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## A Systems Engineering Approach to Aircraft Kinetic Kill Countermeasures Technology: Development of an Active Aircraft Defense System for the C/KC-135 Aircraft. Volume 1

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**Abstract:** Modern Surface to Air Missiles (SAMs) present a significant threat to today's military and civilian aircraft. Current countermeasure systems such as flares and **chaff** rely on decoying the missile threat and do not provide adequate protection against advanced computerized missiles ([Schaffer](#), 1993:1). An aircraft defense system that actively seeks out and defeats an incoming missile by placing a physical barrier in the missile's path offers a promising alternative to current countermeasures technology. This thesis reports the preliminary design of an active aircraft defense system for the protection of the C/KC-135 aircraft from SAMs. The developed system utilizes a kinetic kill mechanism to protect the aircraft from shoulder launched missiles while the aircraft is in the takeoff and climb-out configurations. Both smart anti-missile expendables and dumb projectile expendables are evaluated. The iterative Systems Engineering approach is used to narrow the solution set to the optimal design. The final outcome is the refined design of two candidate aircraft defense system employing a kinetic kill mechanism. Both systems utilize a modified ultra-violet tracker and employ one of two types of nets, one made out of Detonation Cord and the other made out of Spectra.

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