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CHAPTER 2

(S-NOFORN) OCTOBER 1973 MIDEAST WAR (U)

DEPARTMENT OF THE ARMY
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1. (FOUO) INTRODUCTION (U)

a. Various studies, analyses and reports on the October 1973 Mideast War provide the US Army with relevant tactical and technical data which has been used to establish lessons learned. From this, an examination can be made of current tactics, doctrine, training and materiel development. These data also provide insight on future tank design and product improvements necessary on existing US tank fleets. Of the numerous lessons learned, three major lessons stand above the rest.

- You Can Fight Outnumbered And Win.
- The Lethality of Modern Weaponry Has Vastly Increased.
- The Tank Is The Dominant Land Weapon System.

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b. At times these lessons tend to be lost in the myriad of studies and analyses, but there is a very important relationship to be maintained between these lessons learned, organization to fight, and technical detail of equipment design. Supportive data of all available reports, surveys, interviews and briefings are presented in the discussion of the three major lessons learned. Data in the discussion are subject to several limitations.

- Some vehicle samples were small and may not have been representative of their population.
- Personnel surveys may have been biased or inaccurate due to the lapse of time between combat events and the surveys.
- Chronology of events may have led to ^{PREMATURE} ~~premature~~ judgments by Israeli leaders, US ~~representatives~~ and other observers.

c. Although no specific recommendations are stated in this chapter, the discussion of major lessons learned highlight tank design problems, particularly in the discussion of the tank as the dominant land weapon system. These lessons learned were considered in the formulation of recommendations contained in other chapters of this study.

2. (S) DISCUSSION (U)

a. (U) You Can Fight Outnumbered And Win (U).

(1) (S) The ability of the Israelis to fight outnumbered and win is quite clear when an examination of tank availability and exchange ratios

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of the opposing forces is made. Throughout the war the Israelis were outnumbered in tanks by 3, 4 or more to 1. To overcome this numerical disadvantage the Israelis had to make the maximum use of good gunnery, tactics, imagination, and courage.

(2) (S) To completely understand the tank ratios and the ability of the Israelis to fight outnumbered and win, a detailed review is necessary. First, the war must be analyzed from two viewpoints corresponding to the two separate and uniquely distinct fronts, the GOLAN HEIGHTS and the SINAI. Each front then is chronologically divided into phases identified by highlights of the time period, taking first the Golan Heights.

(S) GOLAN HEIGHTS (U)

- PHASE I, 6 to 9 October - Syrian Attack and IDF Holding and Blocking Action
- PHASE II, 9 to 12 October - IDF Counterattack to Retake Golan Heights
- PHASE III, 12 to 15 October - IDF Counteroffensive into Syria
- PHASE IV, 15 to 24 October - IDF Holding Action

(3) (S) A review of tank availability and tank losses, both Arab and Israeli, in each phase in the Golan Heights is graphically portrayed in Figure 2-1. Arab totals include Syrian tanks primarily but take into account the limited number of Jordanian and Iraqi tanks.

(a) PHASE I, 6 to 9 October - Syrian Attack, IDF Holding and Blocking Action. The war started with the attacking Syrians having a 3.3 to 1 tank advantage. Heavy tank losses by the Israelis during this phase of the war are attributed to slow mobilization and subsequently the lack of combined arms operations.

(b) PHASE II, 9 to 12 October - IDF Counterattack to Retake the Golan Heights. Israeli tank strength increased during this phase, however, they were still outnumbered 2.3 to 1. The period was highlighted by a classic tank battle of some 750 tanks. This night battle resulted in 250 Syrian tanks destroyed and 400 abandoned (D-2; 15).

(c) PHASE III, 12 to 15 October - IDF Counteroffensive into Syria and PHASE IV, 15 to 24 October - IDF Holding Action. Although still outnumbered 2.5 to 1 the initiative was clearly with the IDF. The Israelis conducted a limited drive into Syria and then held their gains.

(4) (S) Total tank losses of the Syrians were approximately 1000 (D-2; 21) compared to Israeli losses of 400, of which at least one-half were repaired and returned to combat (W-9; 18).

