



Space Shuttle Mission 2007



Designed By: Michael Swannick

Mission Checklist

STS-124

Crew Members

Commander - Mark E. Kelly | Pilot - Kenneth Ham

Mission Specialist

Karen L. Nyberg | Ronald J. Garan Jr. | Michael E. Fossum | Greg Chamitoff | Akihiko Hoshide

Mission Highlights

Flown by Space Shuttle Discovery on May 31, 2008. Launch moved from an earlier scheduled launch date of May 25, 2008. The main payload was the Japanese Pressurized Laboratory (JPL) KIBO module. This was the second of three Japanese assembly flights. Because of the KIBO module size, the Orbiter Boom Sensor System (OBSS) was not part of the payload. Tile inspection was performed using the OBSS stowed on the ISS by the previous STS-123 mission. STS-124 will also bring home the OBSS.

Payload

Japanese Pressurized Laboratory (JPL) module. The Japanese KIBO laboratory.

Also carried in middeck were several replacement parts for a malfunctioning toilet on the International Space Station. The experiment Validation of Procedures for Monitoring Crew Member Immune Function-Short Duration Biological Investigation (Integrated Immune-SDBI) was performed during the mission.

Samples returned from ISS includes Bisphosphonates as a Countermeasure to Space Flight Induced Bone Loss (Bisphosphonates), Commercial Generic Bioprocessing Apparatus Science Insert - 02 (CSI-02), Coarsening in Solid Liquid Mixtures-2 (CSLM-2), Validation of Procedures for Monitoring Crew Member Immune Function (Integrated Immune), Nutritional Status Assessment (Nutrition), The NASA Biological Specimen Repository (Repository), Simulation of Geophysical Fluid Flow under Microgravity (Geoflow) and The Reverse Genetic Approach to Exploring Genes Responsible for cell Wall Dynamics in Supporting Tissues of Arabidopsis Under Microgravity Conditions and Role of Microtubule-Membrane-Cell wall Continuum in Gravity Resistance in Plants (CWRW).

Experiments and hardware delivered to ISS included Test of Midodrine as a Countermeasure Against Post-flight Orthostatic Hypotension - Long (Midodrine-Long), Sleep-Wake Actigraphy and Light Exposure During Spaceflight - Long (Sleep-Long) and Passive Dosimeter for Life Science Experiment in Space (PADLES)

Flight Summary

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

Duration: 13 Days, 18 Hours, 13 Minutes, 07 Seconds | Landing: Kennedy Space Center



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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 Front Left Panel	L2 F2	* Set CABIN VENT ISOL To CLOSE * Set CABIN VENT To CLOSE * Press MASTER ALARM	Cabin Leak Check Cancel Master Alarm Sound
8	T-00:00:51:00				Pilot Confirms IMU Alignment
9	T-00:00:50:00	Right Panel Overhead Aft Panel Center Panel	R2 O14 O16 C3	* Check BOILER CNTLR/HTR (1/2/3) Are On - A * Set BOILER N2 Supply (1/2/3) To ON * Set L OMS ENG VLV Is ON * Set R OMS ENG VLV Is ON * Set OMS ENG (LEFT & RIGHT) Are Set To ARM/PRESS	Confirm Boiler Power On
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 C2	* Set BFC CRT DISPLAY To ON * Confirm BFC CRT SELECT Is At (3+1) * Enter ITEM 25 EXEC (Use Left Keypad)	Enable Backup Flight System (BFS) And Execute Computer Data Transfer To BFS Copy Primary Avionics SW To BFS
12	T-00:00:36:40	Left Panel Overhead Low Panel	L2 O1	* Set CABIN VENT To CLOSE * Set CABIN VENT ISOL To OPEN * Check CABIN dP/dT Gauge For Possible Depressurization	Cabin Leak Check - Continued
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 Center Panel	F6 C3	* Check ABORT Light ON/OFF For 8 Seconds * Set CAUTION/WARNING MEMORY To CLEAR	Final Test Of The ABORT System 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 Front Center Panel	C3 F7	* Set EVENT TIMER CONTROL To START * Confirm EVENT TIMER Display Continues The Countdown	Start The Nine (9) Minute 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 Front Center Panel Right Panel Front Center Panel Front Left Panel Right Panel	R2 F7 R2 F7 F2 R2	* Set APU FUEL TK VLV (1/2/3) To Open * Check APU/HYD READY TO START (1/2/3) Repeaters-(White) * Set APU OPERATE (1/2/3) To START/RUN * Check HYDRAULIC (APU) Pressure 900psi (Use MFD #2) * Set HYD MAIN PUMP PRESS (1/2/3) To NORM * Check HYDRAULIC (APU) Pressure 3000psi (Use MFD #2) * Press MASTER ALARM (If Required) * Set HYD CIRC PUMP (1/2/3) Set To OFF	APU Start The Master Alarm May Sound Until APU Pressure Reaches 3000 PSI. (Silence Alarm)
21	T-00:00:04:30 T-00:00:04:10	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 APU Check Complete
22	T-00:00:03:45 T-00:00:03:05				Start Hydraulic Check, Aero Surfaces Are Moved, A Gimbal Check Is Performed 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 Center Panel	R2 R1 C3	* Set APU AUTO SHUT DOWN (1/2/3) To INHIBIT * Set AC BUS SNSR (1/2/3) To MONITOR * Set CAUTION/WARNING MEMORY To CLEAR	APU Power - Inhibit



