

## NEAR FUTURE DEVELOPMENTS TO INCREASE THE ROMANIAN AIR DEFENSE POWER

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**Abstract:** *The last political and strategic developments gave the Romanian Army the mission to secure the NATO's South-Eastern airspace at a level that will assure an adequate cover for the units temporary or permanently deployed in the area of responsibility. The Romanian government together with the allied structures generated some measures to gradually increase the quantity and quality of the air defense means both in the field of the strategic cover and in the self-protection of the forces. The newest acquisition programs as Patriot, VSHORAD/SHORAD and Navy's SAM capabilities added to the existing Long Range / High Altitude ADS with its own close defense and the AD capabilities of the Naval Joint Battle-Groups deployed in the Black Sea will assure the base for the improved AD protection of the critical infrastructures, population and economy and military assets. The work-paper, following the previous contributions of the authors regarding the Romanian AD, comes to out light a vision about an area integrated multi-layer AD system that can reach its full capability around the years 2024 – 2028.*

**Keywords:** *AD system, missile, threats, integration, AD cover*

### 1. BASIC CONSIDERATIONS

Like it's shown in previous work-papers [2], [4], today the AD weapons allowed both the Ground Forces and the Air Force consist of relatively obsolete systems between some can be kept in endowment with up-grade programs attached and others were lost almost all their efficacy into the modern battlefield and cannot support an improvement plan in reasonable economical condition [1].

Concerning the threat, three directions were designed as significant evolution in the recent period:

- Start of the equipping air forces around the world with the 4<sup>th</sup> and the 5<sup>th</sup> generation multirole fighters and preparations for the 6<sup>th</sup> generation.
- Growth of the target range in battlefield, including a huge dynamics of drones and stand-off weapons.
- Presence to the large scale of the ballistic threat, with different and specific problems.

As general characteristics, all modern targets have better conditions to out-pass the AD measures, being characterized by:

- low signatures in whole spectrum domains (stealth configuration)
- redundant command and control systems
- increased maneuverability
- high rate of survivability

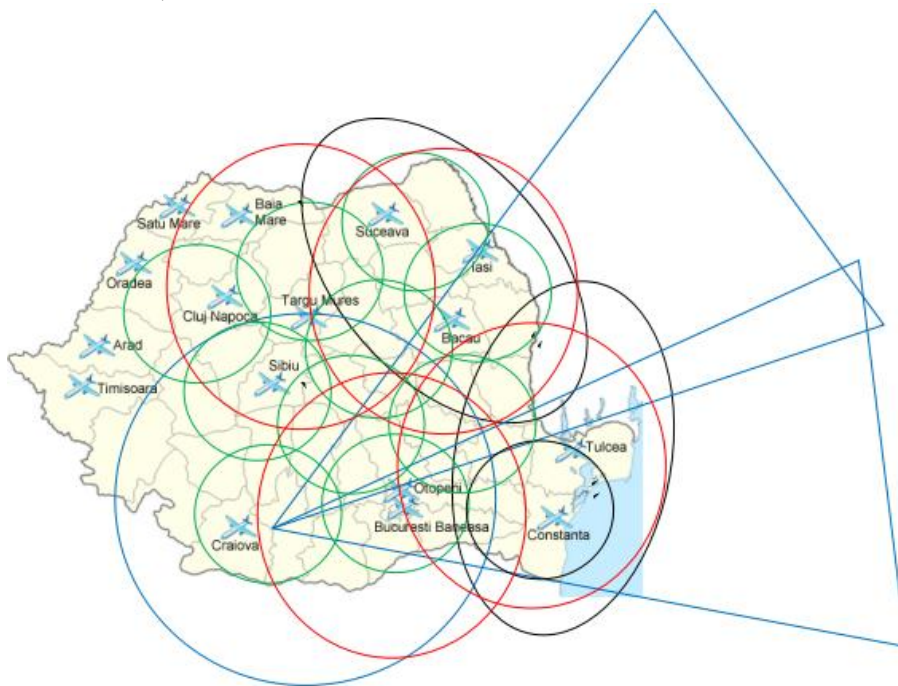
These directions raise in front of an integrated AD system many requirements, one of them strong contradictory, like:

- short reaction time
- high hitting accuracy
- highly efficacy kill mechanism
- enhanced maneuverability
- multiple target engagement capability
- multiple hit-on-target capability
- high speed engagement capability
- low altitude flight path

Generally, such a large requirement range cannot be satisfied by a single AD missile system and an integrated multi-layer disposal of the AD will need [3].

