



RDECOM

Armaments Technology Fire Power Forum

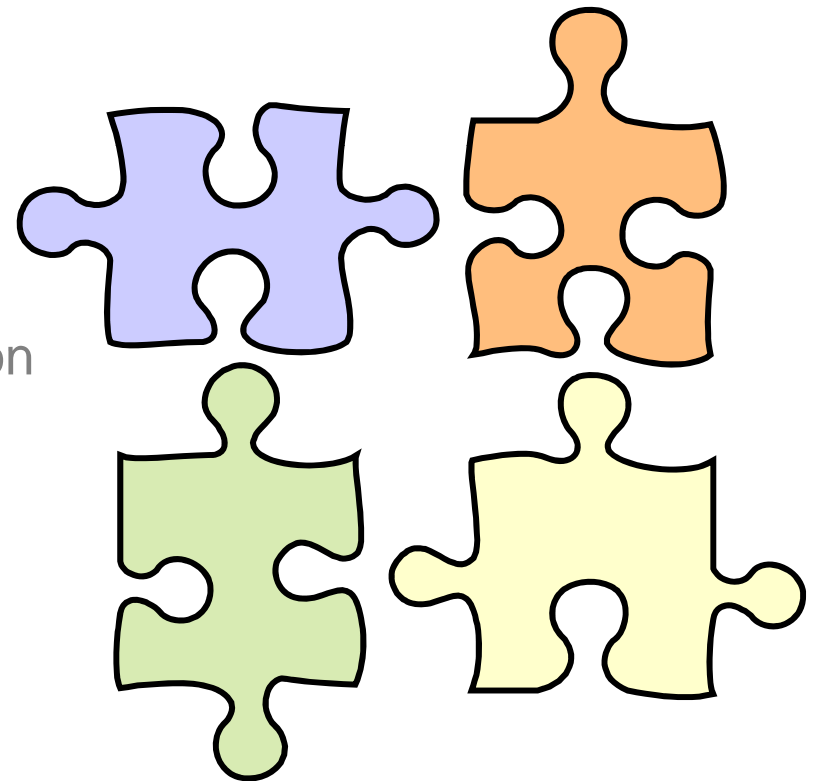


TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

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DISTRIBUTION A: Approved for Public Release.

- Fielded
 - Remote Weapon System (RWS)
 - Gun Fire Detection Integration
- Enabling Technologies
 - Platform Integration
 - Advanced RWS
 - Robotic Integration & Weaponization
- Challenges
- Summary





Remote Weapon Systems (RWS)



Description

- Compatible with M2, Mk19, M240 and M249
- Readily integrated with multiple platforms (MRAP, Abrams, HMMWV)
- Three-Axis Vector Stabilization
- Auto Focus (Day and Thermal)
- Uncooled Thermal Imager
- Auto Track, - Lead, - Scan



Protector M151



CROWS XM153

Warfighter Payoff

- Warfighter protection (operates weapon under armor)
- Enhanced target acquisition, identification, and engagement
- Enhanced situation awareness - both day and night
- Shoot-on-the-move

US Army has fielded Remote Weapon Systems



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**XM154 Vanguard Counter
Sniper System**

Warfighter Payoff

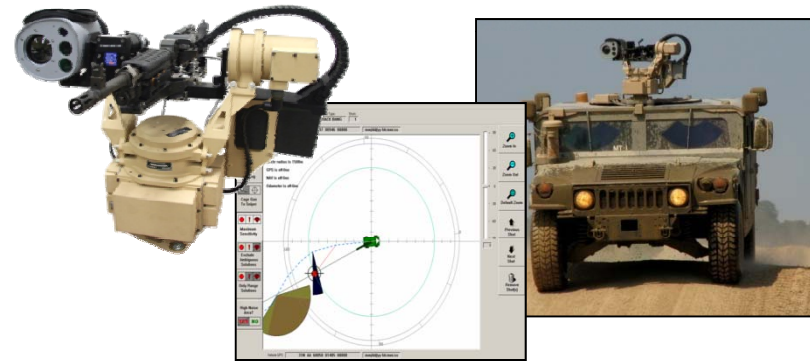
- User can operate the weapon from within the safety of the vehicle
- Provides passive gun fire detection while on the move, with hemispherical coverage
- Track detected shots while on the move and provide Slew-to-Cue capability
- Can be mounted on HMMWVs and MRAPs

- ARDEC is actively involved with sensors integration to address emerging warfighter requirements

Description

- Locate, Identify And Cue Up The Remote Weapon Station
- RWS integration with C2 system and Gun-fire Detection
- Counter Sniper ONS, fielding 679 systems, plus spares

CROWS Lightning / PD Cue





ARDEC Fielding Support To PM Soldier Weapons



- **Test support**
 - In-house laboratory and firing tests
 - APG safety and performance tests
- **System safety support**
 - Identify and remedy potential failure modes
 - Hazard tracking
 - Quality Engineering Center
 - Human factors
- **Weapon integration**
 - Physical integration to mount
 - Monitor configurations for potential interferences
 - Ammo stowage and feed mechanisms
- **Technical support**
 - Mechanical and electrical subsystems
 - Platform integration
 - Software development and test
 - Configuration management
- **Logistics support**
 - Technical Manuals
 - Spare Parts
 - Reliability tracking
 - Diagnostic/repair equipment