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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	PANEL AREA & NOTES
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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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	NOTES
55	Mission Dep.	Right Aft Panel	R11L	* Set DUMP ISOL VLV To OPEN	
59	Mission Dep.	Right Aft Panel Aft Right Panel Right Aft Panel	R11L R13L AIU R11L	* Check MAJ FUNC To GNC * Enter SPEC 25 PRO (AFT Keypad) * Set KU ANTENNA To DEPLOY * Check KU ANTENNA Talkback For DEP * Set KU ANTENNA To GND * Set KU BAND POWER To STBY * Check MAJ FUNC To GNC * Enter SPEC 33 PRO (AFT Keypad) * Enter ITEM 2 EXEC (AFT Keypad)	Deploy KU Antenna Indicates Status For All THC/RHC (Joysticks). KU Antenna Deployment Takes 15 Seconds Indicates KU Antenna Is Deployed Enable KU Antenna
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.				The RMS Is Powered Up And Checked Next Event
1101	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
1102	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
1103	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
1104	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
1105	Mission Dep.	Aft Right Panel	A6U	* Set FLT CNTLR POWER To ON	Gain Manual RMS RHC/THC Control
1106	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.
1107	Mission Dep.			Mission Control Has Detected A Malfunction In The Secondary Controller Of The Left OMS Engine. This Does Not Pose A Serious Threat To The Mission. Mission Control Decides To Lock The Left OMS Engine In The Deorbit Burn Position. The Right OMS Engine Will Be Used For Orbit Burns.	This Ends The Activation And Checkout Of The RMS. Next Event
1115	Mission Dep.	Center Panel Overhead Aft Panel Center Panel	C2 C3 O14 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 L OMS ENG VLV Is OFF * Confirm R OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn	The Crew Will Now Perform The NC-1 Burn
1116	Mission Dep.	Center Panel	C3	* Set OMS ENG (Right) To OFF	NC-1 Burn Complete - Disable OMS Next Event
1120	Mission Dep.	Center Panel Overhead Aft Panel Center Panel	C2 C3 O14 O16 C2	* Set MAJOR FUNC To GNC For CRT #2 * Check CRT2 For OPS 202 Mode * 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 L OMS ENG VLV Is OFF * Confirm R OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn	The Crew Will Now Perform The NC-2 Burn
1121	Mission Dep.	Center Panel	C3	* Set OMS ENG (Right) To OFF	NC-2 Burn Complete - Disable OMS
1122	Mission Dep.	Front Left Panel	F6	* Rotate Shuttle To Proper Attitude (Pitch/Roll) Joystick - RHC)	Maneuver Shuttle To Correct Attitude Target Attitude: Roll=0, Pitch=0, Yaw=90
1123	Mission Dep.	Aft Left Panel Aft Right Panel Aft Left Panel	A8L A6U A8U	* 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	Gain Manual Control Of The RMS The OBSS Is Not Onboard The Shuttle. A Limited Inspection Of The Tiles Is Performed
1127	Mission Dep.	Aft Left Panel	A8L	* Use The RMS End Effector To Inspect The Space Shuttle Tiles	Heat Shield Tile Inspection
1128	Mission Dep.	Aft Left Panel	A8L	* Return The RMS To Its Stowed Position.	The Tile Inspection Takes A Lot Of Time. To Keep Things Simple, We Consider The Tile Inspection Complete. Return The RMS To Its Stowed Position.
1132	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	Disable RMS Enable Forward Flight Control
1133	Mission Dep.	Aft Right Panel	A6L	* SYSTEM POWER (MN A & MN B) To ON * PSU POWER (MN A & MN B) To ON	Power Up The APDS
1134	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



