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UTILIZATION OF ARTILLERY UNDER HOSTILE AIR CONTROL

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INTRODUCTION

Artillery is considered one of the principal weapons in the armed forces. It offers the in-place and on-time cross-fire required in various combat circumstances. In spite of evolution and invention in weaponry, artillery is still the main method with which to provide constant and close fire in support of the element of maneuvering in combat. The role of artillery and its location in a Joint battle is defined based on the tasks it carries out; it is essentially subject to its combat related benefits and properties.

It is no longer a secret to anyone that there is an ongoing debate between the artillery effectively as a main weapon in ground battles and the newly developed weapons that target artillery sites such as fighter jets, helicopters and precision-guided munitions. In this debate, some predict that the artillery era is almost over due to the immense development in aircraft and missile technology. Others assert that the artillery era cannot come to an end because of the continuous development of artillery and ammunition, which makes them superior on a permanent basis. Such development includes the enhancement of fire effectiveness, as well as armouring and painting with materials that result in undetectability.

Artillery is considered weak in the face of hostile air force, particularly in the course of movement and shooting from different locations and angles. Therefore, the purpose of this paper will be to study and analyze the degree of risk posed by potential threats represented by hostile air force weapons; it will also be to find the optimal use of artillery in conditions under hostile air control and determine how to provide the necessary protection with the available resources.

The impact of the hostile air force

The impact of the hostile air force on the movement, mobilization, and the sites of artillery, and ammunition supply could be as follows:

Aerial surveillance

The Air Force is a great source of information. For example, aerial photographs and live video feed provided by the aerial surveillance may enable the detection of guns sites. The size of the relatively large guns and the large number of guns that are mobilized on the ground enables enemy site detection. Consequently, information regarding their movement may be passed to the hostile artillery or air force; as a result, their movement may come under direct enemy threat.

Aerial threat

Aerial threat could be represented in one of the following two methods. Firstly, attack by means of jet fighter planes or drones – such a method is effective for the destruction of guns by smart bombs and direct missiles targeting moving or mobilized vehicles. Secondly, attack by helicopters equipped with surface to air missiles on moving or mobilizing artillery and direct shooting at sites. Also, the destruction of the frontline ammunition storages located at the artillery site.

Avoiding the impact of the hostile air force

In the following two categories, we will discuss how to avoid the impact of the hostile air force, find the optimal use of artillery in conditions under hostile air control, and provide the necessary protection with the available resources.

The mobilization and the movement of artillery

The limited range of artillery requires the preparation and the occupation of more than one site to perpetuate the artillery support to all maneuver units at all stages of war [1]. We must be ready to move the artillery forward whenever forces advance. Although the self-propelled guns secured a great advantage, they also brought a great deal of problems; their large size makes them easily detectable by the enemy.

So, to avoid the impact of hostile air force weapons on the movement and mobilization of the artillery, the following steps should be noted. In the assembly area,[2] spread widely within the mobilization area perimeters. Selection of the appropriate artillery mobilization area will ensure disguise and the ability to use passive defense techniques such as hiding, digging and the use of nets for cover up. (Cover up refers to the use of methods and means of deception and camouflage.) Deployment of guns should result in the ability to operate in multiple directions and improved target selection. In the event of helicopters approaching, we are to use time fused shooting – the resulting explosions in the air would negatively impact the helicopters – along with the available medium range weapons. The mobilization movement within the area and the unification of the roads at the site should be reduced. In situating the guns, move away from the standard format – an irregular site is a prerequisite for the success of camouflage.

While on the move, the following procedures are to be noted. For mountainous areas[3]: mountainous areas are often infiltrated by valleys and trees cover most of the available longitudinal roads. Methods of movement can be summed up according to the stages of the war. In offensive operations, there is the assignment of advanced units to occupy successive locations using the skip technique; any part of the unit is to be occupied and moving and therefore the mountain land nature facilitates guns' protection from air detection and

[1] Royal Artillery Corps, Jordan Army, duties at work Pamphlet, 2004.P15.
[2] Royal Artillery Corps, Jordan Army, artillery Mobilization Pamphlet, 2004. P6.
[3] Jordan Army, Combat doctrine for the utilization of artillery in the Jordanian operation field.

