Making Enhancements to the Current-Generation Light Forces Strongly Improves Overall Force Effectiveness

IN CHAPTER ONE WE ARGUED THAT THERE WAS A SHORTFALL in the current capability of the light forces to repel a heavy force, while the analysis described in Chapter Two made that shortfall concrete: A light force such as the 82nd DRB equipped with modern capabilities—sensors, weapons, and support—does not fare well in a rapid-reaction role against a powerful, armored opponent. Given this outcome, what possible solutions might be available in the near future to enhance the current light forces and improve this outcome? When we analytically examined enhancements needed to do this, we found that without changing numbers of systems, required lift, organization, or mission, *new systems and tactics could strongly improve overall force effectiveness.* Following a brief discussion of the context for the analysis, we explore this finding in more detail.

Setting the Context for Analysis

To determine what near-term solution might be possible, analysts examined the results of upgrading current rapid-reaction forces—as presented in the base case established in Chapter Two—with a near-term concept and with enabling technologies, focusing on some combination of systems similar to those experimented with in the Rapid Force Projection Initiative (RFPI) Advanced Concept Technology Demonstration (ACTD), whose goal was to "put maturing technologies in the hands of soldiers" to allow them to evaluate the utility of technologies firsthand.

Taking light forces down this path would keep the structure of today's light forces basically intact, but it would increase survivability and lethality by adding some improved direct-fire systems and by employing a hunter–standoff killer concept as the indirect-fire system. The hunter–standoff killer enables the light force to engage an attacking enemy from much farther out, allowing the force to capitalize on already-proven advanced technologies. Figure 3.1 illustrates the concept.

Hunters—manned and unmanned, air or ground, and mobile or stationary—sense the presence, position, and status of enemy systems. They communicate the intelligence and targeting data to C2 nodes, which quickly match
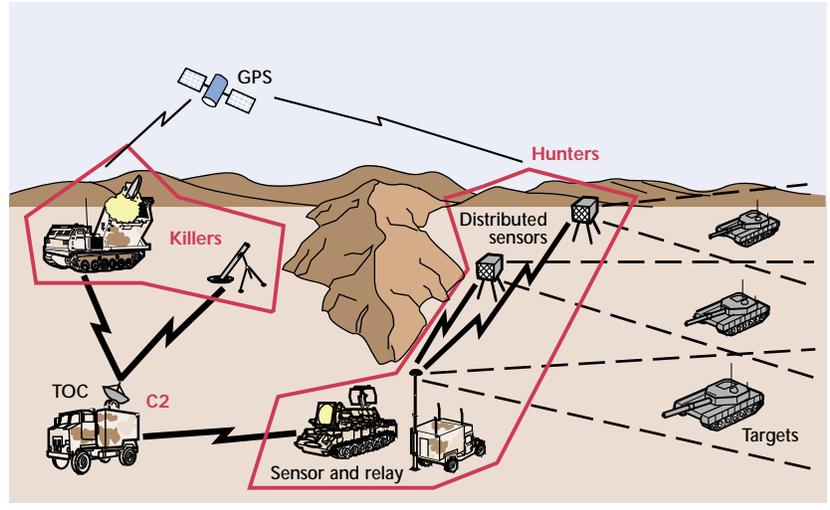
Figure 3.1—Depiction of the Hunter–Standoff Killer Concept

targets to weapons based on range, availability, and effectiveness. Killers—ranging from mortars to cannons to missiles—fire different types of munitions at the targets. Battle damage assessment may sometimes be done by the hunters and possibly the weapons themselves. Global positioning system (GPS) technology can be used extensively throughout the force for positioning and navigation.

Table 3.1 shows how the force mix was adjusted for the three scenarios to create the "enhanced DRB," with entries in boldface reflecting changes to the base case force mixes shown in Table 2.1. Direct-fire capability was improved by substituting out Dragons and Sheridans for Javelins and AGS, respectively, systems that the U.S. Army was pursuing at the time of the analysis. The indirect-fire hunter–standoff killer capability was represented by a reduced-signature hunter vehicle (with mast-mounted sensors) and the enhanced fiber-optic guided missile (EFOG-M). As shown in Figure 3.1, the two systems work as a team, with the forward-positioned hunter vehicle acquiring the target and handing it off to the more safely positioned EFOG-M platform. Finally, "fast C2" was added to the hunter–standoff killer based on the Army light tactical operations center (TOC). In adjusting the force mix, airlift was assumed to be fixed; given this constraint, the direct-fire systems—the Dragons/Sheridans to Javelins/AGS—were one-to-one substitutions, while the indirect-fire systems were swapped out at a precalculated weight ratio, reflected in the numbers shown in the table.

With this context, we now turn to discussing the main finding presented above.

