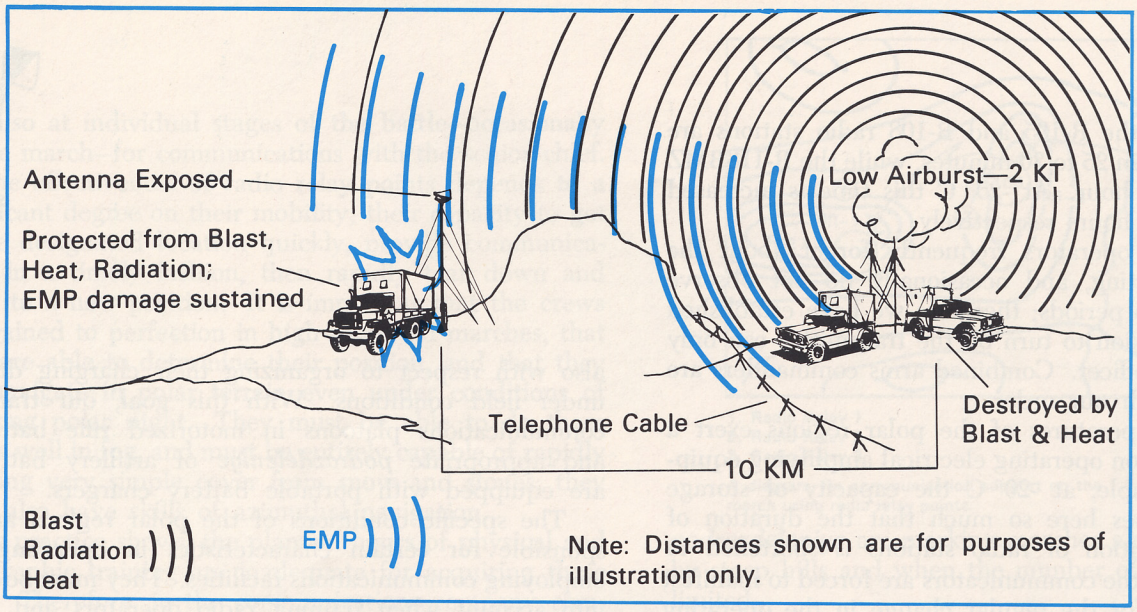


Tactical C-E:

The Voice Of Command—Maybe

by
MAJ Walter B. Heffernan, Jr.

If you're with a brigade or a combat arms battalion, you've probably noticed the tendency of your commander to rely heavily on his FM radio to control the unit.

And if you're a C-E staff officer, you've probably briefed your boss on the subject of electronic warfare and its potential for hampering his ability to communicate. But have you talked to your commander recently about electromagnetic pulse (EMP) and the potential which it has to knock out all his electrical means of communications at the same time?

Have you thought of alternate means of communications and protective measures against EMP? Can your battalion or brigade continue to fight, even if you do lose electrical means of communications?

You say you haven't considered these subjects lately, or ever? Well, your Soviet counterpart has, extensively. Furthermore he and his boss have done some things that you haven't. The Soviets are prepared to fight without overusing the FM radio, as we are prone to do.

What is EMP? EMP is a burst of electromagnetic energy, of extremely high amplitude and short duration, which is produced by a nuclear explosion. This energy travels outward in radio line of sight from the explosion as would any other radio signal. But EMP is broadband, covering the entire portion of the frequency spectrum used by our FM, HF, and VHF equipment. Also, the amplitude is extremely high, perhaps as much as 50,000 volts/meter. Since pulse duration is only a few tens of nanoseconds (a *nanosecond* is 1 billionth of a second), EMP will cause damage to C-E equipment, and newer equipment is more vulnerable to EMP than older, tube-type equipment!