## 2. APPLICATION AIRSPACE

The geographical positioning of our country in the South-Eastern NATO's flank allow us the necessity to cover relatively large spaces, including land, river or sea borders as well as few high altitude corridors where TBM can get in trough their objectives, representing critical infrastructure assets like bridges, depots, energy plants, transport hubs, political centres, i.e.



**FIG. 1.** Multilayer AD coverage variant

In the same time the AD must assure protection for the NATO allied forces using both task force level assigned AD units and tactical units own AD means.

In Eastern side of the Black Sea the AD can be supplemented by the Fleet and allied support ships capabilities for close, medium and sometimes long range.

Using a large part of units in a centric network integrated AD command the sensible non-NATO South-Eastern airspace can be relatively well protected, at an acceptable fire-density level.

To materialise this conception checking the compatibility of the new system acquired with the available sensors and the C3I frame represents a necessity that impose some limits in the models and type of weapons of the different forces categories.

### 3. TYPE AND QUNTIY OF WEAPONRY

In the next future structure of the Army the AD capabilities will be possible distributed as follows:

| Unit / System                | VSHORAD | SHORAD | MRADS | LRADS | THAADS |
|------------------------------|---------|--------|-------|-------|--------|
| AD Units of GF Brigades      | X       | X      |       |       |        |
| AD Units of Divisional Group |         |        |       | X     |        |
| AFB Self-Defence Units       |         | X      |       | X     |        |
| Fleet AD capabilities        | X       | X      |       |       |        |
| Independent Units            | X       | X      |       |       |        |
| NATO THAAD                   |         |        | X     |       | X      |
| NATO Expeditionary Warships  |         | X      | X     |       | X      |

The political establishment has began a daring program destined to increase the Romanian AD capability in the next 10-years period.



**FIG. 2.** Signing the MoU between the representatives of MBDA, ROMARM and SC Electromecanica Ploiesti SA[9]

Regarding the missile systems in discussion was public announced an offer of MBDA for the VSHORAD/SHORAD systems and Raytheon MIM-104 Patriot for LRADMS (HSAM).

MBDA looks for a combination Mistral/VL Mica to satisfy the MoD launched RFI document, offering a pack with technological transfer, integration and maintenance, for an amount of 21 systems in 2 € bill deal.



**FIG. 3.** The Mistral and VL Mica form the base of VSHORAD/SHORAD proposal

The proposal of Raytheon include 7 batteries at a total cost o 4 € bill.



**FIG. 4.** MIM-104 Patriot will become the backbone of the Romanian GBAD

The necessary financial effort must cover also the available systems that can be upgraded, small AD weapons, the AD capability of the Fleet (2 frigates and 4 corvettes in short time), continuously improve of the C3I network, maintenance and some support facilities for the strengthening NATO units.

| System                   | QTY | Estimated cost (bill. €) | Comments            |
|--------------------------|-----|--------------------------|---------------------|
| VSHORAD/SHORAD           | 21  | 2.0                      | Systems             |
| MRADS up-grade           |     | 0.4                      |                     |
| LRADS (HSAM)             | 7   | 4.0                      | batteries           |
| Small AA weapons         |     | 0.4                      |                     |
| Fleet AD capabilities    | 6   | 0.6                      |                     |
| Enhance C3I capacity     |     | 0.2                      |                     |
| Maintenance              |     | 0.3                      |                     |
| NATO Units support       |     | 0.1                      |                     |
| <b>Total (estimated)</b> |     | <b>8.0</b>               | in 10-years program |

#### 4. CONCLUSIONS

In the near future significant growths of the Romanian AD capabilities are expected.

Considering the public available information only regarding the AD weaponry assets a significant financial effort will be done for raising this branch of the Romanian armed power, giving to the political establishment an argument as real deterrence factor to deal the opening of a possible conflict.

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