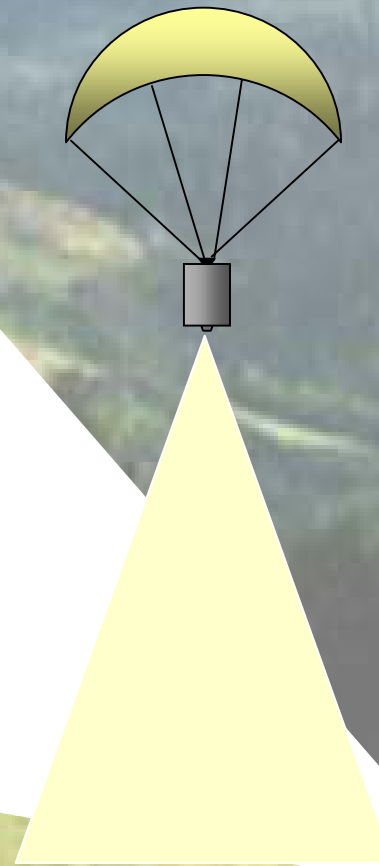
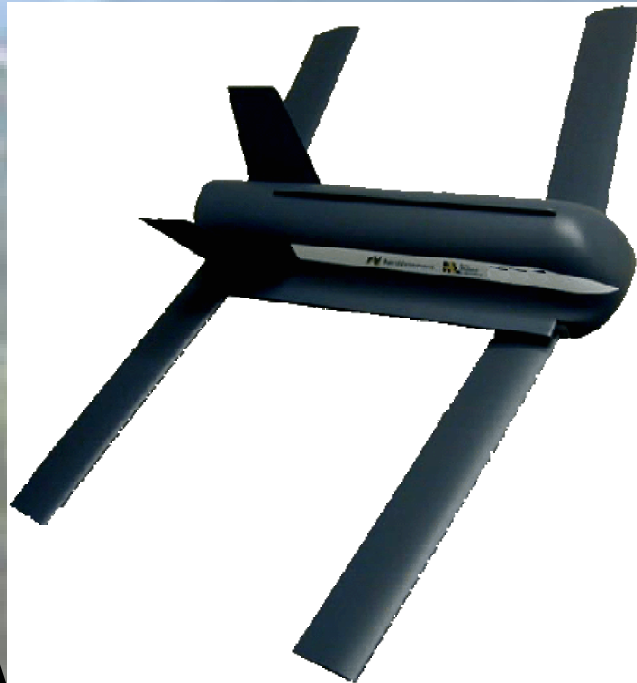


