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SKY FORTRESS PROJECT – A PROPOSED MODEL OF MULTILAYERED C-UAS DEFENCE SYSTEM

Ghiță BÂRSAN, Adrian-Constantin CIOLPONEA, Romana OANCEA, Paul TUDORACHE, Thomasz BAK

Abstract: *A modernized punctual air defence system capable of countering the full spectrum of aerial threats – including Class I small drones, loitering munitions, cruise missiles, and glide bombs – must be designed as a highly adaptive, multi-domain, and technology-integrated solution. Based on the findings of our research and operational experience, we developed a conceptual model of a multilayered Counter-Unmanned Aerial System (C-UAS) defence system. The Enhanced Sky Fortress Project proposes an innovative model for improving Integrated Air and Missile Defence (IAMD) coverage over critical infrastructure in Ukraine, particularly targeting the defence of high-value static objectives such as energy production plants – strategic assets persistently targeted by Russian precision-strike capabilities. The foundation of such a system lies in sensor fusion, combining active electronically scanned array radars, electro-optical/infrared systems, passive radio-frequency detection, and acoustic arrays to enable high-fidelity, all-weather target acquisition and identification. The research culminates in the design of a practical, scalable, and doctrinally adaptable concept: the Enhanced Sky Fortress Project – version 2, aimed at countering the rising threat of unmanned aerial vehicles (UAVs) and loitering munitions.*
Keywords: *UAS, C-UAS, model, multilayered, air defence system, multi domain operations.*

1. INTRODUCTION

The current trends in UAS development are focused on several complementary directions. These include the integration of attack drones at the operational and tactical levels within ground forces, the development of subsonic reactive propulsion UAVs, and the integration of drones at all levels of operation in a digital network that ensures maximum flexibility, increased adaptability, and multi-role spectrum [1].

The development of artificial intelligence (AI) installed on board the aircraft will lead to high autonomy, high speed of data processing and dissemination, and in-flight networking with neighbouring UAVs [2].

Air superiority remains critical. Nevertheless, large-scale utilizations of drones can balance the disadvantage on land, air, and sea.

Drone tactics development is underway having cascade effects on structures and branch-specific education and training, especially given that new specialties are arising in military structures to include drone operators, drone tactics experts, robotic engineers, electronic-warfare (EW) specialists, imagery-intelligence (IMINT) specialists, electronic-intelligence (ELINT) specialists [3].

New military organizations are about to emerge and modify the force ratio between unmanned and manned systems. At the same time, commanders and planners are forced to consider a suitable balance between offensive and defensive effects, platforms, and actions.

The combat area is saturated with sensors, and it is highly EW-contested. In this context, space and cyber effects have a visible impact on current and future operations [4].

The proposed multilayered C-UAS and counter-hypersonic framework aligns with several ongoing developments in Western

military command regarding sensor fusion systems.

There is no "*silver bullet*" solution, but a mix of force conventional and autonomous platforms, complimentary to each other could represent a successful approach, where the human factor is present during the strike phase, while autonomy can be delegated when available time is too short for human reactions.

The paper offers an original model of multilayered defence system based on lessons learned from the Russian aggression against Ukraine. The novelty of the model is based on the integration of a dispersed, multilayered sensor network composed of thousands of acoustic, thermal, and electromagnetic sensors.

2. THE INTEGRATION OF UAV IN FULL SPECTRUM OPERATION

2.1 Warfare trends in full spectrum operation

The set of recommendations is analysed from the perspective of the direct effect of UAV/UAS integration in force structure, decision making, standardization, and training, specialization of personnel and creation of joint effect in military operations [5].

