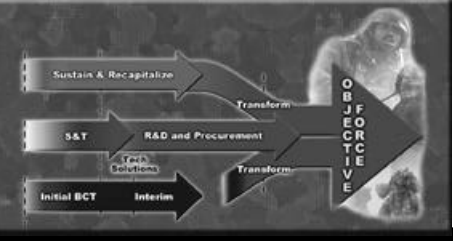




# TOW Bunker Buster



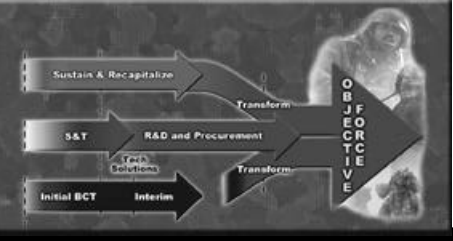
Mr. Jeff Starks  
PM TOW Bunker Buster  
PEO Tactical Missiles

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# TOW Bunker Buster Requirements



## “Breach a Masonry Wall”

- Provide for a minimum through hole of 24” diameter in the 8” double reinforced concrete wall
- Wall requirements defined by Human Engineering Laboratory (HEL) Technical Manual (TM) 30-78

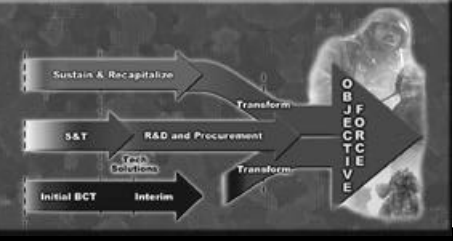


## “Defeat a Bunker”

- Provide a structural overmatch of the Soviet engineered earth & timber bunker
- Bunker requirements defined by HEL TM 30-78
  - Aperture is closed not allowing it to be used as a firing port
  - Roof of the structure has fallen into the crew compartment not allowing re-fortification



# TOW Bunker Buster Assumptions

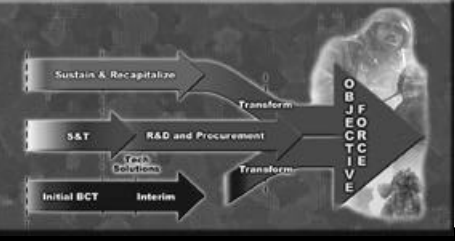


- ❑ Complete development of safe & effective missile within 12 months
  - Uses existing flight algorithms for TOW 2A missile
  - Maintain TOW 2A accuracy and range
  - 50 missiles For qualification testing
  - 50 missiles available for additional testing
  - Use existing mechanical safe and arm device
  - Minimal Insensitive Munitions testing and/or IM waiver required
  - Conduct user test
  - Do not increase logistical support structure requirements
  - Make it simple to use
- ❑ Retrofit & field 500 modified TOW 2A missiles within 4 months of MDA decision

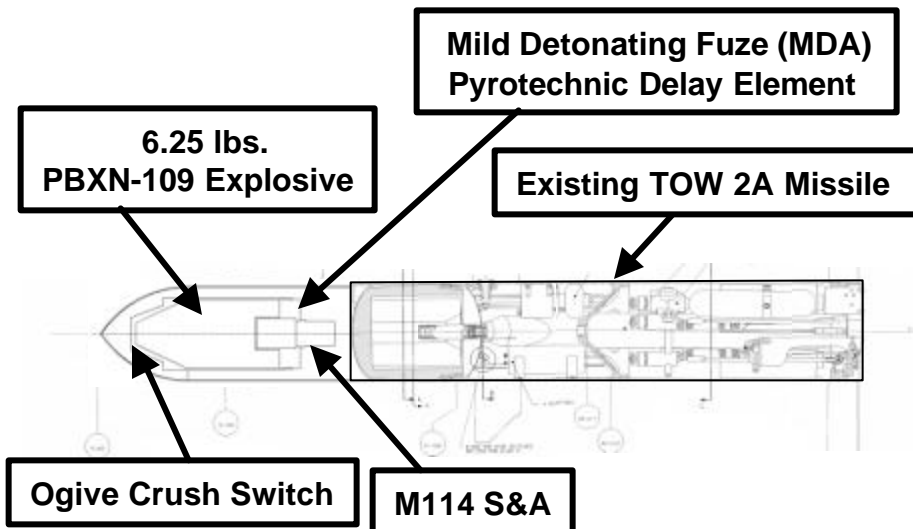
Bottom Line: Brute Force Solution That Is Safe and Effective



