

# Operation Desert Storm A JUST WAR?

Captain Yuval Joseph Zacks, US Army

*Operation Desert Storm has been viewed as a swift, effective and surgical military action that restored the sovereignty of Kuwait. The author examines whether this was a just war and if justice was served in its execution. He also looks at the issue of appeasement and finally, he examines the air campaign and its impact on Iraq's civilian infrastructure.*

**F**OLLOWING Iraq's 2 August occupation and subsequent annexation of Kuwait, the United States was at the forefront of an international coalition aimed at reversing the Iraqi aggression. In the months leading to Operation Desert Storm, our government offered a plethora of reasons for our involvement in the conflict. Domestic economic and oil interests were often mentioned. So was the creation of a "new world order." Also mentioned, repeatedly, was the need to send a signal that wanton aggression, the subjugation of small and weak nations by large and aggressive ones, would not be tolerated. In this latter context, we proclaimed that our cause was just. Liberating Kuwait from Iraqi bondage, even at the point of armed conflict, was a morally sanctioned act.

I will examine whether *Desert Storm* was, in fact, a just war and whether, in the execution of this war, there was justice. These two concepts, *jus ad bellum* (the justice of war) and *jus in bello* (the justice in war), are both central and inseparable in moral philosophy. The justice-in-war question is perhaps especially relevant in light of the advent of "precision" weapons.

The argument of *jus ad bellum* is age-old. Michael Walzer of the Institute for Advanced Study at Princeton and author of the masterpiece, *Just and Unjust Wars*, clearly articulates in his book the legalist paradigm that serves as

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a baseline for the theory of aggression. There are six important clauses to this theory:

- "There exists an international society of independent states."<sup>1</sup> These states, through their governments, are solely charged with the protection and the interests of their citizenry. Most important, states cannot be "challenged in the name of life and liberty by any other states."<sup>2</sup>

- "This international society has a law that establishes the rights of its members—above all, the rights of territorial integrity and political sovereignty."<sup>3</sup> This precept implies that one can differentiate between the territory belonging to one or another group of people and gives weight to the idea of sovereignty.

- "Any use of force or imminent threat of force by one state against the political sovereignty or territorial integrity of another consti-

tutes aggression and is a criminal act.”<sup>4</sup> This principle lays the groundwork for a state’s right of self-defense.

● “Aggression justifies two kinds of violent response: a war of self-defense by the victim and a war of law enforcement by the victim and any other member of international society.”<sup>5</sup> Hence, this tenet sanctions the role of an international “police force.”

● “Nothing but aggression can justify war.”<sup>6</sup> This theory aims at limiting the “occasions for war . . . there must actually have been a wrong, and it must actually have been received.”<sup>7</sup>

● “Once the aggressor state has been militarily repulsed, it can also be punished.”<sup>8</sup> This implies that just wars may include a deterrent role, “punish[ing] aggression to prevent war.”<sup>9</sup>

Implicit objectives perhaps not all withstanding, virtually all of the stated goals of *Desert Storm* met the legalist paradigm outlined by Walzer. *Desert Storm* was the effort of an international coalition (largely composed of American forces), operating under the auspices of the United Nations (UN) to liberate Kuwait from Iraq. *Desert Storm* was a just war in that Kuwait, an independent state with internationally recognized (by virtue of the UN) rights of territorial integrity and political sovereignty, was clearly the victim of Iraqi aggression. This aggression constituted a criminal act. Kuwait, ill-equipped to either defend itself or regain its independence through unilateral action, was necessarily dependent on the international community for its rescue. Furthermore, in countering this blatant aggression, not only the repulsion but also the punishment of Iraq by the international community was warranted. This final notion was, in part, conceptualized by President George Bush in his talk of a “new world order.” The punishment of Iraq would ultimately serve as a deterrent to aggression by expansionist-minded states.

Although the United States and other nations may well have had additional goals in mind while formulating the international response to the Iraqi aggression, these other political issues in no way diminish the “justness” of *Desert Storm*. Richard Harries, the Bishop of Oxford

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and author of *Christianity and War in a Nuclear Age*, states that “the presence of self-interest does not by itself rule out the possibility of a war being just. It is in the interest of all nations to prevent any country thinking that it can simply march across the borders of a neighbor and take it over”.<sup>10</sup> This conflict was truly a just war in the classical sense.

### **The Problem With Appeasement**

In the months prior to *Desert Storm*, there were many critics of the UN (and largely US) policy. It was often argued that in order to avoid an expanded conflict, political and military concessions should have been granted to Iraq. Bush, and ultimately his coalition partners, dismissed these arguments as smacking of appeasement.

Appeasement is a theory largely explained in utilitarian terms. It “suggests that giving in to aggressors is the only way of avoiding war.”<sup>11</sup> Gerald Vann, in writing on appeasement as characterized by the “Munich principle” (a reference to the appeasement of the Nazis in 1938), has stated that “if a nation finds itself called upon to defend another nation which is unjustly attacked . . . it may . . . be its . . . duty, to try to persuade the victim of aggression to avoid the ultimate evil of a general conflict by agreeing to terms less favorable than those which it can claim in justice . . . provided always that such a surrender of rights [would not be] a surrender once and for all to the rule of violence.”<sup>12</sup> It is this last clause, however, that appears inherently contradictory and is perhaps the core of the very argument against appeasement. Vann’s argument seems weak when related to the Nazis—for the very nature of Nazi rule was violence. In much the same manner, one can argue that Saddam Hussein’s



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rule is (and has always been) violent. Thus, as with the Nazis, the appeasement of Hussein (effectively Iraq) would ultimately prove an impossible and unconscionable solution.

### **Justice in War**

Accepting that *Desert Storm* was a just war and recognizing the seemingly lopsided victory of the coalition forces, it is imperative to examine the *jus in bello*. Walzer, who will soon incorporate his thoughts on *Desert Storm* into an updated preface to his book, is quoted in the *New York Times* as theorizing that "modern technology makes it more possible to exercise discrimination, and therefore we should be more critical of any non-discrimination."<sup>13</sup>

Two key premises when referring to justice in war are that there are, in fact, rules of war and that noncombatants must be immune from attack. Details of these principles are provided in law of war treaties that are binding upon Iraq, the United States and its coalition partners.

