

from battalion through corps. The combination of standard vehicles, both tracked and wheeled, with associated tents will make it more difficult for the enemy to distinguish between types of units and echelons of command. With the standardization provided by the SICPS, new electronic systems can

be incorporated more easily and inter-connected more readily regardless of the CP configuration selected by a particular unit. Command posts will be set up or moved faster, operations conducted more efficiently, and unit loads lightened.

Above all else, SICPS will support

a commander's decision-making process on a fast-paced modern battlefield.

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Electronic Signature Eraser

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The tactical operations center (TOC) of armored and mechanized infantry brigades and battalions is a mobile command center that suffers from a significant disadvantage—its electronic signature. A TOC has at its disposal some of the most sophisticated radio communication equipment that can be assembled in one place—FM radio nets, a single sideband voice net, AM radio teletype nets, and a multichannel radio system. This equipment gives a commander and his staff instant communication with higher, lower, and adjacent units and with Air Force, artillery, engineer, and intelligence sources.

At the same time, however, it also gives the opposing force a lucrative target either to exploit or to destroy. If steps are not taken to prevent it, the radio direction finding (RDF) equipment of an opposing force should have little difficulty in locating and disposing of this target. (See also "Improving CP Survivability," by Lieutenant Colonel Jack Silva, INFANTRY, November-December 1987, pages 23-27.)

Our current thinking suggests several ways of reducing the likelihood of detection, but each of these has its drawbacks:

Change frequencies at least every 24 hours. A TOC has several nets at its location and the nets change frequencies at a predesignated time. For example, the "A" net will change from its frequency while the adjoining "B" net may be changing to a frequency close to the one the "A" net just vacated. Under this policy, it won't take an opposing force long to pinpoint the TOC's location and determine its size.

Operate radios with low power as much as possible. A TOC will normally give up the best communication conditions in order to achieve the best cover and concealment. Unfortunately, this requires the use of higher power when transmitting, which also increases the possibility of detection.

Use directional antennas. This is a good way to eliminate a large portion of an electronic signature, but not many people in a TOC can "cut" an accurate antenna, much less position it. If an antenna is not fabricated correctly, it decreases the equipment's operating range and may even damage it. And if an antenna is not positioned correctly, communication is lost or, worse yet, it gives the opposing force prime reception.

Use location and relocation. The

best means of deceiving an opposing force is to choose a location that places mass between the TOC and the opposing force's RDF unit and then to move on a regular basis to keep it off guard. Again, however, trying to conceal a TOC often means sacrificing good communication. If mass is placed between the TOC and the opposing force, then mass is also placed between the TOC and the troops it is supporting. A relocation itself involves a tremendous expenditure of man-hours. Reconnaissance has to be conducted to find new locations, tentage has to be torn down, equipment stowed, movements made, and tentage erected again. Also, each time the TOC is moved the opposing force has an additional opportunity to detect it by observing the move, slips in communication, increases in radio traffic, and the addition of frequencies to control convoy movements.

Remoting and retransmitting. These are certainly helpful ways of getting the electronic signature away from the TOC, but the necessary equipment is not always available. There are only four AN/GRA-39 remote sets in a battalion communications platoon, slightly more at brigade (depending on MTOE), and only one retransmission

unit. The present trend is to remote communications away from the M577 command tracks. In other words, the TOC moves away from the equipment, but the electronic target is still there.

Train the operators. Operator training is effective if there is time to train *all* of the TOC operators to be efficient. There are numerous instances, though, in which only the "inexperienced" are on duty and long transmissions of clear text are made, personal transmissions are made, improper radio telephone procedures are used, and traffic is not authenticated, all of which are lucrative targets for the opposing force.

There are still other little tricks that can hinder an opposing force, but by themselves they don't help much. There is an effective way, however, to incorporate all of the recommended deterrence measures into a single effective tool--a remote retransmission trailer. This trailer would be a self-contained three-quarter-ton to one-and-one-half-ton trailer with radios, mounts, antennas, generators, and all the necessary electrical connections.

In the late 1970s, a trial trailer of such design was tested by the 3d Battalion, 144th Infantry, 49th Armored Division, Texas Army National Guard, at Fort Hood, Texas. A one-and-one-half-ton cargo trailer with only minor modifications was used for the test--the trailer bows and tarpaulin were extended to facilitate easy access into the trailer, and a support leg was installed under the rear of the trailer to steady it during operations.

