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Flying snake flight is a unique form of locomotion, in which the functional 'wing' oscillates from side to side relative to the direction of forward travel. The kinematics and body posture changes of the snake's aerial descent are central to the ultimate goal of understanding its aerodynamics. Methods of photogrammetry were used in a novel fashion to obtain the three-dimensional coordinates of the head, midpoint, and vent throughout the glide trajectory to a precision of 1-4 cm. Twenty-two flying snakes *Chrysopelea paradisi* were videotaped in Singapore gliding from the top of a ten meter tower to a grassy field below. Two digital videocameras recorded the descent in stereo from the top of the tower; a third was placed orthogonally on the ground for increased precision. ERDAS Imagine with Orthobase, a commercial photogrammetry software package, was used to reconstruct the 3D coordinates. Body posture, glide angle, velocity, and acceleration were quantified. Glide paths were found to be similar to those of other vertebrate gliders–after a J-loop takeoff, the snake falls through a ballistic dive, building speed and lift until glide equilibrium is achieved, with final glide angles reaching as little as 17 degrees. In a typical glide at equilibrium, the snake (SVL 54 cm, mass 18 g) undulates at a frequency of 1.4 Hz and amplitude of 23% snout-vent length, with a forward speed of 6.8 m/s, falling speed of 3.0 m/s, and glide angle of 25 degrees. The body is approximately parallel with the ground, yielding an angle of attack of 25 degrees. Within *C. paradisi*, smaller snakes generally achieve lower glide angles and glide farther than larger snakes. Supported by National Geographic grant 6772-00 to JS.