From Tactical Anti-Aircraft Defense to Systemic Aerial Defense

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Introduction

In January 2011, after the conclusion of thorough staff work, during which the anti-aircraft roles of the air force were studied and defined, the name of the IDF’s anti-aircraft array was changed to the “Air Defense Division.” This change was the culmination of a comprehensive transformation process of the whole array. The changing role of the Air Defense Division, which is reflected in its new name, provides us a glimpse not only into the world of air defense in the IDF, but in many ways, also into the formation of a new Israeli security concept.

This article will examine the development of IDF air defenses from its beginning as a tactical anti-aircraft system, to an array with operational and even strategic importance. We shall present this evolutionary process, while examining current challenges, relevant responses and the future outlook for active defense systems.

The IDF’s anti-aircraft array was established in the 1950s. The army at that time lacked military superiority, especially air superiority, of the type that it enjoyed in the years after 1967. This affected its self-image as well. Prime Minister David Ben Gurion, who single-handedly designed the principles of the Israeli defense concept, had personally experienced the horrors of the German aerial blitz on London in World War II, and this experience had a decisive influence on his understanding of the strategic aerial threat to the State of Israel. The aerial might of the Arab armies, as reflected in the bombardment of Tel Aviv during the War of Independence, and the deployment of a French squadron in Israel as

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a precursor to the 1956 Sinai War, was perceived as stronger than the young Israel Air Force (IAF), and anti-aircraft defense was therefore a natural element of his concept.

The threat of strategic bombardment demanded a response in the form of a Strategic Command. According to the concept at that time, the Command was professionally subordinate to the Artillery Corps, and operationally to the IAF, and was divided into northern and southern sub-commands. The Anti-Aircraft Command mainly operated 20 mm guns during the Sinai War and was perceived as vital to the defense of Israel. Its very definition as a Command (even though subordinate to the Air Force during the war) reflects to its role as a key component of Israeli strategy - defense of the home front enabled offense at the front.

The roots of the second chapter in the history of Israeli air defense lie in the era that followed the Six Day War, when the Arab air threat was no longer perceived as a strategic one. The anti-aircraft array changed, and became committed to defense in the tactical and operational contexts - defending the maneuvering ground forces as well as IAF bases, which were perceived as the center of gravity of the IDF's strength. The process was completed with the integration of the anti-aircraft array into the IAF in the early 1970s, resulting in a two-headed array - tactical anti-aircraft defense. It provided defense for the ground forces, which could not rely solely on the aerial cover provided by the Air Force within Israel’s territory, alongside heavier and stationary batteries, which defended the IDF’s main operational assets - the Air Force bases and the nuclear reactor in Dimona. This changed the anti-aircraft array from a strategic command into a tactical force supporting the operations of other offensive centers of gravity - the IAF on the one hand and the IDF’s maneuver formations on the other.

Israeli citizens have been threatened by rockets since the 1960s, when Palestinian terror organizations first attacked population centers in the Beit Shean Valley with Katyusha rockets

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2 This was Ben-Gurion’s condition for launching the joint Israeli-French-British campaign, a condition that arose from his great fear of an aerial “blitz” by the Arab armies on the State of Israel, such as he experienced in London during the Second World War.
from Jordanian territory, and later attacked northern communities and Kiryat Shmona from Lebanon. The First Gulf War and the deployment of Patriot missiles in 1991 greatly contributed to the formulation of a new concept for Israel, which regarded missile wars as a new strategic threat to the state.

One can identify two major stages in the formulation of the new operational concept. The first stage, the wake-up call, originated as we mentioned earlier, in 1991 during the Gulf War and the Al-Hussein missile attacks. The second stage, originated during the 2006 Second Lebanon War, which featured extensive short-range rocket fire. In the interim, Israel began to seek a strategic response to these threats. This began with the establishment of the Arrow system directed at long-term threats, and in the last decade the Iron Dome was added as a response to the seemingly tactical threat of short-range rockets, which has turned into the main type of threat facing Israel.

