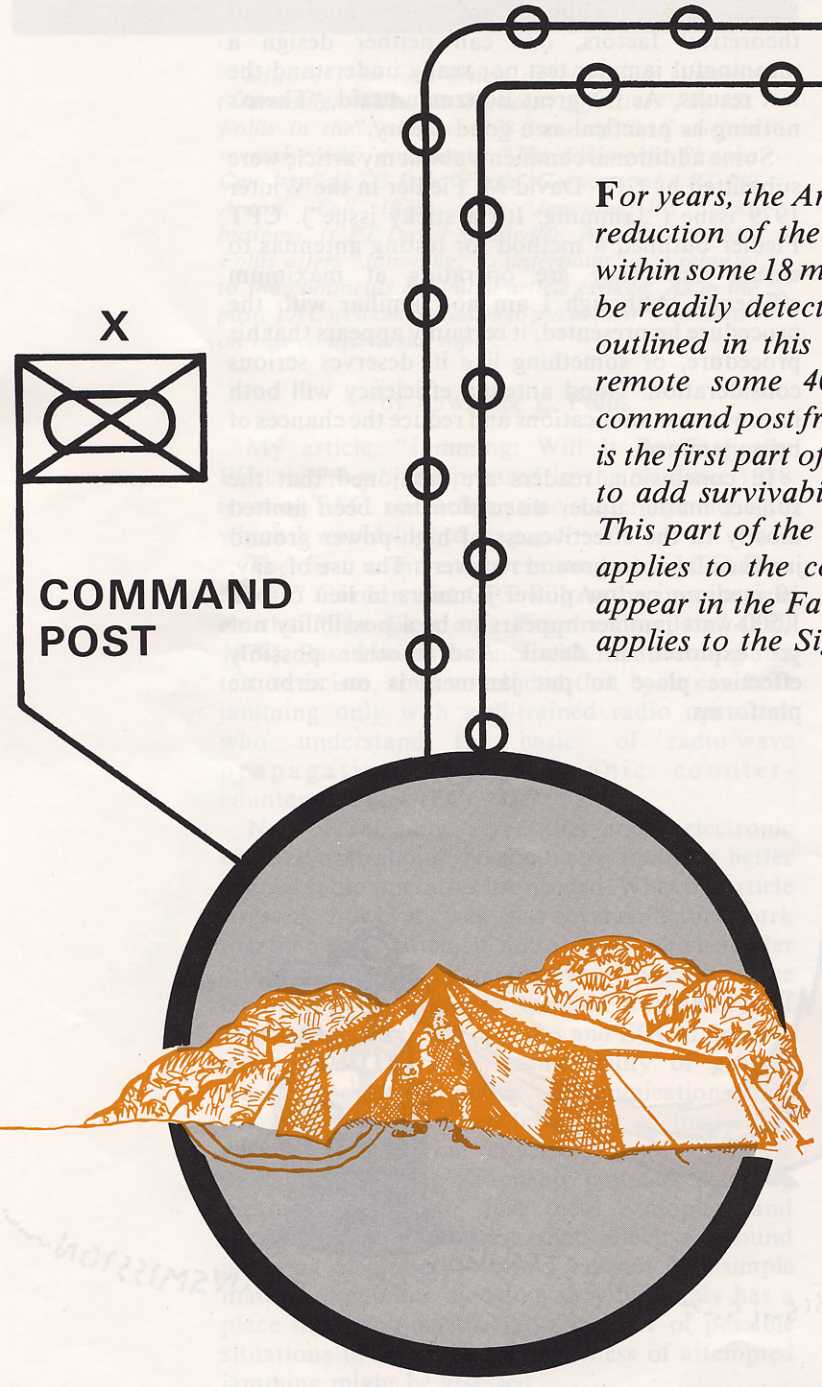
Add SURVIVABILITY to the Command/Control Equation . . . . . Remote



For years, the Army has paid lip service to electronic signature reduction of the command post. Most commanders operate within some 18 meters of 10 to 15 radiating antennas which can be readily detected by the enemy as targets. The techniques outlined in this article use current inventory equipment to remote some 40 radios and telephone circuits into the command post from a Signal center 800-900 meters away. This is the first part of an article dealing with an innovative concept to add survivability to the command and control equation. This part of the article delves into the remoted concept as it applies to the commander. The second portion, which will appear in the Fall 1979 issue of TAC, details the concept as it applies to the Signal officer.

