
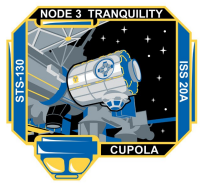


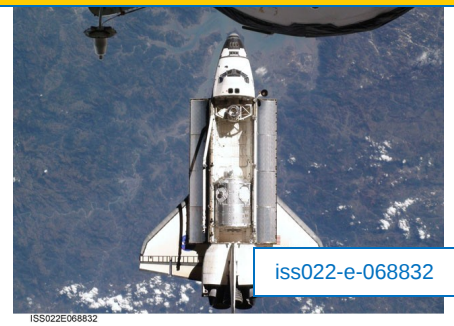
SPACE SHUTTLE MISSIONS SUMMARY

STS-130/20A SEQ FLT # 130 KSC-130 PAD 39A (53) MLP-2 32nd SHUTTLE FLIGHT TO ISS	OV-105 (Flight 24) ENDEAVOUR OMS PODS LPO3 -34 RPO4 30 FRC5-23  	CDR: George D. Zamka (Flt 2 - STS-120) P817/R315/V211/M271 PLT Terry W. Virts, Jr. P818/R351/M304 MS 1 Kathryn P. Hire (Flt 2 - STS-90) P819/R238/V212/F31 MS 2 Stephen K. Robinson (Flt 4 - STS-85, STS-95, STS-114) P820/R222/V152/M196 MS 3 Nicholas J. M. Patrick (Flt 3 - STS-105, STS-116) P821/R303/V186/M263 MS 4 Robert L. Behnken (Flt 2 - STS-123) P822/R323/V213/M279 SS EVA 148 DOCKED QUEST EVA 66 EMU/TETHERED EVA 141 SCHEDULED EVA 139 DURATION 6:32 SS EVA 149 DOCKED QUEST EVA 67 EMU/TETHERED EVA 142 SCHEDULED EVA 140 DURATION 5:53 SS EVA 150 DOCKED QUEST EVA 68 EMU/TETHERED EVA 143 SCHEDULED EVA 141 DURATION 5:48 Continued...	KSC 39A 39:09:14:07Z 4:14:07 AM EST (P) 4:14:07 AM EST (A) Monday (16) 02/08/10 (10) <u>LAUNCH WINDOW:</u> 11M 57S (Total) 7M 32S (Preferred) EOM PLS: KSC TAL: ZZA TAL WX: MRN (NO GO), FMI (NO GO) <u>SELECTED:</u> RTLS: KSC15 N/N TAL: ZZA 30L N/N AOA: KSC 15 N/N 1 ST DAY PLS: EDW 22R N/N TDEL: 0.000 (P) 0.232 (A) MAX Q NAV: 757.6 (P) 756.6 (A) SRB STG: 2:05.9 (P) 2:07.2 (A) PERF: NOMINAL <u>2 ENG TAL (ZZA):</u> 2:42 (P) 2:43 (A) <u>NEG ZZA (2@ 104):</u> 3:52 (P) 3:54(A) PTA (U/S 160 FPS): 5:08(P) 5:06(A)	KSC15 KSC (73) 053:03:20:29Z 9:20:29 PM CST Sunday (17) 02/21/10 (8) <u>DEORBIT BURN:</u> 053:02:14:47Z X RANGE: 336.9NM ORBIT DIR: A/L (44) AIM PT: (Close-In) MLGTD: 2760 FT 053:03:20:29Z VEL: 188 KGS 190 KEAS HDOT: -1.9 FPS <u>TD NORM 195:</u> 240 5 FT DRAG CHUTE DEPLOY: 185 KEAS 053:03:20:31Z NLGTD: 5219	104/104/109% <u>PREDICTED:</u> 100/104.5/10 4.5/ 72/104.5 <u>ACTUAL:</u> 100/104.5/10 0/ 74/104.5 1 = 2059 (4) 2 = 2061 (1) 3 = 2057 (5) M 3 EOM: WEIGHT: 201138 LBS X CG: 1082.8 IN <u>LANDING:</u> WEIGHT: 201084 LBS X CG: 1084.8 IN	BI-141 51.6 (32) RSRM 109 ET-134 SLWT 38 ET IMPACT 1:13:54 MET LAT: 37.192 S LONG: 159.60 3 W	DIRECT INSERTION 01-34 (3) <u>POST OMS-2</u> 124.0x110.08 NM <u>DEORBIT</u> HA 190.3 NM HP 23.3 NM <u>ENTRY VELOCITY:</u> 25866 FPS <u>ENTRY RANGE:</u> 4367.5 NM	CARGO: 40956 LBS <u>PAYLOAD CHARGEABLE:</u> 34931 LBS <u>DEPLOYED:</u> 34648 LBS <u>NON-DEPLOYED:</u> 0 LBS <u>MIDDECK:</u> 283 LBS <u>SHUTTLE ACCUMULATE D WEIGHTS:</u> <u>DEPLOYED:</u> 1641533 LBS <u>NON-DEPLOYED:</u> 1626311 LBS CARGO TOTAL: 4210929 LBS <u>PERFORMANCE MARGINS (LBS):</u> FPR: 2908 FUEL BIAS: 1059 FINAL TDDP: 1188 RECON: 2828 <u>PAYLOADS:</u> PLB: ISS-20A (NODE 3 W/CUPOLA) <u>MIDDECK:</u> ISS-20A, MAUI, SEITE, SIMPLEX, RAMBO-2 5 CRYO TANK SETS ODS, SRMS (87),	<p>Brief Mission Summary: The STS-130 (32nd mission to ISS) main objectives were to deliver and assemble the final U.S. module (Tranquility) and the Italian built Cupola Node plus delivery of ISS equipment, supplies, and experiments. Tranquility provides additional room for the ISS crew and life support systems. The Cupola is a robotic control station and provides a panoramic view of earth through 7 windows, "A Room With a View" - PAO. The mission included 3 EVA's.</p> <p>KSC W/D OPF-2: 130 days + 3 holidays VAB-1: 9 days + 5 contingency days +11 holidays PAD A: 31 days + 3 contingency days Total Work Days = 170 (OPF processing occurred over a total time period of 133 days.)</p> <p>POSTPONEMENTS: - Baseline STS-130 to FDRD - launch date of 12/10/09 on 11/17/08. - Ppd. to 02/04/10 on 03/10/09. Interim change while Cx and SSP schedules were assessed and prioritized. - Ppd. to 02/07/10 on 12/17/09. Launch date change supports efficient use of KSC ground operation resources.</p> <p>LAUNCH SCRUBS: Sunday, 02/07/10 launch attempt was terminated about an hour before scheduled launch of 4:40 AM EST. Launch scrub was due to a massive area of low cloud ceilings that blanked the northern half of Florida.. launch was reset for 02/08/10. WEATHER SCRUB.</p> <p>LAUNCH WINDOW: Total launch window was 11M 57S with window open at 39:09:09:42Z and close at 39:09:21:39Z. Preferred Launch Time was 39:09:14:07Z (In-Plane Time) for a launch window of 7M32S.</p> <p>LAUNCH DELAYS: None. Launch occurred on time at 39:09:14:07Z on Monday 02/08/10.</p> <p>TAL WEATHER: Spaceflight Meteorology Group (SMG) reported "quite challenging" weather for TAL sites: low clouds & showers at Moron & showers in 20 circle at ZZA. Recon aircraft at ZZA reported moisture (not rain droplets) so TAL "rainshower rule" was invoked for "GO". Istres changed form "GO" to "NO GO" (Low cloud ceiling) late in launch count.</p> <p>PERFORMANCE ENHANCEMENTS: Include the standard set plus: 1) PE Operational High Q - WIN/FEB, 2) OMS Assist, 3) a 52 nautical mile MECO, and 4) Del Psi</p>
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iss022e062672