The rise of standoff fire wars, whether long-range (with the threat of non-conventional weapons), or short-range, restored the air defense array to a strategic place in Israel’s security concept. Past wars were mainly conducted at the front, while the home front almost always remained unharmed and uninvolved. The anti-aircraft array, then served as a supportive element to the primary forces - land and air. The missile threat has changed this reality, turning the home front into a real combat theater, and the importance of its defense reverted to becoming a major component in Israel’s security concept.

The aerial defense array, therefore, is today in the midst of another jolt in its short history. In this article, we will examine the challenges and dilemmas that characterize an array experiencing...
dramatic changes in such a short time; how defense is perceived as an element in the broader IDF concept; and how to stabilize the array as it has swung between the tactical and strategic ends since its establishment.

![Image 1: Arrow launcher](image)

**Active Defense's Place in the IDF’s Strategy and Operational Concept**

A major factor that significantly influences the decision to develop active defense systems is Israeli society, or more precisely, the values held by Israeli society. The importance of human life is a basic, central and concrete value within Israeli society, deriving from its democratic and Jewish values. From the end of the 1980s and the
beginning of the 1990s, the desire to avoid loss of human life and limb became a dominant factor in the public discourse, naturally affecting decision makers.

But the sanctity of human life does not relate only to the lives of our soldiers and civilians. The desire to avoid loss of human life relates also to the innocent civilians on the other side, that is, a desire to conduct a campaign or a war in the “cleanest” manner possible. In many ways, this, alongside technology, is the main factor contributing to the decrease in the popularity of ground maneuver within the IDF, at least as reflected in its operations in recent decades, and to the rise of precision fires. The combination of the sanctity of human life, and the rising threat of standoff fire wars, has brought about an understanding of the need to generate strategic defense arrays. This tendency was generally led by civilian policy makers, not by the military. Consequently, when a new strategic array came into being within the IDF, pushed by the statesmen, its operational implications were only gradually revealed.

The relationship between the defensive pillar and the IDF’s broader operational concept has several key aspects. First, the time dimension - active defense changes the perception of time during a confrontation and may even dictate the length of a campaign. The ability of the system to prevent significant damage to the home front, although not absolute, produces a relatively longer window for decision-making, thanks to the knowledge that large salvos will not take a heavy toll on the citizens of Israel. These capabilities enable decision makers to conduct the combat in a calculated and measured manner, avoiding the pressure that would come from harm to the home front. In both of the recent campaigns, Pillar of Defense and Protective Edge, the defensive array had a dramatic impact on the duration of each operation, each in a different and unique manner.

Second, active defense systems also affect the employment of offensive forces. Israel’s geographical dimensions and absence of strategic depth are well known factors. In response to this, Israel has
viewed deterrence, detection, and achieving a decisive victory as the cornerstones of its security concept. Decisive victories are viewed as charging the Israeli deterrence batteries. Offensive action is the outcome of this concept and generally dictates the shape of military force generation.

In the era of standoff fire wars a drastic change was created, whose implications are not yet fully understood. The enemy, employing missile systems, has bypassed the main form of warfare for which we prepared in the past - warfare at the front. The enemies threatening us with high trajectory fire are in one of two categories - either too far, in regions and states very distant from the Israeli borders, thus making it difficult to employ large offensive forces against them, or concentrated on the borders of Israel, but within complex built-up areas, making it very difficult to conduct conventional offensive warfare. Within this new space, the defensive pillar can provide a response to this challenge by neutralizing the enemy's capabilities. Therefore, the combination of defense and offense creates flexibility for force employment, and enables the decisive defeat of the enemy.

However, in these conditions, a concern arises that the presence of the defensive pillar within the framework of Israeli capabilities will allow decision makers to avoid solving the truly difficult puzzle - how to adapt the offensive and decisive defeat capabilities of the IDF to the new circumstances described above.

Third, the legitimacy of warfare has been greatly influenced by the entry of active defense systems into operational service. There is a basic tension between Israel's desire to defend itself and the international norms demanding that it restrict its activities. International legitimacy is mainly measured by the just war principle which includes moral and legal justifications that validate war. The main argument is that due to the ability of the system to prevent harm to the citizens of Israel, there is less justification for military action.

