Dragon Fire Experiment
Background

- Developing Government-designed advanced artillery system for future combat
- First Dragon Fire designed by Army Armament Research Development and Engineering Command (ARDEC) Picatinny Arsenal and fabricated at Rock Island Arsenal in 1998
- World’s first automated towed artillery system: conducted first “sensor-to-shooter” fire missions
- New Dragon Fire II in design as potential Expeditionary Fire Support System (EFSS)
Dragon Fire History

1997 - Mid-1998

MCWL Design initiative

1998

Fabricated at RIA

1998

Firing tests and Operational Assessments

2001-2002

LAV Modular Design
Dragon Fire II Design

2003

DF II/LAV Fabrication at RIA

2004
MCWL Experiments

- Developed Dragon Fire using parts from a French Army rifled 120mm mortar
- Integrated communications, fire control, automatic aiming
- Over 1,000 rounds fired to test system, concept of automating fires
- New standards in responsiveness, mobility, and precision
Dragon Fire
Design Approach

- **Automated Fire Control and aiming**: First-round hit every time/reduced crew requirements
- **Automated fire mission processing and weapon control**: fastest possible response (less than one minute from request to impact): linked directly to AFATDS
- **Expeditionary mobility**: Fits within MV-22 Osprey; LAV system fits in C-130, compact and effective – requires only ammunition and crew to support fire missions
- **Modularity**: Same system flies with air-mobile units, then fits into Light Armored Vehicle (LAV) to support mobile forces.
- **Growth**: improvement of system by replacing modules
- **Designed from the outset to be a Government-developed, Government-produced system for maximum control, flexibility**
Dragon Fire II Firing Position

- Ring Laser Gyro Aiming System
- Semiautomatic Loader
- Cannon
- Elevation Actuator Envelope
- Access Hatches (Electronic Connectors)
- GPS and Fire Control System
- Surge Brake Cylinder
- Spike
- Emplaced Trail
- Tires Rotated 45° Out of Way
- Battery Box
- Azimuth Actuator Envelope
Dragon Fire II Towed Configuration

- Stowed Trail
- Ammunition Tray
- Control Panel
- Radar Velocimeter
- Gun in Stowed Position (5° Elev)
- Suspension System in Ride Configuration
- Hydrostrut
Dragon Fire and the Light Armored Vehicle (LAV)
Modular Firing System
Mission Adapted Configuration

Dragon Fire as towed, Air transportable system

Dragon Fire loaded into LAV
5 minute transition to become armored, self-propelled system
DF II Fire Control System

**Gunner's Display**
- New development
- Regulates system power
- Displays mission information, round type, charge, and fuse type
- Used to position tube to firing elevation & azimuth

**Power Distribution Assembly**

**Digital & Voice Communications**
- Translates digital messages into user prompts
- Calculates ballistics, records mission data
- Monitors system components

**Mission Computer System**
- Calculates ballistics, records mission data
- Monitors system components

**Navigation & Pointing Devices**
- TALIN 5000 HG
- Measures vehicle location & tube orientation
- Sends information to CI for ballistic calculations and vehicle location (for Situational Awareness)

**Increased Mortar…**
- Dispersed emplacement (beyond line of sight)

**Ethernet Switch**

**Main Processor CROW 2000**

**Serial Control Hub**

**Data Collection Node**

**Digitally Integrates Mortars Into Mobile Fire Support**

**FDC not shown**
DF II Project Objectives

- Continue development of LAV Modular Mortar Variant using Dragon Fire technologies
- Enter into EFSS development as producible system or insertion of technologies
- Technology Development in support of experimentation/transformation
Growth capabilities for Fire Support Technologies

• System is fired electronically: Time on Target, groups, series, SEAD/mark missions can be fired on the millisecond
• Guns can be “networked” to function as a single unit for special configuration targets, effects mapping, precise single impact times
• Linear and area targets can be attacked precisely
• “Fire on the Move” from the LAV platform
What are the Advantages?

• The same weapon system can be used for air-lifted long-distance support and for self-propelled high-speed support
• Since DF II uses both rifled and smoothbore 120mm ammunition it can use anybody’s ammo
• The fire control system is designed to network with the Army’s fires coordination system for fast target processing and to ensure that friendlies are not targeted (force protection)
• DF II on the Light Armored Vehicle with Fire on the Move can transform the way we engage enemies in the future
Advanced Area Fires

Preparation Fires

Objective A

Scan the area in or trace it on the map display

440m

830m
Advanced Area Fires

Individual aimpoints computed, passed
From master system to firing units (98 rounds)

For one 6-gun battery, program executed in 4 minutes
For one 18-gun battalion, 1 ½ minutes
Every square meter of the ground hit by effects
Advanced Area Fires

As maneuver moves onto the objective, system precisely phases fires forward.
Saved Rounds?