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STS-124 MISSION CHECKLIST

COMM	MET	PANEL SECTION	PANEL	PROCEDURE	PANEL AREA & NOTES
1135	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
1136	Mission Dep.	Right Aft Panel	R11L	* 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)	Activate Star Trackers Activate Star Trackers Target = International Space Station (ISS)
1137	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
1138	Mission Dep.	Right Aft Panel	R11L	* Press RESUME (Aft Keypad)	Star Trackers Are Configured Resume Closes Star Tracker Display Next Event
1140	Mission Dep.	Center Panel Overhead Aft Panel Center Panel	C2 C3 O14 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 L OMS ENG VLV Is OFF * Confirm R OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn	The Crew Will Now Perform The NC-3 Burn
1141	Mission Dep.	Center Panel	C3	* Set OMS ENG (Right) To OFF	NC-3 Burn Complete - Disable OMS Next Event
1145	Mission Dep.	Center Panel Overhead Aft Panel Center Panel	C2 C3 O14 O16 C2	* Set MAJOR FUNC To GNC For CRT #2 * Enter OPS 202 PRO - If Needed (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 L OMS ENG VLV Is OFF * Confirm R OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn	The Crew Will Perform The Final NC Burn
1148	Mission Dep.	Center Panel Front Left Panel	C3 F6	* Set OMS ENG (Right) To OFF * Rotate Shuttle To Proper Attitude (Pitch/Roll) Joystick - RHC)	Final NC Burn Complete - Disable OMS <u>Maneuver Shuttle To Correct Attitude</u> Target Attitude: Roll=0, Pitch=0, Yaw=90
1149	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=90 If You Are Impatient, Use Next Event
1150	Mission Dep.	Aft Left Panel	A2	* Use RCS Thrusters To Position The Shuttle	The ISS Is In Visual Range. Bring The Shuttle In Front 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 Between The Shuttle And 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=180 PITCH=180 YAW=90
1153	Mission Dep.	Front Left Panel	F6	* Rotate Shuttle To Proper Attitude (Pitch/Roll) Joystick - RHC)	Continue To Pitch The Space Shuttle Up To Complete The 180 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=90
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 Below The Destiny Lab And 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	A7L	* APDS Control Commands Press POWER OFF * Set CONTROL PANEL POWER (A - B - C) To OFF	Docking Complete, Disable The APDS



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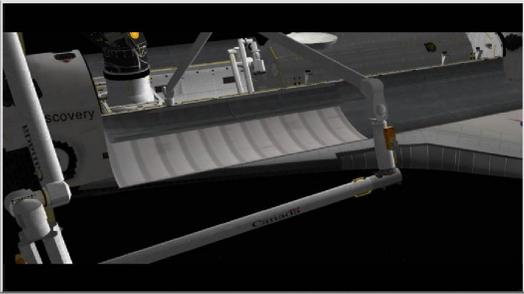