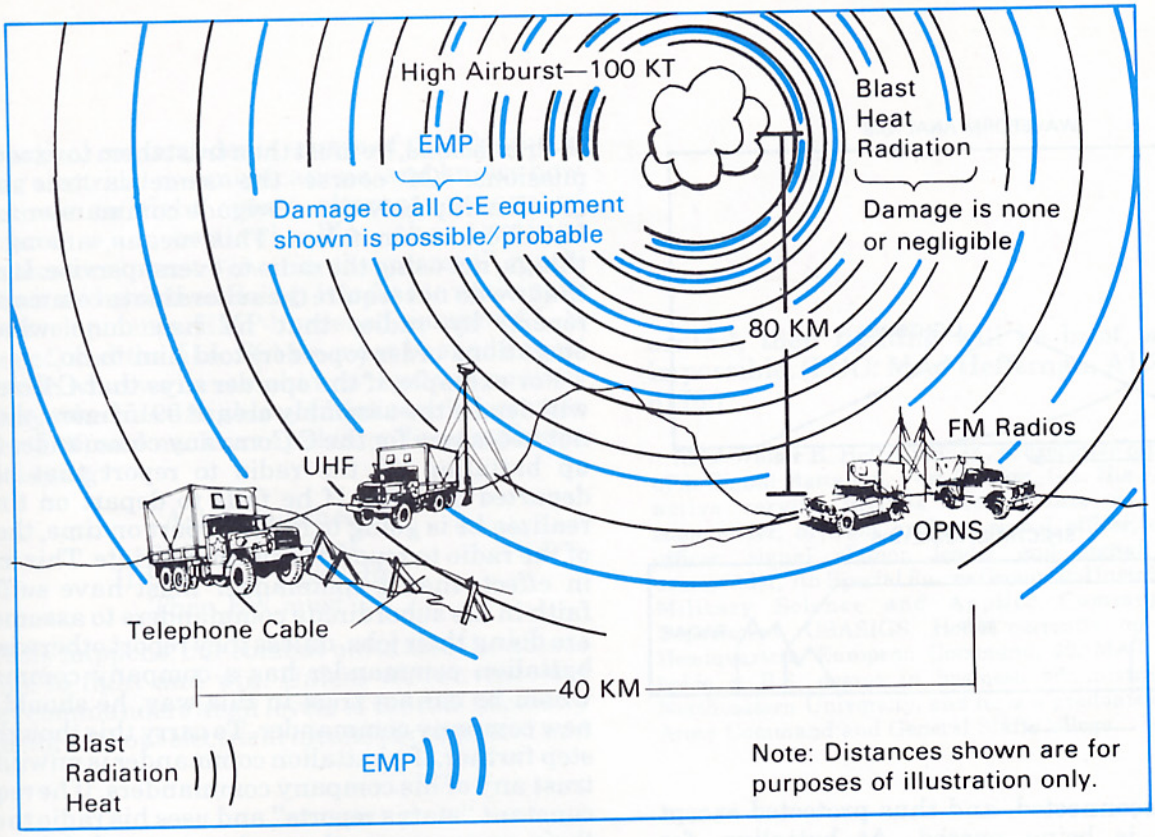
EMP CAN DAMAGE

When EMP strikes antennas, power cables, or communication cables, it causes current to flow. The intensity of EMP is so great that the insulation on power and audio cable does not protect against EMP, and an antenna is designed to pick up electromagnetic energy. The amplitude of the pulse causes an overload of power to be placed on the equipment, radios, telephone switching equipment, or power generators. The quickness of EMP—the short duration of the pulse—is such that no protective device works fast enough to shunt EMP to ground. Remember, pulse duration is measured in a few tens of nanoseconds, and our fastest acting circuit breaker takes a few microseconds to activate.

How does EMP cause damage? It overloads the equipment and "burns it up." That is, it does this to C-E equipment which is operating and in range.

The "effective range" of EMP is another major factor in its damage-causing potential. While this range varies with type of burst and size of weapon, in virtually all cases the "effective range" of EMP exceeds that of the other effects of a nuclear burst. A unit can be far enough away from the detonation so that it is unaffected by blast, radiation, and heat, but still lose all its FM radio communications due to EMP.

Variance in range due to type of burst is most significant. When a low air burst is used, especially one "outside" the atmosphere, then (depending upon the size of the weapon used) EMP damage could occur up to 3,000 miles from the explosion. This being



the case, a nuclear attack against communications which would damage C-E equipment up to 100 kilometers from the site of the burst is possible. Given the overuse of electrical means—especially FM radio—by our combat commanders, such an attack should be considered probable.

