When it comes to fratricide, **"zero is the only good score."**

Better "Blue Force" Tracking

AMERICA'S armed services are in the throes of a new and far-reaching campaign to eradicate the scourge of "friendly fire." Gulf War II had hardly stopped before the services had launched fresh reviews of fratricide—inadvertent attacks that troops inflict on comrades in the swirling confusion of battle. They are reassessing and, at times, altering tactics, technologies, procedures, and doctrine.

One prime objective is dramatic improvement in blue force tracking, that is, the ability to pinpoint the whereabouts of friendly forces in a rapidly changing battlespace.

There has been no upsurge in friendly fire casualties. The opposite is the case, as was seen in Gulf War II's "major combat phase" in March and April 2003. A preliminary analysis showed that fratricide of all types accounted for about 11 percent of 115 US battle deaths. Those figures suggest notable progress in recent years. In Desert Storm in 1991, fratricide was blamed for 35 of 148 US battle deaths—or about 24 percent.

Moreover, analysts debate the true meaning of these figures. During World War II, Korea, and Vietnam, the rate of fratricide was not as high. However, total deaths were far higher. In short, the rate of fratricide today seems high mostly because total ca-

By George Cahlink

Warthog. ***An A-10 rolls in to mark a target with white phosphorous rockets during an aerial demonstration. Pilots flying close air support missions rely heavily on the data collected and provided by ground forces.***

sualties are dramatically low. And that low death rate is attributed, at least in part, to high-speed war, US style. It rapidly shatters the enemy and prevents prolonged, casualty-producing force-on-force ground clashes.

As USAF said in an official Desert Storm analysis: "The loss or injury of any military member is at once tragic and regrettable, but the casualties sustained by the United States in the Gulf War must be considered in light of what they could have been—and what some had predicted they would be, before the war—had the bulk of Saddam Hussein's forces been fit, supplied, intact, and in place, awaiting the onset of the ground operation."

Navy Adm. Edmund P. Giambastiani Jr., commander of US Joint Forces Command, told lawmakers recently that the interaction of air and ground forces was "substantially greater" in OIF than it was during Desert Storm. Yet, even with a "more complex battlefield," the number of fratricide events was lower, he said.

Even so, military leaders argue that the armed forces must do more to reduce friendly fire casualties. Giambastiani listed fratricide prevention under a heading of "capabilities that fell short of expectations" and said more must be done to find joint solutions to the problem.

"We did better in Operation Iraqi Freedom, statistically," said Giambastiani at a House Armed Services Committee hearing on the lessons of Gulf War II. "However, one is too many."

The results of a year-long review of one of the fratricide incidents in Gulf War II highlight the type of communication and command and control problems that have been inherent in combat operations.

A 900-page report prepared by the Air Force and Marine Corps lays out in detail how USAF A-10 attack aircraft came to strike a US Marine company on the fourth day of Gulf War II. Investigators determined that a ground-based Marine air controller, located south of USMC Charlie Company, called in the air strikes against his own forces. He mistakenly believed that his unit was farther north than any others. (See "Aerospace World: A-10 Pilots Cleared in Fratricide," p. 16.)

Fratricides occur most frequently among ground troops, whether the shooting is done by other ground forces or from the air. A DOD analysis of training and combat statistics in the period 1990-99 found that ground forces were the victims in some 97 percent of all fratricides.

USAF photo by SSgt. AAron D. Allmon

Guides. ***SMSgt. Tim Tyvan, a USAF Tactical Air Control Party airman, and a second unnamed airman conduct an April 26 patrol in Iraq. The Air Force wants better communications with such troops at all times.***

Moreover, the 10-year review showed, the overwhelming bulk of the fratricides—about 90 percent—were of the ground-force-on-ground-force variety. Only 10 percent featured air attacks.

When they are launching strikes, pilots rely heavily on the data collected and provided by ground forces. The Air Force has made improving communications and information with blue force tracking systems one of its top priorities.

The key to USAF's antifratricide efforts lies largely in the quality of information its aircrews receive from ground troops. There was no shortage of technologies for identifying and tracking ground forces used during Operation Iraqi Freedom. They included advanced information systems that used GPS and digital maps, beaconing systems that sent out radar signals to friendly forces, thermal panels on vehicles, and even reflective tape soldiers placed on their helmets that gave off a bright signal when viewed through night vision goggles.

Combining Ground Systems

At the heart of Pentagon fratricide prevention measures are efforts to reduce the number of blue force tracking systems and improve communications between ground and air.

During OIF, the military experimented with as many as nine different blue force tracking systems, which often could not share information with one another, said Marine Lt. Col. Mike Sweeney, head of the Marine Corps information superiority branch.

