

SEEING GREEN: AH-64D THERMAL NIGHT VISION SENSOR RESOLUTION FLIGHT TESTING

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ABSTRACT

The second-generation thermal night vision sensors of the AH-64D Apache attack helicopter are elements of the Modernized-Target Acquisition Designation Sight (M-TADS) and the Modernized-Pilot's Night Vision Sensor (M-PNVS). Unlike the aircraft's original sensor suite, these modernized FLIR sensors are software-driven. Shortly after the start of the M-TADS/PNVS unit fielding, a software update was issued. Because the software update did not contain any changes that should have affected sensor resolution, no FLIR resolution flight testing was conducted as part of the software qualification testing. However, early reports from a U.S. Army Apache unit identified a possible reduction in FLIR resolution with the new software. Subsequent testing revealed that there was indeed an unexplained reduction in the system resolution. As a consequence, subsequent sensor software update testing has included thermal sensor resolution flight testing. The resolution testing is in the form of Field Equivalent Bar Target (FEBT) test flights. The FEBT panels are temperature controlled 4-bar vertical and horizontal targets of specific spatial frequencies. In order to maintain a constant apparent spatial frequency of the targets as seen by the observer, each target "run-in" must be flown on a flight path and altitude that maintains a normal orientation to the target panels. This requires low speed level flight runs on a repeatable flight path co-altitude with the target panels. Furthermore, the sensor

(mounted on the nose of the AH-64D) must remain level in order to maintain the vertical and horizontal orientation of the respective bar targets. The observer marks the point at which the bars "break-out" as distinct and separate bars. Until recently, AH-64D FEBT testing was conducted only at the Cibola Range complex at the Yuma Proving Ground (YPG), Arizona. The targets are placed close to the ground which precludes flying co-altitude with the target panels and requires the flight test crew to fly close to the ground. Furthermore, several adverse environmental conditions often make effective resolution testing at YPG difficult and time consuming. In an effort to improve FEBT testing in general, the U.S. Army Aviation Flight Test Directorate (AFTD) has designed, produced, and validated the use of a portable FEBT apparatus. The target panels are mounted on an erectable tower secured to a power unit/trailer. When mounted on top of a hilltop or small mountain, the apparatus allows for safe co-altitude level flight test runs. Testing to-date has revealed that this new target apparatus will be an invaluable tool for early, home-station, thermal night vision sensor resolution flight testing.