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Vietnam's Electronic Battlefield

By Lenny Siegel

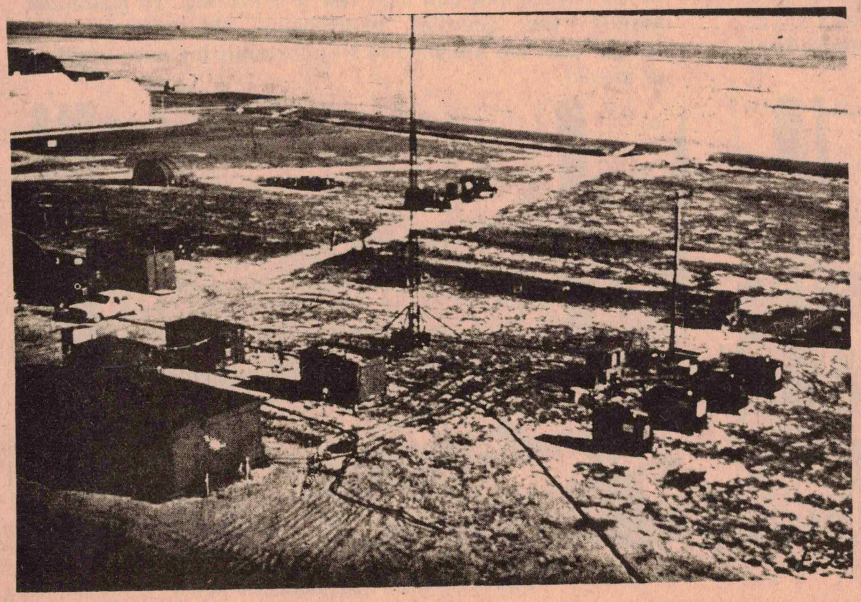
David Packard, the Dean of the "Military-Industrial Complex," told a convention of electronics manufacturers this April that an increase in America's technological military strength must accompany the current reduction in military manpower.[1] The Deputy Secretary of Defense was echoing what military bureaucrats, from General Westmoreland down, have been saying for the past two years. The U.S. military—especially in Vietnam—is attempting to replace men with machines. Vietnam's electronic battlefield is the testing ground for this strategy.

BACKGROUND

When President Johnson ordered the full-scale deployment of American troops in Vietnam, the U.S. military was prepared to fight a conventional war. In both the Korean War and World War II, the U.S. effectively contested territory with enemies using similar, conventional strategies. The U.S. was unprepared for Vietnam since in a guerilla war, the "enemy" does not seek to protect a battlefront. Though secure in its superior firepower, the U.S. in Indochina has always had difficulty finding the enemy.

The initial response was the "Search and Destroy" mission. Infantry patrols and often tanks would roam the countryside seeking the evasive National Liberation Front (NLF) guerillas. A similar tactic used by air cavalry (helicopter) units was "reconnaissance by fire." Pilots would buzz enemy areas until fired upon. Hostile fire was the indication of guerilla presence.

These tactics were unsuccessful because it was still up to the guerillas to let themselves be known. They could easily hide, move away, or melt back into the civilian population. For the American and Saigon (ARVN) troops, however, these search and destroy and reconnaissance-by-fire missions were costly. Many men were killed and much equipment was lost. Not only did this increase political



antagonism at home, but GI's refused to aggressively seek out a dangerous enemy.

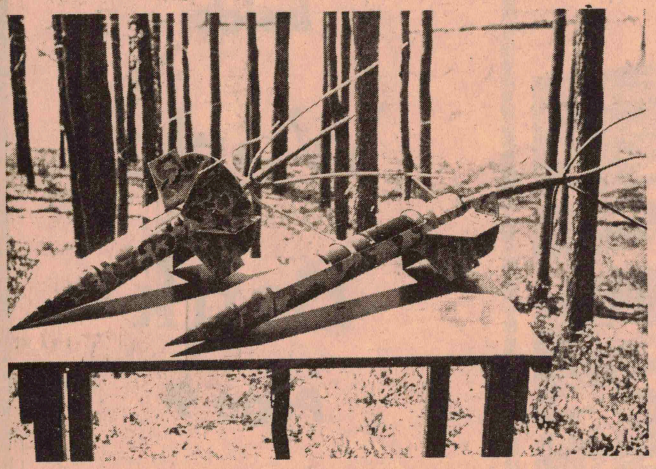
Richard Nixon assumed office against a rising clamor to "Get out of Vietnam." Military victory seemed remote, as the demoralized—often rebellious—U.S. military began to disintegrate. Nixon had little choice if he wished to continue the war: he decided to minimize ground combat involving U.S. troops. With the exception of major attacks against guerilla supply routes in Cambodia and Laos and occasional minor operations using ARVN troops, Nixon has withdrawn troops to urban areas and bases, relying instead on air power.

This is the evolving strategy of **permanent counterrevolution.** Unable to defeat the guerilla movement, the U.S. is seeking a low-profile facade for its continuing involvement—hoping for a favorable political settlement. Political pressures in the U.S. and open rebellion in the military have forced the creation of the "Nixon Doctrine" (the removal of American ground troops) but the air war has intensified.

Bombers, however, have great difficulty targeting evasive guerillas. Some ground presence must supplement air power to make it effective. Though Nixon speaks proudly of "Vietnamization," the ARVN's have proven to be unwilling and unreliable fighters. The alternative to search-and-destroy missions, the replacement of men with machines, is in full swing. This is the electronic battlefield in which the administration hopes to maintain the War in Southeast Asia by replacing American boys with Yankee ingenuity.