Table 3.1—Base Case and Improved DRB Force Mix for the Three Scenarios

Scenarios	Blue Forces: Base Case DRB	Blue Forces: Upgraded DRB	Red Forces
SWA	15 HMMWV-Scouts **54 Dragons** 18 Stingers 6 Apaches **14 Sheridans** 8 M198s **58 HMMWV-TOWs**	15 HMMWV-Scouts **54 Javelin** 18 Stingers 6 Apaches **14 AGS** **18 HMMWV-TOWs** **24 Hunter** **18 EFOG-M**	323 T-72S (Tanks) 219 BMP-2 (APCs) 35 RTR-60 (APCs) 30 120/180 MRL (rocket artillery) 72 152 SPH (cannon artillery) 16 HAVOC/HIND (helicopters)
East Europe	Same as above	Same as above	Same as above
LANTCOM	**34 HMMWV-TOWs** 4 AGS 24 Javelin 6 Apaches 8 155mm howitzer 18 105mm howitzer 18 Forward Observers 2 UAV	**13 HMMWV-TOWs** 4 AGS[a] 24 Javelin 6 Apaches 8 155mm howitzer 18 105mm howitzer **12 EFOG-M** 18 Forward Observers 2 UAV **6 Hunter** **18 Remote Sentry** **36 Overwatch Sensors**	131 T-72S 131 BMP-2 6 120/180 MRL 12 152 SPH 6 HAVOC/HIND

a At the time the analysis was conducted, systems like the Sheridan were still integral to the 82nd Airborne's DRB. In addition, the Army was considering introducing the AGS as a replacement for the Sheridan, plus elsewhere in the force structure.

Light Forces Are More Successful, Driven Mostly by the Hunter–Standoff Killer Capability

Replacing direct- and indirect-fire systems, adding air and ground sensors, and streamlining the C2 system allowed the force to operate successfully, even though it was outnumbered by attacking enemy armor. Figure 3.2 presents an updated version of Figure 2.1, showing the base case performance of the DRB in relation to the enhanced DRB. While in the baseline DRB the LER was not good enough to successfully defend against the Red force, the enhanced DRB decisively stopped the attack in the SWA scenario and marginally fought to a draw in the tougher terrain of the East Europe and LANTCOM scenarios. In the SWA scenario, in particular, the LER was (as the figure shows) actually as high as 30 at the end of the indirect-fire battle. The contribution of the
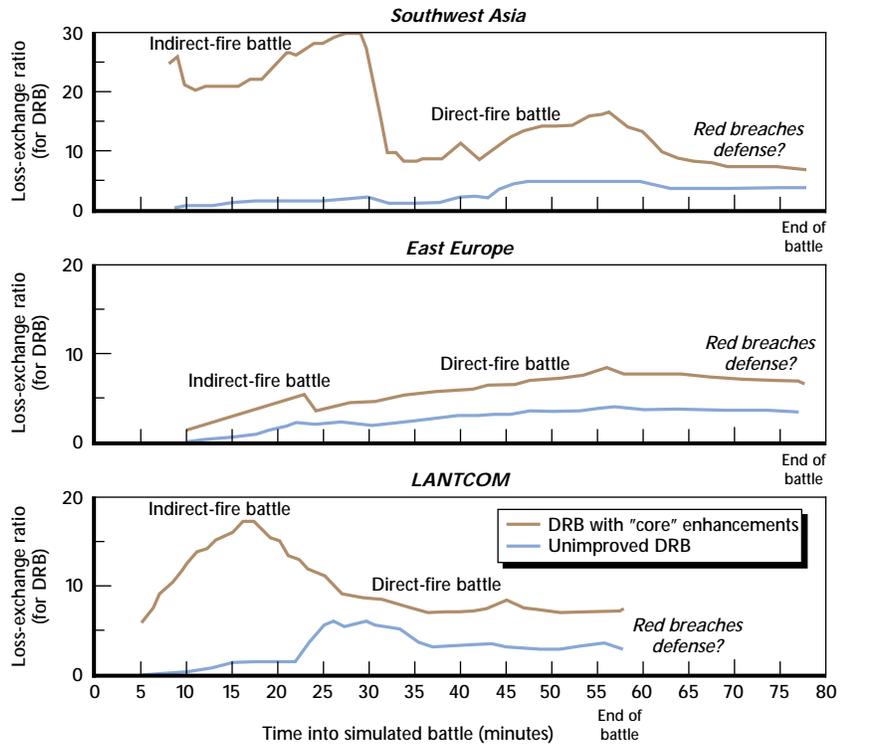
Figure 3.2—In All Three Scenarios, the Enhanced DRB Is More Successful

hunter–standoff killer systems in this scenario is very evident—the battle could start much sooner and could be waged at much longer ranges, well before the main force became susceptible to Red's direct-fire assets. Although not as dramatic, the impact of the hunter–standoff killer systems in the East Europe scenario is still quite evident. The LER improved by a factor of two leading into the direct-fire battle. In the LANTCOM scenario (here with EFOG-M placed forward), Blue begins with a high LER because of EFOG-M kills. The upgraded DRB then moves into the direct-fire phase with a much more favorable force ratio than was present with the baseline DRB.

