Pre-Launch Checklist

COM	TIME	PROCEDURE	Mission Control Notes
1	T-00:05:00	**Launch HOLD** CABIN DOOR to LATCH ENVIRONMENTAL SYSTEM O_2 SYS to OPEN ENVIRONMENTAL SYSTEM N_2 SYS to OPEN ENVIRONMENTAL SYSTEM H_2O LOOP to OPEN **Key in ITEM** **Select A** **Key in DPS** **Select 1 (OPS 1)** **Key in EXEC** BOILER CNTRL POWER (1/2/3) to ON BOILER CNTRL HEATER (1/2/3) to ON BOILER N_2 SUPPLY (1/2/3) to OPEN **Key in DPS** **Select 2 (OPS 2)** **Key in EXEC**	Advise: Go for Load OPS 1 and Execute Announce: Confirm Water Spray Boiler On Advise: Check Boiler Temp Advise: Go for Load OPS 2 and Execute Advise: Go for Cabin Leak Check Advise: Go for Helium (He) Pressurization

1 cont.		PNEUMATIC He ISOL (LEFT/CENTER/RIGHT) to OPEN	Announce: APU Pre-Start Check Is Underway
		APU FUEL TNK VLV (1/2/3) to CLOSE	
		APU SHUTDWN to ENABLE	
		HYD MAIN PUMP PRESSURE (1/2/3) to LOW	
		APU SPEED SELECT (1/2/3) to NORMAL	
		HYD CIRC PUMP (1/2/3) to GPC	Advise: Check Vent Temp
		APU MAIN POWER to ON	
		APU CNTRL POWER (1/2/3) to ON	
		APU MSTR VLV to OPEN	
		APU FUEL TNK VLV (1/2/3) to OPEN	
		APU/HYDRAULICS (1/2/3) to RUN	Announce: Nominal APU Start
		HYD MAIN PUMP PRESSURE (1/2/3) to NORMAL	
		HYD CIRC PUMP (1/2/3) to OFF	
		Confirm central HUD is on and in Orbit Earth Mode. • *If needed* **Select 0** (toggle until Orbit Earth HUD is visible)	
		STAR TRACKER to ON	
		*C - Request **Go/No Go** for launch*	Advise: Mission Control confirms all systems are nominal. You are **Go** for launch.

1 cont.		**Initiate Launch Clock Restart when Go order received** MAIN ENGINE POWER (LEFT/CENTER/RIGHT) to ENABLE N_2 CNTRL VLV LEFT (1/2) to ENABLE N_2 CNTRL VLV RIGHT (1/2) to ENABLE	**OR** Mission Control confirms some systems are Off-Nominal. You are **No Go** for launch until these systems are corrected. Advise: Go for Main Propulsion System (MPS) initialization Advise: Go for OMS Engines Initialization Announce: Stand by to Initiate radar at **exactly** T-4:00
2	T-00:04:00	PRIMARY SYSTEM RADAR to ON RATE GYRO ASSEMBLY (RG1/RG2-3/RG4) to ON INTERNAL SHUTTLE SYSTEM PWR (BAT A/ BAT B) to ON INTERNAL SHUTTLE SYSTEM POWER - INT PWR TRANSFER to ON	Annouce: Synchronization of Fuel Cells Underway Announce: Confirming Shuttle Is On Internal Power
3	T-00:03:00	**Key in DPS** **Select 3 (OPS 3)**	Advise: Go for Load OPS 3 Announce: External Tank Cap is retracted

3 cont.		GLOBAL POSITIONING SYSTEM (GPS-1/GPS-2/GPS-3) to ON	Advise: Check Hydraulic (APU) Pressure
4	T-00:02:00	APU SHUTDWN to INHIBIT *Verify* SRB JETTISON is GPC *Verify* EXT TANK JETTISON is GPC	Announce: Confirm APU Power Shutdown is inhibited Announce: External Tank Liquid Hydrogen vents are closed.
5	T-00:01:00	AC BUS SENSOR to MONITOR INTERNAL SHUTTLE SYSTEM POWER - EXT PWR DISCONNECT to ON	Announce: Confirm ground power disconnect complete. Advise: Mission Commander - You are Go for Executing OPS 3 **at T-4 seconds**
6	**T-00:00:04**	**Key in EXEC**	
7	**T-00:00:00**		Initiate Mission Elapsed Time Clock Announce: Shuttle liftoff, the clock is running

