Virginia Military Institute
Mechanical Engineering Department
Cooperative Engineering Center (CEC)

Night Vision Goggle Frangible Helmet Mount
2001

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When a fixed wing aviator ejects from his/her aircraft, there is a risk associated with the parachute risers snagging on the night vision goggle helmet mount. During the ejection sequence the night vision goggles fall off. However, the night vision goggle helmet mount remains attached. The parachute risers can catch on this mount causing serious injury. The purpose of this project was to redesign the current night vision goggle mount to breakaway from the helmet. The CEC group was required to manufacture and perform tests on three proposed design solutions. The three solutions that the group chose to develop and perform tests on were a spring-loaded latch, a breakaway bolt, and nylon rivets.

The current design has a banana clip that contains the night vision goggle mount, which attaches to the aviator helmet. The banana clip attaches to the helmet with a hook on one side and a latch on the other. All three of the group's suggested designs required a latch to be attached to either side of the banana clip. The spring-loaded latch design required a fastener, manufactured by Guden, to be attached to either side of the helmet. When a load was applied by a parachute riser, the latch would release the banana clip and the night vision goggle mount.

The second design replaced the adjustable steel bolt inside of the latch, with a bolt made of Teflon. Under a certain load the threads on the bolt would strip or the head of the bolt would breakaway, causing the mount to be released.

In the final design, latches were attached to the banana clip with nylon rivets, instead of steel screws. A load applied by parachute risers will cause the nylon inserts to come out or break.