



Marine Corps Warfighting Laboratory



Dragon Fire II Experimental System NDIA Briefing





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

2001-2002

Firing tests and
Operational Assessments

2003

LAV Modular Design
Dragon Fire II Design

2004

DF II/LAV Fabrication at RIA





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





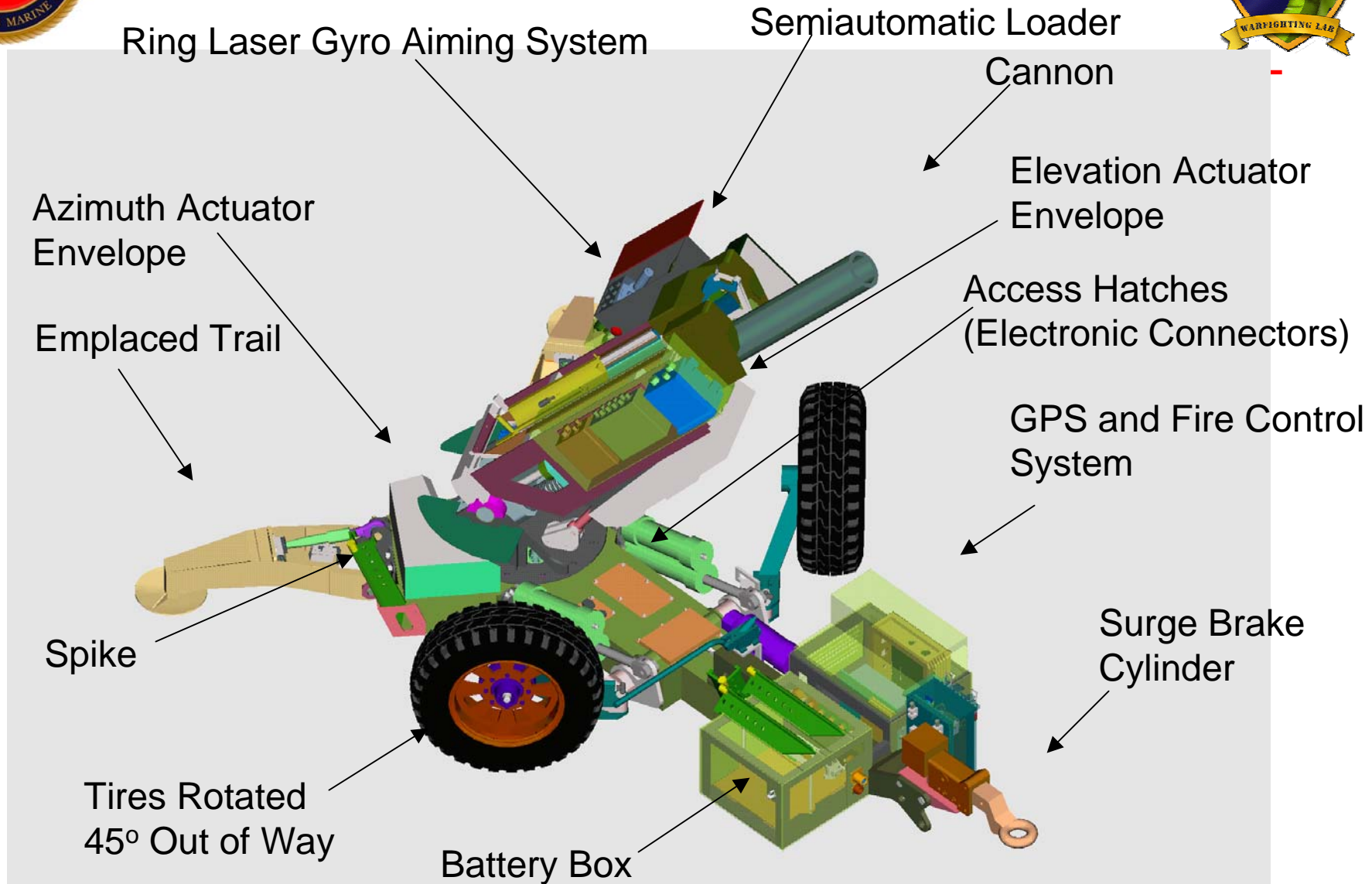
Dragon Fire Design Approach



- **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





Dragon Fire II Towed Configuration



Stowed Trail

Ammunition Tray

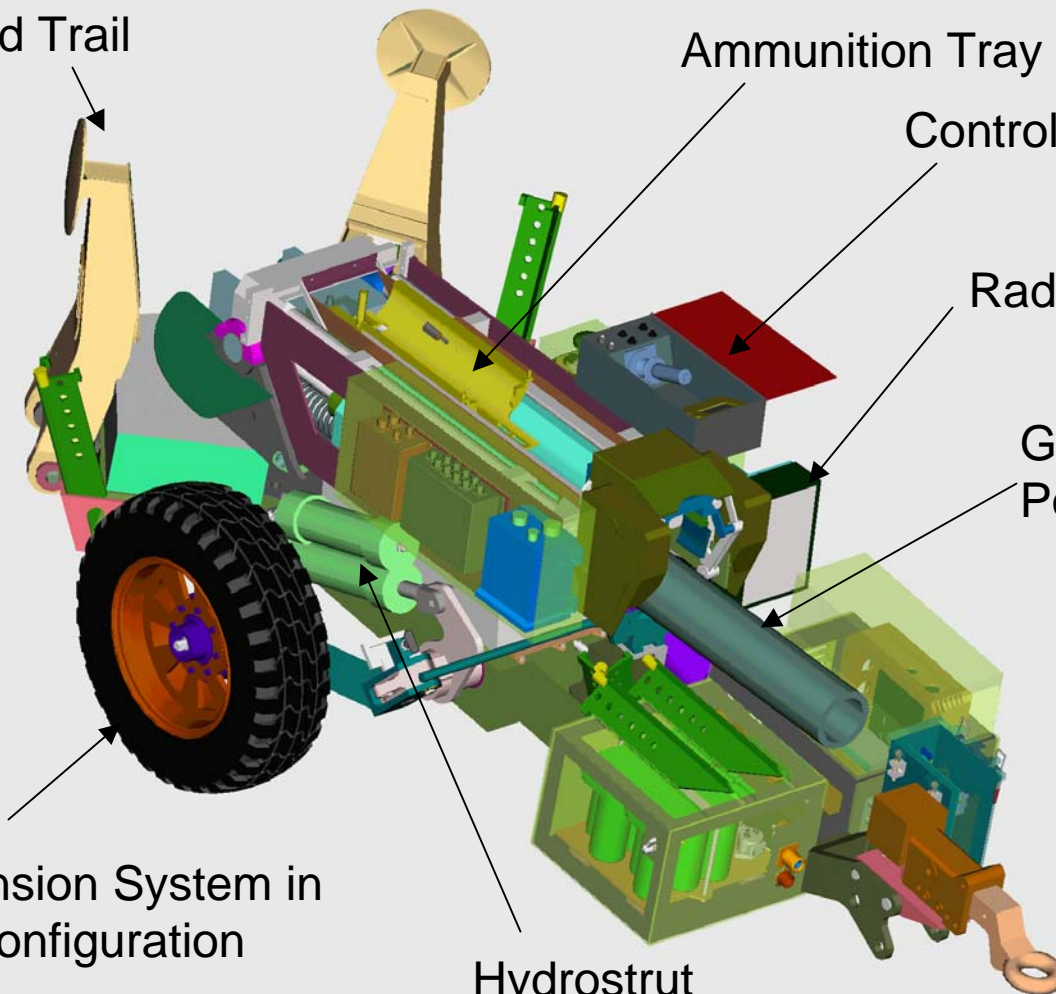
Control Panel

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

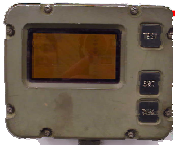




DF II Fire Control System



Gunner's Display



Displays mission information, round type, charge, and fuse type

Used to position tube to firing elevation & azimuth

Power Distribution Assembly

New development

Regulates system power

Digital & Voice Communications



Mission Computer System

Translates digital messages into user prompts

Calculates ballistics, records mission data

Monitors system components



Main Processor CROW 2000

Ethernet Switch



Data Collection Node



Serial Control Hub



Navigation & Pointing Devices



TALIN 5000 HG

Measures vehicle location & tube orientation

Sends information to CI for ballistic calculations and vehicle location (for Situational Awareness)



