# Joint Attack Munition Systems (JAMS) Project Office

# August 16, 2007

# HYDRA-70 Application

## U.S. ARMY

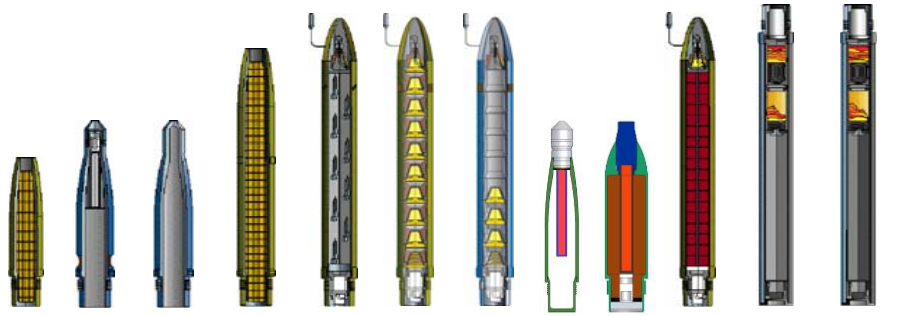
- APACHE
- KIOWA WARRIOR
- COMANCHE
- LITTLE BIRD
- DAP

## U.S. NAVY

- COBRA
- CH-60 SEAHAWK
- F-18

## U.S. AIR FORCE

- F-16
- A-10




## SYSTEM CHARACTERISTICS

- Area Suppression
- High Degree of Modularity
- Family of Warheads: HEPD, Flechette, MPSM, Smoke and Illumination
- Immune to Countermeasures (HYDRA-70)

## USERS

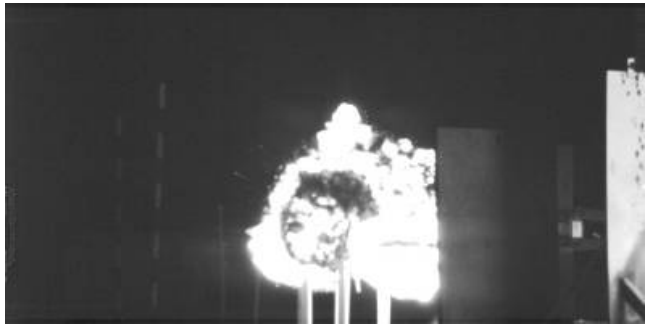
**UNITED STATES**

ARMY
NAVY
MARINES
AIR FORCE

**INTERNATIONAL**

EGYPT
JORDAN
KUWAIT
DENMARK
COLUMBIA
NETHERLANDS
SAUDI ARABIA
SINGAPORE
THAILAND
TUNISIA
UAE

# JAMS PO IM Warhead Explosive Selection



- Explosive Selections
- Test Conducted
  - -Fragment Impact
  - -Mini-Arena
- M151/ IM Explosive Comparison

