

easily recognized in a more modern form of organization where only machines can be held responsible for their own actions.

This is the nice thing about the Electronic Battlefield. It eliminates a constant problem of Vietnam and other wars—that some men must go and fight while others watch on television. With the truly automated system, everybody including the soldiers, will watch the war on televisions—the only difference between the Army and the American Legion being the placement of the viewing screen. And with satellite communications, it may even be possible for Legion groups or football fans at half time to be transmitted the sounds and electronic tracks of an actual person walking through the jungle right now, and then order the strike that destroys him—a portable command post could be driven from shopping center to shopping center on weekends. This would spread the burdens of war among the populace, and also solve the problem of how to win a war while withdrawing the troops. As General Williamson said, "We of the Army are continuing tests at Fort Hood and elsewhere. We are making unusual efforts to avoid having the American young man stand toe-to-toe, eyeball-to-eyeball, or even rifle-to-rifle against an enemy that may outnumber him on the battlefield."

The Vanishing Robot

Another benefit of the Battlefield is that it cannot be pinned down either abroad or at home. It eludes both the enemy that can never locate or destroy it, and the alert citizen or Pentagon critic who can't find it in the budget. It does not show up as a line item on anyone's budget request, and its components are spread throughout all parts of the services. Similarly, development and production have been parceled out to several dozen contractors, none of which has been designated "prime contractor." Those working on the Battlefield range from biggies like IBM, GE, RCA, Hughes Aircraft, and Raytheon, to little specialty firms like Dorsett Electronics of Tulsa, Oklahoma, and Resdel Engineering of Pasadena, California.

There can be no cost overruns because there is no original estimate to overrun. There is no central project office to query or blame if a component doesn't work. There is no publicly announced timetable, so the development of the Battlefield can never be criticized for falling behind schedule. And nobody knows exactly where the Battlefield begins or ends.

Eluding the domestic war critic, a much greater real threat to the Pentagon than the enemy, who, after all, requires more hardware and more appropriations to eliminate, has not been one of the great successes of the Pentagon in recent years. The Automated Battlefield, however, has been remarkably effective, through the strategy of "segmented development," in staying out of newspapers and hearing rooms. The success of the strategy can be seen in the problems encountered in trying to puzzle out the dimensions and cost of the program thus far.

Even after Westmoreland's speech, the Battlefield was still treated as if nobody had heard of it. Six months elapsed before any critical questions came from Capitol Hill, and most Senators and Congressmen were unaware (many still are) that we even have such a program. *Product Engineering*, a trade magazine, did an article on the Battlefield in February, 1970, well before the concept had achieved any attention on the Hill, pointing out, "Congressmen this year will discover they have been trapped again into financing another multi-billion-dollar military development program while learning almost nothing about its overall size, cost, or future defense implications." But if Congress doesn't know about the money, business does. The magazine went on to report that in January, 1970, more than 800 defense contractors showed up for a briefing on the Battlefield, and more than twice that number were turned away because of lack of space.

It was not until July, 1970, that a publicly audible note of dissent was heard from Congress. It occurred when Senator William Proxmire made a speech on the Battlefield: "One of the biggest problems is that the sensors cannot discriminate

between soldiers and women and children. Whole villages may be wiped out by seeding wide areas with air-dropped explosives designed to kill anyone who ventures near them. . . . A second major problem is the extreme vulnerability of much of the electronic equipment to malfunction due to rough treatment. . . ."

Although Proxmire's statement was based on information gleaned from publicly available trade, business, and military magazines, Senator Barry Goldwater inferred that Proxmire had let the nation down by giving up one of its most tightly held secrets. Said Goldwater, ". . . it (the Battlefield) is so highly classified that even the Armed Services Committee has not been able to hold hearings on it. . . . So as long as he has sprung it, so to speak, I can mention it." A few days later Goldwater went on to praise the project: "The increase in sophistication of this equipment has been nothing short of fabulous. Again, I am not allowed to say some of the things I have seen it do, some of the ways it is helping our men in Laos particularly—our airmen and ground forces."

On July 31, Proxmire reminded Goldwater that we were not supposed to have troops in Laos. Goldwater agreed and amended his statement to the effect that it had aided airmen in Laos thereby helping our ground forces in South Vietnam. He then pointed out, without prompting, "The real guts, you might say, of our sensor system is in Thailand, where it is used on the Ho Chi Minh trail."