# TOW Bunker Buster Concept



## Missile Overview



## Technical Approach

- Develop fragmenting HE bulk charge warhead leveraging Hellfire blast-fragment effort
- Use existing mechanical safe & arm device
- Retrofit existing TOW 2A missiles
- Use existing flight algorithms

## Risks

- Pyrotechnic delay design & packaging
- Maintaining minimum safe & arm distance

## Developmental Concept

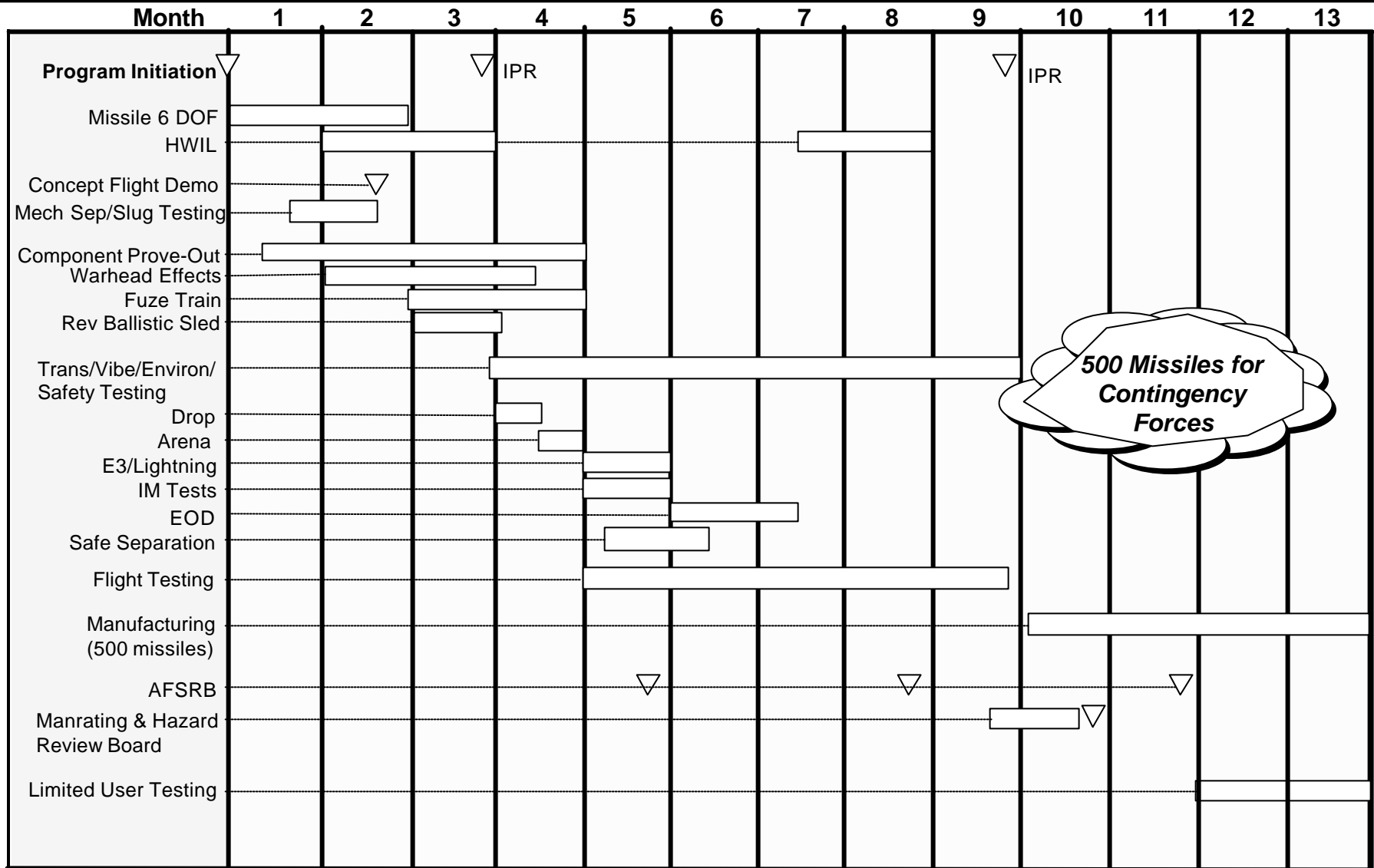
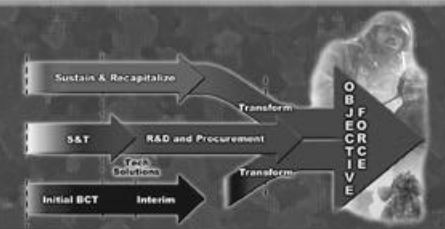
- Joint Government / Contractor development effort
- PRIMEX (Hi-Tech) loads PBXN 109 at Camden, AR (existing T&M contract)
- RDEC / RTTC integrates warhead assembly
- Raytheon conducts modeling & simulation efforts & missile retrofit via existing Engineering Services contract
- 50 missiles for qualification testing
- 50 missiles available for other testing

