White)	APU Start
		Front Center Panel	F7	* Set APU OPERATE (1/2/3) To START/RUN	
		Right Panel	R2	* Check HYDRAULIC (APU) Pressure 900psi (Use MFD #2)	
		Front Center Panel	F7	* Set HYD MAIN PUMP PRESS (1/2/3) To NORM	
		Front Left Panel	F2	* Check HYDRAULIC (APU) Pressure 3000psi (Use MFD #2)	
		Right Panel	R2	* Press MASTER ALARM (If Required) * Set HYD CIRC PUMP (1/2/3) Set To OFF	The Master Alarm May Sound Until APU Pressure Reaches 3000 PSI. (Silence Alarm)
21	T-00:00:04:30	Left Panel	L2	* Set FLASH EVAP FEEDLINE HTR A & B SUPPLY To OFF	The Shuttle Is On Internal Power. Turn Off Flash Evaporator Feed Line & Heater Supply
	T-00:00:04:10				APU Check Complete
22	T-00:00:03:45				Start Hydraulic Check, Aero Surfaces Are Moved, A Gimbal Check Is Performed
	T-00:00:03:05				Hydraulic Check Complete
23	T-00:00:02:55				External Tank Liquid Oxygen (LOX) Vents Are Closing & The External Tank Begins To Pressurize. External Tank Cap Is Retracted.
24	T-00:00:02:00	Right Panel	R2	* Set APU AUTO SHUT DOWN (1/2/3) To INHIBIT	APU Power - Inhibit
		Center Panel	R1	* Set AC BUS SNSR (1/2/3) To MONITOR	
			C3	* Set CAUTION/WARNING MEMORY To CLEAR	



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25	T-00:00:01:40				Liquid Hydrogen External Tanks Closed
25	T-00:00:01:20				Go For Launch Announcement
25	T-00:00:01:00				One Minute Countdown Announcement
25	T-00:00:00:30				Thirty Seconds Countdown Announcement
26	T-00:00:00:15				The Shuttles Main Engines Will Ignite At T-00:00:00:05. A Staggered Start Of The Main Engines Will Commence In 120 millisecond Intervals. The Two SRB's Will Ignite At T-00:00:00:00, Followed By An Almost Instantaneous Liftoff. Once The Shuttle Clears The Tower, It Will Complete A Roll Maneuver.
26	T-00:00:00:00				Shuttle Liftoff

Commence Ascent Checklist



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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	NOTES
27	T+00:00:00:30 T+00:00:01:05				Main Engines Throttle Down To 65% Main Engines Throttle Up To 104%
28	T+00:00:02:00 T+00:00:02:05	Front Center Panel	F7	* Check Pressure Pc<50 (MFD / CRT 1)	Standby For SRB Separation SRB Separation
600	T+00:00:02:10				An OMS Assist Burn Is Now Performed To Add Additional Boost
602	T+00:00:03:00	Overhead Low Panel	O1	* Check FREON - EVAP OUT TEMP Gauge Shows Below 60 Degrees	Check Flash Evaporator Is Operational
29	T+00:00:04:20				Negative Return
601	T+00:00:05:19				The Shuttle Performs A Roll-To-Heads-Up
30	T+00:00:06:56				Single Engine Press To MECO
31	Mission Dep.	Front Center Panel	F7	* Check MAIN ENGINE STATUS Lights (Left/CTR/Right) Are Red	Engines Throttle Down In Preparation For Main Engine Cutoff (MECO)
32	Mission Dep.			* Check MAIN ENGINE STATUS Lights (Left/CTR/Right) Are Red	External Tank Separation
34	Mission Dep.	Left Panel Center Panel Right Panel Front Left Panel Front Right Panel Center Panel	L1 L2 C3 R1 F6 F8 C3	* Set FLASH EVAP CONTROLLER PRI A & PRI B To ON * Set FLASH EVAP FEEDLINE HTR A SUPPLY & B SUPPLY To 1 * Set BFC CRT DISPLAY To OFF * Set AC BUS SNSR (1/2/3) To AUTO TRIP * Set O2 TK 1 (B) & O2 TK 2 (B) HEATERS To AUTO * Set H2 TK 1 (B) & H2 TK 2 (B) HEATERS To AUTO * Check FLT CNTLR POWER Is OFF * Check FLT CNTLR POWER Is OFF * Check ORBIRAL DAP - CONTROL Is Set To AUTO	Remaining MPS Propellants Are Dumped Automatically. Main Engines Are Gimballed Down During The Dump
35	Mission Dep.	Center Panel	C3	* Enter OPS 105 PRO (Use Left Keypad)	Prepare To Circularize Orbit
36	Mission Dep.	Center Panel Overhead Aft Panel Center Panel	C3 C2 O14 O16 C3	* Confirm DAP (Digital Auto Pilot) Switches Are Set To AUTO * Enter ITEM 22 EXEC (Use Right Keypad) * Enter ITEM 27 EXEC (Use Right Keypad) * Enter ITEM 23 EXEC (Use Right Keypad) * Confirm L OMS ENG VLV Is ON * Confirm R OMS ENG VLV Is ON * Confirm OMS ENG (LEFT & RIGHT) Are Set To ARM/PRESS	Circularize Orbit
37	Mission Dep.	Right Panel	R2 R4	* Set 6 ENGINE POWER Switches (LEFT/CTR/RIGHT) To OFF * Set He ISOL A (LEFT/CTR/RIGHT) To GPC * Set He ISOL B (LEFT/CTR/RIGHT) To GPC * Set PNEUMATICS He ISOL To GPC * Set H2 PRESS LINE VENT To OPEN	Propellant Dump Complete
38	Mission Dep.	Right Panel	R2 R4	* Set ET UMBILICAL DOOR - MODE GPC To GPC/MAN * Set CENTERLINE LATCH To STOW * Set LEFT & RIGHT Door To CLOSE * Check Talkback Shows CLOSE * Set LEFT & RIGHT LATCH To LATCH * Check Talkback Shows CLOSED & LATCHED * Set LEFT & RIGHT DOOR To OFF * Set LEFT & RIGHT LATCH To OFF * Set HYD MAIN PUMP PRESS (1/2/3) To LOW * Set APU OPERATE - START/RUN (1/2/3) To OFF * Set APU FUEL TK VLV (1/2/3) To CLOSE * Set APU CNTLR PWR (1/2/3) To OFF * Set BOILER PWR (1/2/3) To OFF * Set BOILER N2 SUPPLY (1/2/3) To OFF * Set HYD CIRC PUMP (1/2/3) To GPC * Set H2 PRESS LINE VENT To GND	Close & Latch The ET Umbilical Doors. APU Shutdown
39	Mission Dep.	Center Panel	C2	* Press EXEC - Confirms ready for OMS burn (Use Right Keypad)	Confirm OMS Burn
40	Mission Dep.	Right Panel Center Panel	R4 C3	* Set PROPELLANT FILL/DRAIN LH 2 OUTBD & INBD To OPEN * Set OMS ENG LEFT & RIGHT To OFF	Liquid He Manual Dump
41	Mission Dep.	Overhead Aft Panel Right Panel	O17 R4	* Set ATVC (1/2/3/4) To OFF * Set Engine Interface Units - EIU (L-C / C-R / R-L) To OFF * Set MEC (1 & 2) To OFF * Set MPS/TVC ISOL VLV - (SYS 1, SYS 2, SYS 3) To CLOSE	Turn Off Main Engine Controllers
42	Mission Dep.	Right Panel Center Panel Front Left Panel	R4 C3 F6	* Set PROPELLANT FILL/DRAIN - LH2 OUTBD To GND * Check PROPELLANT FILL/DRAIN - LH2 INBD To OPEN * ORBITAL DAP/MANUAL MODE - ROTATION YAW, VERN=ON * Set FLIGHT CNTLR POWER To ON * Rotate The Shuttle To Zero Attitude (Pitch/Roll) (Joystick - RHC)	Set Liquid H2 Outboard Fill & Drain Valve To Ground Control Set Attitude Manually Enable Vernier RCS Enable Manual Control Of The RCS Align All ADI Needles
43	Mission Dep.	Right Panel Aft Right Panel	R4 A12	* Set HYDRAULICS - BRAKE HEATERS (A/B/C) To AUTO * Set APU HEATER - GAS GEN/FUEL PUMPS (1/2/3) To A AUTO * Set APU HEATER - LUBE OIL LINES (1/2/3) To A AUTO * Set TANK/FUEL LINE/H2O (SYS 1A, SYS 2A, SYS 3A) To AUTO * Set HYDRAULIC HEATER - RUDDER SPD BRK To A AUTO * Set HYDRAULIC HEATER - BODY FLAP To A AUTO * Set HYDRAULIC HEATER - ELEVON To A AUTO * Set HYDRAULIC HEATER - AFT FUSELAGE To A AUTO	Thermal Condition The Shuttle
44	Mission Dep.	Aft Left Panel	A14	*Set RCS/OMS HEATERS - FWD RCS To A AUTO * Set RCS/OMS HEATERS - LEFT POD To A AUTO * Set RCS/OMS HEATERS - RIGHT POD To A AUTO * Set RCS/OMS HEATERS - FWD RCS JET (1/2/3/4/5) To AUTO	Activate Various Heater Systems



