

A large military helicopter is shown in flight over a dense green forest. The helicopter is viewed from a high angle, and it appears to be firing rockets or missiles, with smoke trails visible. The background is a soft-focus view of the forest canopy.

Aviation Rockets and Small Guided Munitions (ARSGM) Information Brief August 2013

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Hydra Rocket System



August 2013



Hydra Rocket System



Hydra System Capabilities

To provide air-to-ground suppression, smoke screening, illumination, and direct and indirect fires to defeat area materiel and personnel targets at close and extended ranges

General Description

- HYDRA Rocket System utilizes a 70 millimeter (2.75") diameter rocket and compatible launcher
- Warheads include high-explosive anti-personnel, flechette, multi-purpose submunitions, smoke, illumination, penetrator and training
- U.S. users include Tri-Service and Special Operations Forces (SOF) on both fixed- and rotary-wing aircraft

Characteristics

- Range 300-8,000 meters, Velocity > 700 meters/second
- Flechette warhead in a seven-shot volley yields 8,253 individual flechette projectiles
- Improvement efforts are addressing Insensitive Munitions (IM), Safety, Reliability, and Producibility





Hydra Overview

U.S. Army



Apache Little Bird
Kiowa Warrior Black Hawk

U.S. Air Force



F-16 A-10

U.S. Navy/Marine Corps



Cobra F-18 MH-60 Seahawk



CHARACTERISTICS

- Area suppression
- Multiple warheads
- High degree of modularity
- Inherent immunity to countermeasures

IMPROVEMENTS

- Insensitive munitions capability improvements to Rocket Motor, High Energy (HE) warhead, and Shipping and Storage Container (SSC)