I will dismiss the ground phase of *Desert Storm* from consideration in my discussion of justice in

war. The ground war was in essence the culmination of a protracted coalition air campaign.

The ground campaign did not affect noncombatants per se, was very short in duration and in the last analysis, probably resulted in the capturing of more enemy prisoners than in the infliction of deaths. Of the Iraqis captured, there were no reported incidents of atrocities; many Iraqi prisoners surrendered in desperation and in order to receive the food and medical treatment they were denied by their own government. The air campaign, on the other hand, was long in duration, extended into civilian strongholds and incorporated much of the new technology to which Walzer referred. It is on this phase of *Desert Storm* that I will concentrate.

The philosopher Henry Sidgwick deals with utility and proportionality in war. He claims that "it is not permissible to do any 'mischief which does not tend materially to the end [of victory], nor any mischief of which the conduciveness to the end is slight in comparison with the amount of the mischief.'"<sup>14</sup> Proportionality, however, is a difficult measure to apply. There are no easy



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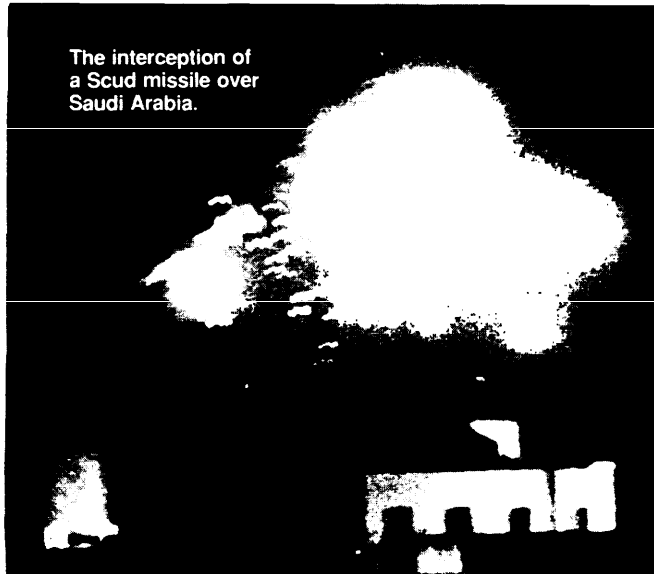
ways to “establish an independent or stable view of the values against which the destruction of war is to be measured. Our moral judgments wait upon purely military considerations and will rarely be sustained in the face of an analysis of battle conditions or campaign strategy by a qualified professional.”<sup>15</sup> Thus, when the coalition air forces destroyed Iraq’s infrastructure, largely affecting its civilian populace, how are we to dispute the efficacy of this military strategy? Doctor David Little of the US Institute for Peace clearly states that “the proportionality criterion is not awfully scientific. There isn’t any calculus you can use. . . . You have to use circumstantial judgment about how important [Kuwait’s freedom] is, and what costs this is worth.”<sup>16</sup>

Sidgwick proposes an “economy of force” approach to warfare—the very same strategy professed by any trained military strategist.<sup>17</sup> The problem is that the moral philosopher’s computation of economy of force may not even begin to approximate that of the military strategist. The latter traditionally receives the benefit of the doubt. Destruction of an opponent’s infra-

structure is problematic in moralistic terms. With respect to military necessity, defined as the force “necessary to compel the submission of the enemy with the least possible expenditure of time, life, and money,” a strong argument can be made for the destruction of an infrastructure.<sup>18</sup>

Today’s military technology relies heavily on the components of most nations’ infrastructures. It is no longer simple to differentiate between that which serves an exclusively military, as opposed to civilian, purpose. Communication systems are relied on heavily by both segments of society. Likewise, television, radio, electricity and road networks have both civilian and military uses. In a society such as Iraq’s where the military merits top priority in the allocation of goods and services, the elimination of a large segment of its infrastructure may arguably be a military necessity. The destruction of a nation’s infrastructure exacts a heavy toll on the civilian populace. Unsanitary conditions and disease proliferate. Famine may erupt, and medical care may be discontinued. Thus, when we talk about the most economical way of forcing the submission of

The interception of a Scud missile over Saudi Arabia.



***The coalition policy of not targeting civilians was in clear contrast to the Iraqi policy that manifested itself in the rape of Kuwait and Scud attacks against the civilian populaces of Israel and Saudi Arabia. Adherence to . . . proportionality is harder to judge given the inherent dilemma between the military practitioner and the moral philosopher.***

the enemy, we must wonder on what basis we are making our calculations. Perhaps had the coalition forces been willing to spend more time and money in concentrating their air attacks strictly on visible military targets, there would have been less loss of Iraqi life. On the other hand, such a strategy may have proved wholly ineffective, needlessly prolonging the war and resulting in not only a greater loss of Iraqi civilians but also of Kuwaitis and coalition forces. Thus, according to George Weigel, president of the Ethics and Public Policy Center in Washington D.C., "proportionality bangs up against the reality that the overwhelming application of force works and shortens wars. Incrementalism causes all sorts of problems—such as, Vietnam."<sup>19</sup>

The destruction of Iraq's infrastructure was not the only source of death for Iraqi civilians. Under the law of war, the Iraqi leadership was obligated to separate military objectives from its civilian population. It failed to do this, choosing instead to use its own civilians as a human shield. Although the stated policy of the allied forces was to refrain from bombing or targeting civilian

objects, accomplished through the maximum use of precision munitions, Iraqi commingling of legitimate targets with the civilian population and the friction of combat resulted in the injury and death of some Iraqi civilians. Such collateral civilian casualties and damage to civilian objects are accepted by moral philosophers, however, and are explained by the theory of double effect. This theory "is a way of reconciling the absolute prohibition against attacking noncombatants with the legitimate conduct of military activity."<sup>20</sup> The key elements of the double effect theory are that "the intention of the actor is good, that is, he aims only at the acceptable effect; the evil effect [killing of noncombatants] is not one of his ends, nor is it a means to his ends," and "the good effect is sufficiently good to compensate for allowing the evil effect; it must be justifiable under Sidgwick's proportionality rule."<sup>21</sup>

Clearly, the first criterion applies if one believes the stated policies of the coalition forces. The coalition policy of not targeting civilians was in clear contrast to the Iraqi policy that manifested itself in the rape of Kuwait and Scud attacks against the civilian populaces of Israel and Saudi Arabia. Adherence to the second criterion, that of proportionality, is harder to judge given the inherent dilemma between the military practitioner and the moral philosopher.