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44	Mission Dep.	Aft Left Panel Left Panel	A14 A8L L1	* Set RCS/OMS HEATERS - AFT RCS JET (1/2/3/4/5) To AUTO * Set RCS/OMS HEATERS - OMS CRSFD LINES To A AUTO * Set PORT RMS HEATER To AUTO A * Set TOPPING EVAP HEATER - NOZZLE (L & R) To A AUTO * Set TOPPING EVAP HEATER - DUCT Selector To A/B * Set HI LOAD EVAP - HI LOAD DUCT HTR Selector To A/B	Activate Various Heater Systems
45	Mission Dep.	Left Panel Overhead Aft Panel	L2 L1 O14 O15 O16 O15	* Set O2 SYS 2 SUPPLY To CLOSE * Set N2 SYS 2 SUPPLY To CLOSE * Set N2 SYS 2 REG INLET To CLOSE * Set H2O LOOP 2 BYPASS - MODE To AUTO * Set H2O PUMP - LOOP 1 To OFF H2O PUMP - LOOP 2 To GPC * Set RGA 1 To OFF * Set RGA 2 & 4 To OFF * Set RGA 3 To OFF * Set ACCEL 3 To OFF * Set ACCEL 4 To OFF	
46	Mission Dep.	Overhead Left Panel Right Aft Panel Overhead Left Panel	O6 R11L O6	* Set GENERAL PURPOSE COMPUTER - MODE 5 To HALT * Check MAJ FUNC Set To GNC * Enter OPS 201 PRO (AFT Keypad) * Set MAJ FUNC To SM * Press GPC/CRT (AFT Keypad) * Enter 4 EXEC (AFT Keypad) * Enter OPS 201 PRO (AFT Keypad) * Set GENERAL PURPOSE COMPUTER - MODE 3 To HALT	Configure Computers For Orbit Switch To On-Orbit SW Mode Load GPC 1/2/3 With GNC SW GPC 3 Preserves Independent Source Data GPC 4 Contains System Management Data GPC 5 Retains The Backup Flight System
47	Mission Dep.	Left Panel	L1 L2	* Set RAD CONTROLLER - (LOOP 1 & LOOP 2) To AUTO A * Set RAD CONTROLLER - BYPASS MODE (1 & 2) To AUTO * Set FREON LOOP ISOLATION - MODE To AUTO	Activate Radiator Cooling
48	Mission Dep.	Right Aft Panel	R11L R13L	* Confirm MAJOR FUNC Is Set To SM * Enter OPS 202 PRO (AFT Keypad) * Enter ITEM 3 EXEC * Enter ITEM 1 EXEC * Set PL BAY DOOR (SYS 1 & SYS 2) To ENABLE * Set PL BAY DOOR To OPEN * Confirm PL BAY DOOR Talkbacks Show DEP	Open Payload Doors PL BAY DOOR SPEC Display Enable Auto Mode Enable AC Power Opening Both PL Doors Takes 3 Minutes Indicating Both PL Doors Are Open
49	Mission Dep.	Right Aft Panel	R13L	* Set PL BAY MECH PWR (SYS 1 & SYS 2) To ON * Set RADIATOR LATCH (SYS A & SYS B) To RELEASE * Check RADIATOR LATCH SYS Talkbacks Indicate REL * Set RADIATOR CONTROL (SYS A & SYS B) To DEPLOY * Check RADIATOR CONTROL SYS Talkbacks Indicate DEP	Deploy Radiators Indicating That The Radiators Are Ready For DEP. Deploying Both Radiators Takes 30 Seconds. Indicating Both Radiators Are Deployed.
50	Mission Dep.	Right Aft Panel	R13L R11L	* Set RADIATOR LATCH (SYS A & SYS B) To OFF * Set RADIATOR CONTROL (SYS A & SYS B) To OFF * Set PL BAY DOOR To STOP * Set PL BAY MECH PWR (SYS 1 & SYS 2) To OFF * Set PL BAY DOOR (SYS 1 & SYS 2) To DISABLE * Enter ITEM 2 EXEC (AFT Keypad)	Disable All Power To PL Doors And Radiators. Disable AC Power To The Doors
51	Mission Dep.	Right Aft Panel	R11U	* Set FUEL CELL - PURGE HEATER To GPC * Set H2O LINE HTR & H2O RELIEF HTR To A AUTO * Confirm PURGE VALVES (1/2/3) Are On GPC * Confirm STARTUP HEATER (1/2/3) Are Set To ENABLE * Set GPC PURGE SEQ To START - Press START For 3 Seconds * Confirm GPC PURGE SEQ START Talkback Is WHITE	Initiate Fuel Cell Purge
52	Mission Dep.	Right Aft Panel Left Panel	R11L L1	* Enter SPEC 69 PRO (AFT Keypad) * Enter SPEC 88 PRO (AFT Keypad) * Set FLASH EVAP CONTROLLER (PRI A & PRI B) To OFF * Set FLASH EVAP CONTROLLER - SEC To OFF * Set HILOAD EVAP To OFF	Check Purge Process On The SPEC Display Check Coolant Loops Secure The Flash Evaporator
53	Mission Dep.	Overhead Left Panel Right Aft Panel	O6 R11L	* Set STAR TRACKER POWER (-Y & -Z) To ON * Set DOOR CONTROL (SYS 1 & SYS 2) To OPEN * Check DOOR CONTROL (SYS 1 & SYS 2) Talkbacks Are OP * Set DOOR CONTROL (SYS 1 & SYS 2) To OFF * Set MAJ FUNC To GNC * Enter SPEC 22 PRO (AFT Keypad) * Enter ITEM 3 EXEC (AFT Keypad) * Enter ITEM 4 EXEC (AFT Keypad)	Deploy & Activate The Star Trackers Indicating The ST Doors Are Open
54	Mission Dep.	Right Aft Panel	R11L	* Check MAJ FUNC To GNC * Enter SPEC 21 PRO (AFT Keypad) * Enter ITEM 16 EXEC (AFT Keypad)	Initiate IMU Alignment
55	Mission Dep.	Overhead Center Panel	O7	* Set GPS 1 POWER To ON * Set GPS 1 PRE AMPL UPPER To ON * Set GPS 1 PRE AMPL LOWER To ON * Set GPS 2 POWER To ON * Set GPS 2 PRE AMPL UPPER To ON * Set GPS 2 PRE AMPL LOWER To ON * Set GPS 3 POWER To ON * Set GPS 3 PRE AMPL UPPER To ON * Set GPS 3 PRE AMPL LOWER To ON	Activate Global Positioning System (GPS) Activate GPS 1 Activate GPS 2 Activate GPS 3



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55	Mission Dep.	Right Aft Panel	R11L	* Set DUMP ISOL VLV To OPEN	
59	Mission Dep.	Right Aft Panel	R11L	* Check MAJ FUNC To GNC	Deploy KU Antenna Indicates Status For All THC/RHC (Joysticks). KU Antenna Deployment Takes 15 Seconds Indicates KU Antenna Is Deployed
			R11L	* Enter SPEC 25 PRO (AFT Keypad)	
			R13L	* Set KU ANTENNA To DEPLOY	
			R13L	* Check KU ANTENNA Talkback For DEP	
		Aft Right Panel	AIU	* Set KU ANTENNA To GND	Enable KU Antenna
		Right Aft Panel	AIU	* Set KU BAND POWER To STBY	
			R11L	* Check MAJ FUNC To GNC	
			R11L	* Enter SPEC 33 PRO (AFT Keypad)	
			R11L	* Enter ITEM 2 EXEC (AFT Keypad)	
60	Mission Dep.				Shuttle Is Configured & Ready For Mission