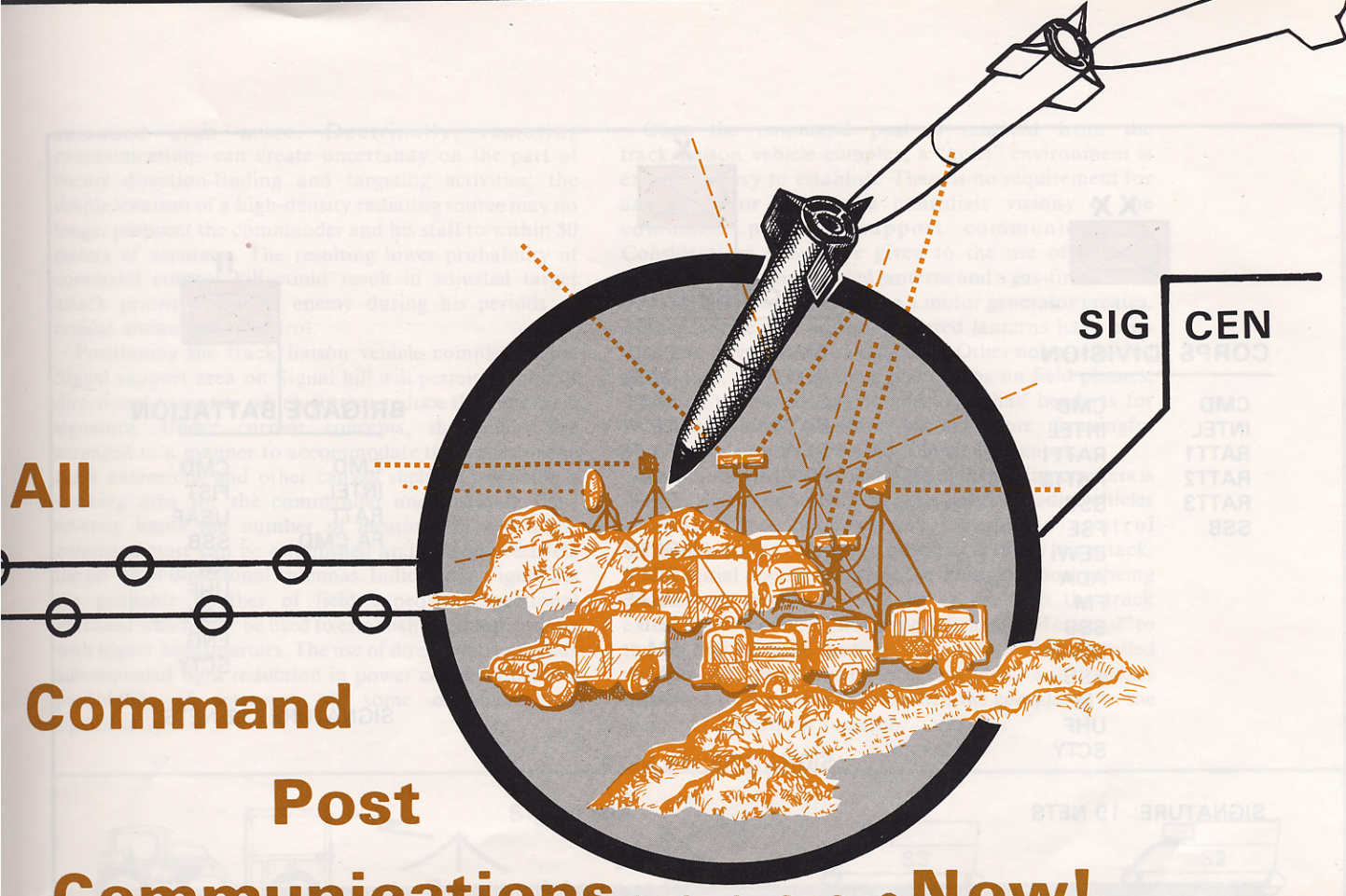
by MAJ Nelson B. Collard, Jr.

