Army Comparative Testing Programs: Foreign Comparative Testing (FCT) & Defense Acquisition Challenge (DAC)

Presented by:
AL TRAWINSKI

3IA Directorate
US Army RDECOM
Fort Belvoir, VA
“International Materiel Cooperation is NOT pushing papers; it’s buying and selling each others’ stuff; politicians understand THAT!”

Anon
Army FCT/DAC Vision

Provide the Best Soldiers in the World with the Best Equipment in the World.
Army FCT/DAC Mission

Test and Evaluation of Non-Developmental Items that Demonstrate Potential to Satisfy U.S. Army Requirements and will then be Procured
1980 - 89: The Foreign Weapons Evaluation (FWE) Program

1986 - 89: The NATO Comparative Testing (NCT) “Nunn Amendment” Program

1990 - 2003: The Foreign Comparative Testing (FCT) Program

2003 – Present: FCT and Defense Acquisition Challenge (DAC) Programs
FCT/DAC AUTHORITY AND POLICY

- Congressionally Mandated Programs
- Consistent With DoD Acquisition Policy
- Key Objectives
  - Improve Warfighting Capability (Better)
  - Accelerate Fielding (Faster)
  - Save Taxpayer Funds (Cheaper)

DoDD 5000.1
12 May 03
The Defense Acquisition System
1. The procurement or modification of commercially available products, services and technologies from domestic or international sources, or the development of dual-use technologies

2. The additional production or modification of previously developed US and/or Allied military systems or equipment

3. A cooperative development program with one or more Allied nations

4. A new Joint DoD Component or Government Agency development program

5. A new DoD Component unique development program
FCT / DAC in the Acquisition Cycle

- Technology Development
- System Development & Demonstration
- Production & Deployment
- Operations and Support

- ACTDs
- Tech Transition Initiative
- Defense Acquisition Challenge
- Foreign Comparative Testing
- Dual Use Science & Technology - DUS&T
- Tech Link
- COSSI
- Manufacturing Technology - ManTech
- Title III of the Defense Production Act
ANNUAL FCT/DAC CYCLE

PROJECTS APPROVED AND FUNDED; CALL FOR NEW PROPOSALS
DRAFT PROPOSALS DUE TO ARMY
FINAL PROPOSALS TO DUE TO ARMY
FINAL PROPOSALS DUE TO OSD
OSD REVIEW & SELECTION

FCT/DAC REVIEW PROCESS

OCT
FEB
APR
JUN
AUG

Flat Panel Displays For Target Acquisition
Portable Welding Robots
Night Attack Avionics
Field Bakery Plant
NBC Decontamination System
## PROJECT SELECTION PROCESS

### SERVICE REVIEWS
- Army Candidate Projects
- Navy/Marines Candidate Projects
- Air Force Candidate Projects
- SOCOM Candidate Projects

### OSD REVIEWS
- Army Review
- Navy Review
- Air Force Review
- SOCOM Review
- CTO Staff Review

### CONGRESS APPROVES
- Dir, CT Office Recommended Projects
- DUSD(AS&C) Recommended Projects

<table>
<thead>
<tr>
<th>Service Reviews</th>
<th>OSD Reviews</th>
<th>Congress Approves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army Candidate Projects</td>
<td>Army Review Committee</td>
<td>DIR, CT Office Recommended Projects</td>
</tr>
<tr>
<td>Navy/Marines Candidate Projects</td>
<td>Navy Review Committee</td>
<td>DUSD(AS&amp;C) Recommended Projects</td>
</tr>
<tr>
<td>Air Force Candidate Projects</td>
<td>Air Force Review Committee</td>
<td></td>
</tr>
<tr>
<td>SOCOM Candidate Projects</td>
<td>SOCOM Review Committee</td>
<td></td>
</tr>
</tbody>
</table>

Each Project That Is Funded Has Gone Through Multiple Disciplined Reviews
**EVALUATION CRITERIA**

**USER ADVOCACY**

**SERVICE PROCUREMENT**

**DOLLARS IDENTIFIED**

**SATISFY FORMAL REQUIREMENTS**

- **ORD / MNS**
- **Versatile Exercise Mine System (UK)**

<table>
<thead>
<tr>
<th>Survey</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**MARKET SURVEY OF U.S. AND FOREIGN SOURCES**

- Small Unit Support Vehicle (Sweden)
- Mine System (UK)
IDENTIFIABLE ADVANTAGE

ITEM IN PRODUCTION

.50 CAL Plastic Ammunition (Germany)

IN USE BY FOREIGN COUNTRY

Lightweight CB Protective Garment (UK)

IDENTIFIABLE ADVANTAGE

FOREIGN OFF-THE-SHELF ITEM

U.S. EXISTING/DEVELOPMENT

PERFORMANCE

FOREIGN OFF-THE-SHELF ITEM

U.S. EXISTING/DEVELOPMENT

COST

ACQN STRATEGY/ CONTRACT STRATEGY

REASONABLE EXPECTATION

CBD ANNOUNCEMENT

PRICED OPTIONS

WITHOUT FURTHER COMPETITION

CRITICAL EVALUATION CRITERIA FOR FCT FUNDING
FCT/DAC MANAGEMENT OVERSIGHT

• QUARTERLY PROGRESS REPORT
• UPDATED PROJECT CHART
• MID-YEAR OSD/SERVICE REVIEW
• ANNUAL REPORT TO CONGRESS
• CLOSE-OUT REPORT
• PROCUREMENT UPDATES
International Participation in Army FCT (Thru FY 04)

22 Countries
182 Projects
24 Years

FCT Funding Received - $185 M
Army FCTs Resulting in Fielding (Thru FY04)

11 Countries
55 Items

- United Kingdom - 11 ($1.60 B)
- France - 4 ($190 M)
- Israel - 6 ($140 M)
- Sweden - 5 ($450 M)
- Switzerland - 1 ($80 M)
- South Africa - 2 ($30 M)
- Denmark - 1 ($10 M)
- Canada - 6 ($100 M)
- Norway - 2 ($110 M)
- Germany - 18 ($730 M)
- Australia - 1 ($30 M)

Totaling $4.5 B in Procurement
FCT is Successful!