In this unpredictable environment few warfare trends are emerging:

– Strategic operational dilemma - it is difficult to anticipate military strategic objectives, although the environment is saturated with sensors;

– Space and cyber effects are critical to shape the operations;

– Volume of fire/reconstitution of forces is critical and can be compensated by a less powerful opponent only through speed and precision of fires, application of network centric warfare in mission command mode, resilient flexible command and control (C2), and use of adaptable emerging disruptive technologies;

– Decision cycle and consequently the killing chain is becoming shorter when sensors are pushed forward and have a direct link with striking vectors;

– Air superiority remains critical; nevertheless, large-scale utilizations of drones could balance the disadvantage;

– Scale is important to create mass effect also for drones.

Orchestrations of mass attacks include drones in combination with other classic vectors: ballistic missiles, cruise missiles, artillery fires, air strikes;

– Next evolution step is represented by coordinated swarm attacks. The swarm must possess a certain amount of autonomy to control its own flight path and payload utilization. The human should command broader tactics and priorities to the UAV swarm [6];

– Terrain and critical infrastructure are still essentials for the defensive/offensive operations;

– Population and strategic communication remain critical. Drones could have a psychological effect on civilian populations.

The main objective is collective defence, aiming to safeguard the territorial integrity and stability of the Alliance [7], [8]. Three major tasks (defence, prevention, cooperation) are deduced from the main objective.

2.2 UAVs - Vectors of a New Physiognomy of War

Critical elements in the equation for successful UAV integration are identified in the present analysis:

– platforms with performance that recommends them for the missions targeted;

– support systems including long-range communications and radio warfare assets;

– appropriately trained technical personnel;

– UAV data analysis and dissemination teams;

– deconfliction of airspace during the targeting process;

– connectivity across the full spectrum of forces (air, land and maritime), integrated at the joint level.

The absence of any of the above elements leads to system dysfunction.

These considerations can lead to the conclusion that UAVs (autonomous and semi-autonomous drones) can become vectors of accelerated change in the physiognomy of war. Due to their growing influence on the trajectory of conflicts, UASs have emerged as a defining component of current military trends. Their integration into operational doctrines is

expected to produce significant effects, notably by reshaping the traditional correlation between space, time, and armed engagement.

3. SKY FORTRESS PROJECT

3.1 Research Methodology

The contributions are grounded in a combination of field analysis, doctrinal interpretation, technological forecasting, and cross-domain operational modelling. They respond directly to doctrinal gaps and strategic needs identified in NATO's evolving defence posture.

Based on both predictive and comparative analysis, the research proposes an original multilayered defence architecture against drone threats.

This model is structured around three concentric belts: early detection, mid-range neutralization, and point-defence hard kill/cyber interference, each operating in synergy through AI-enhanced coordination.

The model is scalable and adaptable for fixed, mobile, and hybrid installations, and is aligned with NATO's IAMD logic.

3.2 The Conceptual Model

Based on the findings of our research and operational experience, we developed a conceptual model of a multilayered C-UAS defence system. The foundation of such a system lies in a sensor network. This sensor network must be seamlessly connected to a real-time C2 node, ideally supported by AI algorithms to assist in threat prioritization, engagement sequencing, and resource allocation.

The AI layer accelerates the detect-decide-act loop and mitigates operator overload, especially during saturation attacks.

The kinetic engagement tier should consist of interoperable layered effectors:

– short-range air defence (SHORAD) missiles;
– high-energy laser (HEL) systems;
– electromagnetic railguns;
– rapid-firing Counter-Rocket, Artillery, and Mortar (C-RAM) guns for terminal engagement.

These systems should be supported by non-kinetic tools such as EW modules, jamming pods, and cyber countermeasures to neutralize threats pre-emptively.

Crucially, the punctual system must also incorporate signature reduction and deception capabilities, including thermal masking, EW emission management, and deployment of multispectral decoys. This not only ensures survivability under enemy drone reconnaissance but also deceives targeting systems of precision-guided threats.

