



EXPAL

**FMCW Proximity Technology with
Advance EM Insensitive Features**

62nd Annual Fuze Conference

Fuzing Innovations for Tomorrow's Weapons

May 13 – 15, 2019 | Buffalo, NY

EXPAL Systems – Luis Abad, Product Manager



Content

- A Story of frustration and success
 - Key Elements of Frustration
 - From Despair to Success
- Testing EM Immunity
 - Land Testing
 - AEGIS Proof Fire test
- Overall, Reliability
 - Production Key Facts
 - True Partners

ABOUT OUR GROUP



The logo for EXPAL, featuring the word "EXPAL" in a bold, sans-serif font. The letter "X" is stylized with a red diagonal line through it. The background of the slide is split diagonally from the top-left corner, with a red triangle on the left and a grey triangle on the right.

EXPAL



Our History

A photograph of several soldiers in camouflage uniforms working with a piece of military equipment, possibly a vehicle or a large machine, in an outdoor setting. The image is semi-transparent.

Global Solutions

A photograph of a modern, single-story office building with large windows and a paved area in front. The image is semi-transparent.

EXPAL USA

PART OF A LEADING TECHNOLOGY COMPANY

MAXAM is a global leader; a company technologically specialized in the design, development, manufacturing and application of **energetic materials**.

Blasting and initiation systems for the mining, quarry and infrastructure industries

Terra Solutions

Cartridges and gunpowder for hunting and sporting use

Outdoors

Products and services for **defence and security industry**

Defense

Key raw materials for **nitro chemical activity**

Chem



History

19th

20th

21st Century

Partnerships with Armed Forces with a **diversified offering**

Strong commitment to **R&D** and **strategic** industry partnerships

Worldwide presence consolidation by extending our activities

First steps

National growth & consolidation

International expansion

Consolidation as a global leader

1872 Alfred Nobel founded the SED *Sociedad Española de la Dinamita, Privilegios A. Nobel*



1911 First supply to the **Spanish Navy**

1979 Ammunition's **loading plant**, one of the **most important for NATO**

1986 Management of entire **life cycle of munitions**

1990 Development of **high capacities** and **advanced technological elements**

Strategic partnership for **engineering services and systems' integration**

Commercial activity in **5 continents**


3 Technology centers

11 Industrial sites: **US Establishment** & R&D propellants plant



MAXAM
Beyond Performance

Our History



Global Solutions

© Armada Española



EXPAL USA

Allies of Armed Forces

AIR



- Solutions to + 25 Air Forces worldwide
- Complete air-to-ground warheads portfolio
- Compatible with most advanced precision guidance systems

LAND



- Leaders in mortar systems
- Complete ammunitions for Indirect fires support global solutions from 60mm to 155mm

SEA



- + 100 years providing naval solutions
- Vertical integration of key components

Fuzing Solutions for Every Scenario



- Fuzing since **1940**
- Presence in **+45 countries**
- **+500,000 units/year** manufacture (60mm up)
- **STANAG Qualified** solutions for Mortar Grenades and Field Artillery
- **In-house production** of key components (energetics and electronics)



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- **Unique competences** as complete rounds manufacturer (availability and know-how)
- **Complete Portfolio** for large calibre ammunition (+60mm)
- **U.S design** based mechanical fuzes (**M739, MTM/MTSQ**)



- Leading **electronic & proximity fuze technology**



MAXAM
Beyond Performance



Our History



Global Solutions



EXPAL USA

Directly Supporting the US Armed Forces



- **2 Industrial Sites:**
 - **Texarkana, TX**
 - **Minden, LA**

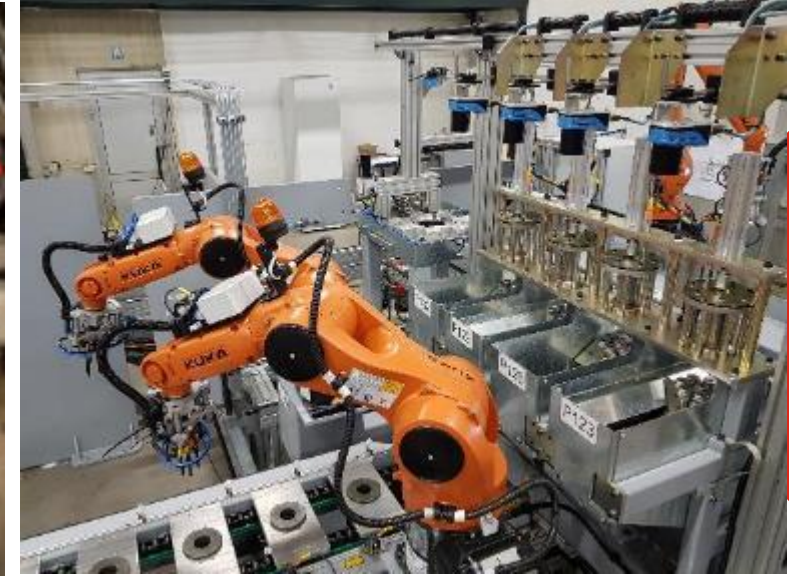
Texarcana



- 200 acres site, **Currently** Ammo LAP, demilitarization, recycling and recovery of munitions and components.