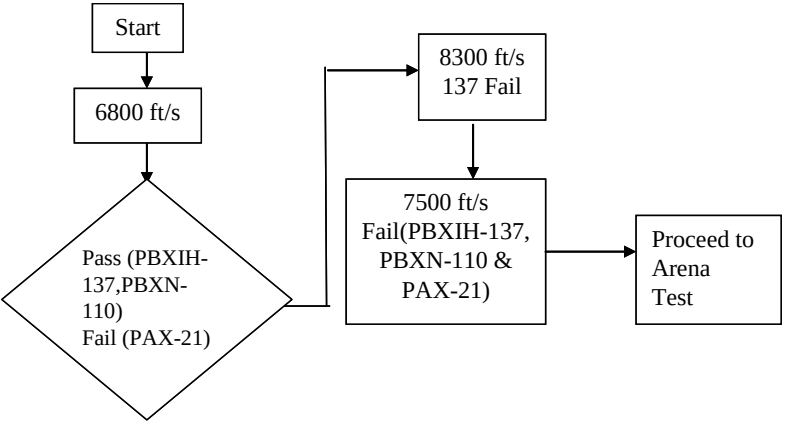
# Explosive Candidate Summary

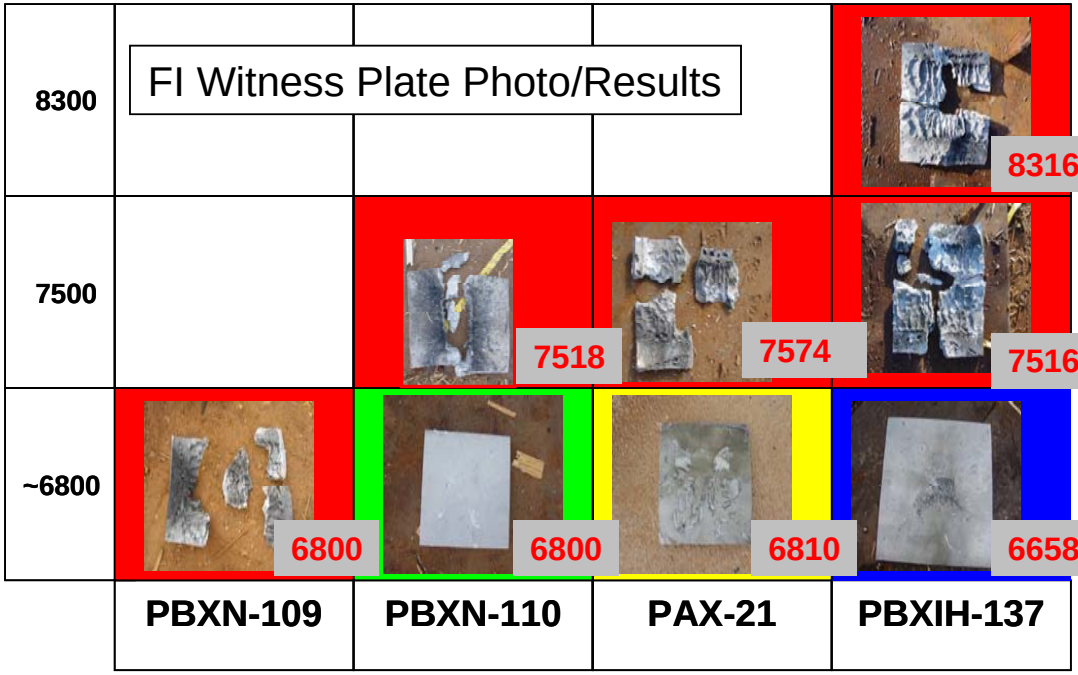
| Explosive | Unit Cost $/lb | Selection based on | Gurney Constant | Nominal Fragment Velocity |
|---|---|---|---|---|
| PBXIH-137 | 10.73 | RDX Based | 8563 ft/s | 4120 ft/s |
| PBXN-110 | 20.03 | HMX Based | 9121 ft/s | 4710 ft/s |
| PBXN-109 | 9.42 | Aluminized | 7415 ft/s | 3532 ft/s |
| PAX-21 | 9.13 | IM use in M720 HE mortar | 8104 ft/s | 4618 ft/s |

•Explosive Selection will be based on cost analysis, Fragment Impact (FI) and Mini-Arena Testing

# Fragment Impact Results

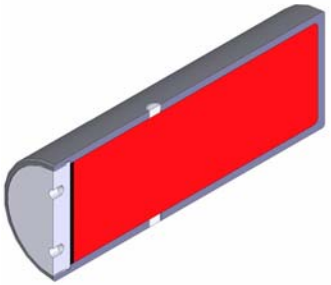
| Reaction Type | Response |
|---|---|
| VI | No Reaction |
| V | Burn |
| IV | Deflagration |
| III | Explosion |
| II | Partial Detonation |
| I | Detonation |