However, in-depth analysis leads to the opposite conclusion. Active defense systems allow decision makers legitimacy to act, since, successful as they may be, active defense systems cannot fully
prevent harm and, of course, cannot prevent the actual firing. They do indeed prevent casualties on the Israeli home front, but do not provide a hermetic defense. The existence of a defensive capability strengthens Israeli claims of a desire to avoid casualties, allowing the same flexibility mentioned above regarding the type of military action, its timing and intensity.4

Fourth, there are extensive economic implications resulting from the employment of active defense systems. War causes genuine harm to the economic activity of the Israeli economy. The threat of missiles and rockets on the Israeli home front augments this harm. The development of the Iron Dome system and other active defense systems, and their use during a confrontation, significantly sharpens the economic motive. The cost of developing and employing the Iron Dome interception system is an important component that should be added to the economic equation.

But this is not the complete equation. The benefits involved in employing the Iron Dome system exceed the cost. Foremost, the preservation of human life is an important component provided by active defense systems. Reducing the number of the casualties on the home front, apart from the obvious human side, carries a huge economic benefit. The researcher, Uzi Rubin, examined the number of compensation claims due to rocket damage.5 His research emphasizes the economic importance of active defense systems. Following the Second Lebanon War in 2006, when the systems did not yet exist, 26,653 claims for compensation were submitted. The number of rockets fired was 4,200. Total compensation paid, stood at NIS 478,950,000.

On the other hand, following Operation Protective Edge in 2014, when the active defense system was in use, and 4,500 rockets

were fired, 4,525 claims were filed and the compensation paid amounted to NIS 89,563,000. Prevention of damage to property and the continuation of normal economic life is another key component, influencing both economic and social resilience of the state during wartime.

The pioneering role that Israel took upon itself in the active defense domain, the uniqueness of our strategic situation, and our special relationship with the United States, have also resulted in an additional unique contribution of the defense array to the Israeli security concept. The active defense systems were jointly developed, with the generous support of our most important ally, the US, which not only lightened the economic burden of our security enterprise, but added to it an important deterrence factor, which will be discussed below.

To summarize, active defense systems generate wide economic leverage. They permit the continuation of economic life in the Israeli home-front, with some restrictions, and they are in fact an important strategic tool, whose economic usefulness is several magnitudes higher than the cost.

An examination of the role of active defense within IDF strategy sharpens our understanding of its importance. Given that the process of establishing its strategic status took place in direct coordination with the political echelon, and considering the values shared by Israeli society, and its impact on the combat theater, this process is bound to deepen.

**Challenges**

The deployment of active defense systems brought to the surface old and new challenges, stemming from the integration, for the first time in history, of the innovative interception of missiles and rockets with an ongoing process of dealing with classic defense dilemmas.

Offensive action is a central element of the traditional Israeli security concept. From this perspective, active defense is like a soccer goalie. The importance of the goalie as a part of the team is clear to all. Without him preventing the other team from scoring, the
possibility of victory diminishes. His role is to thwart the opponents’ intentions to achieve a victory. He allows the team’s strikers to score goals and thus jointly attain victory on the soccer field.

If we compare this with the military dimension, the role of the active defense systems is to prevent goals from being scored by the rival team. They do this by negating the ability of missiles and rockets to cause damage, thus allowing, as mentioned above, other IDF bodies to carry out their offensive missions and to win. Without the ability of the active defense systems to intercept enemy attacks, the task of other units to achieve a decisive defeat through offensive action would become even more difficult. A collaboration between the different units, both active defense and the offensive, is the basis, today and in the future, for IDF success on the battlefield.⁶

There is another challenge on the technological level. The technological struggle between armies is not a new phenomenon. The development of a new weapon or the refinement of another always creates learning and adaptation within the enemy. In other words, the appearance of a new weapon generates a clear advantage to the side operating it, and together with this, after an adjustment and learning period, the opposing side develops a response to that challenge.

