

# SPACE SHUTTLE MISSIONS SUMMARY

FLT NO.	ORBITER	CREW (5) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE, LANDING TIMES, FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	ORBIT		FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
							INC	HA/HP			
<b>STS-93</b>  SEQ FLT # 95  KSC- 95  PAD 39B-41  MP-1L	OV-102 (Flight 26) Columbia  OMS PODS: LPO5-15 RPO5-14 FRC2-26  PLT: Jeffrey S. Ashby P560/R251/M218  M/S 1: Cady G. Coleman (Flt 2 - STS-73) P561/R201/V156/F27  M/S 2: Steven A. Hawley (Flt 5 - STS 41-D, STS 61-C, STS-31 & STS-82) P562/R39/V29/M38  M/S 3: Michel Tognini (CNES-France) P563/R252/M219  MCC WHITE FCR (25)  FLIGHT DIRECTORS: A/E/O1 - J. P. Shannon LD/O 2 - B. P. Austin & P. F. Dye PLNG - C. W. Shaw MOD - B. R. Stone & J. W. Bantle	KSC PAD 39B 204:04:31:00Z 12:24:00 AM EDT (P) 12:31:00 AM EDT (A) Friday 19 7/23/99 (6)  LAUNCH WINDOW: 46 Minutes  EOM PLS: KSC TAL: BYD TAL WX: BEN  SELECTED: RTLS: KSC 15/N/N TAL: BEN 36/N/N AOA: EDW 22/N/N PLS: EDW 22/CI/N  TDEL: 0.05      0.092/0.13  MAX Q NAV: 673                  675  SRB STG: 2:03.5                  2:04  PERE: NOMINAL  2 ENG TAL (BEN): 3:20                  3:18  NEG RETURN: 3:52                  3:59  PTA (U/S 219): 5:25                  5:19  DROOP: 5:26                  5:25  SE TAL (BYD): 6:02                  5:59  PTM (U/S 219): 6:20                  6:10  MECO CMD: 8:28                  8:28  VI: 25876                  25859  Continued...	KSC 33 (KSC 48) 209:03:20:35Z 11:03:20:35 PM EDT  Wednesday 10 7/28/99 (9)  DEORBIT BURN: 209:02:19:00Z  X RANGE: 83 NM  ORBIT DIR: DL 45  AIM PT: NOMINAL  MLGTD: 2533 FT 209:03:20:35Z VEL: 201 KGS 196 KEAS HDOT: -1.0 FPS  TD NORM 195: 2628 FT  DRAG CHUTE DEPLOY: 190 KEAS 209:03:20:37Z  NLGTD: 5470 FT 209:03:20:44Z VEL: 159 KGS 149 KEAS HDOT: -4.1 FPS  BRK INIT: 122 KGS  DRAG CHUTE JETTISON: 43 KGS 209:03:21:05Z  BRK DECEL FPS <sup>2</sup> : AVE 9.1 PK 10.4  WHEELS STOP: 209:03:21:19Z 9384 FT  ROLLOUT: 6851 FT 44 SEC  Continued...	104/104/ 109%  PREDICTED: 100/104/104/ 67/104  ACTUAL: 100/104/104/ 67/104  1 = 2012 (22) 2 = 2031 (17) 3 = 2019 (19)  M 3 EOM:  WEIGHT: 202872 LBS  X CG: 1097.54  LANDING:  WEIGHT: 202796 LBS  X CG: 1099.36	BI-097  RSRM 69  ET-99  SLWT-5  ET RPT: 283K  ET BR/UP: K  ET IMPACT  MET: 1:23:16 LAT: 17.54°N LONG: 154.66°W	28.45° (48)  DIRECT INSERTION  POST OMS-2: 154 X 145 NM	OI-26B (5)	CARGO: 52382 LBS  PAYLOAD CHARGEABLE: 49798 LBS  DEPLOYED: 43080 LBS  NON-DEPLOYED: 5171 LBS  MIDDECK: 1538 LBS  SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 925154 LBS NON-DEPLOYED: 1404092 LBS CARGO TOTAL: 2910842 LBS  PERFORMANCE MARGINS (LBS): FPR: 3553 FUEL BIAS: 720 FINAL TDDP: 2081 RECON: -3981  PAYLOADS: PLB: AXAF-I/IUS (CHANDRA deployed)  MIDDECK: MSX, SIMPLEX, SWUIS, GOSMAR, STL-B, LFSAH, CCM, SAREX-II, EARTHKAM, PGIM, CGBA, MEMS, BRIC	KSC W/D: OPF 223, VAB 5, PAD 43 = 271 days total.  LAUNCH POSTPONEMENTS: - Baselined 8/27/98 as launch date on 5/16/97. - Postponed launch date to 12/3/98 and to 1/21/99 (Multi-flight change to ISS flights). - Postponed to 3/18/99, to 3/25/99, to 4/8/99, to 4/15/99, to 7/9/99, to 7/22/99, and to 7/20/99 (primarily Chandra AXAF/IUS delays).  LAUNCH SCRUBS: - 7/20/99 (12:36 AM EDT.) Launch attempt was halted with a manual GLS cutoff at T-7 seconds (approximately 200 milliseconds prior to Main Engine Start) due to a (false) spike indication of 640 ppm H2 concentration in the aft. Insufficient time to wait for the confirmation sample at T-8 seconds and allow time to issue a manual GLS cutoff before Main Engine Start at T-6.33 seconds. The manual cutoff call was made at T-10 seconds. A 48-hour scrub turnaround was required to replace the Hydrogen Long-Throw Igniters. KSC, BYD, and BEN were forecast and observed GO. Launch reset for 7/22/99. Technical Scrub. - 7/22/99 (12:28 AM EDT.) Launch attempt was scrubbed at T+47:30 due to Range and RTLS weather. During count, rain and lightning hits within 20 NM, and thunderstorms within 20 NM. Counted down to T-5 minutes and held awaiting improved weather. Mission Director gave ok to extend window 36 minutes by giving up first day deploy. Scrubbed launch at 203:05:17:35Z (T+47:30) with no signs of improvement in weather (lightning within 8.6 miles of SLF and thundershowers within 20 NM). Banjul was NO GO for ceiling/rain. Ben Guerir was GO. Launch reset for 7/23/99. Weather Scrub.  LAUNCH WINDOW: 46 Minutes planned window. During count, the customer relaxed contingency deploy opportunities and IUS battery eclipse constraints to extend window to 116 minutes; however, launch window was limited to Range availability (60 minutes).  LAUNCH DELAY: - Launch was delayed 7MOS during T-20 minute hold for MILA to change out A Frame Sync Box to restore the forward link. - Launched at 204:04:31:00Z, 12:31:00 AM EDT on July 23, 1999.  SHUTTLE NIGHT LAUNCH #21  Continued...		