# *Mortar-Launched Recon/Targeting Programs*



**David H. Lyon**

**Chief (A), Ballistics and  
Weapons Concepts Division**

**Army Research Laboratory**

**(410) 306-0601**

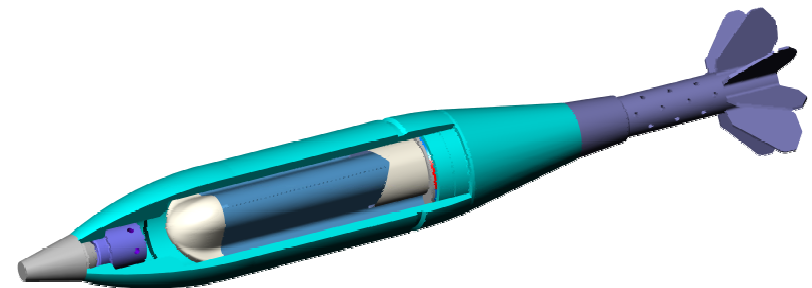
**lyon@arl.army.mil**



# **Mortar-Launched Recon to Provide ORGANIC Overhead Imagery**



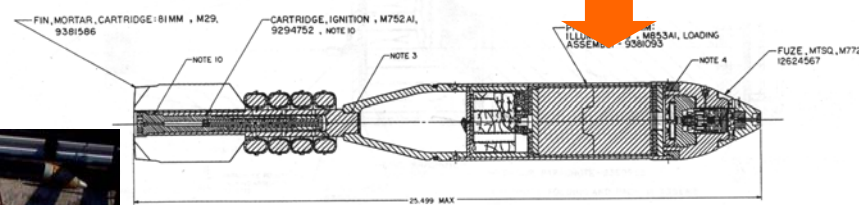
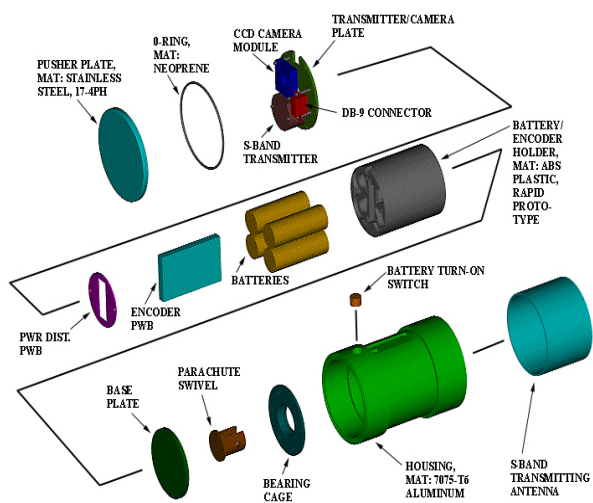
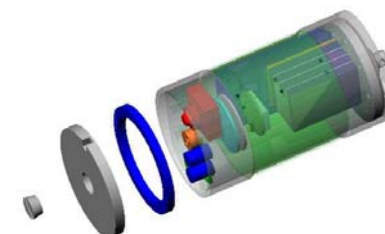
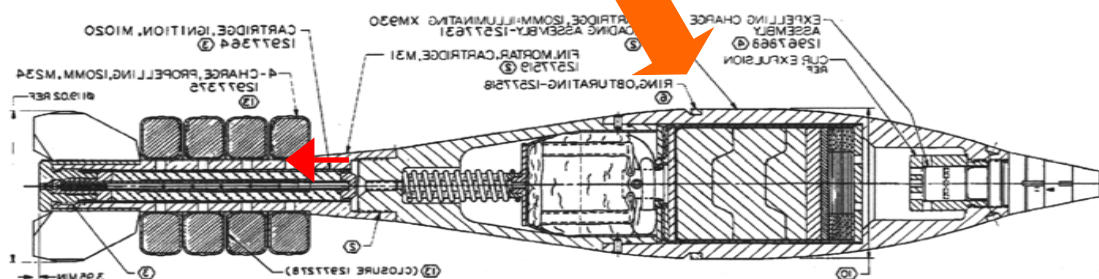
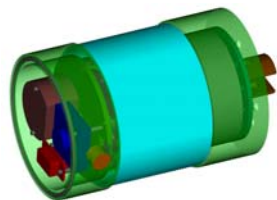
- **Parachute Imagers in both 120-mm & 81-mm**
  - Replace Illumination Candle with Video Camera
- **Mortar-Launched UAV in 120-mm**
  - Silent Operating Aerial Reconnaissance - SOAR
- **Forward Looking Camera**
  - Camera Mounted in Fuze