Commence On-Orbit Mission



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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	PANEL AREA & NOTES
1100	Mission Dep.				Ready For Mission Comm's (Next Event)
1101	Mission Dep.	Center Panel	C2	* Set MAJOR FUNC To GNC For CRT #2 * Enter OPS 202 PRO (Right Keypad) * Enter ITEM 3 EXEC (Right Keypad) * Enter ITEM 22 EXEC (Right Keypad) * Enter ITEM 27 EXEC (Right Keypad) * Enter ITEM 23 EXEC (Right Keypad) * Set OMS ENG (Right) To ARM/PRESS * Confirm R OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn	Perform NC-1 Burn Right Engine Burn
		Overhead Aft Panel Center Panel	C3 O16 C2		
1102	Mission Dep.	Center Panel	C3	* Set OMS ENG (Right) To OFF	NC-1 Burn Complete, Turn Off The Right OMS Engine. (Next Event)
1105	Mission Dep.	Aft Left Panel	A8L	* Set RMS POWER To PRIMARY * Set RMS SELECT To PORT * Set The PORT RMS DEPLOY To DEPLOY	Power Up & Deploy The RMS
1106	Mission Dep.	Aft Left Panel	A8L	* Set The PORT RMS DEPLOY To OFF * Set The PORT RMS Latch To RELEASE * Set The PORT RMS Latch To OFF * Hold The RMS SHOULDER BRACE RELEASE Toward PORT	RMS Deployed Wait Until Talkback Indicates REL Press Until Talkback Indicator Turns White
1107	Mission Dep.	Right Aft Panel Aft Left Panel	R11L A8U	* Set MAJ FUNC To SM * Enter SPEC 94 PRO (Aft Keypad) * Set MODE Rotary Switch To SINGLE * Press ENTER Just Below The MODE Rotary Switch * Set BRAKES Switch To OFF	Continue RMS Preparation
1108	Mission Dep.	Aft Left Panel	A8U	* Set The PARAMETER Rotary Switch To JOINT ANGLE * Set The JOINT Rotary Switch To SHOULDER/PITCH * Press & Hold The SINGLE DIRECT DRIVE In The + Position * Set The JOINT Rotary Switch To ELBOW * Press & Hold The SINGLE DIRECT DRIVE In The - Position * Set The MODE Rotary Switch To MANUAL ORB UNL * Press ENTER Just Below The MODE Rotary Switch	Move RMS Out Of Reach Limit Confirm Digital Readout Indicates +3 Degrees Confirm Digital Readout Indicates -3 Degrees
1109	Mission Dep.	Aft Right Panel	A6U	* Set FLT CNTLR POWER To ON	Gain Manual RMS RHC/THC Control
1110	Mission Dep.	Aft Left Panel Front Left Panel	A8L A8U F6	* Set RMS POWER To OFF * Set RMS BRAKES To ON * Set FLT CNTLR POWER To ON	Turn Off RMS Power For Later Use
1111	Mission Dep.				This Ends The Activation And Checkout Of The RMS. (Next Event)
1115	Mission Dep.	Center Panel	C2	* Set MAJOR FUNC To GNC For CRT #2 * Enter OPS 202 PRO (Right Keypad) - (If Required) * Enter ITEM 2 EXEC (Right Keypad) * Enter ITEM 22 EXEC (Right Keypad) * Enter ITEM 27 EXEC (Right Keypad) * Enter ITEM 23 EXEC (Right Keypad) * Set OMS ENG (Left) To ARM/PRESS * Confirm L OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn	Perform NC-2 Burn If Error On CRT #2 - Press Clear On Keypad Left Engine Burn
		Overhead Aft Panel Center Panel	C3 O14 C2		
1116	Mission Dep.	Center Panel	C3	* Set OMS ENG (Left) To OFF	NC-2 Burn Complete, Turn Off The Left OMS Engine. (Next Event)
1118	Mission Dep.	Aft Left Panel	A8L	* Set RMS POWER To PRIMARY * Set RMS SELECT To STBD * Set The STARBOARD RMS DEPLOY To DEPLOY * Set The STARBOARD RMS DEPLOY To OFF * Set RMS To PORT * Set RMS BRAKES To OFF * Set FLT CNTLR POWER To ON * Set END EFFECTOR MODE To AUTO	Begin Shuttle Inspection With The OBSS. Gain Manual Control Of The RMS.
		Aft Right Panel Aft Left Panel	A6U A8U		
1119	Mission Dep.	Aft Left Panel	A8L	* Use The RMS To Grapple The OBSS 	Grapple The OBSS <u>POSITION - P Y R</u> P: -090.0 Y: 000.0 R: 000.0 <u>POSITION - X Y Z</u> X: 0550 Y: 0099 Z: 0465 <u>JOINT ANGLE</u> YAW: -085.9 SHOULDER: 092.9 ELBOW: -131.1 WRIST PITCH: -051.4 WRIST YAW: 000.0 WRIST ROLL: 086.0
1120	Mission Dep.	Aft Left Panel	A8L	* Set RMS SELECT To STBD * Set The STARBOARD RMS Latch To RELEASE	Unlatch The OBSS



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1121	Mission Dep.	Aft Left Panel	A8L	* Set The STARBOARD RMS Latch To OFF * Set RMS SELECT To PORT	Disable Latches & Regain RMS Control.
1122	Mission Dep.	Aft Left Panel	A8L	* Use The RMS To Inspect The Shuttle's Tiles	The Far End On The OBSS Contains A Laser Dynamic Range Imager (LDRI), A Laser Camera system (LCS), And An Intensified Television Camera (ITVC). Move The OBSS End Below The Shuttle And Thoroughly Inspect The Underside For Damage To The Heat Shield.
1123	Mission Dep.	Aft Left Panel	A8L	* Use The RMS To Return The OBSS To Its Latched Position.	The Tile Inspection Takes A Lot Of Time. To Keep Things Simple, We Consider The Tile Inspection Complete. Return The OBSS Back To Its Latched Position. Use The Same Coordinates As COMM 1119
1124	Mission Dep.	Aft Left Panel	A8L	* Set RMS SELECT To STBD * Set The STARBOARD RMS Latch To LATCH	The OBSS Is In The Latch Position, Latch The OBSS.
1125	Mission Dep.	Aft Left Panel	A8L	* Set The STARBOARD RMS Latch To OFF * Set RMS SELECT To PORT	Set The Starboard RMS Latch To Off.
1126	Mission Dep.	Aft Left Panel	A8L	* Release The OBSS	Release The OBSS
1127	Mission Dep.	Aft Left Panel	A8L	* Stow The RMS	Return The RMS To Its Latched Position.
1128	Mission Dep.	Aft Left Panel Front Left Panel	A8L F6	* Set RMS POWER To OFF * Set RMS BRAKES To ON * Set FLT CNTLR POWER To ON	Heatshield Inspection Complete Next Event
1130	Mission Dep.	Center Panel Overhead Aft Panel Center Panel	C2 C3 O16 C2	* Set MAJOR FUNC To GNC For CRT #2 * Enter OPS 202 PRO (Right Keypad) * Enter ITEM 3 EXEC (Right Keypad) * Enter ITEM 22 EXEC (Right Keypad) * Enter ITEM 27 EXEC (Right Keypad) * Enter ITEM 23 EXEC (Right Keypad) * Set OMS ENG (Right) To ARM/PRESS * Confirm R OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn	Perform NC-3 Burn Right Engine Burn
1131	Mission Dep.	Center Panel Right Aft Panel	C3 R11L	* Set OMS ENG (Right) To OFF * Set MAJOR FUNC To GNC * Enter SPEC 22 PRO (Aft Keypad) * Enter ITEM 5 EXEC (Aft Keypad) * Enter ITEM 6 EXEC (Aft Keypad) * Enter ITEM 11+1 EXEC (Aft Keypad) * Enter ITEM 12+1 EXEC (Aft Keypad)	NC-3 Burn Complete, Turn Off The Right OMS Engine. Activate Star Tracker Target = International Space Station
1132	Mission Dep.	Right Aft Panel Aft Right Panel	R11L A6L	* Enter RESUME (Aft Keypad) * SYSTEM POWER (MN A & MN B) To ON * PSU POWER (MN A & MN B) To ON	Star Trackers Configured Power Up The APDS
1133	Mission Dep.	Aft Left Panel	A7L	* Set CONTROL PANEL POWER (A - B - C) To ON * Set HEATERS DCU POWER (H1 - H2/DCU - H3/DCU) To ON * Set APDS POWER (ABS - BDS - CDS) To ON	Activate APDS Power Panel
1134	Mission Dep.	Aft Left Panel	A7L	* APDS Control Commands Press POWER ON * APDS Control Commands Press APDS CIRC PROT OFF * APDS Control Commands Press RING OUT	Extend APDS Capture Ring
1135	Mission Dep.				Docking System Is Ready For Docking (Next Event)
1136	Mission Dep.	Center Panel Overhead Aft Panel Center Panel	C2 C3 O14 C2	* Set MAJOR FUNC To GNC For CRT #2 * Enter OPS 202 PRO (Right Keypad) - (If Required) * Enter ITEM 2 EXEC (Right Keypad) * Enter ITEM 22 EXEC (Right Keypad) * Enter ITEM 27 EXEC (Right Keypad) * Enter ITEM 23 EXEC (Right Keypad) * Set OMS ENG (Left) To ARM/PRESS * Confirm L OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn	Perform NC-2 Burn If Error On CRT #2 - Press Clear On Keypad Left Engine Burn
1137	Mission Dep.	Center Panel	C3	* Set OMS ENG (Left) To OFF	Final NC Burn Complete - Turn Off The Left OMS Engine
1138	Mission Dep.	Aft Right Panel Right Aft Panel	A1U R11L	* Set KU BAND POWER To ON * Set KU BAND Rotary Switch To AUTO TRACK * Enter SPEC 33 PRO (Aft Keypad) * Enter ITEM 1 EXEC (Aft Keypad)	Activate KU Band Radar
1141	Mission Dep.	Center Panel Front Left Panel Front Right Panel	C3 F6 F8	* Set ORBITAL DAP CONTROL To LVLH * Set ADI ATTITUDE INRTL To LVLH * Set ADI ATTITUDE INRTL To LVLH * Use RCS Thrusters To Position The Shuttle - (Zero LVLH)	Set DAP to LVLH Mode Roll, Pitch, Yaw Should All Be Zero
1142	Mission Dep.	Aft Right Panel	A6U	* Set ADI ATTITUDE INRTL To LVLH * Set FLT CNTLR POWER To ON * Set SENSE To -Z	Set AFT ADI Attitude To LVLH Enable AFT RCS Control Enable -Z SENSE Mode



