An Introduction to VERA: A Large Bore, Low Acceleration Transonic Impact Gun

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Birth of an Idea

SNORT rarely runs for “small” programs....

WHY?
COST
Next question:
Is there a low cost way to accelerate “small” payloads to useful velocities?
GUNS!

Problems...

- Acceleration profiles of traditional gun systems trend to the violent (payload reliability suffers).
- Procurement costs for large laboratory guns are high.
- Difficult to modify existing guns for unique test requirements.
What about a REALLY BIG “Potato Gun?”
Vera
Transonic Impact Gun
Muzzle Energy > 2 MJ
19” x 40’ barrel
Long Barrel Allows for Low Acceleration Forces

Minimum Acceleration Vs. Barrel Length
(to 1000 ft/s)
Large Chamber Minimizes Peak Acceleration
Muzzle Velocity
19” Bore for Large or Oddly Shaped Payloads

- Finned projectiles w/o folding fins
- Extreme AOA possible
Live or Inert Projectiles

- Mass up to 200 lbm
- Designed for fuzes and small warheads
- “Armed” ordnance in barrel is acceptable
Designed for Low Cost

• Easy modification for unique test requirements
  - Communication with projectile while in barrel is trivial
  - Low pressure operation
  - Standard industrial components (COTS)

• Propane & air powered
  - Zero administrative / magazine costs
It’s time to show the movie, Dave!
Summary

• Unique gun designed, built, and tested
  - Live or inert projectiles up to 200 lbm
  - Low acceleration forces (<600 Gs typical)
  - Useful velocities (Mach 0.5 – Mach 1.5)
  - Low cost construction & operation
  - Large bore (19 inch)

• **Attained IOC in fall, 2011**
Questions?
How is Vera Loaded?

- Break action
  - Long projectiles are not a problem.
What About Larger/Smaller Bores?

Vera was designed to accept multiple barrels with minimal effort.

- Adapt breech and hang new barrel from overhead support.
- 12” and 29” bores have already been studied.