Later in the month Proxmire rose again to challenge the program: "Most members of the Senate I have talked to did not even know we had such a program." The questions were straightforward: How much was the Automated Battlefield costing? To what extent did its development encourage future U.S. involvement in guerrilla wars? To what extent would sensing capabilities of the system be employed domestically, adding another threat to privacy? And with what result has it been used in Southeast Asia?

Proxmire was promised answers by Senator John Stennis, chairman of the Senate Armed Services Committee, and in November a special three-man "Electronic Battlefield Subcommittee" met for three days of closed sessions to look into the program. Senators Goldwater and Daniel K. Inouye were appointed members and Senator Howard W. Cannon was named chairman.

Toys Don't Care Who You Are

The Pentagon brought down some of its newly developed sensors to the hearing and laid them on the table, all the MAGIDS, MINISIDS, and MICROIDS, for the Senators to see. The whole presentation was something like a re-run from Mr. Wizard, with the gee-whizzing lad sitting at his knee, bedazzled with the glories of modern science:

Senator Goldwater: Does that beep at regular intervals?

General Deane: Just when it detects something, but right now, because there is so much disturbance here, it keeps beeping.

The disturbances being picked up by the sensors in the hearing room were remarkably positive, even adulatory, and Senator Goldwater led the gleeful, Christmas morning chatter, causing the sensors to beep back in a duck-like chorus of agreement. Before the first witness hit the stand, Senator Goldwater exclaimed, "I personally think it has the possibility of being one of the greatest steps forward in warfare since gunpowder."

Such expectations were confirmed by a long line of military men who testified to the merits of the Automated Battlefield as applied in Vietnam—how it aided the battle of Khe Sanh, made more accurate the random Harassing and Interdiction program (firing blind into the jungle), and how it saved American lives. The sensors, placed around American encampments, provided an early warning that even made the cooks more confident, according to General Williamson, who recounted one raid: "I think I have never seen a more confident group of cooks in my life, who,

after eliminating some 78 of the enemy in one night, boasted that hot breakfast was served right on time the next morning."

The majors and generals gave many such testimonials to the sensors that detected the enemy and the weapons sent to destroy them, stories which seemed to bring back for a moment the glories of past wars not usually associated with Vietnam. They talked of killing hundreds of enemy without any American losses. "In all, on the second night," went one tale of the Night Hawk helicopter attack program, "323 additional enemy were killed and 10 live prisoners taken. I had to move two additional bulldozers up to the area to bury the dead." They talked of expanding the battlefield to other places, like Europe, and what the problems might be. Major General John R. Deane told Senator Stennis that something new would have to be developed for England: "There are great chalk deposits, a very small distance below the surface of the ground. . . . you don't get very good seismic reaction in that kind of soil. . . ." They explained the domestic uses, that the U.S. Border Patrol has already been outfitted with thermal devices to spot border-crossers. (According to a report in *Electronics* magazine, war-tested sensors have also been placed under the White House lawn and in the yards of President Nixon's other homes. This caused a problem in Key Biscayne, Florida, where the salt spray activated the warnings, but the community reacted against a proposal to alter the shoreline so the spray wouldn't hit the lawn.)

One thing the military didn't explain was how the sensors could tell the difference between friend or foe. The investigation hardly brushed on the question of how these computer-driven things that go bump in the night knew for sure who or what is getting clobbered. You don't have to be a scenario writer to imagine what could happen: a programming error that wipes out a neutral village; an automated firepower system able to perceive everything save for a surrender flag (which someone forgot to tell it about); a malfunctioning sensor which orders a strike on our own technicians.

Many of these would be problems for the all-Automated Battlefield, and some are even problems for the sensor devices and systems like Igloo White already in use in Vietnam. As it now stands, a body becomes a number only after death in Vietnam, but with the new Battlefield, even a living soldier will be a numerical blip on a lighted panel, his existence or destruction known only by a blip along the sensor paths, a Tinkerbell whose death is signaled when the blip disappears from the tracking machine, meaning that the drone helicopter has arrived and gone.