- Increased combat capabilities:
  - Army: $4.5 B in procurements from $185 M OSD FCT funds received (55 items from 11 countries)
  - Increased Allied Rationalization, Standardization, Interoperability/Multinational Force Compatibility

- RDT&E cost avoidance:
  - $2.5 B in Army RDT&E costs avoided for $185 M
  - Average reduction in fielding time = 5.0 years
  - Eliminates duplication of RDT&E (182 projects with 22 countries)

- Procurement and O&S costs savings:
  - Increased Competition, Decreased Costs
  - Industry Teaming/Licensing; US Production=US Jobs
  - Offset credit
2 Success Stories

M119A1

7.62 Training Ammo
FCT/DAC POCs

✦ OSD: Dan Cundiff, 703-602-3740
✦ Army: Al Trawinski, 703-806-0999
✦ Navy: Mike Locke, 202-764-2448
✦ USAF: Fred Howell, 703-588-8945
✦ USMC: Shawn Prablek, 703-432-4296
✦ SOCOM: Bill Burke, 813-828-9426

✦ www.acq.osd.mil/cto
✦ www.fedbizopps.gov
✦ https://bids.acqcenter.com.cto
105mm Preformed Fragments

Technology
Improved lethality and increased range, due to unique design, over current U.S. 105mm ammo.

Objectives
Evaluate for procurement. Predict will save $30M in RDT&E and $96M in Procurement costs. 4 – 6 years accelerated fielding.

Participants
• U.S. Army PM-Combat Ammunition Systems, Picatinny Arsenal, NJ
• GDOTS/Denel-Naschem, South Africa

Comments
FCT Funding: $0.965M (FY03) + $1.0M (FY04)
Status: Letter contract awarded to vendor. Initial TWIG conducted. USMC interest – “observer”.
Procurement: Replacement projectiles for M107, M795, M1, M913 buys starting FY04.

POC: Al Trawinski, 703-617-4712
155mm Ammunition

**Technology**
Greatly increased range, due to unique design, over current U.S. 155mm ammo.

**Objectives**
Evaluate for procurement. Predict will save $14M in RDT&E and $58M in Procurement costs. 4 – 6 years accelerated fielding.

**Participants**
- U.S. Army PM-Combat Ammunition Systems, Picatinny Arsenal, NJ
- GDOTS/Denel-Naschem, South Africa

**Comments**
FCT Funding: $1.7M (FY03) + $1.0M (FY04)
Status: Letter contract awarded to vendor. Initial TWIG conducted. USN and USMC added to IPT.
Procurement: Replacement projectiles for M107, M795, M1, M913 buys starting FY04.

POC: Al Trawinski, 703-617-4712
FCT Individual Serviceman NL System

Technologies

• **FN303 Less Lethal Launcher (FN)**
  - Compressed air powered launcher designed to fire 0.68 caliber 8.5 g less-than-lethal projectiles
  - Allows for greater engagement range, higher accuracy, and higher rates of fire than any currently fielded NL capability

• **Constant Kinetic Effect Weapon (Beretta)**
  - Uses terminal constant kinetic energy to ensure the non-lethal dose at the required range
  - Use of a variable gas outlet to regulate muzzle velocity

Capabilities

• **FN303**
  - 1-100 m effective engagement range; 4 types of projectile: Impact, Washable, Indelible, and OC
  - 110 shot capacity air bottle, 15 round magazines

• **Beretta**
  - 10-70 meters Effective Engagement Range
  - Constant Kinetic Energy Across Range; Max Impact Energy, 120 J
  - Accurate to 1 m at 70 m range

Comments

FCT Funding: $376K (FY05) + $613K (FY06)

Procurement: Minimum of 252 systems projected to be procured from FY05-07. Potential for up to 6624 systems.

Cost Avoidance: R&D $2.1M; Procurement N/A; O&M TBD
### System Description

#### Objective
Qualify celluloid mortar increment containers (MICs) for U.S. 60mm and 120mm propulsion systems.

#### Background
MICs are utilized to contain/protect propellant and therefore are a key component of High Explosive, Smoke, Illuminating and Practice propulsion charge systems. KAGO is the world leader in celluloid material production and has the facilities capable of manufacturing 60mm and 120mm MICs.

### Benefits

Use of celluloid MICs has significant potential to **reduce cost** and **improve the robustness** of the MIC for semi and auto-loading capabilities, i.e., *Future Combat System (FCS)* application.

Celluloid MICs provide **100% waterproofing and air tightness**.

### Technical Approach

- Procure test quantities and conduct a test and evaluation program comparing celluloid MIC performance with current production MICs. The following tests will be conducted at YPG:
  - Velocity & Pressure
  - Adverse Condition
  - Hot & Dry Cycle
  - Cold Soak
  - Sequential Rough Handling
  - Residue & Debris
  - Secured Cargo Vibration
  - Rate of Fire

### Funding

**Total OSD FCT Funding:**

- FY04: $0.755M
- FY05: $0.470M

**Participants:**
- EWETD, AETC
- Picatinny Arsenal, NJ
- Kaufman and Gottwald Ges.m.b.h. (KAGO)
  - Vienna, Austria
- U.S. Army Yuma PG, AZ

POC: Mr. Al Trawinski, 703-806-0999
120MM MORTAR PROPELLANT

System Description

FOREIGN COMPARATIVE TESTING (FCT) PROGRAM
OBJECTIVE
Qualify an extruded-impregnated (EI) propellant for the U.S. 120mm propulsion system.

BACKGROUND
Nitrochemie Wimmis AG, Switzerland has state-of-the-art manufacturing facilities and equipment capable of producing 120MM EI propellant.