FIGHTING WITHOUT RADIOS

A brief look at the sort of training routinely conducted by the Soviet Army strengthens this belief in the probability of nuclear attack. Simply stated, the Soviet Army practices maneuvering combat units under conditions of radio silence. What kind of units? Infantry companies and tank battalions, to name just two. They do not provide tactical units with as many radios as we do, and what radios they do provide are strictly controlled. The Soviet commander at battalion and even brigade level is practicing to fight without using radios. He must have a good reason for doing so, because as anyone who has tried it knows, maneuvering units under radio silence is not easy.

EMP is nonpartisan. It does not matter which side owns the C-E equipment. If the equipment is turned on, connected to antennas or cables, and situated within the "effective range" of EMP, it will be damaged. In *The Offensive: A Soviet View* (Washington, GPO, 1973), COL Andrei Siderenko states unequivocally that in future combat, Soviet forces will make extensive use of nuclear weapons, and that all nuclear explosions produce EMP. The practicing of maneuver during radio silence begins to make sense.

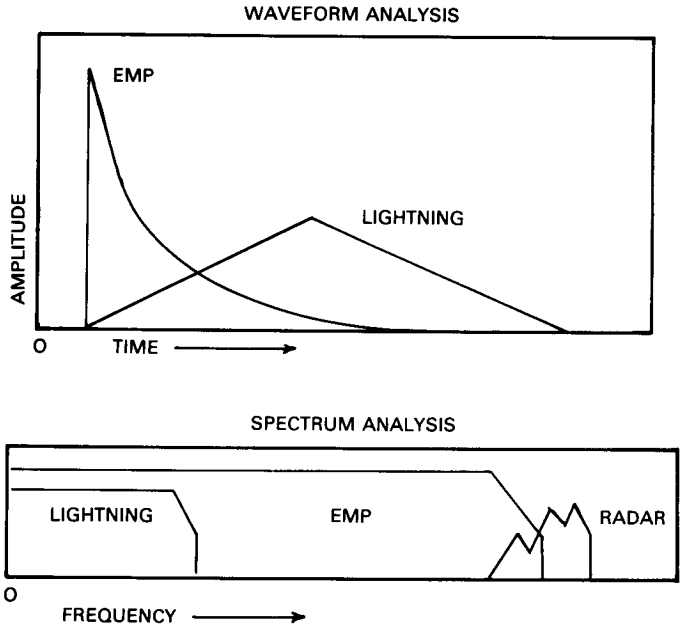
MINIMIZING EMP'S IMPACT

At this point we should agree on several things. EMP does exist. It does cause damage to C-E equipment. We have no protective device capable of preventing damage to operating equipment. Let us then look at what we can do, to minimize the impact of EMP on a unit's ability to fight.

One thing we must do is reduce our reliance on electrical communications, especially the FM radio. As long as our commanders and staffs at battalion and brigade are "tied" to the radio, they are vulnerable. We must look at every radio net we operate, especially since most nets operate 24 hours a day, we must decide whether we really need the net, and, if it is needed, must it be on the air all the time? Since one of our purposes is the reduction of the number of radio sets in operation at any given instant, we should cut down the number of radio nets in constant operation. There are several ways to do this. Simply eliminating some of the nets currently in operation, or combining two or more nets into one (ADMIN & LOG), is one means. In most cases, however, this has already been done, and yet we still have too many nets.

Scheduled contact times can be used in lieu of 24-hour operation. Under this concept, only the net control station stays on the air at all times, the other stations come on the air only at predetermined times, and, when not on the air, the equipment is turned off and disconnected from antenna and power cables. Of course all the nets can't be put on this type of system, or it would be impossible to call the unit in cases of necessity. However, two of three nets which currently operate 24 hours a day could be changed to this system.

Another approach worthy of consideration is to use paging devices. Certainly the cost of these paging units is less than the cost of a radio set. If we equipped our commanders and principal staff members with such devices, then we can leave our



radios off, disconnected, and thus protected except when traffic is being passed. At battalion, for example, we can place a transmitter/receiver and equip each company commander with a pocket pager. When the battalion commander wants to talk to the company commander on the FM, he first pages the commander, who then activates his FM radio and calls battalion. Not only does this allow us to keep radios off and protected when not in use, but it also assists in cutting down the overuse of FM radio. Not having a "hot mike" always available, the commander or staff officer may well think twice before using the radio for traffic which can be sent by other means. Finally, although these pagers may be subject to EMP damage, they can be replaced less expensively than FM transceivers.

