Joint Air Ground Integration

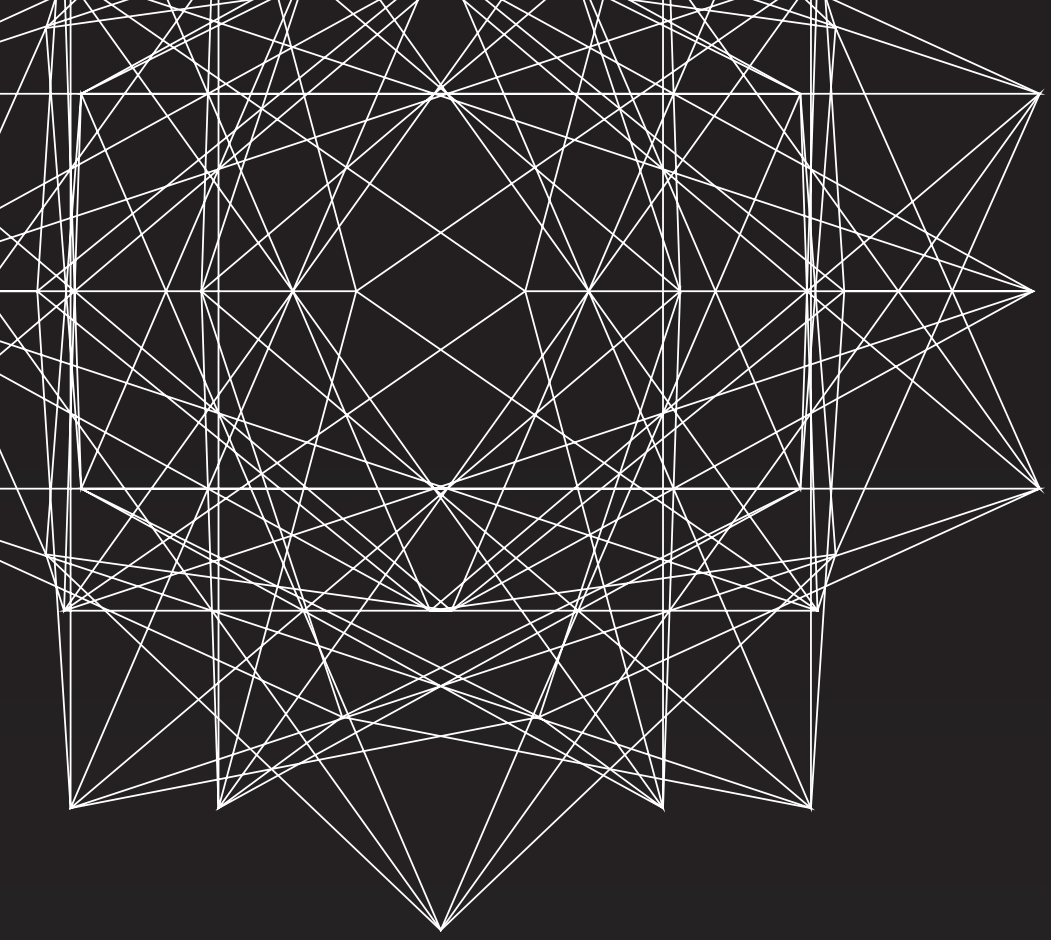
How to describe prudent risk

By Capt. Thomas Evensen

Risk estimated distances (RED) are used by maneuver commanders to determine how close to position their forces to their own indirect fires. Commanders must choose to balance the conditions of the battlefield, the recommended conditions of the REDs, and the requirement to mass Fires against the enemy when creating their plan. This is common practice for Army operations. No such risk estimate exists for airspace clearance. Joint force commanders (JFC) are not provided risk estimates when it comes to the shared airspace for surface-to-surface Fires and aircraft. If a JFC was offered a number, such as a 1 in 10,000 chance that an artillery round would collide with an aircraft based on repeatable scientific modeling, the JFC may make a determination that certain missions could be fired without clearance. Such a modeled estimate would further enable JFCs to balance risk to force with risk to mission.

