

MESA building provides alternatives to field tests

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Rising from the desert floor, looking hugely out of proportion compared to surrounding low-lying structures, the Missile Engagement Simulation Arena building is part of the Wunderlich Laboratory at China Lake

Built in the early 1990's, the multi-use facility houses a 405' L x 150' W x 90' H bay primarily used for testing real size targets in a manner that authentically reproduces engagements in flight, providing an alternative to field tests. MESA has proven useful to many other organizations and departments, including Elsa Hennings, senior engineer and program manager for Recovery Systems Engineering, who tested parachute systems and hardware within its massive interior, for the Navy and NASA applications. Jim Annos, MESA facility lead explains "The MESA facility is being used for various projects other than engagements due to its size, controlled environment, and availability. These include blimp lifting capability tests, multi-purpose ATV-based ground robots development and integration, radar cross section measurements of small watercraft, and small UAV quad-rotor aircraft control technology testing."

Two main projects; The Observer, a Tier 1 size unmanned air vehicle and the Interoperable Stabilized Imager for Situational Awareness, were designed by the Navigation and Weapons Concept Development Branch at MESA. Both projects are grand in nature and are a perfect fit for the MESA building.

Due to its sheer size, the MESA facility serves as an upright resolution target – in that it can be viewed at long distances by Intelligence Surveillance Reconnaissance imagery sensors during flight. At one time, the US Air

Force looked into building an Electro-Optic/InfraRed resolution calibrated target, but due to the proximity of the two bases and the ability to share operational air space, pilots from Edwards Air Force base have used the oversized building for years for their airborne assets.

The south face of the facility is painted with an odd, angular black-and-white shape. The unique pattern is actually an optical edge target. Both vertical and horizontal edges appear within the large uniform black and white areas. It is used for measuring Edge Response Function of an Electro-Optic imaging system, by scanning across a black-white edge in an image. As simple as the target seems, it has a total of 12 points on the building that have been, not only named, but recorded with exact latitude, longitude, and elevation coordinates. Although Ridgecrest's elevation is documented at 2,289 feet above sea level, the top southwest corner of the MESA building is recorded at 2,231.13 feet.

Another benefit of the target is that it allows sensors to determine how sharp the thermal transition edge is on the metal siding between the black-and-white painted surface. This information is helpful in measuring the reliability of sensors on specific airborne assets, at various altitudes and ranges.



Photo by Ken Eubank

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A key goal of the IR imaging part of the test is to determine how long the (solar-induced) temperature edge lasts past sunset. This information is used to record the suitability of the target for IR imaging at night and to discover what occurs between the day-to-night transition. The radiometric and thermal imaging survey determines how close conditions (on the day of testing) match the design point of the ISR sensor being tested and to provide data supporting validation of sensor performance models.

MESA is viewed fondly by China Lakers as a gentle giant; it can be seen for miles in every direction. With its multi-use functionality it has ensured its longevity on base and aligns with Weapons Division Commander Rear Adm David Dunaway's vision for a fully integrated capability that enhances our service to the warfighter.