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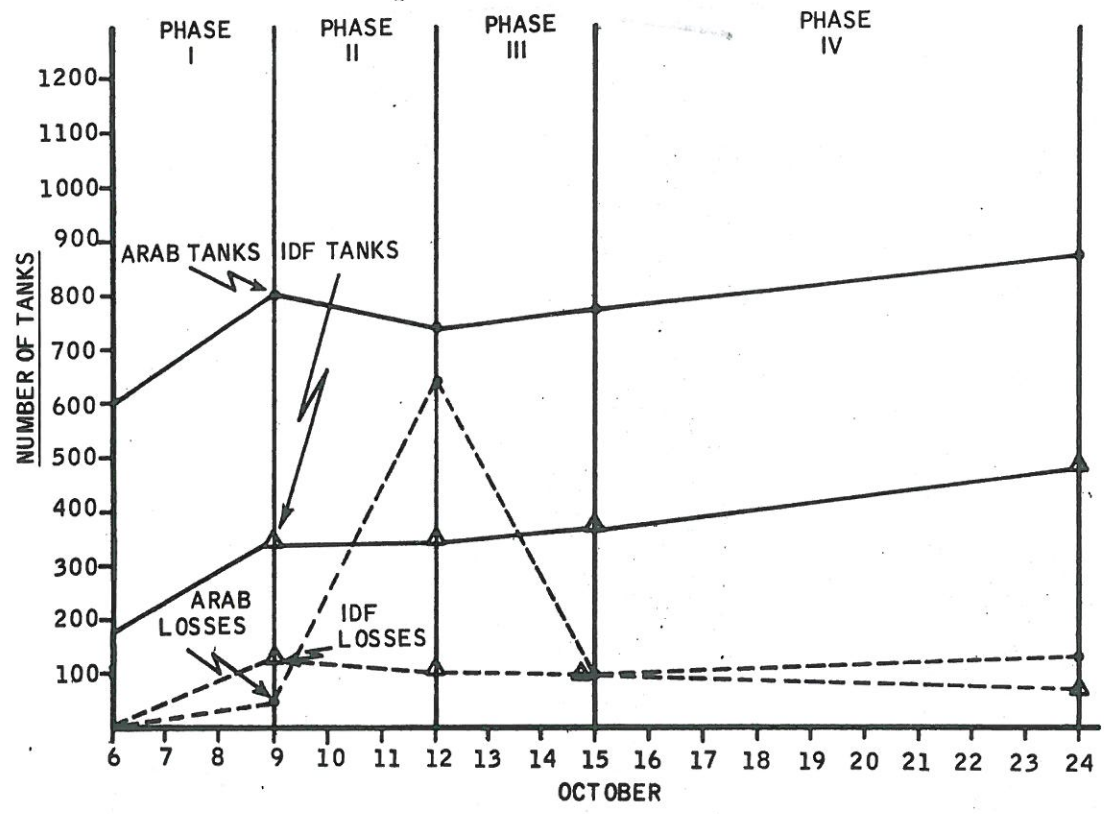


Figure 2-1 (S). Tank Availability and Losses on the Golan Heights (U)

(5) (S) First priority for Israeli survival was to stop the Syrian attack. Space could be traded for time in the south. The situation could be and was much more fluid in the Sinai. With the Syrian threat contained in the Golan Heights the emphasis was shifted to the Sinai.

(S) SINAI (U)

- PHASE I, 6 to 9 October - Egyptian Attack/IDF Containmentment
- PHASE II, 9 to 14 October - Egyptian Reinforcement and Consolidation/IDF Defense
- PHASE III, 14 October - Egyptian Attempted Breakout
- PHASE IV, 15 to 17 October - IDF Canal Bridgehead and Crossing
- PHASE V, 17 to 19 October - Adan Division Crosses Canal
- PHASE VI, 19 to 24 October - IDF Drive to Encircle 3d Egyptian Army

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(a) PHASE I, 6 to 9 October - Egyptian Attack/IDF Containment. The Egyptians had only a slight advantage of tanks on the opening day of the war as indicated in Figure 2-2.