Digitally Integrates Mortars Into Mobile Fire Support

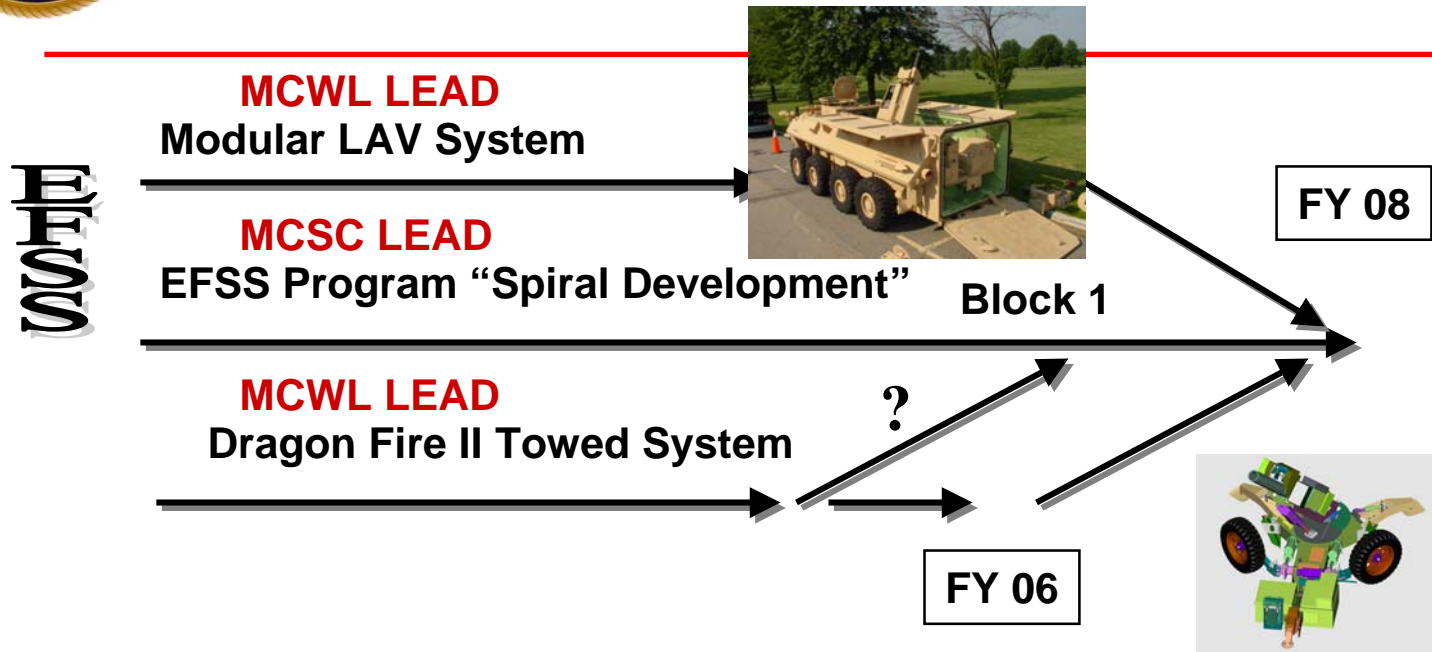
Increased Mortar ...