Despite the undoubtedly heavy civilian and military losses suffered by Iraq and the minimal casualties of the coalition forces, justice in *Desert Storm* prevailed. Civilians were not targeted per se, cities were not razed and massacres did not occur. Technology was used by the coalition forces to compensate for the perceived imbalance in force sizes (1 million Iraqi troops against a half million coalition troops). The poor performance of the Iraqi military should not be used to claim that the coalition used disproportional force. Besides, the Iraqi military was billed as a top-notch fighting force—a claim the Iraqis themselves asserted and intelligence data predicted. Prior to the onset of hostilities, Iraq never called a time-out because of an imbalance in the forces. Instead, the coalition was promised that it would swim in its own blood and that the war would be

the "mother of all battles." The coalition forces repeatedly warned the Iraqis of the pending destruction. The capabilities of our technology and even most of our fighting strategy was well advertised prior to the onset of hostilities. Iraq's failure to heed the coalition's warnings, and its subsequent defeat in battle, does not entitle it to claim that the war was unjustly prosecuted.

For critics of *Desert Storm*, the US failure to intervene militarily in support of the post-*cease-fire* uprising of the Iraqi Kurds and Shiites proved a sure sign of the injustice of the war. Having proclaimed our war against Hussein as morally just and having repeatedly called for the Iraqis to overthrow their despotic leader, we were nevertheless unwilling to aid in a domestic uprising against this tyrant. It was argued that our failure to militarily assist the Kurds and Shiites in their fight against Hussein's forces resulted in a campaign of brutal reprisals against these Iraqi groups. This criticism ignores the legal obligation of the United States and its coalition partners to seek resolution of such crises through the UN rather than acting unilaterally. Just war theory, though, traditionally asserts that "the outcome of civil wars should reflect not the relative strength of the intervening states, but the local alignment of forces."<sup>22</sup> An exception to this rule, however, is when "the dominant forces within a state are engaged in massive violations of human rights . . . [for] when a government turns savagely upon its own people, we must doubt the very existence of a political community to which the idea of self-determination might

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apply."<sup>23</sup> In this case, humanitarian intervention by a third party or parties is justified.

Once Hussein revealed both his ability to withstand the Kurdish and Shiite uprising and his intention to punish these two groups for their disloyalty, the US intervened through *Provide Comfort*. Employing both coalition forces and humanitarian relief organizations, the US established safe havens for these oppressed groups and entered into negotiations with Iraq for the guaranteed future safety of the Kurds and Shiites. Whether the forces of Hussein respect their pledges to provide safety for the Kurds and Shiites, as the US and coalition forces continue to withdraw from their strongholds in northern Iraq, is difficult to predict. There should, however, be no doubt about the resolve of the coalition forces to reintervene for humanitarian purposes in the event that Hussein's words prove once again insincere. **MR**

#### NOTES

1. Michael Walzer, *Just and Unjust Wars* (New York: Basic Books, Inc., Publishers, 1977), 61.

2. *Ibid.*

3. *Ibid.*

4. *Ibid.*, 62.

5. *Ibid.*

6. *Ibid.*

7. *Ibid.*

8. *Ibid.*

9. *Ibid.*, 63.

10. Richard Harries, *The Independent*, 31 October 1990, 19.

11. Walzer, 67.

12. *Ibid.*, 68.

13. Michael Walzer, *New York Times*, 17 March 1991, E-4.

14. Walzer, *Just and Unjust Wars*, 129.

15. *Ibid.*

16. David Little, *The Christian Science Monitor*, 19 February 1991, 6.

17. Walzer, *Just and Unjust Wars*, 130.

18. *Ibid.*, 144.

19. George Weigel, *The Washington Post*, 23 September 1990, A-1.

20. Walzer, *Just and Unjust Wars*, 153.

21. *Ibid.*

22. *Ibid.*, 101.

23. *Ibid.*

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# Bring on the HETs!

## Operational and Tactical Relocation of Heavy Maneuver Forces

Joe Z. Hartner, Captain Jules T. Doux, US Army,  
and Captain Mark A. Peterson, US Army

*During operations Desert Shield and Desert Storm, the Army learned that in order to move heavy forces long distances, heavy equipment transporters (HETs) were required. The authors look at the effort put forth in the desert to execute the assigned mission. They address developing concepts and organization structures to relocate heavy combat forces. Finally, they offer a comparison in the cost of using HETs in peacetime.*

**T**HE Transportation Corps has long known that trucks can easily and efficiently carry tracked combat vehicles over long distances.<sup>1</sup> To do so, however, is truck-intensive as many of the combat vehicles will only fit one to a truck. The truck the Army uses to carry heavy tracked vehicles is called a heavy equipment transporter (HET). A modern HET can carry a combat-loaded M1 Abrams tank; it can also carry other tracked vehicles such as M113 armored personnel carriers (APCs), two at a time.

### **Traditional HET Employment**

For many years, the Army's doctrine for moving combat vehicles by truck has been to individually evacuate and replace damaged combat vehicles.<sup>2</sup> The heavy lift truck capability in the Army has, therefore, been relatively limited.

There are about 1,500 tracked combat vehicles in a heavy division.<sup>3</sup> Yet, divisions have only a small quantity of organic heavy lift capability. An infantry division has only six organic HETs.<sup>4</sup> A heavy division has only 24.<sup>5</sup> The nondivisional transportation heavy truck company, assigned to corps or theater army in a general support role, has only 36 HETs.<sup>6</sup> They, too, are used almost entirely to evacuate severely damaged combat vehicles to major maintenance facilities and to replace them individually.