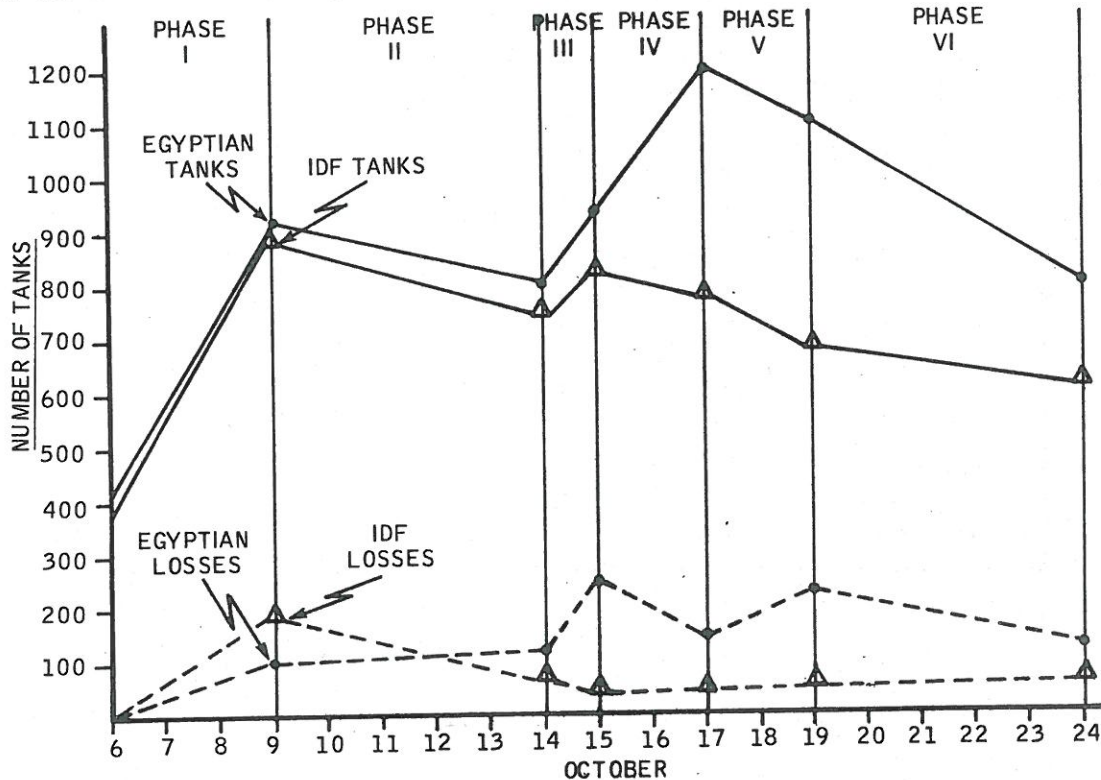


Figure 2-2 (S). Tank Availability and Losses on the Sinai (U)

However, the number reflected is tanks that had crossed the Suez Canal and were in combat on the East Bank. Actually the Egyptians had an aggregate on the East and West Banks of the Suez of 910 tanks, or a 2.5 to 1 ratio. It was in this phase that Israel suffered the heaviest tank losses of the war. Within a matter of hours after the Egyptian attack, local, piecemeal counterattacks began aimed at relief of the Bar Lev strongpoints. It was in these counterattacks that the SAGGER and RPG antitank weapons achieved their greatest success. Primarily this was the result of poor Israeli tactics, lack of accompanying infantry and a shortage of artillery (U-31; 13). This can be attributed to:

- A slower than expected mobilization that denied the IDF necessary equipment and personnel for combined arms operations.
- Egyptian use of a sophisticated air defense system to deny the IDF close air support.
- The Egyptians deploying vast numbers of ATGM's and ATW's that the IDF could not neutralize with their pure tank formations.

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(b) PHASE II, 9 to 14 October - Egyptian Reinforcement and Consolidation/IDF Defense. The Egyptians still held a slight advantage in tanks during Phase II. Losses leveled off while the Egyptians were consolidating and the IDF prepared to launch a major counterattack. Also, once the IDF made the necessary tactical adjustments their losses were reduced considerably.

(c) PHASE III, 14 October - Egyptian Attempted Breakout. An attempted breakout during this phase resulted in heavy Egyptian losses. One isolated battle along the Mitla Pass had an IDF tank battalion destroying 60-70 tanks of an Egyptian brigade (D-2; 29). This phase was the turning point of the war in the Sinai. Israel had successfully seized the initiative from the Egyptians.

(d) PHASE IV, 15 to 17 October - IDF Canal Bridgehead and Crossing. The IDF canal crossing was highlighted by the "Battle of Chinese Farm" which has been described as the most concentrated armor battle ever fought. Outnumbered in tanks by 326 to 130, the Israelis destroyed about 160 Egyptian tanks while losing 51 (U-85; 45).

(e) PHASE V, 17 to 19 October - Adan Division Crosses Canal. Taking into account tanks on both the East and West Banks, the Egyptian advantage was reduced to 1.3 to 1. One brigade of Adan's Division, while moving to make their canal crossing encountered and engaged an Egyptian armored brigade, destroying 96 of 100 tanks without a single loss (D-2; 31).

(f) PHASE VI, 19 to 24 October - IDF Drive to Encircle 3d Egyptian Army. At the beginning of this last phase, the Egyptians still maintained a 1.3 to 1 advantage. Once across the canal, Adan's Division turned and moved south to Suez City encountering the 3d Egyptian Army, destroying 120 Egyptian tanks in battles on the East and West Banks and completely encircling the 3d Egyptian Army (D-2; 33). A total of 200 tanks remained in the 3d Army.