Capabilities for bringing in EXPAL's expertise in other ammo solutions (Fuzes M739, MTM/MTSQ)

Minden



- 100 acres flexible explosive processing plant (incl. twin-screw extruder) with analysis lab
- DCMA site safety survey approved
- BATF&E Type 2X permits
- Louisiana explosive licenses

A Story of Frustration and Success

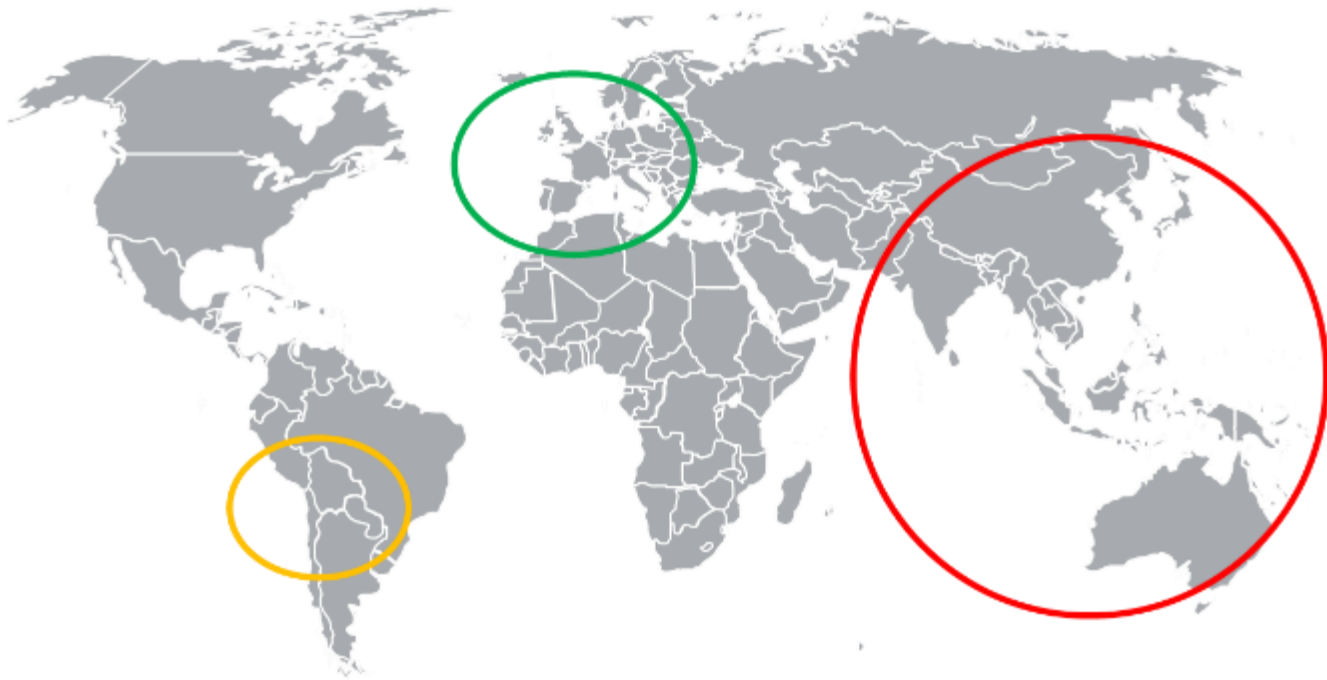


Key Elements of Frustration



- Current standard ordnance solutions not at the same level than Combat Systems
 - Low Reliability (<90%)
 - Dramatically affected by EM Environments
 - Potential Safety Issues (**prematures**)
- Proximity detection and processing based in 80's available technologies
 - Complete Obsolescence (**transistors/oscillators/mixers**)
 - Big Supply Chain Problems and Manufacture unproductiveness (**Big Scrap**)
- **Surprisingly, a very common worldwide non recognized situation**

