The unique 46th Test Group tries out a wide range of weapons systems over the white sands of southern New Mexico.

Test By Trial

Staff photo by Guy Aceto

Photography by Guy Aceto, Art Director and Paul Kennedy

An AT-38B Talon, equipped with a range telemetry pod hanging from its centerline hardpoint, flies over the desert.

The 46th Test Group at Holloman AFB, N.M., operates world-class aerospace testing facilities, many of which have existed since the 1960s at Holloman and nearby at the Army's White Sands Missile Range. The group, which is part of the 46th Test Wing, headquartered at Eglin AFB, Fla., also oversees all Air Force testing conducted within White Sands.

At right, one of the group's AT-38B aircraft, distinctively painted in a low-visibility, two-tone gray color scheme, prepares for a test sortie. (In the background is a German F-4. The German Air Force has a training unit at Holloman.)

Staff photos by Guy Aceto

The 46th Test Group comprises three test squadrons—the 586th Flight Test Squadron, 746th Test Squadron, and 846th Test Squadron—the Directed Energy Office, and the National Radar Cross Section Test Facility.

The 586th Flight Test Squadron operates AT-38s and a one-of-a-kind, specially modified C-12J aircraft used for evaluating avionics, electronics, and guidance/navigation equipment. The C-12J also flies low-speed photographic support and safety chase sorties. In the future, the aircraft may be fitted with external hardpoints to offer even greater test versatility.

At right, the C-12J launches for a sortie to test the Joint Precision Approach and Landing System (JPALS), a next generation landing system being developed for austere environments.

Staff photos by Guy Aceto

The 586th's Talons (above and right) offer Global Positioning System navigation and precision data recording and telemetry, electronic countermeasures, chaff and flare dispensing, and multiple-format photographic coverage, including helmet-mounted video cameras. The aircraft's rear seat area can be fitted with a rack-mounted equipment kit to provide additional test capabilities.

The squadron conducts most of its flight tests over White Sands, which is clear of all commercial air traffic, making possible full up electronic jamming and live-fire weapons testing.

Photos by Paul Kennedy

Sharing ramp space (far left) at Holloman are QF-4 drones used in various DOD weapons tests. The drones are operated by Det. 1, 82nd Aerial Targets Squadron, of the 53rd Weapons Evaluation Group, Tyndall AFB, Fla.

Pictured at near left is a "target" parked at White Sands.

The 746th Test Squadron is also known as the Central Inertial Guidance Test Facility. It is DOD's center of expertise for testing GPS user equipment; inertial guidance systems for aircraft, missiles, and spacecraft; doppler and stellar-aided inertial navigation systems; and navigation subsystems. Its test and evaluation systems include heavy centrifuges such as the one at right.

The 746th has several specialized laboratories and mobile and fixed antenna test assets. After completing functional and performance evaluations in the labs and field, the squadron works with the 586th Flight Test Squadron for flight testing in dynamic operating environments.

Photos by Paul Kennedy

The 846th Test Squadron runs the world's premier rocket sled at the Holloman High Speed Test Track facility. At left is the 50,788-foot sled track, the longest in the world. On it, test sleds can achieve velocities from subsonic through hypersonic. Full-scale aircraft can be tested at realistic flight velocities. The facility fills the gap between lab investigations and full-scale flight tests. Dubbed DOD's center of expertise for aircraft ejection seat testing, it also tests everything from canopies to munitions to scramjets.

Above and right are "wafers"—that is, huge, reinforced slabs of concrete that serve as the targets for sled tests. The wafers are designed with varying specifications, depending upon individual test parameters.

Photos by Paul Kennedy

Above is a time exposure of a sled test of a hypervelocity kinetic warhead. For this type of event, days of preparation come down to a few brief seconds of excitement, followed by a lengthy evaluation of the results.

At right, the same track tests the ejection seat in USAF's new F/A-22 Raptor. High-speed cameras and recording devices capture these events in spectacular detail.

The highly technical nature of this work makes for exact thinking. Note how precisely the unit measures speed—44 fps (feet per second—on the gag road sign below.

46TG photos

At left, high-speed cameras catch a 192-pound Missile Defense Agency payload traveling at 6,416 mph, a new land speed record. The April 30, 2003, test validated the track's hypersonic upgrades and broke its 1982 record of Mach 8.1 for travel on rails.

Exacting tests require equipment made to exacting standards. This often means that the engineers of the 46th Test Group have to fabricate necessary components themselves. True craftsmen, the engineers build the test sleds and even some of the payloads, often from scratch. At right is one of the group's huge milling machines, and, below that, a welder puts the finishing touches on a component for an upcoming test.

The group has a large civilian component. It currently consists of some 90 military, 240 civilian, and 160 contractor personnel—two-thirds of whom are scientists, engineers, and technicians.

Photos by Paul Kennedy

At left, a technician photographs a completed test sled being readied for a hypersonic test.

The Directed Energy Office coordinates the Air Force's directed energy testing on White Sands Missile Range, making use of two high-altitude test sites—North Oscura Peak and Salinas Peak. The office works with the Air Force Research Lab's Directed Energy Directorate at Kirtland AFB, N.M., on test and evaluation of the Air Force's new YAL-1A Airborne Laser.

At right is AFRL's facility on North Oscura Peak.

Staff photos by Guy Aceto

The National Radar Cross Section Test Facility (NRTF) is where DOD first proved that stealth technology worked. NRTF, which has been in operation since 1963, is located at White Sands. It has two complementary outdoor static radar signature measurement ranges, each offering one-of-a-kind capabilities. NRTF is the only facility in DOD capable of making such tests on full-size aircraft. It is government-owned and contractor-operated.

Pictured above, an AT-38B passes by an NRTF structure, housing a 50-foot pylon and gantry crane.

Photos by Paul Kennedy

The 46th Test Group offers a wide variety of capabilities, from indoor evaluations to actual flight checks. The group's goal is to provide accurate tests of the most advanced equipment in the world to ensure the Air Force stays ahead of global threats. n