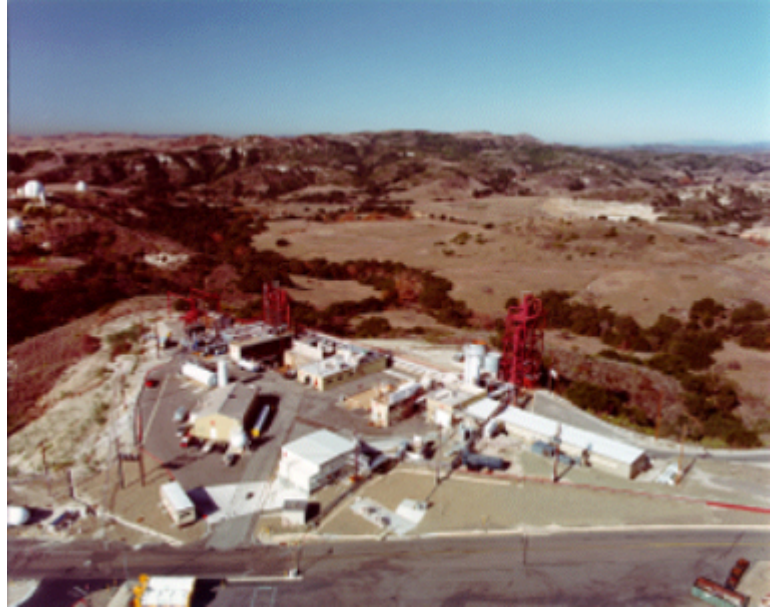


High Energy Propellant Test Stand (HEPTS)

The HEPTS complex is a versatile test area that is available for component development testing of rocket engines, thrusters, gas generators, lasers and other combustion devices. Built in the mid 1960's, the HEPTS complex is an active test area that has been upgraded and modified many times over the four decades since its construction. The facility has the capability to deliver high flow propellants at high pressures. HEPTS is equipped to supply a wide range of exotic reactants in gaseous, liquid and gel forms.

The HEPTS facility is divided into two areas with the HEPTS Control Center (HCC) positioned in the middle. The "A-side" is primarily used for rocket and propulsion testing while the "B-side" is used for testing both rockets and lasers. The facility has nine test cells capable of accommodating multiple programs and activities simultaneously.



The HEPTS facility has data acquisition and control systems (DA&C), which have high capacities in data rate, data storage, and number of channels. The HEPTS Control Center has two A-side test consoles and two B-side test consoles and can accommodate simultaneous testing in multiple test positions.

The A-side has several atmospheric and sea level test positions. Most test positions are equipped with thrust mounts for measuring engine performance. The B-side has one rocket test position, two laser test positions and a gas generator test position. All test positions are covered for protection from the environment.

The HEPTS facility features several vacuum pumping systems, which can provide a high altitude pressure environment (up to 100,000 feet) in various test cells. Depending upon test requirements, vacuum support can be provided by: a mechanically pumped vacuum ullage system, a multi-configuration three-stage intercondensing steam driven ejector system, and a four-stage intercondensing steam driven ejector system. Most configurations of steam ejector operation at HEPTS are sustainable by a bank (2,700 HP total) of locally operated propane fired tube boilers. In configurations where additional steam supply is needed, connectivity with a stored-steam blowdown system at the nearby VETS facility can be employed to supplement.

In addition to the specific reactants available in each test cell, gaseous nitrogen, liquid nitrogen, gaseous helium, cooling water, and de-ionized water are also available in every test cell for pressurization, purging, cooling, and flushing.



HEPTS A-1 Test Cell



HEPTS B-1 Test Cell

HEPTS A-Side

The HEPTS A-Side consists of five test positions. The A-1 test cell is a vertical, sea level test configuration, the A-1A, A-2A, and A-4 test positions are horizontal, altitude test configurations. The A-7 test position is a vertical, altitude test configuration.

HEPTS B-Side

The HEPTS B-Side consists of four test positions. The B-1 test cell is a vertical, sea level rocket engine test position. Cells B-3B and B-5 are horizontal vacuum positions used for chemical laser development and testing. The B-3C test position is used for sea level gas generator development and testing.



HEPTS Control Center

HEPTS Capabilities Breakdown

Cell	Reactants	Thrust	Feed Pressure	Altitude/ Sea level	Comments
A-SIDE					
A1A	N ₂ H ₄ /N ₂ O ₄	0-30 lbf	1200/2000 psi	Altitude	Propulsion
A1	MMH/IRFNA (neat/gels)	5000 lbf	<6000 psi	Sea Level	Propulsion
A2A	N ₂ H ₄ , MMH / N ₂ O ₄ , LO ₂	N/A (200 lbf)	<1400 psi	Altitude	Propulsion
A4	N ₂ H ₄ , MMH / N ₂ O ₄	100 or 200 lbf	<1200 psi	Altitude	Propulsion
A7	N/A	1000 lbf	N/A	Altitude	Propulsion
B-SIDE					
B1	GH ₂ , HC _{liq} / GO ₂ , LO ₂	N/A (2000-3000) lbf	<2450 psi	Sea Level	Propulsion
B3B	H ₂ , D ₂ / F ₂ , NF ₃ , C ₂ H ₄	N/A	<2200 psi	Altitude	Laser
B3C	H ₂ O ₂	N/A	1200 psi	Altitude	Gas Generator
B5	H ₂ , D ₂ / F ₂ , NF ₃ , C ₂ H ₄	N/A	<2200 psi	Altitude	Laser