It is increasingly evident that, for Ukraine, the identification and implementation of effective solutions to counter the evolving spectrum of aerial threats – including drones, loitering munitions, and cruise missiles – has become operationally critical. In this context, the *Sky Fortress Concept* [9] has emerged as a viable and efficient solution, particularly against small drones such as the *Geran-2* and *Shahed-136* [10], [11]. Its effectiveness lies in the integration of a dispersed, multilayered sensor network composed of thousands of acoustic, thermal, and electromagnetic sensors.

These sensors form an interlocked *acoustic detection belt*, capable of providing early warning and localized threat tracking even in Global Position System (GPS) and radar-denied environments. The acoustic signature is being analysed by a software which automatically establishes the identification of the drone and, more importantly, the flight pattern parameters.

In the Ukrainian operational context, flight data acquired by the sensor network is transmitted to so-called *hunter crews*, which are typically equipped with 0.50 calibre heavy machine guns mounted on mobile platforms such as Toyota pickup trucks. These mobile units engage incoming aerial threats based on real-time targeting data relayed via radio communications from centralized command cells. Despite their relatively unsophisticated nature, these systems have demonstrated a high interception efficiency – reportedly between 70% and 90% – against slow and low-flying targets such as *Shahed-136* drones. The operational airspace in these zones is designated as a no-fly zone for friendly forces

and fully integrated into the Joint Air Picture to prevent fratricide.

To further reduce the risk of misidentification, Identification Friend or Foe systems should be incorporated, particularly when combining legacy weapons with modern targeting networks.

Also, to enhance precision and operator effectiveness, upgrades such as long-range thermal optics (2 km range) and advanced fire-control systems like the Great Britain developed SMASH system have been introduced [12]. The SMASH optic system provides automatic target tracking and engagement support, significantly increasing hit probability.

3.3 The Design Model

The *Enhanced Sky Fortress Project 2* proposes an innovative model for improving IAMD coverage over critical infrastructure in Ukraine, particularly targeting the defence of high-value static objectives such as energy production plants or military buildings – strategic assets persistently targeted by Russian precision-strike capabilities (figure 1).

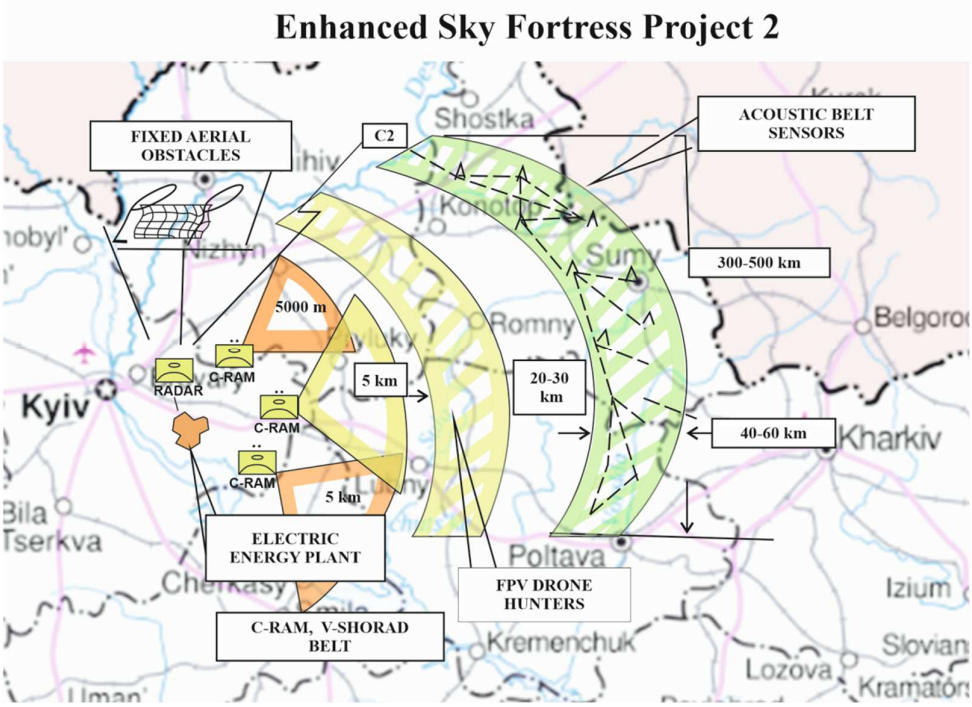


Fig. 1. The Multi-Layer Integrated Air Defence System (Enhanced Sky Fortress Project - 2)