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1142	Mission Dep.	Aft Left Panel	A2	* Use RCS Thrusters To Close On The ISS	The ISS Is Approximately 45,000 Feet Away. Use The RCS Thrusters To Translate The Shuttle Up/Down Until The Yellow Reticules Overlap The White Cross Hairs. Always Maintain The Following Attitude ROLL=0 PITCH=0 YAW=0 If You Are Impatient, Use Next Event
1150	Mission Dep.	Center Panel Aft Left Panel	C3 A2	* Set Orbital Dap Manual Mode Translation Y To Low Z * Use RCS Thrusters To Position On The ISS	Enable Low Z Thrusting The ISS Is In Visual Range. Bring The Shuttle Below Of, And About 600ft From ISS.
1151	Mission Dep.	Aft Left Panel	A2	* Use RCS Thrusters To Set The Closing Rate To Zero	Bring The Closing Rate (Range Rate) Between The Shuttle & The ISS To Zero.
1152	Mission Dep.	Front Left Panel	F6	* Use RCS Thrusters To Pitch The Shuttle Up To 180 Degrees	Slowly Pitch The Shuttle Up To 180 Degrees Pitch Angle. The Correct Attitude Roll ROLL=0 PITCH=180 YAW=0
1153	Mission Dep.	Front Left Panel	F6	* Use RCS Thrusters To Pitch The Shuttle Up To 0 Degrees	Continue To Pitch The Space Shuttle Up To Complete The 360 Degree Maneuver. Digital Images Will Be Taken By The ISS Crew. <u>Maneuver Shuttle To Correct Attitude</u> Target Attitude: Roll=0, Pitch=0, Yaw=0
1160	Mission Dep.	Aft Left Panel Aft Right Panel	A7U A6U	* Set VIDEO INPUT To PL 1 * Set VIDEO OUTPUT To MON 1 * Set PAYLOAD BAY FLOOD DOCKING To BRIGHT * Set FLT CNTLR POWER To ON * Set SENSE To -Z * Set MANUAL MODE TRANSLATION To Y (LOW Z)	Carefully Translate The Shuttle To The Front Of The Destiny Lab At A 90 Degree Pitch Up Angle & Dock With The PMA. Docking Will Be Fully Automatic Once The Shuttle's APDS Gets Close To Unity
1161	Mission Dep.				Contact, Active Damping Is Performed
1162	Mission Dep.				The Ring Aligned Command Is Issued & The Electromechanical Dampers Are Deactivated. An Automatic Ring In Command Activates The Fixers To Rigidize The System.
1163	Mission Dep.	Aft Left Panel Center Panel Aft Right Panel Front Left Panel	A7L C3 A6U F6	* APDS Control Commands Press POWER OFF * Set CONTROL PANEL POWER (A - B - C) To OFF * Set HEATERS DCU POWER (H1 - H2/DCU - H3/DCU) To OFF * Set APDS POWER (ABS - BDS - CDS) To OFF * Set ORBITAL DAP CONTROL To AUTO * Set FLT CNTLR POWER To OFF * Confirm FLT CNTLR POWER To OFF	Docking Complete, Disable The APDS Set DAP Mode To auto
1164	Mission Dep.				After ODS Preparation, The Hatches Are Opened & The ISS And Shuttle Crews Finally Meet. Next Event
1170	Mission Dep.				The ISS/RMS will Now Move In And Capture The Center OBSS Grapple Fixture.
1171	Mission Dep.	Aft Left Panel	A8L	* Set RMS POWER To PRIMARY * Set RMS SELECT To STBD * Set Starboard RMS Retention Latches To RELEASE	Unlatch The OBSS
1172	Mission Dep.	Aft Left Panel	A8L	* Set Starboard RMS Retention Latches To OFF * Set RMS SELECT To PORT	Power Down The Starboard RMS Latches & Select Port RMS Control.
1173	Mission Dep.				The SSRMS Will now Move The OBSS To The Handoff Ungrapple Position.
1175	Mission Dep.	Aft Left Panel Aft Right Panel	A8L A6U	* Set RMS POWER To PRIMARY * Set RMS BRAKES To OFF * Set FLT CNTLR POWER To ON	Gain Manual control Of The RMS Grapple The OBSS <u>POSITION - P Y R</u> P: -087.6 Y: -001.1 R: 090.8 <u>POSITION - X Y Z</u> X: 0879 Y: -0034 Z: 0674 <u>JOINT ANGLE</u> YAW: -012.0 SHOULDER: 071.9 ELBOW: -076.6 WRIST PITCH: -082.7 WRIST YAW: -000.6 WRIST ROLL: -078.7
1176	Mission Dep.				The SSRMS Will Now Release The OBSS And Move To A Safe Distance From The OBSS Boom.



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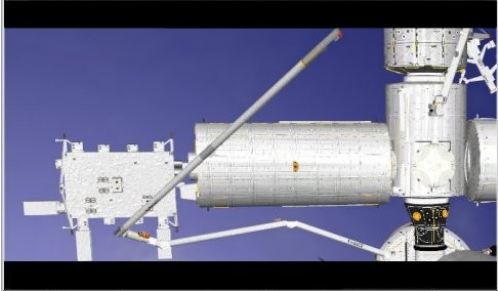
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1177	Mission Dep.	Aft Left Panel	A8L	* Use The Shuttle RMS To Position The OBSS 	Move The OBSS To The MPLM Transfer Survey Position. <u>POSITION - P Y R</u> P: 037.8 Y: 054.5 R: 087.7 <u>POSITION - X Y Z</u> X: 0820 Y: -0605 Z: 0548 <u>JOINT ANGLE</u> YAW: 060.1 SHOULDER: 019.7 ELBOW: -024.2 WRIST PITCH: 025.3 WRIST YAW: 000.4 WRIST ROLL: -055.5
1178	Mission Dep.				Transfer The LEONARDO Multi Purpose Logistics Module (MPLM) To The ISS.
1180	Mission Dep.				Next Event The International Space Station Crew Will Use The SSRMS To Grapple LEONARDO In The Shuttle Bay.
1181	Mission Dep.	Center Panel Aft Right Panel	C3 A6U	* PAYLOAD SAFING Switches (1-2-3-4-5) To NORM * PAYLOAD RETENTION LOGIC POWER (SYS 1) To ON * PAYLOAD SELECT Rotary Switch To 2 * PAYLOAD RETENSION LATCHES (1-2-3-4-5) To RELEASE	Release The LEONARDO Module From The Payload Bay.
1182	Mission Dep.	Aft Right Panel	A6U	* PAYLOAD RETENSION LATCHES (1-2-3-4-5) To OFF * PAYLOAD RETENTION LOGIC POWER (SYS 1) To OFF	Set All Retention Latches To Off.
1183	Mission Dep.				LEONARDO Will Now Be Installed On The ISS.
1184	Mission Dep.				LEONARDO Is Installed. While Attached , Equipment Will Be Transferred To And From ISS. Next Event
1190	Mission Dep.			* EV1	EV1 Emerges From The ISS QUEST Airlock. The First Task Will Be To Remove An Almost Depleted Ammonia Tank Assembly On The First Port Segment Of The Stations Truss. Move EV1 To The Ammonia Tank Using The Handholds On The Truss Segments.
1191	Mission Dep.			* EV3	EV3 Emerges From The Airlock. Move EV3 To The Ammonia Tank To Assist With The Removal.
1192	Mission Dep.			* EV1 & EV3	It Will Take About An Hour And A Half To Remove The Ammonia Tank.
1193	Mission Dep.			* EV1 & EV3	The ISS RMS Will Now Move To The EVA Worksite
1194	Mission Dep.			* EV1 & EV3	The Ammonia Tank Will Be Positioned And Grappled By The SSRMS, An Adjustable Foot Restraint Will Also Be Attached To The Arm. This Will Take About 30 Minutes.
1195	Mission Dep.			* EV1 & EV3	While EV3 Completes The Ammonia Tank Attachment To The SSRMS, Move EV1 To The EuTEF Equipment Mounted On The Columbia Module.
1196	Mission Dep.			* EV1 & EV3	While EV1 Unmounts The EuTEF Equipment, EV3 Is Moved In To Lift It Away.
1197	Mission Dep.			* EV1 & EV3	The Release And Handover Of The EuTEF Will Take About 45 Minutes.
1198	Mission Dep.			* EV1 & EV3	EV3 Is Moved To The Lightweight Carrier In The Shuttle Payload Bay. Move EV1 To The Lightweight Carrier In The Shuttle Payload Bay To Assist EV3 With The Stowage Of The EuTEF.
1199	Mission Dep.			* EV1 & EV3	It Will Take About Thirty Minutes To Mount The EuTEF On The Nadir Side Of The Lightweight Carrier.
1200	Mission Dep.			* EV1 & EV3	While EV3 Dismounts From The SSRMS, EV1 Moves To The Columbus Module Where Two Experiment Boxes (MISSE) Are Removed. Move EV1 To The Columbus Module.
1201	Mission Dep.			* EV1 & EV3	Move EV3 To The Columbus Module To Assist EV1 With Removal.



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1202	Mission Dep.			* EV1 & EV3	It Will Take About 25 Minutes For EV1 And EV2 To Remove And Close The Two MISSE Experiment Boxes.
1203	Mission Dep.			* EV1 & EV3	Move EV1 To The Port Side Of The Shuttle Payload Bay, Below The Shuttle RMS Elbow Latch. This Is Where The MISSE Boxes Will Be Stored.
1204	Mission Dep.			* EV1 & EV3	Move EV3 To The Shuttle Payload Bay , EV1 Needs To Be Positioned Slightly Forward Of The First MISSE Box.
1205	Mission Dep.			* EV1 & EV3	It Will Take About 10 Minutes To Stow The MISSE Boxes.
1206	Mission Dep.			* EV1 & EV3	Move EV1 To The ISS QUEST Airlock For Ingress.
1207	Mission Dep.			* EV3	Move EV3 To The ISS QUEST Airlock For Ingress.
1208	Mission Dep.				This Concludes The First Spacewalk. Next Event
1210	Mission Dep.			* EV1	The Second Task Will Be To Complete The Ammonia Tank Exchange. EV1 Emerges From The ISS QUEST Airlock. Move EV1 To The New Ammonia Tank On The Lightweight Carrier In The Shuttle Payload Bay.
1211	Mission Dep.			* EV1 & EV2	While EV1 Removes Insulation From The New Ammonia Tank, EV2 Emerges From The ISS QUEST Airlock. Move EV2 To The SSRMS For Mounting.
1212	Mission Dep.			* EV1 & EV2	It Will Take About 40 Minutes For EV1 And EV2 To Remove The New Ammonia Tank From The Lightweight Carrier.
1213	Mission Dep.			* EV1 & EV2	The SSRMS Will Be Used To Move EV2 And The New Ammonia Tank To The Installation Point.
1214	Mission Dep.			* EV1 & EV2	EV1 Will Assist EV2 With The Installation Of The Ammonia Tank. Move EV1 To EV2 To Assist With The Installation Of The Ammonia Tank.
1215	Mission Dep.			* EV1 & EV2	Installation Of The New Tank And Hand Over Of The Old Will Tank About One And A Half Hours.
1216	Mission Dep.			* EV1 & EV2	EV2 Is Now Moved To The Shuttle Payload Bay Carrying The Old Ammonia Tank. It Will Be Stowed To The Lightweight Carrier.
1217	Mission Dep.			* EV1 & EV2	Move EV1 To The Lightweight Carrier Located In The Shuttle Payload Bay. EV1 Will Assist EV2 With The Stowing Of The Old Ammonia Tank.
1218	Mission Dep.			* EV1 & EV2	EV1 & EV2 Will Mount The Old Ammonia Tank To The Lightweight Carrier. This Task Will Take About An Hour And A Half.
1219	Mission Dep.			* EV1 & EV2	While EV2 Dismounts The SSRMS, Move EV1 To The ISS QUEST Airlock For Ingress.
1220	Mission Dep.			* EV2	Move EV2 To The ISS QUEST Airlock For Ingress.
1221	Mission Dep.				This Concludes The Second Spacewalk. Next Event
1230	Mission Dep.			* EV1	The First Task Of The Final Spacewalk Will Be To Finish The Job Started By STS-127. EV1 Emerges From The ISS QUEST Airlock, Now Move EV1 To The Payload Attachment System (Aft Of Starboard S3 Truss), Near The Alpha-Rotary Joint.
1231	Mission Dep.			* EV1 & EV2	EV2 Emerges From The ISS QUEST Airlock, Now Move EV1 To The Payload Attachment System (Aft Of Starboard S3 Truss), Near The Alpha-Rotary Joint To Assist EV1.
1232	Mission Dep.			* EV1 & EV2	Payload Attachment System Deployment Takes About One Hour And Forty Minutes.
1233	Mission Dep.			* EV1 & EV2	The Next Task Will Be To Replace The Rate Gyro Assembly (RGA). Move EV1 To The Aft



