Digital sustainment training is critical to increase competencies and gain confidence in our systems. We need to focus on the proper doctrinal and technical application of these systems. Many operators and leaders quickly blame the system whereas training is the deficiency. During a recent digital exercise conducted on Fort Riley, the average mission routing time from sensor to shooter was less than 4 minutes. However, it took the team about 5 hours to configure the database to properly process the missions and route ancillary data. This article outlines our training methodology and leader development to ensure 4 minute processing times are the norm not the exception.

-- Foreword by COL Miles Brown, Commander 2nd Armor Brigade Combat Team, 1st Infantry Division and LTC Jim Collins, Commander 1st Battalion, 7th Field Artillery, 2nd Armored Brigade Combat Team.

In September 2014, 1st Battalion, 7th Field Artillery, 2nd Armored Brigade Combat Team, 1st Infantry Division, completed reorganization in accordance with Army Structure 2014 and began digital sustainment training (DST) in preparation for National Training Center Rotation 15-06. The training objectives were clear, yet complex in execution:

1. Validate the functionality of all systems including their components of end item (COEI). This was critical to assess our digital readiness after the consolidation of all the fire support equipment into the field artillery battalion.\(^1\)

2. Establish a common database to include supplemental software. The database was designed not to enable fire mission processing but to facilitate training objectives by adding complexity to fire mission processing.\(^2\)

3. Build and train on the local area network (LAN), the frequency modulation (FM) network, and other supplemental communication networks in accordance with the unit’s primary, alternate, contingency and emergency (PACE) communication plan.

4. Minimize mission processing “recalculations” in AFATDS at all echelons – understand what is required to analyze target then accept recommendations.

5. Integrate the planning and current operations functions of both AFATDS and the Effects Management Tool (EMT) into TOC operations.

6. Maximize interoperability with other mission command systems\(^3\) using the data distribution server (DDS) and the command and control registry (C2R).

Multi-Echelon Nodal Structure. We estimated, based on the number of hours required to accomplish our training objectives, DST must occur no less than weekly from September 2014 to February 2015. With the Battalion Commander’s emphasis on DST, weekly training was feasible, but due to other competing requirements, it was not realistic to assemble the entire fire support network on such a frequent interval. Therefore, training was separated into three nodes:

1. Fire Support Training: Observer - Task Force Fire Support Elements (FSE) - Brigade FSE.

2. Tactical Fire Direction: Brigade FSE - Battalion Fire Direction Center (FDC).

3. Technical Fire Direction: Battalion FDC - Platoon FDCs - M109A6 Paladin

We assumed risk by executing de-centralized DST but this was required to efficiently target specific training objectives at echelon. Initially, these weekly sessions were very simplistic until we could train the

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1 Ruggedized Handheld Computer V2 (RHC2), Pocket-sized Forward Entry Device (PFED), Stand-alone Computer Unit (SCU) and Fire Support Advanced Field Artillery Tactical Data System (AFATDS).

2 Examples include: FOS with Precision Strike Software/DPDDB, AFATDS guidelines, mission prioritization, fire support coordination measures, data distribution, differing ammunition on hand by unit.

3 Command Post of the Future (CPoF), Tactical Airspace Integration System (TAIS), Force XXI Battle Command Brigade-and-Below Joint Capabilities Release (FBCB2 JCR), and Distributed Common Ground System – Army (DCGS-A)

Continued on Page 8, see Dagger DTS
core group of leaders to understand how to properly structure the weekly training in accordance with the eight step training model and increase technical digital system expertise within each section.

Leader Development. The leader training program was executed concurrently with nodal training to allow the leaders to gain experience, but more importantly confidence, on their systems. This training was done without the system operators – only the company grade officers. The leaders quickly realized that an increased understanding of these digital systems was required to properly train and supervise their sections.

The training focused on three fundamentals:
1. how the system processed data;
2. when errors occur, “why”; and
3. refining the digital standard operating procedures (SOP). The knowledge gained, specifically regarding the integration of plans and current operations on AFATDS, the use of coordination requests, and utilization of continuity of operations (CONOPS) was critical to ensure we were using AFATDS properly and eliminating work-arounds.