This system combines the proven efficiency of acoustic sensor networks, as deployed in the original Sky Fortress concept, with the lethality and responsiveness of C-RAM systems, forming an interconnected and scalable defence grid based on multiple detection and neutralization belts.

The first belt in the ESFP-2 architecture spans a coverage area of approximately 60x20 kilometres, though its geometry may vary depending on terrain, resources, and threat vector orientation (e.g. 360° or sector-based 120° area). The belt would rely on dense acoustic sensors, upgraded with thermal/infrared cameras, sensitive short-range radars, and radio-frequency scanners to ensure layered and redundant detection capacity. The objective of this belt is to provide early detection, flight pattern recognition, and classification of inbound threats – especially Class I drones, gliding bombs, and loitering munitions. Within this belt, designated *Mission Command Boxes* would be established to regulate the rules of engagement, define altitude restrictions, and allocate tactical control sectors to interception units such as *Drone Hunters*.

The second belt introduces mobile *Drone Hunter Teams*, who operate FPV high-speed drones for direct kinetic interception of hostile UAVs and gliding munitions. Ukrainian

operational experience has demonstrated that such FPV drones can achieve speeds of up to 400 km/h, allowing them to engage kamikaze drones with high agility and precision.

These Drone Hunters would operate semi-autonomously, guided by targeting data and vectoring commands received from the acoustic and EM sensor belt, enabling real-time intercept within forward security zones.

The third belt serves as the terminal defence layer, incorporating C-RAM platforms, high-rate-of-fire, systems, or even directed-energy weapons for last-line engagement – completing a responsive and layered defence framework.

The third belt – much closer to the defended objective – will consist of several elements: C-RAM platforms (3-4 units), C2 unit connected with the acoustic belt, sensitive radars and fixed aerial obstacles.

Counter-drone net systems are integrated with mobile aerial nets, including those deployed on tethered aerostats, to enhance coverage and interception capabilities. C-RAM options are unlimited on the market (Gepard 2, Sky Ranger, Sky Net, Mantis, so on). This close belt, C-RAM, could integrate other systems like SHORAD and V-SHORAD.

More conventional threats, ballistic missiles, and air platforms will be addressed by IAMD neighbouring clusters which are using medium and high-altitude interceptors (PATRIOT systems, for example). Gradually, this Air Defence cluster should be integrated with other AD layers and extend the best practices, the balanced configuration to protect critical infrastructure, military targets or residential areas [13], [14].

3.4 The Calculus for a Modular Multilayer C-UAS Architecture. A Practical Guide

The ESFP-2 proposes a three-belt multilayered defence model, integrating kinetic, electronic, and cyber capabilities into a unified C2 architecture. It is designed to defend critical infrastructure, mobile headquarters, and frontline troop concentrations in contested environments.

Designed for the defence of critical infrastructure, mobile headquarters, and high-value units in contested electromagnetic environments, ESFP-2 ensures rapid detection, threat classification, and layered neutralization through intelligent sensor-effector fusion.

1. First Belt: Early Detection and Tracking (20–30 km)

This outer surveillance perimeter is optimized for wide-area coverage and early UAS threat classification using heterogeneous sensor networks, including:

– Low-frequency radar (LFR) for stealth/low RCS target detection;

– Passive acoustic sensors for rotor/micro-jet signature identification;

– RF detectors, thermal/IR cameras, and multi-domain fusion nodes;

– SATINT, SIGINT, forward-deployed UAS assets for extended detection.