bombardment by the hostile air force. There is also difficulty in locating sites for the guns without efforts of engineering; this is due to the usual rugged terrain of the areas, and of course, time does not allow preparations of ideal locations as the support requirements demands movement forward constantly. On the other hand, the movement of artillery squads in defensive operations is conducted as follows: detection squad, movement and preparation of sites before sunset using wheeled vehicles with camouflage work arrangements (such as whitewashing glass and artillery equipment), the use of civilian vehicles, if available, and the use of navigation devices in installing and directing the guns. Then the Guns squad movement commences at night after the sunset; wireless silence is imposed while on the move, density increases during the movement to assume control and speed rate is less than the average in the daytime, and guns are divided into groups while on the move. In the Desert areas: the nature of the land in desert areas is wide open where there is no vegetation and roads usually do not facilitate concealment or cover up. Therefore, resorting to gunning in a widespread and constantly confrontational manner is an ideal movement, thus easing the effects of aerial bombardment.

Guns sites

Artillery occupies several types of sites in the course of its operation. All sites are dedicated to providing artillery front support in timely manner: the main sites, alternative sites, mobile sites, temporary sites, Phantom sites[4]. The features that can bring attention to the artillery sites are[5]: regular intervals between the guns, as indicated by blast, smoke and flashing, modern roads or private tracts ending with guns platforms or command posts, poor hiding of camouflage mechanisms (waste management and other operating equipment that must be in the dugout), movement of individuals, technical equipment, maps, storages etc., newly

[4] Royal Artillery Corps, Jordan Army, artillery Mobilization Pamphlet, 2004. P 26
[5] Ibid, P16.

inverted land showing raised excavation and trenching, stockpiling ammunition places on the artillery site.

To avoid the impact of hostile air force weapons on the site of the artillery, the following steps should be noted. Firstly, the site is determined during the day time, taking into account the points made previously. Guns are deployed over a distance of 300 m, or 500-700m in Desert areas. Artillery movement should be reduced; the artillery sites should be situated as far as possible at the front and site preparation should take place before the arrival of the artillery, with personnel and equipment sent ahead to prepare the site. There should be excavation and fortification, and shelters prepared for individuals and ammunition. Guns should be prepared and fortified. Operating personnel and observatories sites must have cement as deep as 3m. Guns should be secured by cover up with nets, taking into account the nature of the ground. The main roads and movement within the site should be identified, alternative locations prepared. Movement of the main sites should take place prior to the implementation, considering an adequate timeframe in which to occupy the site. For night occupation, a Gun squad should observe noise reduction, disguise and cover up. Organizing and coordinating of the local defense to defend against aerial threat to the artillery site should be supported by the sustainment of local monitoring centers and the preparation of targets around the site which can be engaged with automatic or immediate hits directly on the ground against helicopters. Control of all guns shooting should be ensured by shooting of all guns at one time and on a broad range. There should be preparation of alternative sites which would appear as the main site, site occupation, noise reduction, cover up, and the organization and coordination of local defense of all sides. Also, the Artillery site should be hidden, particularly while on shooting operations; this should be accomplished by improving the gun

position, e.g. placing sand in front of the guns while maintaining non-shooting status, unless executing a mission or an order[6].

As demonstrated in the analysis above, an artillery movement or site is constantly exposed to air threats and therefore:

- The artillery must utilize guns with self-propelled features which enable it to easily navigate, even when deployment arrangements result in increased size of guns and greater/constant susceptibility to air detection.

- The artillery needs to be protected from constant aerial surveillance and bombardment. The aerial attacks threaten to weaken the artillery, especially during movements, due to the lack of the necessary cover.

- Air defense units are to be allocated especially in support of artillery units. This will ensure the protection of guns at all stages, during mobilization, movement or while providing fire support to the maneuvering front elements.

- Deception and camouflage during the movement of guns are to be employed. (Note that a Swedish company is working on developing movement-deceptive traps which are solid, movable and easy to install on all military equipment. The traps are also equipped with all the necessary visual and thermal features such as radar.)[7]

- Modern aircraft guns represent a great risk to the artillery and could potentially destroy it, especially considering the availability of ammunition that can penetrate shields.

