

# SPACE SHUTTLE MISSIONS SUMMARY

| FLT NO.   | ORBITER  | CREW<br>(10) 7 UP, 8 DOWN   | LAUNCH SITE,<br>LIFTOFF TIME,<br>LANDING SITES,<br>ABORT TIMES                                      | LANDING SITE/<br>RUNWAY,<br>CROSSRANGE<br>LANDING TIMES<br>FLT DURATION,<br>WINDS | SSME-TL<br>NOM-ABORT<br>EMERG<br>THROTTLE<br>PROFILE<br>ENG. S.N.   | SRB<br>RSRM<br>AND<br>ET   | ORBIT         |   | FSW          | PAYLOAD<br>WEIGHTS,<br>PAYLOADS/<br>EXPERIMENTS   | MISSION HIGHLIGHTS<br>(LAUNCH SCRUBS/DELAYS,<br>TAL WEATHER, ASCENT I-LOADS,<br>FIRSTS, SIGNIFICANT ANOMALIES, ETC.)   |  |  |
|---|--|---|---|---|---|--|---------------|---|--------------|---|--|--|--|
|   |  | TITLE, NAMES<br>& EVA'S   |   |   |   |  | INC           | HA/HP   |              |   |  |  |  |
| <b>STS-71</b><br><br>SEQ<br>FLT #69<br><br>KSC-69<br><br>PAD<br>39A-42<br><br>MLP-3 | OV-104<br>(Flight 14)<br>Atlantis<br><br>Spacelab-Mir<br>LM-11<br><br>17th<br>Spacelab<br>Flight<br><br>OMS PODS:<br>LPO3-18<br>RPO4-14<br>FRC4-14 | CDR:<br>Robert L. (Hoot) Gibson<br>(Flt 5 - STS-41-B,<br>STS 61-C, STS-27,<br>STS-47)<br>P385/R30/V27/M29 | KSC 39A<br>178:19:32:18.95Z<br>3:32:19 PM EDT (P)<br>3:32:19 PM EDT (A)<br>Tuesday 9<br>6/27/95 (7) | KSC 15 (KSC 23)<br>188:14:54:35Z<br>10:54:35 AM EDT<br><br>Friday 8<br>7/7/95 (6) | 104/104/<br>109%<br><br>PREDICTED:<br>100/104/104/<br>68/104<br><br>ACTUAL:<br>100/104/104/<br>68/104<br><br>SSME S/N:<br>1 = 2028 (10)<br>2 = 2034 (6)<br>3 = 2032 (3) | BI-072<br><br>RSRM<br>45<br><br>ET-70<br><br>LWT<br>63<br><br>ET<br>RPT<br>271.3K<br><br>ET<br>BR/UP<br>214K<br><br>ET<br>IMPACT<br>1:26:57<br>MET<br>LAT:<br>0.08°S<br>LONG:<br>125.4°W | 51.63°<br>(2) | DIRECT<br>INSERTION<br><br>POST OMS-2:<br>159.5 x 85.2<br>NM<br><br>DOCKING<br>CAPTURE:<br>1/17:27:57 MET<br><br>HARD MATE:<br>1/17:35:54 MET<br><br>SHUTTLE<br>HATCH OPEN:<br>1/19:28:56 MET<br><br>HAND SHAKE:<br>1/19:28:56 MET<br><br>SOYOZ<br>UNDOCKING:<br>6/15:32:34 MET | OI-24<br>(1) | CARGO:<br>26577 LBS<br><br>PAYLOAD<br>CHARGEABLE:<br>17941 LBS<br><br>DEPLOYED:<br>0 LBS<br><br>NON-DEPLOYED:<br>17251 LBS<br><br>MIDDECK:<br>690 LBS<br><br>SHUTTLE<br>ACCUMULATED<br>WEIGHTS:<br>DEPLOYED:<br>766624 LBS<br>NON-DEPLOYED:<br>966595 LBS<br>CARGO TOTAL:<br>2062963 LBS<br><br>PERFORMANCE<br>MARGINS (LBS):<br>FPR: 3775<br>FUEL BIAS: 1136<br>FINAL TDDP: 1040<br>RECON: 1398<br><br>PAYLOADS:<br>PLB:<br>SHUTTLE-MIR<br>MISSION 1<br>SL-M/LM<br>ODS<br><br>MIDDECK:<br>IMAX, SAREX-II<br><br>5 CRYO TK SETS<br><br>NO RMS | KSC W/D: OPF 115, VAB 6, PAD 44 = 165 days total.<br><br>LAUNCH POSTPONEMENTS:<br>- Baselined 5/30/95 as launch date on 10/21/93.<br>- Changed launch date to 5/24/95 on 9/1/94.<br>- Postponed launch date to NET 6/19/95 due to delays in SPECKTR launch. STS-70 was moved ahead of STS-71.<br>- Postponed launch date to NET 6/22/95 due to Mir EVA's to allow time to configure Mir docking ports and solar arrays.<br>- Postponed launch date to NET 6/23/95 (docking on FD4 would be same date as 6/24/95 launch with docking on FD3).<br><br>LAUNCH SCRUBS:<br>- Scrubbed 6/23/95 launch at T-6.25 hours when tanking window ran out. Tanking violation of lightning within 5 miles.<br>- Scrubbed 6/24/95 launch at L-44 mins while holding at T-9 minutes due to ceiling violations, rain, and thunderstorms in KSC area.<br><br>LAUNCH DELAYS: None<br><br>TAL WX:<br>- ZZA (prime) was forecast NO GO for ceiling and thunderstorms within 20 nm. MRN (selected) and BEN were both forecast and observed GO.<br><br>DOLILU/I-LOADS:<br>- Selected and uplinked, DOLILU uplink #14, I-load uplink #20, last use of DOLILU I-load.<br><br>FLIGHT DURATION CHANGES: None<br><br>FIRSTS/SPECIAL EVENTS:<br>- Lowest perigee of all space shuttle flights of 85 nm (phasing maneuver) achieved during initial orbit.<br>- Smallest OMS Delta V of all space shuttle OMS-2 burns of 75.5 FPS.<br>- First permanent transfer of Russian/American crews (Mir-19 up and Mir-18 crew down on Atlantis - 7 up, 8 down.<br>- Carried up orbiter docking system and attached to Mir.<br><br>EVENTS:<br>- Thagard lifted off from Baikonur Cosmodrome in Kazakhstan on March 14, 1995, at 9:11:00 AM local time (73:06:11:00Z).<br>- Total Soyuz/Mir time for Thagard 107:09:57:18, total flight time 115:08:43:35.<br>- Mir/Shuttle capture at 180:13:00:14Z, docking complete at 180:13:08:18Z.<br>- Crews transfer time at 180:16:08:18Z (Mir 19 from Atlantis to Mir, and Mir 18 to Atlantis, when seat liners transferred to Atlantis).<br>- Transferred equipment, experiments, 1067 lbm H <sub>2</sub> O, 48 lbm O <sub>2</sub> , and 87 lbm N <sub>2</sub> to Mir.<br>- Undocking completed at 185:11:09:42Z. |  |  |
|   |  | Continued . . .   |   | Continued . . .   |   | M 3 EOM:<br><br>WEIGHT:<br>216527 LBS<br><br>X CG:<br>1079.7<br><br>LANDING:<br><br>WEIGHT:<br>216352 LBS<br><br>X CG:<br>1081.3   |               |   |              |   |  |  |  |