Technical Approach
Procure test quantities and conduct a test and evaluation program comparing 120mm Mortar EI propellant performance with current production M47 propellant.
The following tests will be conducted at YPG:
- Velocity & Pressure
- Blast Overpressure/Flash
- Adverse Condition
- Hot & Dry Cycle
- Cold Soak
- Sequential Rough Handling
- Secured Cargo Vibration
- Propellant Volume
- Rate of Fire

Benefits
Supports Future Combat Support (FCS) System – Lower temperature coefficient that has the potential to increase range for 120MM mortar cartridges by up to 15%
Elimination of diphenylamine (DPA) as a stabilizer to comply with:
Executive Order 128526 – Eliminate or reduce the unnecessary acquisition of products containing extremely hazardous substances or toxic materials
Lower flame temperature resulting in a reduction of blast over pressure and an increase in rate of fire
Increased propellant stability / 3 times longer shelf life

Comments
Total OSD FCT Funding:
FY04: $0.575M
FY05: $0.500M
Participants:
- EWETD, AETC
  Picatinny Arsenal, NJ
- Rheinmetall Nitrochemie Wimmis AG
  Switzerland
- U.S. Army Yuma PG, AZ

POC: Mr. Al Trawinski, 703-806-0999
Participants
- U.S. Army / U.S. SOCOM
- PM-SW / PM-MAS
- Israeli Military Industries

Schedule
- Contract Award: 4Q/FY06
- Technical Test: 3Q/FY07
- Milestone C: 1Q/FY08

Status* - Pending Program Approval

Technology
- Multiple Projectiles fired from Muzzle Launched Ordnance attached to M16/M4 rifles/carbines.

Objectives
- Qualify for the production of a 40mm Anti-Personnel Cartridge.

Funding

<table>
<thead>
<tr>
<th>Funding ($K)</th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO</td>
<td>625</td>
<td>1800</td>
<td>400</td>
<td>2825</td>
</tr>
</tbody>
</table>

Benefits
- RDT&E Cost Savings: Cost avoidance of $2M
- Procurement Potential: High – Substitution into current procurement lines for 40mm ammunition will occur pending Type Classification.
- Implementation Plan/Other Benefits: Improved anti-personnel capability against multiple targets at close range

POC: Al Trawinski, 703-806-0999
AT4CS Enhanced Blast Tandem Weapon
Foreign Comparative Test Program (FY06)

**Participants**
Service Lead: US Army
Other Service Interest: USSOCOM
Program Manager: PM CLOSE COMBAT SYSTEMS
Vendor: Saab, Sweden

**Schedule**
Test Articles Received: Mar 07 (12 MAC)
DT/OT Testing: Mar 07 – Dec 07 (10 Mo. Duration)
IPR: Feb 08

**Status**
Proposal

**Technology**
Through-the-Wall Enhanced Blast AT4CS Weapon System for Enhanced MOUT

**Objectives**
Conduct safety, performance, environmental and operational test and evaluation required to make an acquisition decision.

**Type of FCT:** Qualification Test to Procure

**Funding**

<table>
<thead>
<tr>
<th></th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO</td>
<td>$1.38M</td>
<td>$2.215M</td>
<td>$0.285M</td>
<td>$3.88M</td>
</tr>
<tr>
<td>Sponsor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RDT&amp;E Cost Savings:</td>
<td>$20M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement Cost Savings:</td>
<td>$105M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fielding Reduction:</td>
<td>5 Years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement Potential:</td>
<td>5,000/yr</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

POC: Al Trawinski / Army FCT Office
PM: Gary Barber, PMCCS (973) 724-6778

M:\Briefing\ArmyFCT3.ppt
5.56mm Tracer Cartridge
Foreign Comparative Test

Participants
- U.S. Army / U.S. SOCOM
- PM-SW / PM-MAS
- NAMMO, Norway
- IMI, Israel
- SNC TEC, Canada

Schedule
- Contract Award: 2Q/FY06
- Technical Test: 1Q/FY07
- Milestone C: 4Q/FY07

Status* - Pending Program Approval

Technology
- Pyrotechnic technology for use in tracer cartridges to control fire direction with Day/Night Vision Devices.

Objectives
- Qualify foreign vendor(s) for the production of a 5.56mm IR Dim Tracer Cartridge.
- Qualify a 2nd source for the current tracer cartridge to enhance the U.S. industrial production base capacity.

Funding

<table>
<thead>
<tr>
<th>Funding ($)K:</th>
<th>FY06</th>
<th>FY07</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO:</td>
<td>745</td>
<td>1,275</td>
<td>2020</td>
</tr>
<tr>
<td>Sponsor</td>
<td>500</td>
<td>500</td>
<td>1000</td>
</tr>
</tbody>
</table>

Benefits
- RDT&E Cost Savings: Cost avoidance of $2M
- Procurement Potential: High – Substitution into current procurement lines for linked 5.56mm ammunition will occur pending Type Classification.

POC: Al Trawinski, 703-806-0999
## Family of Extended Range Ammunition (FERA)

### FCT

#### Technology
- Cargo carrier with rocket motor for increased range
- Variety of payloads are planned (HE, Illumination, Non-Lethal, and Training)

#### Objectives
- Combination of increased range & lethality allows for greater organic responsiveness
- STO III.H.12 completed in 2001 and transitions to PM-CAS in FY07 for SDD

### Participants
- RDECOM/ARDEC AETC, MS & TD
- PM Mortars / PM CAS
- Picatinny, NJ 07806-5000
- IMI, Israel
- TDA/GD, France/US

### Schedule
- STO III.H.12 completed in 2001 and transitions to PM Mortars / PM-CAS in FY07 for SDD

### Funding

<table>
<thead>
<tr>
<th></th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO</td>
<td>$2M</td>
<td>$6M</td>
<td>$4M</td>
<td>$12M</td>
</tr>
</tbody>
</table>

### Benefits
- RDT&E Cost Savings: $58M
- O&S Cost Savings:
- Procurement Cost Savings:
- Fielding Reduction:
- Procurement Potential: Replacement of current ammo
- Implementation Plan/Other Benefits:
# 40mm IR Illumination Cartridge