The advantage of the attacker in this struggle is twofold. First, operationally, the attacker determines the timing of the action, its scope and place. Second, strategically, the challenge for the defender and defense is to develop defensive systems against a non-existent technology. The development of defensive measures against an existing offensive system is an important step, but limited. The challenge is in developing defense systems that will cope successfully with future offensive technologies, not yet developed, or in their final stages of development. This is an arms race, a familiar phenomenon since the beginning of military history.

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The technological struggle has not skipped active defense systems. It is reasonable to assume that Israel’s enemies are not ignoring its active defense capabilities and are concurrently developing various courses of action to cope with these capabilities. The more effective a new technology, the faster it is challenged. Active defense systems will be required to address these challenges, understanding that this technological race is a long process in which each side challenges the opponent each time anew. Therefore, we must constantly improve our preparedness to face the enemy’s repeated attempts to improve the type of threat at its disposal, its scope and its range.

The last challenge is related to the human dimension. The soldiers serving in active defense systems are required to cope with a wide range of issues, incorporating unique elements, both new and familiar. The soldier operating a defense system is a new type of soldier, a fighter-defender. A combatant operating such a system is required, in field conditions and for a long time, to be prepared to shift immediately from routine to action and even interception.

In active defense systems, there are no benefits to conventional military education, which promotes initiative and aggressiveness on the battlefield. This is indeed an important organizational value, central to the way we educate, but active defense combatants do not initiate at the tactical-operational level. Their basic working assumption is that the enemy will take the initiative. Continued uncertainty is fundamental to their existence. This is a complicated tactical reality in its human dimension.

Another aspect is the moral standard of the task. Iron Dome soldiers and other defense systems personnel are required to carry on their shoulders the critical implications of their actions. Failure to intercept a rocket or missile is accompanied by a genuine and tangible possibility of civilian casualties or real damage to a strategic facility. The mental strength required of such a soldier is immense.

The challenge of intercepting missiles and rockets is augmented by the fact that these are the first efforts to perform

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interceptions of this type. The lack of historical examples and experience increases the importance of the operators.

The human challenge expands because of the Israeli approach to the operation of the air defense array. The Israeli school maintains that it should be manually operated. Most air defense arrays in foreign armies are activated automatically, and human judgment is very limited. In Israel, the operation of these systems is done manually, with the goal of generating flexibility, margin of maneuverability and security for other aircraft.\(^8\)

This is new, challenging and fraught with operational and tactical challenges. It requires expertise and broad professional knowledge, enabling the consideration of all interception and safety margins. The fighter-defender must be alert, steadfast and disciplined. The combination of a complex technological challenge, stemming from the very sophistication of the active defense weapons systems, and the tactical and human challenge requires appropriate selection and training processes, and the integration of people with unique quality and characteristics within the Air Defense Division.

Examination of these challenges and responses leads to a broader insight into the Air Defense Division. It must cope with many dilemmas directly related to the combat environment and to the dimensions that surround it, both economic and human. The response must be inclusive and multi-layered. The first layer includes the creation of a mutual and overlapping defense array, addressing the dual threats of high trajectory weapons and aircraft, i.e. ABT - air breathing targets. This includes the threat of aircraft and helicopters and that of missiles and rockets. An appropriate response to the second layer, which includes the human and economic elements in the military field, includes more intensive training of the human resources and a comprehensive economic approach to the active defense systems.

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\(^8\) An example of this is the rocket which hit the Israeli town of Yehud and was not intercepted due to an operator’s decision.
Active Defense - More Than “Another Interception”

Active defense systems give Israel advantages in some areas, of which just a few have been exhausted. While the tactical advantages associated with rocket interception and protection of the home front are clear, as demonstrated during Operation Protective Edge, there is a tactical potential not yet realized. This applies mainly to a possible integration of the interception systems with maneuvering ground forces. Furthermore, there appears to be more space to develop and leverage the benefits of these systems at the operational and strategic levels. In what follows, we will review these opportunities, from the strategic to the operational and tactical potentials.

