the x and z velocity channels. As a result, the missile impacted about 12 miles short and 0.2 miles right of target.

170. 52F (Tall Tree 4), 23 Mar 63, Response Mode 4, Flight Phase 1: Missile self-destructed at about 91 seconds for unknown reasons. Impact was near the flight line about 120 miles downrange.

171. 65E (Black Buck), 24 Apr 63, Response Mode NA, Flight Phase 2.5: Vernier hydraulic-system pressure was lost at 301 seconds, resulting in loss of vernier-engine control during the vernier solo phase. The reentry vehicle impact point was not perceptibly affected by this malfunction.

176. 139D LV-3A/Agena B (Big Four), 12 Jun 63: Response Mode 4T, Flight Phase 1: Flight appeared normal until about 88.4 seconds when, due to a hydraulic failure, the vehicle made a violent right and down maneuver. The missile broke up five seconds later at 93.4 seconds.

181. 24E (Silver Doll), 26 July 63, Response Mode 4, Flight Phase 2: Spurious voltage transients caused premature pressurization of the vernier solo tanks at 101.3 seconds, and premature sustainer engine shut down just after booster separation at 141 seconds.

187. 63D (Cool Water III), 6 Sep 63, Response Mode 4, Flight Phase 1: All systems performed satisfactorily till 110 seconds, when the sustainer/vernier hydraulic pressure dropped from 3080 to 490 psig. The failure resulted in premature shutdown of the sustainer engine at 136 seconds. Booster-engine cutoff occurred normally at 140.3 seconds, and the booster was successfully jettisoned. The impact point occurred about 620 miles downrange.

188. 84D (Cool Water IV), 11 Sep 63, Response Mode 4T, Flight Phase 2.5: Flight seemed normal through SECO, although the pneumatic precharge to the vernier solo accumulator was lost at 96.6 seconds. Due to this failure, missile stability was lost near the start of the vernier solo phase. The R/V probably failed to separate.

189. 71E (Filter Tip), 25 Sep 63, Response Mode 4T, Flight Phase 2: Visual observers reported a boat-tail fire, radical oscillations in yaw, and rough running booster and sustainer engines. Failure of the sustainer hydraulic system during the staging sequence resulted in loss of missile stability at 140 seconds. Sustainer and vernier engines shut down at about 267 seconds with the impact point about 600 miles downrange.

190. 45F (Hot Rum), 3 Oct 63, Response Mode 1, Flight Phase 1: The B-1 booster-engine fuel valve failed to open during the start sequence, so the engine did not ignite. Missile toppled over and exploded.