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1233	Mission Dep.			* EV1 & EV2	Side Of The S0 Truss Segment, Right Off The Starboard Side Of The Z1 Truss.
1234	Mission Dep.			* EV1 & EV2	Move EV2 To The S0 Truss Segment To Assist In The RGA2 Swap.
1235	Mission Dep.			* EV1 & EV2	Gyro Assembly Replacement Will Take About An Hour.
1236	Mission Dep.			* EV1 & EV2	Now Move EV1 To The Pressurized Mating Adaptor (PMA) 3 On The Unity Module.
1237	Mission Dep.			* EV1 & EV2	EV1 Sets Up Heater Cables That Will Be Used To Keep The PMA 3 Berthing Port Between UNITY And The Coming TRANQUILITY Node Warm So It Can Be Pressurized. Move EV2 To The Aft Central Part Of The S0 Truss To Replace A Remote Power Control Module (RPCM).
1238	Mission Dep.			* EV1 & EV2	It Will Take About 45 Minutes For EV1 And EV2 To Complete Their Tasks.
1239	Mission Dep.			* EV1 & EV2	Now Move EV1 Further Outboard On The S1 Truss Segment Where Two GPS Antennas Are To Be Connected.
1240	Mission Dep.			* EV1 & EV2	After Finishing The Heater Cable Routing On The PMA3, Move EV1 Down To The S0 Truss, On The Port Side Of The Z1 Truss To Finish The TRANQUILITY Node Avionics Cable Routing.
1241	Mission Dep.			* EV1 & EV2	It Will Take About 30 Minutes For EV1 To Complete The Task.
1242	Mission Dep.			* EV1 & EV2	The Final Task For EV1 Is To Remove A Side Wire On The UNITY Node. Move EV1 To The Upper Part Of The Unity Node, Between The Z1 Truss And PMA-1.
1243	Mission Dep.			* EV1 & EV2	EV2 Has Completed The GPS Installation. The Final Task For EV2 Will Be To Install A Lens Cover On A Camera & Light Assembly On The SSRMS Arm. Move EV2 To The SSRMS End Effector.
1244	Mission Dep.			* EV1 & EV2	It Will Take About 20 Minutes For EV1 And EV2 To Complete Their Tasks.
1245	Mission Dep.			* EV1 & EV2	Move EV1 To The ISS QUEST Airlock For Ingress.
1246	Mission Dep.			* EV2	Move EV2 To The ISS QUEST Airlock For Ingress.
1247	Mission Dep.				This Concludes The Final Spacewalk. The SSRMS Will Move LEONARDO Back Into The Shuttle Bay.
1250	Mission Dep.				The SSRMS Will Now Grapple LEONARDO.
1251	Mission Dep.	Aft Right Panel	A6U	* PAYLOAD RETENTION LOGIC POWER (SYS 1) To ON * PAYLOAD SELECT Rotary Switch To 2 * PAYLOAD RETENSION LATCHES (1-2-3-4-5) To RELEASE	Prepare The Shuttle Payload Bay For The Berthing Of LEONARDO
1252	Mission Dep.				The SSRMS Will Place LEONARDO At The Berthing Position In The Shuttle Payload Bay.
1253	Mission Dep.	Aft Right Panel	A6U	* PAYLOAD RETENSION LATCHES (1-2-3-4-5) To LAT	Latch LEONARDO
1254	Mission Dep.	Aft Right Panel	A6U	* PAYLOAD RETENSION LATCHES (1-2-3-4-5) To OFF * PAYLOAD RETENTION LOGIC POWER (SYS 1) To OFF	Deactivate And Power Down The Payload Latches.
1255	Mission Dep.				The SSRMS Is Now Moved Away From The Shuttle.
1257	Mission Dep.				Now Move The OBSS To The Undock Survey Position With The Shuttle RMS. End Effector Position Should Be As Follows X=883 Y=-306 Z=694 Pitch=-090 Yaw=000 Roll=090 Follow The Diagram On The Next Page



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1257	Mission Dep.	Aft Left Panel	A8L	<p>* Use The Shuttle RMS To Position The OBSS</p> 	<p>Now Move The OBSS To The Undock Survey Position.</p> <p><u>POSITION - P Y R</u> P: -090.2 Y: 000.2 R: 090.0</p> <p><u>POSITION - X Y Z</u> X: 0859 Y: -0292 Z: 0792</p> <p><u>JOINT ANGLE</u> YAW: 029.6 SHOULDER: 058.6 ELBOW: -032.1 WRIST PITCH: -116.8 WRIST YAW: 000.0 WRIST ROLL: -119.6</p>
1258	Mission Dep.	Aft Left Panel Aft Right Panel	A8L A8U A6U	<p>* Set RMS POWER To OFF * Set RMS BRAKES To ON * Set FLT CNTLR POWER To ON * Set SENSE To -Z</p>	Secure The RMS Arm And Enable Aft RCS Control
1259	Mission Dep.				That completes The Docking Part Of STS-128 Next Event
1260	Mission Dep.				ISS And The Shuttle Will Be Put In LVLH Mode When The ISS Is Perpendicular To The Earth's Surface.
1261	Mission Dep.	Center Panel Aft Right Panel Aft Left Panel	C3 A6L A7L	<p>* ORBITAL DAP CONTROL To LVLH * VESTIBULE DEPRESS VALVE (SYS 1) VENT ISOL To OPEN * VESTIBULE DEPRESS VALVE (SYS 2) VENT ISOL To OPEN * VESTIBULE DEPRESS VALVE (SYS 1) VENT To OPEN * VESTIBULE DEPRESS VALVE (SYS 2) VENT To OPEN * Set CONTROL PANEL POWER (A - B - C) To ON * Set HEATERS CDU POWER (H1 - H2/DCU - H3/DCU) To ON * Set APDS POWER (ABS - BDS - CDS) To ON * APDS Control Commands Press POWER ON * APDS Control Commands Press APDS CIRC PROT OFF</p>	Set DAP To LVLH After Closure Of All Hatches, The Docking Vestibule Is Depressurized.
1262	Mission Dep.	Aft Left Panel	A7L	* APDS STATUS Press UNDOCK COMPLETE (Lower Left)	Initiate Undock Sequence
1263	Mission Dep.	Aft Left Panel Aft Right Panel	A7L A6L	<p>* APDS Control Commands Press POWER OFF * Set CONTROL PANEL POWER (A - B - C) = OFF * Set HEATERS CDU POWER (H1 - H2/DCU - H3/DCU) = OFF * Set APDS POWER (ABS - BDS - CDS) = OFF * Docking System Power System Power (MN A & MN B) = OFF * Docking System Power PSU Power (MN A & MN B) = OFF</p>	Secure APDS
1264	Mission Dep.	Front Left Panel	F6	* Use RCS Thrusters To Perform Fly Around Maneuver	Perform A Fly Around Maneuver At 400 Ft. The Shuttle Should End Up Below The ISS With The Payload Bay Facing The ISS. <u>See ISS Approach & Undocking.pdf For Additional In-Depth Documentation</u>
1265	Mission Dep.	Center Panel Overhead Aft Panel Center Panel	C2 C3 O16 C2	<p>* Enter ITEM 3 EXEC (Right Keypad) * Enter ITEM 22 EXEC (Right Keypad) * Enter ITEM 27 EXEC (Right Keypad) * Enter ITEM 23 EXEC (Right Keypad) * Set OMS ENG (Right) To ARM/PRESS * Confirm R OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn</p>	Perform An OMS Separation Burn Using The Right OMS Engine.
1266	Mission Dep.	Center Panel	C3	* Set OMS ENG (Right) To OFF	Burn Complete - Disable Right OMS Engine
1267	Mission Dep.	Center Panel Front Left Panel Front Right Panel Aft Right Panel	C3 F6 F8 A6U	<p>* Set ORBITAL DAP CONTROL To AUTO * Set MANUAL MODE TRANSLATION Y Low Z To OFF * Set FLT CNTLR POWER To ON * Set ADI ATTITUDE To INRTL * Set ADI ATTITUDE To INRTL * Set ADI ATTITUDE To INRTL</p>	Set DPS Mode To AUTO And Enable Normal Z RCS Thrusts. <u>IF REQUIRED</u> Rotate The Shuttle To The On-Orbit Attitude ROLL=0 PITCH=0 YAW=0
1268	Mission Dep.	Aft Left Panel Aft Right Panel	A8L A8U A6U	<p>* Set RMS POWER To PRIMARY * Set RMS BRAKES To OFF * Set FLT CNTLR POWER To ON</p>	A Final Heat Shield Inspection Is Performed Using The OBSS. Gain Manual Control Of The RMS.
1269	Mission Dep.	Aft Left Panel	A8L	<p>* Use The RMS To Return The OBSS To Its Latched Position.</p> <p><u>Note: Use COMM 1119 For Correct Coordinates</u></p>	The Tile Inspection Takes A Lot Of Time. To Keep Things Simple, We Consider The Tile Inspection Complete. Return The OBSS Back To Its Latched Position.
1270	Mission Dep.	Aft Left Panel	A8L	<p>* Set RMS SELECT To STBD * Set The STARBOARD RMS Latch To LATCH</p>	The OBSS Is In The Latch Position, Latch The OBSS.