The limited use of HETs to transport tracked vehicles reflects the Army's long-term preoccupation with the NATO Theater. This theater has well-developed and well-maintained rail and highway networks. The rail network in western Germany is so extensive and so capable

that US heavy divisions use it for almost all their moves to and from training centers. Most armor units in Germany plan only one road march per year in their training schedules.<sup>7</sup>

There is also significant Wartime Host Nation Support (WHNS) highway capability in Germany. There are current requirements for 14 transportation heavy truck companies in the NATO force structure; WHNS units meet eight of them. This is sufficient HET capability to meet the evacuation and replacement mission, but not to provide all the armor and mechanized units with routine training in truck loadout and unit movement. If more heavy lift trucks were available, they would be used (for long-haul unit movement), but the NATO rail capability is so pervasive that it overshadows both Army and host nation truck capabilities.<sup>8</sup>

*Desert Shield* and *Desert Storm* were conducted in an environment that, compared to NATO, has a very austere transportation infrastructure. They, accordingly, forced the Army to reevaluate HET operations, focusing upon the use of HETs for operational and tactical relocation of heavy maneuver units on the battlefield, with the traditional role of evacuation and replacement becoming a secondary mission.<sup>9</sup> Carrying armored units to war is not a new idea.

"The significant role HETs can play in wartime was demonstrated by the Israeli army in their 6-day war of 1967. Every Israeli tank had a transporter to move it to the frontline deployment area, while the Arab opposition had no transporters. Israeli tank brigades arrived battle-ready; Arab tanks arrived with dust-clogged engines, debris-filled tracks, and tired and overheated crews. They arrived on the battlefield at only one-half to two-thirds of their strength because of mechanical breakdowns along the way. Israeli tanks were transported overnight from one sector of the battlefield to another; Arab tanks lumbering along the roads made easy targets for Israeli fighter-bombers."<sup>10</sup>

During *Desert Shield* and *Desert Storm*, virtually every Army combat unit that deployed used truck transportation to an unprecedented extent to preserve the combat readiness of its vehicles.

The desert is a harsh environment; media reports during the operations were replete with references to the maintenance and transportation difficulties it presented, particularly the wear due to the powdery sand and the lack of roads and

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rails. Though the existing roads were quite good, there simply were not enough of them, and the only rail line in Saudi Arabia did not go where the deploying forces needed to go.<sup>11</sup>

A complicating factor associated with transporting heavy forces in the early stages of *Desert Shield* and *Desert Storm* was the early deployment of combat forces with little transportation support. In the earliest stages of *Desert Shield*, simply clearing the combat vehicles out of the port of debarkation in Ad Dammam, Saudi Arabia, was a serious problem.<sup>12</sup> The executive officer of the 93d Transportation Battalion (Provisional) (Movement Control) reported in late August 1990 that "the most important thing we've accomplished . . . [is] to arrange for 90 HETs and 100 lowboys to clear the port of tracked vehicles."<sup>13</sup> A short time later, he reported that "we're moving 100 truckloads a day and still can't make a dent. Lowboys and HETs [are] in big demand. [The] 82d [Division], 101st [Division] and 24th [Division] want to move all their tracks by truck. Unbelievable burden."<sup>14</sup>

As the deployment continued and the number of US forces in Saudi Arabia increased, the requirements for heavy truck transportation also increased. There were 17 transportation heavy truck companies in the Army at the onset of *Des-*



ert Shield; all of them deployed to support *Desert Shield* and *Desert Storm*. One, the 660th Heavy Truck Company, a US Army Reserve unit in Cadiz, Ohio, was scheduled to inactivate about

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the same time that *Desert Shield* started. Its inactivation was delayed indefinitely, and it deployed also.

All the heavy truck companies in the Army, however, were not enough to clear the heavy forces' vehicles out of the ports and carry them upcountry. Both allied army and host nation support were required.

"Even with all [the US heavy truck companies] we did not have enough. We used everybody else's after they were in place. We had HETs and lowboys from Germany, Italy, Saudi, Egypt and Czechoslovakia. [Early on we] moved all of 18th Corps by HETs. Also the 82d [Division] but [we were] not carrying tanks, just engineer and DIVARTY [division artillery] equipment."<sup>15</sup>

The use of Egyptian HETs is particularly significant. The Egyptian army did not have HETs in the Arab-Israeli War in 1967; it does now.

As the deployment of forces into Saudi Arabia and their movement into pre-ground war positions progressed, the requirements for trucks to transport tracked vehicles continued and increased. For example, the 3d Armored Division deployed from Germany, using rail and barges to the ports of Rotterdam, the Netherlands and Antwerp, Belgium. Then it traveled by ship to Ad Dammam, debarked and moved into tactical

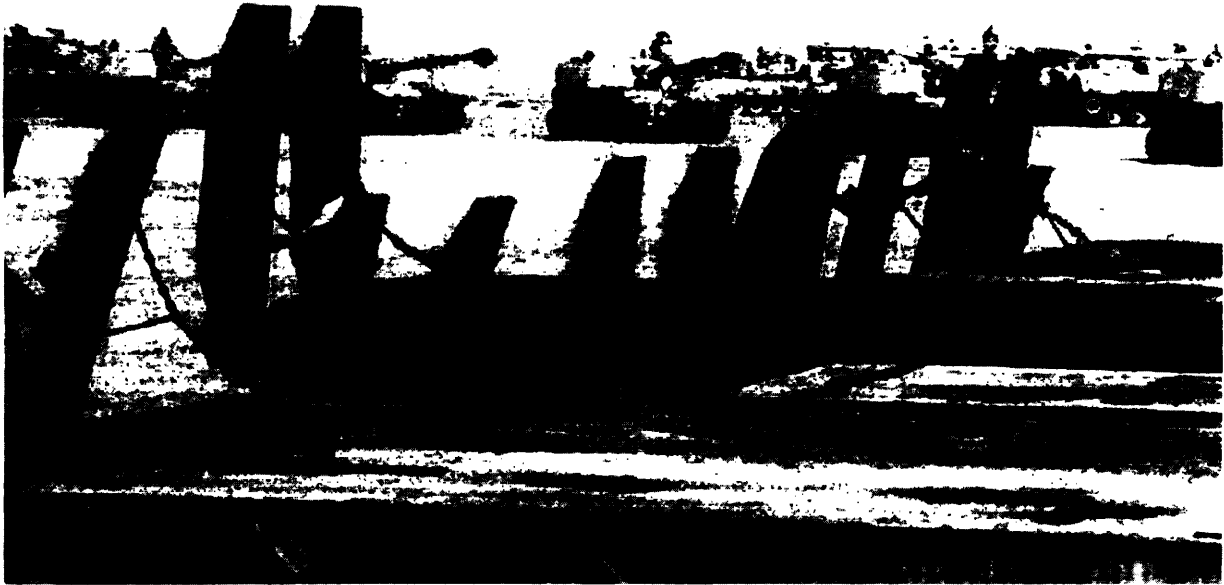
assembly areas "out in the desert about four hundred miles north and west of Ad Dammam."<sup>16</sup> Though the wheeled vehicles mostly road marched under their own power, it required "hundreds of HET loads to move the tracks to the assembly areas. [We used] US HETs, allied HETs and even commercial design lowboys [to make the move]. If we hadn't had HETs, our maintenance readiness would have been seriously degraded."<sup>17</sup>