The potential at the strategic level

Active defense systems embody the potential to strengthen political ties. Cooperation at different levels, up to alliances, is an important element of the toolbox within the framework of the international system. Cooperation or alliances can be formal or informal, defensive or offensive. The broad base of most military cooperation efforts leans on three main pillars: common interests, common values and the capability for military cooperation. To these three factors one must add the overriding element, a common enemy.⁹

Earlier we mentioned the assistance of the US in the development and maintenance of these systems. The development and procurement of defense systems are a relatively comfortable ground for strengthening the deep relationship between the two states and demonstrating it in the region. It is no coincidence that the legacy of the deep military relationship between the two states began with the Hawk missiles transaction in 1962.¹⁰ The rocket and missile threat to Israel provided (in an exceptional manner, even for a relationship that was intimate from the outset) a fertile ground for a wide range of technological, conceptual and resource cooperation.

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¹⁰ See Saul Bronfeld, “Defense - The Other Side of Mars,” in this volume.
This joint activity is not limited to financial assistance or mutual development, but includes joint exercises of air defense systems. Joint exercises are held, which are designed to coordinate the air defense systems of both states, representing a high level of collaboration, knowledge sharing and a joint vision of future challenges. The two states project their combined might to their enemies and exhibit the strength of their connection to the region.

As mentioned previously, the Air Defense Division goes beyond the narrow dimension of high trajectory weapons interception and defending Israel, and is in fact a significant part of the strategic cooperation with the United States. The joint development and exercises demonstrate that both states foresee an integrated future, both at the political and military levels, and are ready to invest effort, time and money in long-term and joint programs. The experience acquired in Israel in operational anti-ballistic warfare is a valuable asset for the United States, whose forces can be sent to conflict areas around the world, most of which are exposed to rocket and missile threats. This collaboration encourages additional cooperation between Israel and the USA, in intelligence and technology, and is a locomotive pulling the entirety of the security relationship between the two states behind it.

Another strategic potential inherent in the active defense systems is related to possibilities for regional cooperation. Alliances and partnerships are not new to Israeli policy. From its early days, the State of Israel understood its position in the Middle East and sought partners and allies to advance common interests and deny achievements to its enemies. The Peripheral States Alliance and various assistance activities to African states in the 1960s and to oppressed minorities such as the Kurds in the 1970s were part of Israel’s strategy for many years. Political processes, including the peace agreements with Egypt and Jordan, created a different regional setting. Peace agreements and softer partnerships promote new frameworks for collaboration between Israel and the states in the surrounding region.
But negative processes also occurred. The Islamic revolution in Iran, the rise of terror organizations and the establishment of sub-state entities within state territories are serious challenges. The threats arising from these players are partly directed against Israel, i.e. the firing of rockets and missiles from Lebanon and the Gaza Strip into Israel. These destabilizing players not only threaten Israel, but its neighbors as well, challenging, to a large extent, the existing regimes in some states. Iran’s missile capability is not directed exclusively at Israel, but can reach many other states in the region.

Israel’s active defense capability enters this space. There is huge potential in the mere existence of such systems. Developed and manufactured jointly with the United States, they generate an extensive and strong appeal to regional players, who see the attractiveness of joining a global power and ally. The reputation created is of tremendous importance.

Furthermore, active defense systems could enable, under certain conditions, interception capabilities for other actors aside from Israel and could provide them with a certain interception umbrella. In certain contexts, it may even be possible to equip friendly states with their own defense systems, with necessary limitations. This variable is an important attractive factor, which could be used as a proactive regional foreign policy engine, at the public and covert levels. Under the auspices of regional defense options, it will be much easier to mobilize regional players having common interests, and more important - common enemies - into broad coalitions and to establish regional security systems, beyond the narrow scope of interception. The active defense systems are in effect an initial enticement, allowing the generation of initial interest, which could be developed into regional security arrangements. Moreover, the Iron Dome success in intercepting missiles and rockets, besides augmenting the Israeli deterrent aspect, offers an economic aspect. The technological success which was observed and viewed around the world, is stirring up the interest of other states sharing Israel’s defensive needs, thus offering many economic opportunities for the Israeli defense industries.
The potential at the operational and tactical levels