Could Mylai have been a product of sensors and drone helicopters? General Deane, during the hearings, addressed himself to that question:

You say the sensors won't tell you. And the sensors might give you an indication if over an acoustic sensor you heard voices and determined from the conversation that they were enemy, that is the only way I would know you would be able to tell. Now, when you get into that kind of a problem, you have to bring to bear your knowledge of where your friendly forces are. . . . and use your best judgement. I think the commanders that I have known, if they had doubts, they would not fire.

The Automated Battlefield is promising, however, not because it demands such a rather unlikely combination of military intelligence and military good will, but because it eliminates their necessity. Nobody will be able to tell what or who has been killed, or why the computer ordered the bombs dropped on a specific piece of real estate. Even the words used to describe the successes or failures of the Battlefield will be indistinguishable from those used in second-level electronics textbooks—modern war stories will be confused with circuit diagrams. The subcommittee caught a glimpse of this when its director of investigations, Ben J. Gilleas, asked Major Jerry E. Hudson,

"Did you have much trouble with false alarms?" Major Hudson answered, "We did later on. The interpretation people did, yes sir. That word has been stricken from the vocabulary. That is now a non-targetable activation."

Of Course, the Automated Battlefield would be a happy alternative to war if both sides had them and merely mapped out an area on which machines could fight until one side emerged with fewer blasted components. Spilled spaghetti-like computer-ganglia, fragmented transistors, and severed carbon memory cores are a fine trade-off for the equivalent in human components. But as the equation becomes American electronics vs. guerrilla flesh, one wonders.

GI Joe, IBM 360

As for specific preview of coming attractions for the system, some strong hints are emanating from the Advanced Research Projects Agency (ARPA), the research contracting arm of the Secretary of Defense. ARPA has been very active in the Battlefield program and in 1970 contributed almost \$30 million to the project kitty. While some of its other research projects have not been officially connected with the Automated Battlefield, it is not hard to see how some of them will fit neatly into it, especially when one recalls Westmoreland's utopian description of the totally automated future army. One such project is called Nite Gazelle, an effort aimed at fielding an unmanned attack helicopter outfitted with a moving-target indicator.

Most mind-boggling in terms of future implication is Pentagon support of research projects in the realm of artificial intelligence, or robotics. For several years now military money has backed projects at Stanford Research Institute and MIT. These efforts have gone far beyond the theoretical stage and have developed beyond mechanical infancy. The Stanford robot can pick out and kick over wood blocks, and the MIT robot can distinguish between faces. While neither robot has yet been drafted into battle, the Department of Defense is not spending money on these projects for nothing.

The costs of the Battlefield are as elusive as the components. Proxmire led off the bidding in 1970 by claiming that the Battlefield had thus far cost over \$2 billion. He was immediately contradicted by Chairman Stennis, who insisted that it had been no more than \$1.685 billion. The next voice heard was that of the Senate Armed Services Preparedness Investigating subcommittee, which after three days of closed hearings on the subject in November, 1970, determined that \$3.25 billion had been appropriated for the program, although not all had been spent.

While the cost that has been run up so far for the Battlefield is hard to puzzle out, it is nothing compared to the question of what the Battlefield will eventually cost. One of the few estimates made thus far has been one of \$20 billion offered by *Business Week*. The Army has tagged that estimate as "without credence" but has not itself given a comprehensive alternative. Clues to the eventual costs may lie in some of the current activity geared to developing and spreading the Automated Battlefield.

At present, the program is moving in many directions. Large hunks of the existing Automated Battlefield will be left in Vietnam for the South Vietnamese to use as they see fit. In fact, all ARVN divisions have been given sensor units, a Sensor School for Vietnamese has been in operation since late 1969, and America's main sensor depot at Cam Ranh Bay is being Vietnamized. Pentagon research boss John Foster announced to the Senate Armed Services Committee in 1969 that work was beginning on the design of a counter-infiltration and intrusion detection system for the Republic of Korea.

Meanwhile, the Army is now organizing its new TRICAP Division, which it hopes to have in operation by this summer at Fort Hood. The function of the division is "test and experimentation," under the command of MASSTER, which will use it to test new Automated Battlefield techniques.

Photo of Laotian guerillas. Courtesy, Women's Union.