PLANNING—THE KEY

If we are to reduce, effectively, our overreliance on electrical communications, we must stop substituting communications for planning where tactical operations are concerned. We must plan operations thoroughly and insure that subordinate commanders are thoroughly "read in" on the entire plan. If the company commander knows not only his first mission and/or objective, but also knows what his subsequent mission(s) may be, then he can continue to fight even when his ability to communicate, electrically, with battalion is disrupted. But if the company commander has only part of the plan, if he has been told to "take the hill, and then I'll tell you what to do next," then when he loses radio contact he may not be able to continue to fight.

Hand-in-hand with good planning goes the old concept of letting commanders command. Another expression for this is "delegate authority." Once the battalion commander has briefed his company commanders on the tactical plan and given them their missions, he must then trust them to execute the missions. Of course the same is true of the relationship between a brigade commander and his battalion commanders. This means, among other things, not using the radio to oversupervise. It means that we do not require the subordinate commander to report, by radio, that he has done what the operations order (oporder) told him to do.

For example, if the oporder says that C Company will depart the assembly area at 0915 hours, then it is not necessary for the C Company commander to call up battalion on the radio to report that he has departed on time. If he fails to depart on time, or realizes he is going to fail to depart on time, then use of the radio to report this is appropriate. This means, in effect, that a commander must have sufficient faith in his subordinate commanders to assume they are doing their jobs, unless they report otherwise. If a battalion commander has a company commander whom he cannot trust in this way, he should get a new company commander. To carry this thought one step further, if a battalion commander is unwilling to trust any of his company commanders, if he requires constant "status reports" and uses his radio to direct their every move, then what is needed is a new battalion commander!

WHEN TO RADIO

Thoughts on using the radio to oversupervise aside, there is a "test" which can be applied to determine whether or not to send a message by radio. Does the message require an immediate action or response by the headquarters receiving it? If it doesn't, as in the case of a company commander telling the battalion commander "I'm complying with the oporder," then it doesn't have to go by radio.

Units must practice operating under radio silence. We must take a page from the enemy's training manual and start doing what he does as well, if not better, than he. This must start at small unit level, say rifle squad, but we should have as a goal practicing it with tank battalions. *Maneuvering battalion-size units under radio silence is possible,* and we should approach such training with this in mind. It is difficult, and the company commander might fail to take his objective the first time he tries to operate without radios. However, he must be allowed to learn from mistakes and try again. If he learns to command his unit without radios, he can do it more easily with radios, but the reverse isn't true.

THE COMMUNICATOR'S JOB

What is the role of the tactical communicator in all this? How does he fit in if the radio is off the air?

The tactical C-E staff officer must be in on the planning from start to finish. He must analyze the plan and tell the commander where he is most vulnerable to attacks on his communications. He must recommend alternate means to be employed, when and if radio communications fail. He must plan for rapid repair and/or replacement of damaged C-E equipment. And, finally, he must be sure that

every tactical commander is aware of the likelihood of losing electrical communications, and knows how to continue to fight using alternate means of command and control. We, the tactical communicators, must "live in the present" much more than we have been doing. It is fine to anticipate future developments, EMP-hardened, jamproof C-E equipment, and the like. But we must be ready to go to war with what we have right now, and win against an enemy who has a highly sophisticated electronic warfare (EW) and nuclear capability. To paraphrase an old saying:

"Ashes to ashes
and dust to dust
If EMP don't get 'cha
Then EW must"

When this happens, our combat units must be able to continue to fight and win. Unless we convince our combat commanders at all levels of the real necessity of fighting without electrical means of command and control, then fighting will be brief, and winning impossible. (POC: MAJ Heffernan, AUTOVON 780-6176.)

MAJ Walter B. Heffernan, Jr., is executive officer of the 67th Signal Battalion, Fort Gordon, GA. His 13 years of active service include assignments as company commander; division artillery signal officer; operations officer; signal platoon leader and signal company commander, 7th Special Forces Group; and instructor at the Military Science and Applied Communications Department, USASIGS. He is currently on orders to Headquarters, European Command, J3. MAJ Heffernan holds a B.S. degree in business administration from Northeastern University, and he is a graduate of the U.S. Army Command and General Staff College.