Envision for a moment a well-camouflaged and concealed general purpose medium tent, set-up some 800 to 900 meters from the nearest hilltop. As you approach, a small sign to the side of the trail reads "BRIGADE TACTICAL OPERATIONS CENTER." You are skeptical: there are no M577s or generators roaring and belching smoke; there are no antennas thrusting from the trees; there are no signs of recovery or refueling activities...

What you see is the work of a well-disciplined security team and, hopefully, only the trail sign and that ring of concertina around the perimeter reveal the identity of the site. Upon entering the tent, you find the commander and his staff working the tactical operation from a much quieter and more survivable location. If this doesn't describe your present command post operation, read on.

The type of command post operation described above effectively remotes all communications to a distant hilltop. It has been established in the European environment at brigade level, and it has been operational within three hours using equipment which is available in

All Command Post Communications . . . . . Now!



the brigade today and using the techniques described in the article. For many years, doctrine has told the commander that a number of actions must be taken to protect the command post from enemy targeting and destruction. However, doctrine has addressed neither the specifics nor the mechanics of establishing command/control communications in a timely manner which would be acceptable on the modern battlefield.

With that objective in mind, this article presents an approach to establishing remoted communications for a brigade-size command post. It should be noted that the concept lends itself equally well to a battalion or division tactical command post.

The Threat

As combat operations on the modern battlefield continue to become more complex, the electronic signature of the command post has a tendency to expand geometrically. The commander is probably aware that there are a number of radio nets radiating from his command post. However, he probably is not aware that a significant threat to the command/control is presented by this signature. Figure 1 depicts some 18 easily targeted radiating signals which portray the brigade, 19 which portray the division main command post, and 12 signals which portray the battalion command post.

As supporting unit liaison teams arrive and link up for operations, the situation gets worse. Everyone has his own radio net and enforces his own standard of communications discipline. It accomplishes very little if the brigade headquarters enforces strict radio discipline on the command and intelligence nets while only seven or eight meters away no radio discipline is maintained on other equally revealing nets. When the first volley of 122-mm multiple rocket launcher rounds impact, it is likely that interest in radio net discipline and remote installation techniques will develop rapidly. In the meantime, it is absolutely essential that the commander and his staff get out from under the umbrella of signals which ties them to the state-of-the art tactical antenna and which, in all certainty, will attract effective enemy artillery or air attacks.

No doubt, the commander is already "threatened to death." However, this fact warrants emphasis: the enemy has, and effectively employs, the capability to locate radiating electromagnetic sources within 30 seconds. This can be accomplished from a distance of 60 kilometers with an accuracy of one kilometer; from 30 kilometers with an accuracy of 500 meters; and from 15 kilometers with an accuracy of 250 meters. Combine this capability with an expressed objective of eliminating at least 50 per cent of Allied command/control communications and the requirement to remote the command post is readily apparent.

The Concept

Most brigade field headquarters are generally divided into the command post track and liaison officer vehicle complex, a close-in Signal support area and an administrative support area. The rationale fails to take into account, though, that the greatest threat to command post survivability is, by far, the electronic and infrared signatures presented by the vehicle and radio complex.

In this remoted command post concept, the three areas are distinctly separated and restructured. The tactical command post consists of a general purpose medium tent (an available barn, building, shed or gasthaus may be substituted), which houses the commander and staff and is equipped with remote sets and telephones. The Signal support area on "signal hill," which is linked to the