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1271	Mission Dep.	Aft Left Panel	A8L A8U	* Set The STARBOARD RMS Latch To OFF * Set RMS SELECT To PORT * Confirm END EFFECTOR MODE Is Set To AUTO * Release The OBSS	Set The Starboard RMS Latch To Off. Release The OBSS
1272	Mission Dep.	Aft Left Panel	A8L	* Stow The RMS	Return The RMS To Its Latched Position.
1273	Mission Dep.	Aft Left Panel Front Left Panel	A8L F6	* Set RMS POWER To OFF * Set RMS BRAKES To ON * Set FLT CNTLR POWER To ON	Secure The RMS And Enable Forward RCS Control.
1174	Mission Dep.				That Completes STS-128 On-Orbit Mission. Next Event

Commence Deorbit & Landing



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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	NOTES
1000	Mission Dep.	Left Panel	L1	* Set RAD CONTROLLER - OUT TEMP To HIGH * Set RAD CONTROLLER (LOOP 1 & LOOP 2) To OFF * Set RAD CONTROLLER - BYPASS MODE (1 & 2) To MAN * Confirm RAD FLOW BYPASS VALVE Talkbacks Display (BYP) * Confirm The HI LOAD EVAP ENABLE Is Set To OFF * Set FLASH EVAP CONTROLLER (PRI A & PRI B) To ON * Set FLASH EVAP CONTROLLER - SEC GPC To ON	Trap Cold Freon In The Bay Radiators If The Rad Bypass Valve Talkbacks Do Not Display (BYP), Set The Manual Rad Flow Bypass Switches 1 & 2 To Bypass.
1001	Mission Dep.	Right Aft Panel Aft Right Panel Right Aft Panel	R11L A1U R13L R11L	* Set The MAJ FUNC Switch To GNC * Enter SPEC 33 PRO (AFT Keypad) * Enter ITEM 2 EXEC (AFT Keypad) * Enter ITEM 1 EXEC (AFT Keypad) * Set KU BAND POWER To OFF * Set KU Antenna To STOW * When KU Antenna Talkback Shows STO, Set KU Antenna To GND * Enter SPEC 22 PRO (Aft Keypad) * Enter ITEM 9 EXEC (Aft Keypad) * Enter ITEM 10 EXEC (Aft Keypad)	Deactivate & Stow The KU Antenna NOTE: Rendezvous Navigation Has Been Used It Must Be Disabled. Confirm On CRT 4 There Are No Asterisks Besides The Following Entries. RNDZ NAV ENA 1 KU ANT ENA 2
1002	Mission Dep.	Right Aft Panel	R13L	* Set PL BAY MECH PWR (SYS 1 & SYS 2) To ON * Set RADIATOR CONTROL (SYS A & SYS B) To STOW * Set LATCH CONTROL (SYS A & SYS B) To LATCH * Set LATCH CONTROL (SYS A & SYS B) To OFF * Set RADIATOR CONTROL (SYS A & SYS B) To OFF * Set PL BAY MECH PWR (SYS 1 & SYS 2) To OFF	Stow The Radiators Wait Until The RADIATOR CONTROL Talkbacks Show STO Before Setting The LATCH CONTROLS SYS 1 & SYS 2 To LATCH. Wait Until Latch Control Talkbacks Show LAT Before Turning Off ALL Radiators.
1003	Mission Dep.	Overhead Left Panel Center Panel Right Panel	O6 C3 R2	* Set GENERAL PURPOSE COMPUTER - MODE 5 To STBY * Set The BFC/CRT - Display To ON * Confirm The BFC/CRT SELECT Is Set To (3+1) * Confirm BOILER CNTLR/HTR Switches (1/2/3) Are ON * Set HYD CIRC PUMP Switches (1/2/3) To OFF	Activate Backup Flight System
1004	Mission Dep.	Overhead Aft Panel Right Aft Panel	O14 O15 O16 O15 R11L	* Set RGA 1 To ON * Set RGA (2 & 4) To ON * Set RGA 3 To ON * Set ACCEL 3 To ON * Set ACCEL 4 To ON * Set SUPPLY H2O - Crossover Valve To OPEN	Gyro Assemblies & Accelerators
1090	Mission Dep.	Aft Left Panel	A8L	* Set RMS POWER To PRIMARY * Set RMS SELECT To STBD * Set STARBOARD RMS (DEPLOY/OFF/STOW) To STOW * Set STARBOARD RMS (DEPLOY/OFF/STOW) To OFF	Stow The OBSS Boom Wait Until Talkbacks Indicate (STO)
1091	Mission Dep.	Aft Left Panel Aft Right Panel	A8L A6U A8U	* Set RMS POWER To PRIMARY * Set RMS SELECT To PORT * Set FLT CNTLR POWER To ON * Set RMS BRAKES To OFF * Set The MODE Rotary Selector To SINGLE * Press ENTER Just Below The MODE Rotary Selector * Set The PARAMETER Rotary Selector To JOINT ANGLE * Set The JOINT Rotary Selector As Required * Depress The SINGLE/DIRECT DRIVE (+/-) Spring Switch	Stow The RMS Return All Joint Angles To Their Stowed Position. By Returning All Joint Angles To Zero, You Will Eventually Reach The RMS Latch Position.
1092	Mission Dep.	Aft Left Panel Front Left Panel	A8L F6	* Port RMS Retention Latches Ready For Latch Talkbacks (White) * Set PORT RMS (RELEASE/OFF/LATCH) To LATCH * Set PORT RMS (RELEASE/OFF/LATCH) To OFF * Set PORT RMS (DEPLOY/OFF/STOW) To STOW * Set PORT RMS (DEPLOY/OFF/STOW) To OFF * Set RMS POWER To OFF * Set FLT CNTLR POWER To ON	Latch The RMS Wait Until Talkbacks Indicate (LAT) Wait Until Talkbacks Indicate (STO)
1093	Mission Dep.	Aft Left Panel	A7U	* Set All PAYLOAD BAY FLOOD Lights To OFF	Turn Off All Payload Bay Flood Lights
1006	Mission Dep.	Right Aft Panel	R11L R13L R11L	* Set MAJ FUNC Switch To SM * If Required, Enter OPS 202 PRO (AFT Keypad) * Enter ITEM 1 EXEC (AFT Keypad) * If Not Already Enabled, Enter ITEM 3 EXEC (AFT Keypad) * Set PL BAY DOOR (SYS 1 & SYS 2) To ENABLE * Set PL BAY DOOR To CLOSE * Set PL BAY DOOR To STOP * Set PL BAY DOOR (SYS 1 & SYS 2) To DISABLE * Enter ITEM 2 EXEC (AFT Keypad)	Close Payload Bay Doors Wait Until The PL BAY DOOR Talkback Shows CL.
1008	Mission Dep.	Right Aft Panel Overhead Left Panel Right Aft Panel	R11L O6 R11L	* Set MAJ FUNC To GNC * Press GPC/CRT (AFT Keypad) * Enter 4 EXEC (AFT Keypad) * Enter OPS 201 PRO (AFT Keypad) * Set GENERAL PURPOSE COMPUTER - MODE 3 To RUN * Enter OPS 301 PRO (AFT Keypad)	Reconfigure GNC's For Deorbit
1009	Mission Dep.	Overhead Left Panel	O6	* STAR TRACKER DOOR CONTROL (SYS 1 & SYS 2) To CLOSE * STAR TRACKER DOOR CONTROL (SYS 1 & SYS 2) To OFF * Set The STAR TRACKER POWER Switches (-Y & -Z) To OFF	Close Star Tracker Doors Wait Until STAR TRACKER DOOR POSITION Talkback Shows CL.
1010	Mission Dep.	Right Panel	R4	* Check HYDRAULICS BRAKE HEATER (A/B/C) Set To AUTO	Final Switch Configuration Check