The electronic battlefield is not much more than the application of technology to the basics of classical counterinsurgency. "Surveillance and detection" equipment is used to find the enemy. "Command and control" equipment helps to evaluate the threat and to dispatch the proper military forces to the scene and navigation as well as "command and control" equipment, makes sure that the weapons reach their target. Tying these functions together are electronic communications. None of these uses of electronics are new, but with the Nixon doctrine of automation, they have risen to a position of prominence in America's arsenal.

It is important to understand that the electronic battlefield does not increase the overall military capabilities of U.S. and Saigon forces in Indochina, despite rave reports by military brass. Technology, regardless of its sophistication, cannot overcome the conviction and perseverance of a people such as the Vietnamese. It is effective only insofar as it lessens the political costs of the war, allowing the U.S. to continue its war of punishment and destruction against the land and its people.



Air-Delivered Seismic Intrusion Detectors

SURVEILLANCE AND DETECTION

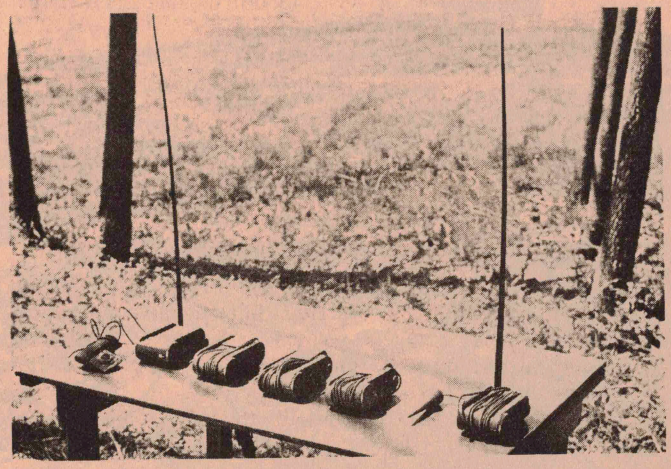
Military usage of the term "electronic battlefield" usually refers to surveillance and detection equipment, designed to locate the "enemy." Such equipment is relatively new to the electronic arsenal, and was developed specifically to meet the need of an army fighting a counter-guerilla operation. Guerillas use the night, inclement weather, and their knowledge of the people and the terrain to mask their activities. To deny these advantages to the guerillas, the U.S. has called upon the same technology that brought us colored television, automatic garage-door openers, and more.

Military contractors such as the Stanford Research Institute have been developing and testing surveillance and detection equipment in Thailand since the early sixties. Their successes led the Jason Division of the Institute for Defense Analysis to recommend, in 1966, the construction of an anti-infiltration barrier across the De-Militarized Zone. This barrier, known as the "MacNamara Wall" or the "Edsel Line," proved costly and ineffective. In 1969 it was abandoned, barely begun, but the technology developed for it led to the electronic battlefield.

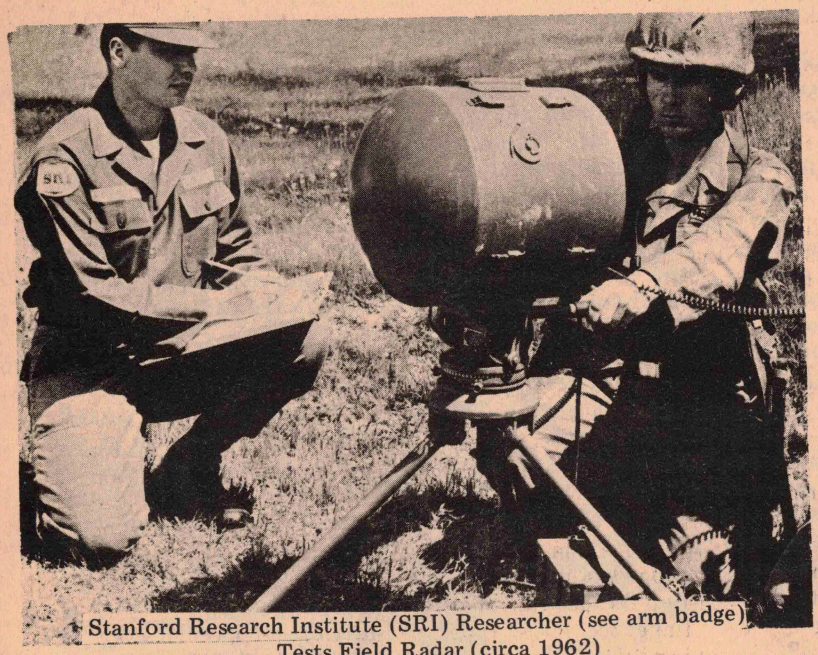
There are many types of surveillance and detection equipment. Devices have been designed to detect men, trucks, weapons, and supplies. Equipment has been developed to sense sound, heat, odor, motion, and ground vibrations. Some detect the presence of metal. Others amplify light. Infrared technology, radar, and magnetic technology are all used.

Acoustic (sound) and seismic (ground vibration) sensors make up the bulk of unattended detection devices. They are often placed at the outskirts of U.S. bases—many versions were first used at Khe Sanh—or along important trails. The sensors monitoring the Ho Chi Minh trail are air-dropped either to hang from trees or to bury themselves in the ground. Sensors are often disguised as foliage of animal droppings. Most unattended sensors have self-contained radio transmitters. The active life of most sensors, if not destroyed upon impact, is around two months, unless they can be retrieved for repair.

