

Fuzing & Ordnance Systems

MISSILE/ROCKET

S&A's – ESAD's AND FUZING

L-3 Fuzing & Ordnance Systems was the first company in the United States to fully Safety Board certify an all electronic safety and arming device (ESAD) and deliver the ESAD to Army inventory. This ESAD is employed in the Army Tactical Missile System (ATACMS) and is in production at L-3 Fuzing & Ordnance Systems. This is typical of the achievements that have established us as a recognized leader in the design, development, and manufacture of fuzes and safety & arming (S&A) devices for virtually all types of munitions. The ESAD exploding foil initiators (EFI), for example, were developed by L-3 Fuzing & Ordnance Systems in partnership with EDC, a highly recognized, specialized development company.



L-3 Fuzing & Ordnance Systems developed an electronic safety and arming fuze (ESAF) for the guided MLRS Unitary Warhead. This fuzing system provides a multi-functional fuzing capability consisting of point detonation, delay, and proximity.

We have extended this design capability to weapon systems including, SDB, JASSM, AWS, and FMU-139 D/B bomb fuze for MK80 series bombs



Over 20 million mechanical and electromechanical fuzes and S&A's have been produced by L-3 Fuzing & Ordnance Systems. A comparable quantity of fuze metal parts have been manufactured for Government load plants and other U.S.-based and international prime contractors. In the 2.75 rocket application, we employed a common, yet effective, technique to achieve safe separation distance prior to arming. The technique employs a "run away escapement device" that senses missile acceleration and performs a mechanical double integration to arm after the safe separation between the missile and the launch site.

In concert with the Government of Switzerland, L-3 Fuzing & Ordnance Systems developed and produced an ESAD for the Swiss Improved Dragon Missile, which was the first high volume production ESAD in the world for a Tandem Warhead Anti-Tank missile. L-3 Fuzing & Ordnance Systems is in the process of developing its fourth generation ESAD architecture.

We are also a leader in the development and production of electronic, in-line Missile Flight Termination Safety and Arming (FTSA's) devices.

L-3 Fuzing & Ordnance Systems also designed and continues to produce an Arm Fire Device (AFD) for the ATACMS missile system. We are under contract for in-line electronic ISD's for the GMLRS, SM-3, AIM-9X, and RAM missiles.

The AIM-9X, ESSM, and GMLRS are the first tactical ESAD's to utilize commercial plastic components, Field Programmable Gate Array's (FPGA's), solid-state high voltage switches, and a Low Energy Exploding Foil Initiator (LEEFI's). These LEEFI devices were developed and qualified by the Naval Air Warfare Center (NAWC) Weapons Division, China Lake.

The attainment of high reliability for ESAD missile fuzing is characterized by simplicity, no moving parts, and positive responsive design that anticipates environmental influences.



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ESAD, ESAF and FTSA PRODUCTS

PROGRAM	END USER	WEAPON DESCRIPTION
ATACMS ESAD	U.S. Army	Mobile ground
ATACMS FTSA	U.S. Army	Mobile ground
PATRIOT ESAD	U.S. Army	Mobile ground launched aircraft/missile interceptor
TSSAM ESAD	U.S. Army U.S. Air Force U.S. Navy	Tri-service standoff attack missile
JSOW ESAD	U.S. Navy U.S. Air Force	Autonomous wing launched glide missile
JSOW FTSA	U.S. Navy U.S. Air Force	Autonomous wing launched glide missile
JASSM FTSA	U.S. Army U.S. Air Force	Joint air to surface standoff missile
DRAGON ESAD	Swiss Army	Shoulder launched man guided anti-tank missile
STOW ESAD	Swiss Army	Mobile anti-tank missile
EFOG-M ESAD	U.S. Army	Mobile ground launched enhanced fiber optical guided precision dual purpose weapon
MK21	U.S. Navy	EFI standard missile
ESAF	U.S. Army	Tank fired projectile
FSU-25/B ESAD	U.S. Navy U.S. Air Force	Sidewinder missile (AIM-9X)
MK88 ESAD	U.S. Navy	Evolved Sea Sparrow missile (ESSM)
GMLRS FTSA	U.S. Army	Guided Multiple Launch Rocket System
GMLRS ESAD	U.S. Army	Guided Multiple Launch Rocket System
GMLRS ESAF	U.S. Army	Guided Multiple Launch Rocket Systems (Unitary)
SONOBUOY ESAD	U.S. Navy	Sonobuoy Pinger
JASSM ESAF	U.S. Air Force U.S. Navy	Joint air to surface standoff missile
SDB ESAF	U.S. Air Force	Small Diameter Bomb
TMD ESAD	U.S. Air Force	Tactical Munition Dispenser
WCMD-ER FTSA	U.S. Air Force	Extended Range Wind Connected Munition Dispenser
RAM ESAD	U.S. Navy	Rolling Airframe Missile
AWS ESAF	U.S. Navy	Affordable Weapon System
NLOS-LS ESAD	U.S. Army	Non-Line of Sight – Launch System
FMU-139 PIP ESAF	U.S. Navy	Mk 80 Series Bomb Fuze
Tomahawk ESAF	U.S. Navy	Tomahawk Missile
M982	U.S. Army	Excalibur Artillery Projectile



GMLRS ESAD



ATACMS ESAD



Dragon ESAD



AIM-9x and GMLRS ESAD's and GMLRS FTSA



MISSILE/ROCKET FUZES

FMU 5001	M442 (2.75" rocket)
FMU 5002	M445 MLRS
FMU 5003	M446 (2.75" rocket)
M72 E7	M447 MLRS AT2
M114 TOW	XM451 (ER) MLRS
M79 DRAGON	M820 HELLFIRE
M143E1 PATRIOT	MK79 MOD 0
M423 SAFE-ARM (2.75" rocket)	SHORE DEFENSE HELLFIRE
M427 SAFE-ARM (2.75" rocket)	TACIT RAINBOW
M429 SAFE-ARM (2.75" rocket)	WDU-4A/A (2.75" rocket)
M433 SAFE-ARM (2.75" rocket)	ATACMS AFD
M439 SAFE-ARM (2.75" rocket)	SAU & FPFSU
M440 (2.75" rocket)	

L-3 FUZING & ORDNANCE SYSTEMS

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L-3. Headquartered in New York City, L-3 Communications is a prime contractor in aircraft modernization and maintenance, C³ISR (Command, Control, Communications, Intelligence, Surveillance and Reconnaissance) systems and government services. L-3 is also a leading provider of high technology products, subsystems and systems.

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