## 500 Missile Retrofit Concept

- Government fabrication and assembly
  - Hi-Tech loads PBXN 109
  - AMRDEC fabricates warhead assembly
- Warhead retrofit at Anniston Munitions Center via MIPR
  - 500 completed missiles delivered to Anniston Munitions Center for contingency storage
  - Missiles issued at DSCOPS direction to support contingency operations



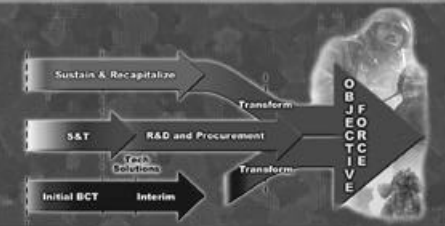
# TOW Bunker Buster Schedule



**500 Missiles for Contingency Forces**



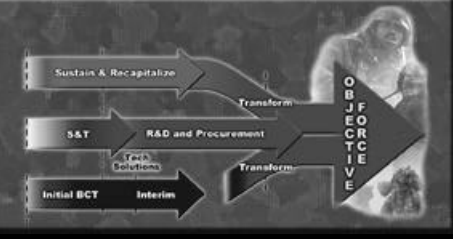
# TOW Bunker Buster



Back-up Slides

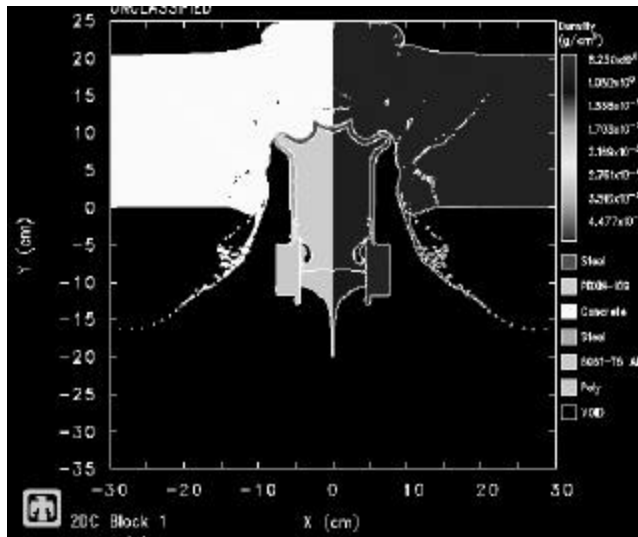


# TOW Bunker Buster Risk Reduction



## AIRGUN Test – Inert Warhead Structure Tests

- Three concepts tested to evaluate “Squash” – “HESH” reactions to target engagement
  - Thin Wall Steel
  - Thick Wall Steel
  - Thick Wall Aluminum
- All three tests successful
- Thick wall steel chosen to provide “Squash” while maintaining explosive train for Optimum Blast Effects (shown below)



Hydrocode Run

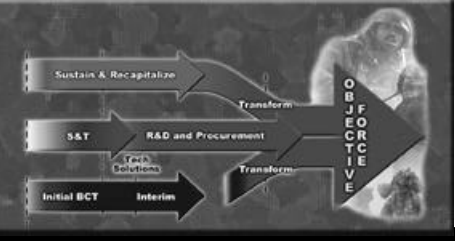


Recovered Hardware





# TOW Bunker Buster Risk Reduction



## Missile Test – TOW 2A With Probe Fixed In Stowed Position

- This test was designed to replicate the mass, CG, and aerodynamic profile of the proposed TOW Bunker Buster missile
- The aerodynamic flight test was extremely successful
- Proved that this profile/configuration could be flown as proposed using existing flight software and guidance algorithms
- The missile impacted the target 8” right and 4” high at 2K range