"I believe that when we are successful you'll see the number of technologies used dwindle to two or three," said Sweeney.

The most widely used blue force tracking system is the Army's Force XXI Battle Command Brigade and Below (FBCB2), a system of ruggedized laptop computers and communications software that uses satellite links to form a wireless battlefield Internet. However, the FBCB2 system used in Gulf War II was limited in the amount of data that could be sent over networks and how quickly that information could be updated.

Ground troops using it complained that even simple messages had to be sent out in segments. They found that their positions would be updated on the digital maps within 10 to 15 seconds, but positions for other friendly forces took several minutes. Enemy positions were rarely displayed on the screens because they had to be entered manually.

The FBCB2 system, which was used by both soldiers and Marines, relied to some extent on commercial satellites, with no provision for sending classified information.

The Marine Corps, meanwhile, had another battlefield network that used Data Automated Communications Terminals located on hundreds of Marine ground vehicles. The Marine system, which won high marks for providing secure communications, had the necessary bandwidth to offer a complete battlefield picture to commanders, but the system relied on line-of-site communication towers to relay information, not satellites, and fast-moving troops often outran the system.

Recently, the Joint Requirements Oversight Council ordered the Army and Marine Corps to merge their battlefield networks and build a single, blue force tracking system for ground forces. The Army is leading the effort, which will retain the Army system's name, FBCB2.

"There are quite a few blue force tracking systems in the field, and we want to get them all under one single manager," said Army Col. Ray Montford, the project manager for blue force tracking.

The new system will combine the best features of Army and Marine Corps tracking systems. For example, the system will use the same ruggedized computers, graphics, system software, and non-line-of-sight networks developed by the Army while relying on the Marine Corps applications to create a common operating picture for commanders.

US Army photo by Capt. Timothy Beninato

Tracking. ***Sgt. 1st Class Kenneth Dawson of Ft. Lewis, Wash., checks the map of his Force XXI Battle Command Brigade and Below (FBCB2) system, a widely used but limited blue force tracking system that is being improved.***

Getting the Picture

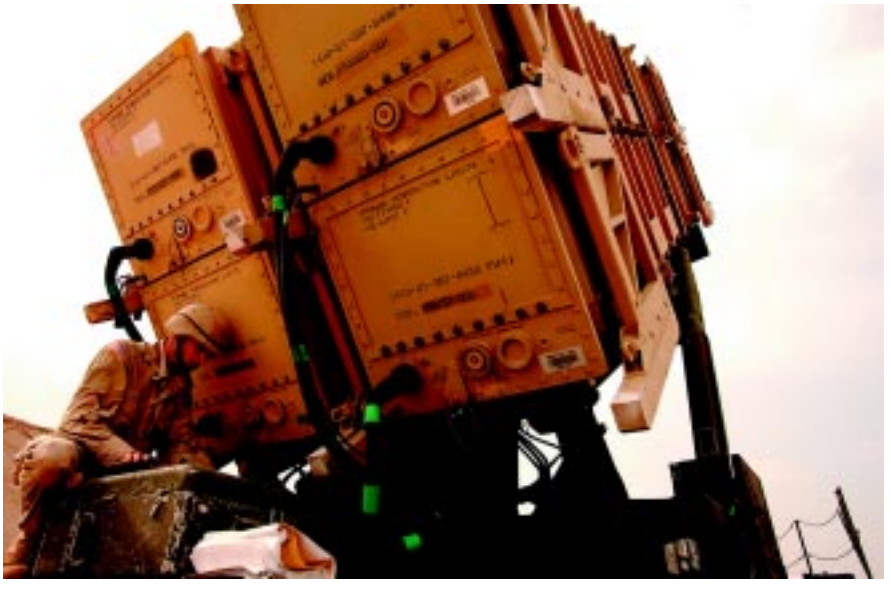
The Air Force plans to focus on improving battlefield management command and control operations at its fifth warfighting experiment, Joint Expeditionary Force Experiment (JEFX) 2004, slated for late July. USAF will test new blue force tracking technology and concepts during the experiment, which will involve hundreds of USAF and other service personnel at a half-dozen bases.

Getting general situational awareness reports—digital updates showing the location of friendly ground forces—sent directly to cockpit computers will be one key test during JEFX. Currently, before launching strikes, pilots receive most reports about location of friendly ground troops through radio communications from the ground or from battle management aircraft. In many cases, they must rely only on what they can see from the cockpit.

The Air Force plans to pump information gathered by the FBCB2 system directly into aircraft cockpits. USAF will attempt to tap into the central ground force battlefield Internet to provide real-time locations of friendly troops.

The information would have to be filtered, removing much data not essential to a pilot, before it would be sent—via a secure data link—to the cockpit. "You can't show everything because you'd have a display with nothing but dots on it," said Don Stuart, the technical advisor to the director of the Air Force Experimentation Office, Langley AFB, Va., which oversees JEFX 2004.