Each time a sensor records activity in its area it sends out a coded radio signal to a manned receiving and display facility. This center knows which coded sensors were put into each area, and can therefore locate the activity. Theoretically, by using an array of several sensors, men or computers at this receiving facility can determine the size of an enemy unit and how fast it is moving. To guarantee against the guerillas re-arranging the sensors, the transmitters are designed to stop transmitting once touched or moved.



Patrol Seismic Instrusion Detector



Stanford Research Institute (SRI) Researcher (see arm badge) Tests Field Radar (circa 1962)

The most widely used manned-detection device is the "Starlight Scope." Weighing from three to six pounds, the Starlight Scope finds use with troops in the field. This scope, which comes in designs fitting rifles or larger crew-served weapons, amplifies light as faint as starlight to give infantrymen night vision. Initial night-vision equipment used infrared light, but was discontinued when the NLF learned to shoot at the infrared flashes. The light-amplifying Starlight Scope emits no light (or other radiation), so it cannot be detected.

Another piece of electronic equipment seeing heavy action is the mortar-locating radar, used to pinpoint the source of incoming artillery fire. The model used most in Vietnam first found use in Korea. Designed for conventional warfare, it has a narrow field of vision. Since artillery fire in Vietnam can come from any direction, the army has been testing new designs.

Since much of the reconnaissance work is done in areas far from troop concentrations, airborne equipment is an important aspect of the electronic battlefield. Specially designed aircraft of all sizes—including helicopters, small planes, and large air transports—carry low-light level television (similar to the Starlight Scope), infrared sensors (to detect campfires or truck engines), and various forms of radar. This equipment augments still photography, which is still used a great deal in aerial reconnaissance, and flares, the traditional aid to vision at night.

Much of the surveillance electronics developed for the battlefield in Vietnam is being brought home to the U.S. A $200,000 plus residential complex near Washington D.C., recently installed sensors along its walls to warn of burglars and other undesirables. Police in many cities are acquiring low-light TV for night-time work. And airlines and prisons are using metal detectors to screen weapons.

COMMUNICATIONS

Military communications have come a long way since Marathon and Paul Revere's ride. But the demands upon communications have grown faster. Electronic communications existed long before the advent of the electronic battlefield, but they are key to its operation.

For the electronic battlefield to work, beeps from sensors must be transmitted to centers where they can be interpreted, decisions can be made, and any one of a large number of attack forces sent out—immediately. The need for real-time (immediate) communications is not peculiar to sensor surveillance. It is necessary in a war where the enemy moves quickly and easily disappears. Throughout the Indochina War the military has been trying to establish communications methods which will transmit data and instructions to or from any spot in Southeast Asia.

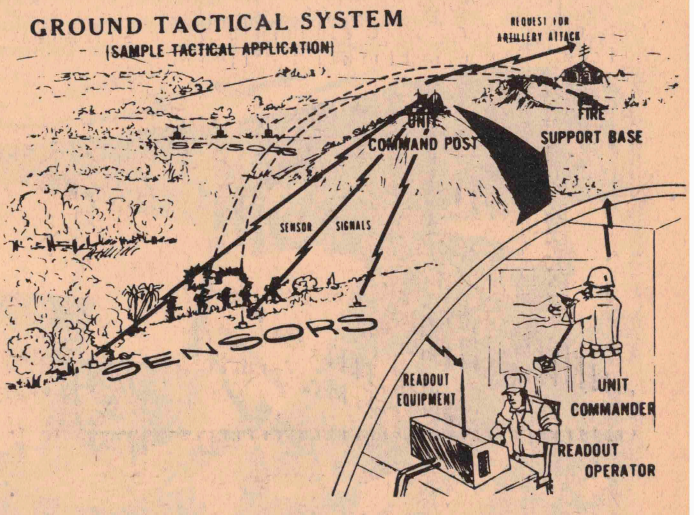
Battle communications can be transmitted by voice, scrambled voice, teletype, or code. In the electronic battlefield nearly every unit communicates by radio with some form of command post. Patrols, base areas, jeeps and tanks, ships and rivercraft, and aircraft, as well as unattended sensors, must have either cable links or radio transmission capabilities. Since undeveloped Indochina has never had large telephone or telegraph networks, the military has relied on radio.

Since some forms of transmission are not reliable over all distances or all terrain, the military has set up relay systems to hold together what has become a complex, intricate network. Relay aircraft and satellites[2] tie unattended sensors to receiving facilities and connect isolated units with command posts. In addition, a microwave radio relay system (similar to that employed by the phone company in the U.S.), with installations on guarded hilltops, criss-crosses Vietnam and even reaches to U.S. installations in Thailand.

Maintaining communications between different types of units is no simple matter. For a long time marines and infantry troops could not speak directly with their air support. The Air Force was using FM radios, while the ground units used equipment designed to meet their specific needs.

New equipment with standardized channels for ground-to-air communications, overcomes this difficulty. Since all air support and ground units must use those channels, transmissions interfere or at least tie up usable channels. Controlled use of radio transmission and complicated switching procedures have been initiated, but prevent full use of the network.

The "telephone" network of microwave relay equipment faces many of the same problems. Connecting all minor bases as well as major headquarters, this "Integrated Communication Service" is called upon to carry extremely heavy traffic. Modern switching techniques and equipment provide a growing number of channels, but technology must race to keep up with a need which grows to meet the complexity of the war.



From Senate Hearings on the Electronic Battlefield

COMMAND AND CONTROL

The use of computers in the battlefield gained public view when General William Westmoreland, in a speech delivered in October, 1969, predicted the "Automated Battlefield."[3] Within a decade, said Westmoreland, the battlefield could be fully automated. Westmoreland may never realize his dream, but computers today assist and even replace men in Vietnam.