The question is: How much sensor deployment is necessary to cover an area (A) over 5,000 km² (A=100 km× 50 km)?

To ensure redundancy and coverage over a 100×50 km area (5,000 km²), sensor deployment (table 1) uses the following formula:

$$N = \frac{A}{\pi r^2}$$

where: N = number of sensors, A = area, r = sensor detection radius in km.

Deployment Estimates:

Table 1

Different types of required sensors

Sensor Type	Radius (km)	Required Units
Acoustic	2	~ 398
Thermal/IR	2	~ 398
RF Scanners	3.5	~ 130
Sensitive Radar	5	~ 64

By using the proposed formula, the following deployment estimates are necessary:

1. Acoustic Sensors (2 km radius): ~400 units
2. Thermal/IR Cameras (2 km): ~400 units
3. RF Scanners (3.5 km): ~130 units
4. Sensitive Radars (5 km): ~65 units

Acoustic Detection and Direction-of-Arrival (DOA) Estimation:

The direction of drone arrival is estimated by using the MUSIC algorithm (MUltiple SIgnal Classification) [15].

The algorithm is a high-resolution technique in signal processing, primarily for accurately estimating the *Direction of Arrival* (DOA) of multiple signals using an antenna array and by exploiting the orthogonality between signal and noise subspaces derived from the eigenvalue decomposition of the received data's covariance matrix, which allows for the separation of signals from noise even in challenging, noisy environments. Based on these parameters, the following formula is used for estimation [16]:

$$\theta = argmax[a(\theta) \cdot (R)^{-1} \cdot a(\theta)]$$

where:

– θ = estimated angle,
– $a(\theta)$ = steering vector,
– R = covariance matrix.

First scenario - Deployment Estimates:

The total number of sensors is around *1000 units*. To effectively detect any small drone in a *100km×50km* area with a probability of $P(k) = 99\%$, the AI-managed mesh must deploy the above sensor, or a total number *1000 units*.

For a border area of *600 km* length and *50 km* width, the minimum number of sensors is *6000 units*. For planners, sensors density and integration represent a critical element, calculus and distribution being paramount for success.

The advantage of mesh network controlled by AI is that the system cannot be deceived by attackers since it combines different spectrums of acoustic, SAR, and thermal detection, which results in high accuracy and overlapping. AI uses multiple algorithms to determine the most likely flight pattern and to estimate the optimum interception point.

Based on the above data, AI distributes the tasks to proper AD platforms, or non-kinetic vectors, in seconds, in order to have the best ammunition consumption rate against different size aerial targets with different flight speeds.

2. Second Belt: Interdiction and Neutralization (5-20 km)

This middle layer uses AI-enabled decision nodes to deploy kinetic interceptors (e.g., short-range missiles, automated gun systems), directed-energy weapons and radiofrequency jamming and spoofing systems. The belt prioritizes dynamic threat evaluation and autonomous interception logic for high-volume swarm attacks.

The second belt is dedicated to drone interceptors. FPV interceptors are highly effective since the top speed reach a staggering *500km/h*. The interceptor could self-destroy in the proximity of the adversary drone and could use other type of kinetic means, such as shot-guns, claymore mines, or net launchers.

3. Third Belt: Last-Ditch Protection (0-5 km)

Closest to the protected asset, this inner circle includes hard-kill C-RAM systems, portable drone guns, and cyber countermeasures activated by neural AI processors. It is integrated with mobile camouflage, passive decoys, and deception tactics.

Aerial Engagement Capability of Local Air Defence Unit (simulation model):

Punctual air defence comprises several elements covering several interception altitudes:

– 1 *Patriot* Battery (~32 interceptors);
– 1 *HAWK* Battery (~36 missiles);
– 1 *Gepard 2* Platoon (~2500 rounds).