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1010	Mission Dep.	Overhead Aft Panel Center Panel Left Panel Aft Right Panel	O15 O14 O16 C3 L2 L1 L2 A12	* Set BRAKES MN B To ON * Set BRAKES MN A To ON * Set BRAKES MN C To ON * ORBITAL DAP / MANUAL MODE / ROTATION - ROLL To PRI * Check ORBITAL DAP / CONTROL To AUTO * Confirm ANTI SKID - Set To ON * Confirm NOSE WHEEL STEERING - Set To 1 * Confirm ENTRY MODE - Set To AUTO * Set FLASH EVAP CONTROLLER (PRI A & PRI B) To GPC * Set FLASH EVAP CONTROLLER SEC To GPC * FREON LOOP ISOLATION - MODE To OFF * Set O2 SYS 2 SUPPLY To OPEN * Set N2 SYS 2 SUPPLY To OPEN * Set N2 SYS 2 REG INLET To OPEN * Set O2/N2 CNTLR VLV SYS 1 To OPEN * Set APU HEATER - GAS GEN/FUEL PUMP (1/2/3) To OFF * Set APU HEATER - LUBE OIL LINE (1/2/3) To OFF * Set All TANK/FUEL LINE/H2O SYS Switches To OFF * HYDRAULIC HEATER - RUDDER SPD BRK (A & B) To OFF * HYDRAULIC HEATER - BODY FLAP (A & B) To OFF * HYDRAULIC HEATER - ELEVON (A & B) To OFF * HYDRAULIC HEATER - AFT FUSELAGE (A & B) To OFF	Final Switch Configuration Check
1012	Mission Dep.	Right Panel	R2	* Set He ISOLATION A LEFT/CENTER/RIGHT To OPEN * Set He ISOLATION B LEFT/CENTER/RIGHT To OPEN * Set PNEUMATICS L ENG He XOVR To OPEN * Set PNEUMATICS He ISOL To OPEN * Set LEFT He INTERCONNECT To - IN OPEN * Set CENTER & RIGHT INTERCONNECT To - OUT OPEN	Main Propulsion System / Helium Release
1013	Mission Dep.	Right Aft Panel	R11L	* Confirm MAJ FUNC Set To GNC * Enter SPEC 21 PRO (AFT Keypad) * Enter ITEM 16 EXEC	Final IMU Alignment
1014	Mission Dep.	Center Panel Right Panel Center Panel	C2 R2 C2	* Enter ITEM 34 EXEC (Right Keypad) * Set BOILER N2 SUPPLY (1/2/3) To ON * Set BOILER PWR (1/2/3) To ON * Set APU FUEL TK VLV (1/2/3) To OPEN * Set APU CNTLR PWR (1/2/3) To ON * Set APU AUTO SHUT DOWN (1/2/3) Set To INHIBIT * Confirm HYD MAIN PUMP PRESS (1/2/3) Set To LOW * Confirm APU SPEED SELECT Set To NORM * Confirm APU/HYD Ready To Start Talkbacks Are WHITE * Confirm GIMBAL CK 34 On CRT 2 Is Complete (No Asterisk) * Enter OPS 302 PRO (Right Keypad)	Perform OMS Gimbal If there's an asterisk next to GMBL CK 34 It means the gimbal check is incomplete. You must wait for the asterisk to Disappear.
1015	Mission Dep.	Center Panel	C2	* Confirm (CRT 1, CRT 3, CRT 2) Are Set To MAJ FUNC GNC * Enter SPEC 50 PRO (Left Keypad) * Enter SPEC 51 PRO (Right Keypad) * Enter ITEM 44 EXEC (Right Keypad)	Horizontal Situation & Override Displays
1016	Mission Dep.	Center Panel Right Panel	C2 R2	* Press RESUME (Right Keypad) * Set APU OPERATE - START/RUN For APU 1	
1017	Mission Dep.	Center Panel Overhead Aft Center Panel	F7 C2 O14 O16 C3 C2	* Check CRT 1 Confirm Display Of OPS MODE 3021 * ITEM 22 EXEC (Right Keypad) * ITEM 27 EXEC (Right Keypad) * ITEM 23 EXEC (Right Keypad) * Confirm L OMS ENG VLV Is ON * Confirm R OMS ENG VLV Is ON * Set OMS ENG (LEFT & RIGHT) To ARM/PRESS * Press EXEC - (Right Keypad) Confirms ready for OMS burn	Perform Deorbit Burn
1018	Mission Dep.	Center Panel Overhead Aft Panel	C3 O14 O16	* Set OMS ENG (LEFT & RIGHT) To OFF * Set L OMS ENG VLV To OFF * Set R OMS ENG VLV To OFF	Deorbit Burn Complete
1020	Mission Dep.	Center Panel Front Left Panel	C2 F6	* Enter OPS 303 PRO (Right Keypad) * Position The Shuttle To The Correct Attitude	<u>Correct Attitude Hint</u> Align All ADI Needles
1022	Mission Dep.	Center Panel Right Panel Overhead Aft Panel Right Panel Center Panel	C2 R2 O17 R1 C2	* Enter ITEM 36 EXEC (Right Keypad) * Enter ITEM 37 EXEC (Right Keypad) * Set APU OPERATE - START/RUN For APU (2 & 3) * Set HYD MAIN PUMP PRESS (1/2/3) To NORM * Set ATVC - (1/2/3/4) To ON * Set AC BUS SNSR (1/2/3) To MONITOR * Enter ITEM 39 EXEC (Right Keypad)	Dump RCS Propellant Pressure Should Rise To 3000 psi
1023	Mission Dep.	Center Panel Overhead Right Panel Center Panel	C2 O8 C2	* Enter ITEM 38 EXEC (Right Keypad) * Enter ITEM 40 EXEC (Right Keypad) * Set FWD RCS - He PRESS (A & B) To CLOSE * Set TANK ISOLATION (1/2 & 3/4/5) To CLOSE * Set MANIFOLD ISOLATION (1/2/3/4/5) To CLOSE * Enter OPS 304 PRO (Right Keypad)	Wait Until The Cycle Completes



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1024	Mission Dep.	Front Left Panel Front Right Panel	F6 F8	* Set Commander ATTITUDE INRTL To LVLH * Set Pilot ATTITUDE INRTL To LVLH	
1025	Mission Dep.	Front Right Panel	F4	* Check PITCH & ROLL/YAW Set To AUTO	
1026	Mission Dep.				The Shuttle Will Perform Roll Reversals
1027	Mission Dep.	Left Panel	L1	* Set RAD CONTROLLER - OUT TEMP To NORM * Set RAD CONTROLLER (LOOP 1 & LOOP 2) To AUTO A * Set RAD CONTROLLER - BYPASS MODE (1 & 2) To AUTO	
1080	Mission Dep.	Right Panel Left Panel	R4 L1	* Set MPS/TVC/ISOL/VLV (SYS1, SYS2, SYS3) To OPEN * Set NH3 BOILER - NH3 CONTROLLER (A & B) To PRI/GPC	Hydraulics / Brake Heater
1028	Mission Dep.	Center Panel Front Left Panel Front Right Panel Overhead Right Panel	C3 F6 F8 O8	* Set AIR DATA PROBE (Left & Right) To DEPLOY HEAT * Set AIR DATA To LEFT * Set AIR DATA To RIGHT * Set RADAR ALTIMETERS (1 & 2) To ON	Deploy Air Data Probes
1029	Mission Dep.	Front Left Panel Front Right Panel Front Left Panel	F3 F3 F2	* Set HUD POWER To ON (Commander) * Set HUD POWER To ON (Pilot) * Set PITCH & ROLL/YAW To CSS (Commander)	Commander & Pilot HUD Power
1031	Mission Dep.	Overhead Right Panel	O8	* Set MLS (1/2/3) Switches To ON * Set MLS Thumbwheel To (111)	Auto Software Transition To OPS 305 Microwave Scan Beam Landing System
1033	Mission Dep.	HUD Display Window		* Press LANDING GEAR ARM (Twice)	Arm The Landing Gear
1034	Mission Dep.	HUD Display Window		* Press LANDING GEAR DOWN (Twice)	Deploy Landing Gear
1035	Mission Dep.	HUD Display Window		* Press SHUTE ARM (Twice) * Press DEPLOY SHUTE (Twice) * Press CHUTE JETT (Twice)	Touchdown: Gently Push The Nose Down Until The Nose Wheel Touches The Runway. Use The Rudder To Steer. Apply Wheel Brakes.
1036	Mission Dep.	HUD Display Window		* Press CHUTE JETT (Twice)	Release Brake Shute
1037	Mission Dep.				End Of Mission