It is noteworthy that the concept of WHNS proved just as viable in *Desert Storm* as it has been in NATO over the years. The significant difference is that WHNS in NATO has always been an in-place asset whose use could be planned. In *Desert Storm*, WHNS and the additional support provided by allied armies was completely ad hoc and was generally provided on an on-demand basis. Despite the provisional arrangements, WHNS in *Desert Shield* and *Desert Storm* was critical to the success of the deployment. "We leased over 800 flatbed [tractors and semitrailers], [and] over 370 HETs . . . we could not have survived without Host Nation Support."<sup>18</sup>

The ad hoc WHNS arrangements were not without complications. The transportation officer at Ad Dammam observed that it was "very difficult to determine the carrying capacity of civilian lowboys and HETs. A 4-axle truck may or may not be able to pull 70 tons. Then again, a 2-axle truck may pull 70 tons. [It is] very frustrating and embarrassing when we put an M1 tank on a 4-axle trailer and it squashes the trailer to the ground, blowing out its tires."<sup>19</sup>

Gallows humor manifested itself when that same officer observed that such events were "kind of funny, actually!"<sup>20</sup>

Another challenge posed by the peculiar characteristics of the Saudi Arabian Theater was the distances involved when deploying forces. From the port at Ad Dammam to King Khalid Military City, Saudi Arabia, is a round trip of over 1,000 miles. The few available roads were always crowded; en route speeds were slow, and the commercial HETs and lowboys had virtually no off-road capability that would have per-



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mitted more flexible routing and bypassing bottlenecks.<sup>21</sup> These factors compounded the difficulty of clearing the ports and delivering vehicles to the combat units. "[There] just aren't enough assets to move everyone. [The] biggest problem is turnaround time. Distances are so big that when a HET/Lowboy goes out, it is gone for 3-4 days."<sup>22</sup>

The distances involved and the resultant turnaround times had more insidious effects. Once a vehicle was committed to a mission, it was difficult, if not impossible, to recall it in response to changing priorities. The transportation officer in Ad Dammam noted:

"It has been an absolute madhouse. Priorities were changed about four times [today] and now that it's 2230 hours, they've just changed another time. [The] problem is that we're now dealing with 2 ports, ammo, a corps move, M1A1 and Bradley transport, extended distances for convoys and normal sustainment."<sup>23</sup>

Changing priorities for movement of units,

personnel and materiel in response to changing operational or tactical situations is a reality. Shortages and a lack of control over the cargo-hauling vehicles exacerbates the complexity and can, in extreme circumstances, preclude appropriate response.

Another predictable, though unavoidable, problem with the movement of heavy vehicles using the ad hoc mix of vehicles was the ever-increasing number of maintenance failures. By early January 1991, the transportation activity was intense. "Every tracked vehicle there is, is being sent forwards as fast as possible."<sup>24</sup> The nonstop activity began to tell.

"Trying to get everyone pushed up is starting to take a toll on our US HETs. They're not built for these M1A1s and now our maintenance is taking a toll. I just hope we can get [the combat forces] all up north before they completely fall apart. Problems include no spare tires (they're popping like crazy), broken rims, and blown gaskets."<sup>25</sup>

***FM 100-5, Operations, the Army's keystone warfighting doctrinal manual, defines agility as "the ability of friendly forces to act faster than the enemy—[it] is the first prerequisite for seizing and holding the initiative." The capability to move heavy forces rapidly provides the division commander with that agility.***

The commercial HETs and lowboys fared no better. "The commercially leased HETs . . . are beat to death from overuse and undermaintenance."<sup>26</sup>

Despite the difficulties and ad hoc support arrangements, *Desert Shield* and *Desert Storm* clearly validated the concept of moving heavy combat forces over long distances by truck.

"The combat forces . . . recognized their requirements for truck transportation. Even [light forces such as] the 82d Airborne [used] contracted lowboys to move their engineer equipment. We carried trucks on HETs all the way to the Kuwaiti border. [We carried] 7th Corps well to the west of Kuwait [before the ground war started]."<sup>27</sup>

### **Heavy Truck Company Design**

US Army Field Manual 100-5, *Operations*, the Army's keystone warfighting doctrinal manual, defines agility as "the ability of friendly forces to act faster than the enemy—[it] is the first prerequisite for seizing and holding the initiative."<sup>28</sup> The capability to move heavy forces rapidly provides the division commander with that agility. *Desert Shield* and *Desert Storm* focused the Army's attention upon, and amply demonstrated, the viability of using trucks to move heavy forces to the battlefield quickly. They reaffirmed the lessons learned in the Arab-Israeli War of 1967—that the use of truck transportation to move heavy forces helps the commander attain the agility that is so vital to the conduct of the AirLand Battle.

The remainder of this article addresses developing concepts and organization structures

to operationally and tactically relocate heavy combat forces.