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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	PANEL AREA & NOTES
1163	Mission Dep.	Aft Left Panel	A7L	* Set HEATERS DCU POWER (H1 - H2/DCU - H3/DCU) To OFF * Set APDS POWER (ABS - BDS - CDS) To OFF	Docking Complete, Disable The APDS
1164	Mission Dep.				After 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.				The ISS/RMS Is Ridgidizing
1172	Mission Dep.			* EV2	EV2 Emerges From The Airlock, Move EV2 To The OBSS Boom.
1173	Mission Dep.			* EV1 & EV2	EV2 Releases The Stanchions Holding The OBSS To The Truss and Removes A Bag That Has Been Protecting The Boom Sensor Package. EV1 Emerges From The ISS Airlock. Move EV1 To The Harmony Active Common Berthing Mechanism.
1174	Mission Dep.			* EV1 & EV2	After Inspecting The Berthing Mechanism, EV1 will assist EV2 By Detaching The Keep Alive Umbilical That Has Been Powering The OBSS System While Stowed. Move EV1 To The End Of The OBSS Boom Where The Sensors Are Located.
1175	Mission Dep.			* EV1 & EV2	The OBSS Boom Is Now Free From The ISS Truss. Move EV1 & EV2 To The Payload Bay, Above The KIBO Module Where They Will Prepare To Deploy It.
1176	Mission Dep.			* EV1 & EV2	EV1 And EV2 Remove The Contamination Covers Where The Module Will connect To Harmony. They Will Also Disconnect The Heater Cables Connecting The KIBO Module To The Shuttle, As Well As Three Launch Securing Bolts. The ISS/RMS Will Move The OBSS Boom To The Space Shuttle's RMS Handover Position.
1177	Mission Dep.	Aft Right Panel Aft Left Panel	A6U A8L A8U	* Set FLT CNTLR POWER To ON * Set RMS POWER To PRIMARY * Set RMS SELECT To PORT * Set RMS BRAKES To OFF * Set END EFFECTOR MODE To AUTO	Gain Manual RMS RHC/THC Control You Have Full Manual Control Of The RMS Arm. Align The End Effector With The OBSS Forward End Grapple Fixture. When The RMS Is In Position Press Enter POSITION - P Y R P: -087.6 Y: 017.2 R: -082.2 POSITION - X Y Z X: 0598 Y: -0592 Z: 0508 JOINT ANGLE YAW: 082.6 SHOULDER: 038.0 ELBOW: -044.8 WRIST PITCH: -065.7 WRIST YAW: 000.0 WRIST ROLL: 000.0
					
1178	Mission Dep.				The ISS/RMS Will Move Toward Harmony (Node 2).
1179	Mission Dep.			* EV1 & EV2	Move EV1 & EV2 To The Starboard Solar Alpha Joint.
1180	Mission Dep.			* EV1 & EV2	EV2 Will Install A Replacement For The Faulty Trundle Bearing Assembly. Meanwhile EV1 Will Inspect A Potentially Damaged On The Joint. EV1 Will Also Try Out Techniques For Cleaning The Surface Of The Joints. Next Event
1181	Mission Dep.			* EV1 & EV2	Move EV1 & EV2 Back To The ISS Airlock For Egress.
1182	Mission Dep.	Aft Left Panel	A8L	* Maneuver The RMS So It Points Straight Forward Joint Angles Yaw=174.0 Shoulder Pitch=000.0 Elbow=-017.7 Wrist Pitch=-038.9 Wrist Yaw=000.0 Wrist Roll=075.6	Move The Shuttle's RMS & OBSS Out Of The Way, In Preparation For KIBO Installation. Position The OBSS/RMS So It Faces Forward, Toward The Shuttle's Nose.
1183	Mission Dep.				The ISS/RMS Will Now Move In To Grapple The KIBO Laboratory.
1185	Mission Dep.				The ISS/RMS Is Now Ridgidizing
1186	Mission Dep.	Center Panel	C3	* PAYLOAD SAFING Switches (1-2-3-4-5) To NORM	Release The KIBO Module