Dispersed emplacement (beyond line of sight)

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



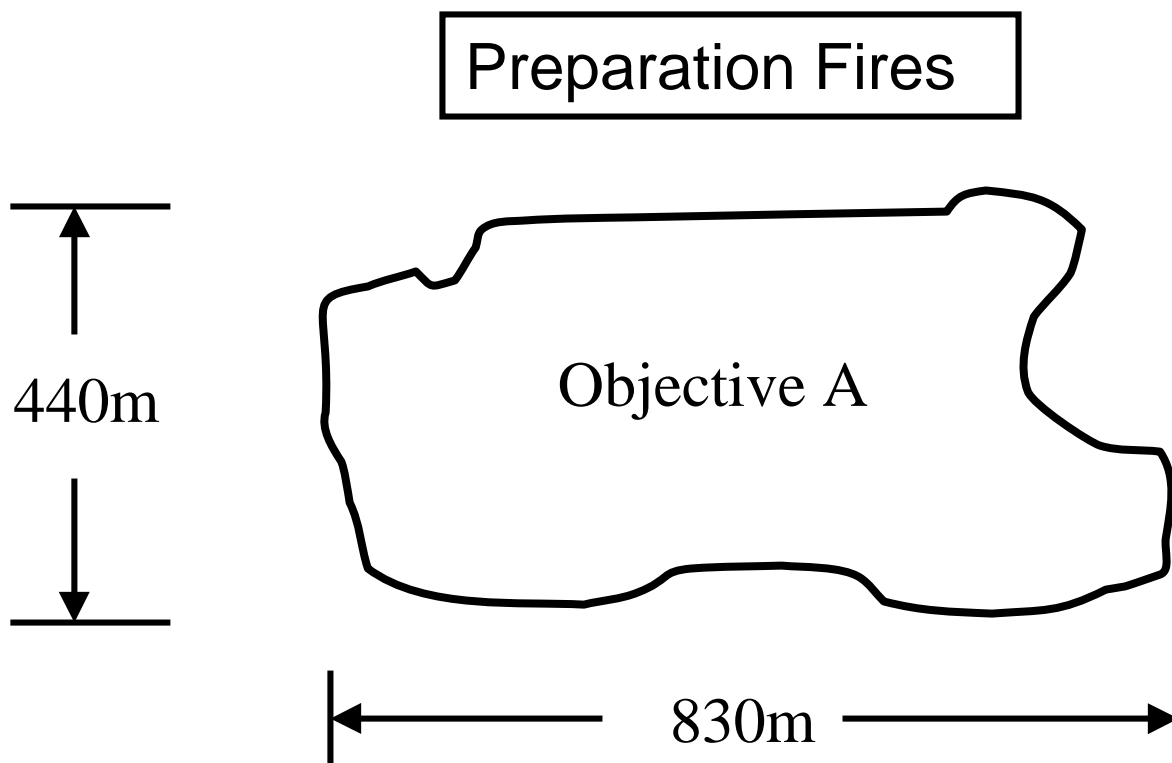
What are the Advantages?