USERS

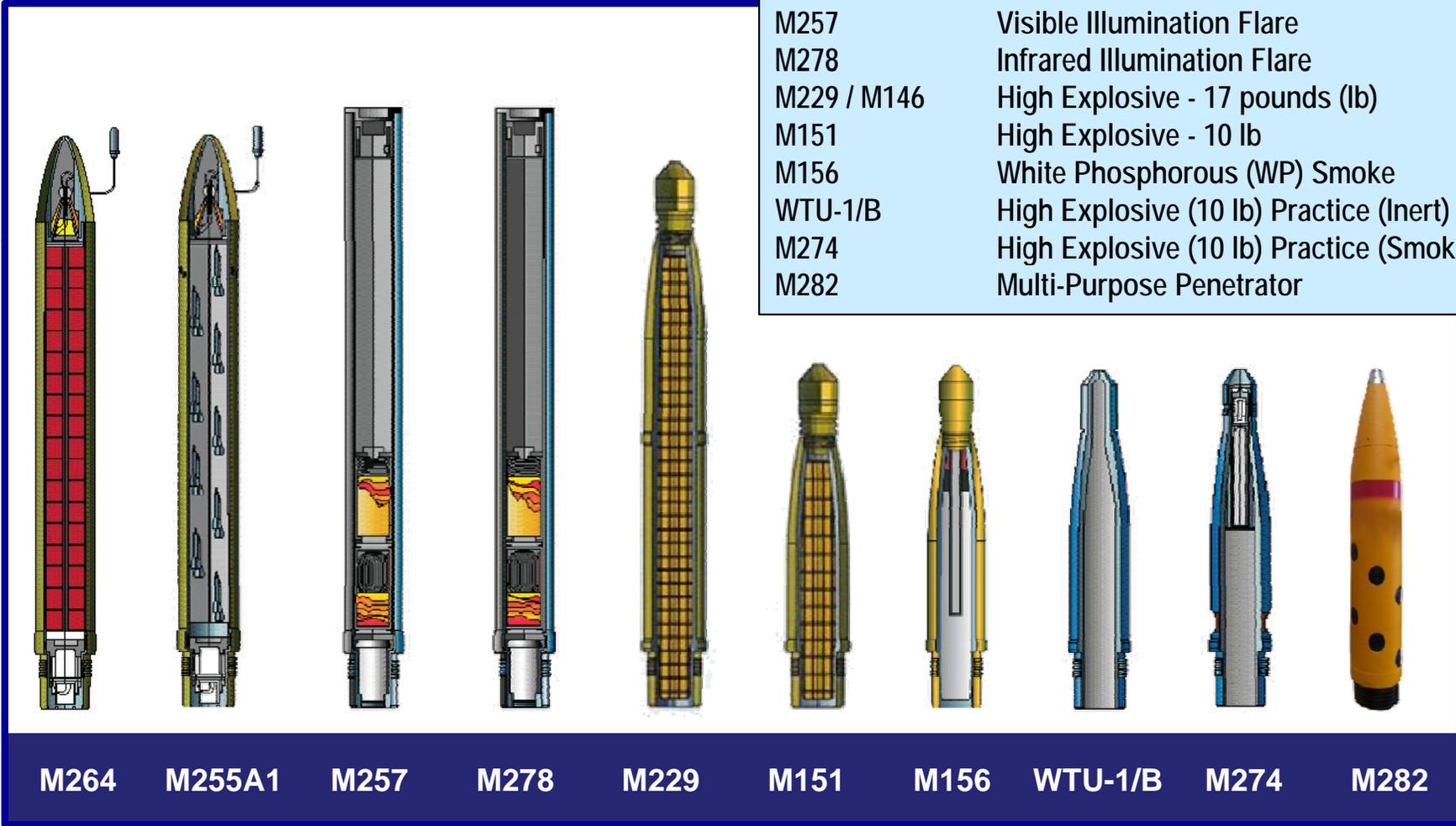
United States

Army - Navy - Marine Corps - Air Force - SOF



Hydra Warheads (Payloads)

M264	Red Phosphorus (RP) Smoke
M255A1 / M149	Flechette
M257	Visible Illumination Flare
M278	Infrared Illumination Flare
M229 / M146	High Explosive - 17 pounds (lb)
M151	High Explosive - 10 lb
M156	White Phosphorous (WP) Smoke
WTU-1/B	High Explosive (10 lb) Practice (Inert)
M274	High Explosive (10 lb) Practice (Smoke)
M282	Multi-Purpose Penetrator



