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EFFECTIVE DETECTION AND ELECTRONIC COUNTERMEASURES AGAINST ENEMY UAV

Анотація: в даній тезі запропоновано один із варіантів підвищення ефективності виявлення та радіоелектронної протидії ворожим БпЛА. А саме встановлення на кожен борт БпЛА радіолокаційної станції та засобів РЕБ та об'єднання їх в тактичні групи. Такий підхід забезпечить ефективність застосування БпЛА в цілому.

Ключові слова: радіоелектронна боротьба; станція активних завад; БпЛА; радіоелектронні засоби; радіоелектронна протидія.

Abstract: this thesis proposes one of the options for improving the effectiveness of detection and electronic countermeasures against enemy UAVs. Namely, the installation of a radar station and electronic warfare equipment on each UAV board and their integration into tactical groups. This approach will ensure the effectiveness of the UAV's use in general.

Keywords: radioelectronic warfare; station of active radio-frequency interferences; electronic warfare; active jamming station; UAV; electronic means; electronic countermeasures.

An analysis of recent military conflicts has shown the effectiveness of unmanned aerial vehicles (UAVs) in gaining air superiority and destroying the main weapons of the enemy's ground forces. The growing interest in unmanned aerial vehicles is accompanied by a noticeable lack of detection capabilities. The growing interest in unmanned aerial vehicles is accompanied by a noticeable lack of detection equipment. Most of the available systems suitable for UAV integration are based on infrared, focal plane beams, laser and ultrasonic rangefinders. These systems usually require significant computing power for successful identification. Therefore, the introduction of a radar station in combination with other devices will increase the probability of detection and identification of enemy targets.

To use such a radar station a ground receiver and a display device are required. The on-board unit processes signals and sends information to the ground control station via a real-time data transmission channel. During the operation of the radar, GPS signals are used to generate high-quality radar information. The data is transmitted to the ground station operator for processing and further use of the information to destroy air targets with various means of destruction after the radar situation in a given airspace is completed.

It is also possible to use electronic means to counter enemy drones based on another UAV in a given direction, using the information received about the target.

Electronic jamming of the airborne component of an unmanned aerial vehicle (UAV) is aimed at ensuring guaranteed electronic jamming (EJ) of communication lines, as well as control and navigation systems of the UAV, radiation-guided or radio-detonating weapons on board, and UAV reconnaissance equipment in the radio wave range, taking into account possible countermeasures and various methods of protection against interference. To effectively counter UAVs with electronic warfare means, it is necessary to ensure timely detection and recognition of signals emitted by UAV onboard transmitters and the use of the UAV's own radar to detect enemy air targets, as well as simultaneous and comprehensive impact of radio interference on electronic equipment (EE) that provides direct use of UAVs (receivers of satellite navigation signals, command channel, manual control channel, telemetry and target information).

Therefore, combining multiple UAVs with radar and electronic warfare capabilities on board into groups to detect and electronically counter enemy drones and communicating clearly between them will result in a significant number of enemy UAV losses.

The use of UAV-based detection and countermeasures and clear communication within groups can be a crucial step in increasing the effectiveness of their use, which in turn will lead to air dominance.

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