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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	PANEL AREA & NOTES
1186	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	Release The KIBO Module From The Payload Bay.
1187	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.
1188	Mission Dep.				The ISS/RMS Will Now Position And Mate KIBO With The Harmony Module.
1189	Mission Dep.				The Final Mating Process Is Under Ground Control Supervision. Next Event
1190	Mission Dep.			* EV2	After Pressurization & Leak Checks, The ISS Crew Starts Outfitting The KIBO Module. EV2 Emerges From The ISS Airlock. Move EV2 To The Forward Area Close To KIBO's Robotic Arm.
1191	Mission Dep.			* EV1 & EV2	EV1 Emerges From The Airlock. Move EV1 Aft Area Close To KIBO's Robotic Arm.
1192	Mission Dep.			* EV1 & EV2	EV1 & EV2 Prepare Cameras And Remove Thermal Covers From The KIBO Robotic Arm. EV1 & EV2 Will Then Inspect And Prepare The Automatic Common Berthing Mechanism (ACBM) For Attachment Of The Japan Logistics Module (JLM). Next Event
1195	Mission Dep.			* EV1 & EV2	Work On The KIBO Module Is Complete. EV1 Will Now Prepare The Nitrogen Tank Assembly (NTA) For Exchange. Move EV1 To A New NTA Mounted On The External Storage Platform (ESP) Near The Quest Airlock.
1196	Mission Dep.			* EV1 & EV2	Move EV2 To The Old NTA Mounted On The ISS Starboard Truss
1197	Mission Dep.			* EV1 & EV2	The Astronauts Will Prepare The Swap By Mounting Thermal Covers And Loosen Bolts On Their Respective NTA.
1198	Mission Dep.			* EV1 & EV2	NTA Preparation Complete. Final Task For EV2 Is To Retrieve A Camera On The Port P1 Truss And Bring It Back To The ISS For Power Unit Replacement. Move EV1 & EV2 To The P1 Truss.
1199	Mission Dep.			* EV1 & EV2	EV1 & EV2 Remove The Faulty Camera.
1200	Mission Dep.			* EV1 & EV2	This Concludes The Second Spacewalk. Move EV1 & EV2 Into The ISS Airlock For Egress.
1201	Mission Dep.				The ISS/RMS Releases The KIBO Module And Will Now Grapple The JLM Module.
1202	Mission Dep.				The JLM Module Is Now Depressurized And Configured For De-Mating. Next Event
1205	Mission Dep.				The JLM Module Is Moved To The KIBO Module For Mating.
1206	Mission Dep.				After Pressurizing And Leak Checks, The ISS Crew Start Outfitting The JLM Module. Next Event
1207	Mission Dep.				The Japanese Arm Is Now Tested.
1208	Mission Dep.				The Arm Test Is A Success. Next Event
1210	Mission Dep.				The ISS Arm Will Now Be Moved Close To The External Storage Platform (ESP).
1211	Mission Dep.			* EV2	EV2 Emerges From The ISS Airlock. Move EV2 To The External Storage Platform To Pick Up A Foot Restraint.
1212	Mission Dep.			* EV2	Move EV2 Close to The ISS Arm End Effector For Mounting.
1213	Mission Dep.			* EV1 & EV2	EV1 Emerges From The ISS Airlock. While EV2 Is Moved To The Old NTA For Removal, Move EV1 Down To The New NTA Stowed On The External Storage Platform.
1214	Mission Dep.			* EV1 & EV2	EV1 & EV2 Perform The Final Task Before The Switch. This Will Take Some Time.
1215	Mission Dep.			* EV1 & EV2	EV2 Now Moves To The External Storage Platform (ESP) Carrying The Old NTA.
1216	Mission Dep.			* EV1 & EV2	EV1 & EV2 Switch NTA's
1217	Mission Dep.			* EV1 & EV2	EV2 Returns To The S1 Truss with The New NTA.