One part of the test entails using a high-resolution situational awareness system, for which USAF has developed software and links to quickly move the blue force tracking data directly to cockpit displays. It will show a pilot specific current information about the area he is targeting. "If you are given a close air support target and a forward controller says attack, you could find the target even before you go there and see if any blue forces were there," said Stuart.



USAF photo by SSgt. Quenton T. Burris

Danger. ***In Gulf War II, Patriot destroyed Iraqi missiles but also shot down two coalition fighters, killing three airmen. Ninety percent of fratricides, however, are of the ground-force-on-ground-force variety.***

During the upcoming JEFX, USAF also plans to examine how to improve situation awareness to help prevent the type of ground-to-air fratricides that occurred during Iraqi Freedom. In two separate incidents, US Army Patriot missiles mistakenly shot down a British Tornado fighter, killing two airmen aboard, and a Navy FA-18C fighter, killing the pilot.

The Air Force will share its daily master air plans with Army Patriot batteries to pinpoint areas where they may overlap. In turn, ground-based air defense units will share more location information with aircrews.

The Army not only will send information to aircrews, but also will rely on information collected by surveillance aircraft to fill out its situational awareness reports. Montford said USAF's Joint Surveillance Target Attack Radar System aircraft, with its sophisticated radars, sensors, and onboard computers used to track the movement of enemy ground forces, will share information with the Army's FBCB2 system to provide a more complete picture of the battlespace—data on both enemy and friendly forces.

"They can add credibility to our system and we can add credibility to their system," said Montford.

Air Force Gen. Richard B. Myers, Chairman of the Joint Chief of Staff, said at a House Armed Services Committee hearing in February that blue force tracking technology, such as FBCB2, was "critical" to the fast-moving ground campaign. However, he emphasized that "challenges remain" in providing "all front-line tactical units with friendly and threat information."

Joint Forces Command, he said, has the lead in a "comprehensive effort" to improve joint battle management command and control, including combat identification.

Part of JFCOM's work is to ensure that the services train in a joint arena with any new combat identification technology.

Army Brig. Gen. Robert W. Cone, director of the Joint Center for Lessons Learned, told reporters in a Pentagon briefing last fall that technology needs to be balanced with training. He said whenever he offers a technological solution to commanders they are quick to say that the system's success relies on training troops in using it.

USAF photo by SSgt. AAron D. Allmon

Keeping Watch. ***TSgt. Cory Langel (left) and A1C Kandess Johnson monitor a console onboard an E-8C Joint STARS aircraft. Such aircraft play a key role in developing detailed information about battlefield activity.***

Giambastiani said that Joint Forces Command has already planned to "embed and assess combat ID capabilities" in upcoming joint exercises.

"We want to get the equipment we need in time for training to be conducted on it before the troops deploy and use it," said Giambastiani. "It needs to be joint forces training so all branches of the military are speaking the same language."

The Bandwidth Issue

Army Lt. Gen. William S. Wallace, who commanded V Corps during Iraqi Freedom, told lawmakers last fall that the Army-Marine Corps fielding of the FBCB2 blue force tracking system was "extraordinarily successful," but he pointed out that the system had "thin fielding."

One reason, said Wallace, was that there was simply not enough time to produce more units. The other reason, he said, was "limitations in satellite capability."

There was not enough bandwidth available to accommodate fielding a blue force tracking system in greater numbers.

Air Force Lt. Gen. Daniel P. Leaf agreed with Wallace. Leaf told lawmakers at the same hearing, "When it comes to bandwidth and the use of the available spectrum, we don't just need to improve our user equipment, ... we have to improve our awareness of the utilization of the spectrum." Leaf is now vice commander of Air Force Space Command, but during Gulf War II, he served as the USAF liaison to the land component commander.

Leaf advocated creating an "operationalized picture," much as is done for air, land, sea, and space activity. He said operational commanders need a picture of "bandwidth utilization, availability, and, in some cases, waste" that they can use to "set and implement priorities" for more efficient use of the bandwidth available.

Leaf went on to say that the blue force tracking system alone is not the entire solution to the fratricide problem. He said it is "part of the overall combat identification matrix."

He told lawmakers that the Air Force's leaders gave Air Force Space Command officials "strong direction to look at how we can improve, enhance, and expand the role of blue force tracker as part of our overall situational awareness."

Leaf said: "In terms of fratricide, zero is the only good score, and we're not there yet." ■

George Cahlink is a military correspondent with Government Executive *Magazine in Washington, D.C. His most recent article for* Air Force *Magazine, "BRAC to the Future" appeared in the April issue.*