Although Israel has a technological advantage over its enemies, non-state adversaries have succeeded in reducing (or at least blurring) this gap due to the growing proliferation of military technologies and their reduced cost. This has enabled Israel’s enemies to acquire precision firepower and advanced intelligence capabilities. Interception technologies, however, are still a field in which only a few states have a clear technological advantage over non-state adversaries.

Israel is a leader among them. It is possible, and from our perspective it would be wise, to integrate the potential of this interception technology not only for defensive uses, but for offensive purposes as well, and to develop interception capabilities that can suppress, for example, anti-tank missile systems, surface-to-air missiles, and the threat from UAVs of all kinds that the enemy is expected to develop. If we take this path, air defense warfighters could once again participate in tactical combat, defending the maneuvering forces on land and in the air, in the same manner as was done in the past by tactical anti-aircraft units against traditional aerial threats.

Our last fundamental-conceptual argument uses two examples of existing weapons systems and their potential integration into the IDF. The first is the American Centurion system, based on the naval Phalanx Close-in Weapon System, used by the US military in Iraq to protect its bases. The Centurion fires 20mm shells and is designed to intercept short range rockets and mortars. It is operated from three main platforms - on ships and aircraft carriers, stationary ground systems and mobile systems on trucks. The Centurion protected, among others, the Green Zone, the heart of the US administration in urban Baghdad. The second system is the American anti-missile system that was supposed to be deployed on Czech and Polish soil (EIS).

Czechoslovakia, while the launchers and missile interceptors were to be placed on Polish territory. This integrated system is meant to be an American solution, protecting Europe and America against an intercontinental missile threat from the Middle East.\textsuperscript{12}

At a conceptual level, these two systems represent a different approach than that of Israel's active defense. The Centurion-Phalanx is a tactical defense system. Through the development of the Centurion-Phalanx concept using more advanced technologies, it may be possible to create spatial defensive-offensive cover for maneuvering forces in areas saturated by missiles (such as anti-tank missiles, surface-to-air missiles, shore to sea missiles or high trajectory fire), thus restoring to conventional military forces their freedom of movement, which has been considerably limited in recent years. In a reality in which our forces can move more securely through enemy saturated areas, even without being dependent on tank and APC protection, the possibility of offensive operations in enemy territory would be seen more positively. It is therefore a tactical idea, but with serious operational significance on IDF offensive moves in enemy territory.

The EIS idea, in contrast, is not tactical, but involves the forward deployment of an interception system. Instead of long-range ballistic missile interception over Western Europe or the United States itself, the system is intended to intercept incoming missiles far away from their targets, and high above the atmosphere.\textsuperscript{13} In this way, not only will the threat be removed from its target, but a second interception opportunity would remain, closer to home, if the first interception were to fail.

Israel's challenge is different. Long-range missiles are not new, but given the presence of short range missiles, this challenge has unique characteristics. From bordering states, we deal with missiles and rockets whose flight range and flying time is much

\textsuperscript{13-15.} This program was formulated during the Bush Jr. administration, and frozen by the Obama administration. Today, similar missile defense programs are being discussed.
\textsuperscript{12} Tali Goldstein. “American Weapons to Be Deployed in Poland, the Russians Are Outraged,” \textit{Walla} (August 20, 2008), \url{news.walla.co.il/item/1333479}. [Hebrew]
\textsuperscript{13} Avi Bitzur, “The Home Front in Israel's Security Concept,” \textit{Ma’arachot}, 426, August 2009, p. 18. [Hebrew]
shorter. However, conceptually the development of a forward interception capability would likely afford the IDF more than one interception opportunity for each threat, and possibly reduce the number of alarms and alerts on the home front. Intercepting enemy missiles in their initial flight stages, might also provide the enemy with a more frustrating combat experience, thus contributing to persuading the enemy of the futility of the war from its own perspective.