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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	PANEL AREA & NOTES
1218	Mission Dep.			* EV1 & EV2	EV1 Is Attaching The Old NDA To The ESP While EV2 Connects The New NDA To The ISS.
1219	Mission Dep.			* EV1 & EV2	EV2 Is Now Moved Back To Unmount From The ISS Arm.
1220	Mission Dep.			* EV1 & EV2	Move EV2 To The External Storage Platform (ESP) To Stow The Foot Restraint.
2121	Mission Dep.			* EV1 & EV2	Move EV2 Back To The S1 Truss For Final Line Connections.
1222	Mission Dep.			* EV1 & EV2	EV1 Will now Finish The Outfitting Of The KIBO Module. Move EV1 To The Far End Of The KIBO Laboratory.
1223	Mission Dep.			* EV1 & EV2	After Finishing The Truss Line Connections, Move EV2 To The Port Truss To Prepare For Camera Re-Installation.
1224	Mission Dep.			* EV1 & EV2	Move EV1 To The ISS Airlock To Retrieve The Repaired Camera.
1225	Mission Dep.			* EV1 & EV2	Move EV1 To The Port Truss To Install The Camera.
1226	Mission Dep.			* EV1 & EV2	It Will Take A Few Minutes To Install The Camera.
1227	Mission Dep.			* EV1 & EV2	That Concludes The Final Spacewalk. Move EV1 & EV2 To The ISS Airlock.
1228	Mission Dep.				Final EVA Is Complete. After Oxygen Transfer, Sleep Period, And The Exchange Of ISS Personnel, The Shuttle Will Prepare For Undocking. Next Event
1260	Mission Dep.	Aft Right Panel Aft Left Panel	A6L A7L	* 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	After Closure Of All Hatches, The Docking Vestibule Is Depressurized.
1261	Mission Dep.	Aft Left Panel	A7L	* APDS STATUS Press UNDOCK COMPLETE (Lower Left)	Initiate Undock Sequence
1262	Mission Dep.	Aft Left Panel Front Left Panel Aft Left Panel Aft Right Panel	A8L F6 A7L A6L	* Set RMS POWER To OFF * Set FLT CNTLR POWER To ON * 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 (ADS - BDS - CDS) = OFF * Docking System Power System Power (MN A & MN B) = OFF * Docking System Power PSU Power (MN A & MN B) = OFF	Disable RMS And Enable RCS Controls Deactivate APDS
1263	Mission Dep.	Center Panel Overhead Aft Panel Center Panel	C2 C3 O14 O16 C2	* Enter OPS 202 PRO - If Not Displayed On CRT2 (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 L OMS ENG VLV Is OFF * Confirm R OMS ENG VLV Is ON * Press EXEC - (Right Keypad) Confirms ready for OMS burn	Perform An OMS Separation Burn
1264	Mission Dep.	Center Panel	C3 C2	* Set OMS ENG (Right) To OFF * Check OPS 202 PRO * Enter ITEM 1 EXEC (Right Keypad)	Separation Burn Complete Enables Both OMS Engines
1269	Mission Dep.	Aft Left Panel Aft Right Panel	A8L A8L A6U	* Set RMS POWER To PRIMARY * Set RMS BRAKES To OFF * Set FLT CNTLR POWER To ON	A Final Heat Shield Inspection Is Performed Using The OBSS. Gain Manual Control Of The RMS.
1270	Mission Dep.	Aft Left Panel	A8L	* Use The RMS To Return The OBSS To Its Latched Position.	Tile Inspection Complete. Return The OBSS Back To Its Latched Position.