Operational relocation, or operational mobility, is the movement of heavy combat forces on HETs from the debarkation ports to the forward areas of the communications zone (COMMZ) or to the corps assembly areas. Tactical relocation, or tactical mobility, is the movement of heavy forces on HETs from the COMMZ/corps assembly area to tactical assembly areas. In either case, the emphasis is carrying the heavy forces as close to the battle as the availability of main supply routes and the factors of mission, enemy, terrain, troops and time available (METT-T) permit. When heavy forces are carried on trucks, rather than road marching vehicles under their own power, they arrive at the battlefield prepared to fight with fuel, fully operable weapon systems, better unit integrity and rested crews. Neither the crews nor weapon systems have been stressed just getting to the battle.<sup>29</sup>

In January 1991, *Desert Shield* was well underway. The commander, US Army Training and Doctrine Command (TRADOC), having previously observed the Israeli army's use of HETs and closely watching the *Desert Shield* deployments, directed the commandant, US Army Transportation School (USATSCH) to develop a concept and an organization design for a HET company capable of moving a tank battalion in a single lift. He estimated that a company with approximately 100 HETs could make the lift.<sup>30</sup> A very quick analysis determined that a company of 96 HETs could meet the requirement.

In late January 1991, USATSCH was host to a joint working group to refine the HET requirement for operational and tactical relocation of heavy combat forces in AirLand Battle (ALB) and AirLand Battle-Future (ALBF), now AirLand Operations.

Representatives from TRADOC, the Combined Arms Center, the Combined Arms Support Command, and the Armor, Ordnance, Engineer and Transportation schools attended. Because of the contributions of the combat arms representatives, the concept of moving a battalion in a single lift changed to one of operational-



*From the port at Ad Dammam to King Khalid Military City, Saudi Arabia, is a round trip of over 1,000 miles. The few available roads were always crowded; en route speeds were slow, and the commercial HETs and lowboys had virtually no off-road capability that would have permitted more flexible routing and bypassing bottlenecks. These factors compounded the difficulty of clearing the ports and delivering vehicles to the combat units.*

ly or tactically relocating a "heavy maneuver force with division slice" in a single lift.<sup>31</sup>

The joint working group conference defined the heavy maneuver force with division slice, a brigade-size unit. It became the baseline for analyzing HET requirements for ALB and AirLand Operations.<sup>32</sup>

Once the objective was defined, the following assumptions evolved to focus the analysis:

- The HETs, now organic to divisions, separate brigades and armored cavalry regiments to evacuate and replace damaged combat vehicles, remain there.
- Maneuver force relocation will be the priority for the HET company, with weapon systems evacuation/replacement secondary.

- The analysis considers only the new 70-ton HET system (the M1070 tractor and M1000 semitrailer). This system will be the one used in the new design HET company.

- Combat vehicles will be loaded two per HET wherever possible.

The heavy force has over 500 tracked combat vehicles. These vehicles fall into weight/size groups as follows:<sup>33</sup>

- Vehicles that, because of their weight or length, can fit only one to a HET. This includes the M1 tank, the armored vehicle launched bridge (AVLB), the M88 recovery vehicle and the combat engineer vehicle (CEV).

- Vehicles that cannot be loaded two per HET but can be loaded one per HET along with

***When heavy forces are carried on trucks, rather than road marching vehicles under their own power, they arrive at the battlefield prepared to fight with fuel, fully operable weapon systems, better unit integrity and rested crews. Neither the crews nor weapon systems have been stressed just getting to the battle.***

another, smaller vehicle from the group below. This includes the M2 and M3 Bradley vehicles, M578, the armored combat earthmover (ACE) and the M109.

- Vehicles that can be loaded two per HET. This includes all the vehicles based upon the M113 chassis—M106, M577, M901, M548 and FISTV (fire integration support team vehicle).

- Certain vehicles in groups two and three above are mutually exclusive. For example, the M2, M3, and M109 cannot be loaded with a FISTV.

Loading these vehicles on HETs while observing the restrictions noted above requires a total of 340 HETs. The Transportation Corps plans for 90 percent vehicle availability, so 378 HETs are required to have the 340 available to move the heavy maneuver force with slice.

## Transportation HET Company

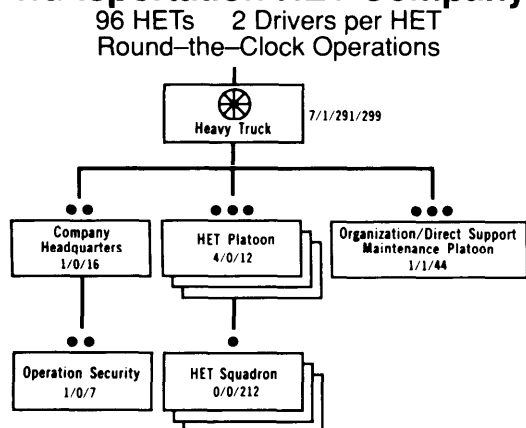


Figure 1.