(6) (S) In the Sinai, IDF losses were approximately 450 tanks; however, over one-half were repaired and returned to service. Egyptian losses were set at 1000 destroyed. The 200 remaining tanks of the 3d Egyptian Army were surrounded and not combat effective (D-2; 34).

(7) (S) This brief review of the war illustrates the ability of the Israelis to fight outnumbered and win. Their success did not come easily however, and clearly was the result of continual refining and integration of:

o Training

Gunnery - Initial training of Israeli gunners requires them to fire approximately 65 tank rounds - 12 to 15 individually and 40-43 as part of crew training. Additionally, each gunner fires 12-15 rounds annually (U-40; D-23).

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Tactics - In the defense the IDF prepared primary, alternate, and supplementary positions on all major avenues of approach. After suffering tank losses as high as 40 tanks in one-half day in one armor brigade, Israeli formations were changed to tank-infantry formations (U-85; 34).

- Imagination. Excellent use of the terrain was made by the Israelis and where natural defilade was lacking they used hastily scooped out defilade firing positions.

- Courage. IDF forces were outnumbered in tanks throughout the war but still continued to fight and win.

b. (U) The Lethality of Modern Weaponry Has Vastly Increased (U).

(1) (FOUO) Modern weapons with greater lethality heavily populated the Mideast battlefield. Emerging from this lesson was the combat truism that, "anything seen on the battlefield can be hit, and anything that can be hit can be killed." Among these lethal weapons are the main battle tank, antitank guided missiles, hand held antitank weapons, artillery, mortars, and air defense systems.

(2) (S) To understand the impact these weapons had on the battlefield, it is necessary to examine the tank losses on both sides. Israeli losses during 18 days of combat totaled on the order of 500 tanks (non-repairable) out of approximately 2,100 deployed, a daily loss rate of 1.3%. Arab daily loss rates were 3% based on the loss of 2,000 of 3,700 deployed (W-9; 18). At least 85% of the 1700 Arab tanks killed were killed by Israeli tanks. An argument can be advanced that the IDF had few means other than tanks, however, looking at the total picture of all tanks destroyed, both Arab and Israeli, at least 60% were killed by other tanks. The ability of the tank to attain a hit and kill out to 2500-3000 meters, coupled with its mobility and protection, makes it the most effective, versatile tank killer.

(3) (S) Antitank guided missiles used by the Arabs were responsible for at most, 24% of the Israeli tanks destroyed. This figure, however, could be as low as 9% (U-40; D-23). Israeli commanders approximate that of the 6000 to 8000 SAGGER missiles fired, only 14% were target hits (U-137; D1-D4). This was in spite of the fact that Arab SAGGER gunner training is known to have been extensive prior to the conflict. The fact that training was also conducted during combat represented a burden, however, the reliance on the system is indicated by the proliferation. Seven launchers, or two-thirds of a SAGGER company, were employed in support of a single infantry company. When queried, as to how the SAGGER missiles were fired, 64 of 198 tank commanders reported them fired in salvo (average salvo - 4.7 missiles) (W-11, Vol 3; 179). At closer ranges other antitank weapons such as the RPG-7 and M72 LAW provided the lethality against armored targets. Presence of new antiarmor systems did not cause

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a major change in the nature of combat, but they do offer potential in countering massive tank assaults. The problem for tanks is how to operate in this environment without suffering catastrophic losses.

(4) (S) Indirect fires by artillery and mortars enabled opposing forces to suppress and destroy at any point on the battlefield. Initially, Arab artillery forces consisted of some 2,440 field artillery pieces opposing the IDF's 750 artillery pieces (U-40; D-I-1). Forty-one of 61 Israeli soldiers surveyed reported smoke to be an effective suppression method against the SAGGER (W-11, Vol 3; 182). In the later phases of the war, artillery and mortars were used to suppress antitank systems, provide smoke screens and night illumination.

(5) (C) Air defense ground systems deployed by the Arabs accounted for 73% of the Israeli Air Force losses. IDF ground operations were severely hampered without close air support, particularly at the beginning of the war.

(6) (U) To overcome the volume and lethality of these modern weapon systems requires a combination of those same factors used by the IDF to fight and win outnumbered.

c. (U) The Tank Is The Dominant Land Weapon System (U).

(1) (FOUO) The main battle tank demonstrated clearly its role as the dominant land weapons system. Attacks, defenses, and control of terrain centered around the versatile firepower and mobility of the tank. However, dominance by the tank on the battlefield must be tempered with the fact that it cannot and did not fight alone. In order to be successful it had to be supported with elements of the combined arms team. The Israelis relearned this lesson quickly. As stated in the introduction of this chapter, there is a very important relationship between the lessons learned, organization to fight, and the technical detail of equipment design. When discussing the tank as the dominant land weapon system considerations of equipment design are most prevalent, however, all are interrelated and cannot be addressed in isolation. Data from the October War that supports the lesson that the tank is the dominant land weapon system also has as a fall out considerations of equipment design. These considerations that impact on both the current fleet and future tank design can be categorized under the three classic characteristics of the tank.