M264

M255A1

M257

M278

M229

M151

M156

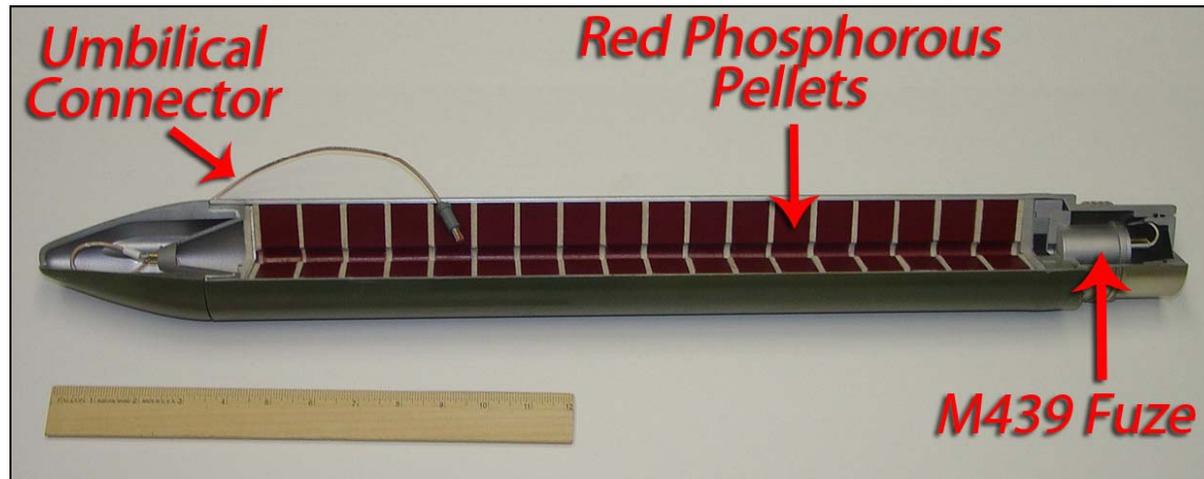
WTU-1/B

M274

M282



M264 Smoke (Red Phosphorous) Warhead



Characteristics

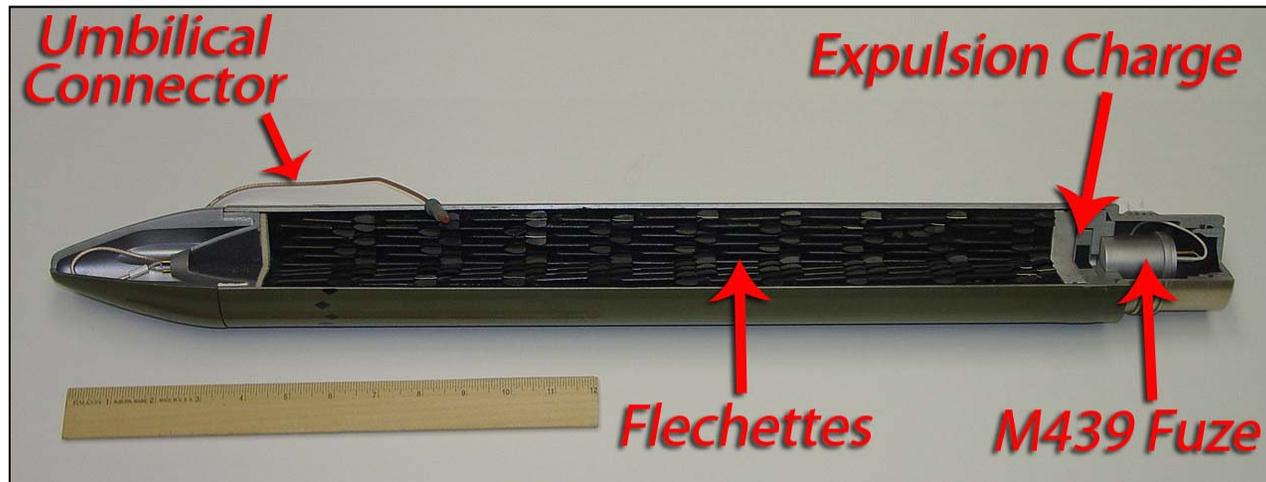
- Red Phosphorus is stable and has improved performance versus other screening agents in high temperature environments
- Utilizes the M439 Remote Set (RS) fuze to control the smoke initiation timing

Capability

- Screen effect from 14 rockets establishes a concentration of smoke across a 300 to 400 meter front for 5 minutes in a 10 knot wind
- Full screening accomplished within 60 seconds after warhead smoke initiation



M255A1 Flechette Warhead



Characteristics

- Each warhead contains 1,179 sixty-grain hardened steel flechettes
- Utilizes the M439 Remote Set (RS) fuze to control flechette expulsion initiation timing
- Full material release issued for use by Army Aviation units July 2006

Capability

- Primarily used for anti-personnel operations



M257 Illumination (Flare) Warhead



Characteristics

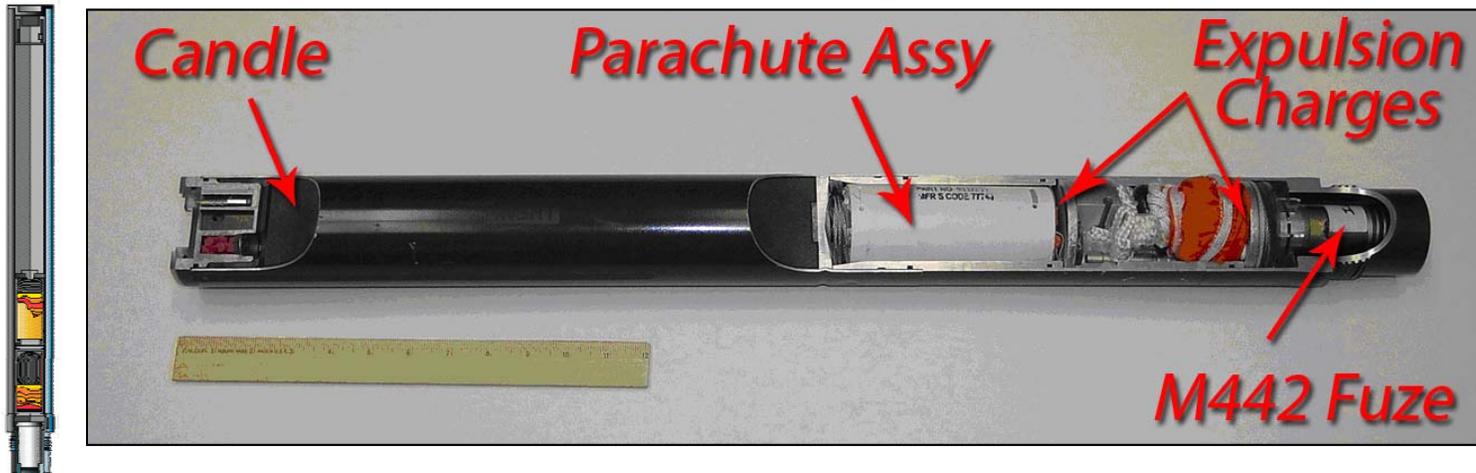
- Designed for battlefield target illumination
- The warhead is assembled to the rocket motor in the field
- Uses the M442 motor burnout fuze to deploy the illuminating candle at a fixed range of ~3,400 meters after launch