- 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

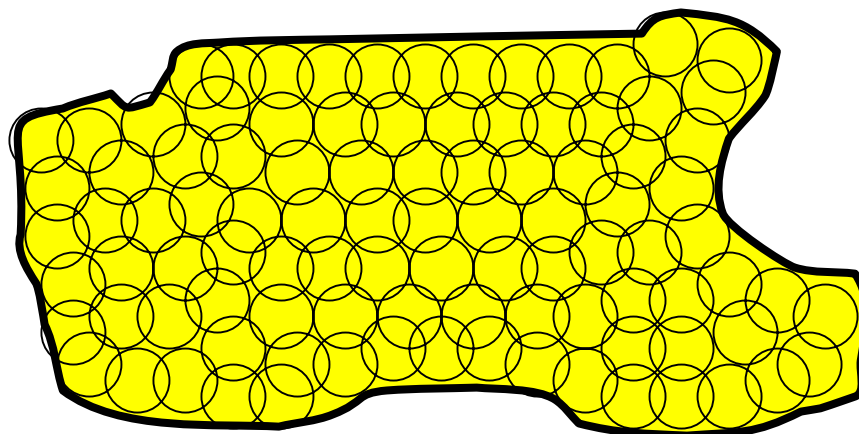


Scan the area in or trace it on the map display



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

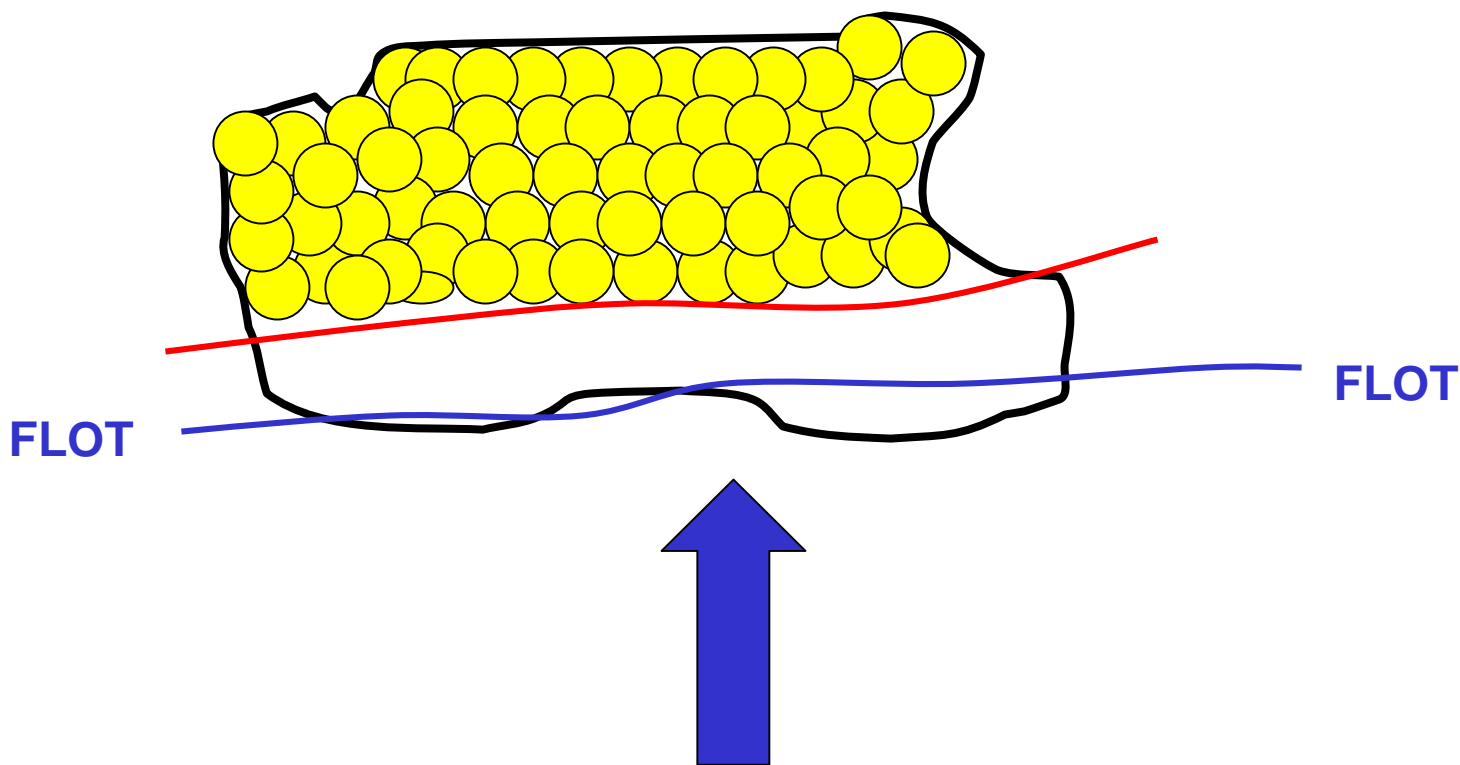
For one 18-gun battalion, 1 ½ minutes

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?