The probability of kill will be calculated with the following formula [17]:

$$P(k) = 1 - (1 - p)^n$$

where:

– $P(k)$ = kill probability,
– p = single-shot probability (0.6),
– n = number of shots (3).

Thus, we can calculate *Total Effective Engagements*:

– *Patriot*: ~20 aerial targets intercepted per wave-higher accuracy, high speed targets (will intercept mainly the ballistic missiles, cruise missiles, large UAVs);
– *HAWK*: ~15–18 targets/wave (SHORAD AD missiles will intercept slower targets);
– *Gepard 2*: ~12–15 platforms/2500 rounds per minute/10 rounds per drone will result in 250 drones destroyed, if the interception point was indicated correct.

A combined drone/missile attack exceeding the number of 20 missiles and 250 drones within 15 minutes wave, will result in

saturation. The attacker is simply adding more drones to overwhelm the air defence. In this case, it becomes clear that for local objective air defence, the saturation level will be present when the attack comprises 20 ballistic missiles and 400 drones. Therefore, detection is not sufficient; all EW and cyber-attack methods should be employed.

The Second Scenario: *Reloading Rate*

In the second scenario, we introduce in calculus the reloading rate for all platforms of air defence system.

In this case, *Saturation Threshold* will be calculated with the following formula:

$$S = \frac{N_T}{N_E}$$

For our example the saturation effect will be:

$$S_{effect} = \frac{N_T \cdot R_{eng}}{N_E \cdot R_{reload}}$$

where:

- N_T = number of targets,
- N_E = number of effectors/interceptors,
- R_{eng} = engagement per target,
- R_{reload} = reload or engagement rate

For example, saturation threshold calculation for 80 targets, 15 effectors, 5 reloads is:

$$S = \frac{80}{15 \cdot 5} = 1.06$$

As observed, the saturation level exceeds *1,* which means that the incoming threats exceed the defensive system's capacity to intercept them. This scenario adds to real world factors such as engagement per target, if two interceptors are needed per each drone and reload rate, representing how many times each effector can re-engage during the attack. In this scenario if the saturation level exceeds *1*, the system cannot cope with the attack.

This formula is twofold: firstly, it allows planners to test how many drones and missiles cocktails will overwhelm the system; secondly, it will confirm the necessity of employing additional measures: directed energy weapons, jamming and spoofing, cyber-attacks, aerial obstacles, FPV interceptors. This calculus represents the core of the ESFP-2 proposed model.

A central innovation of the ESFP-2 is its AI-driven C2 core, which functions as a predictive and autonomous decision support tool. It integrates threat prioritization algorithms, automatic saturation estimation, cooperative kill-chain management between sensors and effectors, and linkage with Multi Domain Operation nodes for joint fires coordination.

The military action of a network of drones can have a significant impact on conducting operations, the decision cycle, and targeting due to several key factors Increased Situational Awareness, Rapid Information Sharing, Improved Targeting and Precision Strikes.

A network of drones provides enhanced situational awareness by offering real-time surveillance, reconnaissance, and intelligence gathering capabilities. This increased situational awareness enables more informed decision-making and enhances the overall effectiveness of military operations.

Overall, the use of a network of drones in military actions brings a transformative impact on conducting operations, the decision cycle, and targeting [18]. It provides increased situational awareness, rapid information sharing, improved targeting capabilities, flexibility, force protection, disruptive actions, and reduced risk to human operators.

These factors collectively contribute to more efficient and effective military operations across a wide range of scenarios [19].

This trend has been confirmed in multiple wargaming exercises, which reveal that actors are more inclined to authorize the use of force when human casualties are minimized or absent.

From a NATO perspective, the results recorded by such a system would bring the proof of concept for all the experts in the Alliance, i.e. that by combining passive and active measures in a multilayered IAMD system, the air threat represented by drones and cruise missiles can be reduced to a minimum.

4. CONCLUSIONS AND FUTURE RESEARCH DIRECTIONS

The present research has yielded a series of original theoretical contributions to the study

and strategic implementation of UAS and C-UAS in modern military operations.