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|---------------------|---------|---|---|---|---|--------------------------|-------|-------|-----|---|---|
|                     |         | TITLE, NAMES<br>& EVA'S   |   |   |   |                          | INC   | HA/HP |     |   |   |
| STS-71<br>Continued |         | <p>Continued . . .</p> <p><u>MIR-18 FLIGHT ENGINEER:</u><br/>Gennady Strekalov<br/>P393/R196/M171</p> <p><u>MIR-18 COSMONAUT<br/>RESEARCHER:</u><br/>Norman E. Thagard<br/>(Flt 5 - STS-7, STS 51-B,<br/>STS-30, STS-42)<br/>P394/R20/V14/M19</p> <p>MCC FCR-1 (48)</p> <p><u>FLIGHT DIRECTORS:</u><br/>A/E - N. W. Hale<br/>LD/O 1 - R. E. Castle<br/>O 2 - P. L. Engelauf<br/>PLNG - P. F. Dye<br/>FD Moscow - W. D. Reeves<br/>MOD - A. L. Briscoe</p> | <p>Continued . . .</p> <p><u>MECO CMD:</u><br/>8:30.72    8:31.1</p> <p><u>VI:</u><br/>25876.5    25871</p> <p><u>OMS-2:</u><br/>42:57.2    42:57.2<br/>Delta V    75.5 FPS<br/>TGO        =    00:47</p> | <p>Continued . . .</p> <p><u>OV-104:</u><br/>93:03:49:17</p> <p><u>DISTANCE:</u><br/>4,100,000 sm</p> |   |                          |       |       |     |   | <p>Continued . . .</p> <p><u>RENDEZVOUS #21:</u><br/>- Rendezvous and dock with Russian Mir Space Station (first docking).</p> <p><u>SIGNIFICANT ANOMALIES:</u><br/>- Postflight disassembly of RSRM nozzle joint 3 revealed RTV gas paths with slight heat effect and erosion to primary O-rings of STS-71 LH RSRM and STS-70 RH RSRM. Technique developed to remove RTV from joint and do a vacuum backfill for STS-69 and STS-73 RSRM's.<br/>- GPC 4 annunciated GPC BITE fault message followed by GPC 4 fail. Determined to be single event upset, GPC 4 was assigned string 4 and used successfully during entry.<br/>- Slow docking module vestibule depress rate.<br/>- H2 manifold valve tank 1 failed open.<br/>- Cryo O2 tank 1 leak through flight cap of fill/drain line QD.<br/>- H2 manifold valve 1 microswitch failure.<br/>- Erratic O2 tank 5 heater temperature.<br/>- VHF system transmit failure.<br/>- PDIP power fail.<br/>- S-band comm string 2 uplink problem.<br/>- RCS jett R2U fail off (low chamber pressure).</p> |