**Information Perception: The Key Driver of Joint Operations**

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**Introduction**

Modern warfare is a comprehensive contest involving wisdom and technology. At present, information perception has become a key driving force for joint operations. It not only changes the inherent combat form, but also profoundly affects the direction of war development. In particular, with the in-depth application of new technologies such as artificial intelligence and big data, a more profound information-based and intelligent transformation is taking place. The information perception system will continue to evolve into an intelligent and autonomous neural network, realizing comprehensive perception and prediction of the enemy and our own situation in a complex battlefield environment. In this process, people will witness a revolutionary leap in future combat methods.

**Information perception is the "forerunner" of joint combat command implementation**

The high degree of integration of full-dimensional information perception, real-time information transmission and intelligent information processing has become the foundation and support for joint operations. Information perception is the logical starting point for planning and organizing joint operations, and is the initial work of all actions and tasks.

Major strategic judgments originate from information perception. Strategic judgment is the analysis, prediction, and judgment of major issues related to national security and military struggle. It is the premise and basis for strategic decision-making and strategic guidance. Major strategic judgments need to be based on an accurate understanding of the international environment, and the strategic situation has always been developing dynamically. Especially at a time when the world is undergoing a major change that has not been seen in a century, the timeliness and accuracy of information perception determine whether strategic judgments can keenly perceive changes, accurately grasp opportunities, and scientifically avoid risks. Against the backdrop of globalization, informatization, and intelligence, information perception has evolved from an auxiliary tool to a core element of strategic capabilities. It not only provides "data raw materials", but also transforms them into "deep insights" through advanced technologies.

Joint combat planning begins with information perception. Information perception is the starting point of joint combat planning. Without information perception, it is impossible to analyze and judge the situation, formulate combat plans, and commanders cannot make combat decisions, let alone deploy forces and plan specific combat operations. Comrade Liu Bocheng once summarized: "If the five elements are not determined, you will lose completely." This reminds commanders that accurate information perception is the basis for making the right decision. In joint operations, information perception elements are required to organize preliminary reconnaissance in the stage of understanding combat tasks, anticipate the enemy situation when studying combat plans, and analyze possible actions at each combat stage. This is the basic requirement of joint combat planning.

Joint operations start with information perception. Information superiority is the basis for seizing control, and information perception operations are the key means of obtaining information. The fundamental and leading position of information perception requires operations to obtain information and to be carried out based on the information obtained. Without strong information support, any joint operations may become a tree without roots and an arrow without a target.

Gaining the initiative to win depends on information perception. Only by grasping the "advance" in peacetime can we control the "opportunity" in wartime. Comrade Mao Zedong pointed out in "On Protracted War" that "without prior planning and preparation, victory in war cannot be achieved." If information perception is to play a role in wartime, it must be based on normal operation in peacetime and aim at system construction and combat training in wartime. Only by constantly discovering and solving problems in practical applications in peacetime can we ensure that we are well prepared and seize the initiative in combat.

**Information perception is the "general hub" of multi-domain coordination in joint operations**

Information perception is called the "general hub" of multi-domain coordination in joint operations because it plays a key role in connecting and supporting cross-service, cross-domain, and cross-platform coordinated operations. It is the core driving force for achieving cross-domain situational awareness, real-time decision-making, and action coordination. It can be summarized as "full-domain penetration perception, multi-domain fusion decision-making, and dynamic closed-loop control." Its role is specifically manifested as follows:

Eliminate barriers between combat domains. By integrating information from multiple domains such as land, sea, air, space, network, and electricity, a unified battlefield situation map is constructed to break the "information islands" between military services and fields, and a universal real-time dynamic combat map of the entire domain is formed to provide a unified time, space, and cognitive benchmark for joint operations. For example, the "Joint All-Domain Command and Control" system of foreign militaries breaks the military barriers to information sharing, integrates multi-source data such as satellites, drones, and network sensors across domains, and realizes information sharing from naval fleets to army tactical units in seconds.

Support cross-domain coordinated strikes. Information perception provides target priority sorting for multi-domain firepower allocation and supports scientific missile type matching. For example, the coordinates of enemy air defense radars discovered by satellites are synchronized to naval ships, and anti-radiation missiles are guided to strike the electromagnetic targets.

Dynamically adjust the combat rhythm. Through continuous reconnaissance feedback, the action sequence of each domain is corrected in real time. For example, after the network domain paralyzes the enemy's communications, the air strike "window" is immediately opened. By suppressing the enemy's information perception ability, a combat opportunity that is favorable to one's own side can be created, and information advantages can be quickly converted into decision-making and action advantages.