That being the case, these two foreign examples provide us with conceptual inspiration for ways that technologies and advanced defense and interception capabilities might change the defensive equation. These could transform combat interception systems into an important part of the IDF’s offensive concept, both in securing the movement of our forces in enemy territory, and by taking advantage of the proximity of our forces to the launchers, in order to improve the overall interception capabilities of the IDF while undermining the enemy’s expectations from war.

**Future Potential and Conclusions**

In this article, we have reviewed the active defense arrays that are a part of the Air Defense Division. The predecessor of the division was established in the early days of the State, and is a key operational service within the IDF’s capabilities. The active defense arrays are the young children of this network. The first interception of the Iron Dome occurred only in April 2011, and the system was fully operational for Operation Pillar of Defense in November 2012. During Operation Protective Edge, in July-August 2014, the active defense system was employed extensively, registering considerable successes. In this article, we analyzed the effect of the active defense systems on the duration of hostilities, on the economy and legitimacy. Further, we reviewed the challenges facing active defense systems, and finally, we demonstrated the further, offensive potential of missile interception.
In conclusion, we can point to the important evolutionary process that has taken place within the Air Defense Division. This process occurred simultaneously with the growth in challenges to the security of the State of Israel, and it is still developing. This process gave the division a highly important role, as part of the overall IDF response to these challenges. The process has contributed to a change in the status of the Aerial Defense Division and the active defense systems, from marginal status to a central strategic position - within the military might of the State of Israel.

Today, the Air Defense Division integrates both the logic of decisive victory and the logic of defense. It serves as the main defensive wall preventing enemy attacks, as well as enabling the offensive element to find expression in the IDF’s concept. The division exists in the tension between being reactive and taking the initiative. It links the three pillars of the Israeli security concept - deterrence, early warning and decisive victory. On the one hand, by virtue of being a defensive system, it responds to enemy action. Still, as we have shown, it has the potential for initiative, which may develop in the future beyond the tactical realm of preventing enemy fire.

It is important to note two other issues, relevant to the future vision of the Air Defense Division. The first issue is related to the optional technological development of non-kinetic interception. Iron Dome is based on the “Iron on Iron” principle. An interceptor missile hits an incoming rocket. In recent years, a new interception approach has been developing, based on electrical laser beams. Such systems use a beam produced by electrical power and are designed to intercept targets at short ranges. There are three types of laser interceptors: fiber, panel fiber and free-electron laser. Fiber laser is the most advanced, having the greatest potential of all, whereas the other systems are based on it. Many advantages are expected of laser systems, low interception cost, a never-ending magazine, automatic battle management capability and relatively easy operation. A future integration of systems of this type in the framework of the air defense array, would augment Israel's defensive
capabilities, enabling it to better cope with current and future threats.14

The second issue relates to a future vision of regional realities. If Iran succeeds in achieving nuclear capability, with or without an agreement, it will be important to regard active defense systems as a tie-breaker, which would bring to such a campaign a weapons system that Iran does not possess. Israel’s interception capabilities, especially the Arrow system, would enable it, in a complex, difficult and extremely dangerous balance of power, to employ a response that would thwart the nuclear missile threat, and assist in maintaining its strategic superiority.

In conclusion, for as long as Israel is faced with security challenges, a strong and professional defensive arm will be required, providing responses to all levels of warfare. The untapped potential of the Air Defense Division and its technologies, should be developed to play a significant role in the offensive lineup of the IDF. Thus, through a balanced development and deployment of interception systems, it will be able to offer a proper response in coping with the challenges forming in our environment.

A professional, flexible system that nurtures its personnel, understands future challenges and is adept at adjusting itself to rapid changes in the environment, is the key to victory in the next campaign. From our familiarity with the Air Defense Division and the active defense systems, assuming proper and timely procurement, we are certain that they will cope successfully with any challenge at their doorstep, and continue to provide Israel with the protective wall that is so necessary for its existence.

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