Ascent Checklist

COM	MET	PROCEDURE	Mission Control Notes
8	T+00:00:20	Switch Left MFD back to Surface Mode **Key in 9**	
9	T+00:00:44		Announce: Automatic Main Engines Throttle Down to 65%
10	T+00:01:10		Announce: Automatic Main Engines Throttle Up to 104%
11	T+00:02:05	*SRB Separation* FREON LOOP to OPEN H_2O HX to OPEN AIR HX to OPEN	Announce: OMS assist burn start
12	T+00:03:00		Advise: Check Flash Evaporator Is Operational
13	T+00:04:20		Advise: Negative Return
14	T+00:05:00	INTERNAL SHUTTLE SYSTEM PWR (BAT A / BAT B) to STANDBY	Advise: Confirm Status of Fuel Cells
15	T+00:08:00		Advise: Go for Engines Automatic Throttle Down in Preparation for Main Engine Cutoff (MECO)
16	T+00:08:55	*Main Engine Cutoff (MECO)*	Advise: Confirm Main Engine Shutdown and Engine Cutoff (MECO)

Orbit Insertion Checklist (Post MECO)

COM	MET	Procedure	Mission Control Notes
17	T+00:09:00	FWD RCS He TANK ISOL (A/B) to OPEN AFT RCS LEFT He TANK ISOL (A/B) to OPEN AFT RCS RIGHT He TANK ISOL (A/B) to OPEN	Announce: Initialize External Tank Separation system
18	T+00:09:20	*Confirm* N_2 CNTRL VLV LEFT (1/2) are ENABLEd *Confirm* N_2 CNTRL VLV RIGHT (1/2) are ENABLEd	Announce: Standing by for Auto OMS1 Burn
19	T+00:09:30	FLT CNTRL PWR to INHIBIT ENGINE DAP to AUTO	
20	T+00:09:45	MAIN ENGINE POWER (LEFT/CENTER/RIGHT) to OFF	
21	T+00:10:00	HYD MAIN PUMP PRESSURE (1/2/3) to LOW APU SHUTDWN to ENABLE APU/HYDRAULICS (1/2/3) to OFF APU FUEL TNK VLV (1/2/3) to CLOSE APU MSTR VLV to CLOSE APU CNTRL POWER (1/2/3) to OFF APU MAIN POWER to OFF	

21 Cont.		HYD CIRC PUMP (1/2/3) to GPC	Announce: APU Shutdown complete Announce: Confirm External Tank Separation
22	T+00:10:30	DUMP ISOL VLV to OPEN H_2 RECIRC VLV to OPEN H_2 OUTBOARD VLV to OPEN H_2 INBOARD VLV to OPEN PNEUMATIC He ISOL (LEFT/CENTER/RIGHT) to GPC O_2 VENT LINE to OPEN O_2 OUTBOARD VLV to OPEN O_2 INBOARD VLV to OPEN	Announce: MPS Propellants Automatic Dump initiated.
23	T+00:11:00 approximate	*Advise Mission Control when OMS Burn Initiated* BOILER N_2 SUPPLY (1/2/3) to CLOSE BOILER CNTRL HEATER (1/2/3) to OFF BOILER CNTRL POWER (1/2/3) to OFF	Advise: Confirm OMS Burn Initiated
24	T+00:12:00 approximate	H_2 INBOARD VLV to CLOSE H_2 OUTBOARD VLV to CLOSE H_2 RECIRC VLV to CLOSE O_2 INBOARD VLV to CLOSE O_2 OUTBOARD VLV to CLOSE	

24 Cont.		O_2 VENT LINE to CLOSE DUMP ISOL VLV to CLOSE	Announce: Auto MPS Propellant Dump Complete
25	T+00:14:00 approximate	AIR HX to GPC H_2O HX to GPC FREON LOOP to GPC	
26	T+00:15:10 approximate	*Advise Mission Control when OMS Burn Complete* N_2 CNTRL VLV LEFT (1/2) to DISABLE N_2 CNTRL VLV RIGHT (1/2) to DISABLE AC BUS SENSOR to AUTO	Advise: OMS Burn complete
27	Mission Dependent	Confirm central HUD is on and set to Orbit Earth mode. • If needed **Select 0** (toggle until Orbit Earth HUD is visible) H_2 RECIRC VLV to GPC H_2 OUTBOARD VLV to GPC H_2 INBOARD VLV to GPC O_2 VENT LINE to GPC O_2 OUTBOARD VLV to GPC O_2 INBOARD VLV to GPC ENGINE DAP to MANUAL	Announce: Liquid H_2 Fill & Drain Valves are set to Computer Control Announce: Liquid O_2 Fill & Drain Valves are set to Computer Control