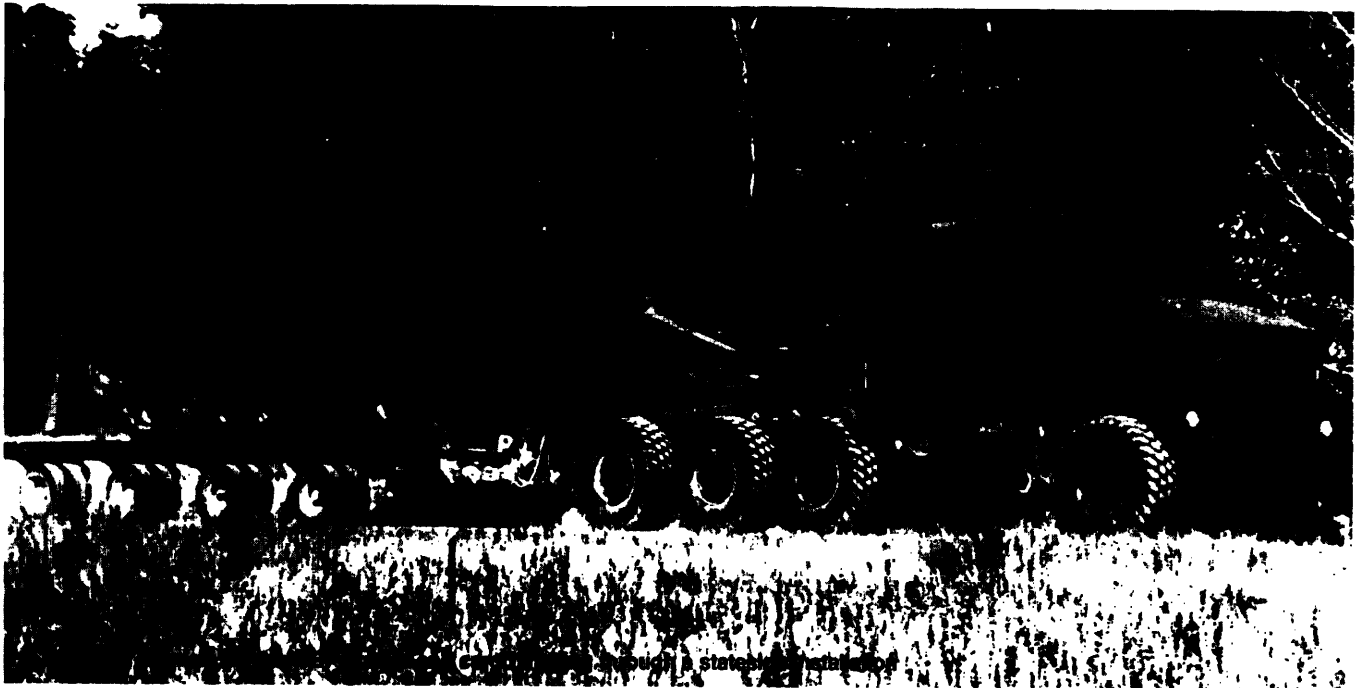
The first requirement for designing a new HET company is to determine the number of HETs; this subsumes all other factors for building the unit. The original estimate of 96 HETs to move an armor battalion in a single lift was evaluated against the requirement to single lift the heavy maneuver force with slice. Four such companies, totaling 384 HETs, can make the lift so the 96-HET design was retained.

The organization of the proposed 96-HET company is shown in figure 1. It is a large company with nearly 300 personnel. It is unusual among combat service support companies in that it has organic direct support (DS) maintenance capability. To do its mission of operationally and tactically transporting heavy forces, particularly during rapid deployments, this HET company must deploy very early. Maintenance units capable of performing DS maintenance generally deploy later, hence, the organic DS capability.<sup>34</sup>

## Cost Avoidance, Peacetime Operations and Readiness for War

Moving heavy combat forces on HETs offers significant cost advantages besides the tactical and operational ones already addressed. Tracked vehicles are very expensive to operate. The Army Tank-Automotive Command (TACOM) provided data on the operating costs of selected tracked combat vehicles (fig. 2).<sup>35</sup> These costs are the life cycle, per mile operating cost for each vehicle, not including procurement costs.<sup>36</sup> For those vehicles for which no cost was readily available, that of the closest type vehicle available was used. All these cost data have been conservatively rounded.

When the total per mile operating cost of all the vehicles in the heavy maneuver force with slice is computed, the cost to move the force becomes staggering—over \$180,000 to move the tracked combat vehicles in this brigade-size force 1 mile under their own power. It costs \$15,000 to move them 1 mile on HETs—a cost avoidance of over \$165,000 per mile.



*Cost is not usually a primary factor in determining warfighting requirements. However, all Army units spend most of their lives at peace. Operating costs are a major factor affecting their peacetime existence, the quality of their training and their capability to perform their wartime missions when called to do so.*

A table of organization and equipment (TOE) defines the minimum requirements of personnel and equipment for a type unit to go to war and to execute its doctrinal warfighting mission. Cost is not usually a primary factor in

determining warfighting requirements. However, all Army units spend most of their lives at peace. Operating costs are a major factor affecting their peacetime existence, the quality of their training and their capability to perform their wartime missions when called to do so. Little imagination is required to envision the opportunities available to an installation that hosts a heavy brigade or division if HETs are used for nothing except cycling the brigade or division's tracked combat vehicles to and from firing ranges.

The cost information noted above is significant even when the cost of fielding a transportation heavy truck company with 96 HETs is considered. What would be the wartime cost of not having enough heavy transportation capability? In NATO, the Army has managed to avoid an-

### Vehicle Operating Costs

Representative Examples

M1	—	\$550
M88	—	\$400
M2	—	\$350
M3	—	\$350
AVLB	—	\$550
M113	—	\$100
HET	—	\$50

*Per  
Mile*

Figure 2.

**Subjecting this mix of vehicles to the same loading protocol as discussed previously generates a requirement for 357 HETs to tactically or operationally relocate the [brigade] force in a single lift. Four HET companies with 96 HETs each can easily accomplish this mission.**

**The total per mile operating cost of all the vehicles in the heavy maneuver force with slice is . . . staggering—over \$180,000 to move the tracked combat vehicles in this brigade-size force 1 mile under their own power. It costs \$15,000 to move them 1 mile on HETs—a cost avoidance of over \$165,000 per mile.**

swering that question by using WHNS capability to offset Army force structure requirements. Also, *Desert Shield* and *Desert Storm* made extensive use of WHNS and allied army assets, thereby maintaining agility and initiative but still avoiding the question at issue here. Suppose *Desert Shield* and *Desert Storm* had not been in Saudi Arabia; suppose the Army never has to fight in NATO.

“There are very few Third World countries with the infrastructure Saudi has. Their welfare state is based on construction so they have large numbers of heavy haulers [available]. What if we had been in Chad? Or Somalia? Or Central America?”<sup>37</sup>

The most viable answer to this question is to ensure the Army has an inherent capability to operationally and tactically relocate its heavy forces in any likely warfighting scenario. The 96-HET heavy truck company design, in appropriate numbers, provides that capability.

## **AirLand Operations**

AirLand Operations, previously known as ALBF, is the newly approved concept for the

Army's future warfighting doctrine. Although AirLand Operations changes much of the way the Army will conduct its warfighting business, the heavy maneuver force with slice remains the focal point for operational and tactical relocation. The AirLand Operations heavy maneuver force with division slice will not differ significantly from the baseline force used in the ALB analysis above; the types and mixes of vehicles, however, will change. The AirLand Operations heavy force with slice will have fewer M1 tanks and more M2 and M3 Bradley fighting vehicles. Figure 3 shows a reasonable list of vehicles in this force.<sup>38</sup>

### **ALB-F Heavy Maneuver Force** With Slice Vehicle Distribution

M113	– 69	M1	– 88
M577	– 41	AVLB	– 12
M548	– 6	CEV	– 6
M88	– 15	ACE	– 21
Bradley chassis vehicles	– 174	M578	– 3
		<b>TOTAL:</b>	<b>435 Vehicles</b>

Figure 3.