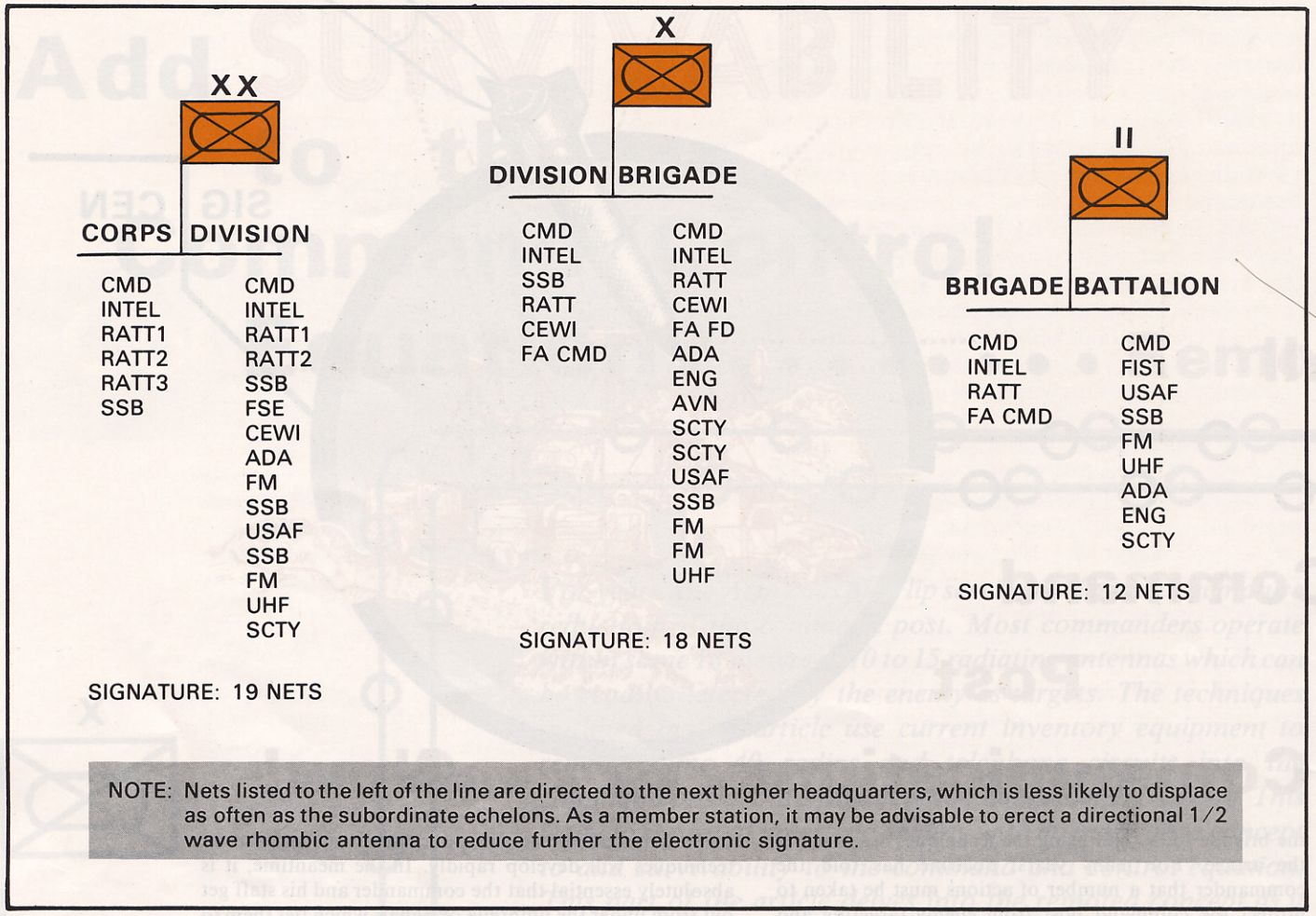


Figure 1. Command Post Electronic Signatures

command post by two 26-pair cables, contains all transmitting radio vehicles: M577s for the S-2, S-3 and fire support officer; M151s for air liaison officer, engineer, air defense officer, civil-military affairs officer, liaison officers, Signal shelters (switchboard, communications center, multichannel radio terminals, radio teletype terminals, both organic to the brigade and attached for support from the division Signal battalion). The administrative support area consists of headquarters, headquarters company activities (maintenance, mess, etc.) and all other Signal support vehicles/equipment not actively involved in direct support of the command post communications mission (jump M577s, spare multichannel radio terminals and radio teletype terminals, etc.).