LAN vs. FM

Periodically during the nodal training and leader training program, multiple nodes would assemble for collective training. This was critical to ensure each node understood how the actions of one system effects the rest of the network. The use of a LAN focused the training on communication between systems and database management. Five to seven feet of separation between systems created a controlled environment where personnel benefitted from their colleague’s knowledge and facilitated group learning. Training on a LAN connection is ideal for troubleshooting, establishing standards across the network, and the validation of SOP. However, under very few circumstances will the tactical network be completely LAN; training must be balanced between the LAN and FM network.

We established the FM digital network in the combat vehicles: M3A3 BFIST, M1068, and M109A6 Paladin.

The FM network is ideal to verify the functionality of system hardware and exercise crew drills. The FM network in combat vehicles introduced new challenges such as network saturation, range issues, and maintenance. Additionally, sections were able to train crew drills, such as howitzer tracking charts, analog graphics, ammunition trackers, intervening crests, and records of fire (DA Form 4504/4513). The FM network allows the training to be more tactically oriented and easily applied to field or combat scenarios. In December 2014, the above mentioned training objectives were complete and we transitioned to collective, scenario-based DST.

Scenario Based Training

Scenario-based training integrates all nodes with collective training objectives into short, intense sessions where shortfalls can be identified, corrected, and applied throughout multiple iterations in a single day. The Brigade FSO and Battalion FDO, working collaboratively with the Brigade FSCOORD, facilitated the training event by introducing friction points and injects targeting specific training objectives. Scenario based training is the best way to stress each of the nodes and replicate combat operations. Each node had separate training objectives that fit into the network as a whole. For example, to train the employment of precision munitions, observers trained on using Digital Precision Strike Suite software to mensurate target grids, FSEs conducted basic weaponeering, the Battalion FDC conducted tactical fire direction, and Platoon FDCs conducted technical fire direction with GPS guided munitions. Scenarios built confidence and competence on the digital systems and allowed for the evolution of DST to more advanced training objectives.

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6 We utilized movement to contact scenarios, with each unit established in an initial position and their movement triggered by maneuver actions, controlled by the Brigade Fire Support Officer (FSO) or the Brigade Fire Support Coordinator (FSCOORD). Observers executed missions in conjunction with planned targets as they are triggered. Platoon FDCs maneuver throughout the Position Areas for Artillery (PAA) and manage ammunition while executing fire missions. Each session lasted 30-45 minutes with a hotwash at the end, allowing for assessments to be applied to the next iteration.

7 1-7 FA defined advanced training as the incorporation of simulations, integration of additional communication platforms, and the inclusion of advanced ABCS.
DFSTS
The utilization of the Digital Fire Support Training System (DFSTS) added realism to the training. DFSTS can replicate firing units, sensors, adjacent units and higher headquarters. We programmed DFSTS with scenarios to saturate the Brigade FSE with numerous data injects focused on mission prioritization and fire support coordination measures (FSCM) management. Additionally, the DFSTS was used to replicate 18 Paladins when their participation wasn’t feasible (LAN environment). The simulated howitzers added realism by sending mission status updates through the network from shooter to sensor.

Communication Platforms
The utilization of high frequency (HF) radios increases our ability to communicate at echelon and expands the PACE beyond the FM and LAN networks. Confidence gained in operating the FM network can be applied to HF radios. The HF digital capability expanded the range of communication beyond 100+ kilometers. We successfully exchanged data using AFATDS between Fort Riley and Fort Sill.

Internal Fires Systems Expansion
AFATDS interfaces with the EMT and Computer Meteorological Data-Profiler (CMD-P) - both provide unique capabilities. The functions of the EMT vary but we focused our training on synchronization of current operations, the planning of subsequent operations, and as part of the airspace clearance drill. Of course, the CMD-P is required to obtain metrological data to meet the 5 requirements for accurate fire. Once the core competencies in the internal fires network had been established, external systems were introduced into the DST program.