The model demonstrates the following:

1. Integration Principle of Parallel UAS and C-UAS Development: The model introduces the principle that drones and counter-drones technologies must be developed and deployed in parallel, particularly at tactical and operational levels.

2. AI as a Doctrinal Imperative for MDO C2 Evolution: The design of ESFS underscores the imperative role of AI in C2 structures within MDO. It establishes the theoretical basis for AI-enabled swarm coordination, C2 resilience, and predictive saturation management, suggesting a framework where future doctrinal development must integrate AI-driven platforms as co-decision agents in contested environments.

3. *Redefining the Tactical Decisional Loop under Drone Saturation:* A novel contribution of the research is the formulation of the *Saturation Dilemma*, where defenders face a non-linear threat volume due to drone swarms. This transforms the classical Observe – Orient – Decide – Act (OODA) loop into a multi-threaded response system requiring decentralized autonomy, doctrinally supporting distributed C2 nodes, and real-time AI arbitration.

4. *The optimal air defence architecture* designed to C-UAV threats – ranging from low-cost Class I drones to more complex Class III systems, requires a comprehensive, multi-layered approach that integrates a wide array of systems and capabilities. One effective model includes components traditionally found in C-RAM systems, adapted to address the unique threat posed by UAVs. Surveillance and Detection Systems form the outermost defensive layer, utilizing a combination of radar platforms, electro-optical/infrared sensors, acoustic arrays, and radio frequency detectors to achieve persistent situational awareness and early warning. It is crucial to have an in-depth defence approach that provides multiple opportunities to negate threats using various effector options and increase the probability of success [20].

5. Short-Range Air Defence Systems: SHORAD systems are designed to engage and destroy low-altitude aerial threats, including UAVs. These systems can include surface-to-air missiles, such as man-portable air defence systems (MANPADS) or vehicle-mounted systems, as well as directed energy weapons or gun-based systems.

6. C-UAV Systems: Specific C-UAV systems, such as dedicated UAV jammers, may be employed to disrupt UAV communication links, control systems, or GPS navigation, causing the UAVs to lose control or return to their operators.

To be effective, the air defence architecture against UAS must be fully integrated with existing legacy systems, such as surface-to-air missile platforms, manned fighter aircraft, and ground-based sensors [21]. This integration ensures seamless coordination across platforms and provides complementary capabilities that address diverse aerial threats, ranging from low-cost loitering munitions to high-speed reconnaissance drones.

Given the complexity and evolving nature of drone threats, it is imperative to adopt a holistic and systemic approach. There is no singular or universal *"silver bullet"* solution, capable of addressing all aspects of the UAS threat spectrum. Despite the absence of a silver bullet solution, it is evident that a comprehensive, multi-domain approach encompassing both passive and active measures is imperative to mitigate the pervasive threat posed by drones in the context of armed conflict.

The clear advantages of the ESFP-2 system are maximum available time for target allocation /interception, minimum latency, multiple sensors combined in multiple spectrum detection, and cost effectiveness.

The ESFP-2 is designed to be modular and mobile, deployable via land vehicles, fixed installations, and naval platforms. Each belt can operate semi-independently depending on the threat environment. This modularity makes the system adaptable for urban defence, local point air defence or extended area air defence, border protection control, forward operating bases, airfields and energy infrastructure security.

The ESFP-2 embodies NATO's future requirements for IAMD within the context of

Emerging and Disruptive Technologies (EDTs). It can directly inform capability development priorities in the NATO Defence Planning Process, Future Allied Doctrinal Documents on C-UAS and AI, Interoperability protocols and multinational acquisition planning.

A future research direction should be focused on intending to provide a comprehensive overview on saturation attack concept. The utilization of modelling and simulation, as well as wargaming, is a viable approach for investigating and anticipating the behaviours and solutions associated with the integration of UAS in Special Operations.

