

Superfluid Helium Zero-gravity Test Facility. P. v. Mason and R. Chave, NASA Jet Propulsion Laboratory. Experiments in zero-gravity aircraft are performed as stand-alone experiments yielding worthwhile scientific data or in preparation for longer rocket or space flights. Up to 20 seconds in a 10 mgee environment, or 10 seconds in a 0.1 mg can be achieved.

We describe a facility to perform zero-gravity experiments requiring temperatures in the superfluid helium range (1.5 to 2.2 K) with visible access. The system consists of a float package and an instrumentation rack. The float package contains a liquid helium cryostat, a surrounding liquid nitrogen bath, a vacuum pump to maintain the helium in the superfluid state, valve manifold, instrumentation and a video camera recorder. The instrumentation rack contains power supplies, sensor drivers and read-outs, a computer-based data gathering system, and a video display.

The helium cryostat is 3-1/2" in diameter and 2" deep. Windows provide visual access to the entire interior of the cryostat. GRT sensors and a pressure gauge define the state of the cryostat. A three-axis accelerometer senses accelerations to 0.1 mg. Additional instrumentation can be provided.