## Foreign Comparative Test

### Participants
- U.S. Army / U.S. SOCOM
- PM-SW / PM-MAS
- Nico Pyrotechnic, Germany

### Schedule
- Contract Award: 4Q/FY06
- Technical Test: 3Q/FY07
- Milestone C: 1Q/FY08

### Status
- Pending Program Approval

### Technology
- IR Pyrotechnic technology for use in 40mm Illumination to enhance Day/Night Vision Devices.

### Objectives
- Qualify foreign vendor(s) for the production of a 40mm Infra-red Illumination Cartridge.

### Funding

<table>
<thead>
<tr>
<th></th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO: Sponsor</td>
<td>790</td>
<td>955</td>
<td>420</td>
<td>2165</td>
</tr>
</tbody>
</table>

### Benefits
- RDT&E Cost Savings: Cost avoidance of $2.2M
- Procurement Potential: High – Substitution into current procurement lines for 40mm ammunition will occur pending Type Classification.
- Implementation Plan/Other Benefits: Improved capability on battlefield to detect and recognize targets.

POC: Al Trawinski, 703-806-0999
Non-Lethal Bursting Hand Grenade

**Technology**
To provide a Hand Thrown Munition to the US Army Military Police School (USAMPS) and the Non-Lethal Capability Set (NLCS).

**Objectives**
To Type Classify and field a NLBHG which will provide the soldier an alternative force option to lethal force in civil unrest and crowd control situations.

**Participants**
- **<Sponsoring Service>**
  U.S. Army (USAMPS)
- **<Sponsoring Program Office>**
  U.S. Army (OPMCCS)
- **<Company, Country/State>**
  France

**Schedule**
- Contract Award: 2Q/FY08
- Milestone OT: 3Q/FY09
- Milestone C: 1Q/FY10

**Status**
Unfunded

**Funding**

<table>
<thead>
<tr>
<th>Funding ($)</th>
<th>FY05</th>
<th>FY06</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO</td>
<td>$225</td>
<td>$1600</td>
<td>$1825</td>
</tr>
</tbody>
</table>

**Benefits**
- RDT&E Cost Savings: TBD
- O&S Cost Savings: TBD
- Procurement Cost Savings: TBD
- Fielding Reduction: TBD
- Procurement Potential: TBD
- Implementation Plan/Other Benefits: Operational Capability

**POC**
Al Trawinski / DSN 767-0999

**PM**
Mr. Yusif H. Yafai / DSN 880-6794
Reconnaissance Cartridge
DACP

Technology
• IR camera technology for use in Rifle Grenade or 40mm Cartridge to provide real time battlefield situational awareness

Objectives
• Qualify for the production of a Reconnaissance Rifle Grenade and a 40mm Cartridge.

Participants
• U.S. Army
• PM-SW / PM-MAS
• IMI, Israel
• MEI, USA / FL

Schedule
Contract Award 4Q/FY06
Technical Test 3Q/FY08
Milestone C 3Q/FY08

Status* - Pending Program Approval

Funding
Funding ($K): FY06 FY07 FY08 Total
CTO: 1575 2250 600 4425

POC: Al Trawinski, 703-806-0999

Benefits
RDT&E Cost Savings: Cost avoidance of $4.4M
Procurement Potential: High – Substitution into current procurement lines for 40mm ammunition will occur pending Type Classification.
Implementation Plan/Other Benefits: Improved capability on battlefield to detect and recognize targets.
Operational Capability:
- This proposal applies innovative surface and plasma engineering technology to gun bore surface and interface to improve adhesion of bore coating. New technology is applicable to coating process for all caliber tri-service gun systems.

- Improve gun manufacturing processing by replacing concentrated acid pre-clean bath, use hollow cathode discharge and hydrogen plasma clean, surface and interface nitriding, and ion-assisted and in-situ physical vapor deposition technology.

- This project meets EPA mandates for environmental friendly wear and erosion resistant coatings, improves fatigue life and performance of future guns to deliver hot projectiles. Technology targets FCS 120mm smooth-bore and 155mm rifled-bore sections, applicable to NAVY Advanced Gun Systems.

Proposed Technical Approach: New Effort
Phase 1 (FY05): (Coupon sample demonstration)
• Improved electrochemical clean with new NaCl etc electrolytes.
• Hydrogen plasma cleaning and nitriding for enhanced adhesion.
• Ion-assisted cylindrical and in-situ magnetron deposition.
• Demonstrate superior adhesive coatings on gun steel coupons.

Phase 2 (FY06): (Bore section deposition)
• Optimize new surface clean, interface preparation, and coating deposition techniques.
• Demonstrate superior adhesive coatings on FCS 120mm smooth bore and 155mm rifled bore sections.
• Analytic testing, vented combustor firing tests.
• Technology transition to US Army Coating Program MTO-CMS, full scale FCS and Navy AGS gun systems.

Rough Cost and Schedule:
Phase 1 (FY05), Period of performance is 12 months, cost $390K
Phase 2 (FY06), Period of performance is 12 months, cost $390K
Total Period of Performance is 24 months, Total cost is 780K

Deliverables:
• Coated gun bore sections with superior adhesion and wear properties.
• Improved coatings deposition process, including pre-cleaning, surface and interface preparation and nitriding, and ion assisted deposition.
• Report summarizing accomplishments.

Investigator Information:
Dr. Sabrina Lee
US ARMY-RDECOM-ARDEC-Benet Labs, AMSRD-AAR-AEW
Watervliet, NY 12189-4050
518-266-5503, DSN 374-5503, sabrilee@pica.army.mil
BARREL ARMOR
DACP

Technology
TPL has demonstrated the ability to explosively bond refractory metals on the interior curved surfaces of medium and large caliber gun tubes. The resulting metallurgical bond can withstand the interior ballistic forces, and resist the harsh chemical and thermal environment generated by repeated, rapid cannon firing.

