Investigation of AFDS Conversion for Range Extension

Author: Evangelos Georgiou
ID: 1056661

Academic Work 2022-2023

Supervisor:
Prof. Vaios Lappas

Laboratory of Technical Engineering and Oscillations

1. Introduction

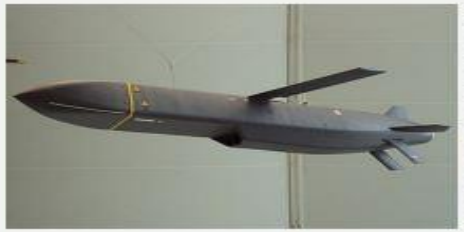
An Autonomous Free-flight Dispenser System is a bomblet carrier system that does not rely on a propulsion system but is rather released from an aircraft and is let to glide to its ground target where it dispenses its package.
Most often guided by a global positioning system, inertial navigation system as well as infra-red seeker for the final targeting guidance, it is a fire and forget system that can operate in various and adverse conditions.
Since it has no propulsion, its range is determined by the altitude it is dropped from, its release velocity and it can shift and correct its course with small tail fins.

2. Key Parameters

Key Parameters	
Type	Glide bomb
Range	5-14 nmi
Weight	680 kg
Wing Span	1 m x 0.6 m
Length	3.5 m
Diameter	0.9 m
Guidance	GPS / INS
Warhead	24 RCB weighing 870 lbs each
Engine	-

AFDS mounted on F4 Phantom

3. Similar Platforms



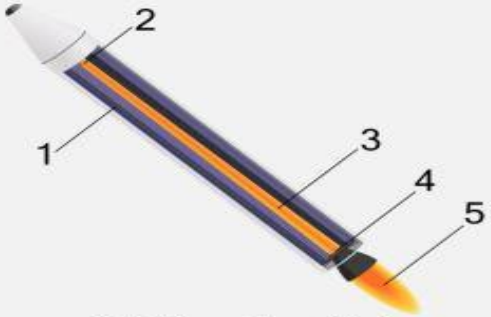
Storm Shadow

Taurus KEPD 350

AGM-154 JSOW

4. Propulsion Systems

Microturbo TRI 60



Solid Propellant Engine

5. Conclusions

What we can assess from our introduction so far, is that most of the similar range and type missile systems in the world that exist and are now in service use a propulsion system with an engine comparable to the Microturbo TRI or some sort of foldable wings or both.
For bigger, heavier and faster package delivering systems, more powerful propulsion systems are required that fall in the rocket, ramjet and possibly in the future on scramjet engine category.
We can see that from the start of the cruise missiles history, the aim was always to build better, faster, more accurate, harder to detect and counter measure with as much range as possible.