Shuttle approaches ISS with Node 3/Cupola.



iss022-e-068832

http://www.nasa.gov/images/content/389937main_2009-5728.jpg Ares 1-X Rocket (1st Test Flight) and STS-129 Shuttle

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FLT NO.	ORBITER	CREW (6) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM AND ET	ORBIT		FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
			LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.		INC	HA/HP			

SPACE SHUTTLE MISSIONS SUMMARY

STS-130/20A Continue d...	Continued...
	MCC WHITE FLIGHT FCR (60) FLIGHT DIRECTORS: SHUTTLE: A/E- Norm knight LD/O1- Kwatsi Alibaruho O2- Gary Horlacher Planning- Chris Edelen MOD - John Mccullough Team 4- Paul Dye ISS O1 - Royce Renfrew LD/O2 - Bob Dempsey O3 - Mike Lammers Team 4 - Dana Weigel CAPCOMS: SHUTTLE A/E - Rick Sturckow - Steve Frick (Wx) LD/O1 - Danny Olivas - Rick Sturckow (Flt Days 3 & 12) O2 - Mike Massimino Planning - Shannon Lucid Team 4 - N/A ISS O1 - Robert Hanley LD/O2- Hal Getzelman O3 - Kathy Bolt Team 4 - N/A

Continued...
PTM (U/S 181 FPS): 6:10(P) 6:12(A) SE PRESS 104 6:57(P) 6:56 (A) MECO CMD: 8:22.5 (P) 8:21.4 (A) VI: 25819(P) 25817(A) OMS-2: 37:44 (P) 37:42(A) 143.4(P) 142.1(A) FPS


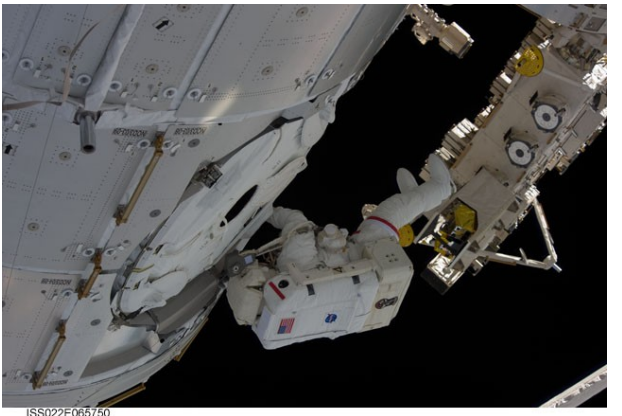



Endeavour launch as seen in time lapse photo from top of the Intracoastal Waterway Bridge in Ponte Vedra, FL, 115 Miles from the launch site, Monday, February 8, 2010 @ 4:14 am EST. Photo by: James Vernacotola, copyright 2010: www.jamesvernacotola.com

Continued...
FLIGHT DURATION CHANGES: On FD6 MMT agreed to add +1 day to nominal flight plan to facilitate complete transfer of the regen ECLSS racks to Node 3 as well as assist with accomplishing other flight objectives. Landed on KSC Runway 15 at 053:03:20:29Z, Sunday, February 21, 2010 at 9:20:29 CST.
FIRSTS/LASTS: - Shuttle's last night launch. - Shuttle's 1st night landing. - Last U.S. on-orbit Segment (Node 3) installed on ISS. - Orbiter: First flight of Main Engine Ignition Overpressure Acoustic Instrumentation. - First lunar rock returned to space. The sample was collected on Apollo 11 by Neil Armstrong in 1969 and carried by Scott Parazynski (Shuttle astronaut) in 2009 on his climb of Mt. Everest. Now on ISS, it orbits Earth once again.
NIGHT LAUNCH: # 34
RENDEZVOUS: #77 Rendezvous and dock with ISS.
EVENTS: - FD1: OMS2 ignition at 039:09:51:49Z resulted in a 124.0 by 110.0 NM orbit. - FD2: During RCC surveys the crew downlinked some views of pulled up portion of port wing upper surface flapper door seal area. Area was cleared. - T1 maneuver at 041:02:28:25Z resulted in a 187.4 by 180.7 NM orbit - FD3: R-Bar Pitch Maneuver was performed. No issues. MMT concurred no focus inspection required. - Docking Contact occurred at 041:05:05:56Z - Hard Dock, hooks closed, occurred at 041/05:54:12Z - ISS Hatch opened at 1:16 AM CST Wednesday, Feb. 10, 2010, welcomed by ISS crew. - FD4: EVA 1: Behnken & Patrick successfully completed preparations for unberthing Tranquility (Node 3). ISS arm unberthed Node 3 & installed it on Node 1 port side followed by crew activation. EVA1 duration 6:32. - FD7: EVA2: Behnken & Patrick All planned activities were completed including installation of the ammonia jumpers, integrating Node 3 to EATCS Loop A, and installing the Node 3 port center disc cover (CDC). Cupola was