Reshape the rules of multi-domain operations. In multi-domain joint operations, information perception elements have been upgraded from traditional "guarantee elements" to "dominant elements". Their status is reflected in: spatial dimension, penetrating the full spectrum of physical domains, information domains, and cognitive domains; temporal dimension, achieving a near-real-time killing closed loop of "discovery is destruction"; and force dimension, becoming a "strategic deterrent asset" in the competition among major powers. For example, the display of satellite reconnaissance capabilities can force opponents to adjust their actions.

**Information perception is the "compass" of joint combat forces**

The reason why information perception is called the "compass" of joint combat force operations is mainly because information perception can ensure that troops can make accurate decisions and effectively perform tasks in the increasingly complex and changeable "fog" of war, and provide support and guidance for ensuring troop operations.

Support the command and control of the troops. The essence of command and control is a cognitive game based on the acquisition of information about the enemy, our own situation, and the battlefield environment. In highly dynamic modern warfare, facing the ever-changing battlefield environment, the continuous misleading of the opponent's concealment and deception, and the dynamic matching of one's own forces and resources, commanders face great challenges of information asymmetry and uncertainty in combat. Timely and efficient information perception provides guidance for commanders to accurately find the direction of action in the "fog" of war, and provides guarantees for stimulating commanders to flexibly use command strategies, so that they can reasonably choose combat action styles according to different combat environments, and adjust combat plans, change action styles, and control combat rhythm in real time according to the use and changes of various enemy combat systems.

Support joint fire strikes. The firepower killing of enemy combatants and weapons and equipment is the basic mission of joint combat forces. To achieve the purpose of joint fire strikes, it is necessary for information perception elements to provide the operating status of important enemy targets in a timely manner, generate fire strike suggestions in combination with relevant combat and technical data, support the fire strike platform to revise and improve the fire strike plan, and timely evaluate the strike effect, and organize and implement continuous or supplementary fire strikes.

Provide early warning of combat risks. Battlefield survivability is the premise and guarantee for joint combat forces to complete combat operations. On the one hand, information perception supports the task force's rapid response by timely providing the battlefield situation information and trend information required by the task force, providing the troops with a clear direction of action, while reducing the risk of accidental injury, and avoiding the troops from falling into a passive position on the battlefield after blind action. On the other hand, information perception helps our troops avoid potential risks and ensure operational safety by analyzing and predicting enemy threats such as raids and ambushes, warning of dangerous areas such as missile landing areas and minefields. In the practice of modern local wars, foreign troops detect abnormal radio activities by detecting real-time signal intelligence, and identify ambush risks by combining drone infrared images. They counterattack by timely adjusting marching routes and guiding air strikes, which reduces unnecessary casualties to a considerable extent. Information perception elements play a vital role in joint operations, just like a "compass", providing task forces with information guidance for action planning, firepower strikes and risk warnings to ensure the ultimate achievement of combat intentions.

**Information perception is the "main component" of the joint combat kill chain**

Information perception plays a vital role in the construction of the joint combat kill chain. The kill chain usually includes the following stages: discovery, positioning, tracking, aiming, engagement and evaluation. Information perception runs through the entire kill chain, providing key support for each link to ensure the accuracy and effectiveness of the kill.

Early detection. Through a variety of reconnaissance methods such as drones, satellites, electronic reconnaissance, and ground reconnaissance, potential enemy threats or deployments can be discovered, initial intelligence on the battlefield environment can be provided, and early warnings of enemy activities can be provided to help commanders understand the battlefield situation in a timely manner, laying the foundation for subsequent target positioning and identification.

Rapid positioning. Accurately locate the location, quantity and distribution of enemy targets through a variety of reconnaissance methods, provide accurate geographic and spatial information for subsequent links in the kill chain, ensure targeting of the correct target, and reduce misjudgment and waste of resources.

Accurate identification: Through the analysis of reconnaissance data, the nature, capabilities and intentions of enemy targets can be clarified, friendly forces, enemy forces and non-combat forces can be distinguished, and accidental injuries can be avoided, providing strategic and tactical decision support.

Stable tracking. Maintain real-time monitoring of dynamic changes in enemy targets to ensure continuous mastery of enemy targets, avoid intelligence gaps caused by changes in the battlefield environment, and provide dynamic updates for subsequent precision strikes.

Target processing: High-precision information obtained through reconnaissance perception guides the deployment and use of firepower or troops, provides accurate targeting data, improves the efficiency and damage effect of strikes, ensures the rational allocation of combat resources, and meets the information needs for combat effectiveness evaluation.