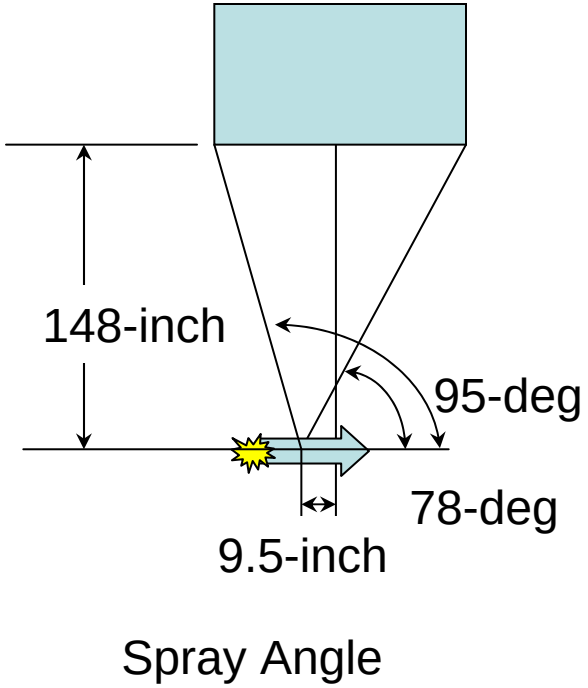



# Mini-Arena Test Summary

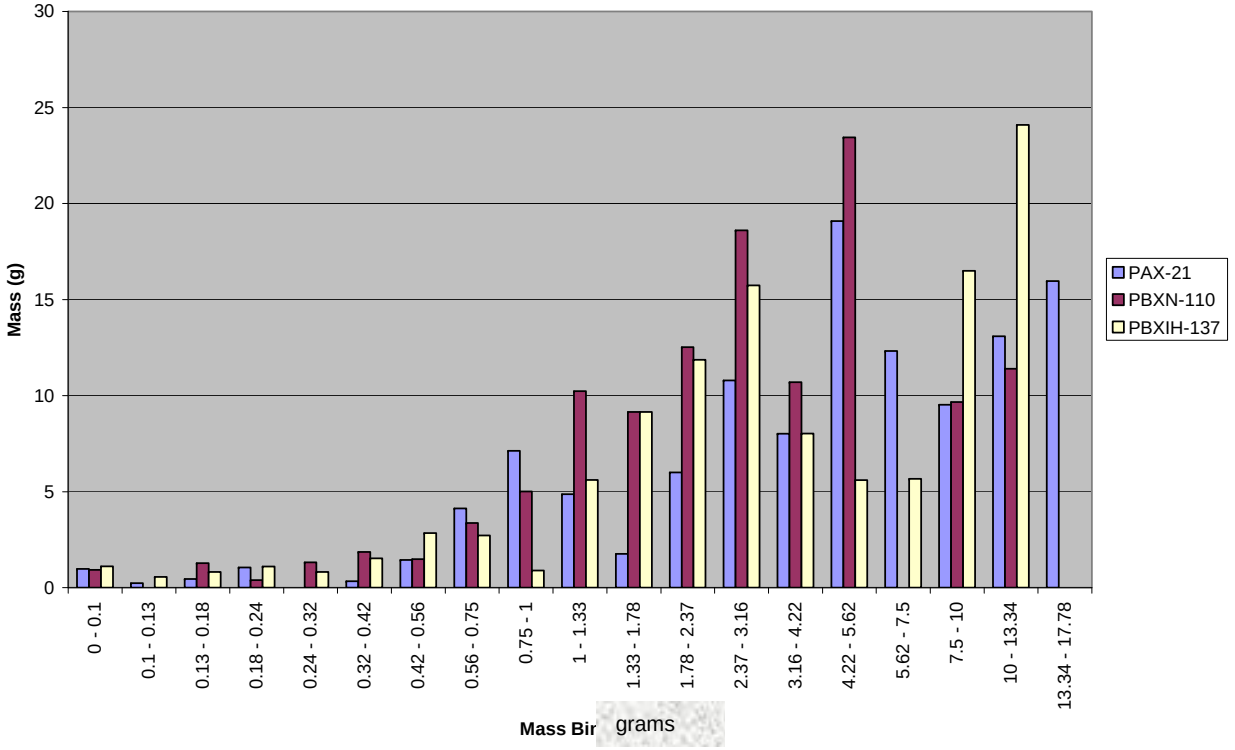
| Explosive | | PAX-21 | PBXN-110 | PBXIH-137 |
|---|---|---|---|---|
| Fragments | Number* | 58 | 81 | 73 |
| | Total Mass* (grams) | 116.67 | 121.05 | 114.11 |
| | Average Mass* (grams) | 2.01 | 2.03 | 1.94 |
| Velocity | Initial Velocity (ft/s) | 6120 | 6610 | 5990 |
| * This ignores the fragments below 0.05-grams | | | | |



