

Title (en)

Method for checking the functionality of unmanned armed missiles

Title (de)

Verfahren zur Überprüfung der Funktionsfähigkeit von unbemannten, bewaffneten Flugkörpern

Title (fr)

Procédé de surveillance de la capacité fonctionnelle de corps volants entièrement robotisés et armés

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Application

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Priority

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Abstract (en)

The procedure for testing the operativeness of remote-piloted, armed missile (1) having electronic components, comprises testing the operativeness of sensor and actuators of the components and testing communication of the missile over its communication interfaces for the communication of a part of the component with arrangements arranged outside of the missile. During the testing, the respective time duration of technical process in the missile is measured and then stored in a storage arrangement of the missile. The missile is furnished during the testing without energy, data and coolant. The procedure for testing the operativeness of remote-piloted, armed missile (1) having electronic components, comprises testing the operativeness of sensor and actuators of the components and testing communication of the missile over its communication interfaces for the communication of a part of the component with arrangements arranged outside of the missile. During the testing, the respective time duration of technical process in the missile is measured and then stored in a storage arrangement of the missile. The missile is furnished during the testing without energy, data and coolant. During the testing, assessed errors are categorized in sporadic appearing errors, not embarrassing errors and embarrassing errors. A discontinuance of the testing is carried out in the appearance of an embarrassing error and an error message and/or an error protocol forming a defect image of the component is issued over a missile interface. The sporadic appearing errors and non-embarrassing errors are stored in the storage arrangement and are issued after termination of the test over the missile interface. The embarrassing error is terminated when testing without appearance. The testing is carried out for inertial measuring unit, satellite navigation unit, altimeter, battle head, control head, drive unit, target spacing analyzer, engine, rudder machine and control calculator of the missile. During testing, the component of the missile is implemented for actuation test, demand-pull self-test and continues test during a missionary simulation and/or test of component group and function chain, and the inertial measuring unit and the navigation computer are tested in which the acceleration measured through the inertial measuring unit and rolling rate is compared with the effective earth rotation and earth acceleration. During the test of the missile, the rudder machine, a local control computer and the board computer are tested, for which the test leads to a control person through a dialogue and the control person is given each of test and then to confirm its predetermined action. The test comprises detaching the rudder of the bolts holding at the missile, sequentially and manually unlocking of each rudder machine, individually actuating each rudder machine with a control input, automatically testing weather reaching the control input from the rudder machine, simultaneously moving several rudder machine with corresponding control input check, and back controlling the rudder machine on its neutral position of 0[deg] . During testing of the missile, detector of infrared-guidance head is tested its camera, image processing computer and on-board computer, in which the measured pixel grey tone with increased integration time of corresponding linear rise is tested in constant scenario. The target acquisition function of the target guidance head is tested during the test by arranging a land mark mask with an engraved target contour in a defined interval of the infrared target guidance head, cooling the infrared target guidance head, and controlling a test mission plan having a corresponding land mark in the control computer of the missile. An independent claim is included for a device for testing the operativeness of remote-piloted, armed missile.

Abstract (de)

Ein Verfahren zur Überprüfung der Funktionsfähigkeit von unbemannten, bewaffneten Flugkörpern, wobei der Flugkörper eine Vielzahl von elektronischen Komponenten aufweist, wobei der Flugkörper Kommunikationsschnittstellen zur Kommunikation von zumindest einem Teil der Komponenten mit außerhalb des Flugkörpers vorgesehenen Einrichtungen aufweist, wobei zumindest einige der Komponenten Sensoren und/oder Aktuatoren aufweisen, wobei der Flugkörper während der Überprüfung von außen mit Energie, Daten und Kühlmittel versorgt wird, wobei die Überprüfung zumindest die Funktionsfähigkeit der Sensoren und Aktuatoren des Flugkörpers und die Kommunikation des Flugkörpers über seine Kommunikationsschnittstellen umfasst, ist dadurch gekennzeichnet, dass während der Überprüfung festgestellte Fehler kategorisiert werden in sporadisch auftretende Fehler, nicht-fatale Fehler und fatale Fehler, dass beim Auftreten eines fatalen Fehlers einer Komponente ein Abbruch der Überprüfung erfolgt und eine Fehlermeldung sowie ein Fehlerbild dieser Komponente bildendes Fehlerprotokoll über eine Flugkörper-Schnittstelle ausgegeben wird, dass sporadisch auftretende Fehler und nicht-fatale Fehler in einer Speichereinrichtung des Flugkörpers gespeichert und nach Abschluss der Überprüfung über eine Flugkörper-Schnittstelle ausgegeben werden, auch wenn die Überprüfung ohne das Auftreten eines fatalen Fehlers abgeschlossen worden ist und somit zu einer Freigabe des Flugkörpers geführt hat.

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- [DA] DE 102004042990 A1 20060316 - GRABMEIER MICHAEL [DE]
- [A] EP 0356908 A2 19900307 - HONEYWELL REGELSYSTEME GMBH [DE]
- [A] EP 0579143 A1 19940119 - HUGHES AIRCRAFT CO [US]
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