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[6] Col. Mohamed Alzobe ,Essay, the Ideal method for artillery operation under hostile air threat2002 . P3.
[7] Methods and means of camouflage and deception in the air defense.
http://defense-arab.com/vb/threads/44094/

- Work on the deployment of guns in mountainous areas from 300-500m and desert areas from 500-700m instead of 150 × 150 as is currently in force.

- Situate the artillery positions on accessible areas in the mountainous areas and conduct fortification work on them.

- Establish a direct and immediate communication between the artillery and air force to report any air raid by the enemy until the shooting stops and the artillery enters shelters or individuals spread around the site to avoid being targeted by hostile air attack.

- Use wired communications between observatories and sites so as not to reveal the artillery location by wireless surveillance.

- Provide artillery sites with smoke grenades corrals with self-propelled guns to shoot within the site perimeters when an air raid occurs at the site.

- Work to find and prepare the decoy sites which are well equipped to be misleading artillery sites for the anti-Air Force. (Note that a UK defense company invented and produced fake inflatable targets, including tanks and armored personnel carriers.)[8]

- Use a hit-and-move (Guerilla war) style implemented by small battalions to attack and withdraw instantly.

- To avoid air strikes and distinguish hostile aircraft, implement the appropriate training methods.

- Make use of the night vision factor in movements and occupation of artillery sites, as well as in providing ammunition.

[8] Methods and means of camouflage and deception in the air defense. http://defense-arab.com/vb/threads/44094/.

- Engineering materials are needed to fortify artillery sites, and for the tasks of disguising and hiding the site so that it is integrated with the surrounding nature.

- Use modern camouflage nets to conceal and reduce the thermal signature of equipment (Infra-Red Camouflage) so that equipment does not appear in an infra-red film. Some types of modern nets are designed to deflect radar waves emitted by the stations and radar surveillance devices, resulting in better concealed equipment. This type of net is known as a radar scattering net. In addition, some types of modern painting are used in concealment techniques[9].

- Electronic deception is one of the electronic methods of warfare. It is defined by the deliberate sending of electromagnetic waves, or the changing direction, absorbing, or reflecting of electromagnetic waves in order to mislead the enemy.

- Consider deception guided missiles and smart bombs: their use of corner reflectors deceives anti-missile infrared rays and they may also be used to launch smoke grenades to conceal sites.

- Developing the scientific and technological future of the military continues, and with that will come developments in camouflage patterns for military uniforms, vehicles, etc. Better camouflage techniques will be useful to the artillery to protect it from the aerial threat. Consider some of the camouflage techniques may be useful for the Artillery[10]:

  (i) CARC coating: a kind of paint that is resistant to chemical agents; it is for coating military equipment and mechanisms. The company "Intermat" Greek has

[9] Ibid.
[10] Military Camouflage "Camouflage"
http://arabdefencejournal.com/newdesign/index.php

produced Coatings "Camelean" that reduce to a large degree the Thermal footprint of mechanisms.

(ii) Graphite Foam: currently offered by Oak Ridge National Laboratories in the United States. It uses foam material Graphite "Graphite Foam" which is characterized by large capacity to deliver heat and electricity to reduce the thermal footprint of mechanisms.

(iii) The hoods "TactiCAM": these are distinctive three-dimensional drawings meant to deceive the sense of sight. However, in terms of camouflage gear, it does not seem to be effective.

CONCLUSION

The role of artillery in supporting our armed forces is mainly as one of the most important weapons of the main support force – a force which a hostile air force constantly seeks to target and destroy. Artillery is important in light of the hostile air control. Therefore, we should try to avoid forces' movement and occupation of their positions during the day time. We must also prepare and fortify artillery sites, sustain the local defense, control the shooting of guns and spending of ammunition, and safely secure/cover up guns at an appropriate time and place.

The enemy always tries to invalidate the effectiveness of the artillery by destroying it, particularly by using their air force units to do so. The different nature of the ground in the field of operations requires the use of different methods for the navigation of artillery as well as the careful selection of positions to occupy while under hostile air control. While electronic warfare, aerial surveillance and air power have evolved, the means of passive defense and disguise, concealment and fortification, and use of primitive nature will be able to continue to confuse and deceive electronic means.

The methods outlined in this paper may be used to secure the protection of guns sites in cases of aerial threat. However, in cases where enemy air control is widespread, fortification, good concealment of guns, and a "hit and run" system capitalizing on the mobility that characterizes modern guns is the preferred method.

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