Objectives
Erosion resistant gun barrels that will extend barrel life 400%; bridges the war fighter gap and creates a life cycle savings due to logistics, enhanced survivability and greater lethality

Participants
United Defense, LP (UDLP)
NSWC Dahlgren
PEO IWS
ARDEC, Benet, ARL
SFAE-AMO-MAS

Schedule
25/30mm firing test 03Q05
Cost assessment report 03Q05
Manufacturing Process Report 03Q05
76mm firing test 04Q05

Funding

<table>
<thead>
<tr>
<th>Funding ($K):</th>
<th>FY05</th>
<th>FY06</th>
<th>FY07</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO (mortars):</td>
<td>$478</td>
<td>$478</td>
<td>$0</td>
<td>$956</td>
</tr>
<tr>
<td>CTO (tank):</td>
<td>$400</td>
<td>$1,000</td>
<td>$600</td>
<td>$2,000</td>
</tr>
</tbody>
</table>

• Mortar funding can slide to FY06 and FY07 with the same total if required by funding cycles.

• Tank funding can be $1MM in FY06 and $1MM in FY07 if required by funding cycles.

• TPL is prepared to start work in 03Q05 on both programs.
## Enhanced Forcible Entry Cannon DACP

### Technology

The Project is to use the GDLS/DENEL 105mm Self-propelled Howitzer (SPH) as a technology carrier to demonstrate the ability for a candidate EFEC howitzer to fire both US semi-fixed ammunition, as well as, the ACAAP (DENEL) projectiles and the modular charge system. As the armament will be the same for the EFEC and the LAV III demonstrator, the use of the SPH will allow the US Army to not only demonstrate the ability of the cannon to fire both types of ammunition, but will also allow the Army to characterize the entire system.

### Objective

The objective is to determine whether the cannon system can fire both US semi-fixed ammunition and DENEL ACAAP ammunition with modular charges and can be configured for either in a short (1 ½ hour) time span. While proving the concept, it will also allow complete characterization of the system to include projectile, propellant and breech/barrel, as well as, safety certification and partial qualification of the system. Furthermore, it will allow soldiers to handle the system and make any recommendations for improvement they want to see on the towed demonstrator which will be substituted for the SPH when it is completed in FY06.

### Participants

**US Army**  
PM CAS  
GDLS, USA  
DENEL, South Africa

### Schedule

| Characterization/Safety Cert | 4thQtr/FY06 |
| Qualification | 4thQTR/FY07 |
| OT | 4thQTR/FY08 |
| Milestone C | 1thQTR/09 |

### Funding

<table>
<thead>
<tr>
<th>Funding ($K):</th>
<th>FY06</th>
<th>FY07</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO:</td>
<td>$1.8M</td>
<td>$1.4M</td>
<td>$3.2M</td>
</tr>
<tr>
<td>Sponsor</td>
<td>UNK</td>
<td>UNK</td>
<td>UNK</td>
</tr>
</tbody>
</table>

### Benefits

- RDT&E Cost Savings: >$220M
- O&S Cost Savings: >$100-300M
- Procurement Cost Savings: >$250M
- Procurement Potential: 735 Total >$1B
- Implementation Plan/Other Benefits: SDD for EFEC could be much shorter and in the hands of the troops sooner.

POC: Al Trawinski, (703) 806-0990  
PM: Jim Vickrey, 596-826-8412
Extremely Low Signature Projectile Launch System

DACP

Technology
The Extremely Low Signature Projectile Launch System is a stealthy, indirect fire weapon. It incorporates a device that can propel lethal, less than lethal and UAV payloads without any detectable heat or light and almost no sound. It has individual soldier and vehicle or ground multiple launch options.

Objectives
Demonstrate system capability and UAV Integration.

Participants
Vendor: United Defense ASD, Minneapolis MN

Schedule
Ph 0: Kick Off Q1/FY06
Ph I: Demonstration Q2/FY06
Ph II: UAV Integration Demo Q2/FY07

Funding Requested
Funding ($K): <FY06> <FY07> Total
CTO: <$> <$> <$
Sponsor <$> <$> <$

Benefits
Capability Improvement Using a US manufactured version of a system fielded by every arm of the French military.

United Defense POC: Patrick Schmidt 763-572-4959
Optimize Lightweight Cannon Production via In-Bore Stress Monitoring of Composite Overwrap and Double Autofrettage Processes

Technology
Innovative cannon manufacture processes, composite overwrap and double swage autofrettage, reduce cannon weight while maintaining strength and fatigue life. Nondestructive stress technology maps stress distributions at ID and OD. Combined with finite element modeling, the technology can optimize these processes for transition of prototype to production. Technology is applicable to large caliber FCS (NLOS/BLOS and NLOS-C) and Legacy 120mm and 155mm cannons.

Objectives
To test-evaluate-fabricate an in-bore stress analyzer to optimize large caliber cannon production; To optimize innovative composite overwrap and dual swage processes for cannon weight reduction. Successful completion of the project delivers an in-bore stress analyzer and optimized process parameters with safe maximum pressure and life.

Participants
<US Army>
<US Army-RDECOM-ARDEC-Benét Labs>
<Proto Manufacturing, Old Castle, ON, Canada-Ypsilanti, MI>
<Technology for Energy Corp, Knoxville, TN>

Funding

<table>
<thead>
<tr>
<th>Funding (SK)</th>
<th>&lt;FY06&gt;</th>
<th>&lt;FY07&gt;</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO:</td>
<td>&lt;$600k</td>
<td>&lt;$600k</td>
<td>&lt;$1,200k</td>
</tr>
<tr>
<td>Sponsor</td>
<td>&lt;$100k</td>
<td>&lt;$100k</td>
<td>&lt;$200k</td>
</tr>
</tbody>
</table>