Commence Shutdown



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	Mission Dep.	Left Panel Right Panel Front Left Panel Front Right Panel Front Left Panel Front Right Panel	L2 R2 R1 F6 F8 F3 F3	* SPD BK - MAN (Full FWD) * NWS - OFF * APU Auto Shutdown (1/2/3) - ENABLE * APU Speed Select (1/2/3) - NORM * AC BUS SNSR (1/2/3) - AUTO TRIP * Commander FLT CNTLR POWER - OFF * Pilot FLT CNTLR POWER - OFF * Commander HUD POWER - OFF * Pilot HUD POWER - OFF	
	Mission Dep.	Center Panel	C3	(PERFORMED IF ELS) * MSTR MADS - OFF (DoD ELS, MCC call DoD OSC on NCC)	Note: MCC Will Report Go/No-Go To DOFF Suits. (Post Safety Assessment)
	Mission Dep.	Center Panel Overhead Aft Panel	C3 O14 O15 O16 O14 O15 O16 O14 O16	* OMS ENG (Left & Right) - OFF * RJDA 1A DRIVER (L2/R2 MANF) - OFF * RJDA 2A DRIVER (L4/R4 MANF) - OFF * RJDF 1B DRIVER (F1 MANF) - OFF * RJDA 1B DRIVER (L1/R1 MANF) - OFF * RJDF 1A DRIVER (F2 MANF) - OFF * RJDA 2B DRIVER (L1/R1 MANF) - OFF * RJDF 2A DRIVER (F1 MANF) - OFF * RJDF 2B DRIVER (F1 MANF) - OFF * RJDA 1A LOGIC (L2/R2 MANF) - OFF * RJDA 2A LOGIC (L4/R4 MANF) - OFF * RJDF 1B LOGIC (F1 MANF) - OFF * RJDA 1B LOGIC (L1/R1 MANF) - OFF * RJDF 1A LOGIC (F2 MANF) - OFF * RJDA 2B LOGIC (L1/R1 MANF) - OFF * RJDF 2A LOGIC (F1 MANF) - OFF * RJDF 2B LOGIC (F1 MANF) - OFF * L OMS ENG VLV - OFF * R OMS ENG VLV - OFF	RMS OMS Safing (RDJs)
	Mission Dep.	Overhead Aft Panel	O15 O16 F2 F3 F4	(NOT PERFORMED IF ELS) * MNB - DRAG CHUTE SYS 2 - op * MNC - DRAG CHUTE SYS 1 - op * DRAG SHUTE - LT OFF * DRAG SHUTE - LT OFF * DRAG SHUTE - LT OFF	Drag Chute Safing
	Mission Dep.	Center Panel	C3	* AIR DATA PROBE (Left & Right) - DEPLOY	Deactivate Air Data Probe HTRS
	Mission Dep.	Right Aft Panel Aft Right Panel Front Left Panel Front Right Panel Aft Right Panel Right Aft Panel	R14 A12 F6 F8 A12 R14	(NOT PERFORMED IF ELS) * ESS 1BC LDG GEAR / ARM/DN - RESET CL * LG ARM/DN RESET - Set Switch To The RESET Position * LDG GEAR - LT OFF * LDG GEAR - LT OFF * LG ARM/DN RESET - Set Switch To The Down Position * ESS 1BC LDG GEAR / ARM/DN - RESET OP	Landing Gear Safing
	Mission Dep.	Right Panel	R2	* ET UMBILICAT DOOR / MODE - GCP/MAN * ET UMBILICAT DOOR / RIGHT LATCH - RELEASE * ET UMBILICAT DOOR / RIGHT LATCH - OFF * ET UMBILICAT DOOR / LEFT LATCH - RELEASE * ET UMBILICAT DOOR / LEFT LATCH - OFF * ET UMBILICAT DOOR / MODE - GCP	ET Umbilical Door Opening
	Mission Dep.	Front Right Panel Front Left Panel Right Panel Center Panel	F4 F8 R2 C3 R2	* BODY FLAP - MAN * FLT CNTLR PWR - ON * HYD MAIN PUMP PRESS #1 - LO * Run Full Load Test * HYD MAIN PUMP PRESS #1 - NORM * HYD MAIN PUMP PRESS #3 - LO * Repeat Load Test * HYD MAIN PUMP PRESS #3 - NORM	Hydraulic Load Test A Minimum Of Two Operating Hydraulic Systems Are Required For This Test
	Mission Dep.	Center Panel Front Right Panel Center Panel Right Panel Center Panel Right Panel Center Panel	C3 C2 F4 C3 R4 C2 R4 C2	* BFC CRT DISPLAY - ON * Enter Item OPS 000 PRO (Right Keypad) * Enter Item OPS 901 PRO (Right Keypad) * BODY FLAP - MAN * BODY FLAP - DOWN * HYDRAULICS - MPS/TVC ISOL VLV (SYS 1, SYS 2, SYS 3) OPEN * Enter ITEM 8 EXEC (Right Keypad) * Enter ITEM 1 +0 2 EXEC (Right Keypad) * Enter ITEM 5 EXEC (Right Keypad) * HYDRAULICS - MPS/TVC ISOL VLV (SYS 1, SYS 2, SYS 3) CLOSE * Enter ITEM 23 EXEC (Right Keypad) * Enter ITEM 1 EXEC (Right Keypad) * Enter ITEM 29+1 EXEC (Right Keypad) * Enter ITEM 30+8 EXEC (Right Keypad) * Enter ITEM 31 EXEC (Right Keypad) * Enter ITEM 32 EXEC (Right Keypad)	DPS Transition GNC 9 (If Pass)



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	Mission Dep.	Overhead Left Panel Left Panel	O1 L1	* Confirm FREON EVAP OUT TEMP >40 degrees * RADIATORS / RAD CONTROLLER - OUT TEMP - HI * H2O PUMP LOOP 1 - ON	Radiator Reconfiguration
	Mission Dep.	Right Panel	R4 R2	* HYDRAULICS - MPS/TVC ISOL VLV (SYS 1, SYS 2, SYS 3) - CLOSE * BOILER PWR (1/2/3) - OFF * BOILER N2 SUPPLY (1/2/3) - OFF * APU OPERATE (1/2/3) - OFF * APU FUEL TK VLV (1/2/3) - CLOSE * APU CNTLR PWR (1/2/3) - OFF	APU/HYD Shutdown
	Mission Dep.	Right Panel	R2	* He ISOLATION (A & B) - CLOSE * PNEUMATICS / L ENG He XOVR - CLOSE	Post Landing MPS Reconfiguration
	Mission Dep.	Left Panel	L2	* Set O2 SYS SUPPLY 1 - CLOSE * Set O2 SYS SUPPLY 2 - CLOSE * Confirm O2 EMER Talkback Indicates CL	PCS Deactivation
	Mission Dep.	Aft Left Panel Overhead Center Panel	A13 O7	* GPS POWER (1 & 2) - OFF * GPS PRE AMPL UN - OFF * GPS PRE AMPL LC - OFF * GPS POWER (GPS 1, GPS 2, GPS 3) - OFF * GPS PRE AMPL UPPER (GPS 1, GPS 2, GPS 3) - OFF * GPS PRE AMPL LOWER (GPS 1, GPS 2, GPS 3) - OFF	GPS Power Down
	Mission Dep.	Center Panel	O2	* Enter ITEM 8 EXEC (Right Keypad) * Enter ITEM 1+03 EXEC (Right Keypad) * Enter ITEM 2 EXEC (Right Keypad) * Enter ITEM 5 EXEC (Right Keypad)	Vent Door Purge Positioning (PASS)
	Mission Dep.	Overhead Center Panel	O7 O8 O7	* MASTER RCS CROSSFEED - OFF * LEFT OMS / He PRESS/VAPOR ISOL (A & B) - GPC * RIGHT OMS / He PRESS/VAPOR ISOL (A & B) - GPC * LEFT OMS CROSSFEED (A & B) - OPEN/CLOSE * RIGHT OMS CROSSFEED (A & B) - OPEN/CLOSE * LEFT OMS TANK ISOLATION (A & B) - CLOSE/OPEN/GPC * RIGHT OMS TANK ISOLATION (A & B) - CLOSE/OPEN/GPC * LEFT OMS CROSSFEED (A & B) - OPEN/GPC * FWD RCS / He PRESS (A & B) - CLOSE/GPC * FWD RCS TANK ISOLATION (1/2 & 3/4/5) - CLOSE * FWD RCS MANIFOLD ISOLATION (1/2/3/4/5) - CLOSE * FWD RCS MANIFOLD ISOLATION (1/2/3/4/5) - OPEN/GPC * LEFT OMS / He PRESS/VAPOR ISOL (A & B) - CLOSE/GPC * RIGHT OMS / He PRESS/VAPOR ISOL (A & B) - CLOSE/GPC * LEFT MANIFOLD ISOLATION (1/2/3/4/5) - CLOSE * RIGHT MANIFOLD ISOLATION (1/2/3/4/5) - CLOSE * LEFT MANIFOLD ISOLATION (1/2/3/4/5) - OPEN/GPC * RIGHT MANIFOLD ISOLATION (1/2/3/4/5) - OPEN/GPC * LEFT RCS TANK ISOLATION (1/2 & A 3/4/5 B) - CLOSE * RIGHT RCS TANK ISOLATION (1/2 & A 3/4/5 B) - CLOSE * LEFT & RIGHT RCS CROSSFEED - OPEN/CLOSE/GPC	RCS, OMS Valve Test Open, Then Close Open, Then Close Close, Then Open, Then GPC Close, Then Open, Then GPC Open, Then GPC Close, Then GPC Open, Then GPC Close, Then GPC Close, Then GPC Open, Then GPC Open, Then GPC Open, Then Close, Then GPC
	Mission Dep.	Overhead Center Panel	O7	* LEFT RCS TANK ISOLATION (1/2 & A 3/4/5 B) - OPEN/GPC * RIGHT RCS TANK ISOLATION (1/2 & A 3/4/5 B) - OPEN/GPC	Open, Then GPC Open, Then GPC
	Mission Dep.	Overhead Left Panel	O6	* GPC MODE (1/2/3/4/5) - STBY/HALT	STBY, Then Halt
	Mission Dep.			IF LANDING AT (KSC, EDW, NOR) <u>HATCH OPENING PROCEDURE</u> * Pull G SUIT Controller Clip - (If Inflated) * Lap Belt & Chute - Release * Egress Seat - (Helmet Required If ELS) * Unstow - 'Return To Houston' Bags - (Except ELS)	Hatch Opening
	Mission Dep.			IF YOU ARE NOT LANDING AT (KSC, EDW, NOR) <u>HATCH OPENING PROCEDURE</u> * Tabs/Visor - CLOSE * Green Apple - PULL * Open Hatch/Deploy Slide Per Decal	Hatch Opening
	Mission Dep.			<u>ORBITER UNAIDED EGRESS</u> * Egress Orbiter * Hand Carry Landing Site Data Book * If ELS - (Reference ELS POST LANDING Procedures)	Orbiter Egress