External Fires Systems Expansion
The integration of TAIS, CPOF, and DCGS-A using the DDS and C2R servers is necessary to establish a common operating picture. These systems are critical for planning, collaboration, airspace clearance and battle damage assessment (BDA) reporting throughout the brigade. Since this expanded DST requires assets that are not organic to the field artillery battalion, they must be integrated into events where the brigade establishes their ABCS and network. We utilized the Mission Command System Integration (MCSI) and Command Post Exercises (CPX).

Lessons Learned
1. Guidance Workspace. Proper management of the data within guidance workspace is critical to eliminate work-arounds. Both the Brigade FSO and Battalion FDO need to understand the algorithm that determines mission value and closely manage the cannon attack methods to ensure the munition allocation provides an executable firing solution that meets the commander’s intent for fires.

2. Data Distribution. The automated distribution of data expedited the sharing of the common operating picture across all fire support systems. Understanding what units require specific information is key to establishing a system’s distribution lists; however, the data distributed is not always all-encompassing. Certain key geometries and data are not automatically distributed across the network and this must be understood to ensure the common operating picture is maintained (e.g. the coordinated firing line (CFL)).

3. AFATDS Planning Function. AFATDS has both current operations and planning capabilities. We were familiar with current operations but lacked knowledge on the proper utilization of the planning function. In accordance with the MTOE allocation we attempted to maximize both; the Brigade FSE tried to conduct collaborative planning by developing multi-phase courses of action and publishing fire support products across the fires network through the Text Index. However, during our training, we were mostly unsuccessful. The transfer of the plans to current routinely corrupted the database and proved impractical. Instead, the Brigade FSE utilized its plans AFATDS to disseminate changes to current operations (e.g. guidances (HVTs, HPTs, priority of fires, TAIs, and cannon attack methods), geometries, and use of field order message formats to publish WARNOs and the Brigade’s Annex D).

Conclusion
Frequent DST is invaluable. Critical, and sometimes
Dagger DTS...Continued from Page 9

painful, friction points that were discovered during our digital training events are easily remedied with a more sophisticated understanding of the database. Every opportunity to train DST in a controlled environment significantly increases efficiency during field exercises. Conditions are set to test the quality of our DST program during the upcoming decisive action rotation of the NTC.

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1 January 1969, The U.S. Army Artillery and Missile School was officially redesignated as the U.S. Army Field Artillery School.

6 January 1776, Alexander Hamilton formed his field artillery battery, called Alexander Hamilton’s battery, that later became 1-5th Field Artillery.

8 January 1869, The site of Fort Sill was staked out by MG Philip H. Sheridan who led a campaign into Indian Territory to stop hostile Native American tribes from raiding white settlements in Texas and Kansas.

15 January 1918, Employing balloons and fixed-wing aircraft, the School for Aerial Observers at Fort Sill was fully operational training aerial observers to locate enemy targets to be engaged with field artillery fire.

23 February 1847, Major General Zachary Taylor’s army of 5,000 effectively employed its field artillery to defeat the much larger Mexican army under Santa Anna at the Battle of Buena Vista. Captain Braxton Bragg’s battery galloped into action at a critical time and successfully repelled a Mexican charge.

24 February 1991, The 42nd, 76th, and 142nd Field Artillery Brigades launched a fiery bombardment to support the breaching operation to start the ground war in Operation Desert Storm. More than 350 field artillery pieces fired 11,000 rounds and 414 MLRS rockets in a field artillery preparation of 30 minutes. Besides crushing Iraqi morale, this massed fire destroyed 50 tanks, 139 armored personnel carriers, and 152 field artillery pieces.

28 February 1991, the Gulf War ended by driving Iraq out of Kuwait. During the 100-hour ground war, the American Field Artillery fired 57,168 rounds. Of that total the Americans shot 32 Army Tactical Missile System (ATACMS) missiles of artillery.