- Firepower
- Mobility
- Protection

(2) (S) Firepower. To highlight the versatile firepower that the tank provides, an examination of the target distribution in the Golan

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Heights and Sinai is necessary. A survey of distribution by kind and number of targets reported on by IDF tank commanders showed that combat vehicles (tanks, APC's and other vehicles) made up 91.2% of 544 targets in the Golan Heights. In the Sinai, combat vehicles were 74.4% of the 1,260 reported (W-11, Vol 3; 81). Figure 2-3 shows this distribution.

(a) Against this target distribution IDF tank commanders reported using their main gun 1,489 times; 74.9% of the targets engaged with the main gun were tanks and 12.8% were APC's and other vehicles. Another survey revealed the IDF achieved a first or second round hit in 55% of the 1,392 hits reported by tank commanders. The long range capability of the tank is illustrated by the fact that a sample of Israeli opening main gun engagements show that 521 of 1,339 were at ranges of 2,000 meters or more (W-11, Vol 3; 90, 99, 94) (Figure 2-4). At opening ranges of 2,000-3,000 meters the M60's range finder and fire control were a definite asset. Despite some early criticism of the US 105mm APDS ammunition, the 105mm proved to be combat effective and the Israelis consider it to be at least equal to the 115mm smoothbore on the T62. The 105mm gun tube was praised for its quick change capability.

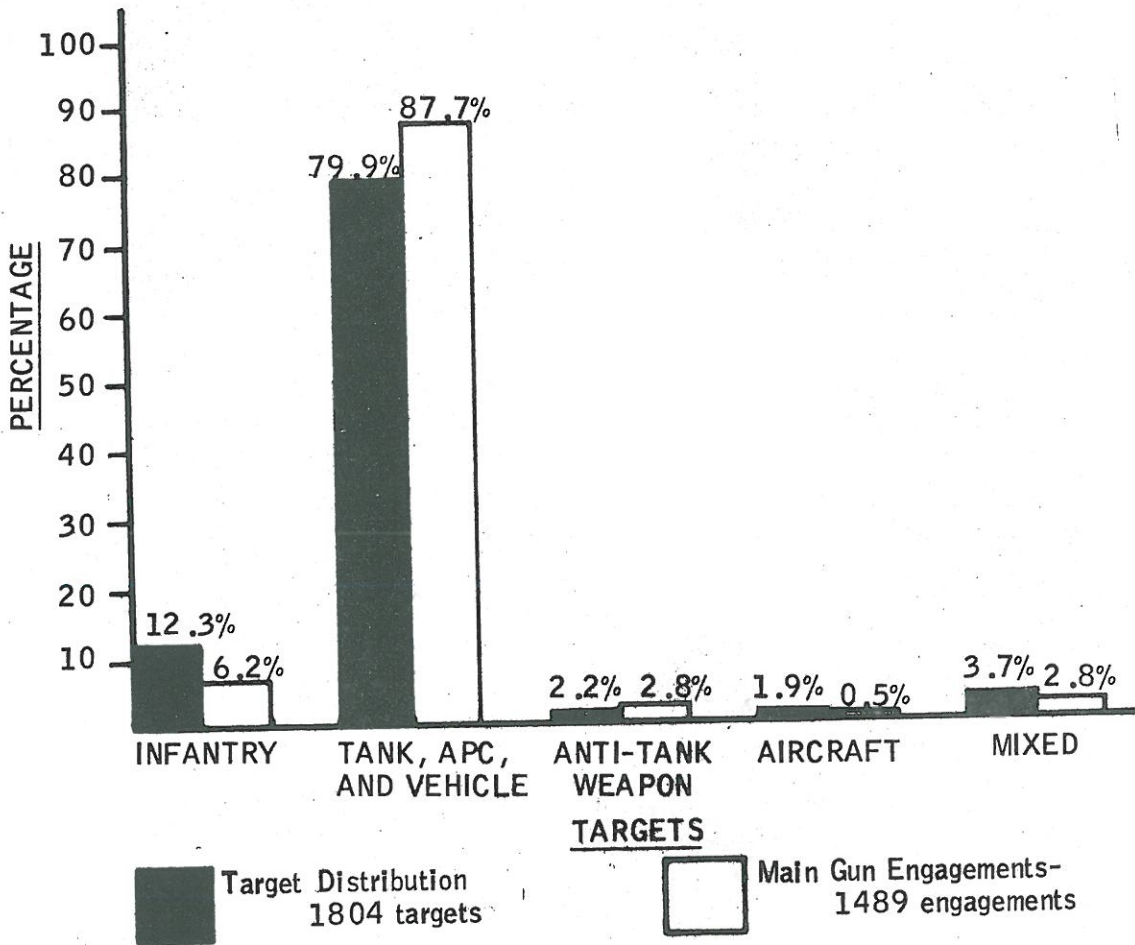


Figure 2-3 (S). Target Distribution and Main Gun Engagements (U)