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		TITLE, NAMES & EVA'S					INC	HA/HP			
STS-93  Continued			Continued...  <u>OMS-2:</u> 41:04      41:06.9 200 FPS    200 FPS 2:14            2:14	Continued...  <u>WINDS:</u> 04T, 5L KTS <u>OFFICIAL:</u> 2405P06 SS: OT, 5L PK: OT, 6L  <u>DENS ALT:</u> 1551 FT  <u>FLT DURATION:</u> 4:22:49:35  <u>S/T:</u> 816:16:28:48  <u>OV-102:</u> 273:21:09:17  <u>DISTANCE:</u> 1,796,000 sm						Continued...  <u>TAL WX:</u> - Banjul (prime) was forecast NO GO (thunderstorms and anvil clouds) and observed NO GO (thunderstorms and ceiling). Ben Guerir (selected) was forecast and observed GO.  <u>PERFORMANCE ENHANCEMENTS:</u> - Standard set. - PE LO Q SUM/JUL  <u>SHUTTLE NIGHT LANDING # 12:</u> KSC 33 on Wednesday, 7/28/99 at 11:20:35 PM EDT - moonlit landing.  <u>FLIGHT DURATION CHANGES:</u> None - Landed on orbit 80 as planned.  <u>FIRSTS/LASTS:</u> - First space flight with female Commander (Eileen Collins). - First U.S. flight for Michel Tognini (CNES-France). Michel's first space flight was to Mir on Soyuz TM-15S. - Last flight of phase 2 engines. - Most aft landing Xcg (1099.36)  <u>SHUTTLE NIGHT LAUNCH #21</u>  <u>SHUTTLE NIGHT LANDING #12:</u>  <u>SIGNIFICANT ANOMALIES:</u> - At approximately Liftoff plus 5 seconds, there was a short circuit on AC1 Phase A for approximately 0.5 seconds. The resultant under voltage caused SSME 1 "A" and SSME 3 "B" controllers to be disqualified. Postflight, it was determined the short was on AC1 Phase A to SSME 1 "A" controller. - At liftoff, the right SRB hydraulic pressure sensor 2 was erratic. - Four ET LO2 sensors indicated dry resulting in low-level cutoff of main engines and slightly early MECO. - Right SSME multiple performance parameters deviations (Post-flight inspection revealed ruptures in three Engine 2019 nozzle tubes caused by an impact of a loose LOX post deactivation pin. LH2 leak resulted in controller compensating for fuel loss with additional LOX flow, a 16 fps underspeed, and 8 nm lower altitude). - CRT 3 Critical BITE. - High-load FES excessive water carryover. - Camcorder tape jam. - Primary thruster F2D low fuel injector temperature.	