SPECIAL FOCUS TRAINING

The New Aerial Weapon Scoring Systems

(Not your father's AWSS)

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The Aerial Weapon Scoring System (AWSS) is the Army standard for scoring aviation gunnery. It is comprised of a radar-based bullet scoring system, an acoustic rocket scoring system, and a laser accuracy scoring system. The system scores crew qualification and provides crew performance printouts and a commander's report.

AWSS is managed by the Program Manager for Instrumentation, Targets and Threat Simulation (PM ITTS).

AWSS Scoring Components

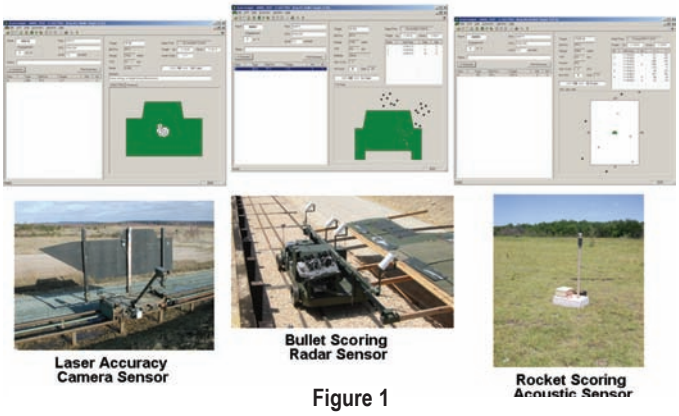


Figure 1

Background

In 1991, the Army fielded three AWSS to provide objective scoring for helicopter gunnery. This was required because existing target hit sensors could not score several aviation weapon engagement standards.

These systems exposed crew accuracy shortfalls particularly in the arena of rocket engagements.

Rocket accuracy data was used to justify increasing and maintaining training rocket resources. Also, 30mm accuracy issues were identified.

This ultimately led to task condition standard adjustment for 30mm engagements. These systems added much but were not without shortcomings. While bullet scoring worked well, rocket scoring was problematic.

The rocket impact acoustic sensors were temperamental and had significant problems discerning rocket "bow wave" from impact signature at given ranges.

Rocket Bow Wave Illustration

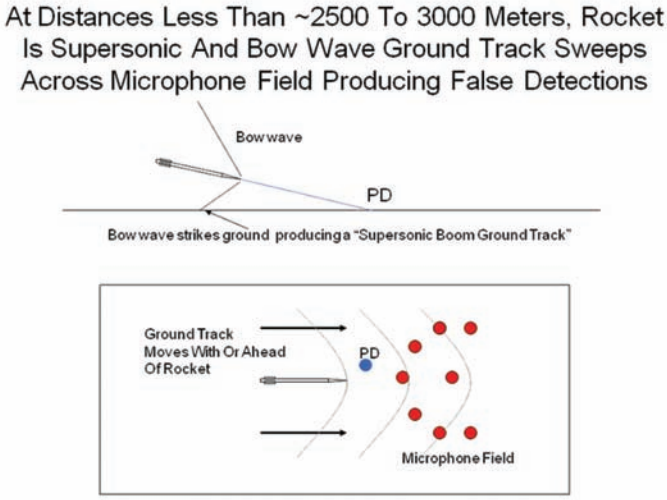


Figure 2

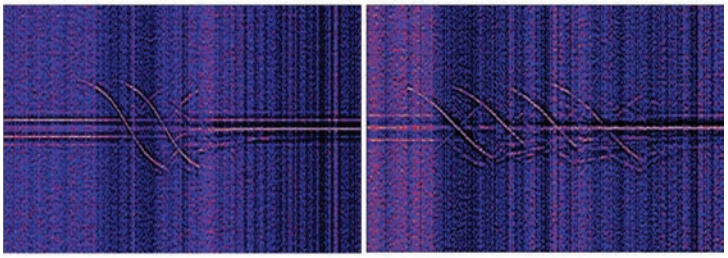
Even though bullet scoring was accurate, crews began to mistrust the system when they felt they were achieving hits that were not being scored. In most cases this discrepancy is a result of crew/grader vantage point to the target area. In many cases crews thought they were "all over" the target when in fact they were hitting just short of the scored area. Many trips downrange confirmed this phenomenon.