Subjecting this mix of vehicles to the same loading protocol as discussed previously generates a requirement for 357 HETs to tactically or operationally relocate the force in a single lift. Four HET companies with 96 HETs each can easily accomplish this mission. A major change in the structure of the AirLand Operations heavy force will not affect the capability of the 96-HET company to relocate the force; it may, depending on the size of the change, alter the number of HET companies required.

The lessons the Army has already learned from *Desert Shield* and *Desert Storm* portend significant changes in the movement of heavy combat forces by truck. The focus is changing from the individual vehicle to the heavy maneuver unit. Operational and tactical relocation of heavy forces by truck is, in the Army, still conceptual and not yet published doctrine. The

concept is still subject to further analysis and refinement. Nothing, however, in the future will obviate two of the most basic tenets—agility and initiative—of the Army's warfighting doctrine. This concept addresses a fundamental method of attaining agility and initiative of heavy maneuver forces. That it provides significant peacetime cost avoidance opportunities while doing so is serendipitous. It is virtually certain that the operational and cost advantages of

carrying combat vehicles to the battlefield, also to peacetime training sites, will make this concept a part of the transportation doctrine of the future. **MR**

*The TOE for the transportation combat HET company has been written, staffed and passed by the TRADOC TOE review board. The TOE has been approved by the commander of TRADOC and forwarded to Headquarters, Department of the Army for final approval. The TOE is currently scheduled for publication in April 1992.*

**NOTES**

1. MG Samuel N. Wakefield, chief of transportation, personal interview, 21 March 91.
2. US Department of the Army Field Manual (FM) 55-30, *Army Motor Transportation Units and Operations* (Washington, DC: US Government Printing Office [GPO], 29 August 1980), B-4.
3. MAJ Duane W. Sweeney, "Heavy Equipment Transportation Requirements in the Heavy Division," US Army Command and General Staff College paper, 1 May 1990, 2.
4. Table of Organization and Equipment (TOE) 55138L000, "Transportation Motor Transport Company, Main Support Battalion, Infantry Division," Headquarters, Department of the Army (HQDA), 1 April 1987.
5. TOE 55188L000, "Transportation Motor Transport Company, Main Support Battalion, Heavy Division," HQDA, 1 October 1986.
6. TOE 55729L000, "Transportation Heavy Truck Company, HQDA, 1 October 1985.
7. COL Daniel M. Kelleher, assistant commandant, US Army Transportation School, personal interview, 18 March 1991. Kelleher previously commanded the Division Support Command in the 1st Armored Division in the Federal Republic of Germany.
8. *Ibid.*
9. Wakefield.
10. Alicia E. Sack, "HET: A Tank's Best Friend", *Army Logistician* (March-April 1984) 24.
11. LTC Phillip J. McManus, director of support, US Army Transportation and Aviation Logistics Schools, personal interview, 18 March 1991. McManus was chief of the Central Command (CENTCOM) J4/7 Host Nation Support Office during operations *Desert Shield* and *Desert Storm*.
12. *Ibid.*
13. MAJ Michael E. Mamer, personal letter, 28 August 90. Mamer was the executive officer of the 93d Transportation Battalion (Provisional) (Movement Control) during *Desert Shield* and *Desert Storm*. He wrote a series of personal letters to his wife, CPT Roseanne O. Mamer, who graciously provided appropriate excerpts. Mamer's letters will, henceforth, be cited only by date.
14. Mamer, 3 September 1990.
15. McManus.
16. MAJ Thomas L. Moore, personal interview, 2 April 1991. Moore was temporarily assigned to the Center for Army Lessons Learned, Fort Leavenworth, KS, and deployed to Saudi Arabia as an observer with the 3d Armored Division. He was with the division for most of *Desert Shield* and all of *Desert Storm*.
17. *Ibid.*
18. McManus.
19. Mamer, 16 October 1990.
20. *Ibid.*
21. McManus.
22. Mamer, 18 December 1990.
23. Mamer, 19 December 1990.
24. Mamer, 19 January 1991.
25. Mamer, 20 January 1991. The HETs referred to in this note are the current design M911 tractor and M747 semitrailer. This HET is designed to carry 60 tons.
26. McManus.
27. McManus.
28. US Department of the Army FM 100-5, *Operations* (Washington, DC: US GPO, 5 May 1986), 16.
29. Memorandum, US Army Transportation School, ATSP-CDC, 19 February 1991. Subject: Heavy Equipment Transporter Interim Operational Concept, enclosure, 1 and 2.
30. Wakefield.
31. *Ibid.*
32. MAJ Jeffrey R. Yoe, US Army Combined Arms Center, Fort Leavenworth, KS. Yoe participated in the Joint Working Group at Fort Eustis, Virginia, January 1991. During and since the Joint Working Group, he has answered numerous technical and doctrinal questions regarding the deployment and employment of heavy armored forces. His contributions to this article have been invaluable.
33. Technical Manual 43-001-31, *Equipment Data Sheets for TACOM Combat and Tactical Equipment*, HQDA, June 1985.
34. Timothy D. Fulton, supervisory logistics management specialist, Directorate of Combat Developments, US Army Transportation School, Fort Eustis, Virginia. Fulton is the senior force developer for the design of the 96-HET heavy truck company. His contributions to this article have been numerous and invaluable.
35. Russel Feury, director of Systems and Cost Analysis, Tank-Automotive Command (TACOM), Warren, Michigan. Feury was the single point of contact for obtaining operating cost data from TACOM. His assistance was invaluable.
36. Colonel Elijah Toney, director of Combat Developments, US Army Transportation School, Fort Eustis, Virginia, personal interview, 9 January, 1991.
37. McManus.
38. Yoe.

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