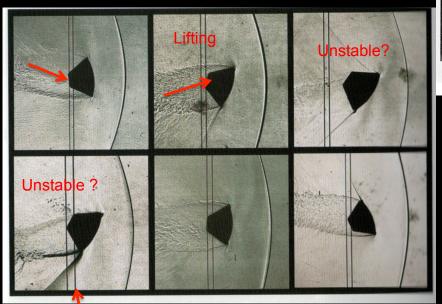
Two of the Computers Who Analyzed the Ballistic Test Images





Measure angles and positions to determine oscillation frequency of the vehicle and its lift and drag coefficients. Lift and drag values used by the astronauts to direct the spacecraft to the desired landing spot.

Note: fiducial grids used to determine positions, scales, and angles

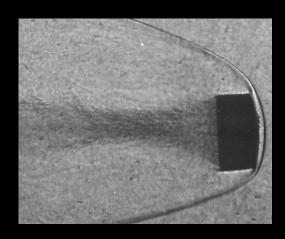
Design of a Light-gas Gun Needed to Propel Models to 25,000 mph

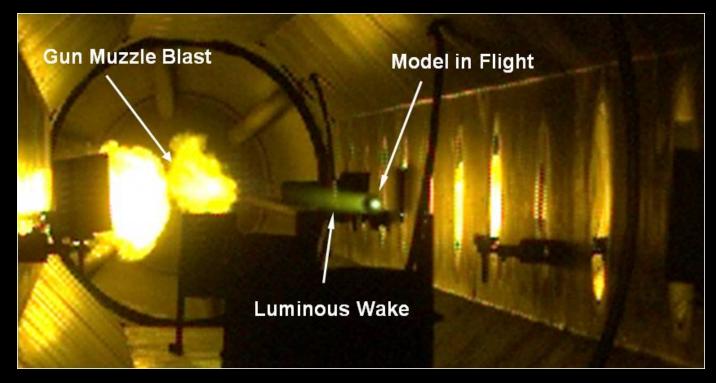
Massive high-pressure steel coupling capable of withstanding 30,000 psi pressure Compressed hydrogen High-pressure gas from gun powder explosion Driver tube Gun barrel liner Heat shield test model Steel diaphragm fails at 30,000 psi Hollow-nose plastic piston (deformable)

Hollow cone coupling to be filled with deformable piston to compress the hydrogen gas to 30,000 psi (~ 10 inch diameter, 12 inches long)

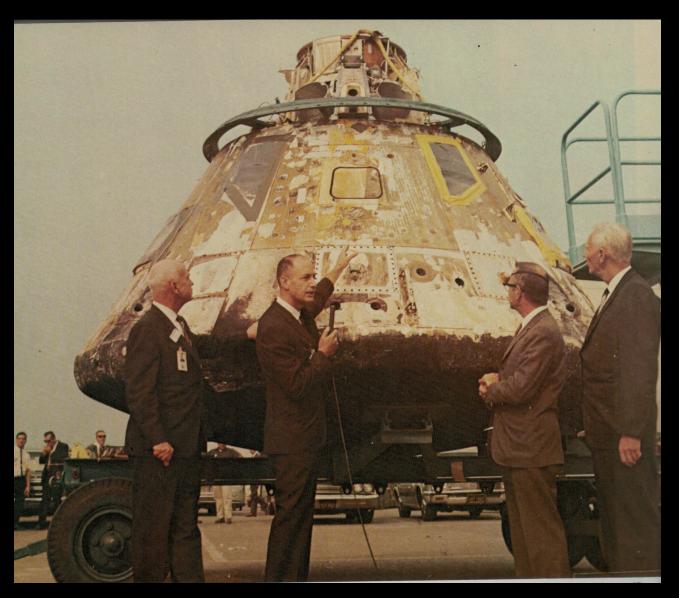
VIEW INSIDE THE TEST CHAMBER

Heat shield candidate traveling at escape speed





Apollo Heat Shield After Atmospheric Entry at 25,000mph





One small contribution from a worker bee, One giant step for humankind.



NASA Lunar Sample 15498 OptoMechEngineer 7/12/2017