A huge factor in mitigating system shortfalls was the exceptional performance of the support teams that accompany the system. In many cases post-event critiques found issues with the system but support personnel consistently received high marks for on the spot "work-arounds" and doing their best to maximize system performance.

The Program Manager for Field Operations (PM Field OPs) has done an outstanding job managing and resourcing these teams and continues to do so today.

Due to system challenges, a new Operational Requirements Document (ORD) was developed and published May 1995 and ultimately six new systems were fielded between 2005 and 2006; four at Killeen, Texas, one in Germany, and one in Korea.

Raw Radar Rocket Scoring Output



Engagement with Pair of Rockets

Rapid Rocket Engagement with Four Rockets

Figure 3

These systems provided substantial capability improvements (i.e., better rocket scoring for hovering engagements, better / faster processing), but additional requirements were emerging.

Army Aviation had begun to employ running and diving fire as a primary weapons engagement tactics, techniques and procedure (TTP) and the 2003 Helicopter Gunnery Manual included task, condition and standards for diving fire.

Rocket engagements were being made at much closer ranges and the six new systems were not up to the task.

Shortfalls were identified in the April 2005 Operational Needs Statement (ONS) submitted by the 4th Cbt. Avn. Bde. (CAB). The TRADOC Capability Manager for Live Training (TCM-L) presented system shortfalls at the August 05 Army Requirements Review Board (AR2B).

As a result, TCM-L teamed with the USAACE Gunnery Branch and PM ITTS to provide effective contemporary operating environment (COE)-based scoring capabilities.

We determined that the most expeditious method was to improve the fielded system (developing and funding a new system could take a decade).

A "blocked capability" approach was adopted and resources were programmed.

The first chore was to fix rocket scoring. Data was collected at Fort Rucker by leveraging daily gunnery training and range support. With minor adjustments, it was determined AWSS could score short range single rocket engagements down to 300 meters with no additional components.

While this was a great success there were still problems.

The system had challenges scoring rapid rocket engagements and diving fire with "pairs" of rockets fired simultaneously. Attacking this challenge was pushed to the "Block III" effort. Next, "out of the box" methods were evaluated to further increase scoring capability.

The Apache Aviation Tactical Engagement Scoring System (AV TESS) was leveraged to economically enhance scoring by providing platform data to AWSS. This resulted in improved captive Hellfire engagement scoring by negating the requirement for a crew "shot" call at trigger pull.

Ultimately critical 4th CAB ONS issues were addressed within 24 months. Remaining issues continue to be addressed.

Current Actions

Block III AWSS efforts are ongoing to further exploit AV TESS output to enhance scoring capabilities.

To solve remaining rocket scoring challenges, TCM-L and the Gunnery Branch are working with PM ITTS to develop radar scoring components that will be added to the system.

PM ITTS coordinated a successful data capture event in March 2010 by leveraging Fort Rucker training aircraft and ranges with great support provided by the 110th Avn. Bde. and range control.

This method of data capture continues to achieve substantial cost avoidance while gathering the required data.

The radar components scored rapid rocket and pair engagements with an accuracy of 2 meters.

The fielding intent is to initially provide one radar rocket scoring system to each AWSS and move toward the appropriate mix of sensors through attrition (i.e., replace damaged acoustic components with radar).

During the data capture event flechette rockets were fired to evaluate bullet scoring component potential to score M255 flechette engagements.

While this was non-conclusive due to sensor placement, much was learned about flechette expulsion ranges (See the April 10 Tactics Newsletter for more information).

Additionally, TCM-L and the Gunnery Branch are teaming to develop a commander's report that will truly indicate a unit's gunnery performance, identify training deficiencies and highlight problematic engagements.

Unit commander's reports will be rolled into an Army-wide picture that can be used by the Gunnery Branch to validate training and resource requirements.