The second research direction is to identify the right mix of forces to attain the proper balance of manned and unmanned systems for SF, particularly for missions such as special reconnaissance and in-depth direct actions.

This important research area has a crucial impact for NATO and Allied Command Transformation when defining the future force design, to include the manned and unmanned systems in a mix of forces, in the next decades.

The third and most critical research direction represents the subsequent stage of drone evolution which is the swarm technology. How will the swarm technology impact the wage of war in the conflict? How will the swarm affect any air defence architecture? What would be the interdependency between swarm technology and electromagnetic spectrum?

Associated with swarm technology development, another area of research refers to introduction of Quantum technology in C2 navigation, detection, crypto, targeting, all in all a real game changer in the field and a powerful subject for future research.

Questions regarding the maximum level of autonomy admitted for drones in combat are also possible research directions. Will AI decision-based autonomous system characterize the next generation of drones and dominate the future of warfare in the next 20 years?

These are challenging questions, the answers to which are yet to be determined. It is evident that the drone revolution is not finished. It has just started.

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Proiectul Sky Fortress – un posibil model de sistem de apărare C-UAS multistratificat

Rezumat: Un sistem modernizat de apărare aeriană punctuală, capabil să contracareze întregul spectru de amenințări aeriene – inclusiv drone mici de clasa I, muniții care zăbovesc, rachete de croazieră și bombe planore – trebuie conceput ca o soluție extrem de adaptivă, multi-domeniu și integrată tehnologic. Pe baza rezultatelor cercetării și experienței noastre operaționale, am dezvoltat un model conceptual al unui sistem de apărare multistrat împotriva vehiculelor aeriene fără pilot (C-UAV). Proiectul Enhanced Sky Fortress propune un model inovator pentru îmbunătățirea acoperirii integrate a apărării aeriene și antirachetă asupra infrastructurii critice din Ucraina, vizând în special apărarea obiectivelor statice de mare valoare, cum ar fi centralele de producție a energiei - active strategice vizate în mod constant de atacurile rusești de precizie. Fundamentul unui astfel de sistem constă în fuziunea senzorilor, combinând radare cu matrice scanată electronic activă, sisteme electro-optice/infraroșii, detecție pasivă de radiofrecvență și sistem de procesare a rețelei acustice pentru a permite achiziția și identificarea țintelor, în orice condiții meteorologice.Cercetarea culminează cu proiectarea unui model de apărare aeriană C-UAS multistratificat, practic, scalabil și adaptabil din punct de vedere doctrinar: Proiectul Enhanced Sky Fortress – versiunea 2, care vizează contracararea amenințării crescânde a UAS și a munițiilor cu dispersie.

Ghiță BÂRSAN, Professor, Technical Sciences Department, "Nicolae Bălcescu" Land Forces Academy, Member of the Academy of Romanian Scientists, ghbarsan@gmail.com, +40 269 432 990, 3-5 Revolutiei Street, Sibiu, Romania.
Adrian-Constantin CIOLPONEA, Associate Lecturer, Military Sciences Department, "Nicolae Bălcescu" Land Forces Academy, cycady@yahoo.com, +40 269 432 990, 3-5 Revolutiei Street, Sibiu, Romania.
Romana OANCEA, Associate Professor, Technical Sciences Department, "Nicolae Bălcescu" Land Forces Academy, oancea.romana@gmail.com, +40 269 432 990, 3-5 Revolutiei Street, Sibiu, Romania.
Paul TUDORACHE, Professor, Military Sciences Department, "Nicolae Bălcescu" Land Forces Academy, p_tudorache@yahoo.com, +40 269 432 990, 3-5 Revolutiei Street, Sibiu, Romania.
Thomasz BAK, Professor, University of Information Technology and Management, Rzeszow, Poland, + 48 601 885 820, Zaczernie 375 D, Zaczernie 36 -062, Poland.