Of the various weapons in the enhanced DRB, EFOG-M was the most efficient, especially in the SWA and LANTCOM scenarios, where the system contributed 48 and 53 percent of the kills, respectively. The substitution of the Javelin for the Dragon system in the direct-fire battle also provided a higher share of the overall force lethality, especially in the East Europe case, where it was responsible for nearly 40 percent of the kills.

Defending Against an Advanced Threat Requires a Richer Mix of Sensors and Weapon Systems

While the enhanced DRB does much better against a current threat, how would it fare against a more sophisticated future enemy threat—one with better sensors (FLIRs), armor (state-of-the-art Russian tanks and armored personnel carriers), weapons (longer-range and smarter munitions), and air defenses (high-end SA-15s and SA-19s)? Not surprisingly, the performance of the enhanced DRB is significantly reduced by all the additions.

To counter the improved threat, we enhanced the DRB again with additional RFPI systems: two RSTA systems—remote sentry (FLIR with acoustic cuer), and an unmanned aerial vehicle (UAV); a direct-fire system—line-of-sight anti-tank (LOSAT), which is a kinetic-energy missile (KEM) that can be fired from pods; and two other indirect-fire systems—precision-guided mortar munitions (PGMM), and the high-mobility artillery rocket system (HIMARS) with a pod of multiple-launch rocket systems (MLRS) containing sense and destroy armor (SADARM). Finally, we added in an obstacle system, the wide-area munition (WAM), and an autonomous vehicle capable of engaging combat vehicles out to a 100-meter range.

Figure 3.3 shows the impact of each RFPI system on the upgraded DRB LER. We found that most systems can provide at least some further improvement to the LER, but these tend to be relatively incremental improvements at best. The UAV did not survive in East Europe against radar-guided air defenses. The short-range PGMMs were competing with the direct-fire systems and consequently did not provide meaningful improvement to the LER. HIMARS as an individual system traded in to the DRB was seen to be effective in SWA, but it was not assessed in East Europe because there were not enough sightings
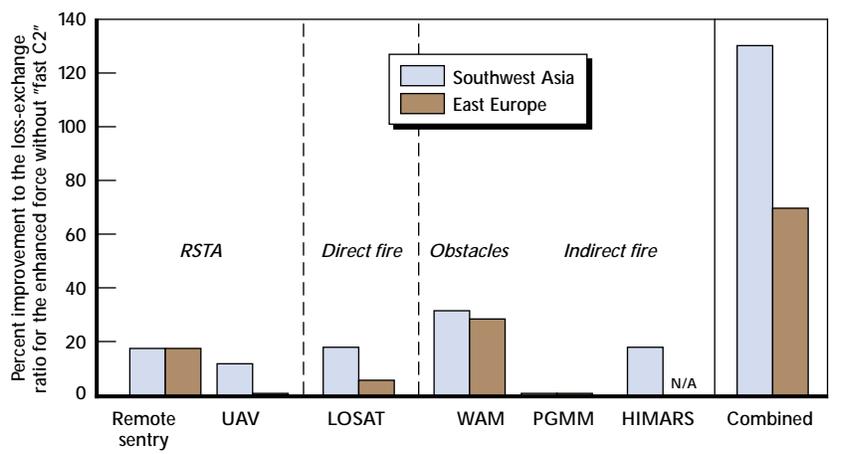

Figure 3.3—Effect of Additional DRB Upgrades on LERs in Southwest Asia and East Europe Scenarios

of company-sized targets by the hunter sensors to call for this type of massed fire. Interestingly enough, when all the listed systems are included in the simulation (the combined bars in the figure), there was a complementary improvement to the overall LER. One example of this: WAM slows down the Red force and presents more opportunities for the other Blue indirect-fire weapons to engage the force from afar. The end result is improvements around 140 percent in the SWA scenario and around 80 percent in Eastern Europe.

With the improvements from the combined case, the DRB easily wins the battle in SWA but struggles barely to a draw in East Europe, in part because the relatively small-footprint smart munitions that were added were unable to effectively "encounter" mobile targets in a dispersed attack formation and in part because the forward-positioned sensors (manned hunter vehicles, remote sentries, and UAVs) did not survive throughout the engagement in East Europe.

To counter these problems, we added in a larger-footprint submunition (3x radius) to increase the probability of "encounter" and a large (300-element) sensor called the air-deliverable acoustic sensor (ADAS). With these additions, the DRB was able to improve the LER to the point where a decisive win was attained. As it turns out, the more advanced artillery with a larger-footprint smart munition was not sufficient to provide a win. Rather, the lack of a good RSTA system proved to be the deciding factor.