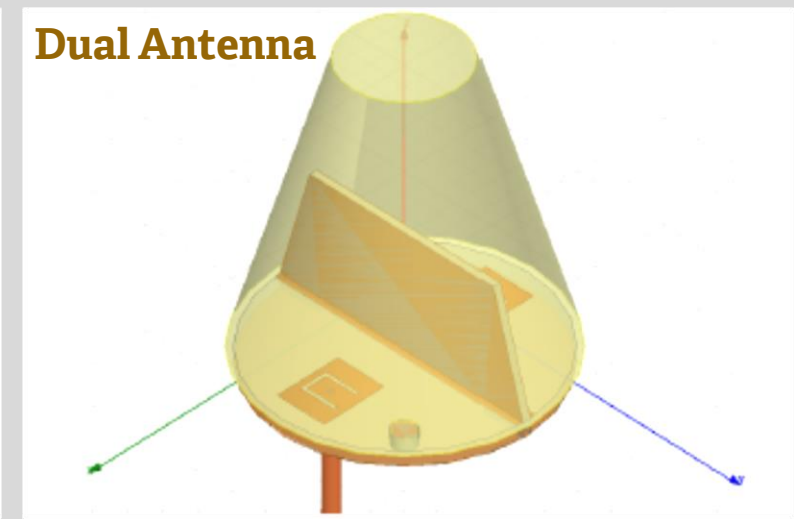
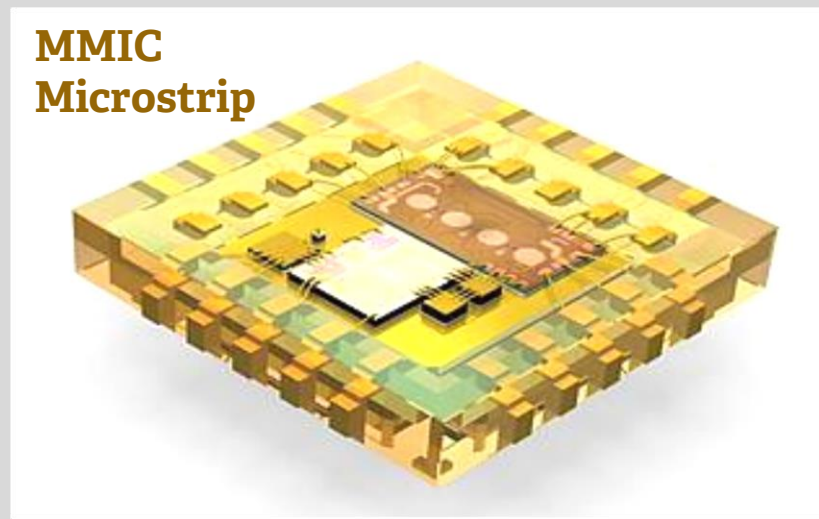
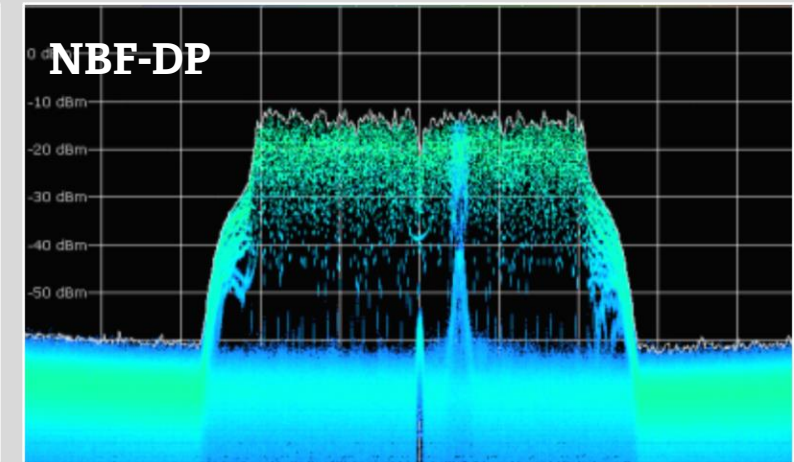
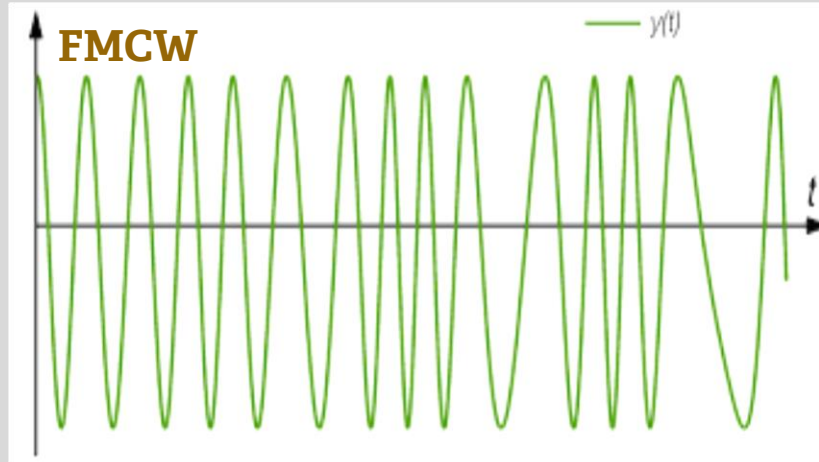
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From Despair To success