POSITION - P Y R
P: -090.0 | Y: 000.0 | R: 000.0

POSITION - X Y Z
X: 0550 | Y: 0099 | Z: 0465

JOINT ANGLE
YAW: -085.9
SHOULDER: 092.9
ELBOW: -131.4
WRIST PITCH: -051.4
WRIST YAW: 000.0
WRIST ROLL: 086.0



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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	PANEL AREA & NOTES
1271	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.
1272	Mission Dep.	Aft Left Panel	A8L A8U	* Set The STARBOARD RMS Latch To OFF * Set RMS SELECT To PORT * Confirm END EFFECTOR MODE AUTO * Release The OBSS - Press Backspace	Set The Starboard RMS Latch To Off.
1274	Mission Dep.	Aft Left Panel	A8L	* Stow The RMS	Return The RMS To Its Stow Position.
1275	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	This Completes The Heat Shield Inspection That Concludes STS-124 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	<ul style="list-style-type: none"> * 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 	<p>Trap Cold Freon In The Bay Radiators</p> <p>If The Rad Bypass Valve Talkbacks Do Not Display (BYP), Set The Manual Rad Flow Bypass Switches 1 & 2 To Bypass.</p>
1001	Mission Dep.	Right Aft Panel Aft Right Panel Right Aft Panel	R11L A1U R13L R11L	<ul style="list-style-type: none"> * 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) 	<p>Deactivate & Stow The KU Antenna</p> <p>NOTE: Rendezvous Navigation Has Been Used It Must Be Disabled.</p> <p>Confirm On CRT 4 There Are No Asterisks Besides The Following Entries. RNDZ NAV ENA 1 KU ANT ENA 2</p>
1002	Mission Dep.	Right Aft Panel	R13L	<ul style="list-style-type: none"> * 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 	<p>Stow The Radiators</p> <p>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.</p>
1003	Mission Dep.	Overhead Left Panel Center Panel Right Panel	O6 C3 R2	<ul style="list-style-type: none"> * 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 	<p>Activate Backup Flight System</p>
1004	Mission Dep.	Overhead Aft Panel Right Aft Panel	O14 O15 O16 O15 R11L	<ul style="list-style-type: none"> * 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 	<p>Gyro Assemblies & Accelerators</p>
1090	Mission Dep.	Aft Left Panel	A8L	<ul style="list-style-type: none"> * 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 	<p>Stow The OBSS Boom</p> <p>Wait Until Talkbacks Indicate (STO)</p>
1091	Mission Dep.	Aft Left Panel Aft Right Panel	A8L A6U A8U	<ul style="list-style-type: none"> * 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 	<p>Stow The RMS</p> <p>Return All Joint Angles To Their Stowed Position.</p> <p>By Returning All Joint Angles To Zero, You Will Eventually Reach The RMS Latch Position.</p>
1092	Mission Dep.	Aft Left Panel Front Left Panel	A8L F6	<ul style="list-style-type: none"> * 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 	<p>Latch The RMS</p> <p>Wait Until Talkbacks Indicate (LAT)</p> <p>Wait Until Talkbacks Indicate (STO)</p>
1093	Mission Dep.	Aft Left Panel	A7U	<ul style="list-style-type: none"> * Set All PAYLOAD BAY FLOOD Lights To OFF 	<p>Turn Off All Payload Bay Flood Lights</p>
1006	Mission Dep.	Right Aft Panel	R11L R13L R11L	<ul style="list-style-type: none"> * 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) 	<p>Close Payload Bay Doors</p> <p>Wait Until The PL BAY DOOR Talkback Shows CL.</p>
1008	Mission Dep.	Right Aft Panel Overhead Left Panel Right Aft Panel	R11L O6 R11L	<ul style="list-style-type: none"> * 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) 	<p>Reconfigure GNC's For Deorbit</p>
1009	Mission Dep.	Overhead Left Panel	O6	<ul style="list-style-type: none"> * 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 	<p>Close Star Tracker Doors</p> <p>Wait Until STAR TRACKER DOOR POSITION Talkback Shows CL.</p>
1010	Mission Dep.	Right Panel	R4	<ul style="list-style-type: none"> * Check HYDRAULICS BRAKE HEATER (A/B/C) Set To AUTO 	<p>Final Switch Configuration Check</p>



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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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DEORBIT & LANDING CHECKLIST

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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	NOTES
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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SHUTDOWN CHECKLIST

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COMM	MET	PANEL SECTION	PANEL	PROCEDURE	NOTES
	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 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 UMBILICAL 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)