Benefits

RDT&E Cost Savings:
O&S Cost Savings: <based on FCS-Abrams production schedule>
Total Benefits = $22M (10 yrs), $34M (20 yrs)
BIR = 12.4 (10 yrs), 14.7 (20 yrs); ROI = 57.0%
Procurement Cost Savings: <N/A>
Fielding Reduction: <N/A>
Procurement Potential: <N/A>
Implementation Plan/Other Benefits: <PM-Lethality shall implement in-bore stress technique and optimized manufacturing processes for cannon weight reduction, increased strength and life savings>

Schedule
1Q-2Q/06: Test-evaluate prototype in-bore stress analyzers
2Q/06-2Q/07: Design-modify-fabricate in-bore stress analyzer
2Q-4Q/07: Establish stress quality procedures for gun tubes
2Q/06-2Q/07: Testing double swage autofrettage process
2Q/06-2Q/07: Testing composite overlap process
3Q/06-3Q/07: FEM of elastic-plastic deformation in processes
1Q-3Q/07: Operational testing for double swage
4Q/07: Optimize manufacture process parameters
4Q/07: Documentation and Technology Deployment

Status
POC: <Dr. Sabrina Lee, Mr. D. Crayon/518-266-5503>
PM: <Mr. Pete DeMasi/973-724-4938, DSN 880-4938>

Technology
Innovative cannon manufacture processes, composite overwrap and double swage autofrettage, reduce cannon weight while maintaining strength and fatigue life. Nondestructive stress technology maps stress distributions at ID and OD. Combined with finite element modeling, the technology can optimize these processes for transition of prototype to production. Technology is applicable to large caliber FCS (NLOS/BLOS and NLOS-C) and Legacy 120mm and 155mm cannons.

Objectives
To test-evaluate-fabricate an in-bore stress analyzer to optimize large caliber cannon production; To optimize innovative composite overwrap and dual swage processes for cannon weight reduction. Successful completion of the project delivers an in-bore stress analyzer and optimized process parameters with safe maximum pressure and life.
Supercapacitor for High “G” Gun Launch Munitions

Participants
US Army ARDEC, Picatinny
Project Manager for Excalibur
Raytheon Missile Systems, AZ, USA
Maxwell Technologies, CA, USA

Schedule
Performance Validation Completed 2Q/FY06
Design Integration / Performance Verification 4Q/FY06
Subsystem Rail Gun Survivability Demo 2Q/FY07
System Live Gun Firing Qualification Testing 3Q/FY07
Milestone C (per Excalibur Schedule) 1Q/FY08

Technology
Supercapacitor based power source design.
High G packaging design for artillery gun applications.

Objectives
Eliminate a one shot battery lithium reserve cell power source.
Qualify an unlimited usage and operating life power source.
Demonstrate 20 year storage life survivability of power source.
Demonstrate artillery gun survivability; up thru projectile level.
Modify Excalibur design for new power source integration.
Eliminate the need to expend an expensive projectile within days after initializing it with GPS target coordinates.
Provide the Warfighter with a more versatile projectile at a significant cost savings and increased reliability.

Funding

<table>
<thead>
<tr>
<th></th>
<th>06</th>
<th>07</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO:</td>
<td>354</td>
<td>245</td>
<td>599</td>
</tr>
<tr>
<td>Sponsor:</td>
<td>12</td>
<td>6</td>
<td>18</td>
</tr>
</tbody>
</table>

Benefits
RDT&E Cost Savings: $1.4M (Live gun testing cost avoidance.)
O&S Cost Savings: $1.1M ($36K X 30 fewer rounds discarded.)
Procurement Cost Savings: $5.4M ($179 ea X 30000)
Fielding Reduction: 30 Fewer Rounds @ $36K ea
Procurement Potential: $2.1M (30000 X $71.00 ea)
Other Benefits: Increased factory handling safety since supercapacitor power source approach eliminates battery primer.
## SOCOM 40mm Tactical Marking & Day/Night Training Cartridges FCT Project

### Technology
- Tac Marking: Provides Accurate IR “Gen 3” signal to mark targets at night, effective range of 200 meters
- Support Air-Ground Fire Coordination (especially in urban areas and MOUT) at night
- Training Round: Provides non dud-reducing day + night training cartridge allow operators to train with 40mm weapons at night – M781 PIP

### Objectives
- Qualify a Joint tactical marking cartridge allowing SOF/Army forces to coordinate fires at night time
- Qualify a 40mm day and night training cartridge

### Participants
- U.S. Special Operations Command
- U.S. Army PM Ammunition
- U.S. Army Special Operations Command
- U.S. Naval Special Warfare Command
- NSWC Dahlgren
- NICO Pyrotechnik (Germany)
- Flexi Solutions (New Zealand)

### Comments

<table>
<thead>
<tr>
<th>Funding ($M)</th>
<th>FY05</th>
<th>FY06</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.497</td>
<td>2.629</td>
<td>3.126</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Technical Test</th>
<th>4QFY05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Operational Test</td>
<td>1QFY06</td>
</tr>
<tr>
<td></td>
<td>Milestone C</td>
<td>4QFY06</td>
</tr>
</tbody>
</table>

Procurement Potential: Initial $6.7M USSOCOM/US Army procurement. (additional USMC procurement anticipated)

POC: Mr Bill Burke, (813) 828-9426
PM: Mr Tracy White (540) 653-7920
## SOCOM 84mm Multi-Target Warhead FCT Project

### Technology
- Tandem warhead for 84mm weapon - MAAWS - multiple target capability
- Ability to penetrate 12” triple brick, 8” reinforced concrete and provide “kill behind wall ”capability in urban terrain

### Objectives
- Integrate & evaluate existing components into MT warhead using HEAT751 as baseline
- Full SOF qualification of warhead

### Participants
- U.S. Special Operations Command
- U.S. Naval Special Warfare Command
- U.S Army Special Operations Command
- U.S. Army ARDEC
- Saab Bofors Dynamics, Sweden
- Defense Threat Reduction Agency

### Comments

<table>
<thead>
<tr>
<th>Funding ($K)</th>
<th>FY05</th>
<th>FY06</th>
<th>FY07</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,360</td>
<td>1,580</td>
<td>1,245</td>
<td>5,185</td>
</tr>
</tbody>
</table>

Schedule:
- Technical Testing: 4Q05
- Operational Test: 2Q07
- Milestone C: 3Q07

Procurement Potential: Initial $11M for 5,000 rounds with additional procurement in FY09-11.