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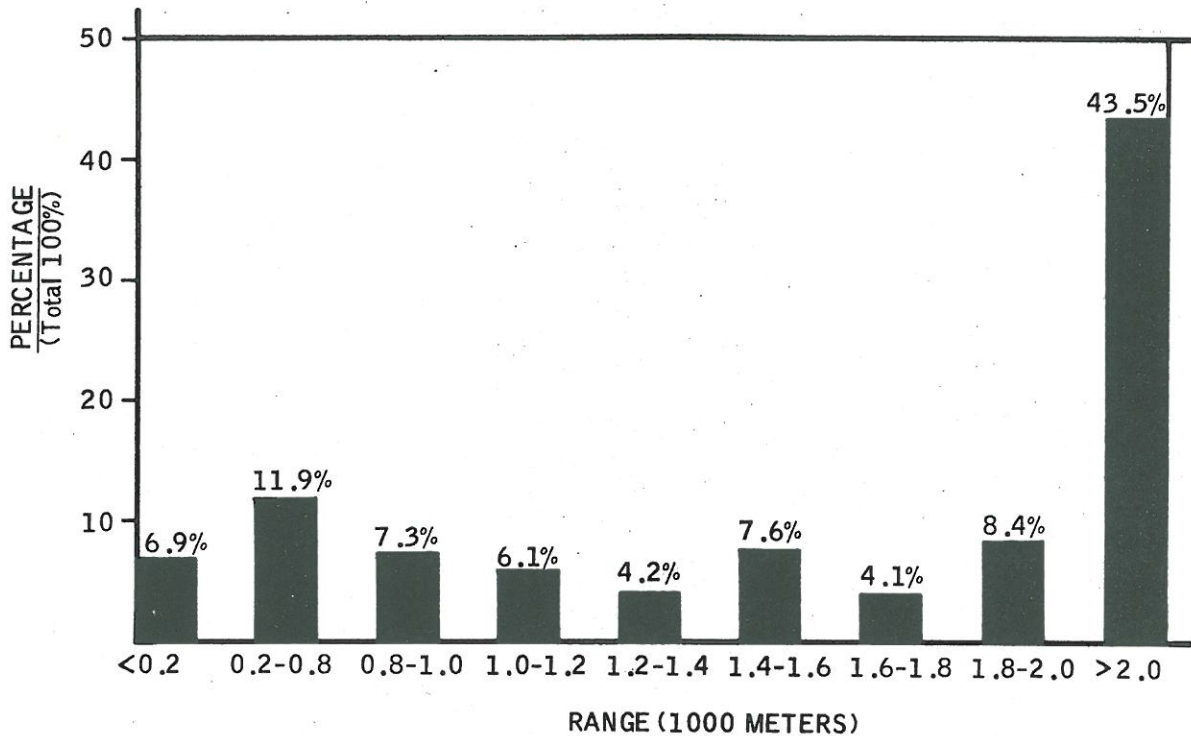
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Targets Acquired - 1416

Figure 2-4 (S). Acquisition of Targets: Combat Vehicles (U)

(b) Complementary armament adds to the tank's firepower versatility. According to a survey of IDF tank commanders, the coaxial mounted machineguns were used 100 times against various targets - 53% of the time against infantry and 27% of the time against aircraft (Figure 2-5). Another survey of 630 tank commanders showed 440 utilized the tank commander's machinegun to engage infantry, 413 to engage aircraft and 175 to engage APC's (W-11, Vol 3; 90).

(c) The IDF advocate a high volume of small caliber (7.62mm) fire against infantry and aircraft; 14-16 enemy aircraft were claimed by this tactic (U-137; C1). Of tank commanders surveyed, 151 of 174 were satisfied with the Browning caliber .30 machinegun as the tank commander's weapon (W-11, Vol 3; 191). They also prefer a flex type mount at the tank commander's station because the cupola elevation and traverse controls are inadequate in tracking fast targets. The Israelis had problems with the .50 caliber M85 machinegun at the tank commander's station and the 7.62mm coaxial machinegun (both the M219 and M73A1). Malfunctions were in part attributed to:

- Excessive wear due to dust and sand.
- Ruptured cartridges.