The facilities which receive the transmissions of sensors use computers to pinpoint the location of the activity and to analyze what type of disturbance activated the sensors. At other stations radar beeps are processed, compared with the terrain, and analyzed to determine the source. Transforming electronic data into usable information is key to the electronic battlefield. Computers are integral to this operation.

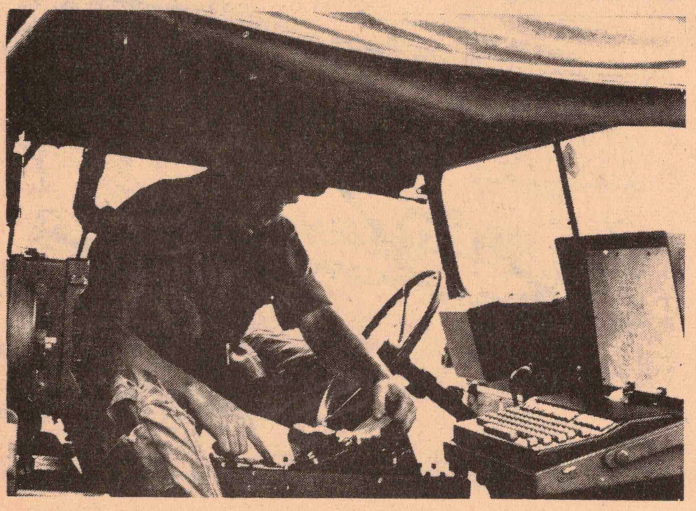
Another use of computers for command and control is the direction of artillery fire. Computers receive coordinates defining targets and aim guns to hit them. Some artillery units are tied directly to battlefield sensors. The army has not yet succeeded in removing the human element, but according to Westmoreland, it is working hard at it.

The military is not only working on systems to aim weapons at designated targets. It is developing systems to determine which weapons system is to be used against a target at any given time. In Vietnam, where the U.S. maintains a multiple-threat assault force—including B-52's, fighter-bombers, helicopter gunships, tanks and infantry—this has been no easy task. Human commanders have had difficulty insuring that bombers would not be bombing friendly helicopters or ground troops, and have wasted valuable resources by not focusing the various assault forces in the most efficient way. Computer systems for tactical operations seem to be the answer, but today they are only used to aid human commanders. It may be some time before the machines takes command.

NAVIGATION

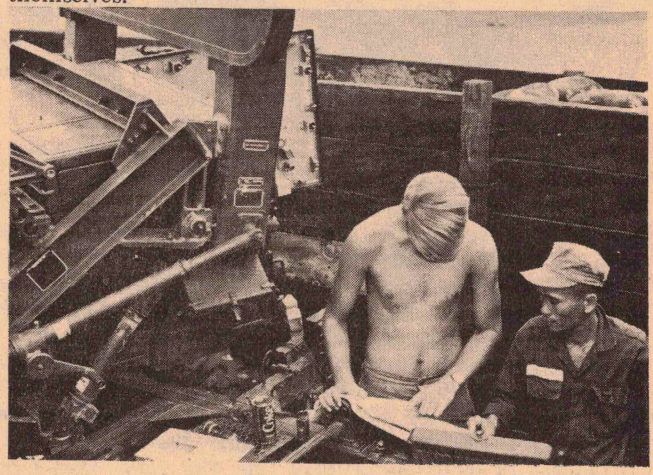
The military has also developed a large number of navigational aids to support the huge fleet of aircraft in use in Southeast Asia. Radar and computer guidance, commonplace in commercial air transport, are rudimentary to the control of American aircraft in Southeast Asia. To direct bombs or missiles from fast high-flying aircraft to small, often cloud-covered targets, the military has taken navigation a step further.

The laser-guided bomb is a navigational device which, claims the Air Force, increases bombing accuracy tenfold. The laser is useful because its narrow beam follows a straight line in real-time (at the speed of light). One aircraft aims the laser at the target. A second aircraft releases a bomb which homes in on the light (at the particular frequency of the laser) reflected from the target. The laser-guided bomb, like its sister, the electro-optical (TV-guided) bomb is extremely expensive, costing in the tens or hundreds of thousands of dollars each.



The "Wild Weasel" is a missile which homes in on the radar from surface-to-air missile sites in North Vietnam. The Wild Weasel now used in "protective reaction" raids, is an advanced version of those used in the daily bombing of North Vietnam in 1968.

A third new use of navigation is the "Skyspot Radar" or "Highway-in-the-Sky" technique. A computer facility programmed with the location of a target guides an aircraft to the target. The pilot, if he has anything to do at all, merely follows instructions from ground radar. This system permits ground technicians or computers to actually release the bombs, but pilots usually prefer to press the button themselves.



Technicians Ponder Hot-Weather Breakdown of Mortar-Locating Radar

EFFECTIVENESS

When a Senate sub-committee held hearings on the electronic battlefield last November,[4] a literal parade of military brass reported remarkable success in Indochina. Lower-ranking vets tell another story—one which matches the weak state of U.S. forces in Indochina. These devices have replaced men but they have not increased military effectiveness. The military can cite successes, such as the defense, by support troops, of Fire Base Crook, but for every success there are failures. Once the guerillas learn of the particular devices being used against them, they can adjust their tactics. Meanwhile the U.S. faces the difficulties and costs of fighting an exceedingly complicated war.