POC: Bill Burke (813) 828-9426
PM: Bhuvesh Thoguluva (973) 724-7976
**SOCOM MAAWS Illumination Round Upgrade FCT Project**

**Status**
- US Product Qualification Tests (PQT) nearing completion (both Army and Navy).
- Test streamlining has reduced test hardware requirements.
- Blast Overpressure testing has been completed.
- Anticipate full PQT completion by 2QFY05.

**Technology**
- 84mm illumination round compatible with Multi Role Anti Armor Anti Personnel Weapon System
- Qualify ammunition fuze meeting U.S. safety standards

**Objectives**
- Evaluate an 84mm improved illumination round

**FUNDING**

<table>
<thead>
<tr>
<th>Funding ($K)</th>
<th>Prior FY03</th>
<th>FY04</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO</td>
<td>1240</td>
<td>465</td>
<td>645</td>
</tr>
<tr>
<td>Sponsor</td>
<td>2350</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**BENEFITS**
- RDT&E Cost Savings: $15M
- O&S Cost Savings: $0.5M
- Procurement Cost Savings: $5M
- Procurement Potential: $5.2M in POM. Army adoption will increase POM FY06
- Other Benefits: Increased combat effectiveness & survivability

POC: Mr Bill Burke, (813) 828-9426
PM: Mr Bhuvanesh Thoguluva, (973) 724-7876
### SOCOM 40mm IR and Visual Parachute Flare

#### FCT Proposal

**Participants**
- U.S. Special Operations Command
- Naval Surface Warfare Center Crane
- US Army Special Ops
- USMC
- Nico Pyrotechnik, Germany

**Schedule**
- Technical Test: 4QFY06
- Operational Test: 3QFY07
- Milestone C: 4QFY06

**Technology**
- Provides IR Illumination of battle space and covert signaling.

**Objectives**
- Qualify an IR Flare and its visual variant for use by NAVSPECWARCOM, US Army Special Operations, and USMC.

<table>
<thead>
<tr>
<th>Funding ($K)</th>
<th>FY06</th>
<th>FY07</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO</td>
<td>300</td>
<td>1,500</td>
<td>1,800</td>
</tr>
</tbody>
</table>

**Funding**

- Sponsor: 0

**BENEFITS**

- RDTE Cost Savings: $ TBD
- O&S Cost Savings: $ TBD
- Procurement Cost Savings: $ TBD
- Fielding Reduction: TBD
- Procurement Potential: TBD

RDC: Mr. Bill Burke, (612) 828-9426
PM: Mr. Dennis Lambrecht, (612) 854-5808
**Project Description:**
This joint USMC/USSOCOM FCT will evaluate the integration of improved propulsion system, propellant & Insensitive Munitions with a self destruct fuse into an improved low velocity 40mm HEDP cartridge for use in M79 and M203 Grenade Launchers.

**Benefits to the Warfighter:**
Provides the Warfighter with a more accurate and lethal HEDP cartridge for use against a broad spectrum of targets.

**Schedule:**
- Contract Award: 3rd Qtr FY05
- WSERB Certification: 4th Qtr FY06
- Procurement Decision: 4th Qtr FY06

**Key Participants:**
- Germany, Rhinemetall
- Canada, ARGES
- USMC Joint with USSOCOM
- USAF
- US Army

**Technology:**
Product Improvement Program to the existing 40mm HEDP ammunition.
5.56mm SPECIAL EFFECTS SMALL ARMS MARKING SYSTEM 05 Project

**Project Description**
Evaluate the safety & integration suitability of 5.56mm linked low-velocity training munitions for the M249 Squad Automatic Weapon (SAW).

**Key Participants:**
- Canada, Simunitions
- USMC
- MCWL

**Technology:**
- User installed weapons modification kit that allows the individual Marine to fire, at short range, low velocity marking ammunition, while precluding the weapon from firing live ammunition.

**Benefits to the Warfighter:**
- Provides rifle companies & platoons to integrate training of all small arms weapons (M16/M4, M9 pistol, .45cal pistol etc.)
- Capability to conduct pre-mission training in a more realistic manner

<table>
<thead>
<tr>
<th>Funding Profile</th>
<th>FY03</th>
<th>FY04</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCT ($M)</td>
<td>.420</td>
<td>.330</td>
<td>.750</td>
</tr>
<tr>
<td>Non-FCT Funding</td>
<td>.150</td>
<td>.100</td>
<td>.250</td>
</tr>
</tbody>
</table>
M16A2/M4 Training Bolt 05 Project

Technology
- Designed to prevent accidental chambering & firing of live rounds
- Low cost & SESAMS compatible
- Integration into TRNG w/o any modification

Objectives
- TRNG bolt will replace the current SESAMS upper receiver for the M15A2 & M4 Service Rifle.

Participants
- USMC
- Canada/ SNC Technologies

Comments

Funding: FY05 FY06 FY07 Total
FCT ($M): .395 .395
USMC($M): .175 .175

Schedule: Tech. testing 2Q05 Operat. Assess. 3Q06 Milestone C 1Q06

Procurement Potential ~ $1.6M
7,955 Units @ $200

POC: Ms. Shawn Prablek, 703-432-4296
PM: Mr. Robert Ream, 703-432-3607
**40MM High Explosive Dual Purpose (HEDP) Product Improvement Program 05 Project**

**Project Description**
Integrate an improved propulsion system, propellant, standardized fuze interface and an improved Insensitive Munitions energetic tech into 40mm HEDP for use in MK19 and MK47.