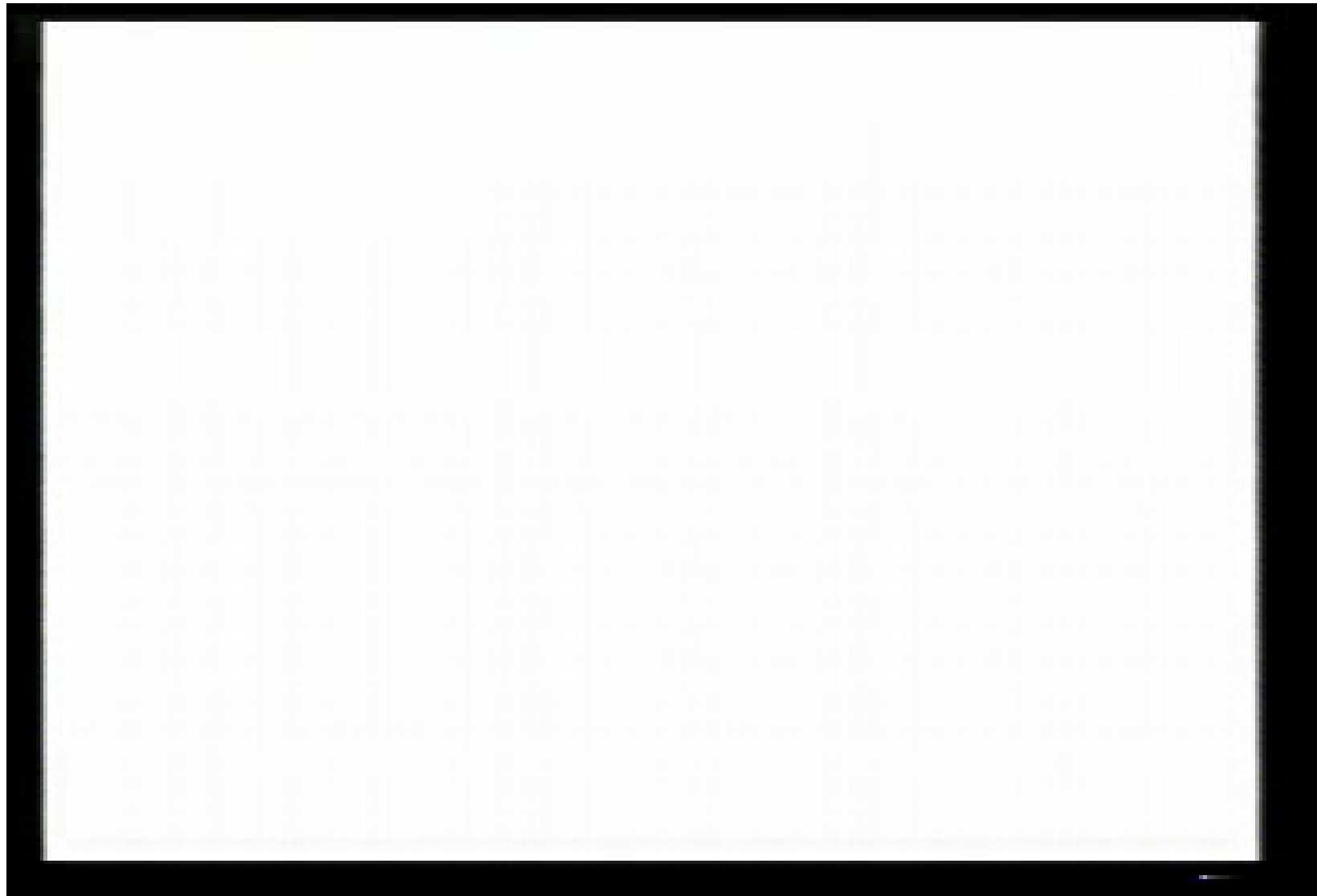
# Repackaged Current Illum. Rounds

## 120-mm M930 and 81-mm M853A1





# *Slow Motion Video (81-mm Tech Demo)*





# *Frames from Video (81-mm Tech Demo)*





# ***High Resolution Snapshot Air-Gun Launch 81-mm (Courtesy GTRI)***





# Silent Operating Aerial Reconnaissance SOAR

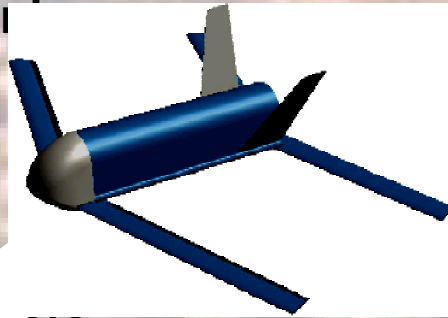


## SOAR Provides Real Time:

- Reconnaissance
- Targeting
- Battle Damage Assessment
- Metrological Data
- Communications Link

## Payloads:

- EO / IR Video
- Chem-Bio Sensors
- Acoustic, Magnetic, etc.
- Non-Lethal / Lethal