Since the War's beginning, fighting men in Vietnam have complained about the ineffectiveness of their electronic equipment. Some of those complaints have subsided, but only after immense research and development resources were brought to bear. New developments were required just to bring equipment up to the performance levels of Korea or Germany.[5]

The most common causes of failure for electronics in Vietnam have been the alternative conditions of dry dust and high humidity. Until equipment was designed to seal out moisture and dust, even the best equipment shorted out. Radio equipment which works elsewhere is often rendered useless by the tropical magnetic background. Most electronic equipment—computers, especially—is designed to

operate in cool, often air-conditioned environments. In hot, rural Vietnam, equipment must function in high temperatures. Most new, complicated equipment is tested under laboratory conditions by well-trained personnel. Under battlefield stress, exaggerated a former Air Force Captain, "Nothing works, as a rule of thumb."

HO CHI MINH TRAIL

One of the biggest tests the electronic battlefield has been along the Ho Chi Minh trail network in Laos. The Air Force claims that "Igloo White," the Air Force's use of sensors to stop the infiltration of men, equipment, and supplies from North Vietnam, has reduced guerilla activity and sharply raised the cost. But the military does not explain why, after three years of massive bombing using the most modern detection equipment, it was still necessary to send Vietnamese ground troops into Laos this February and why the ARVN's met such heavy resistance.

An Air Force Lieutenant formerly involved in air reconnaissance from Thailand offers some explanation. In response to an Air Force claim the Skyspot Radar allowed bombing with an accuracy of ninety meters, he said "That's all well and good, except that the maps themselves aren't accurate down to ninety meters, they're only accurate down to 2-300 meters."[6] The Lieutenant added that high-flying planes had difficulty detecting Vietnamese roadbuilding battalions. Once the Vietnamese heard plane noise they would melt into the jungle. If they were working in a rice-growing area, they would quietly form a line, which from a speedy aircraft might look like a paddy-dike.

Other equipment failed to detect enemy activity. Side-looking radar, was designed for flat terrain, not mountainous Laos. Airborne infrared (heat-detecting) devices were designed to detect warm truck engines. Not only has infrared been ineffective in tracking bicycle traffic—much of the resupply effort—but in the warm, rain-soaked jungles of Laos the heat diffuses before it leaves the jungle. Furthermore, the Vietnamese have learned to confuse the heat-detectors by building diversionary fires or letting bomb fires burn.

Magnetic metal detectors may work well in air terminals, but the Ho Chi Minh trail is covered with shrapnel, bomb casings, and disabled vehicles. The detectors cannot distinguish between trucks and truck frames, or between weapons and metal scraps; thus they are useless along the trail.

Even the unattended sensors work poorly. Many are destroyed on impact. The others, whose small transmitters operate from covered areas, transmit signals which cannot be received without noisy interference. Once the signals are received and interpreted, it is still necessary to dispatch aircraft to the site. The time lag makes the bombing of moving targets inaccurate, and the Air Force is often forced to resort to the blind saturation bombing required before the wide-scale deployment of sensors in 1969.

Pod for Air-Delivery of Sensors

Still the U.S. can bomb the "trail." However, as the American public learned this February there are many trails. Photography and electronic devices can detect individual paths, but the Vietnamese are always switching routes and building fake roads (to divert bombs from real trails). The Air Force argues that "Igloo White," sharply increases the costs for the Vietnamese. The Air Force fails to mention that the operation itself is costly. An Air Force Lieutenant—obviously not an official source—concluded that "A guess of $100,000 (cost to U.S.) per truck destroyed on the trail is a very conservative figure."

The benefits of this costly operation are simple. The administration does not have to face the political consequences of maintaining large numbers of U.S. ground troops in Southern Laos—this is forbidden by the Cooper-Church amendment.

Crew-Served Starlight Scope

STARLIGHT SCOPE

Official sources regularly praise the Starlight Scope as a revolutionary advance, but enlisted men have stories which cast some doubt on its value. Army magazine describes an officially-told incident in which a scope-aided U.S.-patrol maneuvered between two NLF companies at night and tricked them into firing at each other.[7] Despite this success story, the overall picture is not so rosy.

A communications specialist told me that the scopes detected movement only twenty percent of the time. Their use, he felt, was negated by the false sense of security they brought. He also said that the best equipment was always hoarded by troops in secure base areas. It was often impossible to get batteries to keep equipment running. An infantry platoon leader told me that the scopes were impossible to fix in the field—they wouldn't focus well—because they were sealed to avoid the interference of dust or moisture.

Another difficulty with the Starlight Scope was the ease with which the NLF adapted it to their own uses. The platoon leader said that his men had re-captured scopes from the enemy on several occasions.

Troposcatter Antennas for the Integrated Communications Service

CAPTURED EQUIPMENT

Portable equipment such as the scope are not the only components of the electronic battlefield captured or used by the guerillas. Since many radar and data processing units are large and require a great deal of power, they are fixed and easy to find. A former Air Force captain told me that the generators required to run much of the new (and some old) equipment made enough noise to attract every NLF soldier within miles. Such installations, he said, were "sitting ducks." In 1968 the North Vietnamese captured a major navigational radar on a mountain-top in North Laos. A secret monitoring station code-named "Hickory," a mile north of Khe Sanh, was captured this June along with equipment worth "hundreds of thousands or even millions of dollars."[8]

The guerillas have been able to plug into the Integrated Communication Service of Microwave switching and relays, according to Microwave magazine, without capturing its relay stations. And, according to Microwave rather than the hill-top installations, "Vietcong who believe in the imminence of their victory want to preserve these links for their own use."[9]

The NLF and North Vietnamese have captured fixed equipment, portable equipment, and unattended sensors. With a strong spy network throughout the ARVN and Saigon bureaucracy, the Vietnamese probably know more about the electronic battlefield than the U.S. Congress.