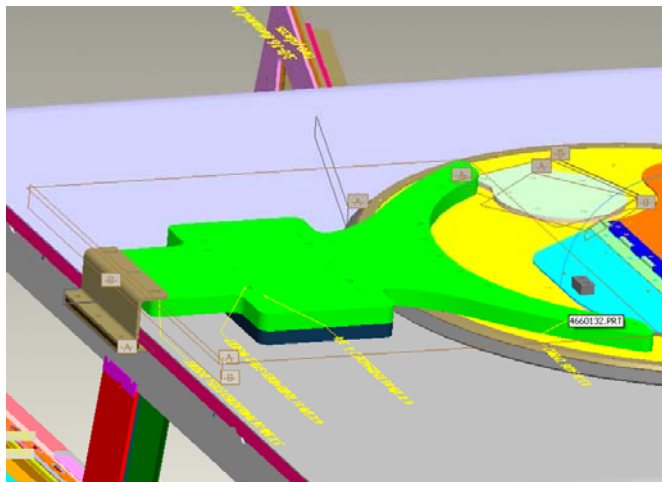
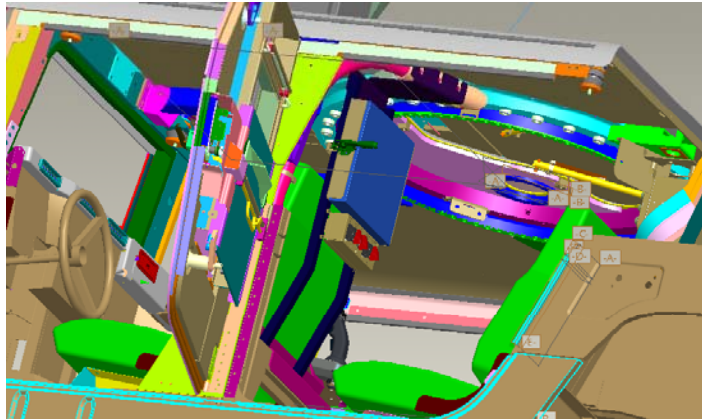


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- Integrated systems on various manned and unmanned platforms
- Each platform presents unique issues
 - Power takeoffs
 - Interior space claims for ECUs, displays, etc.
 - Roof and internal structures
 - No fire zones / motion inhibits
 - Hatches
 - Vehicle dynamics
 - EMI



ARDEC Developed HMMWV Vehicle Integration Kit



PRO Engineer Models

Hardware

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Vehicle Integration



CROWS on M1A2 Tank



CROWS on M1114 HMMWV



CROWS on M1151 HMMWV



M151 on Stryker Platform



CROWS on RG31

• **Platform requirements are consistently changing per mission and theater requirements.**

Additional platforms targeted and fielded with CROWS:

- PM Light Tactical Vehicles – M1114, M1151
- PM Assured Mobility Systems - RG31, Buffalo, JERRV, MMPV
- JPO Mine Resistant and Ambush Protected - Caiman, MaxxPro (+), RG33L, Cougar, MATV
- JPM NBC Contamination Avoidance - Fox M93A1

Other Services: SOCOM, USAF, UMSC/DOE/JLTV

Picatinny Lightweight RWS

- Weight: 160 lb
- Slew rates:
 - Azimuth: >200 deg/s
 - Elevation: > 160 deg/s
- EI Range: -20 to 45 deg
- Az Range: Continuous 360 deg
- Weapons: M240, M249 and FN 303
- Sensor suite: Day camera
- Can be integrated:
 - FLIR
 - Laser range finder
 - Stabilization



Advance Remote/Robotic Armament System

- Remote weapon re-load and ammo type change
- Improved weapon reliability & safety
- Theft resistant weapon and ammunition
- Enables low energy propulsion munitions (non lethal)
- Design allows weapon super elevation to 90°
- Maximize internal ammo stowage (1500 - 7.62rds)

PLWRWS integrated on RIPS AW



System Description:

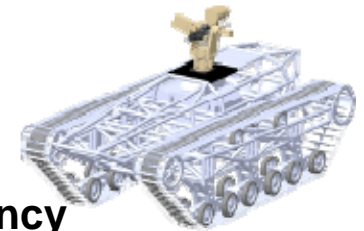
- Modular Common Platform that can support multiple mission profiles
- Tele-Operated via a Remote Command Center
- Large Class (payload of 2000 lbs)
- Fast - speeds up to of 60mph
- Agile - Zero Turn Radius
- All Terrain and Rugged

ARDEC Partnership

- Platform was developed by the Howe and Howe Technologies, Inc
- Teamed with TARDEC
- ARDEC has integrated
 - Picatinny Light Weight Remote Weapon Station (PLWRWS)
 - Modular Crown Control Munitions (MCCM)
 - Remote Reality 360° camera
 - Counter IED Sensors



Command Center



•RF Link management, Weapon control, System latency, Emergency stop, Communication interference among other systems, Weapon safety in degraded modes, Operator interface

- Technical
 - Integrating state-of-the-art technologies to satisfy warfighter requirements
 - Improve secure communication bandwidth and range
- Safety
 - Eliminate single point failures
 - User in the loop
- Quality and Testing
 - Facilities and evaluation criteria required to test latest Armed Remote/Robotics technologies

Pulling the pieces together

- ARDEC is actively engaged in the integration of Remote Armament Systems on both manned and unmanned vehicles
- ARDEC has unique capabilities to provide remote armaments solutions for robotic platforms
 - Emerging technologies
 - Development programs
 - Network lethality
 - System Safety Certification
- ARDEC is partnering with OGAs and Industry
 - CRADAs – Foreign & Domestic