- Development Program started in **2009** sponsored by the Spanish Navy.
- Several Stages, concluding proximity in **2015**,
- Operative Fuzes in service since 2016.
- Still, 76 and 127mm subjected to improvements until **2017**, wrapping up the project.



Testing

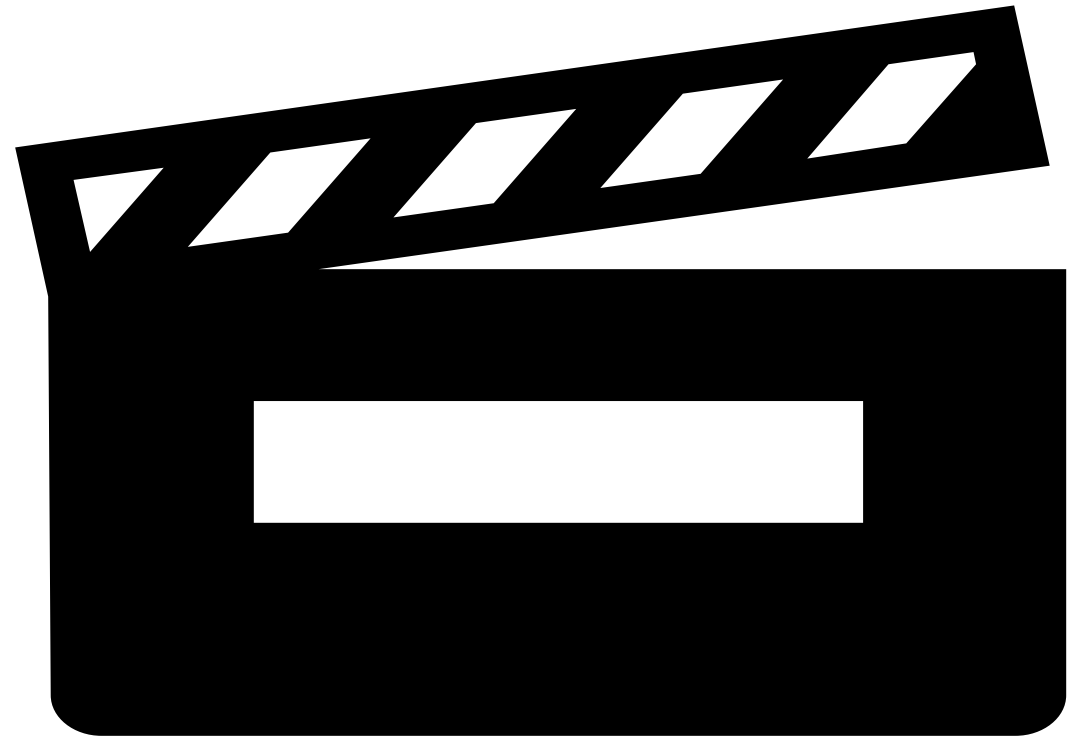


Testing EM Immunity

On-Board Immunity Testing

- 5 inch mk45 mod.2 Gun
- HE Shell with full service charge
- EF-127C Fuzes Long Intrusion
- **Most adverse EM (precise configuration Classified as Confidential)**
- **23 secs trajectory illuminated, 10.000 yards target**
- **100% fired rounds performed satisfactory (no prematures and proximity detection evidenced)**

Fire Testing



Overall, Reliability



PRODUCTION KEY FACTS



+10,000

76mm & 5" Fuzes
put in service

5 countries

already trusting us

4 guns

Compatibility tested

~ 300

Fuzes tested

+95%

Reliability in Prox.Detec.
(~98% combined)

0

Premature



A TRUE PARTNER

In constant R&D&i

- Improvements for present products profiting of everyday new techs.
- R&D's for Multi-option an Combat Sys. integration with Spanish Navy

Applying stable & reliable solutions

- In-house production & integration of key components
- Reliable mechanical solutions

Focused in customer needs

- Engineering answering to the Armed Forces needs
- Tailored solutions

Thank you