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STS-130/20A Continued ...				Continued... <u>ROLLOUT:</u> 102 06 FT 1:3 1 M:S <u>WINDS:</u> 0.3R 5H KTS OFFICIAL: 16007P10KT (X1P1 H7P10) <u>DENS ALT:</u> 410 FT <u>FLT DURATION:</u> 13:18:06:2 2 <u>S/T:</u> 1250:11:48:0 3	ISS022-E-067727 --- Crews for STS-130 (red) & Exp22 (blue) in Harmony node. Front row (lt to rt): Exp22 CDR Jeffrey Williams, Patrick/MS, CDR Zamka, & Behnken/MS. Middle row: Exp22 Soichi Noguchi/FE (JAXA), Hire/MS, & Exp22 T.J. Creamer/FE. Back row: Maxim Suravev & Oleg Kotov, both Exp22/FE (RSA); along with Robinson/MS & PLT Virts.	ISS022-E-067184 --- Behnken (left) & Patrick conduct 3rd EVA, here removing insulation blankets & launch restraint bolts from each of Cupola's seven windows.	Continued... EVENTS: Continued... - FD8: Cupola unberthed and moved from forward end to nadir port of Tranquility. - FD10: EVA3: Behnken & Patrick All planned and a number of get ahead tasks were completed including Loop B QD opening (integration of EATCS Loop B with Node 3 heat exchanger), PMA-3 cable installation, Cupola MLI removal, and VSC video cable routing. EVA3 duration (PET) 5:48. -Transfers: 36,130 Pounds of hardware transferred to ISS (inside & out) 29,788 Tranquility Node 3 weight in pounds (as installed) 3,594 Cupola 757 Integrated Stowage Platform cargo 24 Pounds of Oxygen transferred into ISS Airlock tanks 0 Pounds of Nitrogen transferred (N2 was used to repress the stack) 1,991 Pounds of middeck items delivered to ISS aboard Endeavour 1,803 Pounds of middeck items returned from ISS to Endeavour ~1,095 Pounds of water transferred to ISS 799,045 Mass in space of the International Space Station (in pounds) - FD13: Undocked at 051:00:53:52Z - During entry a manual handover to TDRS-46 early avoided rolling on to a lower antenna and prevented a comm blackout period. Continued...			
ISS construction and maintenance continue. Above: ISS022-E-062844 -- Patrick during EVA1. Below: ISS022-E-065750 -- Behnken during EVA 2		 <p style="font-size: small; margin-top: 5px;">ISS022E062844</p>	 <p style="font-size: small; margin-top: 5px;">ISS022E065750</p>	 <p style="font-size: small; margin-top: 5px;">ISS022E067184</p>						

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STS-130/20A
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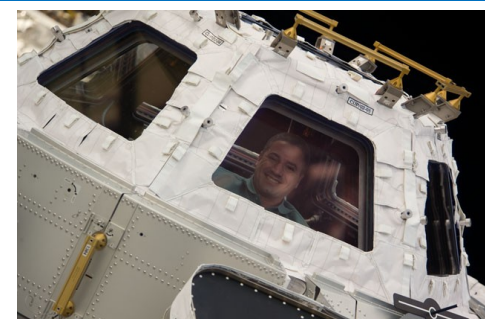
Quoting Oscar Wilde's "Life imitates art far more than art imitates life", Dave Zani - CinemaBlend.com, sees the Cupola window as the inside window of a Star Wars TIE Fighter.

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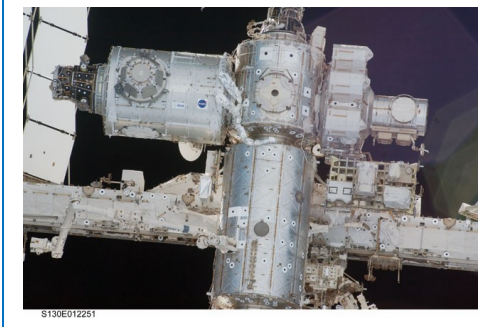
SIGNIFICANT ANOMALIES:
Orbiter:
 - During STS-130 Ascent monitoring, WLE Sensor Unit S/N 1155 experienced two (2) off-scale high data spikes.
 - MUX bypass switch will not switch to Bypass front for OCA 48Mbps downlinks.
 - Audio drop-out during EVA 1.
 - Trajectory Control Sensor (TCS) had trouble transitioning to CW mode. CW data became ratty and unusable.
KSC:
 12 IFA's entitled "STS-130 Post Launch Debris"
SRB: None.
RSRM: None.
SSME: None.
ET:
 - POST-FLIGHT REV. IDENT. 2 FOAM LOSSES +Z SIDE INTERTANK NCFI 24-124 ACREAGE, 19 FOAM LOSSES ?Z SIDE OF THE INTERTANK NCFI 24-12 ACREAGE
MOD:



S130-E-010380--- Soichi Noguchi/JAXA/FE ISS Exp 22, takes earth photo from a window in Cupola.



ISS022-E-068724 -- CDR Zamka tries out view from Cupola.



S130-E-012251 --- A close-up view of ISS during post-undocking showing newly installed Tranquility node & Cupola at top



JSC2010-E- 017955 --- Flight Directors in JSC MCC: From left: Chris Edelen, Norm Knight, Kwatsi Alibaruho and Gary Horlacher.



S130-E-012188 --- ISS as seen by Endeavour post-undocking and separation. Tranquility & Cupola are located just left of center.



STS130-S-128 --- Shuttle's last night landing. Drag chute is deployed at MLGTD on KSC Runway 15 at 10:20:29 PM EST on Feb. 21, 2010. It was the 23rd night landing in Shuttle history and the 17th at KSC.