Capability

- Provides 1,000,000 (one million) foot candles of visible illumination for approximately 3 minutes
- Illumination of approximately one square mile



M278 Infrared (IR) Illumination Warhead



Characteristics

- Designed for battlefield target illumination in conjunction with infrared goggles
- The warhead is assembled to the rocket motor in the field
- Uses the M442 motor burnout fuze to deploy the IR illuminating candle at a fixed range of ~3,400 meters after launch

Capability

- Provides an average near IR light output of 250 watts per steradian with less than 1,000 candle power visible light
- Provides IR illumination for approximately 3 minutes



M151/M229 High Explosive Unitary Warheads



**M151 High Explosive
(10 pound)**

**M229 High Explosive
(17 pound)**



Characteristics

- General purpose explosive warheads
- Point detonating (impact) fuze
- Malleable cast iron case fragments upon detonation
- 10 lb warhead (M151) and 17 lb warhead (M229) versions

Capability

- Area suppression
- Anti-personnel
- Anti-material



WTU-1/B (Practice) Non-Functional



Characteristics

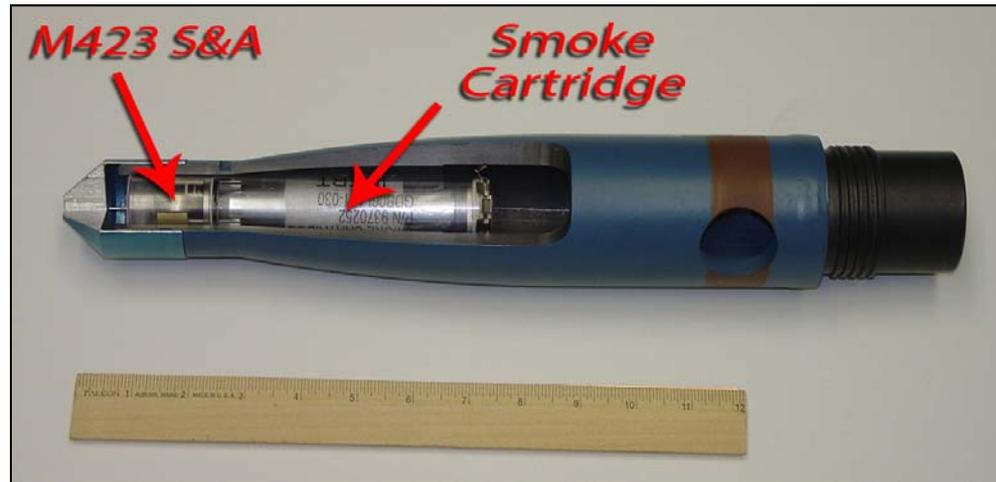
- **Ballistic match to the M151 warhead**
- **Inert unit – No fuze, No explosives**
- **Weighs 9.4 pounds**
- **Utilized for training by the U.S. Navy and U.S. Air Force**

Capability

- **Safe for use on both live-fire and electronic instrumented ranges**



M274 Signature (Practice) Warhead



Characteristics

- Training practice warhead for the M151 warhead
- Ballistic match to the M151 warhead
- Provides flash, bang, and smoke signature at impact for accurate scoring on firing range

Capability

- Smoke and flash visible up to 8 kilometers
- Useful for both day and night training
- Safe for use on both live-fire and electronic instrumented ranges



M282 High Explosive Incendiary (HEI) Warhead



Characteristics

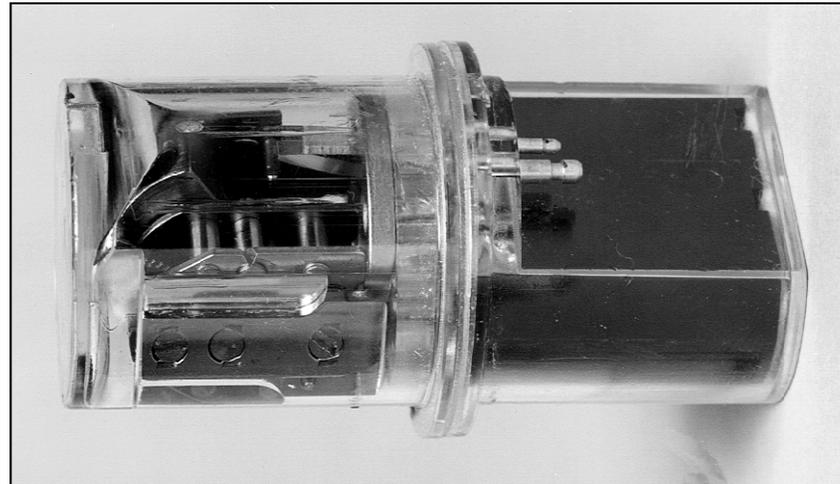
- Proprietary design by Norwegian Ammunition Company (NAMMO)
- Uses a M423-modified Safe & Arm
- Fuze has a “delay from impact” feature
- Contains plastic vent plugs, which improve the insensitive munitions (IM) performance