Command and control during the period in which the cable team is extending communications "down the hill" may be conducted from the M577 complex in the same fashion that it is conducted on a continuous and dangerous basis today. Experience in set-up times on major field training exercises in Europe has demonstrated that the entire operation could be set up in less than three hours. The use of pre-cut wire harnesses for the general purpose medium tent and track complex, combined with the techniques described later in this article, will reduce the time considerably. If this concept were integrated into the ARTEP, a realistic time frame to train against would be 60 minutes.

The Payoffs

Under this remoted command post concept, all of the command/control communications means which are available to the commander and his staff in the normal command post configuration are available for full command/control operations in an electronically "quiet" and noise-free environment.

All of the communications assets organic to the brigade and/or attached units in support of the brigade (division Signal platoon and liaison teams) must be coordinated and directed toward the goal of providing rapid command/control communications to the commander and his staff in a significantly improved and survivable environment. By remoting the electronic and infrared signatures from the point where command and control is accomplished, the enemy direction-finding and targeting activities will be forced to consider an area many times larger than what is represented by the radiating source in order to target the decision-makers.

The techniques described in this article depict remoted command post operations of only 800 to 900 meters primarily because of deficiencies in multiple pair cable in current modification tables of organization and equipment (MTOE). With the addition of 26-pair cable to the MTOE (18 to 20 sections could be used with four to six junction boxes), the area which enemy direction-finding and targeting activities must search could be

extended even more. Doctrinally, remoting communications can create uncertainty on the part of enemy direction-finding and targeting activities; the simple location of a high-density radiating source may no longer pinpoint the commander and his staff to within 50 meters of accuracy. The resulting lower probability of command/control kill could result in adjusted target attack priorities by the enemy during his periods of critical ammunition control.

Positioning the track/liaison vehicle complex in the Signal support area on Signal hill will permit the use of directional antennas which further reduce the electronic signature. Under current concepts, the tracks are arranged in a manner to accommodate the set-up of the track extensions and other canvas shelter to provide a working area for the commander and his staff. This severely limits the number of locations in which the command post can be established and severely restricts the set-up of directional antennas. Indicated in Figure 2 is the probable number of field expedient directional antennas which may be used to establish communications with higher headquarters. The use of directional antennas accompanied by a reduction in power could reduce the probability of intercept on some of these nets significantly.

Once the command post is remoted from the track/liaison vehicle complex, a "quiet" environment is extremely easy to establish. There is no requirement for any generator set in the immediate vicinity of the command post to support communications. Consideration should be given to the use of battery-powered or gasoline-fueled lanterns and a gas-fired coffee pot as trade-offs for the noise a motor generator creates. Both gasoline and battery-powered lanterns have been used and have proven satisfactory. Other noise-reducing techniques, such as placing neon bulbs on field phones, disabling telephone ringers and using half headsets for communications operators, become more meaningful once major noise sources have been eliminated.

One of the greatest advantages of dispersing emitters is the fact that there will be a larger number of radio vehicles available to reconstruct command/control communications following the initial artillery/air attack.

For initial operations while the command post is being established, operations will be as usual in the track extension complex. Following the "transfer of control" to the general purpose medium tent, canvas may be rolled up, pre-cut wiring harnesses extended, and vehicles dispersed to a greater degree when the complex is in the principal operations location.