The Gunnery Branch will establish a data base with this empirical data that will provide training need insights, help determine the particular ammunition resources that are needed and identify the areas where Army-wide training focus needs to occur.

Finally, units have begun to use AWSS to score door gunnery to provide objective scoring of critical gunnery skills, a need specifically identified in the 1995 AWSS ORD.

TCM-L is working with PM Field OPS to ensure appropriate resource requirements are captured and programmed to support this requirement.

The Future of AWSS

AWSS will be integrated into the Digital Range Training System (DRTS). The objective is to utilize AWSS components and software to provide an integrated scoring capability on the Digital Air Ground Integration Range (DAGIR).

Scoring components will be applied in a "plug and play" methodology at individual target pits and rocket targets

Improved Commander's Report Samples

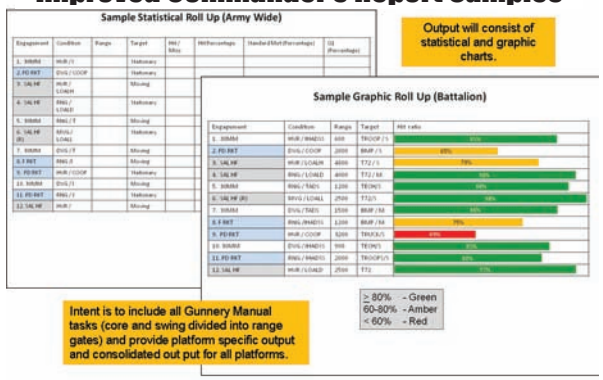


Figure 4

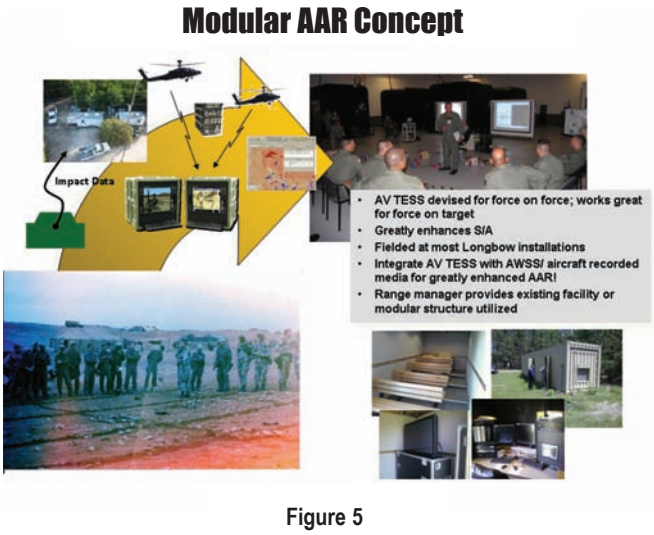


Figure 5

with results being transmitted up range via range fiber and integrated into a comprehensive after action review (AAR).

A modular AAR is also being developed for use at non-digital ranges to finally provide an adequate AAR capability by integrating AWSS, AV TESS, and aircraft recorded media output for a composite AAR.

This concept has CG, TRADOC concurrence as indicated in his memorandum approving an Integrated Concept Team which will begin meeting in August of this year.

Obviously the six AWSS systems cannot last forever. With Sustainable Range Program (SRP) manager approval, TCM-L and the Gunnery Branch are beginning efforts on an initial capabilities document (ICD) to define requirements for a new scoring system to accommodate improving technology and AWSS wear/component damage. The objective is to field a new system in 2018.

How Can You Help

Commanders and Master Gunners can help by using the system. FM 3-04.140 specifies AWSS as the standard.

User input is the primary factor that enabled AWSS to mature, improve into the viable system it is today, and adapt to changing requirements. Feed back should highlight AWSS performance (positive and negative), training detractors, and challenges the unit/support team had to work around or were able to overcome.

Ensure deficiencies and positive comments are provided on user surveys, AARs, and Unit Status Reports (USR).

The Gunnery Branch and TCM-L will use this feed back to continue improving the system and set the requirements for the Army's future aviation scoring system.

Only in this way can we take objective scoring capabilities to the next level.

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