COUNTERMEASURES

The NLF have developed many extremely clever countermeasures to the equipment the U.S. is using against them. For instance, the U.S. has long been using mortar-locating radars. So, for many years, the NLF has used simple water-clock fuses to fire rockets long after they leave an area. The patient NLF avoid radar designed to pick up troops moving radially by hiding behind hills, moving circumferentially, or moving slowly. A Pentagon official responsible for expediting Vietnam-related research reports that:

> (A guerilla) can stop a tank with a hand-held anti-tank weapon because he just plain sneaks up to it, stays under a bush two or three days, or submerges himself in a rice paddy for the tank to come along.[10]

Even the most modern radar can't do much about that.

An interesting countermeasure frequently reported has been the use of bags of urine to throw "people-sniffers" out of whack. Now the Army has developed new sniffers which rely on other chemical properties.

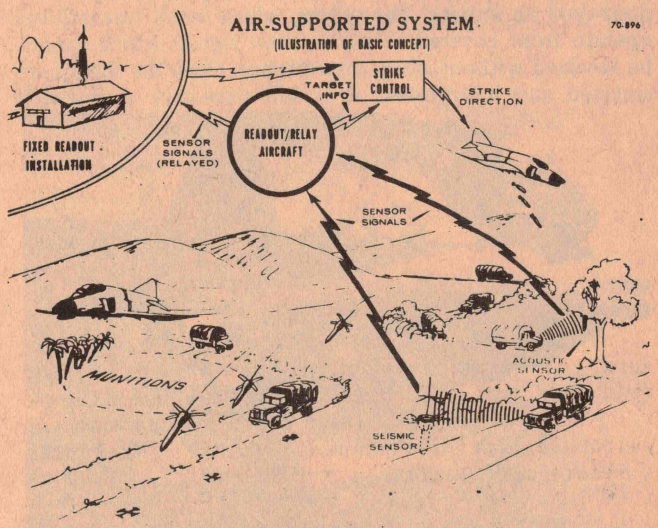
Other methods of diversion have been reported, and many more, one can assume, are used as well. The NLF is capable of creating disturbances which will be picked up by sensors while sending their main forces elsewhere. Just as the TV hero throws a rock to the other side of his waiting target, the NLF deceive the sensors, using rocks, buffalo, and often volunteers.

COMMAND DIFFICULTIES

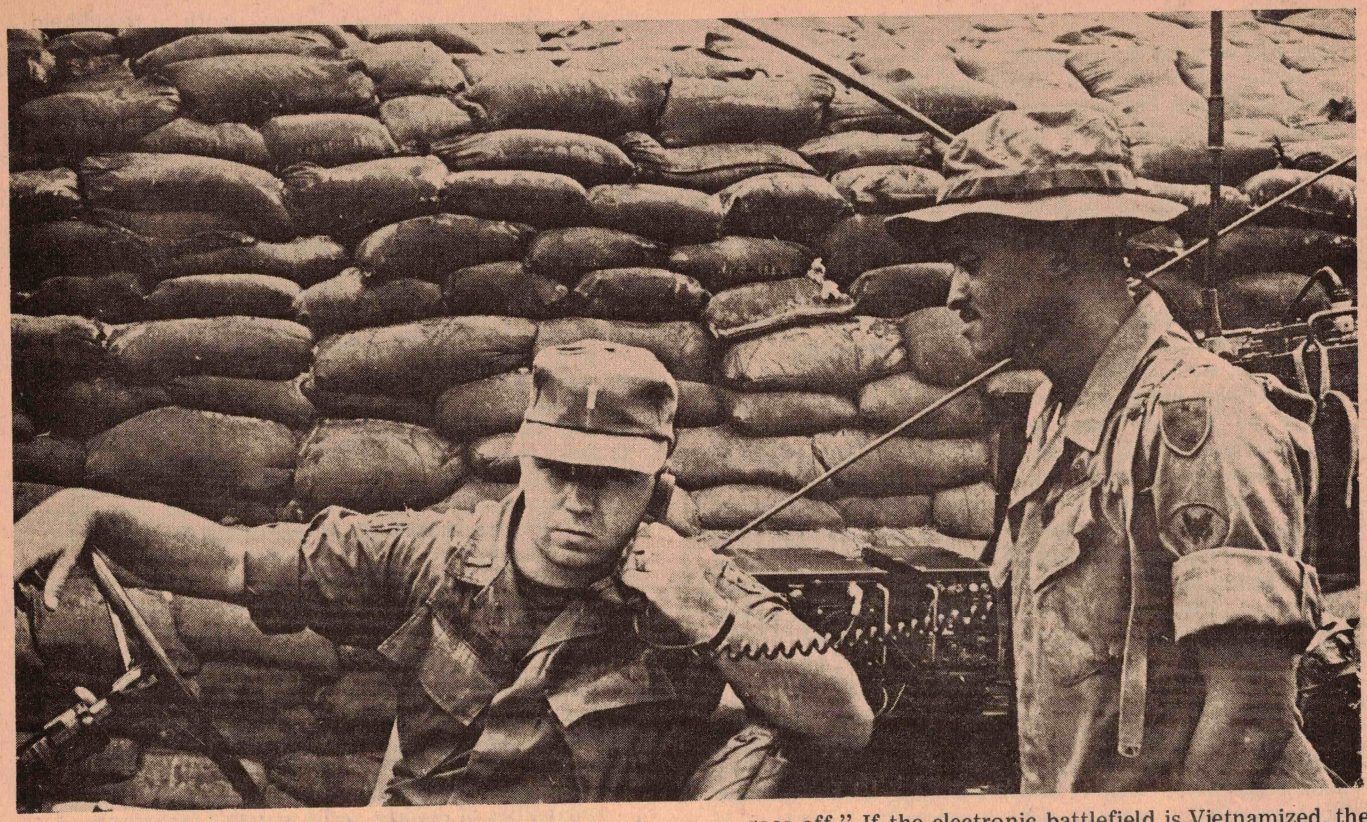
As the battlefield of Vietnam is automated, more decisions are made by computers or commanding officers far from the scene of battle. While the centralization of command may seem efficient to the lords of the Pentagon, distant commanders can actually know very little about battle situations. This is especially important when fighting an "enemy" as clever as the Vietnamese. Computers and sensors are programmed to respond to events similar to known past actions. They have no way to compensate for the creativity of the Vietnamese.