A table the width of the bed was placed in the front of the trailer, and four FM radios (RT-524s) were mounted on it. Shelves were built under the table and the receiving sets of the remote unit (AN/GRA-39) were installed. These remotes were then connected to the radios and permanently wired into a junction box attached outside the front of the trailer. The radios were wired into a terminal box that had a three-way switch. The trailer's electrical power was supplied by two DC generators that were transported inside the trailer

and removed for operation. With the three-way switch, a generator could be serviced without loss of power to the radios. A retransmission cable kit MK-456/GRC was wired in between two of the radios for retransmission capabilities. This enabled the trailer either to remote four radios, to

were installed on each of the four corners of the trailer on brackets that permitted the RC-292 pole to be used with the whip or the omni-directional RC-292 antenna--by using the 292 pole and co-axial cable, the antenna could be raised or lowered as the situation dictated.

The trailer was operated and deployed by the communication platoon in the following manner:

The TOC provided its own communication during a displacement. The communication trailer traveled with the jump TOC, being pulled by whatever equipment was available--normally an M577 in the communications platoon. When the TOC location was reached, the battalion wiremen reeled off the specially prepared WD-1 wire (which had been tied together and tagged for identification) from the TOC (located in good cover and concealment, normally a low wooded area) to a good communication location, normally one mile to one-and-one-half miles away. They then connected the wire to the junction box. All the radios were made operational, and frequencies were monitored while the TOC was still moving to the new location. As the TOC moved into position, the wiremen tied the wire to the sending portion of the remotes already installed in the M577 tracks. As soon as the trailer was operational, the TOC ceased transmitting and remoted to the trailer, thus moving the electronic signature away from the TOC.

The trailer could be moved at random with little down time, and this would create havoc with any opposing force RDF unit trying to pinpoint the TOC's location. The trailer was also used for various other requirements such as range operations, retransmission sites, and relay stations.

If each battalion or brigade TOC had three of these trailers pulled by the TOC's vehicles, each mounting at least four radios, it could operate more efficiently. When set up, the radio-equipped trailers could provide the TOC's communications and leave it free from signal detection. Instead of tearing down and moving the TOC



retransmit, or to use a combination of remoting and retransmitting.

The trailer's lighting was supplied by a light set that allowed blackout conditions during night operations. The trailer also carried a wire reeling machine (RI-31) and five reels (RI-159-U) of specially prepared WD-1 wire.

The antennas, with matching units,

every few hours, the transmissions would simply change from one trailer to another and then the trailer would be moved.

With the addition of the trailers, the established solutions to electronic signature detection could be reconsidered:

Changing frequencies. If frequencies were changed at the same time transmissions were switched from one trailer to another, the operator of an opposing force RDF station would be very confused. Not only would he lose the frequency, he would also lose the location and have to find both the new operating frequency and the new location. This might mean he would have to relocate to get his triangulation; by the time he could set up, though, the signal could be moved again.

Using low power. With the trailer

situated in the most advantageous location for communications, the radio could be operated on low power, and with mass between it and the opposing force's RDF, the signal would be blocked. Only the antenna that needed to be exposed to the front lines would be raised to a height that could be detected.

Directional antennas. The trailer would be manned by personnel of the communications platoon who would have the training and experience to fabricate and install these antennas, thereby assuring a continuous operation.

Operator training. Having members of the communications platoon on shift in the trailer would add another "watch dog" to monitor the traffic being sent. With the built-in telephone hook-up in the AN/GRA-39,

there would be instant communication between the trailer and the TOC.

The use of these communication trailers would more than offset the cost of placing them in the inventory. The saving in man-hours now required to move a battalion or brigade TOC would pay for the trailer and its equipment. In addition, the unit would save the cost of replacing the men and equipment that could be destroyed because of the electronic signature emitted by today's TOC.

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SWAP SHOP



Perimeter security is vital to all units. We understand that. In a chemical environment, however, with the soldiers in MOPP (mission oriented protective posture) gear, perimeter security is often nonexistent in many units. Therefore, an enemy force using captured MOPP gear can virtually walk in and destroy friendly personnel, equipment, and morale.

The solution is for a unit to take its existing challenge and password system and modify it for the MOPP-gear equipment.

The Soldier's Manual of Common Tasks uses these procedures, with modifications, that are meant to be a guide in developing a unit SOP for this purpose:

- Because of the reduction in the ability to communicate while wearing the protective mask, all personnel must be halted on sight, and the initial challenge should take the form of a hand signal, which can be changed periodically.
- When the order "Advance to be recognized" is

given, one member of a two-man security team advances with his weapon pointed at the challenged individual while the other remains concealed with his weapon also aimed at that individual. Only after a face-to-face confirmation of the person's identity or mission should he be allowed to pass. Because a hand signal is visible and can be compromised, and because communication is limited, the face-to-face confrontation must take place.

- The exact placement of M9 detector paper on MOPP gear can in itself become an identifiable marking and should be used as such. This method, too, should be used carefully, because it can also be compromised.

The use of hand signals and the exact placement of the M9 chemical detection paper can be changed at the commander's discretion.

The goal of developing an effective perimeter security system in a chemical environment is to protect a unit's soldiers, equipment, and morale.

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