**Key Participants:**
- Norway, NAMMO
- Germany, Nico Pyrotechnic
- Switzerland, Nitrochemie
- SOCOM
- USMC

**Benefits to the Warfighter**
- Increase Performance
- Increase Operator Safety
- Increase Transportation Safety

**Technology:**
- 40mm HEDP PIP for use in the MK19 and MK47

**Schedule: (2004-2007):**
- Contract Award: 3rd Qtr FY04
- WSES RB Certification: 1st Qtr FY07
- Procurement Decision: 4th Qtr FY06
66mm Grenade Discharger, Visual and Infra-red Screening Smoke (VIRSS)
06 FCT Proposal

Technology
An improved 66mm IR Smoke Grenade which is used to conceal armored vehicles on the battlefield, preventing detection in the visual and IR bands against modern threats.

Objectives
Effectively screen armored vehicles and troops on the battlefield from visual and IR detection by enemy forces. Utilize the current USMC 66mm launching system without modification. Qualify a round that is safe for training.

Participants
- USMC
- PM, Ammunition
- USSOCOM
- Rheinmetall RWM, Germany

Schedule
- Technical Test: 4QFY06
- Safety/Environmental Test: 2QFY07
- Milestone C: 4QFY07

Funding

<table>
<thead>
<tr>
<th></th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO:</td>
<td>$370</td>
<td>$500</td>
<td>$0</td>
<td>$870</td>
</tr>
<tr>
<td>Sponsor:</td>
<td>$300</td>
<td>$500</td>
<td>$300</td>
<td>$1,100</td>
</tr>
</tbody>
</table>

Benefits
- RDT&E Cost Savings: $853K
- O&S Cost Savings: $10M/yr
- Procurement Potential: 40,200 Rounds for $4,020M, potential future procurement to Marine Corps AAO of 383,800 Rounds for $38,38M
- Other Benefits: The VIRSS will allow the War fighter to resume training on amphibious ranges with the 66mm IR Smoke Grenade. Currently, the round is used only on the battlefield.
CTG, 7.62mm 4&1 Link (REHA)  
06 DAC Proposal

**Technology**

Cartridge, 7.62mm Lead free (green ammo). The lead free cartridge will solve the environmental problems associated with the use of 7.62mm ammunition that contains lead components.

**Objectives**

- Prevent environmental contamination of lead build up at training ranges
- Reduce the cost for range clean up and lifecycle cost of the cartridge

**Participants**

- USMC
- PM, Ammunition
- Nammo, Norway; ATK, USA; Winchester, USA; Kilgore, USA

**Schedule**

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Quarter FY07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Test</td>
<td>2QFY07</td>
</tr>
<tr>
<td>Filed Test</td>
<td>3QFY07</td>
</tr>
<tr>
<td>Milestone C</td>
<td>4QFY07</td>
</tr>
</tbody>
</table>

**Funding**

<table>
<thead>
<tr>
<th></th>
<th>FY06</th>
<th>FY07</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO:</td>
<td>$250</td>
<td>$0</td>
<td>$250</td>
</tr>
<tr>
<td>Sponsor:</td>
<td>$300</td>
<td>$150</td>
<td>$400</td>
</tr>
</tbody>
</table>

**Benefits**

- **RDT&E Cost Savings**: $8.8M
- **O&S Cost Savings**: $50M
- **Procurement Potential**: 13.2M Rounds for $6.864M
- **Other Benefits**: These rounds will have no compromise in ballistic performance. Qualification of this round will allow for decreased requirements for enclosed firing restrictions.
CTG, 9mm Ball (REHA)  
06 DAC Proposal

Participants

- USMC
- PM Ammo
- Nammo, Norway; ATK, USA; Winchester, USA; Kilgore, USA; Remington, USA; Elk River Corp., USA; Precision Ammunition, USA

Schedule

<table>
<thead>
<tr>
<th>Test Type</th>
<th>FY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Test</td>
<td>2QFY07</td>
</tr>
<tr>
<td>Filed Test</td>
<td>3QFY07</td>
</tr>
<tr>
<td>Milestone C</td>
<td>4QFY07</td>
</tr>
</tbody>
</table>

Technology

Cartridge, 9mm lead free (green) ammo. The lead free cartridge will solve the environmental problems associated with the use of 9mm ammunition that contains lead components.

Objectives

- Prevent lead contamination at training ranges
- Qualify a round that will reduce the need and cost for range clean up and the lifecycle cost of the cartridge

Funding

<table>
<thead>
<tr>
<th>Funding ($K)</th>
<th>&lt;FY&gt;</th>
<th>&lt;FY&gt;</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTO</td>
<td>$250</td>
<td>$0</td>
<td>$250</td>
</tr>
<tr>
<td>Sponsor</td>
<td>$250</td>
<td>$150</td>
<td>$400</td>
</tr>
</tbody>
</table>

Benefits

- RDT&E Cost Savings: $5.8M
- O&S Cost Savings: $65M
- Procurement Potential: 16.8M rounds for $2.184M
- Other Benefits: The round will not compromise any ballistic performance of the previous lead round. The round will allow for decreased requirements for enclosed firing restrictions.
FA Suppressor 06 DAC Proposal

Technology
SUREFIRE sound Suppressor provides the following features; noise and flash reduction, “Fast Attach / detach” mounting solution, limited length added to the weapon system, light weight and allows for no loss of accuracy and minimal impact shift (+/- 1 m.o.a.) of the weapon system. The suppressors have + 10,000 round durability and minor maintains. This system gives the operator the lightweight and maneuverability to be more effective in combat.

Participants
USMC
PM, Infantry Weapons
Surefire, LLC., Fountain Valley, CA

Funding
Funding ($K): FY06 Total
CTO: $500 $500
Sponsor

Benefits
RDT&E Cost Savings: $1.8M
Fielding Reduction: 6 months
Implementation Plan/Other Benefits: The FA Suppressor by Surefire gives the operator a suppression system that produces no flash, can be mounted on the weapon for continued operation, quick attach/release, and durability so that it does not have to be removed in combat. It will also increase the accuracy of there system.