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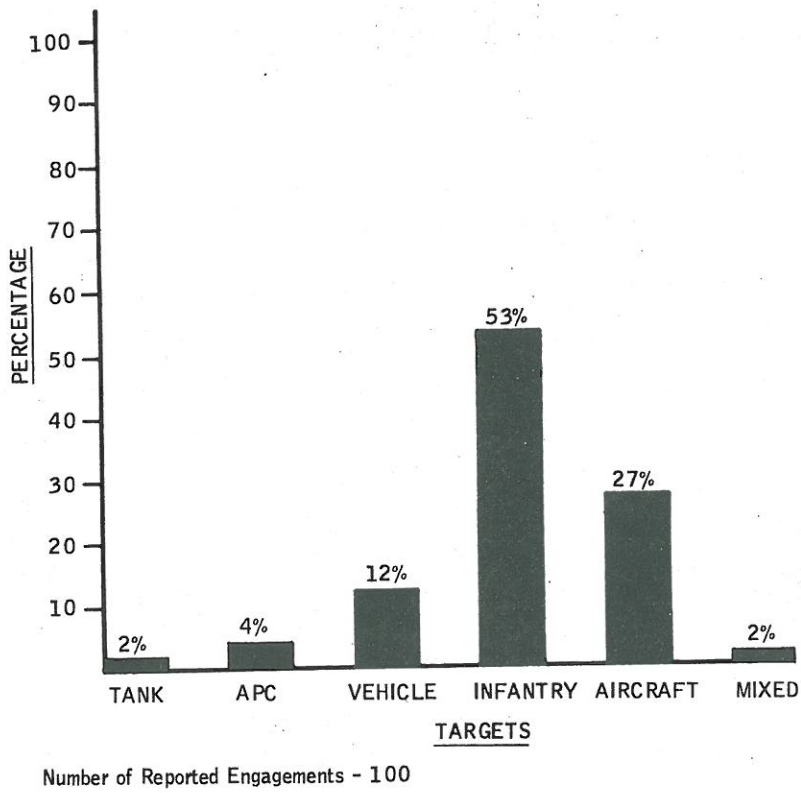


Figure 2-5 (S). Engagements of Targets by Coaxial Machinegun (U)

- Broken extractors.

The most prevalent problems were ruptured cartridges and broken extractors.

(3) (S) Mobility and Protection. Only an imaginary or at most a thin line separates mobility and protection. One complements the other but both, when rated and considered with the same priority in design, equal survivability.

(a) The survivability of the tank and its crew was of critical importance to both the Arabs and Israelis. It appears that the survivability of a tank depends in large measure upon its arrangement/protection of fuel and ammunition, agility and possibly silhouette.

(b) Contributing factors to the high percentage of destroyed and nonrepairable M48/M60 tanks may have been (1) the M60 tank suffers from the same vulnerability defects as the T62, i.e., a faulty distribution and placement of fuel and ammunition throughout the tank, and (2) the main gun stowage above the turret ring.

(c) Israeli tanks reportedly degraded enemy fire accuracy by employing stop and go, erratic and rapid acceleration maneuvers.

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(d) The silhouette of the M60 was initially reported as being too high and therefore presented a good target for the Arab gunners. This finding gained rather undue acceptance; however, intangibles such as technique of employment and firing discipline could have made a difference. A comparison of the M60 and T62 silhouette does show the M60 received hits on portions of its silhouette that would not have hit the T62; however, consideration must be given to the fact that had the silhouette been lower, the gunners would have aimed lower. Integral to the silhouette question are the trade-offs between the 10° gun depression of the M60 and Centurion and the T62's 4° gun depression. In the design of the M60 and Centurion, a higher turret was accepted as a trade-off to attain 10° depression of the main gun. This gives a significant advantage in limiting exposure from the turret ring down. Design of the T62 emphasis is on overall silhouette size and a 4° depression is accepted. Given a T62 and M60 side by side in hull defilade the M60 presents a frontal view of the turret approximately six inches higher than that of the T62. The tradeoff being that to engage a target on lower ground (greater than 4° to the horizontal) the T62 must pull forward or back out of position. In either case more frontal area is exposed presenting a larger target. A more detailed discussion can be found in Chapter 6, Firepower.

