



RID, A2CS, PANTHER-IT and the Tactical Bubble

Published on 29/11/2025

In a recent contribution dedicated to A2CS, PANTHER-IT, and the protection of the so-called “tactical bubble,” a very advanced vision of future Italian armored vehicles is proposed. A2CS and PANTHER-IT are presented as digital platforms, interconnected, rich in sensors, jammers, and integrated hard and soft kill systems, coordinated via BMS within a cooperative network of crewed and uncrewed nodes.

The underlying reasoning is clear: the battlefield is changing, the threat from drones and precision artillery tends to surpass the “classic” threat of IEDs, RPGs, and anti-tank missiles, and protection is called to become multi-level – physical, kinetic, electronic, and cybernetic – not only on the individual vehicle but on the entire tactical bubble. It is a setup consistent with many recent operational lessons, but it can be accompanied by some considerations of caution.

The more sophisticated the bubble becomes, the more it risks becoming a prime target. If the vehicle increasingly depends on links, distributed sensors, software, continuous updates, and an always-connected BMS, it cannot be ruled out that effective jamming, a cyber attack, or heavy

degradation of the electromagnetic spectrum could render the entire system temporarily blind, mute, or slowed down. The text insists on network protection, but perhaps a crucial point is less highlighted: when the bubble degrades or collapses, the vehicle must still be able to continue fighting. The real test of a weapon system is not only its functioning in an ideal training context but its ability to remain operational when the BMS does not update, the drone does not arrive, sensors are limited, and logistics suffer delays.

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Not Just Protection: Robustness, Scenarios, and Sustainability

The [A2CS programs](#) and PANTHER-IT are described as vehicles equipped with anti-drone weapons and ammunition for classes 1 and 2, passive IR sensors to operate in “radarless” mode, RF sensors to intercept drone protocols, and jammers capable of disrupting enemy links, all managed by the BMS integrating hard kill and soft kill. The question, more than contradictory, is one of balance: is it really necessary for every single vehicle to transform into a platform heavily loaded with electronics, antennas, and delicate equipment, or would a more graduated distribution of capabilities be preferable?

The contribution touches on the theme of cost and sustainability, questioning how much such a vehicle might cost and how many units can realistically be acquired. From this reflection arises another point: a weapon system is not “protected” just because it is difficult to hit; it is also, and perhaps especially, if it is difficult to put permanently out of action. A vehicle that accumulates capabilities but tends to break down often, that requires specialist interventions for every malfunction, and that sees its effectiveness quickly reduced as the network degrades, risks being more vulnerable in other respects, despite being advanced technologically.

The war in Ukraine is rightly mentioned to show how drones and guided artillery have profoundly changed the maneuver and survival of mechanized complexes. However, if vehicles are designed almost exclusively for that scenario, there is a risk of being less prepared in different contexts. Looking at the Middle East, Iran, and the IDF, it has been seen that not all drone swarms work the same way and that the adversary's response, between electronic warfare and air superiority, can drastically reduce their impact. The question then becomes

whether to focus on highly specialized vehicles for the “Ukrainian field” or on systems perhaps more essential, but capable of withstanding a broader range of operational, environmental, and logistical adversities.

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Full Capability to the Bubble or the Vehicle That Stands?

An important question is raised in the debate: at what organizational level should the “full capability” of the tactical bubble be guaranteed? Platoon, company, battalion, Task Force? In theory, it makes perfect sense to think in terms of a tactical complex: not all vehicles with everything, but the ensemble that has all the necessary functions. In practice, however, the day the “enabling” vehicles are hit, the Task Force disperses, or some key nodes of the network are neutralized, what makes the difference is no longer the elegance of the conceptual model, but which vehicles continue to fight effectively and with what minimum guaranteed capabilities.

In this perspective, rather than multiplying modules and devices, it seems crucial to focus on essential redundancy and ruggedness. Each vehicle should preserve a minimum core of capabilities – observation, basic communication, autonomous fire – that does not depend on the perfect health of the network. The installed systems should be as resistant as possible to shocks, extreme temperatures, dirt, shrapnel; and at the same time easy to repair and replace in the field by non-hyper-specialized personnel. The priority, alongside interconnection, is the ability to physically and functionally withstand the typical adversities of the battlefield.

Ultimately, it is not about opposing network technology and “traditional” robustness, but about seeking a realistic balance. It is not enough to protect the vehicle and the bubble; it would be desirable to orient towards weapon systems that continue to move, see, communicate, and employ fire even when everything around degrades. Technology and the network are powerful force multipliers only if they rest on robust platforms, relatively simple to maintain, and difficult to put permanently out of combat. The question for programs like A2CS and PANTHER-IT is therefore not only how many protective capabilities they can integrate, but to what extent each of these vehicles will be able to withstand the real adversities – physical, electronic, and logistical – of future battlefields.