One significant example of how sensor-dependent commanders can misjudge a situation was the original battle for Khe Sanh. One night, sensors indicated an attacking force of North Vietnamese or NLF. The commanding officer ordered artillery strikes on the path of the advancing troops. Sensor activation stopped, so the Captain, relying only on sensors and the faulty information of a "North Vietnamese deserter," concluded that the attackers had been destroyed or scared away. Apparently the Vietnamese had switched their path, however, and, according to the Captain, "Marine NCO's and other ranks made up for the mistakes of the alleged brains of and on the staff"[11]—beating back the "surprise" assault.

The military's solution to the Khe Sanh debauchal is more sensors and better-trained commanders—at additional cost and complexity. The NLF, on the other hand, relies on autonomous decision-making in the field by men who know exactly what is happening. All the computers in Indochina can't do much better than that.



From Senate Hearings on the Electronic Battlefield



SKILLED MANPOWER

Getting trained operators and repair personnel into the field is difficult if not impossible. Repair service requires people familiar with the latest designs and most modern technology. Often this means a civilian—a manufacturer's representative or government employee. A communications adviser told me that he had to wait days, even weeks, for a Saigon-billeted civilian to repair his remote stationed 1200X word per minute teletype.

The men who daily operate computer-directed artillery are often inadequately trained. The army expects them to learn on the job, but the typical one-year tour in Vietnam for an artillery officer includes only three months at a fire base. Such rapid turnover prevents the development of teamwork as well as operator skill, and severely reduces the effectiveness of the artillery. Since training is expensive and experience invaluable, the Army has been offering multi-thousand dollar re-enlistment bonuses to skilled officers but has had little success.

Some equipment is too sophisticated for military personnel. The Army hires civilians—at high civilian wages—to operate its newest radar systems.

Manpower problems go beyond the difficulty of training skilled personnel, however. If assigned to try out a new electronic device in combat, today's demoralized soldier may step out of sight, smoke some dope, and later sign a card verifying that the device worked well.

If maintaining an armed force skilled enough to operate the electronic battlefield is difficult for the United States, it is impossible for the Vietnamese. ARVN morale is even worse than that of American GI's. In addition, few Vietnamese have sufficient education to easily learn the use of sophisticated electronics, even if texts are translated into Vietnamese. Living in a nation without much consumer use of electronics, Vietnamese have little experience to relate to in their training. An adviser who worked with the ARVN signal corps was pessimistic about ARVN's ability to operate, maintain, and repair communications equipment. He said, "They don't even know to kick a radio when it goes off." If the electronic battlefield is Vietnamized, then the Vietnamese will need to rely on continuing American technical support—military or civilian—as well as on American initial design and production.

IDENTIFICATION

Tom Lehrer once wrote a song about the deer hunter that killed "Two Game Wardens, Seven Hunters, and a Cow" by shooting at anything that moved. Despite America's technological accomplishments, the electronic battlefield can do no better. Many sensors cannot distinguish between mice and men, to say nothing of tigers or water buffalo. Early reports of unattended sensor use mentioned that devices were often set off by rain and even the wind rustling the elephant grass. The Army claims that new techniques, experience, and better equipment have overcome this difficulty but there is little evidence to back up the claim. Guerillas have learned to move as quietly as the wind.

The most difficult problem, of course, is detecting which people are "enemy," "friendly," or "neutral." Lt. General Harry Kinnard wrote:

> When I took the First Cavalry Division (Airmobile) to the Republic of Vietnam in 1965, I knew that finding the enemy would be one of our toughest jobs. It occurred to me that perhaps we would be able to identify the guerilla—a farmer by day and a fighter by night—by the dark circles under his eyes. [12]

Very little has changed; electronics equipment cannot determine a man's ideological or national sympathies. Columns of woodcutters or ARVN can be mistaken for NLF guerillas. The sensors cannot be used in cities, where NLF supporters abound. What good is a solid protective perimeter around a U.S. base if the Vietnamese prostitutes, cooks, and chauffeurs are NLF agents.

In Northern South Vietnam and Southern Laos, the U.S. has deployed a large number of electronically activated anti-personnel mines, often disguised as animal dung. These mines cannot distinguish friend from foe. When American and Vietnamese troops undertake offensives in these zones,

they too must avoid the mines.

