

RADAR JAMMING PROTECTION - TECHNICAL SOLUTIONS

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Abstract: Radar protection from intentional jamming is a contradictory task that is difficult to solve in practice. Namely, if a radar is to carry out its task, it should emit an electromagnetic energy. Such an emission offers to enemy excellent conditions for the reception, analysis, selecting, as well as necessary time to take countermeasures. Consequently, radar electronic protection from jamming involves a group of well calculated measures and procedures that are to be carried out with consistency and on all the radar control levels in order to fully utilize the jammed radar.

Key words: selective jamming, radar jammer, jamming modes, radar protection

1. INTRODUCTION

Electronic protective measures should be carried out in all radar development and usage stages.

Stages through which the activities are carried out are included in:

- radar development stage: by selection of such a radar design concept that will, to the highest extent, disable the existing and known modes of jamming, and force the opponent to take its radar countermeasures with highly sophisticated units;
- radar usage stage: by applying such measures and procedures to leave the opponent only the remotest possibilities for its countermeasures;
- radar operator training course: by applying and performing the training that will train the operator to adopt the methods of interference identification and protective measures undertaking.

2. ELECTRONIC WARFARE STRUCTURE

Electronic combat includes a group of measures and procedures taken for electronic surveillance, electronic jamming and deception of enemy's systems and provision of electronic protection of own electronic systems, equipment and facilities. Electronic combat is planned, organized and carried out from land, sea, air and space. Electronic combat is divided into four main divisions:

- *Electronic surveillance* involves data gathering on electronic units and systems that radiate electromagnetic energy. Electronic surveillance is always a passive activity.
- *Electronic countermeasures* include procedures taken to deceive and impede-disable normal functioning of enemy's electronic devices and systems.
- *Electronic protection* includes organizational, operative, tactical and technical measures and procedures aimed at the protection of own electronic devices and systems.
- *Electronic attacks* are aimed at the destroying of enemy's devices and systems.

In addition to the above division, another electronic warfare division is in application in Europe. This division involves

tactical and technical division against the Figure 1.

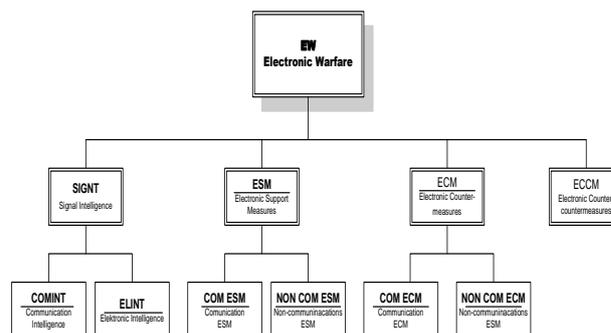


Fig. 1. Electronic Warfare Structure

The division against the above structure is included in:

- *SIGINT (Signal Intelligence)*, is intelligence-gathering by a signal interception and processing in the spectrum analyzer and allocation of the signal to the device type and equipment complement of platform.
- *ESM (Electronic Support Measures)*, electronic support measures taken to detect, intercept, identify, locate, record and/or analyze sources of radiated electromagnetic energy for the purpose of an immediate threat recognition to own equipment.
- *ECM (Electronics Counter-measures)*, is a set of electronic countermeasures taken to protect own systems from intentional interferences.
- *ECCM (Electronics Counter-Countermeasures)*, is a part of electronic warfare that includes a variety of practices attempting to reduce or eliminate the effect of electronic countermeasures (ECM) on electronic sensors aboard vehicles, ships and aircrafts. ECCM is also known as electronic protective measures (EPM).

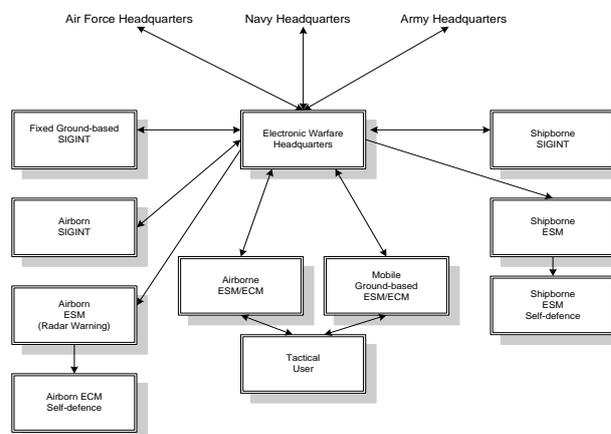


Fig. 2. Armed Forces Electronic Warfare System

