

CHAPTER 1

Introduction

Regardless of the terminology, most scholars would agree that communications involve at least four basic elements: **transmitter**, **message**, **medium**, and **receiver**. Communications occur when the receiver understands the idea sent by the transmitter well enough to provide some form of feedback. This publication approaches those communications that must rely on the electromagnetic spectrum as a medium to convey messages. It focuses on the disruption of the listener's ability to receive.

IMPORTANCE OF COMMUNICATIONS

The execution of the AirLand Battle Doctrine requires the skillful use of resources, target acquisition, and strike capability. To do this, a timely and responsive working relationship must

exist between the respective combat forces. Reliable communications are needed to achieve this goal. The lack of communications can affect the outcome of any battle.

IMPACT OF JAMMING ON COMMUNICATIONS

Jamming is an electronic countermeasures (ECM) technique which supports intelligence and electronic warfare (IEW) doctrine. IEW doctrine directs that jamming be integrated into various phases of combat operations. Jamming degrades communications by reducing or denying the enemy's ability to pass key information at critical

times and can cause enemy operators to become irritated, confused, or misled during offensive, defensive, or retrograde operations. When applied successfully, jamming can contribute to the failure of those actions which depend on communications using the electromagnetic spectrum. For example, an enemy fire direction

net must communicate in order to function. Proper jamming can force the net to change frequencies, reestablish communications, increase

power output, or switch to a less reliable means of communications.

ELECTRONIC WARFARE SUPPORT MEASURES SUPPORT TO JAMMING

Electronic warfare support measures are the primary source of information used to identify and develop jamming targets. The primary function of electronic warfare support measures is to gather information on the enemy's electronic systems. Electronic warfare support measures information can be passed directly to our analytical systems where it is correlated with data collected from multiple sources and used to determine the enemy's locations and intentions. From listening to the enemy's transmissions, we gain significant information about his electronic systems. Some of this information is used to direct our actions to reduce his combat effectiveness by interfering with his electronic systems. Further, it assists us to identify enemy targets and position our equipment to best disrupt or deny the enemy's use of his systems. The techniques employed to deny the enemy's use of his electronic systems are a part of ECM called

jamming. Jamming is the action taken to reduce or deny the enemy's effective use of his electronic systems.

Indiscriminate jamming wastes resources, could impede friendly communications, or could attract artillery fire. Consequently, jamming operators need to know exactly who, what frequency, and when to jam. To obtain this information, mission planners require data supplied through electronic warfare support measures. We listen to and locate enemy emitters to gain this information; not only to correlate it with other data for intelligence production, but to identify data needed to deny the enemy the use of his electronic systems. Electronic warfare support measures also provide technical data on the enemy's ability to jam friendly electronic systems. This information enables us to conduct protective measures to ensure our continued use of friendly electronic systems.

DECISION TO JAM

The commander's decision to use jamming is influenced by several factors. The key factor is timing. Intercepting, direction finding (DF), and jamming cannot be conducted simultaneously against the same targeted communications link. The identifiable electronic signature created by jamming signals readily exposes friendly jammer locations. The tactical commander should treat ECM assets the same as artillery assets, because ECM mission results on communications can be as devastating as artillery on personnel and equipment. ECM assets are deployed to support committed units based on their mission priority,

the capabilities of available systems, and potential enemy actions. In the planning phase, thoughts should reflect the relative scarcity of ECM assets, their limitations, and their transient effects. The commander must balance the negative aspects of jamming operations against the positive tactical advantages of disrupting enemy communications.

Jamming, when integrated into combat operations, must support the commander's battle plan. IEW doctrine dictates that commanders will integrate jamming with fire support and

maneuver forces to disrupt and confuse enemy forces during offensive, defensive, or retrograde operations.

The commander's decision to employ jamming is carried out by military intelligence (MI) units and should be coordinated with the fire support element and integrated into the commander's fire support plan. These MI units detect, identify, and locate enemy communications nets and intercept their traffic to provide the commander with intelligence. The commander uses this intelligence to decide when and where to employ jamming in his concept of the operation. The MI units also direct ECM against enemy communications, jamming those based on the commander's decision. This capability to locate the enemy, to intercept the enemy's messages, and to hamper the enemy's operations at critical periods contributes directly and indirectly to the effectiveness of the friendly commander's concept of the operation.

Enemy nets, which routinely pass information of intelligence value, should be identified and monitored. Other nets, such as those having a high tactical value to the enemy but little or no intelligence value to friendly forces, could be attacked with jammers or fire support depending on the tactical situation. Enemy secure communications may also be jammed with the

intention of drawing the enemy into clear voice communications, thus allowing interception and further identification. Enemy jammers should be located, reported, and destroyed based on the demands of the tactical operation. Guidance for jamming, destroying, or exploiting enemy electronic emitters should be reviewed before each tactical operation. Additionally the TABOO, RESTRICTED, and GUARDED frequency lists must be reviewed prior to the execution of all jamming missions (see FM 34-40).

Jamming should interrupt or disrupt the enemy's communication at decisive moments in the battle, for example, when key information needs to be passed or new instructions are required. Jamming may be effective for only the short periods that the enemy needs to take evasive action or to execute countermeasures. Jammers need to be used judiciously and moved often to avoid their destruction.

Jammers support other combat actions by—

- Disrupting key command and control nets, thus slowing or disorganizing the enemy in critical situations.
- Denying the enemy the ability to react to changes on the battlefield.
- Reducing the effectiveness of enemy fire support and air control nets.

EMPLOYMENT OF JAMMING

There are three steps in employing jamming. The first step concerns information collection and target acquisition. The second step involves planning the jamming mission. The third step is the execution of the jamming mission. This sequence is also called the **decide, detect, and deliver** method.

The field commander is confronted with an enemy electronic array that comprises thousands of emitters and hundreds of communication nets.

Collectively this emitter density is meaningless unless the emitters are sorted by—

- Function.
- Position in a net.
- Position on the battlefield.
- Ability to affect the combat plan.

Once the enemy emitter has been identified and located, this information flows to a coordination center where an interface occurs between

intelligence and operations. Based on this information the commander provides the guidance on whether to jam, destroy, deceive, or intercept for intelligence. As often as possible, this decision must be a part of the initial planning and coordination. When the decision is to intercept for intelligence purposes, it must be continually reevaluated to determine whether to continue collecting, to initiate jamming, or to destroy. The commander provides the guidance to the TCAE or the staff to identify certain nets that have a high tactical value to the enemy, but minimal or no intelligence value to friendly forces.

Enemy command nets of units in contact, fire direction nets, and enemy target acquisition systems usually meet this criterion. As these nets are identified and located, they are jammed or destroyed in accordance with the commander's attack guidance.

Jamming must complement the concept of operation. Jamming provides the commander with time to react or time to change his estimate to gain the tactical advantage. To maintain this tactical advantage, jamming would best be used against priority targets and with careful timing to achieve the desired tactical results.