27 Cont.		FLT CNTRL POWER to ENABLE RATE GYRO ASSEMBLY (RG1/RG2-3/RG4) to OFF Orient the shuttle to a zero attitude while using the Kill Rotation command (**key 4**) to stabilize the maneuver.	Advise: Go for Initiating Manual Zero Attitude Correction Announce: Confirm Shuttle in zero attitude (manual prograde)
28	Mission Dependent	PAYLOAD BAY POWER to ON PAYLOAD BAY DOOR to OPEN RADIATORS to DEPLOY Ku ANTENNA to DEPLOY	Advise: Go for payload bay door open program Announce: Confirm Payload Bay Doors are open Announce: Confirm Radiator Deployment Announce: Confirm KU Antenna Deployment Announce: Shuttle is correctly configured for the mission

De-Orbit Checklist

COM	MET	Procedure	Mission Control Notes
29	Mission Dependent	STAR TRACKER to OFF Ku ANTENNA to STOW RADIATORS to STOW PAYLOAD BAY DOOR to CLOSE PAYLOAD BAY POWER to OFF	Advise: Go for Payload Bay Door Close program. Announce: Confirm KU Antenna is stowed Announce: Confirm Radiators are stowed Announce: Confirm Payload Bay Doors are closed
30	Mission Dependent	BOILER CNTRL POWER (1/2/3) to ON BOILER CNTRL HEATER (1/2/3) to ON BOILER N_2 SUPPLY (1/2/3) to OPEN	
31	Mission Dependent	*Position the Shuttle to The Correct Attitude – Retrograde* **Key in 6** – Retrograde	Announce: Confirm Shuttle in retrograde attitude
32	Mission Dependent	DUMP ISOL VLV to OPEN PNEUMATIC He ISOL (LEFT/CENTER/RIGHT) to OPEN	Announce: Main Propulsion System Helium Release Initiated

33	Mission Dependent	APU MAIN POWER to ON APU CNTRL POWER (1/2/3) to ON APU MSTR VLV to OPEN APU FUEL TNK VLV (1/2/3) to OPEN APU SHUTDWN to INHIBIT APU/HYDRAULICS (1/2/3) to RUN HYD MAIN PUMP PRESSURE (1/2/3) to LOW APU SPEED SELECT (1/2/3) to NORMAL HYD CIRC PUMP (1/2/3) to OFF	
34	Mission Dependent	PNEUMATIC He ISOL (LEFT/CENTER/RIGHT) to CLOSE DUMP ISOL VLV to CLOSE	Announce: Main Propulsion System Helium Release Completed
35	Mission Dependent	N_2 CNTRL VLV LEFT (1/2) to ENABLE N_2 CNTRL VLV RIGHT (1/2) to ENABLE Engine Throttle to Maximum Engine Throttle to OFF N_2 CNTRL VLV LEFT (1/2) to DISABLE N_2 CNTRL VLV RIGHT (1/2) to DISABLE	Advise: Go for Performing De-orbit Burn Advise: Confirm De-orbit Burn Complete

36	Mission Dependent	*Position The Shuttle to The Correct Attitude – Prograde* **Key in 7** – Prograde	Announce: Confirm Shuttle in prograde attitude
37	Mission Dependent	RE-ENTRY SYS CHECK to ON HYD MAIN PUMP PRESSURE (1/2/3) to NORMAL	
38	Mission Dependent	FWD RCS He TANK ISOL (A/B) to CLOSE AFT RCS LEFT He TANK ISOL (A/B) to CLOSE AFT RCS RIGHT He TANK ISOL (A/B) to CLOSE AC BUS SENSOR to MONITOR	Announce: Pressure cycle complete
39	Mission Dependent		Advise: De-Orbit Procedure is Complete

Landing Checklist

COM	Altitude	Procedure	Mission Control Notes
40	**35 k**	*Disengage RCS mode* **Key in D** LANDING SYS to ARM LANDING SYS CHECK to ON LANDING SYSTEM RADAR to ON	
41	**28 k**	*(Lift takes affect)*	Announce: ***Actual*** altitude and speed
42	**25 k**	*P – Announce: Kennedy VOR is Acquired* *P – Announce Runway 15/33 ILS is Acquired*	Advise: Hydraulics/Brake Heater auto-activated Announce: ***Actual*** altitude and speed
43	**2.5 k**	GEAR to DEPLOY	Announce: Gear deployed
44	**0.5 k (500 m)**	SPEED BRAKE to DEPLOY	Announce: Speed Brake deployed
45	**Touchdown**	DROGUE CHUTE to DEPLOY	Announce: Touchdown
46			Announce: Wheels Stop
47		*End of Mission*	