Lightweight Small Arms Technologies
“The Epilogue”

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What is an Epilogue?

ep·i·logue  *noun*  \(\text{ˈe-}\text{-pə-, lōg, -, läg}\)

1 : a concluding section that rounds out the design of a literary work

2a : a speech often in verse addressed to the audience by an actor at the end of a play; *also* : the actor speaking such an epilogue

b : the final scene of a play that comments on or summarizes the main action
21.5 pounds of weight savings for the SAW Gunner

Total = 52.15 pounds

Total = 30.6 pounds

Standard M249

1000 Rounds of Ammo

LSAT Cased Telescoped

9.4

21.2
A Revolutionary, Next Generation Weapon System

**Cased Telescoped (CT) Light Machine Gun:**
- LMG and CT Ammo TRL 7 testing ongoing
- 37% ammo weight reduction / 12% volume reduction
- Light Machine Gun provides 48% weight reduction over M249 SAW (8.5 pounds)
- Over 45,000 rounds of CT ammo fired to date
- Pilot production facility for ammunition is operational

**Cased Telescoped (CT) Carbine:**
- Carbine action - TRL 5 completed in August 2011
- Approximately 250 rounds of CT ammo fired
- M4 size & weight, with 1” longer barrel
- With buttstock folded, weapon < 25” long
- Use of CT Ammo saves 2.5 lbs per combat load
CT Caliber Study
- Determine weight/size savings potential for calibers larger than 5.56mm
- Included 6.5mm, 7.62mm, .338 and .50 cal
- Designed to have same muzzle velocity and approximate chamber pressure as baseline brass cartridge
- Results: Weight savings ranged from 29.4% (.50 cal) to 42.8% (6.5mm); CT cartridges are between 20% and 30% shorter than their brass case counterparts

M855A1 EPR/Cased Telescoped Integration
- Preliminary analysis to determine if EPR projectile in the CT configuration is feasible
- Tested small quantities of CT EPR, measure velocity, pressure and dispersion in test barrel (not weapon)
- Goal was to achieve required muzzle velocity and dispersion
- Results: Initial testing of 130 rounds achieved the goals
- Follow up tests will be conducted in weapon, and at hot/cold temperatures
• CT LMG & Ammunition TRL 7 Assessment:
  – Tests based on qualification criteria (TOPs) for small arms & ammo
    • TOP 4-2-016 Ammunition, Small Arms
    • TOP 3-2-045 Small Arms – Hand, Shoulder Weapons, & Machineguns
  – Approximately 30,000 rounds of ammo tested
  – Assessing reliability, durability, environmental resilience, and safety
  – Testing nearly complete, remaining tests:
    • Weapon: Adverse conditions, high and low temperature
    • Ammunition: Thermal shock; Extreme temperature storage
  – Two tests require additional analysis and retest:
    • Weapon static dust
    • Weapon water spray
  – All others successfully passed TRL 7 criteria
LSAT Military Utility Assessment

- Conducted September 2011 at Ft. Benning by Maneuver Center Battle Lab, in coordination with ARL HRED
  - 19 soldiers (9 Infantry & 10 MP’s), plus 2 from 3/75th Rangers in a separate event
  - 2+ weeks, 8 CT LMGs under test, approximately 23,000 rounds fired
  - Comparative analysis of CT LMG against baseline M249 SAW
  - User surveys done after every event, and After Action Report at close out

- Sample Findings:

![Graph showing comparison between M249 and CT LMG on various attributes such as Most Accurate, Fastest Engagement Times, Best Firing Position, Preference for Day Engagements, Preference for Night Engagements, Preference for Woodland & Foot March, Preference for Urban, Easier to Engage Targets, and Preference for Use in Combat.](image)
Ammunition Pilot Plant

- Facility established at MAST Technology in Warrensburg, MO
- Output for pilot plant: 15,000 rounds per day
- Produced 65,000 rounds to date, additional 22,000 underway
- Provided baseline information for facilitization study

Bullet in Endcap

Cartridge Case

Primer Support
CT Plate Loading Key Process Steps

1. Loading Plates Readied
2. End Caps w/Bullets, Primed Case Positioned in Plates (Vibratory)
3. Propellant Drop (Volumetric)
4. Cartridges Removed from Plates
5. Propellant Compaction & End Cap Installation
6. Link and Pack
Leadership Exposure

- Between May 2011 and May 2012:
  - Nine live fire demos
  - Numerous briefings, from Specialist E-4 to Command Sergeant Major E-9, AMC Commander and the Army Acquisition Executive
Canadian Collaboration

- US & Canada joint efforts:
  - Canadians purchased cased telescoped ammunition and a quantity of ammunition components from AAI
  - Canada developing an assault rifle that uses CT Ammo
  - US-CA drafting a cooperative development program to include:
    - Weapons and Ammunition
    - Fire Control
    - Grenade Launched Munitions
    - Lethality
Summary

- **LSAT Addresses Critical Capabilities:**
  - Individual Soldier load reduced by 21.5 pounds for Automatic Rifleman
  - Selective fire increases mission versatility

- **Increases Effectiveness:**
  - Increased accuracy
  - Ability to carry more ammunition
  - Reduced probability of cook-off

- **CT System Maturity Increasing:**
  - TRL 7 assessment nearly complete
  - Ammunition pilot production shows feasibility of manufacturing process
  - User assessments and demos provide hands on feedback
A U.S. Army soldier with the 101st Airborne Division returns fire with a M249 light machine gun during combat operations in the valley of Barawala Kalet, Kunar province, Afghanistan, on March 29, 2011. DoD photo by PFC Cameron Boyd, U.S. Army.