Airspace clearance is difficult and time consuming. In order to conceptualize airspace, an entire MOS is dedicated to developing graphics and controls in three dimensions, and further tracking these measures by time. Indirect Fires use airspace, and quite often will travel through portions of airspace already dedicated to other users. The risk of a mid-air collision is conceivable, though not defined, and is a topic of much debate between the United States Army and United States Air Force. An agreement between the Army and Air Force was made to create centers at the Army division echelon to address the conceivable risks of artillery rounds colliding with aircraft midflight. The goal of these centers is to ensure the risk is brought to zero, since there is no understanding of the likelihood of mid-air collisions.

Joint air ground integration centers (JAGIC), comprised of both Air Force and Army personnel, work a process that involves receiving a ballistic solution from the firing unit; determining what



aircraft are effected; contacting those aircraft and providing a new route; confirming they no longer occupy their original route; then informing the firing unit it is clear to fire. This process can take as little as thirty seconds, or as long as ten minutes. During the Army's Warfighter Exercise 19.2, the 1st Armored Division JAGIC added an average of four minutes and twenty-five seconds processing time to every rocket artillery mission. Though the JAGIC accomplished its purpose in ensuring other airspace users were protected from friendly fire, the additional four minutes increased risk to mission as the enemy continuously moved out of target areas and attacked the division at large.

Work to decrease processing time is ongoing. Though an average of nearly four and a half minutes may be quick for JAGICs at large, that additional time may feel like a lifetime to forces under fire. There is benefit to modeling the likelihood of a mid-air collision of artillery and another airspace user. The model would be used to inform joint force commanders the risk to force, specifically airspace users, if a division needs to place surface-to-surface Fires on a target under strict conditions. Historical models and some simulated models have been used previously, but neither have addressed every condition that could be imposed to eliminate those four extra minutes to destroy the enemy as rapidly as possible.

A repeatable "clearance risk estimate" model would require multiple conditions in order to be used. The number of firing unit locations, volume of fire over time, number and types of aircraft in the sky, and the altitudes of each aircraft are only a few of the variables that must be considered. If any of the variables deviate from the clearance risk estimate model, the risk percentage may need recalculating.

If the model determines that four battalions of rocket artillery will fire 100 rounds per launcher in a day, and 50 aircraft will be in the battlespace in that day, two percent of the time an aircraft will be downed by surface-to-surface Fires, the commanders now have a number to base a decision. The commander may ask the planners to change the variables. If the model is then reworked to account for only 20 aircraft, ignoring 30 of them because they are unmanned, the probability might inform them that an aircraft is shot down only 0.2 percent of the time. The Airspace Control Authority at that point could require that the fastest aircraft are cleared, since those aircraft would be at the highest risk of occupying the same location as a ballistic round if the round violated its airspace. The model then could be worked again considering only the slowest aircraft, which the model could then show that if no clearance is conducted for the slowest moving aircraft, only 0.0005 percent of them will be shot down. This risk, determined on a mission by mission basis, could be considered prudent by the joint force commander.

Large Scale Combat Operations require a combination of both art and science. Airspace clearance as it is right now is procedurally a science, but planned as an art. If the enemy does not present itself in the exact way the intelligence community estimates, 24-72 hours from the time airspace is planned, processing times increase and the responsiveness of Fires decrease. The goal of estimating the risk to force using a scientific approach is not to replace procedural and positive control during the integration of surface-to-surface Fires, but rather to inform all commanders of the probable risk when prior integration fails to account for an enemy who refuses to conform to planned target areas.

Capt. Thomas Evensen serves as the 1st Armored Division's Assistant Fire Support Coordinator Chief. He has performed duties as the 1st AD JAGIC Chief for two division Warfighter Exercises and has served in a Strike Cell in Iraq performing airspace deconfliction for close supporting Fires. He has graduated the Echelons Above Brigade Airspace Course and the Specialized Joint Aerospace Training.