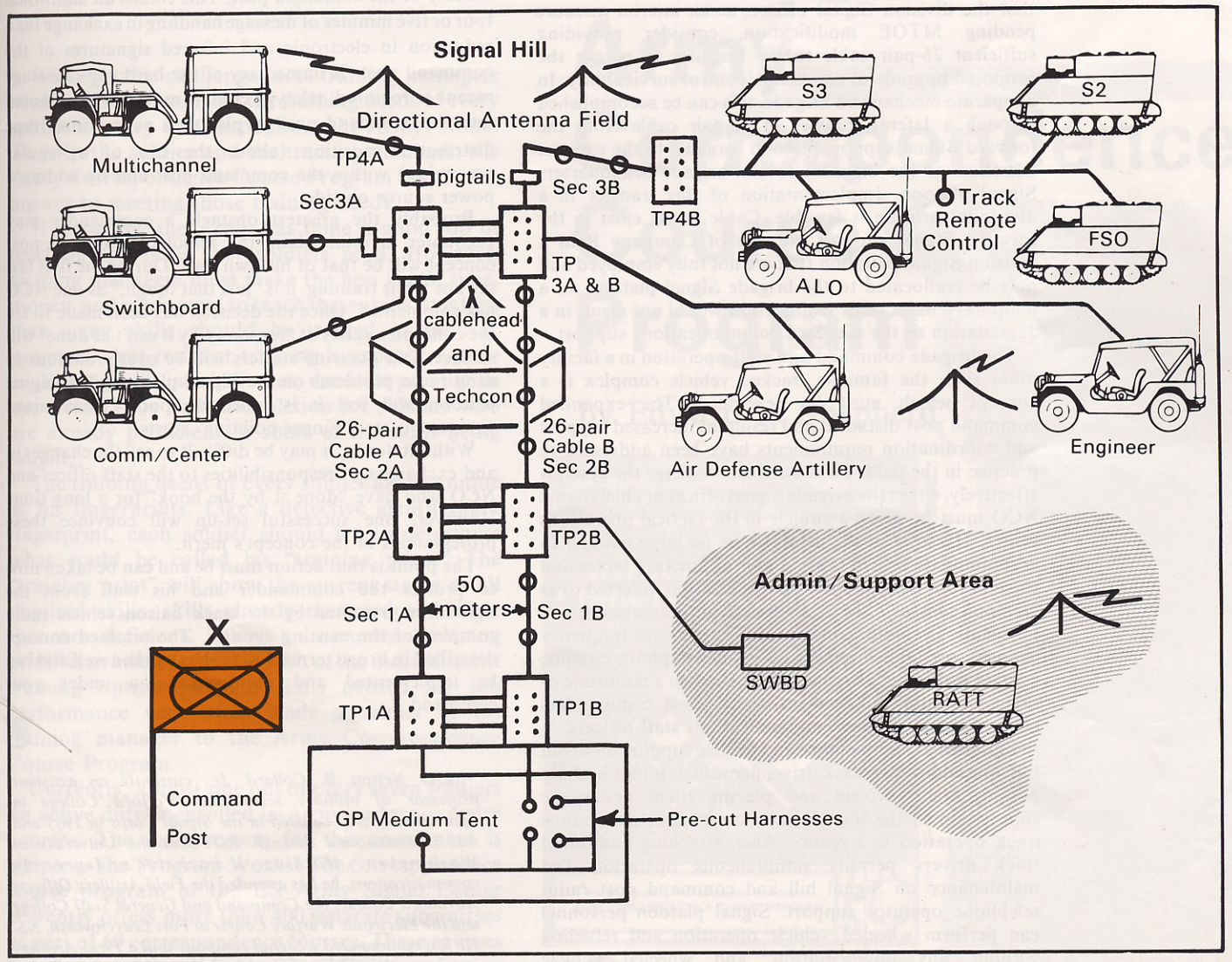


Figure 2. Cable Distribution Plan

The Obstacles

The potential obstacles which require the attention of the commander in order to implement the remoted command post concept are few, but they must be recognized. Most of them have been encountered by the author and have involved readjusting some "mind-sets" and/or "doctrinal" responsibilities within the unit. The one which requires command attention outside the brigade is obtaining 26-pair cable, an item critical to the rapid installation and remoting of some 40 telephone and radio sets from signal hill to the command post.

Depending on the type unit, the brigade table of organization and equipment provides for approximately four sections of 26-pair cable to be used with the brigade switchboards and communications center. To remote all of the circuitry effectively over the distances described in an acceptable time, 16 to 18 additional cable lengths are required. Within the division Signal battalion, there is a substantial amount of cable which may not be required in support of Signal battalion-installed communication systems. Additionally, there is 26-pair cable employed full time in support of a much lower priority than the systems at the brigade command post.