Deployment & transition to flight

Glide Ratio of 8:1



Target

Flight Plan can be programmed prior to launch or in air



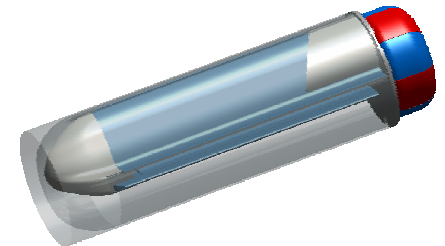
FO/SOCOM Operator



# What Separates SOAR from Other UAVs



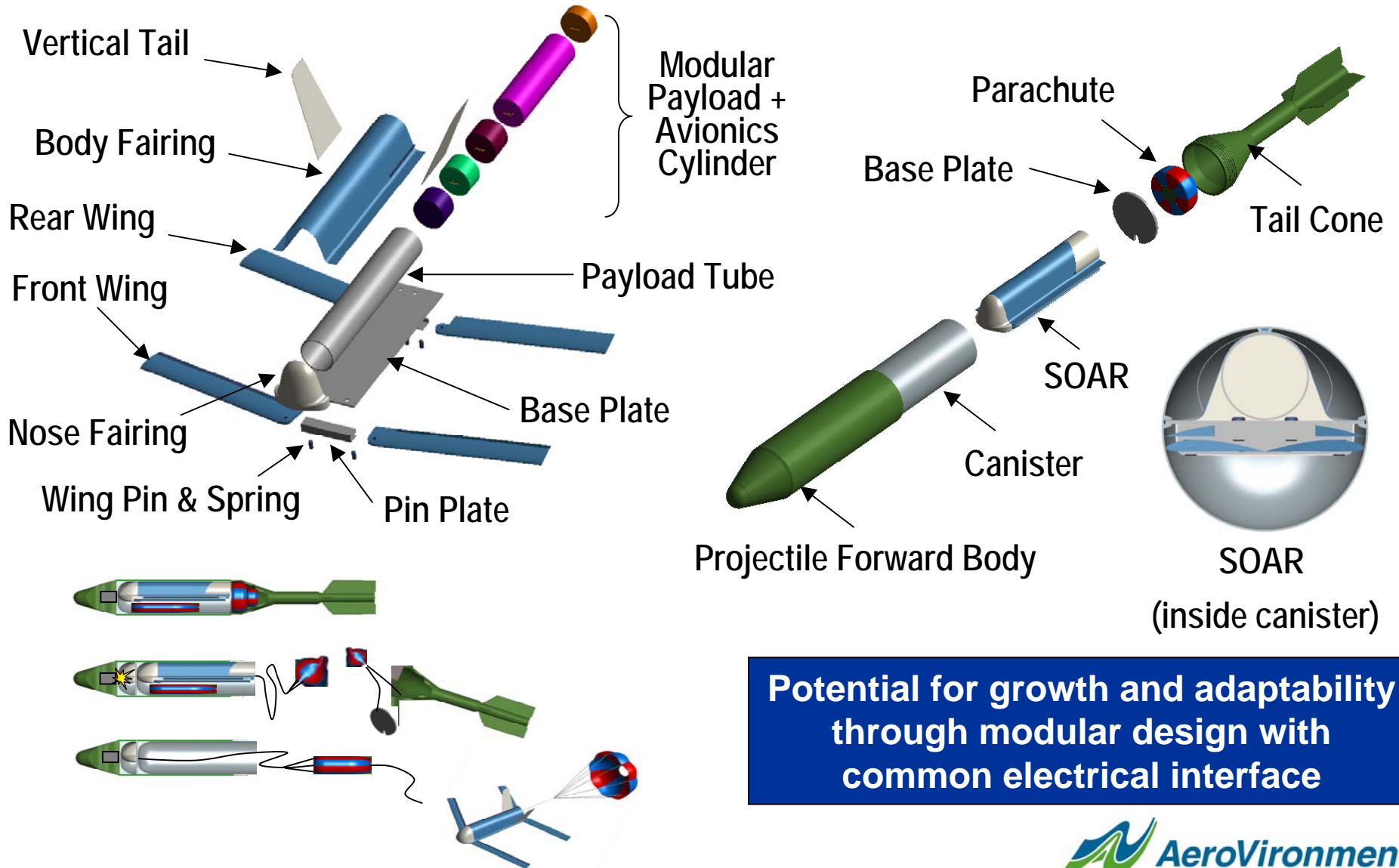
- **Organic Asset for Unit Level**
  - Down range and on-station quickly
  - Contains its own line-of-sight comms link
- **Stealthy**
  - Unseen, unheard, low RCS, low altitude
- **Low Cost Disposable Operation**
  - Low parts count = Simple construction
  - COTS sensors & GPS at low altitude = High resolution
- **Minimal Logistics Tail**
  - Launched from existing weapon systems
- **Glider demoed, Powered version Dec '03**
  - Glider deployed at 3 km = 24 km range, 20 min. air time
  - Electric power = 66 km range, 57 min. air time







# 120mm/105mm SOAR Package



Potential for growth and adaptability through modular design with common electrical interface



# ***SOAR Expulsion Testing (120-mm)***





# ***SOAR Expulsion Testing (120-mm)***



GT002, 1000 fps, 6/17/03, ARL BP





# SOAR Flight Experiments



- **Conducted 8 Test Flights**
  - Heads Down Video Display
  - Pilot-in-the-Loop Control
  - Airframe Stability Confirmed
- **Program Plans**
  - Confirm Mortar Launch and Dispense System – Oct 03
  - Electric Power Demo - Dec 03
  - Addition of GPS/way Point Navigation
  - Integration of Network Communications
  - Demo Gun-Hard Servos and Sensors
  - Full-up Technology Demo