Capability

- Provides both blast fragment and incendiary effects
- Considered a “bunker buster”, the M282 is for engaging light armored vehicles, bunkers, and reinforced MOUT targets
- Currently in inventory with U.S. SOF and the U.S. Navy



M439 Remote Set Variable Time Fuze



Description

- **User selectable time delay for warhead activation (airburst) set by platform electronics**
- **Used on M264 and M255A1 warheads**
- **Mounted in base of warhead**

Characteristics

- **Weight - 0.24 pounds**
- **Length - 2.75 inches**
- **Diameter - 1.05 inches**
- **Maximum delay time from rocket launch ~25 seconds**



M442 Fuze



Description

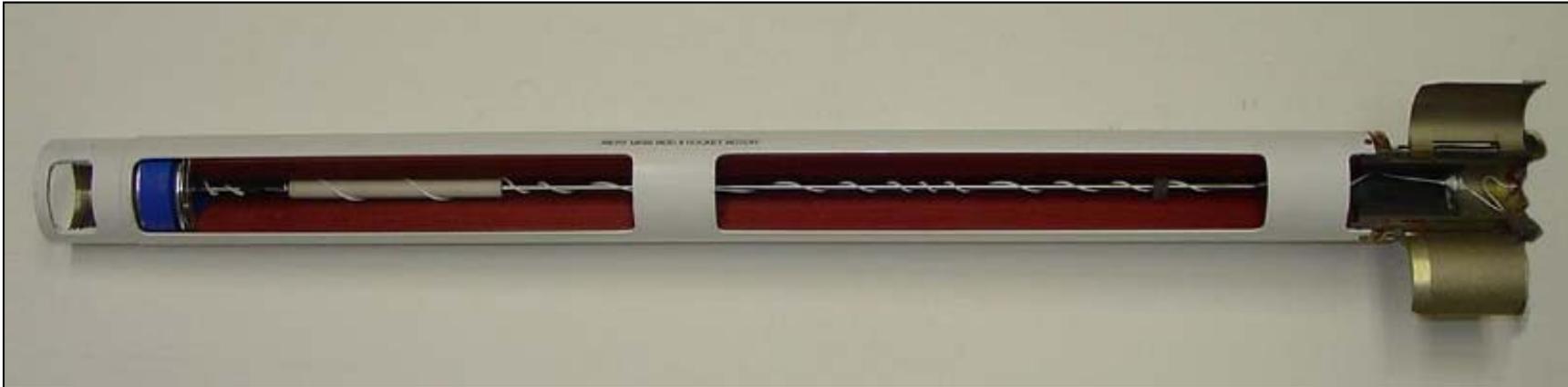
- **Airburst, motor-burnout followed by a delay**
- **8 to 10 second delay from motor-burnout (pyrotechnics)**
- **Used on M257 and M278 illumination (flare) warheads**

Characteristics

- **Weight - 0.6 pounds**
- **Length - 3.1 inches**
- **Diameter - 1.5 inches**
- **17 to 22g's to arm**



Mk66 Rocket Motor



Description

- **Current version is Mk66 Mod4**
- **Solid propellant**
- **Folding, wrap-around fins on nozzle**
- **Nozzle-induced spin (roll) for inertial stability**
- **Compatible with all U.S. DoD Hydra rocket warheads**

Characteristics

- **Weight – 13.6 lbs**
- **Length – 41.7 inches**
- **Burn time ~1.05 to 1.10 seconds**
- **Average Thrust ~1,300 to 1,370 lbs**
- **Burnout range ~1,300 feet**



U.S. Army Hydra Launchers



M260



M261



Description

- Light weight aluminum launchers
- Two variants
 - 7 rocket capacity (M260)
 - 19 rocket capacity (M261)
- Compatible with U.S. Hydra rockets, including remote set fuze rockets

Characteristics

M260	M261
• Weight – 35 lbs	• Weight – 82 lbs
• Length – 66.19 in	• Length – 66.19 in
• Diameter – 9.75 in	• Diameter – 15.875 in
• Standard 14" spaced suspension lugs	• Standard 14" spaced suspension lugs