Some critics of the electronic battlefield, notably Senator William Proxmire, have attacked the indiscriminate nature of the electronic battlefield. In a speech before Congress Proxmire charged:

> One of the biggest problems (with the Electronic Battlefield) is that it may be an indiscriminate weapon. The sensors cannot tell the difference between soldiers and women and children.[13]

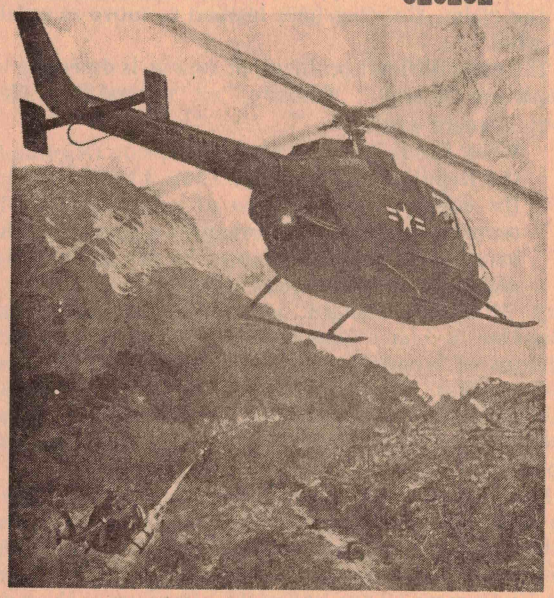
The Washington Monthly calls the electronic battlefield "Strangelove's Answer to War Crimes" because electronics cannot be brought to trial as Lieutenant Calley was.[14]

Though such criticism is valid, it fails to recognize that indiscriminate killing and destruction has always been U.S. policy in Vietnam. Men are no more competent than machines in determining who the enemy is in a guerilla war. Counterinsurgents must assume that the people, as a whole—and their chickens, water buffalo, rice fields, etc.—are the enemy. If Calley's reduced sentence represents America's response to years of War Crimes in Indochina, then putting machines in his position shouldn't make much difference. The replacement of men with machines merely serves to acknowledge America's genocidal strategy.

CONCLUSION

Although the military advantages of an electronic battlefield are minimal, the political advantages are clear. With the aid of technology, the Pentagon hopes to create a dedicated, elite, volunteer army—including civilian military employees—to carry out unpopular wars of counterinsurgency, starting in Indochina. By upgrading military pay and relaxing the traditional discipline the military hopes to attract a small number of long-term volunteers who have the ability and desire to manage a technological war.

Nixon hopes that the electronic battlefield will help to perpetuate the myth that he is winding down the war, but the fact of continued death and destruction remains. As the American people weigh the cost of technological war—$4 billion for the electronic battlefield,[15] billions more for the air war—against the benefits of propping up a corrupt dictatorship in Saigon, then the pressures for total withdrawal of men and equipment mounts. Until that pressure succeeds, American taxpayers will be stuck paying for a war their government cannot win. The cost to the Vietnamese cannot be measured.



FOOTNOTES

1. Speech given to Western Electronics Manufacturers Association (WEMA) at the San Francisco Hilton, April 8, 1971.
2. Although the primary use of satellites for military communications is to connect S.E. Asian forces with the Pentagon and other stateside stations, they can be used to relay transmissions from the smallest units in the field. See Major William M. Mannel, "Military Satellite Communications," *Military Review* (U.S. Army War College, Leavenworth, Kansas) July, 1968, p. 91.
3. Address to the Annual Luncheon, Association of the United States Army, Sheraton Park Hotel, Washington, D.C. October 4, 1969.
4. See Electronic Battlefield Subcommittee of the Preparedness Investigating Subcommittee of the U.S. Senate Committee on Armed Services, *Investigation into Electronic Battlefield* (hearings), November 18, 19 and 24, 1970.
5. *Electronics* magazine reported in 1966 that U.S. Communications fell far short of requirements. *Microwave* reported the same in 1968. *Electronics*' 1970 report, however, claims that industry has solved most of the earlier technical problems. *Electronics* (McGraw Hill, New York), May 16, 1966, October 26, 1970, and November 9, 1970. *Microwaves* (A Hayden Publication, New York) February, 1968.
6. The Lieutenant did not explain why the maps were not more accurate. Ninety meters is well within the capabilities of modern aerial mapping techniques.
7. Robert G. McClintic, "Rolling Back the Night," *Army* (Association of the U.S. Army, Washington, D.C.) August, 1969, p. 32.
8. UPI, June 26, 1971.
9. *Microwaves*, February, 1968, p. 24.
10. Leonard Sullivan, Jr., "R&D For Vietnam," *Science and Technology*, October 1968, p. 34.
11. Letter from Captain Baig, Khe Sanh Commander, printed in *Investigation into Electronic Battlefield*, (hearings) p. 85.
12. Lt. General Harry W.O. Kinnard, "Narrowing the Combat Intelligence Gap," *Army*, August, 1969 p. 23.
13. *Congressional Record* (Government Printing Office) July 6, 1970, p. S10546.
14. Paul Dickson and John Rothchild, "The Electronic Battlefield, Firing Down the War," *Washington Monthly*, (Washington, D.C.) May, 1971.
15. According to a speech by Proxmire (*Congressional Record*, March 23, 1971, p. S3618) the Electronic Battlefield subcommittee released a report March 1, 1971, in which it said $3.25 billion had been spent so far for the electronic battlefield. This figure excludes much of the munitions, aircraft, and other expenditures associated with the electronic battlefield, which has never been defined as a "program" by the military.

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For a listing of "The Components and Manufacturers of the Electronics Battlefield," send 50c to NARMIC (National Action Research on the Military Industrial Complex) 160 North 15th St., Philadelphia, Pennsylvania, 19102.