(e) A related element to survivability was resupply of tank ammunition. The limiting factor for Israeli operations was the resupply of ammunition rather than fuel. The problem is not primarily a delivery problem but rearming while in contact. The stowed load of the M60 (63 rounds) and Centurion (73 rounds) was a significant advantage over the T62 (40 rounds) (U-137; E1). There was a high daily main gun ammunition expenditure. A survey indicates that 122 of 347 IDF tank commanders in the defense and 79 of 320 in the attack expended more than 20 main gun rounds per day. Another survey of 584 IDF tank commanders (Regular and Reserve) show that 55% had less than 20 rounds left in their tanks at certain phases of the war. Among the 145 IDF Regular Army tank commanders surveyed, 64 had less than 10 rounds remaining (W-11, Vol III; 110, 111). The average number of impacts per Arab tank killed was 2.5 (W-11, Vol VII; 40); and 78 of 191 tank commanders surveyed fired until evidence of a catastrophic kill was observed (W-11, Vol III; 203). An example of ammunition expenditure in the Golan Heights showed the defending Israeli 7th Brigades' 40 remaining tanks with less than four rounds each after a major Syrian attack (D-12; 192).

(4) (S) Although the tank was dominant there are certain characteristics of design that caused problems that must be considered. For example, any equipment located on the exterior of the vehicle will be perforated. Air cleaners on the M60 tank perforated by artillery fragmentation led to engine failure. Headlights and searchlights on the M60 tank were destroyed by artillery and mortar fragments. Loss of the searchlight eliminated infrared capability (U-137; E1). Also, the tank commander's cupola on the M48/M60 tank was considered unsatisfactory because of restrictions in both vision and space for movement of the tank commander. This restrictiveness led to fighting with the hatches open and subsequently

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to significant casualties. (U-40; D-22). Surveys show 42% of 1,442 IDF tank crew members that were KIA/WIA were tank commanders (W-11, Vol III; 163). Seventy-five percent of all eye injuries suffered by the Israelis were experienced by tank crews and 50% of those by tank commanders (U-137; 03).

(5) (S) Another factor to consider when reviewing the design of future tanks is the threat force night fighting and CBR equipment that was displayed in the war. Arab night vision devices included active infrared on T62 tanks, image intensifier equipment (passive) on BMP's, and passive night sights (starlight scopes) for RPG-7's (U-40; D6). The proliferation indicates the emphasis placed on night operations. In addition to the night fighting equipment, all Arab combat vehicles were equipped with automatic radiological warning devices and decontamination kits. Arab prisoners of war indicated that individual soldiers were equipped and trained for CBR operations (U-137; I-1).

(6) (S) The overall performance of the Patton and Centurion tanks proved to be a significant factor in the victory of the Israeli Defense Forces (U-137; E-1). The M60A1 was cited as having good reliability and very good mobility. Pattons and Centurions were cited for their superiority in main gun ammunition stowage. The Israelis conclude that the T62's smoothbore is a fine weapon but the external fuel cells, fuel and ammunition stowage side by side in the fighting compartment make the tank extremely vulnerable. Soviet designers apparently have accepted certain crew hazards and relaxed human engineering as a trade-off for a low profile tank. The Centurion has the greatest survivability of any tank used in the war due in part to the stowage boxes on the outside of the turret, bazooka plates and the stowage of main gun ammunition below the turret ring.

3. (S) SUMMARY. Events of the October 1973 Mideast War have been studied and the formulated lessons learned applied to the review and validation of the requirements of the XM-1 Main Battle Tank Materiel Need (Engineering Development) document. Those lessons learned especially relevant to the review of tactics, doctrine, training, materiel development and future tank design are:

YOU CAN FIGHT OUTNUMBERED AND WIN

- Combined arms team essential in combat.
- Training, imagination and courage must be continually refined and integrated into combat operations.

LETHALITY OF MODERN WEAPONRY HAS VASTLY INCREASED

- Tank characteristics of firepower, mobility and protection make it the most versatile, effective tank killer.

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- Antitank guided missile systems provide accurate long range fire and are effective in countering massive tank assaults.
- Indirect and direct fire systems can suppress and destroy targets at any point on the battlefield.
- Air defense cannon and missile systems can deny close air support in localized areas.

THE TANK IS THE DOMINANT LAND WEAPON SYSTEM

- Combat operations centered around the main battle tank.
- A significant majority of the target distribution on the modern battlefield will be combat vehicles.
- Complementary weapons add to the tanks versatile firepower with a high volume of small caliber fire.
- Tank survivability is dependent on ammunition and fuel placement, agility and silhouette.
- Resupply of tank ammunition can pose serious problems when units are engaged for extended periods.
- Externally mounted equipment is frequently damaged and degrades tank's fightability.
- Cupola revision and space restrictions led to open hatch fighting with resultant high casualties.
- Threat forces show sophistication and proliferation in their night vision and CBR equipment.
- Western tanks proved to be superior to Soviet tanks.

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