As the principal staff officer charged with electronic counter-countermeasures for the division, it is imperative that the division Signal officer, as an interim measure pending MTOE modification, consider providing sufficient 26-pair cable to the brigades to permit the proposed upgrade of command/control survivability. In a separate mechanized brigade, this can be accomplished through a lateral transfer of 26-pair cable from the forward Signal support platoon (organic to the support battalion of the brigade) to the brigade headquarters Signal platoon. Implementation of this transfer in a divisional brigade is feasible. Cable assets exist in the forward Signal support platoon of Company B in a division Signal battalion that are not fully employed and may be reallocated to the brigade Signal platoon on a temporary basis. This reallocation would not result in a degradation of the standard communications support.

The brigade command and staff operation in a facility other than the familiar tracked vehicle complex is a concept which must be developed. The expanded command post distances and resultant increased support and coordination requirements have been addressed in practice in the field. To control and manage the systems effectively, either the brigade Signal officer or chief Signal NCO must be given a cubicle in the tactical operations center. His area in the center must be large enough to accommodate a field table, a pair of junction boxes and three or four field phones. To this position, referred to as "remote control," the staff directs all communications problems. Remote control can implement frequency changes, reestablish remote radio and telephone circuits, reroute traffic and, in general, accomplish a multitude of other communications tasks which most commanders never demand of their communications staff officers.

For normal maintenance and vehicle support on signal hill, one additional track driver per vehicle is required. By pooling track drivers and placing them under the supervision of the Signal platoon sergeant, continuous track operation is a reality. Also, attaching additional track drivers permits simultaneous operation and maintenance on Signal hill and command post radio telephone operator support. Signal platoon personnel can perform wheeled vehicle operation and refueling without any augmentation, and wheeled vehicle maintenance can be performed by drivers assigned from the liaison and staff sections. The most significant problem that has occurred with this kind of arrangement has been with transportation during evacuation of personnel and equipment from signal hill and evacuation of personnel from the command post when drivers were removed from their vehicles on signal hill and were working for a staff section in the command post. To correct this situation, Signal personnel on the hill were trained and licensed to drive any wheeled vehicle, a stand-by troop transport was prepositioned at the command post and rendezvous points were established.

Another potential problem may be that the quartering party will need additional maintenance and support personnel to set up the command post tent before the arrival of the cable teams. This cuts down on installation time; pre-cut harnesses are simply dropped into place and telephones and remote lines are connected in a standard fashion. To accomplish this with minimum hassle, both the headquarters company commander and the operations sergeant major have to readjust their thinking.

One trade-off of particular importance to the commander is the location of the hard-copy message means (communications center and radio teletype). Under the remoted command post concept, both of the hard copy means are displaced from the immediate vicinity of the command post. This entails an additional four or five minutes of message handling in exchange for a reduction in electronic and infrared signatures of the command post. If immediacy of the hard copy message means is required, teletype circuits may also be remoted into the command post by placing a page printer/tape distribution position (about the size of a regular typewriter) within the command post and by adding a power source outside.

Probably the greatest obstacle a commander may encounter in establishing the remoted command post concept will be that of his own staff. During the first few set-ups while training, it is "just that tough," as one NCO has commented. Once the decision has been made to try the concept, a series of "reasons why it can't be done" will surface. Old doctrine staffers will be overly anxious to drop radio problems on the Signal platoon. The Signal platoon will feel it is inheriting poorly maintained equipment, etc. "Finger pointing" starts.

Without doubt, it may be difficult to sell the changes in and exchanges of responsibilities to the staff officer and NCO who have "done it by the book" for a long time. However, one successful set-up will convince these professionals of the concept's merit.

The point is that action must be and can be taken now to protect the commander and his staff from the signatures presented by the track/liaison vehicle radio complex of the existing systems. The remoted concept described in broad terms thus far has worked well and can be implemented and improved upon under your command.

MAJ Nelson B. Collard, Jr., currently an assistant professor of military science at Wofford College in Spartanburg, SC, enlisted in the Signal Corps in 1963 and was commissioned through ROTC at the University of Washington. Holding a bachelor's degree in communications, he has attended the Field Artillery Officers Advanced Course, the Command and General Staff College and the Electronic Warfare Course at Fort Leavenworth, KS. He has commanded a Signal company and a Field Artillery battery and has served as a brigade and battalion Signal officer in CONUS, East Asia and Europe.