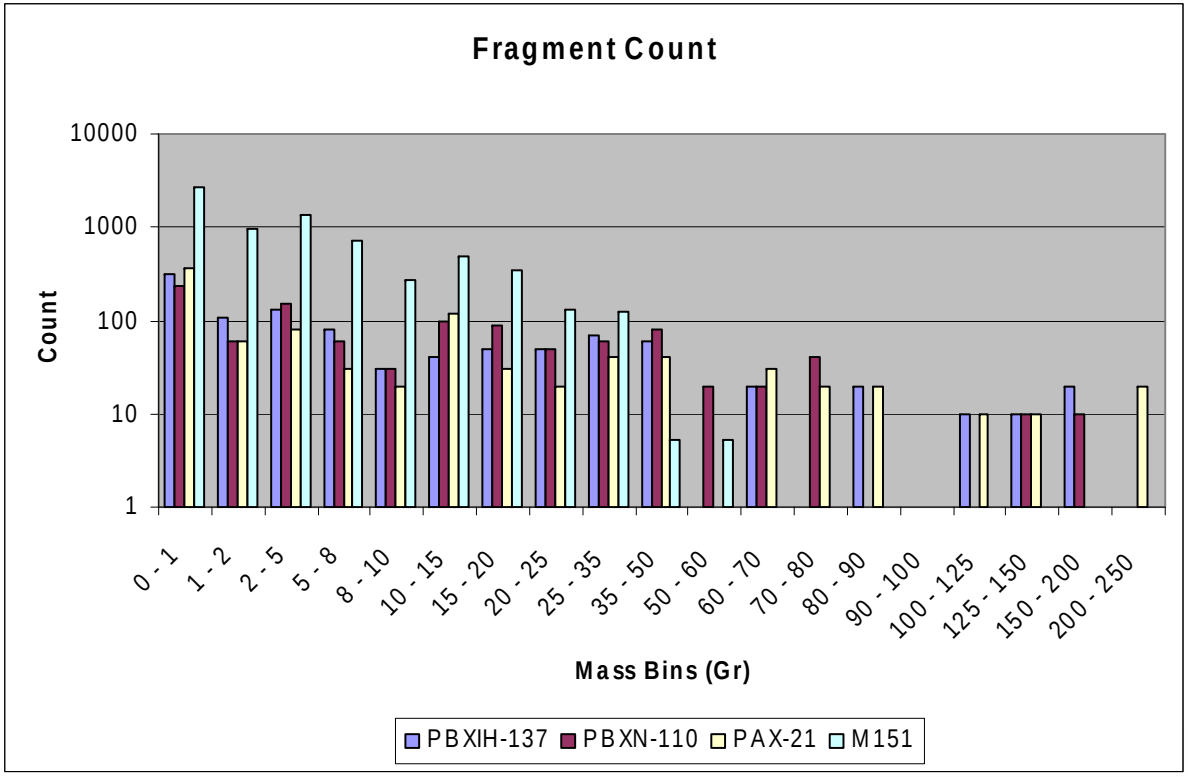
**Total Mass Recovered**

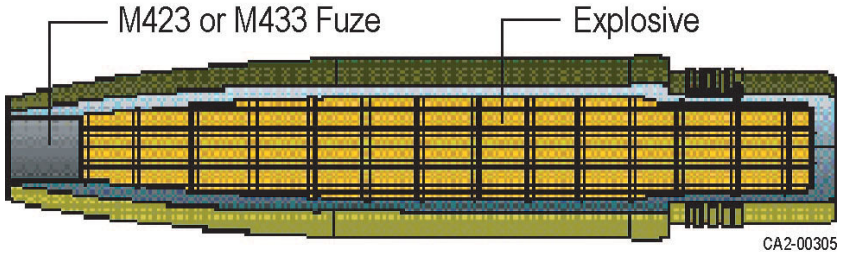


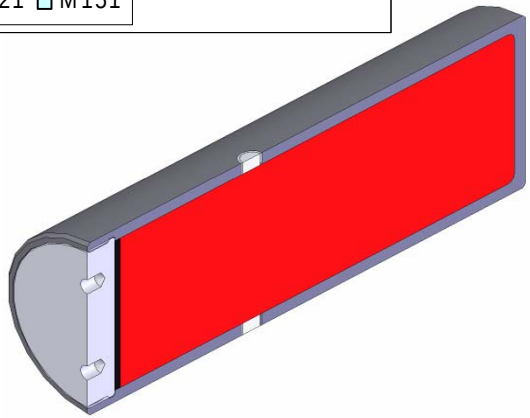

Spray Angle



# Fragment Comparison To Current M151 WH



# IM Warhead Explosive Selection Summary

- Fragment Impact was used as a discriminator to assess relative IM performance.
  - PBXN-110 and PBXIH-137
- Mini arena tests were conducted to validate fragment velocity.
  - All three explosives had improved distribution of fragment sizes
  - Velocity was highest in PBXN-110 and PAX-21
- Cost
  - PBXN-110 was highest